UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE COMMISSION, Plaintiff, v. RIPPLE LABS INC., BRADLEY GARLINGHOUSE, and CHRISTIAN A. LARSEN, Defendants.	**20-cv-10832 (AT) (SN)** **(S.D.N.Y.)**

DECLARATION OF JOHN E. DEATON

I, John E. Deaton, hereby declare under penalty of perjury pursuant to 28 U.S.C. § 1746 that the following is true and correct:

1. I am an attorney admitted to practice before this Court *pro hac vice* and the managing partner of the Deaton Law Firm LLC, and I am counsel for amici curiae in the above-captioned action.

2. I respectfully submit this declaration in support of amici's brief in opposition to the Securities and Exchange Commission's (SEC) Motion for Summary Judgment against all Defendants (ECF 639, 640).

3. Attached hereto as **Exhibit A** is a true and accurate copy of Duggan, W. (n.d.). *The History of Bitcoin, the First Cryptocurrency*. U.S. News. Available at https://money.usnews.com/investing/articles/the-history-of-bitcoin

4. Attached hereto as **Exhibit B** is a true and accurate copy of *Former SEC Commissioner Grundfest's Dec. 17, 2020 Ltr. to SEC Chairman Clayton*. Available at CryptoLaw. https://www.crypto-law.us/wp-content/uploads/2021/12/FOIA-12092020-Grundfest-Ltr-to-SEC-Commsnrs-Copy.pdf

5. Attached hereto as **Exhibit C** is a true and accurate copy of (2020) *Selected SEC Accomplishments: May 2017 – December 2020*. U.S. Securities and Exchange Commission. Available at https://www.sec.gov/selected-sec-accomplishments-may-2017-2020

6. Attached hereto as **Exhibit D** is a true and accurate copy of McKenzie, W. (2018) *Ethereum, the ICO craze of 2017 and the Platform Wars*. Medium. Available at https://medium.com/@williammckenzie1997/ethereum-the-ico-craze-of-2017-and-the-platform-wars-d3c79fc2cf93

7. Attached hereto as **Exhibit E** is a true and accurate copy of (2015) *Attachment A: Statement of facts and violations*. U.S. Financial Crimes Service Network. Available at https://www.fincen.gov/sites/default/files/shared/Ripple_Facts.pdf

8. Attached hereto as **Exhibit F** is a true and accurate copy of (2014) *GAO Virtual Currencies Report: Emerging Regulatory, Law Enforcement, and Consumer Protection Challenges*. U.S. Government Accountability Office. Available at https://www.gao.gov/assets/gao-14-496.pdf

9. Attached hereto as **Exhibit G** is a true and accurate copy of (2015) *Coinflip, Inc. et al*, CFTC Docket No. 15-29, *Order Instituting Proceedings Pursuant To Sections 6(C) And 6(D) Of The Commodity Exchange Act, Making Findings And Imposing Remedial Sanctions*. U.S. Commodity Futures Trading Commission. Available at https://www.cftc.gov/sites/default/files/idc/groups/public/@lrenforcementactions/documents/legalpleading/enfcoinfliprorder09172015.pdf

10. Attached hereto as **Exhibit H** is a true and accurate copy of (2019) *2019 Annual Report.* U.S. Financial Stability Oversight Council. Available at https://home.treasury.gov/system/files/261/FSOC2019AnnualReport.pdf

11. Attached hereto as **Exhibit I** is a true and accurate copy of (2021) *Bailard, Inc. Code of Ethics*. U.S. Securities and Exchange Commission. Available at https://www.sec.gov/Archives/edgar/data/1048702/000119312521047532/d119950dex9928p7.htm

12. Attached hereto as **Exhibit J** is a true and accurate copy of Bambrough, B. *Ripple (XRP) overtakes Ethereum as second largest cryptocurrency on CEO's bullish bet*. Forbes. Available at https://www.forbes.com/sites/billybambrough/2018/09/26/ripple-xrp-overtakes-ethereum-as-second-largest-cryptocurrency-on-ceos-bullish-bet/?sh=52bedbaa1c22

13. Attached hereto as **Exhibit K** is a true and accurate copy of (2018) *Cryptocurrency Market Capitalizations*. CoinMarketCap. Available at https://web.archive.org/web/20180103125710/https:/coinmarketcap.com/

14. Attached hereto as **Exhibit L** is a true and accurate copy of Lewitinn, L. (2019) *Coinbase announces acceptance of XRP, ripple ensues*. Modern Consensus. Available at https://modernconsensus.com/cryptocurrencies/xrp/coinbase-pro-xrp-trading-ripple/

15. Attached hereto as **Exhibit M** is a true and accurate copy of (2019) *Securities Purchase Agreement By and Between MoneyGram International, Inc. and Ripple Labs Inc.* U.S. Securities and Exchange Commission. Available at https://www.sec.gov/Archives/edgar/data/1273931/000119312519174813/d766773dex101.htm

16. Attached hereto as **Exhibit N** is a true and accurate copy of (2019) *MoneyGram Announces Strategic Partnership with Ripple.* U.S. Securities and Exchange Commission. Available at https://www.sec.gov/Archives/edgar/data/1273931/000119312519174813/d766773dex991.htm

17. Attached hereto as **Exhibit O** is a true and accurate copy of (2020) *MGI February 24, 2020 Earnings Report*. MoneyGram International, Inc. Available at https://ir.moneygram.com/node/20741/html

18. Attached hereto as **Exhibit P** is a true and accurate copy of SEC Office of Investor Education and Advocacy Email correspondence.

19. Attached hereto as **Exhibit Q** is a true and accurate copy of Wang, N. (2021) *Gensler Says Most Crypto Trading Platforms Need to Register With SEC*. CoinDesk. Available at https://www.coindesk.com/policy/2021/09/13/gensler-says-most-crypto-trading-platforms-need-to-register-with-sec/

20. Attached hereto as **Exhibit R** is a true and accurate copy of Beyoud, L. (2022) *SEC's Gensler Steps Up Push to Get Crypto Exchanges to Register With Regulator*. Bloomberg. Available at https://www.bloomberg.com/news/articles/2022-07-28/sec-chair-gensler-hardens-line-on-crypto-exchange-registration?leadSource=uverify%20wall

21. Attached hereto as **Exhibit S** is a true and accurate copy of Price, M. (2022) *Crypto intermediaries should register with U.S. SEC, agency chair says*. Thomson Reuters. Available at https://www.reuters.com/technology/crypto-intermediaries-should-register-with-us-sec-agency-chair-says-2022-09-08/

22. Attached hereto as **Exhibit T** is a true and accurate copy of Hadjiloizou, L. (2020) *The XRP TipBot lives on through Uphold*. XRP Arcade. Available at https://www.xrparcade.com/news/the-xrp-tipbot-lives-on-through-uphold/

23. Attached hereto as **Exhibit U** is a true and accurate copy of Khatri, Y. (2021) *Time Magazine now accepts bitcoin and other cryptocurrencies for digital subscriptions*. The Block. Available at https://www.theblock.co/linked/102166/time-magazine-bitcoin-digital-subscription-payments

24. Attached hereto as **Exhibit V** is a true and accurate copy of (2022) *XRP directory - Top companies accepting XRP*. Cryptwerk. Available at https://cryptwerk.com/pay-with/xrp/

25. Attached hereto as **Exhibit W** is a true and accurate copy of GlobaliD. (2021) *Introducing the XRP MasterCard® Debit Card*. Medium. Available at

https://medium.com/global-id/introducing-the-xrp-mastercard-debit-card-827c0b37445b

26. Attached hereto as **Exhibit X** is a true and accurate copy of Pirus, B. (2020) *Uphold's New Debit Card Lets You Pay With Bitcoin, XRP and Gold*. Cointelegraph. Available at https://cointelegraph.com/news/upholds-new-debit-card-lets-you-pay-with-bitcoin-xrp-and-gold

27. Attached hereto as **Exhibit Y** is a true and accurate copy of (2022) *FTX Partners With Visa To Offer XRP And BTC To Millions Of Users*. ProCoinNews. Available at https://procoinnews.com/ftx-partners-with-visa-to-offer-xrp-and-btc-to-millions-of-users/

28. Attached hereto as **Exhibit Z** is a true and accurate copy of Weeks, R. (2020) *Andreesen Horowitz-backed Deel launches crypto payroll tool*. The Block. Available at https://www.theblock.co/linked/84255/andreesen-horowitz-backed-deel-launches-crypto-payroll-tool

29. Attached hereto as **Exhibit AA** is a true and accurate copy of *BigCommerce Support - Connecting with BitPay*. BigCommerce. Available at https://support.bigcommerce.com/articles/Public/Connecting-with-BitPay

30. Attached hereto as **Exhibit BB** is a true and accurate copy of a Coinbase advertisement promoting the utility of XRP for international transfers

31. Attached hereto as **Exhibit CC** is a true and accurate copy of Alexandre, A. (2019) *Coinbase Expands Into Cross-Border Payments*. Cointelegraph. Available at https://cointelegraph.com/news/coinbase-expands-into-cross-border-payments

32. Attached hereto as **Exhibit DD** is a true and accurate copy of Haselton, T. (2018) *How to buy XRP, one of the hottest bitcoin competitors*. CNBC. Available at https://www.cnbc.com/2018/01/02/how-to-buy-ripple.html

33. Attached hereto as **Exhibit EE** is a true and accurate copy of Khanzadaev, G. (2022) *XRP Can Now Be Easily Bought in Europe Straight from Bank Account, Here's How*. U.Today. Available at https://u.today/xrp-can-now-be-easily-bought-in-europe-straight-from-bank-account-heres-how

34. Attached hereto as **Exhibit FF** is a true and accurate copy of (n.d.) *XRPL Use Cases - Powering Innovation Technology*. XRPL.org. Available at https://xrpl.org/uses.html

35. Attached hereto as **Exhibit GG** is a true and accurate copy of (n.d.) *Binance Rewards - Calculate your crypto earnings*. Binance. Available at https://www.binance.com/en/earn/xrp

36. Attached hereto as **Exhibit HH** is a true and accurate copy of (n.d.) *Get a Loan Backed by Your XRP*. CoinLoan. Available at https://coinloan.io/crypto-backed-loans/xrp-loan/

37. Attached hereto as **Exhibit II** is a true and accurate copy of Ponnezhath, M., & Wilson, T. (2022) *Major crypto lender Celsius files for bankruptcy*. Thomson Reuters. Available at https://www.reuters.com/technology/crypto-lender-celsius-files-bankruptcy-2022-07-14/

38. Attached hereto as **Exhibit JJ** is a true and accurate video clip of Gary Gensler, *Ethics and Governance in the Blockchain Era, Gary Gensler, MIT, April 23, 2018* https://www.youtube.com/watch?v=Bx4Q19xA7Oc

39. Attached hereto as **Exhibit KK** is a true and accurate copy of *Gensler Remarks*. SEC Emblem. (2021, August 3) available at https://www.sec.gov/news/speech/gensler-aspen-security-forum-2021-08-03

40. Attached hereto as **Exhibit LL** is a true and accurate copy of *XRPL services*. XRPL Services. (n.d.). Available at https://xrpl.services/xrpl-statistics

Executed on November 15, 2022, in East Providence, Rhode Island.

Respectfully Submitted,

/s/John E. Deaton

John E. Deaton (*admitted pro hac vice*)
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Attorney for Amicus Curiae, XRP Holders

Exhibit A

The History of Bitcoin, the First Cryptocurrency

There have been many ups and downs in Bitcoin's relatively short history.

By Wayne Duggan

Aug. 31, 2022

In 2010, Bitcoin first became available to buy, sell and trade on online exchanges. (DAN KITWOOD/GETTY IMAGES)

Bitcoin (BTC) was the first cryptocurrency ever created back in 2009, and it remains the most popular and valuable digital currency in the world today. Bitcoin is a blockchain-

based decentralized digital currency powered by a network of users who verify and record transactions without relying on a central authority or intermediary.

Bitcoin is an alternative to fiat currencies, such as the U.S. dollar, that are controlled by governments and central banks. Transactions are verified via a process known as a proof-of-work consensus mechanism. Bitcoin miners compete to verify transactions by solving complex mathen ers.

Some Bitcoin enthusiasts simply see the crypto as a fun asset for trading and speculation, while others believe it could ultimately become the universal currency of the digital world. There's no question Bitcoin has had a meteoric rise in popularity since its inception, but the first 13 years have also exposed several key flaws and shortcomings of the world's most popular digital asset.

Here's an overview of several of the key eras in Bitcoin's brief history and how they may affect its future:

- When did Bitcoin start?
- Bitcoin price history.
- 2022 Bitcoin crypto winter.
- Bitcoin price predictions.

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When Did Bitcoin Start?

It's no coincidence that Bitcoin was born during one of the most chaotic financial environments in U.S. history. During the global financial crisis of 2007 to 2009, distrust of banks and central governments was at a peak.

Bitcoin was created in 2009 by a person or group of people using the pseudonym Satoshi Nakamoto, the name which appeared on the original 2008 Bitcoin white paper that first described the blockchain system that would serve as the backbone of the entire cryptocurrency market.

Over the years, several people have stepped forward claiming to be the real Satoshi Nakamoto, but none could provide sufficient evidence to support their claims.

The Bitcoin blockchain was officially launched when the first Bitcoin block, the genesis block, was created on Jan. 3, 2009. In the first seven months following Bitcoin's launch, Satoshi reportedly mined up to 1.1 million Bitcoins. At August 2022 prices, those coins would now be worth about $22 billion.

Joshua Peck, founder and chief investment officer of cryptocurrency hedge fund TrueCode Capital, says early Bitcoin enthusiasts were captivated with its design, even if they weren't exactly certain of what it was going to actually be.

"It had some economic value, but I was looking at it more from an engineering perspective thinking that we could use it for secure message passing or getting strong cryptography into the hands of everyday users, so the financial value was somewhat secondary," Peck says.

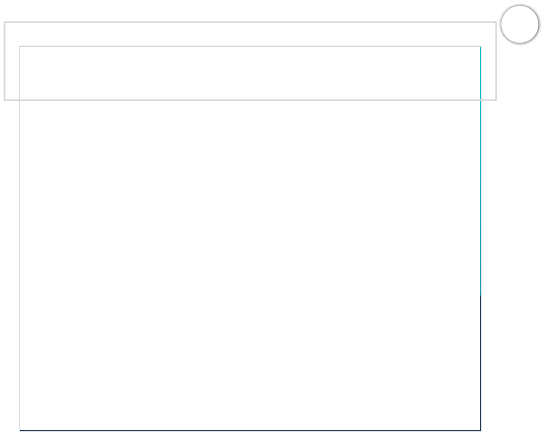
The first reported real-world financial transaction involving Bitcoin took place on May 22, 2010, when a Florida man negotiated to pay 10,000 BTC for two Papa John's pizzas priced at about $25. That transaction valued the price of one Bitcoin at roughly a fourth of a cent. To this day, the Bitcoin community celebrates Pizza Day on May 22.

"Over time, the financial value became more broadly understood and, of course, today it has become the cornerstone of the fastest-growing asset class of my generation," Peck says.

Bitcoin Price History

Bitcoin first became available to buy, sell and trade on online exchanges in 2010. In April 2011, the price of Bitcoin crossed the $1 threshold for the first time.

Bitcoin also faced its first competition in the crypto space in 2011. Litecoin (LTC) was launched in October 2011. The Ethereum blockchain went live several years later in 2015.



As Bitcoin's price continued to rise, so too did its visibility, popularity and volatility. By November 2013, Bitcoin prices reached $1,000. Bitcoin prices and trading volumes really started to snowball in late 2017 – with prices hitting $10,000 per coin for the first time in November 2017 – and reached about $20,000 in December 2017.

One of the driving forces behind the parabolic rise in Bitcoin prices was an announcement by CME Group Inc. (ticker: CME) that it would be launching Bitcoin futures contracts in December 2017. These contracts represented the first Bitcoin-related financial product offered by a regulated U.S. financial institution.

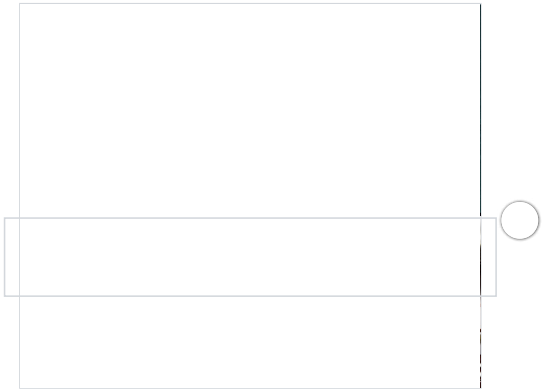
Jarek Hirniak, founder and CEO of Generation Lambda, says Bitcoin followed a common innovation trajectory known as the Gartner Hype Cycle. According to the model, as a new technology such as Bitcoin gains visibility, expectations initially soar to an unreasonably high level.

"At first, most people ignore it, and then suddenly everyone gets more excited until it becomes obvious that promises can't keep up with reality," Hirniak says.

"Such a situation and lack of liquidity, combined with little regulation, made it ripe for market manipulation."

In late 2017, excitement, hype and a crypto market frenzy created the perfect storm for an asset bubble. Many startups took advantage of the cryptocurrency boom to raise money via initial coin offerings, or ICOs. In 2017 and 2018, more than 800 ICOs raised roughly $20 billion in funding. The ICO space was plagued by outright frauds and scams, and the value of many of these ICO tokens collapsed within a year.

By the end of 2018, the bursting of the crypto bubble had dragged Bitcoin prices back down to less than $4,000 per coin.



[**SEE:** 7 of the Best Cryptocurrencies to Buy Now.]

2022 Bitcoin Crypto Winter

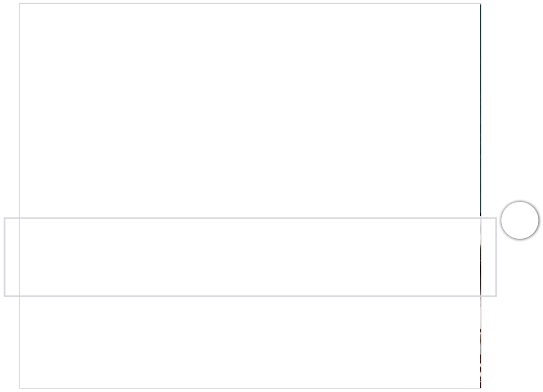
The next major boom in Bitcoin popularity came during the COVID-19 pandemic in late 2020. Extended shutdowns of entertainment and leisure businesses such as sports and casinos coupled with multiple rounds of government economic stimulus payments left many younger Americans with extra disposable income and time on their hands, which helped fuel another surge in Bitcoin prices in late 2020.

The ProShares Bitcoin Strategy ETF (BITO), the first Bitcoin exchange-traded fund, or ETF, to launch on a major U.S. exchange, began trading in October 2021. The BITO ETF launch was followed by several other cryptocurrency futures ETF launches, including the Valkyrie Bitcoin Strategy ETF (BTF), the VanEck Bitcoin Strategy ETF (XBTF) and the Global X Blockchain & Bitcoin Strategy ETF (BITS).

Bitcoin broke out to new all-time highs of more than $20,000 in December 2020 and eventually made it as high as $68,990 in November 2021.

Unfortunately, persistently elevated inflation prompted the Federal Reserve to begin aggressively tightening monetary policy in early 2022, triggering sharp sell-offs in cryptocurrencies and other risky assets. To make matters worse, the sharp declines in crypto prices in early 2022 triggered a liquidity crisis that led to the collapse of the $10 billion crypto hedge fund Three Arrows Capital and the bankruptcies of crypto lenders Celsius and Voyager Digital.

Crypto market volatility also led to the $60 billion collapse of Luna and its associated stablecoin Terra USD (UST) and caused the world's largest stablecoin Tether (USDT) to briefly lose its peg to the U.S. dollar in May 2022.



Omid Malekan, author and adjunct professor at Columbia Business School, says the rapid rise in crypto prices in 2021 along with aggressive central bank tightening set the 2022 crypto winter in motion.

"The collapse of Luna and UST blew a hole in the balance sheet of major players and led to cascading failures of crypto lenders like Celsius and over-leveraged hedge funds, accelerating declines," Malekan says.

Will Regulation Affect Crypto Prices?

Bitcoin Price Predictions

As of this writing, one Bitcoin is worth about $20,000. Its value is well off its 2021 high of more than $68,000, but it is still higher than its 2018 lows of less than $4,000.

Even after its 2022 sell-off during the crypto winter, Bitcoin remains one of the best-performing financial assets over the long term. However, Bitcoin's extreme volatility remains a hurdle if it is ever going to gain acceptance as a truly universal currency.

At this point, Bitcoin remains a high-risk speculative investment, and there is no clear way to assess its intrinsic value or predict where its price is headed next. Still, Bitcoin bulls remain convinced that the future is bright for the world's preeminent cryptocurrency.

"It's hard to predict the future – particularly for something as volatile as Bitcoin – but so long as general adoption continues, digital assets of all kinds normalize further and regulators create sensible guardrails, then prices should appreciate in the long run," Malekan says.

7 Best Cryptocurrency Exchanges

Updated on Aug. 31, 2022: This story was published at an earlier date and has been updated with new information.

Tags: money, investing, bitcoin, cryptocurrency, blockchain, altcoin, CME Group

Exhibit B

From: Joe Grundfest
To: (b)(6); (b)(7)(C)
Subject: Confidential Communication
Date: Thursday, December 17, 2020 10:01:08 AM
Attachments: XRP SEC Grundfest 201217 (final) .pdf

Dear (b)(6); (b)(7)(C),

Attached is a copy of a letter sent to the Commission earlier this morning addressing an enforcement matter relating to transactions in XRP.

Regards,

Joe Grundfest

Professor Joseph A. Grundfest
The William A. Franke Professor of Law and Business
Senior Faculty, Rock Center on Corporate Governance
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Stanford

FOIA CONFIDENTIAL TREATMENT REQUESTED BY RIPPLE LABS, INC.

December 17, 2020

The Honorable Jay Clayton
Chairman
The Honorable Caroline A. Crenshaw
The Honorable Allison Herren Lee
The Honorable Hester M. Peirce
The Honorable Elad L. Roisman
Commissioners
U.S. Securities and Exchange Commission
100 F. Street, NE
Washington, DC 20549

Dear Chairman Clayton and Commissioners:

I am informed that the Commission's Staff is contemplating enforcement proceedings relating to transactions in XRP. I express no views as to the substantive merits of any such action.[1]

As a procedural matter, however, a decision to advance an enforcement proceeding at this time is highly problematic and contra-indicated. A new Administration soon takes office. A new Secretary of the Treasury will be appointed. The Chairmanship will soon change hands. So too will leadership of key divisions. Important new key players in the regulatory process will emerge. A new Congress portends changes in committee leadership and Congressional policy. The views of a soon-incoming Administration and Congress as to the regulation of transactions similar to those at issue can differ substantially from current perspectives.

Deferring this matter for consideration by a new Chair, who can coordinate with a new Administration and Congress, generates substantial benefits. The contemplated proceedings implicate a broad range of policy concerns with significant consequences for the nation's financial and securities markets. Those proceedings can have significant effects on the evolution of emerging technologies involving novel forms of financial transactions, as well as for banking, money transfer,

[1] The views expressed in this letter are my own. They do not reflect the views of Stanford University or of Stanford Law School, neither of which have any knowledge of the matters addressed herein. (b)(4)
(b)(4)
(b)(4)

and other markets far beyond the Commission's legal remit. The implications are international. They are not narrowly limited to technical matters of securities law interpretation.

In contrast, the cost of allowing a new Chair, selected by a new Executive, confirmed by a new Senate, coordinating with new senior Commission personnel, to address the multiple significant policy questions implicated by the contemplated proceeding are insignificant. No pressing reason compels immediate enforcement action.

The contemplated enforcement proceeding alleges no fraud, misrepresentation, or omission. But simply initiating the action will impose substantial harm on innocent holders of XRP, regardless of the ultimate resolution. Upon learning of the proceeding, intermediaries will cease transacting in XRP because of the associated legal risk. The resulting reduction in liquidity will cause XRP's value to decline. XRP's aggregate market capitalization as of December 16, 2020, was approximately $23.8 billion, making it the third largest form of cryptocurrency in the world.[2] Given the significance of liquidity to the XRP market, the withdrawal of intermediaries will most likely cause billions of dollars of losses to innocent third-party holders. This result would, to my knowledge, be unprecedented. I am aware of no instance in which the simple announcement of a Commission enforcement proceeding has, absent allegations of fraud, misrepresentation, or omission, caused multi-billion-dollar losses to innocent third parties. Creating precedent, and imposing losses, of this sort raises public policy concerns that would benefit from the views of an incoming administration.

The directors of the Divisions of Enforcement, Corporate Finance, and Trading and Markets have all been deeply involved in the decision to recommend these proceedings. Each of these key Commission staffers has announced their departure from the agency by the end of this calendar year. None of the key staffers with senior-most responsibility for recommending this action will therefore remain at the Commission to take any form of responsibility for the consequences of a systemically important decision that they advocate only on their way out the door. It is far from clear that the next generation of Division Directors, to whom this litigation would be bequeathed, would concur that the contemplated proceedings are superior to the various forms of settlement that have been the subject of detailed negotiation. A mass exodus of every senior staffer responsible for a major enforcement decision with broad policy implications is, to my knowledge, unprecedented in agency history. It raises obvious concerns.

The contemplated proceedings also raise the securities law equivalent of "equal protection" concerns. Fairness is a hallmark of the Commission's enforcement and rulemaking activities. The Commission strives to treat like as like, and to address similarly situated instruments similarly. The contemplated proceedings break with that tradition. The staff has articulated no material distinction between the operation of Ether and of XRP that is relevant to the application of the federal securities laws. Imposing securities law obligations on XRP while leaving Ether untouched raises fundamental fairness questions about the exercise of Commission discretion. If the Commission is to maintain its tradition of fairness, Ether and XRP should be treated similarly: if Ether is to be allowed to trade freely in the market, so too must XRP, and if XRP is to be subject to restrictions, so

[2] CoinMarketCap, available at https://coinmarketcap.com (viewed on Dec. 16, 2020, at 5:01pm EDT).

too should Ether. Any other result creates a competitive imbalance that cannot be rationalized with reference to fair enforcement of the federal securities laws.

The contemplated proceedings will also reinforce the view that the agency is anti-innovation, and that it applies the federal securities laws inflexibly in a manner that impedes fundamental forms of technological progress. While I understand that many in the agency hold the view that the federal securities laws can co-exist with virtually any form of cryptographic innovation, the reality is that this enforcement action can only drive innovation offshore. Developers will evaluate the international regulatory landscape and rationally conclude that, of all jurisdictions, the United States is among the least welcoming. Investors will reach the same conclusion. They will be reticent to fund innovative technologies targeting the United States market. Fintech in the United States will thus likely fall behind foreign markets, with a range of potential adverse consequences as foreign enterprises take the lead – as many already have – in various forms of payment and transfer technology.

National security considerations are also at stake. Correspondence from the United States Senate to the Director of National Intelligence and to the National Security Advisor regarding national security concerns arising from Chinese control over Bitcoin and Ether underscore the benefits of measured inter-agency coordination regarding matters implicated by the contemplated proceedings.[3] The Director of National Intelligence has also reportedly written directly to the Commission's Chair regarding this issue, and has offered the Chair a briefing on the threat to national security posed by the dominance of Bitcoin and Ether with no effective U.S.-based competition.[4] The red flag raised by national security authorities is further cause for coordinated decision making with the incoming Chair and Administration.

Simply put, an incoming Chair will ideally not be bound as to important, long term matters of national policy by eleventh-hour enforcement decisions made absent compelling cause for immediate action, particularly when there are substantial benefits from inter-agency cooperation.

It is also apparent that central challenges raised by the contemplated proceedings can be addressed through rulemaking. Rulemaking can generate a rich, nuanced record informed by sophisticated technologists, economists, legal experts, and policy analysts. Rulemaking can allow the Commission to craft a sophisticated regulatory response to the larger policy challenges raised by the contemplated proceedings. Indeed, from a pragmatic perspective, rulemaking gives the Commission far greater control than litigation over the evolution of the law governing matters raised by the contemplated proceedings.

A litigated resolution will lack all of the nuance attainable through rulemaking, and could limit the Commission's ability to control the evolution of the law as it relates to important emerging

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3 Letter of Tom Cotton, United States Senator to The Honorable John L. Ratcliffe, Director of National Intelligence and The Honorable Robert C. O'Brien, National Security Advisor, July 30, 2020.

4 Jerry Dunleavy, Trump Spy Chief Seeks SEC Scrutiny of Chinese Dominance in Cryptocurrency, Washington Examiner, Nov. 24, 2020.

technology. Litigation cannot, by design, address, and much less resolve, important structural questions at the heart of the contemplated proceedings. A court can only decide the controversy before it, and cannot make broad policy judgments or set broadly applicable standards governing the evolution of new technology as applied to important emerging markets. Litigation is inevitably backward-looking, and is highly constrained in its ability to consider the prospective implications of any decision that a court might reach. Litigation therefore presents a material risk that, by resolving the narrow case and controversy before it, a court will inadvertently rule in a manner that generates collateral consequences adverse to the nation's long-term interests. Rulemaking is less likely to generate these negative consequences.

Commissioners have long debated the merits of regulation by prosecution, as Commissioner Karmel described the process, or of regulation by enforcement, as sitting commissioners apply the term. The contemplated proceedings reprise that debate, but with an important variation. Here, the Commission retains the option of first initiating a rulemaking and then considering whether enforcement proceedings are appropriate in light of the rulemaking record. There is no binary choice between litigation and regulation. The ability to sequence the process so that enforcement decisions are informed by a rulemaking record adds significantly to the agency's ability to fashion an effective approach to the challenges presented by evolving new technology. Decisions as to whether to proceed by enforcement or regulation, and how to sequence the process, are also best made by an incoming Chair, informed by larger policy considerations that are consistent with the views of a new Administration and Congress.

Again, I express no view as to the merits of any decision that the Commission might make. My views are limited to matters of procedure and timing. There is powerful reason to conclude that the questions raised by the contemplated proceedings are of sufficient import that, absent cause for immediate enforcement action, an incoming Chair, who reflects the views of a new Administration and Congress, should participate in the decision as to whether and how to proceed in this matter.

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Pursuant to 17 C.F.R. § 200.83, Ripple requests that confidential treatment be accorded to all copies of this letter and to any notes, memoranda, or other records created by or at the direction of the SEC, its officers or staff members, that reflect, refer, or relate to this letter.

Please promptly inform Ripple of any request under the Freedom of Information Act seeking access to any documents or materials provided to you on behalf of Ripple, including this letter, to enable Ripple to substantiate the grounds for confidential treatment. Should the SEC be inclined to grant such a request, Ripple expects that it will be given at least ten (10) business days' advance notice of any such decision to enable it to pursue any remedies that might be available. In such event, Ripple requests that you telephone Andrew Ceresney, Esq., from Debevoise & Plimpton LLP, counsel for Ripple, at (212) 909-6947.

The confidential information contained herein remains the property of Ripple. Accordingly, Ripple request that this letter (and all copies thereof) be returned after the SEC has completed its efforts on this matter. Furthermore, production of the confidential material is not intended to, and does not, waive any applicable privilege or other legal basis under which information may not be subject to production. If it were found that production of any confidential material constitutes

disclosure of otherwise privileged matters, such disclosure would be inadvertent. By production of such information, Ripple does not intend to and has not waived the attorney-client privilege or any other protections.

Sincerely,

Joseph A. Grundfest

cc: (b)(6); (b)(7)(C), Division of Corporation Finance
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(b)(6); (b)(7)(C) Strategic Hub for Innovation and Financial Technology
(b)(6); (b)(7)(C) Ripple Labs, Inc.
Andrew J. Ceresney, Debevoise & Plimpton LLP

Exhibit C

Selected SEC Accomplishments: May 2017 – December 2020

"The accomplishments listed below are a testament to the 4,500 women and men of the SEC and their unwavering, collective commitment to the SEC's mission to protect investors, maintain fair, orderly and efficient markets and facilitate capital formation. The Main Street investor-focused achievements of the Commission outlined below are impressive by any measure, but particularly when considered in light of the unprecedented professional and personal challenges currently facing the members of our team and the investing public we serve.

It has been the privilege and honor of a lifetime to serve alongside the women and men of the SEC."

- Jay Clayton

PROTECTING MAIN STREET INVESTORS THROUGH STRONG ENFORCEMENT AND OVERSIGHT

The Commission remained focused on protecting our nation's investors—particularly Main Street investors—at all points through which they interact with our markets. The SEC's Enforcement Division worked tirelessly to bring high-quality enforcement actions, hold bad actors accountable and return money to harmed investors. The actions brought by the Commission include actions against Wall Street firms, publicly-traded corporations, private companies, corporate executives, investment professionals, and others.

Since May 2017, the Commission:

- brought over 2,800 enforcement actions,
- obtained over $15 billion in financial remedies,
- returned approximately $3.5 billion to harmed investors, and
- paid awards of over $580 million to whistleblowers.

In fiscal year 2020, the Commission ordered financial remedies of $4.68 billion, which is the highest ever ordered in a single year since the Commission began reliably tracking this figure. In 2019, the Commission ordered the second-highest amount, at $4.3 billion.[i]

BRINGING SIGNIFICANT ACTIONS TO PROTECT MAIN STREET INVESTORS, HOLD INDIVIDUALS ACCOUNTABLE AND RETURN MONEY TO VICTIMS

- Brought investor-focused actions addressing conduct that spanned the securities markets, including conduct involving financial fraud, insider trading, offering fraud, Foreign Corrupt Practices Act violations, misconduct by broker-dealers and investment advisers, and more.
- Brought strong actions to stop frauds targeting members of identifiable communities and exploiting existing relationships of trust and friendship within the groups (often referred to as "affinity fraud").

  - Cases that were brought involved frauds that victimized military service members, seniors, African immigrants, and members of the Hispanic, Amish and Mennonite, and deaf, hard of hearing, and hearing loss communities, among others.
  - Brought charges against a Houston-based financial services vendor for failing to disclose to teachers practices that generated millions of dollars in fees and other financial benefits for the company.

- Launched the Share Class Selection Disclosure Initiative to address the substantial number of investment advisers who had not disclosed to investors conflicts of interest created by obtaining fees for placing clients in higher-cost mutual funds share classes, where lower- cost share classes were available. As result, more than $139 million has been or is scheduled to be returned to investors.
- Obtained more than 90 asset freezes in emergency actions to stop ongoing fraudulent conduct and freeze illicit profits, in an effort to preserve funds for distribution to victims.
- Brought charges against individuals in more than two-thirds of its cases for a range of violations, from misleading statements, to fraudulent fundraising, to inappropriately sharing confidential data. The individuals charged include those at the top of the corporate hierarchy—including chief executive officers, chief financial officers, and chief operating officers—as well as gatekeepers including accountants, auditors, and attorneys.
- Created a new office of Bankruptcy, Collections, Distributions, and Receiverships in the Enforcement Division, designed to streamline current processes and maximize distributions to and results for investors.

STRENGTHENING THE WHISTLEBLOWER PROGRAM

- Awarded over $580 million to eligible whistleblowers, including:
  - a record $175 million to 39 whistleblowers in fiscal year 2020, which is both the highest dollar amount and the highest number of individuals awarded in any fiscal year, and
  - the largest single award to date under the history of the program – $114 million to a single whistleblower – as well as the five next largest awards.
- Approved final rule amendments to improve the efficiency, clarity and transparency of the whistleblower award program, helping get more money into the hands of whistleblowers, and at a faster pace.
- Implemented changes to make the process of evaluating and issuing awards substantially more efficient, resulting in a substantial increase in the rate at which whistleblower claims are evaluated and awards are issued.

MAINTAINING INVESTOR PROTECTION EFFORTS DURING COVID-19

- Suspended trading in the securities of 36 issuers in connection with inadequate or inaccurate information in the marketplace in connection with the virus followed by six fraud cases involving false and misleading claims relating to COVID-19. A full list of trading suspensions and enforcement actions related to COVID-19 is available here.
- The Division of Examinations (formerly the Office of Compliance Inspections and Examinations (OCIE)) remained fully operational nationwide and, with adjustments to take into account health and safety measures, business continuity plans, firm-specific operational matters and other factors, continued to execute on its investor protection mission.
- Issued a risk alert for registered entities highlighting operational, technological, commercial, cybersecurity and other challenges caused by COVID-19.
- Issued investor alerts outlining the types of frauds Main Street investors should be especially wary of during COVID-19.

- Issued a statement emphasizing to corporate issuers and other market participants the importance of maintaining market integrity and following corporate controls and procedures, particularly with respect to non-public information.

BRINGING ACTIONS AGAINST CYBER-RELATED MISCONDUCT

- Established the Cyber Unit in the Division of Enforcement focused on violations involving digital assets and cryptocurrency, cyber-related trading violations such as hacking to obtain material nonpublic information, and cybersecurity disclosures and procedures at public companies and financial institutions.
- Brought 57 cases involving ICOs, blockchain or distributed ledger technology, and/or digital assets since the July 2017 issuance of aninvestigative report regarding the offers and sales of digital assets. Among others, cases involved efforts to defraud investors through the use of digital asset securities as well as violations of the registration provisions of the federal securities laws in the offer and sale of digital asset securities.
- Halted 18 suspected frauds involving blockchain or distributed ledger technology and/or digital assets.

ESTABLISHING INVESTOR-FOCUSED INITIATIVES

- Created the Retail Strategy Task Force to focus on proactive, targeted initiatives to identify misconduct impacting retail investors. Historically, these types of misconduct have included offering frauds, microcap frauds and Ponzi schemes, as well as other areas targeted by the Enforcement Division more broadly, such as:
    - investment professionals placing customers in higher-fee mutual fund share classes, when lower-fee share classes of the same fund are available;
    - abuses in wrap-fee accounts, including with respect to trading away or the purchase of alternative products generating fees;
    - investment professionals recommending customers buying and holding products for long-term investment when those products were designed for short-term holding periods, such as inverse exchange-traded funds (ETFs);
    - sales practice concerns with structured products, including inadequate disclosures regarding fees and mark-ups; and
    - churning, excessive trading and other abusive practices.
- Established the Teacher Initiative to focus enforcement and investor education resources on informing and protecting America's teachers. Among other things, the initiative helps teachers become better informed about the investment options available to them and the costs associated with them. The initiative resulted in a number of multimedia resources and tools for teachers, including podcasts, digital resource guide, and information on basics of investing.
- Established the Military Service Members Initiative, which increased enforcement resources as well as proactive outreach to the active military service and veterans communities to help educate them about savings and investment, investment fees and expenses, retirement programs specific to service members, and the red flags of investment fraud through events hosted by SEC staff and Regional Offices across the country.
- Created a new online search tool for retail investors to research their financial professionals. The SEC Action Lookup for Individuals – or SALI – enables anyone to find out if the individual he or she is dealing with on an investment has been sanctioned as a result of SEC enforcement actions, whether or not the individual is registered.

EXAMINING FOR COMPLIANCE WITH THE SECURITIES LAWS

- Since May 2017, Examinations (formerly OCIE):
    - completed over 10,000 examinations,
    - improved the coverage ratio of investment adviser examinations to a 15-17% range, up from a 10-11% range in the years prior, and
    - referred hundreds of examinations to the Division of Enforcement.
- In fiscal year 2019, which included a government shutdown, Examinations staff completed nearly 3,100 exams, up over 25% from 2016, covering registered investment advisers, investment companies, broker-dealers, national securities exchanges, municipal advisors, transfer agents, FINRA and clearing agencies.
- At the outset of each year, Examinations continued its practice of publishing its national examination priorities for the year. These priorities included:
    - The protection of retail investors, including seniors and those saving for retirement, including with respect to compliance with Regulation Best Interest and the fiduciary duty. Among others, specific priority areas included management of conflicts of interest, cost and fee disclosures, sales practices, wrap fee programs, retail-targeted products (including mutual funds and ETFs, municipal and other fixed-income securities, and microcap securities), products and accounts focused on senior investors, and fixed income order execution.
    - Compliance and risk in registrants responsible for critical market infrastructure, including clearing agencies, national securities exchanges, transfer agents, and Regulation Systems Compliance and Integrity (SCI) entities.
    - Financial technology and innovation, including with respect to digital assets and automated/digital investment advisory platforms (such as “robo-advisers”).
    - The activities of the Financial Industry Regulatory Authority (FINRA) and the Municipal Securities Rulemaking Board (MSRB).
    - Cybersecurity efforts, including with respect to governance and risk assessment, access rights and controls, data loss prevention, vendor management, training, and incident response and resiliency.
    - The effectiveness of anti-money laundering programs, including with respect to identifying customers, performing customer due diligence, monitor accounts for suspicious activity, and filing suspicious activity reports.
    - Additional areas specific to broker-dealers, including with respect to the safeguarding of customer cash and securities, risk management, certain types of trading activity (including, for example, trading in odd lots and the use of automated trading algorithms), the effects of evolving commissions and other cost structures, best execution, and payment for order flow arrangements
    - Additional areas involving registered investment advisers and investment companies, including compliance programs of dually-registered entities, the accuracy of disclosures concerning new and emerging investment strategies, and issues specific to advisers to private funds.
- Issued 24 Risk Alerts to help inform registrants, investors and other market participants of potential risk areas and OCIE’s observations, including in the areas of cybersecurity, LIBOR transition, management of conflicts of interest, best execution, compliance programs, and the safeguarding of assets, among other areas.
- Created the forward-thinking Event and Emerging Risks Examination Team (EERT) to proactively engage with financial firms about emerging threats and current market events, and to quickly mobilize to provide expertise and resources to the SEC's regional offices when critical matters arise.
- Issued a statement on conducting more focused examinations that assess the implementation of specific requirements of Regulation Best Interest, including those that go beyond suitability standards and require

broker-dealers to have a reasonable basis to believe that recommendations are in retail customers' best interests.

- Renamed OCIE, which since its inception has grown to represent the second largest office or division at the SEC, as the Division of Examinations.

ADVANCING DIVERSITY, INCLUSION AND OPPORTUNITY AT THE SEC AND IN THE SECURITIES INDUSTRY

The SEC focused on efforts to promote diversity, inclusion and opportunity, including building and maintaining a diverse workforce, cultivating an inclusive work environment, and fostering diversity in the network of suppliers and in the regulated entities the SEC oversees. For more information, visit this dedicated page.

DIVERSITY, INCLUSION AND OPPORTUNITY AT THE SEC

- Developed the SEC's first Diversity and Inclusion Strategic Plan, with input from staff throughout the Commission, which outlines measurable goals and strategies for continuing to build a workforce that will deliver on the SEC's mission for fiscal years 2020-2022.
    - The plan also recognizes that diversity, inclusion and opportunity should be reflected in the outward-facing aspects of the Commission's work, including through seeking to ensure that education, outreach and capital formation promotion efforts better include traditionally underserved communities.
- Established a Diversity and Inclusion Senior Policy Advisor position in partnership with the Office of Minority and Women Inclusion (OMWI), which advises the Chairman, the Commission and staff on diversity and inclusion issues and engages with thousands of SEC employees in groups large and small, formal and informal.
- Improved the gender diversity of the SEC's Senior Officers. As of November 2020, 44% of the SEC's Senior Officers were women, up from 31.3% at the end of fiscal year 2012. In addition, as of the end of fiscal year 2020, nearly half (46%) of the divisions and offices that report directly to the Chairman were led by women.
- Minorities held over 25% of the SEC's supervisory and managerial positions as of November 2020, up from 18.1% in fiscal year 2012.
- Continued to see improvements in diversity as the SEC increased hiring. The SEC onboarded nearly 300 new hires during fiscal year 2020, of whom 45% were women and 38% were minorities.
- Established the SEC's first agency-wide mentor program.
- Established, in coordination with the National Treasury Employees Union (NTEU), the SEC's first paid parental leave program.
- Chairman Clayton led the SEC's Diversity Council, and sponsored three Employee Affinity Groups: the African American Council (AAC), Hispanic and Latino Opportunity, Leadership, and Advocacy Committee (HALO), and the Veterans Committee.
- Promoted diversity, inclusion and opportunity through some of SEC's most important shared experiences, such as, among many, an African American History Month celebration featuring Harvard University Professor Henry Louis Gates, Jr., and recognition of diverse government leaders such as U.S. Treasurer Jovita Carranza during Hispanic Heritage Month and retired Army General Flora Darpino during Women's History Month.
- Sponsored events focusing attention on the contributions of, and supporting, "first generation professionals."
- Continued a tradition of strong Federal Employee Viewpoint Survey (FEVS) scores, with an average SEC Engagement Score from 2017-2019 of 80.1, above the mid-size agency score of 67.8 during that time

period. In each of the four key FEVS indices – Employee Engagement, Global Satisfaction, Leader Effectiveness, and Overall FEVS Average – the SEC in 2020 met or exceeded its highest scores since the agency began tracking this data in 2012.

- Ranked in the top five for mid-sized agencies in the Partnership for Public Service's "Best Places to Work in the Federal Government" rankings, in each year from 2017 to 2019.
- Launched, in partnership with NTEU, the SEC internal FEVS Insights Dashboard to provide data to all SEC colleagues on how various subgroups report their work experience in the survey.

DIVERSITY, INCLUSION AND OPPORTUNITY WITH SEC VENDORS

- Hosted monthly Vendor Outreach Days that gave hundreds of minority-owned and women-owned businesses (MWOBs) that are potential SEC vendors the chance to share their capabilities with the Commission. Participated in dozens of national supplier business conferences in-person and virtually; jointly hosted a national supplier diversity event at George Mason University in Arlington, VA.
- Awarded MWOBs $185 million in fiscal year 2020, representing 34% of the SEC's total contract awards, up from 32% in fiscal year 2019. The average dollar value of a MWOB contract award with the SEC increased from $1.1 million in fiscal year 2015 to $1.9 million in fiscal year 2020.

DIVERSITY, INCLUSION AND OPPORTUNITY IN THE FINANCIAL INDUSTRY

- Launched the Diversity Assessment Report to help regulated entities conduct self- assessments of their diversity policies and practices, as envisioned by the Joint Standards, and provided these entities with a template for submitting information about their self- assessments to OMWI.
- Established procedures to promote the selection of a diverse slate of new members appointed to SEC Advisory Committees.
- Encouraged (see also here) Advisory Committees to highlight issues relating to diverse and underrepresented investors and other market participants, and to promote diversity, inclusion and opportunity in their respective industries. These events included:
    - A meeting of the Small Business Capital Formation Advisory Committee, focusing on how capital markets are serving underrepresented founders, including minorities and women.
    - Three meetings (here, and here here) of the Asset Management Advisory Committee, featuring discussions on improving diversity and inclusion in the asset management industry.
    - A special panel on minority community investor inclusion through the Investor Advisory Committee.
    - A panel discussion on diversity and capital formation during the 2018 and 2020 Government-Business Forum on Small Business Capital Formation.

MODERNIZING REGULATIONS TO BENEFIT INVESTORS, ISSUERS AND MARKETS

ENHANCING STANDARDS OF CONDUCT FOR INVESTMENT PROFESSIONALS WHO PROVIDE RECOMMENDATIONS TO MAIN STREET INVESTORS

The Commission adopted over 70 rules from the policy divisions and offices, one of the busiest rulemaking calendars in Commission history. Chairman Clayton's rulemaking agenda included long-overdue modernization efforts and transformative market structure initiatives. The SEC enhanced disclosures and protections for retail investors, increased capital formation opportunities for smaller issuers, and expanded investment opportunities

while maintaining important investor protections. The SEC also worked to finalize a number of the remaining Dodd-Frank mandates, including standing up the Title VII regime for security-based swaps.

- The Commission adopted several investor-focused rules to enhance important investor protections. For example, the Commission adopted a strong package of rules and interpretations to enhance the quality and transparency of Main Street investors' relationships with their investment professionals. Rather than favoring one type of service or relationship, these actions were designed to increase investor protection across the landscape, while preserving access for Main Street investors—both in terms of choice and cost—to a variety of investment services and products.
- For the first time, regardless of whether investors choose a broker-dealer or an investment adviser, investors are entitled to a recommendation that is in the investor's best interest and does not place the interests of the firm or the financial professional ahead of the investor.
- Enhanced the standard of conduct applicable to broker-dealers by establishing Regulation Best Interest, which requires broker-dealers to not put their interests ahead of their retail customers.
- Reaffirmed and clarified the Commission's views on the fiduciary duty that investment advisers owe to their clients under the Advisers Act to provide greater clarity about advisers' legal obligations.
- Required financial professionals to provide retail investors with simple, easy-to-understand information about the nature of their relationship by establishing Form CRS.
- Clarified when a broker-dealer's performance of advisory activities causes it to become an investment adviser within the meaning of the Advisers Act.
- Established a new investor-focused website page to assist investors in reading and understanding Form CRS and its benefits.
- Created a staff Standards of Conduct Implementation Committee to assist the Commission, regulators, and market participants in preparing for the timely implementation of Regulation Best Interest and Form CRS.
- Issued more than 70 responses to frequently asked questions about Regulation Best Interest and Form CRS compliance obligations.
- Held a roundtable where staff from the Commission and FINRA discussed initial observations on implementation of Regulation Best Interest and Form CRS.

IMPROVING TRANSPARENCY AND INVESTOR PROTECTIONS FOR EMERGING MARKETS INVESTMENTS

- As part of the President's Working Group on Financial Markets (PWG), developed several key recommendations outlined in the Report on Protecting United States Investors from Significant Risks from Chinese Companies (PWG Report) designed to strengthen protections for investors and promote the integrity of our capital markets with respect to the risks associated with increased investment exposure to emerging markets.
    - The recommendations are centered on (1) leveling the playing field and (2) improving disclosure and consideration by financial professionals of the risks of investing in emerging markets, including China.
- Directed staff to begin developing recommendations consistent with each of the PWG Report recommendations and December 2020 congressional mandate.
- Held an Emerging Markets Roundtable in July 2020 to discuss risks – and potential ways to address those risks – related to the increase in exposure by U.S. investors and capital markets to companies with significant operations in emerging markets, including China.

- Issued several joint statements to highlight concerns with access to information and other regulatory barriers related to Chinese companies listed in the U.S., and to inform investors of the SEC's ongoing efforts to address related investor protection issues, including in December 2018, February 2020 and April 2020.

IMPROVING THE EXPERIENCE FOR MAIN STREET INVESTORS WHO INVEST IN FUNDS

The Commission sought to improve investor protections by advancing efforts to modernize the design, delivery and content of fund disclosures and other information for the benefit of investors. These initiatives recognize that Main Street investors are increasingly using mutual funds, ETFs and other investment vehicles to invest for their futures. These initiatives are an important part of how the Commission can better serve investors in the 21st century, including through enhancements enabled by technology.

Modernizing How Investors Receive Information About Their Fund Investments, Including Through Layered Disclosures and Technological Advancements

- Proposed comprehensive improvements to the mutual fund and ETF disclosure framework for investors. The improvements would feature concise and visually engaging shareholder reports that would highlight information that is particularly important for retail investors to assess and monitor their fund investments.
- Enhanced disclosures for investors about variable annuities and variable life insurance contracts, including through the use of a concise, reader-friendly prospectus designed to improve investors' understanding of the contracts' features, fees, and risks. The framework's use of layered disclosure and technology provides investors with a roadmap so that they can more easily access information that they need to make an informed investment decision.
- Finalized reforms to modernize rules that govern investment adviser advertisements and payments to solicitors to comprehensively and efficiently regulate investment advisers' marketing communications.
- Modernized the permitted methods for delivering fund shareholder reports by providing an optional "notice and access" method to allow funds to satisfy their obligations to transmit shareholder reports, while ensuring that investors who prefer to receive paper can continue to do so.
- Requested comment on current requirements that restrict the use of potentially misleading fund names to determine whether the existing rule continues to accomplish its purpose to protect investors and help ensure they are not misled by a fund's name.

Modernizing and Improving Regulation of the Asset Management Industry

- Created a standardized framework for the regulation of the vast majority of ETFs operating today, leveling the playing field and facilitating greater competition and innovation. The new standardized framework replaced one in which ETFs were required to obtain individualized exemptive orders, and the new framework includes important investor- protection measures designed to enhance transparency and disclosure.
- Issued exemptive orders that for the first time permit certain actively managed ETFs to operate without being subject to daily portfolio transparency, further promoting opportunity and choice for Main Street investors.
- Created a consistent, rules-based framework for fund of funds arrangements that provides robust protections for retail investors who use these arrangements as a convenient way to allocate and diversify their portfolio through a single, professionally managed investment.

- Established an expedited review procedure for exemptive and other applications under the Investment Company Act to make the application process more efficient as well as to provide additional certainty and transparency.
- Modernized the registration, offering and investor communications processes for business development companies (BDCs) as well as other closed-end funds to use the securities offering rules that are already available to operating companies.
- Modernized the regulation of the use of derivatives by registered investment companies, including mutual funds, ETFs, and closed-end funds, as well as BDCs.
- Established an updated framework for fund valuation practices.
- To facilitate more informed decision making, reduced obstacles to providing research on investment funds by harmonizing the treatment of such research with research on other public companies.
- Established the Asset Management Advisory Committee to provide the Commission with diverse perspectives on asset management and related advice and recommendations.
- Launched a smaller fund outreach initiative to better understand regulatory compliance costs and barriers smaller and mid-size fund sponsors encounter.

FACILITATING CAPITAL FORMATION FOR AMERICAN BUSINESSES AND EXPANDING INVESTMENT OPPORTUNITIES FOR MAIN STREET INVESTORS

The Commission has focused on helping American businesses – particularly small businesses – access capital to grow and create new jobs. The Commission's efforts recognized that historically, much of our nation's capital has been directed at narrow segments of the U.S., and more work is needed to help small businesses "between the coasts." In turn, the Commission's efforts helped provide investors, including Main Street investors, expanded investment opportunities to participate in America's growth. Through modernizing our regulatory structure, the Commission effectively advanced capital formation and investor protection objectives for the benefit of Main Street investors and businesses alike.

Focusing on Smaller and Medium-sized Businesses

- Simplified, improved and harmonized the "patchwork" exempt offering framework to promote capital formation for smaller and medium-sized businesses, while preserving and enhancing important investor protections. Among a number of other enhancements, these rule amendments:
    - provided additional flexibility to "test the waters" for an exempt offering and to conduct "demo day" communications;
    - increased the offering limits for Regulation A, Regulation Crowdfunding, and Rule 504 offerings, and revised certain individual investment limits; and
    - establish more clearly, in one broadly applicable rule, the ability of issuers to move from one exemption to another.
- Updated the accredited investor definition to allow individuals to participate in our private capital markets based not only on income or net worth, but on established, clear measures of financial sophistication. The amendments also add tribal governments and other organizations to the list of entities qualified to participate.
- Expanded the amount of securities that private companies may issue to employees, consultants and advisors as compensatory awards without registration, allowing for participation in the company's growth. Also issued a concept release soliciting comment on additional potential modernization efforts in light of, for example, the evolution of the "gig economy." In response to feedback on the concept release:

  - Proposed amendments to modernize the framework for compensatory offerings by reporting companies and non-reporting companies;
  - Proposed temporary rules to permit companies, subject to certain conditions, to issue compensatory awards to certain workers who provide services available through the company's technology-based marketplace platform.

- Encouraged capital formation in rural areas by implementing congressionally-mandated exemptions for investment advisers to rural business investment companies (RBICs), which make venture capital investments mostly in smaller enterprises located primarily in rural areas.
- Issued a statement explaining the potential application of state and federal securities laws to fundraising for Opportunity Zones.
- In an effort to assist small businesses to raise capital and to provide regulatory clarity to investors, issuers, and finders who assist them, proposed a new limited, conditional exemption from broker registration requirements for "finders" who assist issuers with raising capital in private markets from accredited investors.
- Named the first Advocate for Small Business Capital Formation in response to congressional directive. The Office of the Advocate for Small Business Capital Formation (OASB) is dedicated to continuing to advance the interests of small businesses and their investors at the SEC and in our capital markets.
  - In its first two years, OASB conducted 14 in-person events, meeting with entrepreneurs, small businesses, and investors in 12 states including Kansas, Missouri, Nebraska, Arkansas, Colorado, and others.
- Established the Small Business Capital Formation Advisory Committee, which provides a formal mechanism for the Commission to receive advice and recommendations on issues affecting small businesses and their investors.
- Regularly engaged with entrepreneurs, small business, and investors, resulting in valuable feedback on many Commission initiatives affecting small businesses. As the COVID-19 pandemic took hold, OASB maintained its regular outreach efforts, quickly pivoting to launch a series of Virtual Coffee Breaks to engage with small businesses and their investors.

Tailoring Regulations for Smaller Public Companies

- Expanded the JOBS Act's "test the waters" rules allowing all issuers to increase the likelihood of successful public securities offerings.
- Tailored the accelerated and large accelerated filer definitions to exclude a subset of lower- revenue, smaller companies where the additional requirement of an internal control over financial reporting (ICFR) auditor attestation may not be an efficient way of benefiting and protecting investors, allowing those companies to redirect the associated cost savings into growing their businesses.
- Modernized and expanded the definition of "smaller reporting company," allowing more companies to qualify for existing scaled disclosure requirements.
- Expanded to all companies the ability to have draft registration statements reviewed non- publicly by SEC staff prior to an IPO or a follow-on offering within one year of an IPO.

Updating, Simplifying and Improving Public Company Disclosures

- Updated and expanded the statistical disclosures that bank and savings and loan registrants provide to investors, in light of changes in the sector over the past 30 years.

- Modernized the description of business, legal proceedings, and risk factor disclosures that registrants are required to make pursuant to Regulation S-K to improve disclosures for investors and to simplify compliance efforts for registrants. These amendments further modernized the rules to include descriptions of issuers' human capital, to the extent material to an understanding of a company's business, recognizing human capital as an important driver of long-term value.
- Took steps to improve the quality and accessibility of the information companies provide their investors in Management's Discussion and Analysis, giving investors greater insight into the information management uses to monitor and manage the business, including:
    - Issued guidance designed to improve the quality of companies' presentation of key performance indicators and metrics.
    - Adopted amendments to modernize, simplify and enhance the focus of certain financial disclosures on material information, while simplifying compliance efforts.
- Enhanced the quality of information that investors receive regarding significant acquisitions or dispositions while reducing unnecessary complexity and compliance costs.
- Updated disclosures to provide investors with a more comprehensive understanding of a registrant's mining properties and more closely align disclosures with international standards.
- Simplified financial disclosures by eliminating requirements that are outdated, overlapping, or duplicative with other Commission rules or U.S. GAAP, thereby reducing compliance burdens without significantly altering the total mix of information available to investors.
- Simplified and streamlined disclosures for guarantors and issuers of guaranteed securities, to improve the quality of disclosure and increase the likelihood that issuers will conduct debt offerings on a registered basis.
- Proposed amendments to modernize, clarify and strengthen Rule 144 and to update and simplify Form 144 filing requirements, including to require electronic filing.
- Adopted amendments to require the use of Inline XBRL for financial statement information and risk/return summaries, designed to increase the quality and accessibility of data.
- Adopted rules to require resource extraction issuers to disclose payments made to foreign governments or the U.S. federal government for the commercial development of oil, natural gas, or minerals, consistent with requirements of Dodd-Frank and the Congressional Review Act.
- Adopted congressionally mandated rules requiring companies to describe practices and policies regarding hedging by directors, officers, and other employees.
- Adopted interpretive guidance to assist companies in complying with the pay ratio disclosure rule and reduce the costs associated with preparing disclosures.
- Clarified public company disclosure obligations for self-identified diversity characteristics of board members and nominees.
- Issued staff guidance for publicly traded companies, auditors, and others to help ensure timely public disclosures of the accounting impacts of the Tax Cuts and Jobs Act.

Modernizing the Proxy Process to Improve Shareholder Engagement

- Updated the criteria, including the ownership requirements, that a shareholder must satisfy to be eligible to require a company to include a proposal in its proxy statement for consideration by all of the company's shareholders. The amendments facilitate shareholder engagement and ensure an appropriate alignment of interests between shareholder- proponents and their fellow shareholders.

- Modernized rules to provide investors using proxy voting advice access to more transparent, accurate, and complete information on which to make voting decisions.
- Clarified the responsibilities of investment advisers when proxy voting on behalf of their clients, as well as the application of federal proxy rules to proxy voting advice.
- Held a roundtable on the proxy process to hear the views of investors, issuers and other market participants on the SEC's proxy rules.

Strengthening the Reliability and Effectiveness of Audits

- Modernized the loan provision and additional provisions of the auditor independence rules to focus the rules on those relationships and services that may pose threats to an auditor's objectivity and impartiality, recognizing the evolving complexity of registrant capital structures.
- Approved a PCAOB rule that requires significant enhancements to certain public company audit reports, including the communication of critical audit matters and the disclosure of auditor tenure, in an effort to make auditors' reports more informative.
- Approved a PCAOB rule designed to strengthen and enhance the requirements for auditing accounting estimates, including fair value measurements, by replacing the existing three standards (the accounting estimates standard, the fair value standard, and the derivatives standard) with a single standard that sets forth a uniform, risk-based approach.

IMPROVING AND MODERNIZING MARKETS TO PROMOTE TRANSPARENCY AND MARKET INTEGRITY

The Commission focused on ensuring our markets remain fair, orderly and efficient while advancing initiatives that modernize our markets and enhance transparency that can energize competitive forces to benefit investors.

Modernizing Equity Market Structure

- Adopted rules to modernize market data infrastructure to update and significantly expand the content of NMS market data and better meet the diverse needs of today's investors. Notably, these rules expand the content of NMS market data and foster a competitive environment for processing and distributing NMS market data.
- Rescinded a rule exception in order to ensure public notice and comment and Commission approval prior to the effectiveness of amendments to national market system plans (NMS plans) that would establish or change a fee or other charge.
- Directed the equity exchanges and FINRA to modernize the governance of the NMS plans that produce public consolidated equity market data and disseminate trade and quote data from trading venues.
- Issued staff guidance to assist the national securities exchanges and FINRA in preparing Fee Filings that meet their burden to demonstrate that proposed fees are consistent with the requirements of the Securities Exchange Act of 1934 and rules thereunder.
- Invited exchanges and other market participants to submit innovative proposals designed to improve the secondary market structure for exchange listed equity securities that trade in lower volumes.
- Hosted roundtables to address critical market structure issues, including combatting retail investor fraud, market structure for thinly traded securities, and market data and market access.
- Conducted an extensive series of external outreach and coordination meetings to facilitate market participants' transition from a T+3 to a T+2 settlement cycle.

Enhancing Main Street Investor Protections in the Over-the-Counter (OTC) Market

- Substantially enhanced disclosure and investor protections in the OTC market to address microcap fraud and to modernize the rules in light of technological and communications innovations that have taken place over the past 30 years. The Commission's amended rules provide that, subject to certain exceptions, broker-dealers may not publish quotations for an issuer's security when current issuer information is not publicly available.
- Highlighted for broker-dealers various risks arising from illicit activities associated with transactions in low-priced securities through omnibus accounts.

Enhancing Market Transparency and Resiliency

- Enhanced operational transparency and regulatory oversight of ATSs that trade NMS stocks, thereby promoting greater transparency in stock order interaction, matching, and execution, which will help empower investors and their intermediaries to find those trading venues that best meet their trading and investing objectives.
- Enhanced disclosures by broker-dealers to investors about the way they handle investors' orders, to help investors better understand and assess the impact of their broker-dealers' routing decisions on order execution quality.
- Jointly with the FDIC, and in consultation with the Securities Investor Protection Corporation (SIPC), adopted rules to clarify and implement provisions relating to the orderly liquidation of covered broker-dealers in the event the FDIC is appointed receiver under Title II of the Dodd-Frank Act.
- Enhanced standards for SEC-registered central counterparties and central securities depositories for the purpose of both enhancing and clarifying the definition of a covered clearing agency.

Updating "Volcker Rule" Regulations

- In coordination with other federal financial regulators, modified regulations implementing the Volcker Rule's covered fund provisions. In part, the amendments facilitate the ability of banking entities to provide important financing through venture capital funds to businesses, particularly small businesses in areas "between the coasts" where financing is less readily available, as banks currently do directly.
- In coordination with our partner agencies, simplified compliance relating to the Volcker Rule for firms that do not have significant trading activity, with more stringent compliance requirements applying to firms with significant trading activity.
- Consistent with congressional mandate, excluded community banks from the Volcker Rule.

Moving the Consolidated Audit Trail from Concept to Reality

- Employed project management best practices – effective oversight, engagement with stakeholders and talented, dedicated personnel – to firmly establish the the Consolidated Audit Trail (CAT) moved forwardas an operational regulatory reporting system.
- Enhanced transparency and financial accountability for CAT's implementation by amending the CAT NMS Plan to require the publication of an implementation plan and quarterly progress reports. In addition, the amendments include financial accountability provisions that establish deadlines for four implementation milestones and reduce the amount of fee recovery available if those critical deadlines are missed.

- Exempted SROs from collecting and retaining most sensitive retail customer information in the CAT.
- Proposed amendments to the CAT NMS plan to accomplish a number of data security enhancing goals that provide greater oversight, consistency and transparency regarding the appropriate use of CAT data while reducing the amount of sensitive PII data collected by the CAT.
- Addressed operational issues through several exemptive orders including establishing a phased timeline for broker-dealer CAT reporting. The SROs and the industry have achieved key milestones outlined in this timeline, including the start of equities reporting on June 22, 2020 and the start of options reporting on July 20, 2020.
- Established the role of Senior Policy Advisor for Regulatory Reporting in the Chairman's Office, bringing substantial project management experience to coordinate the Commission's efforts to monitor the SROs' development of the CAT.

Improving Fixed Income Markets and Transparency in Our Municipal Markets

- Established the Fixed Income Market Structure Advisory Committee (FIMSAC), which provides the Commission with diverse perspectives on the structure and operations of the U.S. fixed income markets, as well as advice and recommendations on matters related to fixed income market structure.
- Proposed rules to enhance operational transparency and system integrity for alternative trading systems trading U.S. Treasuries and other government securities by extending Regulations ATS and SCI to those markets.
- Issued a concept release soliciting public comment on the regulatory framework for electronic platforms that trade corporate debt and municipal securities.
- Approved a FINRA rule filing establishing a New Issue Reference Data Service for corporate bond data.
- Increased transparency of municipal issuers' financial obligations to better inform investors and other market participants about the current financial condition of issuers of municipal securities and obligated persons.
- Hosted, along with the MSRB, and FINRA, Compliance Outreach Programs for Municipal Advisors to provide municipal market participants an opportunity to hear from SEC, MSRB, and FINRA staff on timely regulatory and compliance matters for municipal advisors
- Held *The Road Ahead: Municipal Securities Disclosure in an Evolving Market* conference which brought together municipal securities market participants and regulators to discuss important developments, current trends in disclosure, and potential opportunities for regulatory and industry improvement.
- Held *Spotlight on Transparency: A Discussion of Secondary Market Municipal Securities Disclosure Practices* conference which brought together municipal securities market participants and regulators to discuss current secondary market disclosure practices, including COVID-19 related disclosure and potential opportunities for regulatory and industry improvement.
- Published a series of investor bulletins designed to increase retail investor awareness of municipal bonds, the structure of the municipal securities market, and risks associated with investing in municipal securities.

Fostering Regulatory Cooperation to Enhance Competition in the Securities Industry

- With Assistant Attorney General Makan Delrahim, Chairman Clayton announced an historic Memorandum of Understanding with the Justice Department's Antitrust Division, formalizing the exchange of knowledge between the agencies to ensure the maintenance of the efficient and competitive markets that American investors rely on.

STANDING UP THE REGULATORY FRAMEWORK FOR THE SECURITY-BASED SWAPS MARKET

- Harmonized significant aspects of the security-based swaps regulatory framework the CFTC.
- Expanded and improved the framework for regulating cross-border security-based swaps, including single-name credit default swaps, which triggered the compliance date for registration by security-based swap entities and stood up the Commission's broad security- based swap regulatory regime under Title VII of the Dodd-Frank Act.
- Adopted rules requiring the application of risk mitigation techniques to portfolios of uncleared security-based swaps.
- Adopted new rules and amendments under Title VII of the Dodd-Frank Act related to the recordkeeping and reporting requirements for security-based swap dealers, major security- based swap participants, and broker-dealers.
- Adopted rules and rule amendments under Title VII of the Dodd-Frank Act to enhance the risk mitigation practices and ensure the financial integrity of firms that stand at the center of our security-based swap market, thereby protecting investors and counterparties and reducing risk to the market as a whole. These rules established capital, margin, and segregation requirements for swap entities.
- Held the first-ever joint meeting of the SEC and CFTC to vote on joint releases, which led to (i) the adoption of a joint final rule to harmonize the minimum margin level for security futures held in a futures account with the minimum margin level for security futures held in a securities portfolio margin account, and (ii) the issuance of a joint request for comment on the portfolio margining of uncleared swaps and non-cleared security-based swaps.
- Issued the first substituted compliance order, in response to an application by Germany's BaFin, as well as a notice of a proposed order to conditionally provide substituted compliance in response to an application by France's Autorité des Marchés Financiers (AMF) and Autorité de Contrôle Prudential et de Résolution (ACPR).
- Consistent with the SEC and CFTC's shared commitment to greater harmonization under Title VII of the Dodd-Frank Act, issued a statement setting forth a time-limited Commission position regarding documentation implementation issues that may arise when security-based swap entities are registered with both the SEC and CFTC, in order to minimize potential market disruptions to existing counterparty relationships.
- Adopted a rule to create a transparent, efficient and comprehensive process for registered security-based swap entities to submit applications to the Commission regarding the statutory disqualification prohibition, and to harmonize the Commission's approach for a related exclusion with that of the CFTC.
- Adopted a rule to limit the potential for overlapping or duplicative regulation within the security-based swap regulatory regime.
- Established the Security-Based Swaps Joint Venture, a collaborative venture among several SEC divisions and offices that will be responsible for coordinating functions related to the regulation of security-based swaps and oversight of certain entities that will be required to register with the Commission.

RESPONDING TO INTERNATIONAL REGULATORY AND POLITICAL DEVELOPMENTS

- In response to the European Union's 2018 Markets in Financial Instruments Directive (MiFID II), the Commission issued a number of no-action letters to enable U.S. market participants to ensure compliance with U.S. federal securities laws:

  - Providing relief for money managers to operate within the Exchange Act Section 28(e) safe harbor if the money manager makes payments for research to an executing broker-dealer out of client assets alongside payments for execution in certain specified circumstances.
  - Providing that money managers may continue to aggregate orders for mutual funds and other clients, where some clients may pay different amounts for research because of MiFID II requirements.
  - Providing that broker-dealers, on a temporary basis, may receive research payments from money managers through client commission arrangements in hard dollars or from advisory clients' research payment accounts, without having to register as investment advisers.

- Signed the IOSCO Administrative Arrangement and the FCA Administrative Arrangement to facilitate transfers of personal data between EU and UK securities regulators, respectively, and the SEC, and the IOSCO Enhanced Multilateral Memorandum of Understanding, which makes available several new forms of cross-border assistance in connection with enforcement investigations.
- Signed, with the CEO of the UK's Financial Conduct Authority (FCA), two updated Memoranda of Understanding (MOUs) to ensure the continued ability to cooperate and consult with each other regarding the effective and efficient oversight of regulated entities across national borders, as well as a new supervisory cooperation arrangement with the Commissione Nazionale per la Societa e la Borsa (CONSOB).
- Released staff guidance encouraging market participants to proactively manage their transition away from LIBOR and outlining several potential areas that may warrant their increased attention during that time.
- Provided technical assistance to more than 6,400 foreign regulatory and law enforcement officials – across more than 100 countries and approximately 200 foreign authorities – to help with a variety of topics. Topics included international standards and best practices for cross border enforcement and supervisory cooperation, insider trading, market manipulation, pyramid schemes, corporate governance, inspections and compliance, anti- money laundering, and a host of other market development and enforcement issues.
- Cooperated on 7,680 cross-border actions, including with respect to bad actors transferring assets abroad or basing their scams and fraudulent activities overseas.

SUPPORTING MARKET INTEGRITY IN THE FACE OF COVID-19

The Commission responded quickly and effectively to the onset of the COVID-19 pandemic and its effects that created economic stress and historic volatility in the capital markets. A complete list of these actions is available here.

MONITORING MARKET FUNCTIONS AND SYSTEM RISKS

- In early February 2020, assembled a cross-divisional working group to prepare for the possible adverse effects of COVID-19. The working group conducted ongoing outreach efforts with public companies, clearing agencies, exchanges, issuers, broker-dealers, investment companies, public accounting firms, investor representatives, credit rating agencies, fund sponsors, investment advisers, and other market participants. The agency also collaborated with other domestic and foreign authorities and participated in international work streams as the pandemic and related market volatility unfolded.
- In April 2020, announced the members of the COVID-19 Market Monitoring Group, an internal, cross-divisional, senior-level group that assists the Commission and its various divisions and offices in (1) Commission and staff actions and analysis related to the effects of COVID-19 on markets, issuers, and investors, and (2) responding to requests for information, analysis, and assistance from fellow regulators and other public sector partners.

PROVIDING PROMPT TARGETED GUIDANCE AND REGULATORY RELIEF TO ISSUERS, FINANCIAL PROFESSIONALS AND OTHER REGISTRANTS IMPACTED BY COVID-19

- A summary of the Commission's targeted guidance and relief to market participants can be found here. These actions include:
    - Worked closely with national securities exchanges to, among other things, facilitate the closing of physical trading floors and the transition to all-electronic trading.
    - Approved temporary rules to expedite the offering process for smaller, previously established companies directly or indirectly affected by COVID-19 that are seeking to meet crowdfunding needs through Regulation Crowdfunding.
    - Provided conditional temporary relief to registrants and others unable to meet certain filing deadlines due to certain circumstances related to COVID-19.
    - Issued a number of statements and guidance documents to facilitate timely and robust disclosures by issuers on the impact of COVID-19 on their operations.
    - Highlighted the importance of disclosure, particularly of forward looking information, to help investors, suppliers, vendors and other market participants understand companies' current status and plans for addressing the effects of COVID-19.
    - Provided staff views regarding disclosure and other securities law obligations that companies should consider with respect to COVID-19 and related business and market disruptions; provided additional staff views regarding operations, liquidity and capital resource disclosures in anticipation of the second fiscal quarter.
    - Issued a statement on financial reporting issues in connection with COVID-19, including with respect to significant estimates, reasonable judgments, internal controls, and other complex or emerging issues.
    - Issued a statement highlighting the importance for municipal issuers to provide updated financial and other disclosures – including with respect to sources of liquidity; the availability of federal, state and local aid; and reports prepared for other governance purposes – to investors, and for financial professionals to discuss these matters with Main Street investors.
    - Provided staff no-action relief on receiving electronic submissions of required paper filings.
    - Provided staff guidance for conducting shareholder meetings in light of COVID-19 concerns
    - Issued exemptive relief facilitating remote board meetings and remote approval of certain agreements, plans and arrangements by directors of registered funds.
    - Issued exemptive relief providing additional flexibility for business development companies to issue and sell senior securities in order to provide capital to small and medium-sized portfolio companies in which they invest, and to participate in investments in these portfolio companies alongside certain affiliated private funds.

MAINTAINING CONTINUITY OF COMMISSION OPERATIONS

- Prepared for SEC telework readiness in the weeks prior to March 9, including conducting network capacity tests, preparing for remote Commission meetings, and encouraging all employees to test their remote connectivity.
- Prior to March 2020, and as a result of modernization efforts that started many months prior to the onset of the COVID-19 pandemic, the agency transitioned to electronic voting and distribution for most Commission

actions. As a result of these efforts, the Commission was able to act more efficiently in a remote work environment, while saving an estimated 2 million pages of paper per year.

- Established protocols for remote open and closed Commission meetings, allowing Commission to remain fully operational after transitioning to a full telework posture in March.
- Released statements from SEC divisions and offices to inform market participants and others about their operating status and how to best engage with staff during this time.

PROMOTING INNOVATIONS IN FINANCIAL TECHNOLOGIES WHILE PROTECTING INVESTORS AND MARKETS

- Issued an investigative report in July 2017, explaining the application of the federal securities laws to the offer and sale of a digital asset security called the “DAO Token,” which was offered through an initial coin offering (ICOs).
- Established position of Senior Advisor for Digital Assets and Innovation to coordinate efforts across the SEC regarding the application of the federal securities laws to emerging digital asset technologies and innovations.
- Launched the Strategic Hub for Innovation and Financial Technology (FinHub) and established it as a stand-alone office to lead the agency's work to identify and analyze emerging financial technologies affecting the future of the securities industry, and engage with market participants on FinTech-related issues and initiatives, such as distributed ledger technology (including digital assets), automated investment advice, digital marketplace financing, and artificial intelligence/machine learning.
- Released, through the FinHub staff, a framework to assist market participants in analyzing whether a digital asset is offered and sold as a security under the federal securities laws.
- Issued a statement to provide the staff’s views to market participants on securities laws issues affecting digital assets, including with respect to offers and sales, secondary market trading, and investment vehicles investing in digital assets.
- Issued a statement and request for comment to set forth the Commission’s position that, for a period of five years, a special-purpose broker-dealer operating under certain circumstances will not be subject to an enforcement action if it custodies digital asset securities for its customers on the basis that the broker-dealer deems itself to have custody of digital asset securities for purposes of rule 15c3-3.
- Promoted engagement among fund sponsors, the digital asset community and interested members of the public regarding fund innovation and cryptocurrency-related holdings, including with respect to non-DVP custodial practices.
- Issued no-action letters (see, e.g., here and here) with respect to the offer and sale of certain digital assets, and with respect to a securities settlement system.
- Hosted a staff public forum focusing on distributed ledger technology and digital assets where panelists explored topics such as initial coin offerings, digital asset platforms, distributed ledger technology innovations, and how these technologies impact investors and the markets.
- Issued a series of investor bulletins to educate investors on the characteristics and risks of digital assets and ICOs.
- Established a fake ICO page, “HoweyCoins,” replete with a bogus white paper and other elements common to ICO investment schemes, as an educational awareness initiative designed to educate investors about the red flags of fraud in the ICO space.
- In addition, Chairman Clayton:
    - Issued a statement on cryptocurrencies and initial coin offerings in late 2017, including potential considerations for Main Street investors.

- Testified before Congress, together with the CFTC Chairman, on the roles of the SEC and CFTC with respect to virtual currencies.
- Issued a joint statement, together with the Director of FinCEN and the CFTC Chairman, reminding persons engaged in activities involving digital assets of their anti-money laundering and countering the financing of terrorism obligations under the Bank Secrecy Act.

FOCUSING ON CYBERSECURITY

Cybersecurity and minimizing cyber risks at the SEC have been a top priority for the Commission. In 2017, the agency discovered that its EDGAR system was the target of a successful hacking effort in 2016. Since 2017, the agency has added new functions, dedicated additional resources, and established a governance structure to strengthen the agency's cybersecurity posture.

Further, recognizing the increasing seriousness of cybersecurity threats and the potential consequences to investors, issuers, other market participants, the financial markets and the economy, the Commission enhanced its participation in interagency, international and private sector outreach initiatives to help encourage greater attention to cybersecurity and coordination by all parties in the financial sector.

FOCUSING ON THE SEC'S INTERNAL CYBERSECURITY AND RESILIENCY

- Implemented a number of information security enhancements, including through increased resources and hiring, designed to strengthen the agency's posture to address the increased sophistication and complexity of threats.
- Made additional investments in cyber defenses, information assurance capabilities, incident response preparation, compliance and audit requirements, and security training and awareness, recognizing that additional work remains to be done.
- Advanced efforts to limit the intake of PII and sensitive data, including by eliminating the collection of social security numbers on EDGAR forms and modifying submission deadlines to reduce the market sensitivity of certain data at the time it is transmitted.
- Established the Office of the Chief Risk Officer to strengthen the agency's risk management program and coordinate enterprise risk management efforts, including those related to cybersecurity and operational resilience.
- Established the position of the Chief Data Officer with a focus on developing the SEC's data management strategy and priorities; enabling data analytics to support enforcement, examinations and policymaking; and advancing efforts to ensure that the agency collects only the data it needs to fulfill its mission.
- Established a Cybersecurity and Data Protection Policy office to lead efforts to further enhance, integrate and coordinate the SEC's interagency work in this area, and to inform internal cybersecurity policy.

STRENGTHENING CYBERSECURITY IN THE FINANCIAL INDUSTRY

- Issued guidance to assist public companies in preparing disclosures about cybersecurity risks and incidents.
- Published a first-ever report on Cybersecurity and Resiliency Observations to assist market participants navigating increasingly complex threats by providing considerations on how to enhance cybersecurity preparedness and operational resiliency.
- Increased issuance of risk alerts on key cybersecurity issues including credential stuffing, ransomware attacks, and safeguarding customer records.

ENHANCING THE SEC'S INTERAGENCY, INTERNATIONAL AND PRIVATE SECTOR CYBERSECURITY PARTNERSHIPS

- Enhanced interagency partnerships and cybersecurity initiatives, including by strengthening the SEC's support to the Financial and Banking Information Infrastructure Committee (FBIIC).
- Worked closely with the Department of Treasury and FBIIC members on numerous initiatives, including the development of the first comprehensive sector specific incident response plan and of an enhanced information sharing framework among financial regulators in support of critical infrastructure requirements.
- Supported international cybersecurity initiatives by providing expertise to several cybersecurity initiatives, including the G-7 CEG's initiatives as well as participation in cyber incident response protocols among G-7 financial authorities; the FSB's development of a Cyber Lexicon, Regulatory and Supervisory Issues Relating to Outsourcing and Third Party Relationships, Report on a Toolkit of Effective Practices Related to Cyber Inciden Response and Recovery; and IOSCO's Cyber Task Force Report and Principles of Outsourcing Consultation Report.

ENGAGING WITH INVESTORS, MARKET PARTICIPANTS AND POLICYMAKERS

The SEC focused on meeting investors where they are and providing educational materials that help them make more informed investment decisions. The SEC has also provided the public access to high-quality, informative and timely research and analysis on issues important to policymakers and market participants.

MAIN STREET INVESTOR-FOCUSED EDUCATION AND OUTREACH EFFORTS

- Recorded "Notes from the Chairman" video series which provides Main Street investors with Chairman's personal notes on investing.
- Conducted more than 600 investor education events focused on seniors, military personnel, teachers, younger investors, and other affinity groups, including large town-hall style events for the Military Service Members Initiative at Scott Air Force Base, the Pentagon and Marine Forces Reserve Headquarters.
- Met directly with Main Street investors at seven roundtables held across the country to solicit their views on the Commission's proposed rules regarding the obligations of financial professionals.
- Held a roundtable on combating elder investor fraud and a conference on combating community-based financial fraud, among other events.
- Interacted with hundreds of investors at "Investing in America: Atlanta Town Hall" in Atlanta, GA with the Chairman, Commissioners and senior SEC staff.
- Created the "Before You Invest, Investor.gov" public service campaign, encouraging investors to use Investor.gov to check the background of investment professionals and learn more about investing wisely.
- Designed a short, electronic feedback form to engage everyday investors with Commission rulemaking proposals by providing them with a series of targeted questions.
- Issued nearly 150 investor alerts, investor bulletins, and Director's Take articles to educate Main Street investors on investment-related matters, including possible fraudulent schemes. Together with the public service campaign, the new content helped more than double the visits to Investor.gov.
- Assisted individual investors with complaints and inquiries about the securities markets and market participants, closing nearly 75,000 files, and encouraging people to report possible securities fraud using the SEC's online TCR system.

SEC RESEARCH AND EVENTS ON CRITICAL MARKET MATTERS

- Published "U.S. Credit Markets: Interconnectedness and the Effects of the COVID-19 Economic Shock," a staff report which focuses on the origination, distribution and secondary market flow of credit across U.S. credit markets amid the COVID-19 pandemic. Staff hosted a Roundtable on Interconnectedness and Risk in U.S. Credit Markets to discuss the issues raised in the report.
- Published quarterly the "DERA Economic and Risk Outlook," which provides a quarterly examination of economic and risk indicators, providing real-time insight to the Commission and the public on the status of the financial markets.
- Report on Algorithmic Trading in the U.S. Capital Markets," which reviewed risks and benefits of algorithmic trading in the capital markets.
- Issued report to Congress on "Access to Capital and Market Liquidity," which reviewed the impacts of the Dodd-Frank Act and other financial regulations on access to capital and market liquidity.
- Published a staff report on the regulation of clearing agencies which provided historical information, an overview of the current landscape, and a discussion of current trends, all in an effort to facilitate further discussion developments in the national system for clearance and settlement since the 2007– 2009 financial crisis.
- Hosted "The State of Our Securities Markets," a conference which brought together experts from government and the private sector to discuss the economic trends impacting our securities markets.

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[i] Consistent with prior practice, historical amounts do not include certain monies ordered in Securities and Exchange *Commission v. Medical Capital Holdings, Inc.*, Civil Action No. SA CV 09-818 DOC (RNBx) (C.D. Cal.) ($831 million); *Securities and Exchange Commission v. Enrica Cotellessa-Pitz*, Civil Action No. 11 CV 9302 (LTS) (S.D.N.Y.) ($97.3 billion); and *Securities and Exchange Commission v. Eric Lipkin*, Civil Action No. 11 CV 3826 (LTS) (S.D.N.Y.) ($30.6 billion).

Modified: Dec. 23, 2020

Exhibit D

William McKenzie Follow
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Ethereum, The ICO craze of 2017 and The Platform Wars

The ICO craze of 2017 revisited. What other platforms look promising as contenders to Vitalik's mighty creation?

photo source: https://www.ethereum.org

What is Ethereum?

Ethereum is an open source platform to build and distribute next generation decentralized applications (dApps). These applications have no middlemen where users interact within social systems, financial systems and gaming interfaces all in a peer to peer fashion. Ethereum utilizes the making of digital enforceable agreements in the form of smart contracts. Also, fixing minor code problems within bitcoin that make Ethereum more easily programmable within the protocol.

Think of Ethereum as a decentralized world computer where hundreds of thousands of computers around the globe will comprise of the Ethereum network. While, the ether is the digital currency that is used for operating smart contracts on the Ethereum network. Just

like Bitcoin, the Ethereum network and the ether are not controlled or issued by any government, bank or third party; rather it is an open network managed by its users.

What are the problems facing Ethereum?

Ethereum is a smart contracts platform built on top of a Proof of Work (PoW) consensus blockchain. There are a few negatives to this as well as ongoing developments that have yet to been made:

- Proof of Work is expensive and archaic
- Transactions per second (tps) is very slow with a mere 15 tps
- Smart contracts are written in Solidity and don't lend themselves to formal verification
- Fundamental changes to the chain are handled through hard forking, which can lead to numerous problems within the community and disrupt the network effects that are formed over time.
- Scaling solutions and sharding remain yet to be fully deployed

Of these problems, predominately an on chain governance for seamless upgrades is needed. It is very hard to implement new tech on Ethereum because it will have negative effects on the community and will split it in two as the result of a hardfork. This in turn will lead to a decrease in network effects that are formed over time.

Ok.. Ethereum has first mover advantage and will do well regardless

Why this may or may not be the case

Evolve or Die.

It's very simple truly, anything that wants to remain substantial and a strong competitor in its field will have to evolve and gain more of a competitive advantage against it's competitors. We have seen new projects such as ICON, Tezos and a few other players begin to emerge that seek to improve a few of the problems facing ethereum. Most notably, is Ethereum's inabilty to adopt new tech without causing uneasy community tension as the result of a hardfork. As well as serious concerns stemming from a scaling solution and the deployment of sharding within the ethereum protocol.

With many strongholds placed firmly with Fortune 500 companies through the Enterprise Ethereum Alliance, there is a large gateway to the business world. However developments and scaling concerns need to be addressed for future growth.

Source: https://entethalliance.org/

First mover advantage

With the rise of smart contracts platforms which allow for the enforcement of digital agreements, Ether gained traction first. As we have seen throughout history and within past bubbles, early movers such as Blockbuster and Kodak paved the way.

Blockbuster eventually faded away over time as the need for movie and game rentals died with the rise of media and instant downloads. People could now download and buy and rent movies online, limiting the demand for stores that provide game and movie rentals.

Kodak on the other hand lost its demand for camera sales as the rise of cell phones began to emerge. Cell phones became increasingly popular and over time have reduced the need for a compact camera, leaving the market for professional and hobby photographers. It became more easy for the user to just snap photos on their phone and with the rise of social media, it allowed for instant sharing real time through Snapchat, twitter, Facebook etc..

Will ether suffer the same fate? It's far too early to tell but nonetheless much progress is to be made in development.

The ICO and Exuberant Crypto Craze of 2017.. Revisited

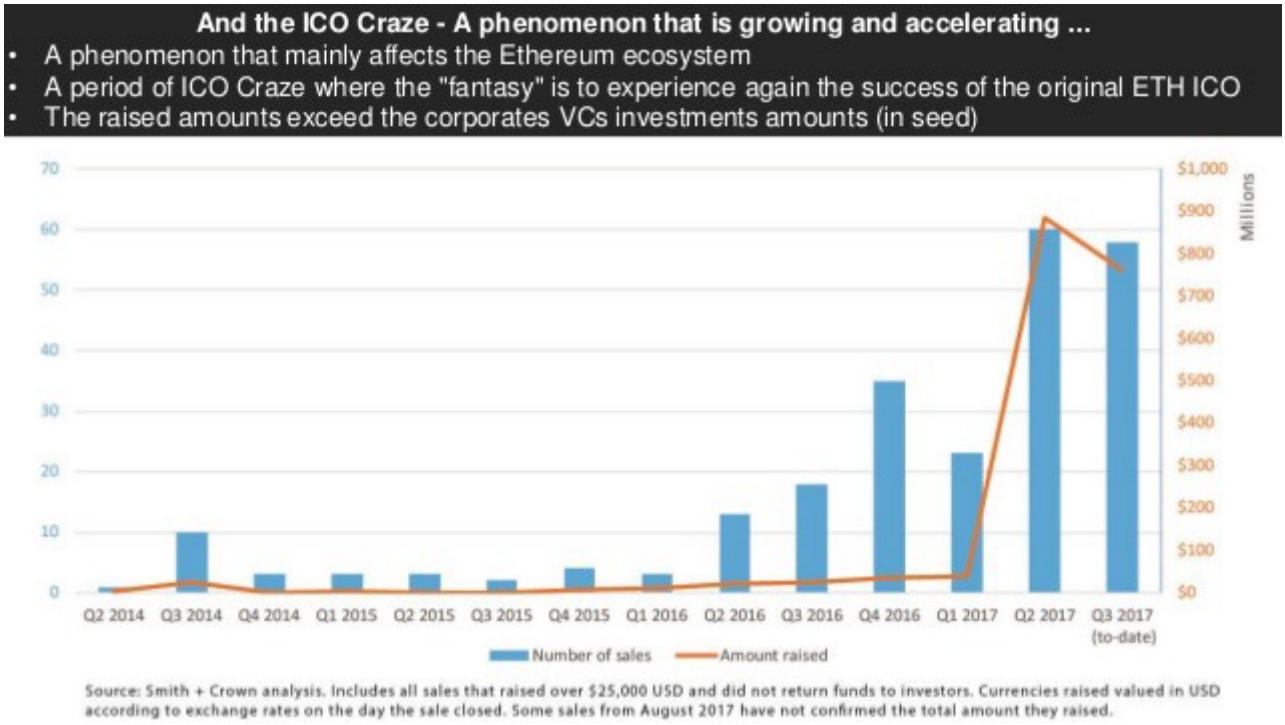

image source: https://blockchain-trust.com/cryptocurrency/ico-craze-of-2017-visualized/

Exuberant optimism

The trading price for one ether at the beginning of January 2017 was around $8. 2 months later that figure had quadrupled and then the rest we know was history. The price for one ether reached an all time around $1440 on January 13th 2018, up 18,000% from previous year.

Source: https://coinmarketcap.com/currencies/ethereum/historical-data/

ICO's or initial coin offerings were raking in millions of dollars from "promises" within their white papers, with many not having a real working product. Speculation was turning into sublimation, and every project was adorned regardless of how long it will take to implement features and developments.

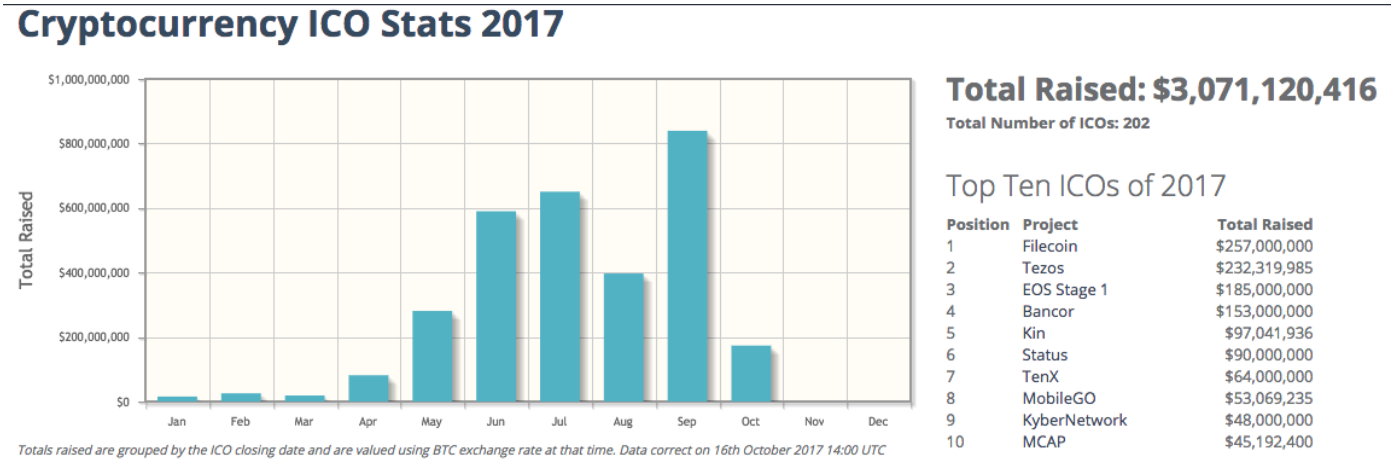

photo source: https://hype.codes/top-failed-ico-2017

Articles were published left and right proclaiming ether as the most promising cryptocurrency. Fortunes were made and we began to see rise of articles like this one surface: https://www.nytimes.com/2018/01/13/style/bitcoin-millionaires.html

Newly minted bitcoin and ethereum millionaires were popping up everywhere and people began wanting learn more. Most notably Eric Finman, a young 18 year having put $1000 into bitcoin when its trading price was $10. He famously made a bet with his parents if he became a millionaire by the age of 18 he would never attend college. Which he became just that.

Aftermath

For awhile it seemed there was no top to the market, it just kept growing and growing. ICO funding was reaching record highs with some such as Tezos and Filecoin raking in nearly a quarter of a billion dollars. A truly surreal crypto ICO bubble had been formed, one which seemed to never end. But, savvy investors locked in profits and began to prepare for an inevitable decline in prices across the board.

This bubble as we can look at it now through an outside lense began forming when media attention and loans were being taken out to buy crypto "at the top". We began to see news sources such as CNBC fast money teaching people how to buy Ripple XRP at $3, then

shortly a few months later the same source telling them to sell it at $0.50. All these things created a bubble that would inevitably collapse and correct rather heavily.

What followed next is still occurring within crypto, people cashed out their profits and with the introduction of futures contracts, bitcoin could be shorted and the “big short” was timely made around $20000. The primary goal being to tame bitcoin. Since that figure was reached we have yet to see it again.

Conclusion

With this is mind we can glean that a surreal crypto ICO bubble and the rise of Ether is surely a once in a lifetime happening. Until we see key problems with ether such as the adoption of new tech without causing a split in community, scaling and sharding solutions fully deployed… It will be hard to put Ether above a 50 billion market capitalization for quite awhile.

Where We’ve Been and Where We are Headed

A sign of whats to come in the blockchain space.

Where we’ve been

First, we saw Blockchain 1.0 with Bitcoin and this reset of collective delusion given to money collided, allowing us to transfer value without a central third party or government. This was an extremely huge feat that was accomplished and will have lasting implications

on not only how we perceive money but what we deem value and a medium of exchange to be.

This realization that money could be immutably want it wants was a driving force in the early days of crypto. With all the decentralized forms of communication such as bittorrent and other file sharing databases, people collectively got together and wondered why can't we create digital cash? Thus bitcoin was born shortly after one of the largest corrections of traditional finance markets we have seen to this day.

Collectively this idea of a new social construct of value and the idea that people could get together and form a new financial system was one of the reasons that sparked Ethereum founder, Vitalik Buterin to create Ethereum. The traditional ideology of money being created and handled through these centralized and large entities was challenged.

This technology represents epiglottal changes in the ways that we choose to interact with each other. Through bitcoin, we saw the transfer of value being sent peer to peer eliminating in a sense the need for just solely banks to transfer value. Whereas, with the birth of Ethereum and Blockchain 2.0, Ether extended that to making digital enforceable agreements in the form of smart contracts and fixing minor code problems within bitcoin making this more easily programmable within the new Ethereum protocol.

Where we are headed

Now, we glance to the future and where we are currently going. Blockchain 3.0 sets to challenge current problems facing protocols like Ethereum such as a split community as the result of forking, the data silos created within new blockchains and its lack of connectivity through interoperability between chains. Many believe these will be the focus of where we are headed and the solutions to these problems will be characteristics of 3rd gen protocols.

The Platform Wars

What are promising contenders to Vitalik's mighty creation?

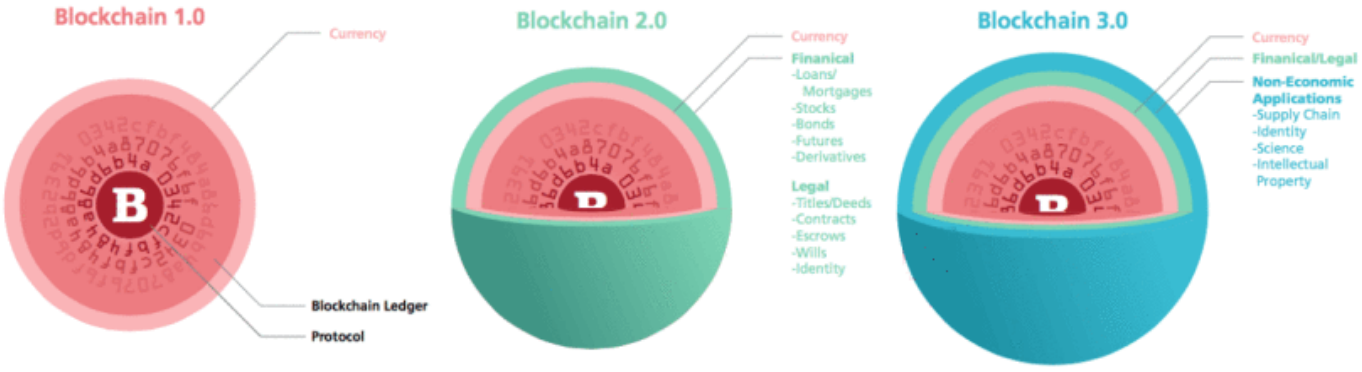

image source: https://dzone.com/articles/getting-an-insight-of-blockchain

Progressing deep towards Blockchain 3.0, Newer projects like Tezos, seek to grow their network effects over time and not have them diminish through its self amending ledger; allowing the chain to upgrade new tech and evolve as tides change. While through ICON, communities that were once isolated can connect and share various services through the icon network. Essentially, bringing about a hyper connected world where everyone builds and connects their communities. We'll go into more detail on these projects specifically.

Tezos (XTZ)

image source: https://tezos.com/

Tezos, seeks to solve this problem of hard forking with its self amending ledger, allowing the protocol to change based on community consensus as it goes forward. This eliminates the value to decrease and change as its network effects do not split and get cut off directly as a result of a hard fork. Through consensus this will maintain the value and perhaps help it grow as the network effects will not diminish in this process.

So what is Tezos?

Tezos is a self-amending blockchain that can evolve over time by upgrading itself. Through self amendment it allows Tezos to upgrade itself without having to fork the network into two different blockchains. Stakeholders can vote on amendments to the protocol not limited to any factor to reach consensus on proposals. Much like Ethereum, Tezos supports smart contracts and offers a platform to allow others to build decentralized applications (Dapps) on top of it.

Tezos, comparative to other chains implements several features that ensure unity and validity across the network driving incentives to hold Tezos (XTZ).

Including:

- Self-amendment: Allowing the network to upgrade itself over time without having to hardfork and cause a divide in community, alter stakeholder incentives and disrupt the network effects that are formed over time.
- On-Chain governance: Where stakeholders in Tezos can particpate in the governing protocol, allowing for a formal and systematic procedure for stakeholders to reach agreement on proposed protocol amendments.
- Decentralized Innovation: Proposed amendments to the protocol by stakeholders will include payments to groups or individuals to improve the protocol, furthering innovation and decentralizing the maintenance of the network.
- Smart contracts & Formal verification: Tezos offers a platform to create smart contracts and build Dapps that cannot be censored or shut down. Unlike Ethereum, Tezos facilitates formal verification to prove validity of smart contracts.
- Proof of Stake (PoS): Unlike Ethereum, Tezos utilizes PoS where participants provide the necessary computational resources to keep the network running. This is less costly

compared to PoW and unlike other PoS protocols any stakeholder can participate in the consensus process and be rewarded for contributing to the security and stability of the network.

- Delegation: A security deposit is required to participate in the consensus process. The consensus process relies on an honest majority for its security and thus will penalize any dishonest particpants to the point of losing their deposit. But, will be rewarding to honest behavior.

ICON (ICX)

image source: https://oracletimes.com/reasons-for-which-icon-icxs-current-price-is-irrelevant-as-the-coin-boasts-enormous-potential/

ICON is a decentralized network where anyone can participate and connect to any blockchain. Through ICON communities that were once isolated can connect and share various services through the ICON network. Bringing about a new world where everyone builds and connects their communities.

What is ICON?

Originating in South Korea, ICON wishes to become one of the largest decentralized platforms. With a unique diplomatic approach.

Instead of operating as a single platform where transactions can be made, ICON wants to let different blockchains to interact with each other through its network. Each blockchain will be able operate independently but also communicate with each other through ICON's loopchain technology, something unique to it. Essentially, ICON is an ecosystem of blockchains.

ICON's ecosystem is made possible through the ICON Republic, a lobby in which all individual blockchain communities will gather together. ICON also uses Artificial Intelligence to manage reserve values and exchange rates, as well as calculate the network's Incentives Scoring System (IISS). It also features its own exchange, DEX. What distinguishes ICON from the other platforms is that it conducts inter-blockchain transactions, while still letting each blockchain maintain its own consensus and independence.

Community Initiative ICA & HX57

ICON Community Alliance (ICA) was formed to harness collective intelligence from the ICON community, focusing on education, marketing, public relations, local representation, community outreach, and other business development opportunities. ICA is run by a group (HX57) of ICON enthusiasts, offering to promote ICON and help its adoption, on a voluntary basis. The alliance's ultimate goal will align with ICON foundation's vision, to hyperconnect the world.

Learn more here about ICA & HX57: https://t.me/iconhx57

Conclusion

Revisting the ICO craze of 2017 while detailing the problems lying within Ethereum, where we have been and are headed within the blockchain space we can see a few promising contenders for becoming dominant platforms. Platforms, especially Tezos will be major sources for VC's to begin investing in and funding new projects being developed. ICON's unique democratic approach should be noted, why let others fight for the throne when everyone can work together each with a different purpose.

Disclaimer: I am not a financial advisor nor should my detail be taken as an immediate means to purchase any crypto assets. The opinions in this article represent my own and as always please do your own dilligence and research.

Exhibit E

ATTACHMENT A: STATEMENT OF FACTS AND VIOLATIONS

I. INTRODUCTION AND BACKGROUND

1. Ripple Labs Inc. ("Ripple Labs") is a corporation registered in Delaware and headquartered in San Francisco, California. NewCoin, Inc. and OpenCoin, Inc. ("OpenCoin") are the predecessors of Ripple Labs.

2. Ripple Labs facilitated transfers of virtual currency and provided virtual currency exchange transaction services.

3. The currency of the Ripple network, known as "XRP," was pre-mined. In other words, unlike some other virtual currencies, XRP was fully generated prior to its distribution. As of 2015, XRP is the second-largest cryptocurrency by market capitalization, after Bitcoin.

4. XRP Fund II, LLC, a wholly-owned subsidiary of Ripple Labs, was incorporated in South Carolina on July 1, 2013. On July 2, 2014, XRP Fund II changed its name to XRP II, LLC. During a portion of the relevant timeframe, the entity was named XRP Fund II, LLC, but it will be referred to as XRP II throughout this document.

II. LEGAL FRAMEWORK

5. The U.S. Attorney's Office for the Northern District of California ("U.S. Attorney's Office") is a component of the Justice Department. The Financial Crimes Enforcement Network ("FinCEN") is a bureau within the Department of Treasury. The Bank Secrecy Act and its implementing regulations require Money Services Businesses ("MSBs") to register with FinCEN by filing a Registration of Money Services Business ("RMSB"), and renewing the registration every two years. *See* 31 U.S.C. § 5330; 31 C.F.R. § 1022.380. Operation of an MSB without the appropriate registration also violates federal criminal law. *See* 18 U.S.C. § 1960(b)(1)(B). This is a requirement separate and apart from state licensing requirements, if any, that may be required by law.

6. On March 18, 2013, FinCEN released guidance clarifying the applicability of regulations implementing the Bank Secrecy Act, and the requirement for certain participants in the virtual currency arena to register as MSBs under federal law. *See* FIN-2013-G0001, Application of FinCEN's Regulations to Persons Administering, Exchanging, or Using Virtual Currencies (Mar. 18, 2013) (the "Guidance"). Among other things, the Guidance defines two categories of participants in the virtual

currency ecosystem: "exchangers" and "administrators." The Guidance states that exchangers and administrators of virtual currencies are money transmitters (a type of MSB) under FinCEN's regulations, and therefore are required to register with FinCEN as money service businesses.

7. Specifically, the Guidance defines an exchanger as a person or entity "engaged as a business in the exchange of virtual currency for real currency, funds, or other virtual currency." The Guidance also defines an administrator of virtual currency as a person or entity "engaged as a business in issuing (putting into circulation) a virtual currency, and who has the authority to redeem (to withdraw from circulation) such virtual currency."

8. Both exchangers and administrators are MSBs that must register with FinCEN unless they fall within an exemption. And regardless of whether they have registered as required, MSBs are subject to certain additional requirements under the Bank Secrecy Act and its implementing regulations.

9. The Bank Secrecy Act and its implementing regulations require MSBs to develop, implement, and maintain an effective written anti-money laundering ("AML") program that is reasonably designed to prevent the MSB from being used to facilitate money laundering and the financing of terrorist activities. *See* 31 U.S.C. §§ 5318(a)(2) and 5318(h); 31 C.F.R. § 1022.210.

10. Under the Bank Secrecy Act, an MSB is required to implement an AML program that, at a minimum: (a) incorporates policies, procedures and internal controls reasonably designed to assure ongoing compliance; (b) designates an individual responsible for assuring day to day compliance with the program and Bank Secrecy Act requirements; (c) provides training for appropriate personnel including training in the detection of suspicious transactions; and (d) provides for independent review to monitor and maintain an adequate program. 31 C.F.R. §§ 1022.210(d).

11. Further, an MSB must report transactions that the MSB "knows, suspects, or has reason to suspect" are suspicious, if the transaction is conducted or attempted by, at, or through the MSB, and the transaction involves or aggregates to at least $2,000.00 in funds or other assets. 31 C.F.R. § 1022.320(a)(2). A transaction is "suspicious" if the transaction: (a) involves funds derived from illegal activity; (b) is intended or conducted in order to hide or disguise funds or assets derived from illegal activity, or to disguise the ownership, nature, source, location, or control of funds or assets derived from illegal activity; (c) is designed, whether through structuring or other means, to evade any requirement in the Bank Secrecy Act or its implementing regulations; (d) serves no business or apparent lawful purpose, and the MSB knows of

no reasonable explanation for the transaction after examining the available facts, including the background and possible purpose of the transaction; or (e) involves use of the MSB to facilitate criminal activity. *Id.*

12. As part of their risk assessment and risk mitigation plans, MSBs are required to implement Know-Your-Customer/Know-Your-Counterparty procedures. Such procedures allow the MSB to assess the risk involved in providing account-based or transactional services to customers based on their identity and profile, and to comply with their AML Program requirements regarding foreign agents or foreign counterparties. *See* FinCEN Interpretive Release 2004-1, Anti-Money Laundering Program Requirements for Money Service Businesses With Respect to Foreign Agents or Foreign Counterparties, 69 Fed. Reg. 74,439 (Dec. 14, 2004).

13. Financial institutions, including MSBs, are also subject to the Funds Transfer Rule, 31 C.F.R. § 1010.410(e), which provides that (subject to certain exceptions) for individual transactions of $3,000.00 or above, the transmitting financial institution must obtain, verify, and keep key information (set forth in the regulation) from the transmitting party (the transmittor). If acting as an intermediary financial institution, it must obtain and keep key information (the transmittal order received) from the transmittor's financial institution. And, if acting as the financial institution for the recipient of the funds, the financial institution must obtain, verify, and keep key information (also set forth in the regulation) from the recipient. The same financial institution may be acting as both transmittor's and recipient's financial institution.

14. Similarly, financial institutions, including MSBs, are subject to the Funds Travel Rule, 31 C.F.R. § 1010.410(f), which provides that (subject to certain exceptions) for individual transactions of $3,000.00 or more, the transmittor's financial institution must pass on key information from the transmittor and the transaction to any intermediary financial institution; if acting as the intermediary financial institution, it must pass on this information to the recipient's financial institution. And, if acting as the recipient's financial institution, it must receive, evaluate, and store this information received from the intermediary or the transmittor's financial institution.

15. The FinCEN registration requirement and other requirements of the Bank Secrecy Act are independent obligations. An MSB's failure to register with FinCEN does not relieve an MSB of its obligations under the Bank Secrecy Act and implementing regulations. Nor does an MSB's registration with FinCEN mean that the MSB has fulfilled all of its requirements under the Bank Secrecy Act and regulations. In other words, an MSB might have complied with the Bank Secrecy Act and implementing regulations, but failed to register as an MSB with FinCEN. Likewise, an entity might

have registered as an MSB with FinCEN, but not have complied with the Bank Secrecy Act and implementing regulations.

III. VIOLATIONS

A. Ripple Labs's Operation as a Money Services Business in March-April 2013

16. Ripple Labs has previously described itself in federal court filings and in a sworn affidavit as "a currency *exchange service* providing on-line, real-time currency trading and cash management . . . . Ripple facilitates the transfers of electronic cash equivalents and provides virtual currency exchange transaction services for transferrable electronic cash equivalent units having a specified cash value." *See Ripple Labs, Inc. v. Lacore Enterprises, LLC*, Motion for Preliminary Injunction, 13-cv-5974-RS/KAW (N.D. Cal. 2013) (emphasis added).

17. From at least March 6, 2013, through April 29, 2013, Ripple Labs sold convertible virtual currency known as "XRP."

18. Ripple Labs was not registered with FinCEN as an MSB while engaging in these sales.

19. As described in Paragraphs 6 and 7 above, on March 18, 2013, FinCEN released guidance that clarified the applicability of existing regulations to virtual currency exchangers and administrators. Among other things, this Guidance expressly noted that such exchangers and administrators constituted "money transmitters" under the regulations, and therefore must register as MSBs.

20. Notwithstanding the Guidance, and after that Guidance was issued, Ripple Labs continued to engage in transactions whereby it sold Ripple currency (XRP) for fiat currency (*i.e.*, currency declared by a government to be legal tender) even though it was not registered with FinCEN as an MSB. Throughout the month of April 2013, Ripple Labs effectuated multiple sales of XRP currency totaling over approximately $1.3 million U.S. dollars.

21. During the time frame that it was engaged in these sales and operated as a money transmitter, Ripple Labs failed to establish and maintain an appropriate anti-money laundering program. Ripple failed to have adequate policies, procedures, and internal controls to ensure compliance with the Bank Secrecy Act and its implementing regulations. Moreover, Ripple Labs failed to designate a compliance officer to assure compliance with the Bank Secrecy Act, had no anti-money laundering training in place, and failed to have any independent review of its practices and procedures.

B. XRP II's Program and Reporting Violations

22. On July 1, 2013, Ripple Labs incorporated a subsidiary, XRP Fund II, LLC ("XRP Fund II"), now known as XRP II, LLC, in South Carolina. XRP II was created to engage in the sale and transfer of the convertible virtual currency, XRP, to various third parties on a wholesale basis. XRP II sold XRP currency in exchange for fiat currency in much the same way that Ripple Labs had previously done from March through April 2013. In other words, XRP II replaced Ripple Labs as a seller of XRP.

23. By on or about August 4, 2013, XRP II was engaged in the sale of XRP currency to third-party entities.

24. On September 4, 2013, XRP II registered with FinCEN as an MSB.

25. As of the date XRP II engaged in sales of virtual currency to third parties in exchange for value, XRP II became subject to certain requirements under the Bank Secrecy Act and its implementing regulations, as described in Paragraphs 5 through 15 above. XRP II was required to have an effective written AML program, to implement that program, and to have an anti-money laundering compliance officer.

26. Notwithstanding these requirements, despite engaging in numerous sales of virtual currency to third parties, XRP II failed to have an effective, written AML program. For example:

a) It was not until September 26, 2013, that XRP II developed a written AML program. Prior to that time, XRP II had no written AML program;

b) It was not until late January 2014 that XRP II hired an AML compliance officer, some six months after it began to engage in sales of virtual currency to third parties;

c) XRP II had inadequate internal controls reasonably designed to ensure compliance with the Bank Secrecy Act;

d) XRP II failed to conduct an AML risk assessment until March 2014;

e) XRP II did not conduct training on its AML program until nearly a year after beginning to engage in sales of virtual currency, by which time Ripple Labs was aware of a federal criminal investigation; and

f) XRP II did not conduct an independent review of its AML program until nearly a year after it began to engage in sales of virtual currency, by which time Ripple Labs was aware of a federal criminal investigation.

27. Further, from the date XRP II began engaging in sales of virtual currency to third parties, XRP II was required to report transactions that it knew, suspected, or had reason to suspect were suspicious and where the transactions or attempted transactions involved or aggregated to at least $2,000.00 in funds or other assets. *See* 31 C.F.R. § 1022.320(a)(2).

28. In addition to XRP II's lack of an effective AML program, XRP II also engaged in a series of transactions for which it either failed to file, or untimely filed, suspicious activity reports. For example:

a) On September 30, 2013, XRP II negotiated an approximately $250,000.00 transaction by email for a sale of XRP virtual currency with a third-party individual. XRP II provided that individual with a "know your customer" ("KYC") form and asked that it be returned along with appropriate identification in order to move forward with the transaction. The individual replied that another source would provide the XRP virtual currency and did not "require anywhere near as much paperwork" and essentially threatened to go elsewhere. Within hours, XRP II agreed by email to dispense with its KYC requirement and move forward with the transaction. Open source information indicates that this individual, an investor in Ripple Labs, has a prior three-count federal felony conviction for dealing in, mailing, and storing explosive devices and had been sentenced to prison, *see United States v. Roger Ver*, CR 1-20127-JF (N.D. Cal. 2002);

b) In November 2013, XRP II rejected an approximately $32,000.00 transaction because it doubted the legitimacy of the overseas customer's source of funds. XRP II failed to file a suspicious activity report for this transaction; and

c) In January 2014, a Malaysian-based customer sought to purchase XRP from XRP II, indicating that he wanted to use a personal bank account for a business purpose. Because of these concerns, XRP II declined the transaction but again failed to file a suspicious activity report for the transaction.

Exhibit F

United States Government Accountability Office

Report to the Committee on Homeland Security and Governmental Affairs, U.S. Senate

May 2014

VIRTUAL CURRENCIES

Emerging Regulatory, Law Enforcement, and Consumer Protection Challenges

GAO Highlights

Highlights of GAO-14-496, a report to the Committee on Homeland Security and Governmental Affairs, U.S. Senate

May 2014

VIRTUAL CURRENCIES

Emerging Regulatory, Law Enforcement, and Consumer Protection Challenges

Why GAO Did This Study

Virtual currencies—digital representations of value that are not government-issued—have grown in popularity in recent years. Some virtual currencies can be used to buy real goods and services and exchanged for dollars or other currencies. One example of these is bitcoin, which was developed in 2009. Bitcoin and similar virtual currency systems operate over the Internet and use computer protocols and encryption to conduct and verify transactions. While these virtual currency systems offer some benefits, they also pose risks. For example, they have been associated with illicit activity and security breaches, raising possible regulatory, law enforcement, and consumer protection issues. GAO was asked to examine federal policy and interagency collaboration issues concerning virtual currencies.

This report discusses (1) federal financial regulatory and law enforcement agency responsibilities related to the use of virtual currencies and associated challenges and (2) actions and collaborative efforts the agencies have undertaken regarding virtual currencies. To address these objectives, GAO reviewed federal laws and regulations, academic and industry research, and agency documents; and interviewed federal agency officials, researchers, and industry groups.

What GAO Recommends

GAO recommends that CFPB take steps to identify and participate in pertinent interagency working groups addressing virtual currencies, in coordination with other participating agencies. CFPB concurred with this recommendation.

View GAO-14-496. For more information, contact Lawrance L. Evans, Jr. at (202) 512-8678 or evansl@gao.gov.

What GAO Found

Virtual currencies are financial innovations that pose emerging challenges to federal financial regulatory and law enforcement agencies in carrying out their responsibilities, as the following examples illustrate:

- Virtual currency systems may provide greater anonymity than traditional payment systems and sometimes lack a central intermediary to maintain transaction information. As a result, financial regulators and law enforcement agencies may find it difficult to detect money laundering and other crimes involving virtual currencies.
- Many virtual currency systems can be accessed globally to make payments and transfer funds across borders. Consequently, law enforcement agencies investigating and prosecuting crimes that involve virtual currencies may have to rely upon cooperation from international partners who may operate under different regulatory and legal regimes.
- The emergence of virtual currencies has raised a number of consumer and investor protection issues. These include the reported loss of consumer funds maintained by bitcoin exchanges, volatility in bitcoin prices, and the development of virtual-currency-based investment products. For example, in February 2014, a Tokyo-based bitcoin exchange called Mt. Gox filed for bankruptcy after reporting that it had lost more than $460 million.

Federal financial regulatory and law enforcement agencies have taken a number of actions regarding virtual currencies. In March 2013, the Department of the Treasury's Financial Crimes Enforcement Network (FinCEN) issued guidance that clarified which participants in virtual currency systems are subject to anti-money-laundering requirements and required virtual currency exchanges to register with FinCEN. Additionally, financial regulators have taken some actions regarding anti-money-laundering compliance and investor protection. For example, in July 2013, the Securities and Exchange Commission (SEC) charged an individual and his company with defrauding investors through a bitcoin-based investment scheme. Further, law enforcement agencies have taken actions against parties alleged to have used virtual currencies to facilitate money laundering or other crimes. For example, in October 2013, multiple agencies worked together to shut down Silk Road, an online marketplace where users paid for illegal goods and services with bitcoins.

Federal agencies also have begun to collaborate on virtual currency issues through informal discussions and interagency working groups primarily concerned with money laundering and other law enforcement matters. However, these working groups have not focused on emerging consumer protection issues, and the Consumer Financial Protection Bureau (CFPB)—whose responsibilities include providing consumers with information to make responsible decisions about financial transactions—has generally not participated in these groups. Therefore, interagency efforts related to virtual currencies may not be consistent with key practices that can benefit interagency collaboration, such as including all relevant participants to ensure they contribute to the outcomes of the effort. As a result, future interagency efforts may not be in a position to address consumer risks associated with virtual currencies in the most timely and effective manner.

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Figure 4: How Bitcoins Enter into Circulation and Are Used in Transactions 42

Abbreviations

BSA	Bank Secrecy Act
BSAAG	Bank Secrecy Act Advisory Group
CFPB	Consumer Financial Protection Bureau
CFTC	Commodity Futures Trading Commission
DATA	Digital Asset Transfer Authority
DEA	Drug Enforcement Administration
DHS	Department of Homeland Security
DOJ	Department of Justice
ECTF	Electronic Crimes Task Forces
EFTA	Electronic Fund Transfer Act
FATF	Financial Action Task Force
FBI	Federal Bureau of Investigation
FDIC	Federal Deposit Insurance Corporation
FFIEC	Federal Financial Institutions Examination Council
FinCEN	Financial Crimes Enforcement Network
HSI	Homeland Security Investigations
ICE	U.S. Immigration and Customs Enforcement
IOC-2	International Organized Crime Intelligence and Operations Center
IRS	Internal Revenue Service
NCUA	National Credit Union Administration
OCC	Office of the Comptroller of the Currency
SEC	Securities and Exchange Commission
TOR	The Onion Router
USAID	United States Agency for International Development
VCET	Virtual Currency Emerging Threats Working Group

U.S. GOVERNMENT ACCOUNTABILITY OFFICE
441 G St. N.W.
Washington, DC 20548

May 29, 2014

The Honorable Thomas R. Carper
Chairman

The Honorable Tom A. Coburn
Ranking Member
Committee on Homeland Security and Governmental Affairs
United States Senate

While not widely used or accepted, virtual currencies, such as bitcoin, have grown in popularity in recent years and have emerged for some as potential alternatives to traditional currencies issued by governments. Virtual currencies operate over the Internet and, in some cases, may be used to buy real goods and services and exchanged for traditional currencies. They offer potential benefits over traditional currencies, including lower transaction costs and faster funds transfers. Because some virtual currency transactions provide greater anonymity than transactions using traditional payment systems, law enforcement and financial regulators have raised concerns about the use of virtual currencies for illegal activities. Additionally, recent cases involving the loss of funds from virtual currency exchanges have highlighted potential consumer protection issues.

You asked us to examine potential policy issues related to virtual currencies and the status of federal agency collaboration in this area. This report focuses on the federal financial regulatory agencies and selected federal law enforcement agencies that have a role in protecting the U.S. financial system and investigating financial crimes.[1] Specifically, this report addresses (1) agency responsibilities related to the use of virtual currencies and the emerging challenges these currencies pose to the

[1]Other federal agencies that were outside the scope of this report, such as the Internal Revenue Service (IRS), have responsibilities related to virtual currencies. For example, as we reported in May 2013, IRS is responsible for ensuring taxpayer compliance for all economic areas, including virtual economies and currencies. For more information, see GAO, *Virtual Economies and Currencies: Additional IRS Guidance Could Reduce Tax Compliance Risks*, GAO-13-516 (Washington, D.C.: May 15, 2013). In March 2014, IRS determined that virtual currencies will be treated as property for purposes of U.S. federal taxes. Therefore, general tax principles that apply to property transactions apply to transactions using virtual currency. See IRS Notice 2014-21.

agencies; and (2) actions the agencies have taken in response to the emergence of virtual currencies, including interagency collaborative efforts. We selected the law enforcement agencies included in our review based on their involvement in investigating virtual-currency-related crimes and participation in interagency collaborative efforts and congressional hearings on virtual currency issues.

To describe agency responsibilities related to the use of virtual currencies and the emerging challenges these currencies pose, we reviewed the following agency information: testimony and written statements from relevant congressional hearings, written responses to congressional questions, unclassified intelligence assessments, financial reports, training presentations, and descriptions of missions and responsibilities from agencies' websites.[2] We also reviewed prior GAO reports, Congressional Research Service reports, and relevant laws and regulations, including the Bank Secrecy Act (BSA) and related anti-money laundering provisions such as Title III of the USA PATRIOT Act, to gain an understanding of agencies' responsibilities in administering and enforcing anti-money-laundering laws and regulations, as well as in investigating and prosecuting financial and other crimes.[3] In addition, we reviewed academic articles and papers from industry stakeholders. Further, we interviewed officials from the following federal financial regulatory and law enforcement agencies:

- The Board of Governors of the Federal Reserve System (Federal Reserve);
- The Bureau of Consumer Financial Protection (also known as the Consumer Financial Protection Bureau or CFPB);
- The Commodity Futures Trading Commission (CFTC);
- The Department of Homeland Security (DHS), including U.S. Immigration and Customs Enforcement–Homeland Security Investigations (ICE-HSI) and the U.S. Secret Service (Secret Service);

[2]We reviewed testimony and agency statements from two congressional hearings: the November 18, 2013, U.S. Senate Committee on Homeland Security and Governmental Affairs hearing "Beyond Silk Road: Potential Risks, Threats, and Promises of Virtual Currencies," and the November 19, 2013, U.S. Senate Committee on Banking, Housing, and Urban Affairs hearing, "The Present and Future Impact of Virtual Currency."

[3]Pub. L. No. 91-508, 84 Stat. 1114 (1970) (codified as amended at 12 U.S.C. §§ 1829(b), 1951-1959; 31 U.S.C. §§ 5311-5330); Pub. L. No. 107-56, 115 Stat. 272 (2001) (codified as amended in scattered sections of U.S.C.).

- The Department of Justice (DOJ), including the Criminal Division and two of its components—the Asset Forfeiture and Money Laundering Section and Computer Crime and Intellectual Property Section—and the Federal Bureau of Investigation (FBI);
- The Department of the Treasury (Treasury), including the Financial Crimes Enforcement Network (FinCEN) and the Office of the Comptroller of the Currency (OCC);
- The Federal Deposit Insurance Corporation (FDIC);
- The National Credit Union Administration (NCUA); and
- The Securities and Exchange Commission (SEC).

Additionally, we interviewed an academic whose research focused on virtual currencies and industry stakeholders, including the Bitcoin Foundation, the Digital Asset Transfer Authority (DATA), and the National Money Transmitters Association, which represent the interests of a large number of virtual currency and money transmission businesses.

To examine the actions and collaborative efforts federal agencies have undertaken in response to the emergence of virtual currencies, we reviewed agency information, including FinCEN's regulatory guidance and administrative rulings on the applicability of BSA to virtual currency participants, testimony and written statements from the previously mentioned congressional hearings, written responses to congressional questions, intelligence assessments, a CFPB query of its Consumer Complaint Database, and press releases.[4] We also interviewed officials from the agencies listed previously to obtain further information on the actions they have taken to address the emergence of virtual currencies and their efforts to collaborate with other federal agencies on this issue. Additionally, we interviewed the academic and industry stakeholders noted previously, as well as the Digital Economy Task Force, to determine the extent to which private sector groups were involved in

[4]FinCEN, *Application of FinCEN's Regulations to Persons Administering, Exchanging, or Using Virtual Currencies*, FIN-2013-G001, March 18, 2013; FinCEN, *Application of FinCEN's Regulations to Virtual Currency Mining Operations*, FIN-2014-R001, January 30, 2014; FinCEN, *Application of FinCEN's Regulations to Virtual Currency Software Development and Certain Investment Activity*, FIN-2014-R002, January 30, 2014; and FinCEN, *Application of Money Services Business Regulations to the Rental of Computer Systems for Mining Virtual Currencies,* FIN-2014-R007, April 29, 2014.

interagency collaborative efforts.[5] We reviewed GAO's key practices on collaboration and assessed whether interagency collaborative efforts related to virtual currencies were consistent with practices concerning the inclusion of relevant participants.[6]

We conducted this performance audit from November 2013 to May 2014 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

Background

Virtual currencies are financial innovations that have grown in number and popularity in recent years. While there is no statutory definition for virtual currency, the term refers to a digital representation of value that is not government-issued legal tender. Unlike U.S. dollars and other government-issued currencies, virtual currencies do not necessarily have a physical coin or bill associated with their circulation. While virtual currencies can function as a unit of account, store of value, and medium of exchange, they are not widely used or accepted. Some virtual currencies can only be used within virtual economies (for example, within online role-playing games) and may not be readily exchanged for government-issued currencies such as U.S. dollars, euro, or yen. Other virtual currencies may be used to purchase goods and services in the real economy and can be converted into government-issued currencies through virtual currency exchanges. In previous work, we described the

[5]The Digital Economy Task Force was established in 2013 by Thomson Reuters (a multinational media and information firm) and the International Centre for Missing & Exploited Children to explore the benefits and risks of the emerging digital economy, including the use of virtual currency. This task force includes members from both the public and private sectors.

[6]GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, GAO-12-1022 (Washington, D.C.: Sept. 27, 2012) and *Managing for Results: Implementation Approaches Used to Enhance Collaboration in Interagency Groups*, GAO-14-220 (Washington, D.C.: Feb. 14, 2014).

latter type of virtual currencies as "open flow."[7] Open-flow virtual currencies have received considerable attention from federal financial regulatory and law enforcement agencies, in part because these currencies interact with the real economy and because depository institutions (for example, banks and credit unions) may have business relationships with companies that exchange virtual currencies for government-issued currencies. Throughout the remainder of this report, we use the term virtual currencies to mean open-flow virtual currencies, unless otherwise stated.[8]

Virtual currency systems, which include protocols for conducting transactions in addition to digital representations of value, can either be centralized or decentralized. Centralized virtual currency systems have a single administering authority that issues the currency and has the authority to withdraw the currency from circulation. In addition, the administrating authority issues rules for use of the currency and maintains a central payment ledger. In contrast, decentralized virtual currency systems have no central administering authority. Validation and certification of transactions are performed by users of the system and therefore do not require a third party to perform intermediation activities.

A prominent example of a decentralized virtual currency system is bitcoin. Bitcoin was developed in 2009 by an unidentified programmer or programmers using the name Satoshi Nakamoto. According to industry stakeholders, bitcoin is the most widely circulated decentralized virtual currency. The bitcoin computer protocol permits the storage of unique digital representations of value (bitcoins) and facilitates the assignment of bitcoins from one user to another through a peer-to-peer, Internet-based

[7]GAO-13-516. In that report we described "closed-flow" virtual currencies as those that can be used only within a game or virtual environment and cannot be cashed out for dollars or other government-issued currencies. We also described hybrid virtual currencies as those that have characteristics of both open- and closed-flow currencies—for example, such currencies can be used to buy real goods and services but are not exchangeable for government-issued currencies.

[8]Some stakeholders with whom we spoke said they preferred the term digital currency to virtual currency, due partly to the connotation that something which is virtual cannot be used in the real world. We use the term virtual currency to be consistent with terminology used in prior GAO work and in key federal guidance on participants in virtual currency systems.

network.[9] Each bitcoin is divisible to eight decimal places, enabling their use in any kind of transaction regardless of the value. Users' bitcoin balances are associated with bitcoin addresses (long strings of numbers and letters) that use principles of cryptography to help safeguard against inappropriate tampering with bitcoin transactions and balances.[10] When users transfer bitcoins, the recipient provides their bitcoin address to the sender, and the sender authorizes the transaction with their private key (essentially a secret code that proves the sender's control over their bitcoin address). Bitcoin transactions are irrevocable and do not require the sender or receiver to disclose their identities to each other or a third party. However, each transaction is registered in a public ledger called the "blockchain," which maintains the associated bitcoin addresses and transaction dates, times, and amounts. Users can define how much additional information they require of each other to conduct a transaction.

Because peer-to-peer bitcoin transactions do not require the disclosure of information about a user's identity, they give the participants some degree of anonymity. In addition, computer network communication can be encrypted and anonymized by software to further hide the identity of the parties in transactions.[11] However, the transactions are not completely anonymous because the time and amount of each transaction and the associated bitcoin addresses are permanently recorded in the blockchain. As a result, peer-to-peer bitcoin transactions are sometimes described as "pseudonymous." The anonymity of bitcoin is also limited by data analysis techniques that can potentially link bitcoin addresses to personal identities. For example, information about a customer's identity may be recorded when an individual exchanges dollars for bitcoins, and this information may be combined with data from the blockchain to determine

[9]A peer-to-peer network allows users to share data directly and conduct permitted activities without a central server.

[10]Cryptography is a branch of mathematics that is based on the transformation of data and can be used to provide security services such as confidentiality and authentication. Bitcoin and other virtual currencies that use cryptography are sometimes called cryptocurrencies.

[11]According to industry observers, examples of technologies used to increase the privacy of participants in virtual currency transactions include (1) anonymizing networks, which use a distributed network of computers to conceal the real Internet address of users, such as The Onion Router (TOR); (2) "tumblers" such as BitcoinBath and BitLaundry that combine payments from multiple users to obstruct identification through the blockchain; and (3) alternative virtual currencies such as Zerocoin and Anoncoin that aim to make transactions fully anonymous.

the identities of participants in bitcoin transactions. In addition, researchers have developed methods to determine identities of parties involved in some bitcoin transactions by analyzing clusters of transactions between specific addresses.[12]

Bitcoins are created and entered into circulation through a process called mining. Bitcoin miners download free software that they use to solve complex math problems. Solving these problems verifies the validity of bitcoin transactions by grouping several transactions into a block and mathematically proving that the transactions occurred and did not involve double spending of a bitcoin. On average, this process takes about 10 minutes. When a miner or group of miners (mining pools) solves a problem, the bitcoin network accepts the block of transactions as valid and creates new bitcoins and awards them to the successful miner or mining pool.[13] (For a diagram on how bitcoins enter into circulation through mining, how transactions are conducted, and how miners verify transactions, see app. I.) Over time, the computer processing power needed to mine new bitcoins has increased to the point where mining requires specialized computer hardware and has become increasingly consolidated into large mining pools.

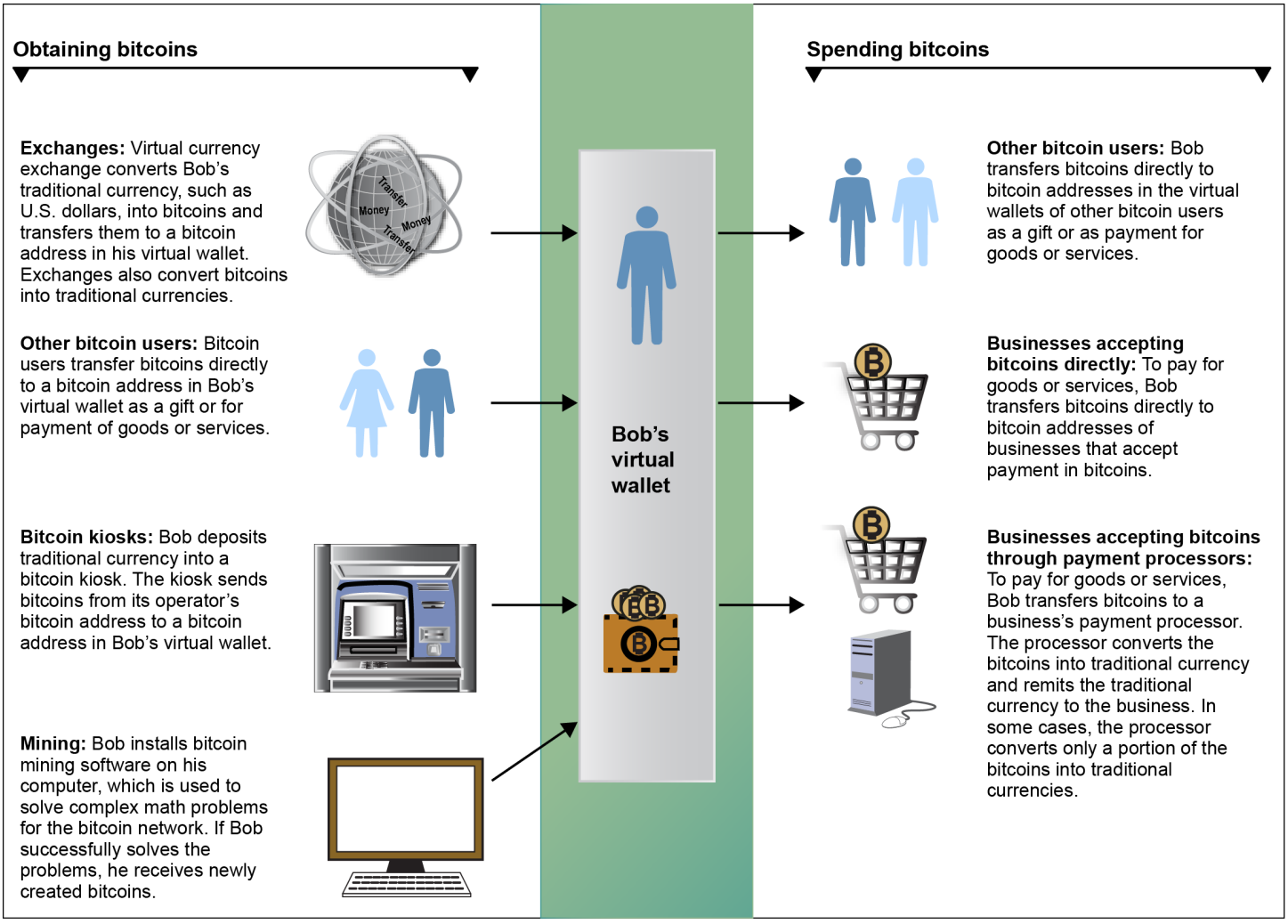
In addition to mining new bitcoins, users can also acquire bitcoins already in circulation by accepting bitcoins as gifts or payments for goods or services, purchasing them at bitcoin kiosks (sometimes referred to as bitcoin automated teller machines), or purchasing them on third-party exchanges. These exchanges allow users to exchange traditional currencies such as U.S. dollars for bitcoins, and exchange bitcoins back to traditional currencies. Individuals may store their bitcoins in a "virtual wallet" (a program that saves bitcoin addresses) on their computer or other data storage device, or use an online wallet service provided by an exchange or third-party virtual wallet provider. To spend their bitcoins, individuals can buy goods or services from other bitcoin users. They may also make purchases from online businesses that either accept bitcoins

[12]See Sarah Meiklejohn, et al, "A Fistful of Bitcoins: Characterizing Payments Among Men with No Names," *;Login:,* vol. 38 no. 6 (2013), available at https://www.usenix.org/system/files/login/articles/03_meiklejohn-online.pdf.

[13]By design, there will be a maximum of 21 million bitcoins in circulation once all bitcoins have been mined, which is projected to occur in the year 2140. Once all bitcoins have been mined, miners will be rewarded for solving the math problems that verify the validity of bitcoin transactions through fees rather than bitcoins.

directly or use third-party payment processors that take payments in bitcoins from buyers and provide businesses the payments in the form of a traditional currency or a combination of bitcoins and traditional currency. Figure 1 shows various ways that individuals can obtain and spend bitcoins.

Figure 1: Ways to Obtain and Spend Bitcoins



Source: GAO.

Due to limitations in available data, the size of the bitcoin market is unclear.[14] Nonetheless, some data exist that may provide some context for the size of this market:

- According to statistics from the bitcoin blockchain, as of March 31, 2014, approximately 12.6 million bitcoins were in circulation.[15]
- At exchange rates as of March 31, 2014 (about $458 per bitcoin), the total value of the approximately 12.6 million bitcoins in circulation was about $5.6 billion.[16] For perspective, the total amount of U.S. currency held by the public and in transaction deposits (mainly checking accounts) at depository institutions was about $2.7 trillion as of March 2014.[17]
- Bitcoin exchange rates against the U.S. dollar have changed dramatically over time (see fig. 2). According to one bitcoin price index, the price was about $13 per bitcoin in the beginning of January 2013 and rose to more than $1,100 by the beginning of December 2013. Prices subsequently fell to about $522 in mid-December 2013 and have fluctuated between roughly $450 and $950 since then.[18]
- From April 2013 through March 2014, the number of bitcoin transactions per day ranged from about 29,000 to 102,000.[19] In comparison, the Federal Reserve Banks processed an average of 44

[14]Given these limitations, we did not test the reliability of data, such as the data generated from the bitcoin network, but we are providing some figures to provide context for the possible size of the bitcoin market and other virtual currency markets.

[15]http://blockchain.info. (Accessed on Mar. 31, 2014.) Due to data limitations, it is difficult to calculate the velocity, or the rate at which bitcoins are spent, and the number of transactions between unique users in a given time period.

[16]For data on bitcoin price, see https://www.coindesk.com. (Accessed on Apr. 1, 2014.) For data on the total value and number of bitcoins in circulation, see https://blockchain.info. (Accessed on Mar. 31, 2014.)

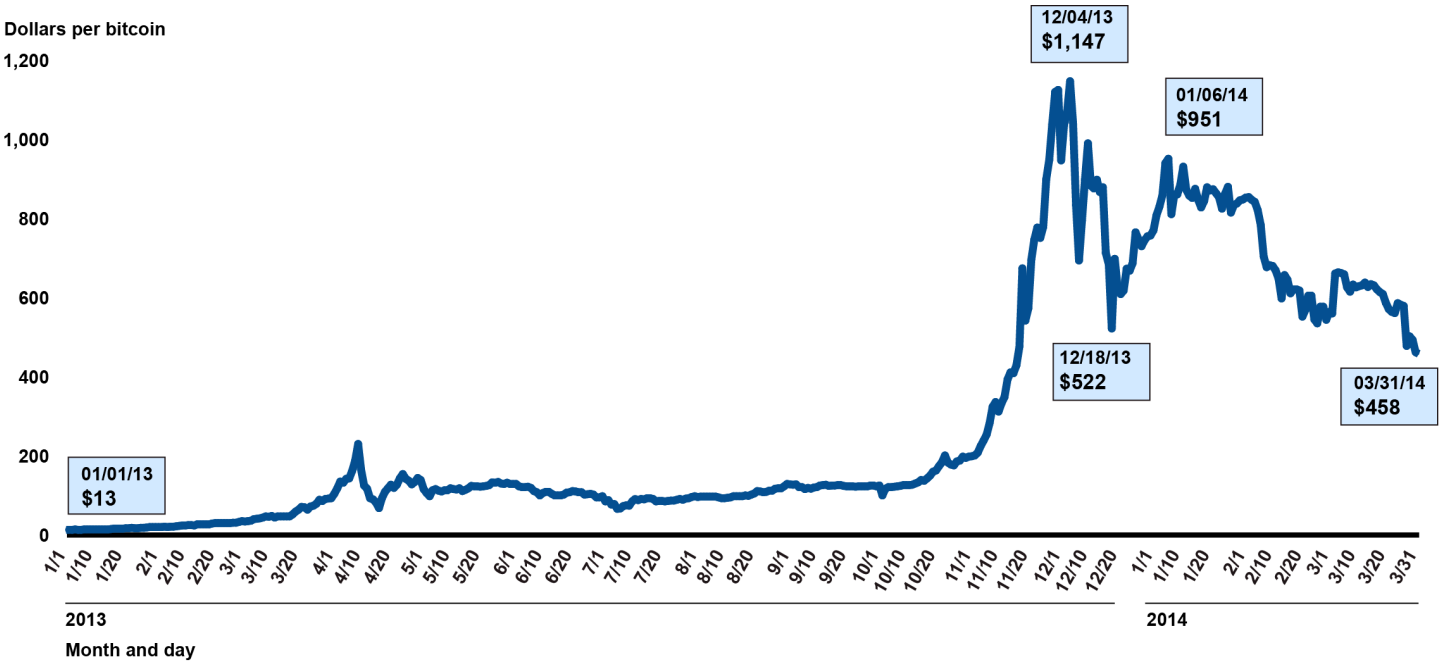
[17]See Federal Reserve Statistical Release H.6 “Money Stock Measures” (Apr. 10, 2014) at http://www.federalreserve.gov/releases/h6/current/H6.pdf.

[18]https://www.coindesk.com. (Accessed on Apr.1, 2014.) This index is a composite price calculated as the simple average of bitcoin prices across leading global exchanges that meet certain criteria.

[19]https://blockchain.info. (Accessed on Apr. 1, 2014.)

million commercial Automated Clearing House (a traditional payment processor) transactions per day in 2013.[20]

Figure 2: Bitcoin Price Index in U.S. Dollars, January 1, 2013 through March 31, 2014



Source: GAO analysis of data from http://www.coindesk.com/price/ (accessed on Apr. 1, 2014).

Note: The index is a composite price calculated as the simple average of bitcoin prices across leading global exchanges that meet certain criteria. The values are expressed in current U.S. dollars.

While bitcoin is the most widely used virtual currency, numerous others have been created. For example, dozens of decentralized virtual currencies are based on the bitcoin protocol such as Litecoin, Auroracoin, Peercoin, and Dogecoin. Similar to the bitcoin market, the size of the market for these virtual currencies is unclear. However, as of March 31, 2014, the total reported value of each of these currencies was less than $400 million (ranging from about $33 million for Dogecoin to about $346 million for Litecoin).[21] Other virtual currencies that have been created are

[20]Federal Reserve. See http://www.federalreserve.gov/paymentsystems/fedach_yearlycomm.htm. (Accessed on Apr. 1, 2014.)

[21]https://coinmarketcap.com. (Accessed on Apr. 1, 2014.)

not based on the bitcoin protocol. One of the more prominent examples is XRP, which is used within a decentralized payment system called Ripple. Ripple allows users to make peer-to-peer transfers in any currency. A key function of XRP is to facilitate the conversion from one currency to another. For example, if a direct conversion between Mexican pesos and Thai baht is not available, the pesos can be exchanged for XRP, and then the XRP for baht. As of March 31, 2014, the total value of XRP was $878 million.[22]

Virtual currencies have drawn attention from federal agencies with responsibilities for protecting the U.S. financial system and its participants and investigating financial crimes. These include, but are not limited to, CFPB, CFTC, DHS, DOJ, SEC, Treasury, and the prudential banking regulators. The prudential banking regulators are the FDIC, Federal Reserve, NCUA, and OCC. Within Treasury, FinCEN has a particular interest in the emergence of virtual currencies because of concerns about the use of these currencies for money laundering and FinCEN's role in combating such activity.[23] Additionally, because virtual currencies (like government-issued currencies) can play a role in a range of financial and other crimes, including cross-border criminal activity, key components of DOJ and DHS have an interest in how virtual currencies are used. Relevant DOJ components include the Criminal Division (which oversees the Computer Crime and Intellectual Property Section and the Asset Forfeiture and Money Laundering Section), the FBI, and the Offices of the U.S. Attorneys (U.S. Attorneys). Relevant DHS components include the Secret Service and ICE-HSI.

[22]https://coinmarketcap.com.(Accessed on Apr. 1, 2014.)

[23]Money laundering is the process of disguising or concealing the source of funds acquired illicitly to make the acquisition appear legitimate.

Federal Agencies Face Emerging Challenges in Carrying Out Responsibilities Related to the Use of Virtual Currencies

While federal agencies' responsibilities with respect to virtual currency are still being clarified, some virtual currency activities and products have implications for the responsibilities of federal financial regulatory and law enforcement agencies. Virtual currencies have presented these agencies with emerging challenges as they carry out their different responsibilities. These challenges stem partly from certain characteristics of virtual currency systems, such as the higher degree of anonymity they provide compared with traditional payment systems and the ease with which they can be accessed globally to make payments and transfer funds across borders.

Some Virtual Currency Activities and Products May Have Implications for Federal Agencies' Responsibilities

Although virtual currencies are not government-issued and do not currently pass through U.S. banks, some activities and products that involve virtual currencies have implications for the responsibilities of federal financial regulatory and law enforcement agencies. These activities and products encompass both legitimate and illegitimate uses of virtual currencies. Examples of legitimate uses include buying virtual currencies and registered virtual-currency-denominated investment products. Examples of illegitimate uses include money laundering and purchasing illegal goods and services using virtual currencies.

FinCEN

FinCEN administers BSA and its implementing regulations.[24] The goal of BSA is to prevent financial institutions from being used as intermediaries for the transfer or deposit of money derived from criminal activity and to provide a paper trail to assist law enforcement agencies in their money laundering investigations. To the extent that entities engaged in money transmission conduct virtual currency transactions with U.S. customers or become customers of a U.S. financial institution, FinCEN has

[24]Pub. L. No. 91-508, 84 Stat. 1114 (1970) (codified as amended at 12 U.S.C. §§ 1829(b), 1951-1959; 31 U.S.C. §§ 5311-5330); 31 C.F.R. chap. X. In 1994, the Secretary of the Treasury delegated overall authority for enforcement of, and compliance with, BSA and its implementing regulations related to money laundering to the Director of FinCEN. In the same year, the Secretary also delegated BSA examination authority to the prudential banking regulators. 31 C.F.R. § 1010.810(b)(1)-(5).

responsibilities for helping ensure that these entities comply with BSA and anti-money-laundering regulations.[25]

FinCEN regulations set forth requirements for money services businesses, which include financial institutions and other entities engaged in money transmission.[26] FinCEN guidance states that the agency's regulations regarding money services businesses apply to virtual currency exchangers and administrators.[27] FinCEN applies its regulations to "convertible virtual currency," which either has an equivalent value in real currency or acts as a substitute for real currency. FinCEN regulations require money services businesses to assess their exposure to money laundering and terrorist financing and establish risk mitigation plans in the form of anti-money-laundering programs.[28] Additionally, money services businesses are required to maintain transaction records. For example, for money transfers that are $3,000 or more, money services businesses must obtain information on the transmitter, the recipient, and the transaction itself, and pass on such information to other intermediary financial institutions in any subsequent fund transmissions. Money

[25]FinCEN shares this responsibility with IRS, to which FinCEN has delegated examination authority for money services businesses. See 31 C.F.R. § 1010. 810(b)(8). IRS activities were outside the scope of our review. FinCEN has also delegated examination authority for BSA compliance to a number of other federal agencies, including the prudential banking regulators, CFTC, and SEC. See 31 C.F.R. § 1010.810(b). These agencies can also use their independent authorities to examine entities under their supervision for compliance with applicable BSA and anti-money-laundering requirements and regulations.

[26]Under 31 C.F.R. § 1010.100(ff)(1)-(7), money services businesses are generally defined as any of the following: (1) currency dealer or exchanger, (2) check casher, (3) issuer or seller of traveler's checks or money orders, (4) provider or seller of prepaid access, (5) money transmitter, and (6) the U.S. Postal Service. FinCEN's regulations define a money transmitter as a person that provides money transmission services, or any other person engaged in the transfer of funds. 31 C.F.R. § 1010.100(ff)(5)(i).The term money transmission services means the "acceptance of currency, funds, or other value that substitutes for currency to another location or person by any means." Id.

[27] FinCEN, *Application of FinCEN's Regulations to Persons Administering, Exchanging, or Using Virtual Currencies*, FIN-2013-G001, March 18, 2013. FinCEN defines an exchanger as a person engaged as a business in the exchange of virtual currency for real currency, funds, or other virtual currency. *Id*. FinCEN defines an administrator as a person engaged as a business in issuing (putting into circulation) a virtual currency, and who has the authority to redeem (to withdraw from circulation) such virtual currency. *Id.* An administrator or exchanger that (1) accepts and transmits a convertible virtual currency, or (2) buys or sells convertible virtual currency for any reason is a money transmitter under FinCEN's regulations.

[28]31 C.F.R. § 1022.210, subpart C.

services businesses are also required to monitor transactions and file reports on large currency transactions and suspicious activities. In addition, certain financial institutions must establish a written customer identification program that includes procedures for obtaining minimum identification information from customers who open an account, such as date of birth, a government identification number, and physical address.[29] Further, financial institutions must file currency transaction reports on customer cash transactions exceeding $10,000 that include information about the account owner's identity and occupation.[30]

FinCEN also supports the investigative and prosecutive efforts of multiple federal and state law enforcement agencies through its administration of the financial transaction reporting and recordkeeping requirements mandated or authorized under BSA. In addition, FinCEN has the authority to take enforcement actions, such as assessing civil money penalties, against financial institutions, including money services businesses, that violate BSA requirements.

Prudential Banking Regulators

The prudential banking regulators—FDIC, Federal Reserve, NCUA, and OCC—provide oversight of depository institutions' compliance with BSA and anti-money-laundering requirements. Therefore, these regulators are responsible for providing guidance and oversight to help ensure that depository institutions that have opened accounts for virtual currency exchanges or other money services businesses have adequate anti-money-laundering controls for those accounts.[31] In April 2005, FinCEN and the prudential banking regulators issued joint guidance to banking organizations (depository institutions and bank holding companies) to clarify BSA requirements with respect to money services businesses and to set forth the minimum steps that banking organizations should take

[29]31 C.F.R. § 1020.220(a)(2)(i). Under the USA PATRIOT Act, financial institutions also must implement appropriate, specific, and, where necessary, enhanced, due diligence for correspondent accounts and private banking accounts established in the United States for non-U.S. persons. 31 U.S.C. § 5318(i).

[30]31 U.S.C. § 5313(a); 31 C.F.R. § 1010.311.

[31]In addition, officials from the prudential banking regulators either stated or acknowledged that they would have authority to regulate a supervised entity that issued virtual currency, or cleared or settled transactions related to virtual currency.

when providing banking services to these businesses.[32] As part of safety and soundness or targeted BSA compliance examinations of depository institutions, the prudential banking regulators assess compliance with BSA and related anti-money-laundering requirements using procedures that are consistent with their overall risk-focused examination approach.[33] In examining depository institutions for BSA compliance, the regulators review whether depository institutions (1) have developed anti-money-laundering programs and procedures to detect and report unusual or suspicious activities possibly related to money laundering; and (2) comply with the technical recordkeeping and reporting requirements of BSA.[34] While most cases of BSA noncompliance are corrected within the examination framework, regulators can take a range of supervisory actions, including formal enforcement actions, against the entities they supervise for violations of BSA and anti-money-laundering requirements. These formal enforcement actions can include imposing civil money penalties and initiating cease-and-desist proceedings.[35]

Consumer Financial Protection Bureau

CFPB is an independent entity within the Federal Reserve that has broad consumer protection responsibilities over an array of consumer financial products and services, including taking deposits and transferring money. CFPB is responsible for enforcing federal consumer protection laws, and it is the primary consumer protection supervisor over many of the

[32]FinCEN, *Interagency Interpretive Guidance on Providing Banking Services to Money Services Businesses Operating in the United States*, April 26, 2005. FinCEN concurrently issued guidance to money services businesses that identified and explained the types of information and documentation that money services businesses were expected to have and provide to banking organizations. Bank holding companies are companies that own or control one or more banks. In the United States, most banks insured by FDIC are owned or controlled by a bank holding company.

[33]Under the risk-focused approach, those activities judged to pose the highest risk to an institution are to receive the most scrutiny by examiners.

[34]See 12 U.S.C. § 1786(q), § 1818(s) (federal banking agencies must promulgate regulations requiring insured depository institutions and credit unions to establish procedures regarding BSA compliance; regulators' examinations must include review of BSA compliance procedures); see also procedures for monitoring BSA compliance: 12 C.F.R. § 208.63 (Federal Reserve), 12 C.F.R. § 326.8 (FDIC), 12 C.F.R. § 748.2 (NCUA), and 12.C.F.R. § 21.21 (OCC).

[35]A civil money penalty is a punitive fine assessed for the violation of a law or regulation or for other misconduct. A cease-and-desist proceeding is a formal process that may result in an order that a party halt certain activities or practices; the order may also require the party to take affirmative action to correct the conditions resulting from the practices. See 12 U.S.C. § 1786(e), § 1818(b).

institutions that offer consumer financial products and services. CFPB also has authority to issue and revise regulations that implement federal consumer financial protection laws, including the Electronic Fund Transfer Act[36] and title X of the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act).[37] CFPB officials stated that they are reviewing how these responsibilities are implicated by consumer use (or potential consumer use) of virtual currencies.

Other relevant CFPB responsibilities concerning virtual currencies include accepting and handling consumer complaints, promoting financial education, researching consumer behavior, and monitoring financial markets for new risks to consumers. For example, under authorities provided by the Dodd-Frank Act, CFPB maintains a Consumer Complaint Database and helps monitor and assess risks to consumers in the offering or provision of consumer financial products or services.[38] CFPB also issues consumer advisories to promote clarity, transparency, and fairness in consumer financial markets.

Securities and Exchange Commission

SEC regulates the securities markets—including participants such as securities exchanges, broker-dealers, investment companies, and investment advisers—and takes enforcement actions against individuals and companies for violations of federal securities laws. SEC's mission is to protect investors; maintain fair, orderly, and efficient markets; and facilitate capital formation. Virtual currencies may have implications for a number of SEC responsibilities. For example, SEC has enforcement

[36]Pub. L. No. 90-321, 92 Stat. 3728 (1978) (codified as amended at 15 U.S.C. §§ 1693-1693r). CFPB issues and enforces Regulation E, which implements the Electronic Fund Transfer Act (EFTA). EFTA establishes basic rights, liabilities, and responsibilities of consumers who use electronic fund transfer services and of financial institutions that offer these services.

[37]Pub. L. No. 111-203, § 1021(c)(5), 124 Stat. 1376, 1980 (2010) (codified at 12 U.S.C. § 5511(c)(5)). For example, section 1032(a) of the Dodd-Frank Act confers authority on CFPB "to prescribe rules to ensure that the features of any consumer financial product or service, both initially and over the term of the product or service, are fully, accurately, and effectively disclosed to consumers in a manner that permits consumers to understand the costs, benefits, and risks associated with the product or service, in light of the facts and circumstances." 12 U.S.C. § 5532(a). In prescribing such disclosure rules, section 1032 requires the Bureau to "consider available evidence about consumer awareness, understanding of, and responses to disclosures or communications about the risks, costs, and benefits of consumer financial products or services." 12 U.S.C. § 5532(c).

[38]Pub. L. No. 111-203, § 1013(b)(3), § 1021(c), 124 Stat. 1376, 1969, 1980 (2010) (codified at 12 U.S.C. §§ 5493(b)(3), 5511(c)).

authority for violations of federal securities laws prohibiting fraud by any person in the purchase, offer, or sale of securities. SEC enforcement extends to virtual-currency-related securities transactions. Additionally, when companies offer and sell securities (including virtual-currency-related securities), they are subject to SEC requirements to either register the offering with SEC or qualify for a registration exemption. SEC reviews registration statements to ensure that potential investors receive adequate information about the issuer, the security, and the offering. Further, if a registered national securities exchange wanted to list a virtual-currency-related security, it could only do so if the listing complied with the exchange's existing rules or the exchange had filed a proposed rule change with SEC to permit the listing.

Virtual currencies may also have implications for other SEC responsibilities, as the following examples illustrate:

- SEC has examination authority for entities it regulates, including registered broker-dealers, to ensure compliance with federal securities laws, SEC rules and regulations, and BSA requirements. According to SEC officials, if a broker-dealer were to accept payments in virtual currencies from customers, this could raise potential anti-money-laundering issues that the broker-dealer would have to account for.
- SEC also regulates and has examination authority over investment advisers subject to its jurisdiction.[39] Under the Investment Advisers Act of 1940, investment advisers are fiduciaries.[40] To the extent that an investment adviser recommends virtual currencies or virtual-currency-related securities, the investment adviser's federal fiduciary duty would govern this conduct.
- If registered broker-dealers held virtual currencies for their own account or an account of a customer, SEC would have to determine how to treat the virtual currencies for purposes of its broker-dealer financial responsibility rules, including the net capital rule.[41]

[39]15 U.S.C. §§ 80b-2(a)(11), 80b-11(g)-(h).

[40]See 15 U.S.C. § 80b-6(1)-(2); *SEC v. Capital Gains Research Bureau, Inc.,* et al., 375 U.S. 180 (1963).

[41]17 C.F.R. § 240.15c3-1. SEC's net capital rule requires all broker-dealers to maintain a minimum level of net capital consisting of highly liquid assets. Assets that are not liquid are deducted in full when computing net capital.

Commodity Futures Trading Commission

CFTC has the authority to regulate financial derivative products and their markets, including commodity futures and options.[42] In addition, CFTC investigates and prosecutes alleged violations of the Commodity Exchange Act and related regulations.[43] CFTC's mission is to protect market users and the public from fraud, manipulation, abusive practices, and systemic risk related to derivatives subject to the Commodity Exchange Act. CFTC's responsibilities with respect to virtual currencies depend partly on whether bitcoin or other virtual currencies meet the definition of a commodity under the Commodity Exchange Act.[44] CFTC officials said the agency would not make a formal determination on this issue until market circumstances require one. According to CFTC, such circumstances could include virtual-currency derivatives emerging or being offered in the United States or CFTC becoming aware of the existence of fraud or manipulative schemes involving virtual currencies. The officials said that if prospective derivatives that are backed by or denominated in virtual currencies that CFTC determines to be commodities emerge, CFTC's regulatory authorities would apply to those derivatives just as they would for any other derivative product subject to CFTC's jurisdiction. To carry out its regulatory responsibilities, CFTC would, among other things, evaluate the derivatives to ensure they were not susceptible to manipulation, review applications for new exchanges wishing to offer such derivatives, and examine exchanges offering these derivatives to ensure compliance with the applicable commodity exchange laws.

Similar to SEC, CFTC has examination authority for BSA compliance—in this case directed at futures commission merchants and other futures market intermediaries—and acceptance of virtual currency payments by

[42]7 U.S.C. § 2. Financial derivatives are financial instruments whose value is based on one or more underlying reference items. They are used to hedge risk or to exchange a floating rate of return for a fixed rate of return. In the virtual currency context, a derivative might be used to reduce exposure to volatility in virtual currency exchange rates.

[43]7 U.S.C. §§ 1-26; 17 C.F.R. chap. I.

[44]The Commodity Exchange Act defines a commodity as certain agricultural goods and "all services, rights, and interests (except motion picture box office receipts, or any index, measure, value or data related to such receipts) in which contracts for future delivery are presently or in the future dealt in." 7 U.S.C. § 1a(9).

these entities could raise BSA compliance concerns.[45] Like SEC, CFTC would also have to make determinations about the capital treatment of virtual currencies if these entities held virtual currencies for their own account or an account of a customer.

Departments of Homeland Security and Justice

Law enforcement agencies, including but not limited to DHS and DOJ component agencies and offices, have responsibilities to investigate a variety of federal crimes that may involve the use of virtual currencies and to support the prosecution of those who commit these crimes. Like traditional currencies, virtual currencies can facilitate a range of criminal activities, including fraud schemes and the sale of illicit goods and services, that may fall under the purview of federal law enforcement agencies.

The emergence of virtual currencies has had particular significance for financial crimes. According to DOJ officials, the main law enforcement interests with respect to virtual currencies are to (1) deter and prosecute criminals who use virtual currency systems to launder money (that is, move or hide money that either facilitates or is derived from criminal or terrorist activities); and (2) investigate and prosecute virtual currency services that themselves violate money transmission and money laundering laws.[46] A number of DOJ and DHS components, including the FBI, ICE-HSI, and Secret Service, investigate financial crimes as part of their broader responsibilities. In addition, DOJ's Asset Forfeiture and Money Laundering Section prosecutes money laundering violations, and DOJ and DHS manage the seizure and forfeiture of assets that represent the proceeds of, or were used to facilitate, federal crimes. Key laws that may apply to the use of virtual currencies in financial crimes include BSA,

[45]Futures commission merchants are entities that solicit or accept orders for the purchase or sale of a commodity for future delivery on or subject to the rules of any exchange and that accept payment from or extend credit to those whose orders are accepted.

[46]One example would be a centralized virtual currency system that allowed users to make untraceable funds transfers.

as amended by Title III of the USA PATRIOT Act, and anti-money-laundering statutes.[47]

Additionally, because virtual currencies operate over the Internet, they have implications for agency components that investigate and prosecute computer crimes (also called cybercrimes). For example, DOJ's Computer Crime and Intellectual Property Section stated that virtual currencies can be attractive to entities that seek to facilitate or conduct computer crimes over the Internet, such as computer-based fraud and identity theft. The section's responsibilities include improving legal processes for obtaining electronic evidence and working with other law enforcement agencies in improving the technological and operational means for gathering and analyzing electronic evidence. The FBI, Secret Service, and ICE-HSI also investigate computer crimes.

Virtual Currencies Present Regulatory, Law Enforcement, and Consumer Protection Challenges

The emergence of virtual currencies presents challenges to federal agencies responsible for financial regulation, law enforcement, and consumer and investor protection. These challenges stem partly from certain characteristics of virtual currencies, such as the higher degree of anonymity they provide and the ease with which they can be sent across borders. In addition, the growing popularity of virtual currencies has highlighted both risks and benefits for agencies to consider in carrying out their responsibilities.

Greater Anonymity

As previously noted, some virtual currency systems may provide a higher degree of anonymity than traditional payment systems because they do not require the disclosure of personally identifiable information (that is, information that can be used to locate or identify an individual, such as names or Social Security numbers) to transfer funds from one party to another. When transferring funds in the amount of $3,000 or more between the bank accounts of two individuals, the banks involved are required by FinCEN regulations to obtain and keep the names and other

[47]Pub. L. No. 91-508, 84 Stat. 1114 (codified as amended at 12 U.S.C. §§ 1829(b), 1951-1959; 31 U.S.C. §§ 5311-5330); Pub. L. No. 107-56, tit. III, 115 Stat. 272, 296-342 (International Money Laundering Abatement and Anti-Terrorist Financing Act of 2001) (codified at 31 U.S.C. §§ 5301-5318A) (to prevent, detect, and prosecute international money laundering); see also Money Laundering Suppression Act of 1994, Pub. L. No. 103-325, §§ 401-413, 108 Stat. 2160, 2243-2255 (codified at 31 U.S.C. § 5330 and scattered sections of U.S.C.) (requires money transmitting businesses to register with Treasury).

information of the individuals, as well as information on the transaction itself.[48] The customer identification information collected by the banks helps create a paper trail of financial transactions that law enforcement agencies can use to detect illegal activity, such as money laundering or terrorist financing, and to identify and apprehend criminals.[49] However, in a transfer between two individuals using bitcoins (or a similar type of decentralized virtual currency) no personally identifiable information is necessarily disclosed either to the two individuals or a third-party intermediary.[50] As a result, virtual currencies may be attractive to parties seeking to protect personally identifiable information, maintain financial privacy, buy or sell illicit goods and services, or move or conceal money obtained by illegal means. Further, virtual currency exchangers or administrators may be used to facilitate money laundering if they do not collect identifying information from customers and retain other transaction information. For these reasons, law enforcement and federal financial regulatory agencies have indicated that virtual currencies can create challenges for agencies in detecting unlawful actions and the entities that carry them out. For example, the FBI has noted that because bitcoin does not have a centralized entity to monitor and report suspicious activity and process legal requests such as subpoenas, law enforcement agencies face difficulty in detecting suspicious transactions using bitcoins and identifying parties involved in these transactions.

Cross-Jurisdictional Nature

Because they operate over the Internet, virtual currencies can be used globally to make payments and funds transfers across borders. In addition, according to agency officials, many of the entities that exchange traditional currencies for virtual currencies (or vice versa) are located outside of the United States. If these exchangers have customers located in the United States, they must comply with BSA and anti-money-laundering requirements. Due to the cross-jurisdictional nature of virtual

[48]31 C.F.R. § 1020.410.

[49]Financial institutions are also required to obtain customer information to satisfy "know-your-customer" or "customer due diligence" identification programs as part of their anti-money laundering obligations, and financial institutions must subject certain bank accounts held by non-U.S. persons to enhanced due diligence procedures. See 31 U.S.C. § 5318(i).

[50]However, in a virtual currency transfer between individuals through a third-party intermediary (such as a virtual currency exchange), personally identifiable information is required to be collected if the transaction is for $3,000 or more. This requirement became effective in 2011. We discuss this requirement in the next section of this report.

currency systems, federal financial regulatory and law enforcement agencies face challenges in enforcing these requirements and investigating and prosecuting transnational crimes that may involve virtual currencies. For example, law enforcement may have to rely upon cooperation from international partners to conduct investigations, make arrests, and seize criminal assets. Additionally, violators, victims, and witnesses may reside outside of the United States, and relevant customer and transaction records may be held by entities in different jurisdictions, making it difficult for law enforcement and financial regulators to access them. Further, virtual currency exchangers or administrators may operate out of countries that have weak legal and regulatory regimes or that are less willing to cooperate with U.S. law enforcement.

Balancing Risks and Benefits

Virtual currency industry stakeholders have noted that virtual currencies present both risks and benefits that federal agencies need to consider in regulating entities that may be associated with virtual-currency-related activities. As previously noted, the risks include the attractiveness of virtual currencies to those who may want to launder money or purchase illicit goods and services. Another emerging set of risks involves consumer and investor protection—in particular, whether consumers and investors understand the potential drawbacks of buying, holding, and using virtual currencies or investing in virtual-currency-based securities. Consumers may not be aware of certain characteristics and risks of virtual currencies, including the following:

- *Lack of bank involvement.* Virtual currency exchanges and wallet providers are not banks. If they go out of business, there may be no specific protections like deposit insurance to cover consumer losses.[51]
- *Stated limits on financial recourse.* Some virtual currency wallet providers purport to disclaim responsibility for consumer losses associated with unauthorized wallet access. In contrast, credit and debit card networks state that consumers have no liability for fraudulent use of accounts.
- *Volatile prices.* The prices of virtual currencies can change quickly and dramatically (as shown previously in fig. 2).

Additionally, an SEC official told us that virtual-currency-based securities may be attracting individuals who are younger and less experienced than typical investors. The official expressed concern that younger investors

[51]We discuss examples of such losses in the next section of this report.

may lack the sophistication to properly assess the risks of such investments and the financial resources to recover from losses on the investments, including losses resulting from fraud schemes.[52]

While virtual currencies present risks to consumers and investors, they also provide several potential benefits to consumers and business.

- *Cost and speed.* Decentralized virtual currency systems may, in some circumstances, provide lower transaction costs and be faster than traditional funds transfer systems because the transactions do not need to go through a third-party intermediary. The irrevocable feature of virtual currency payments may also contribute to lower transaction costs by eliminating the costs of consumer chargebacks.[53] Industry stakeholders have noted that cost and time savings may be especially significant for international remittances (personal funds immigrants send to their home countries), which sometimes involve sizeable fees and can take several days. In addition, industry stakeholders have indicated that the potentially lower costs of virtual currency transactions—for example, relative to credit and debit cards—may facilitate the use of micropayments (very small financial transactions) as a way of selling items such as online news articles, music, and smartphone applications.
- *Financial privacy.* To the extent that bitcoin (or other virtual currency) addresses are not publicly associated with a specific individual, peer-to-peer virtual currency transactions can provide a greater degree of financial privacy than transactions using traditional payment systems, because no personally identifiable information is exchanged.[54]
- *Access.* Because virtual currencies can be accessed anywhere over the Internet, they are a potential way to provide basic financial services to populations without access to traditional financial

[52]The next section of this report discusses an example of a fraud scheme involving a virtual-currency-based security.

[53]A chargeback is a payment reversal initiated by a consumer due, for example, to nondelivery of a purchased product.

[54]As previously noted, that privacy may be lost if a connection is established between a bitcoin address and its owner.

institutions, such as rural populations in developing countries.[55] However, the potential benefit hinges on access to the Internet, which these populations may not have, and may be offset by the lack of protections against losses noted previously.

Federal agency officials have acknowledged the need to consider both the risks and benefits of virtual currencies in carrying out their responsibilities. For example, the Director of FinCEN has testified that the emergence of virtual currencies has prompted consideration of vulnerabilities that these currencies create in the financial system and how illicit actors will take advantage of them. However, she also noted that innovation is an important part of the economy and that FinCEN needs to have regulation that mitigates concerns about illicit actors while minimizing regulatory burden. Similarly, the former Acting Assistant Attorney General for DOJ's Criminal Division has testified that law enforcement needs to be vigilant about the criminal misuse of virtual currency systems while recognizing that there are many legitimate users of those services. Balancing concerns about the illicit use of virtual currencies against the potential benefits of these technological innovations will likely be an ongoing challenge for federal agencies.

Agencies Have Taken Some Actions on Virtual Currencies, but Interagency Working Groups Have Not Focused on Consumer Risks

Federal financial regulators and law enforcement agencies have taken a number of actions related to the emergence of virtual currencies, including providing regulatory guidance, assessing anti-money-laundering compliance, and investigating crimes and violations that have been facilitated by the use of virtual currencies. However, interagency working groups addressing virtual currencies have not focused on consumer protection and have generally not included CFPB.

[55]Some industry observers have suggested that virtual currency system protocols may have applications beyond financial transactions. For example, just as the bitcoin protocol transfers and records ownership rights to currency, it could, in theory, be used to transfer and record ownership rights to stocks, among other things.

FinCEN Has Issued Rules, Guidance, and Administrative Rulings Regarding Virtual Currencies

FinCEN has taken a number of actions in recent years to establish and clarify requirements for participants in virtual currency systems. For example, in July 2011, FinCEN finalized a rule that modified the definitions of certain money services businesses.[56] Among other things, the rule states that persons who accept and transmit currency, funds, or "other value that substitutes for currency," are considered to be money transmitters.[57] Additionally, in March 2013, FinCEN issued guidance that clarified the applicability of BSA regulations to participants in certain virtual currency systems.[58] The FinCEN guidance classified virtual currency exchangers and administrators as money services businesses and, more specifically, as money transmitters.[59] The guidance also specified that virtual currency users are not money services businesses.[60] As a result, the guidance clarified that virtual currency exchangers and administrators must follow requirements to register with FinCEN as money transmitters; institute risk assessment procedures and anti-money-laundering program control measures; and implement certain recordkeeping, reporting, and transaction monitoring requirements, unless an exception to these requirements applies.[61] According to FinCEN officials, as of December 2013, approximately 40 virtual currency exchangers or administrators had registered with FinCEN.

[56]*Bank Secrecy Act Regulations; Definitions and Other Regulations Relating to Money Services Businesses*, 76 Fed. Reg. 43585 (July 21, 2011).

[57]31 C.F.R. § 1010.100(ff)(5)(i)(A).

[58]FinCEN, *Application of FinCEN's Regulations to Persons Administering, Exchanging, or Using Virtual Currencies*, FIN-2013-G001, March 18, 2013. This guidance addresses convertible virtual currency—that is, virtual currency which either has an equivalent value in real currency or acts as a substitute for real currency.

[59]According to FinCEN, virtual currency exchangers and administrators with U.S. customers must comply with BSA requirements, such as instituting anti-money-laundering controls, even if they are based outside of the United States.

[60]FinCEN's guidance defines a virtual currency user as "a person who obtains convertible virtual currency and uses it to purchase real or virtual goods or services on the user's own behalf." Although a user is not considered to be a money transmitter, FinCEN warns that a user's activities must still comply with other federal and state laws and regulations.

[61]Most states also regulate money services businesses and some have taken steps to address virtual currencies. For example, New York is developing licensing and regulatory requirements specific to virtual currency exchanges and Texas has issued a memorandum describing how current licensing requirements apply to virtual currency exchanges. FinCEN coordinates with its state counterparts to encourage application of FinCEN's guidance on virtual currencies as part of this process.

In 2014, in response to questions from industry stakeholders, FinCEN issued administrative rulings to clarify the types of participants to which the March 2013 guidance applies.[62] In January 2014, FinCEN issued rulings stating that the way in which a virtual currency is obtained is not material, but the way in which a person or corporation uses the virtual currency is. As a result, the rulings specify that two kinds of users are not considered money transmitters subject to FinCEN's regulations: miners who use and convert virtual currencies exclusively for their own purposes and companies that invest in virtual currencies exclusively as an investment for their own account.[63] However, the rulings specify that these two kinds of users may no longer be exempt from FinCEN's money transmitter requirements if they conduct their activities as a business service for others. The rulings also note that transfers of virtual currencies from these types of users to third parties should be closely scrutinized because they may constitute money transmission. In April 2014, FinCEN issued another administrative ruling, which states that companies that rent computer systems for mining virtual currencies are not considered money transmitters subject to FinCEN's regulations.[64]

FinCEN has also taken additional steps to help ensure that companies required to register as money services businesses under FinCEN's March 2013 virtual currency guidance have done so. According to FinCEN officials, FinCEN has responded to letters from companies seeking clarification about their requirements. Also, officials told us that FinCEN has proactively informed other companies that they should register as money services businesses.

[62]FinCEN, *Application of FinCEN's Regulations to Virtual Currency Mining Operations*, FIN-2014-R001, January 30, 2014, and FinCEN, *Application of FinCEN's Regulations to Virtual Currency Software Development and Certain Investment Activity*, FIN-2014-R002, January 30, 2014.

[63]For example, a company that purchases and sells virtual currencies whenever such purchases and sales make investment sense according to the company's business plan is acting as a virtual currency user, not a virtual currency exchange.

[64]FinCEN, *Application of Money Services Business Regulations to the Rental of Computer Systems for Mining Virtual Currencies,* FIN-2014-R007, April 29, 2014.

Some Financial Regulators Have Taken Actions Concerning Anti-Money-Laundering and Securities Law Compliance

As part of their oversight activities, NCUA and SEC have addressed situations involving virtual currencies, and other federal financial regulators have had internal discussions regarding virtual currencies. NCUA has had two supervisory situations in which credit unions were involved with activity related to virtual currencies. These situations emerged after reviews of credit unions found that their anti-money-laundering and antifraud measures needed to be revised in light of activity involving virtual currency exchanges.

- In 2013, NCUA issued a preliminary warning letter to a federal credit union that provided account services to money services businesses that also served as bitcoin exchanges. The warning letter was based on various conditions that NCUA determined could undermine the credit union's stability. For example, the credit union did not have adequate anti-money-laundering controls in place for its money services business accounts. Further, the letter stated that the credit union should not have served money services businesses that were not part of the credit union's strategic plan, and that serving these businesses was not consistent with the credit union's charter, which called for serving the local community. The warning letter required the credit union to immediately cease all transactions with these money services business accounts and establish an appropriate BSA and anti-money-laundering infrastructure. As a result, the credit union ceased such activity and strengthened its BSA and anti-money-laundering compliance program.
- In 2012, NCUA provided support to a state regulator's review of a credit union's commercial customer. The state regulator found that this commercial customer was a payment processor—that is, a payment network that allows any business or person to send, request, and accept money—that had customers that were bitcoin exchanges. According to NCUA, the state regulator worked with the credit union to ensure that its BSA compliance program was adequate to monitor and address the risks associated with payment processors that serve bitcoin exchanges. The state regulator also worked to ensure that the payment processor's risk management practices included sufficient antifraud and anti-money-laundering measures. The payment processor subsequently suspended all accounts that served virtual currency exchanges.

In addition, SEC has taken enforcement action against an individual and entity that are alleged to have defrauded investors through a bitcoin-

denominated Ponzi scheme.[65] The agency has also issued related investor alerts, has begun to review a registration statement from an entity that wants to offer virtual-currency-related securities, and is monitoring for potential securities law violations related to virtual currencies.

- In July 2013, SEC charged an individual and his company, Bitcoin Savings and Trust, with offering and selling securities in violation of the antifraud and registration provisions of securities laws.[66] Specifically, SEC alleges that the founder and operator defrauded investors through a bitcoin-denominated Ponzi scheme. The founder and operator allegedly promised investors up to 7 percent weekly interest. However, he allegedly used bitcoins from new investors to make purported interest payments and cover investor withdrawals on outstanding trust investments, diverted investors' bitcoins for day trading in his personal account on a bitcoin currency exchange, and exchanged investors' bitcoins for U.S. dollars to pay for personal expenses. SEC also alleges that Bitcoin Savings and Trust raised at least 700,000 bitcoins in investor funds, which amounted to more than $4.5 million based on the average price of bitcoin in 2011 and 2012 when the investments were offered and sold. This case was still unresolved as of April 14, 2014.
- SEC's Office of Investor Education and Advocacy has issued two investor alerts on virtual currencies.[67] The first alert, issued in July 2013, warned about fraudulent investment schemes that may involve bitcoin and other virtual currencies.[68] The second alert, issued in May

[65]A Ponzi scheme is a type of investment fraud that involves the payment of purported returns to existing investors from funds contributed by new investors.

[66]*Securities and Exchange Commission v. Shavers*, No. 413-CV-416 (E.D. Texas Aug. 6, 2013).

[67]In addition, in March 2014, the Financial Industry Regulatory Authority, a self-regulatory organization for the securities industry, issued an investor alert about the risks of buying, using, and speculating in virtual currencies and the potential for related scams. See http://www.finra.org/Investors/ProtectYourself/InvestorAlerts/FraudsAndScams/P456458. Also, in April 2014, the North American Securities Administrators Association issued an investor advisory on virtual currencies, related investment risks, and the types of investments that might involve virtual currencies. See http://www.nasaa.org/30631/informed-investor-advisory-virtual-currency.

[68]http://www.investor.gov/news-alerts/investor-alerts/investor-alert-ponzi-schemes-using-virtual-currencies.

2014, addressed fraud and other investment risks related to virtual currencies.[69]

- SEC staff have begun to review a registration statement from a company that wants to conduct a public offering of virtual-currency-related securities and has received notice of a company offering a private virtual-currency-related security, relying upon an exemption from registration. In July 2013, the Winklevoss Bitcoin Trust filed a registration statement for an initial public offering of its securities. The Trust is structured similarly to an exchange-traded fund and will hold bitcoins as its only assets.[70] The Trust filed amended registration statements in October 2013 and February 2014, but the registration statement remains pending as of April 14, 2014, meaning that the Trust is not yet permitted to sell its securities in a public offering. Also, in October 2013, Bitcoin Investment Trust, a bitcoin-denominated pooled investment fund affiliated with SecondMarket, Inc. and available only to accredited investors, filed a notice with SEC indicating that it had sold securities in an exempt offering in reliance on Rule 506(c) of the Securities Act.[71] Rule 506(c) allows an issuer to raise an unlimited amount of money, but imposes restrictions on who can invest in the offering and requires the issuer to take reasonable steps to verify that those investing are accredited investors.[72]
- SEC staff are also monitoring the Internet and other sources, such as referrals from other agencies, for potential securities law violations involving bitcoin and other virtual currencies.

[69]http://www.investor.gov/news-alerts/investor-alerts/investor-alert-bitcoin-other-virtual-currency-related-investments.

[70]Exchange-traded funds are commonly structured as open-end investment companies and offer investors a proportionate share in a pool of stocks, bonds, and other assets.

[71]Rule 506(c) is one of the exemptive rules under Regulation D that allow some businesses to offer and sell their securities without having to register the offer and sale of securities with SEC. Regulation D is designed to (1) simplify the previously existing rules and regulations, (2) eliminate any unnecessary restrictions that those rules and regulations place on small business issuers, and (3) achieve uniformity between state and federal exemptions to facilitate capital formation consistent with protecting investors.

[72]17 C.F.R. § 230.506(c). Accredited investors include, among others, individuals whose net worth is more than $1 million (not including the value of their primary residence) or whose individual income exceeds at least $200,000 for the most recent 2 years (or joint income with a spouse exceeding $300,000 for those years) and a reasonable expectation of the same income level in the current year. It also includes certain types of entities, such as insurance companies, banks, and corporations with assets exceeding $5 million. 17 C.F.R. § 230.501(a).

Further, all of the federal financial regulatory agencies we interviewed have had internal discussions on how virtual currencies work and what implications the emergence of virtual currencies might have for their responsibilities. While agencies generally told us that their conversations have been informal and ad hoc, some efforts have been more organized:

- In 2013, the Federal Reserve took several steps to share information on virtual currencies among the Board of Governors and the 12 Federal Reserve Banks. Among other things, the Board of Governors' BSA and anti-money-laundering specialist conference included a session focused on FinCEN's virtual currency guidance and recent law enforcement actions. The Board of Governors also circulated general information about virtual currencies within the Federal Reserve System to use in answering questions from media and the public about virtual currencies and federal financial regulatory actions to date.
- In 2013, SEC formed an internal Digital Currency Working Group, which aims to foster information sharing internally and externally. According to SEC, the working group consists of approximately 50 members from among SEC's divisions and offices.
- In 2012, FinCEN held three internal information-sharing events on virtual currencies. These events covered issues including how virtual currencies compare to traditional currencies and risks related to emerging payment systems such as virtual currencies.

Law Enforcement Agencies Have Taken Actions against Parties Alleged to Have Used Virtual Currencies to Facilitate Crimes

Law enforcement agencies have taken actions against parties involved in the illicit use of virtual currencies to facilitate crimes. These parties have included administrators and users of centralized virtual currency systems designed to facilitate money laundering or other crimes, parties who have used virtual currencies to buy or sell illicit goods and services online, and virtual currency exchanges and online payment processors operating without the proper licenses.

- In 2013 and 2014, law enforcement agencies took actions against Silk Road, a black market website that allegedly accepted bitcoin as the sole payment method for the purchase of illegal goods and services. The website contained over 13,000 listings for controlled substances as well as listings for malicious software programs, pirated media content, fake passports, and computer hacking services (see fig.3). The FBI; Drug Enforcement Administration (DEA); IRS; ICE-HSI; the Bureau of Alcohol, Tobacco, Firearms, and Explosives; the Secret Service; the U.S. Marshals Service; and Treasury's Office of Foreign Assets Control investigated the case together, along with officials from

New York as well as Australia, Iceland, Ireland, and France. In September and October 2013, law enforcement shut down the Silk Road website and seized approximately 174,000 bitcoins, which the FBI reported were worth approximately $34 million at the time of seizure.[73] In February 2014, DOJ indicted Silk Road's alleged owner and operator on charges including narcotics conspiracy, engaging in a continuing criminal enterprise, conspiracy to commit computer hacking, and money laundering conspiracy.

- In May 2013, law enforcement agencies seized the accounts of a U.S.-based subsidiary of Mt. Gox, a now-defunct Tokyo-based virtual currency exchange with users from multiple countries including the United States, on the basis that the subsidiary was operating as an unlicensed money services business. The seizure included U.S. bank accounts of Mt. Gox that were held by a private bank and Dwolla, an online payment processor that allegedly allowed users to buy and sell bitcoins on Mt. Gox. According to ICE-HSI, Mt. Gox had moved funds into numerous online black markets, the bulk of which were associated with the illicit purchase of drugs, firearms, and child pornography. At the direction of the U.S. Attorney's office, ICE-HSI ordered Dwolla to stop all payments to Mt. Gox and seized $5.1 million from the Mt. Gox subsidiary's U.S. accounts.

- Also in May 2013, law enforcement agencies shut down Liberty Reserve, a centralized virtual currency system that was allegedly designed and frequently used to facilitate money laundering and had its own virtual currency. Secret Service, ICE-HSI, and IRS investigated the case together, along with officials from 16 other countries. To shut down the site, FinCEN identified Liberty Reserve as a financial institution of primary money laundering concern under section 311 of the USA PATRIOT Act, effectively cutting it off from the U.S. financial system.[74] DOJ then charged Liberty Reserve with operating an unlicensed money transmission business and with money laundering for facilitating the movement of more than $6 billion

[73]As of March 31, 2014, these bitcoins were worth about $80 million, according to bitcoin prices from https://www.coindesk.com.

[74]31 U.S.C. § 5318A. Section 311 of the USA PATRIOT Act grants the Secretary of the Treasury the authority, upon finding that reasonable grounds exist for concluding that a foreign jurisdiction, institution, class of transaction, or type of account is of "primary money laundering concern," to require domestic financial institutions and financial agencies to take certain "special measures" to address the primary money laundering concern.

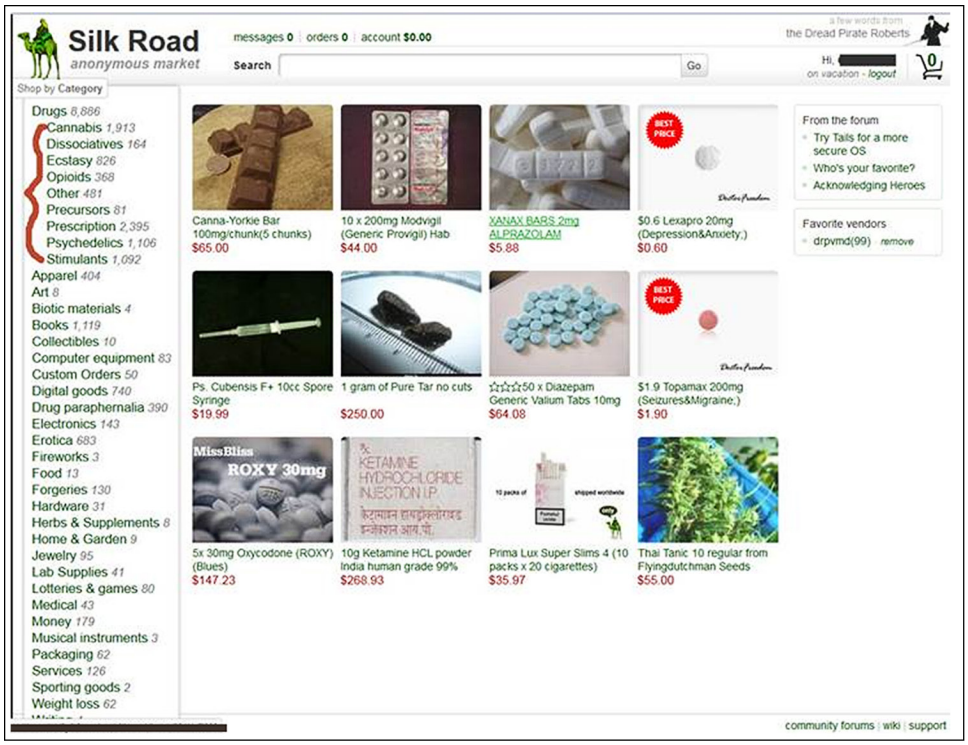
in illicit proceeds.[75] As of April 2014, this investigation had produced $40 million in seizures and had resulted in the arrests of five individuals.

- In April 2013, law enforcement agencies filed a civil asset forfeiture complaint against Tcash Ads Inc., an online payment processor that allegedly enabled users to make purchases anonymously from virtual currency exchanges, with operating an unlicensed money services business. Additionally, law enforcement agencies seized the bank accounts of Tcash Ads Inc. The Secret Service worked on the case with FinCEN and DOJ's Asset Forfeiture and Money Laundering Section.

- From October 2010 through November 2012, law enforcement agencies convicted three organizers of a worldwide conspiracy to use a network of virus-controlled computers that deployed e-mail spam designed to manipulate stock prices. The organizers paid the spammers $1.4 million for their illegal services via the centralized virtual currency e-Gold and wire transfers. Charges included conspiring to further securities fraud using spam, conspiring to transmit spam through unauthorized access to computers, and four counts of transmission of spam by unauthorized computers.

[75]This case is being prosecuted jointly by the DOJ Criminal Division's Asset Forfeiture and Money Laundering Section and the U.S. Attorney's Office for the Southern District of New York.

Figure 3: Screen Shot of the Silk Road Website



Source: U.S. Immigration and Customs Enforcement.

Law enforcement agencies have also taken other actions to help support investigations involving the illicit use of virtual currencies, including the following examples.

- The FBI has produced numerous criminal intelligence products addressing virtual currencies. These intelligence products have generally focused on cases involving the illicit use of virtual currencies, ways in which virtual currencies have been or could be used to facilitate crimes, and the related challenges for law enforcement. The FBI shares these products with foreign, state, and local law enforcement partners as appropriate.

- Through standing bilateral agreements governing the exchange of law enforcement information, ICE-HSI is arranging meetings with various international partners to exchange intelligence and garner operational support on virtual currency issues.

- ICE-HSI also developed the Illicit Digital Economy Program, which aims to target the use of virtual currencies for money-laundering purposes by defining and organizing the primary facets of the digital economy, building internal capacity, training and developing agents and analysts, engaging other agencies, and promoting public-private partnerships.

Interagency Working Groups Have Begun to Address Virtual Currencies, but Have Not Emphasized Consumer Risks or Generally Included CFPB

Federal agency efforts to collaborate on virtual currency issues have involved creating a working group specifically focused on virtual currency, leveraging existing interagency mechanisms, and sharing information through informal interagency channels. For example, in 2012, the FBI formed the Virtual Currency Emerging Threats Working Group (VCET), an interagency working group that includes other DOJ components, FinCEN, ICE-HSI, SEC, Secret Service, Treasury, and other relevant federal partners. The purpose of VCET is to leverage members' expertise to address new virtual currency trends, address potential implications for law enforcement and the U.S. intelligence community, and mitigate the cross-programmatic threats arising from illicit actors' use of virtual currency systems. The VCET meets about once every 3 months.

Federal agencies have also begun to discuss virtual currency issues in existing interagency working groups that address broader topics such as money laundering, electronic crimes, and the digital economy, as follows:

- The BSA Advisory Group—which is chaired by FinCEN and includes the prudential banking regulators, Treasury, federal and state law enforcement and regulatory agencies, and industry representatives—has addressed virtual currency issues in a number of ways. In May 2013, FinCEN provided a briefing on bitcoin, and in December 2013 three stakeholders from the virtual currency industry gave presentations on their business models and regulatory challenges. In addition, the BSA Advisory Group invited a representative of the virtual currency industry to join the group in 2014.
- The Federal Financial Institutions Examination Council (FFIEC) Bank Secrecy Act/Anti-Money-Laundering Working Group—which is currently chaired by OCC and includes the prudential banking regulators and CFPB—is in the process of revising the current (2010)

FFIEC BSA/Anti-Money Laundering Examination Manual.[76] The revisions related to virtual currencies may include information on FinCEN's March 2013 guidance and regulatory expectations that depository institutions should undertake a risk assessment with a particular focus on the money laundering risks posed by new products and services.

- The Secret Service-sponsored Electronic Crimes Task Forces (ECTF) includes 35 Secret Service field offices; federal law enforcement agencies such as ICE-HSI; and members of the private sector, academia, and state and local law enforcement.[77] This group's mission is to prevent, detect, and investigate electronic crimes, including those involving virtual currency. This group has conducted computer forensics and other investigative activity on various virtual currencies and made arrests of individuals who have used virtual currencies as part of their criminal activities. This group has also held quarterly meetings on virtual currencies to discuss legal and regulatory issues and trends in crimes involving virtual currencies.

- The Digital Economy Task Force was established in 2013 by Thomson Reuters (a multinational media and information firm) and the International Centre for Missing & Exploited Children.[78] This task force includes members from both the public and private sectors. Task force members from the federal government include representatives from the FBI, ICE-HSI, Secret Service, the Department of State, and the United States Agency for International Development. This group published a report in March 2014 on the benefits and challenges of

[76]FFIEC is a formal interagency body empowered to prescribe uniform principles, standards, and report forms for the federal examination of financial institutions by the Federal Reserve, FDIC, NCUA, OCC, and CFPB, and to make recommendations to promote uniformity in the supervision of financial institutions.

[77]The Secret Service was mandated by the USA PATRIOT Act to establish a nationwide network of Electronic Crimes Task Forces. Pub. L. 107-56, § 105, 115 Stat 272, 277 (2001) (codified at 18 U.S.C. § 3056 note). The goal of the network is to bring together federal, state, and local law enforcement, as well as prosecutors, private industry, and academia to prevent, detect, and investigate various forms of electronic crime.

[78]The International Centre for Missing & Exploited Children is a nonprofit corporation that leads a movement to protect children from sexual exploitation and abduction. The Centre is involved in virtual currency issues because of connections between digital technologies that facilitate anonymity and commercial child pornography, sexual exploitation, and sex trafficking.

the digital economy.[79] Among other things, the report recommended continuing private and public research into the digital economy and illegal activities, investing in law enforcement training, rethinking investigative techniques, fostering cooperation between agencies, and promoting a national and global dialogue on policy related to virtual currencies.

A number of other existing interagency working groups have discussed or addressed virtual currency issues to some extent. See appendix II for more information on these groups.

Federal agencies have also started to collaborate outside of these working groups to help improve their knowledge of issues related to the emergence of virtual currencies and share pertinent information with various agencies.

- FinCEN and SEC have hosted meetings with industry representatives and consultants to discuss how virtual currency systems such as bitcoin and Ripple work and what legal, regulatory, technology, and law enforcement issues they present. These agencies have invited officials from other federal agencies to these sessions.
- FinCEN consulted with financial regulators and law enforcement agencies as it was formulating its March 2013 guidance on virtual currencies. These agencies included CFPB, CFTC, DEA, FBI, ICE-HSI, IRS, the prudential banking regulators, SEC, and the Secret Service.
- SEC notified CFTC of its review of the Winklevoss Bitcoin Trust registration statement.
- FinCEN issued a Networking Bulletin on cryptocurrencies in March 2013 to provide details to law enforcement agencies and assist them in following money moving between virtual currency channels and the traditional U.S. financial system. Among other things, the bulletin addressed the role of entities that facilitate the purchase and exchange of virtual currencies and the types of records these entities maintain that could be useful to investigative officials. Also, the Networking Bulletin elicited information from its recipients, which in turn helped FinCEN issue additional analytical products of a tactical nature to inform law enforcement operations. FinCEN has also shared

[79]Digital Economy Task Force, *The Digital Economy: Potential, Perils, and Promises* (March 2014).

this information with several regulatory and foreign financial intelligence unit partners.

- CFPB officials said they had recently conferred on virtual currency issues with a number of domestic and international regulators, including the Federal Reserve Bank of San Francisco, the Federal Trade Commission, NCUA, OCC, Treasury, New York State's Department of Financial Services, and the European Banking Authority. In addition, the officials said they had met with industry participants on these issues and conferred with interested academic and consumer group stakeholders, as well as law firms, consultancies, and industry associations.

Although there are numerous interagency collaborative efforts that have addressed virtual currency issues in some manner, interagency working groups have not focused on consumer protection issues. Rather, as previously discussed, these efforts have focused on BSA and anti-money-laundering controls and investigations of crimes in which virtual currencies have been used. In addition, CFPB's involvement in interagency working groups that address virtual currencies has been limited. GAO's key practices on collaboration state that it is important to include relevant participants in interagency collaborative efforts in order to ensure, among other things, that these participants contribute knowledge, skills, and abilities to the outcomes of the effort.[80] In addition, these key practices state that once an interagency group has been established, it is important to reach out to potential participants who may have a shared interest in order to ensure that opportunities for achieving outcomes are not missed.[81] CFPB might be a relevant participant in a broader set of collaborative efforts on virtual currencies because virtual currency systems provide a new way of making financial transactions, and CFPB's responsibilities include ensuring that consumers have timely and understandable information to make responsible decisions about financial transactions.[82] Further, CFPB's strategic goals include helping consumers

[80]GAO, *Managing for Results: Key Considerations for Implementing Interagency Collaborative Mechanisms*, GAO-12-1022 (Washington, D.C.: Sept. 27, 2012).

[81]GAO, *Managing for Results: Implementation Approaches Used to Enhance Collaboration in Interagency Groups*, GAO-14-220 (Washington, D.C.: Feb. 14, 2014).

[82]CFPB (via the Office of Financial Education) is responsible for educating and empowering consumers to make better-informed financial decisions. Pub. L. No. 111-203, § 1013(d), 124 Stat. 1376, 1970 (2010).

understand the costs, risks, and tradeoffs of financial decisions and surfacing financial trends and emergent risks relevant to consumers.

Although interagency working groups addressing virtual currencies have not focused on consumer protection issues, recent events have highlighted the risks individuals face in buying and holding these currencies. For example, notable examples of bitcoin thefts by computer hackers have occurred in the past few years, including the theft of more than 35,000 bitcoins from a virtual wallet provider in April 2013 and 24,000 bitcoins from a bitcoin exchange in September 2012.[83] More recently, in February 2014, Mt. Gox filed for bankruptcy, stating that a security breach resulted in the loss of 850,000 bitcoins, the vast majority of which belonged to its customers. These bitcoins were worth more than $460 million when Mt. Gox filed for bankruptcy.[84] Mt. Gox subsequently reported that it had found 200,000 of these bitcoins in an unused virtual wallet.

Certain parties have taken actions to inform consumers about the potential risks associated with virtual currencies, but these actions have occurred outside of federal interagency efforts and have not included CFPB. In April 2014, the Conference of State Bank Supervisors and the North American Securities Administrators Association issued joint model consumer guidance to assist state regulatory agencies in educating consumers about virtual currencies and the risks of purchasing, exchanging, and investing in virtual currencies.[85] Additionally, from February through April 2014, a number of states issued consumer alerts about virtual currencies.[86] On the international front, the European

[83]Congressional Research Service, *Bitcoin: Questions, Answers, and Analysis of Legal Issues* (Washington, D.C.: Dec. 20, 2013).

[84]Data from Coindesk.com. These bitcoins were worth approximately $390 million as of March 31, 2014. https://www.coindesk.com.

[85]For the Conference of State Bank Supervisors and the North American Securities Administrators Association joint model consumer guidance, see http://www.csbs.org/legislative/testimony/Documents/ModelConsumerGuidance--Virtual%20Currencies.pdf.

[86]These states include Alabama, California, Florida, Hawaii, Maryland, Massachusetts, Nevada, Washington, and Wisconsin.

Banking Authority issued a warning to consumers in December 2013 about the risks involved in buying or holding virtual currencies.[87]

Federal interagency working groups addressing virtual currency issues have not focused on consumer protection, and CFPB has generally not participated in these groups, for a number of potential reasons. For example, the extent to which individuals using virtual currencies are speculative investors or ordinary consumers is unclear, and CFPB has received few consumer complaints about these currencies.[88] In addition, incidents involving the use of virtual currencies for illicit purposes have made money laundering and other law enforcement issues primary concerns, and existing interagency working groups are primarily composed of agencies that share responsibilities for these matters. However, emerging consumer risks indicate that interagency collaborative efforts may need to place greater emphasis on consumer protection issues in order to address the full range of challenges posed by virtual currencies. Additionally, without CFPB's participation, interagency working groups are not fully leveraging the expertise of the lead consumer financial protection agency, and CFPB may not be receiving information that it could use to assess the risks that virtual currencies pose to consumers.

Conclusions

Bitcoin and other virtual currencies are technological innovations that provide users with certain benefits but also pose a number of risks. Because virtual currencies touch on the responsibilities of multiple federal agencies, addressing these risks will require effective interagency collaboration. Thus far, interagency efforts have had a law enforcement focus, reflecting the attractiveness of virtual currencies to those who may want to launder money or purchase black market items. If virtual currencies become more widely used, other types of regulatory and enforcement issues may come to the forefront. For example, recent events suggest that consumer protection is an emerging risk, as

[87]European Banking Authority, *Warning to Consumers on Virtual Currencies*, EBA/WRG/2013/01, Dec. 12, 2013. See http://www.eba.europa.eu/-/eba-warns-consumers-on-virtual-currencies.

[88]CFPB's complaint intake system is not specifically geared towards virtual currency complaints. However, in February 2014, CFPB ran a query of its Consumer Complaint Database to determine the number of complaints that had mentioned virtual currency or bitcoin and found that only 14 out of about 290,000 complaints met that condition.

evidenced by the loss or theft of bitcoins from exchanges and virtual wallet providers and consumer warnings issued by nonfederal and non-U.S. entities. However, federal interagency working groups addressing virtual currencies have thus far not emphasized consumer-protection issues, and participation by the federal government's lead consumer financial protection agency, CFPB, has been limited. Therefore, these efforts may not be consistent with key practices that can benefit interagency collaboration, such as including all relevant participants to ensure that their knowledge, skills, and abilities contribute to the outcomes of the effort. As a result, future interagency efforts may not be in a position to address consumer risks associated with virtual currencies in the most timely and effective manner.

Recommendation for Executive Action

To help ensure that federal interagency collaboration on virtual currencies addresses emerging consumer protection issues, we recommend that the Director of CFPB (1) identify which interagency working groups could help CFPB maintain awareness of these issues or would benefit from CFPB's participation; and (2) decide, in coordination with the agencies already participating in these efforts, which ones CFPB should participate in.

Agency Comments

We provided a draft of this report to CFPB, CFTC, DOJ, DHS, FDIC, the Federal Reserve, NCUA, OCC, SEC, and Treasury for review and comment. CFPB and NCUA provided written comments, which are reprinted in appendixes III and IV. In addition, CFPB, CFTC, DHS, DOJ, the Federal Reserve, NCUA, OCC, SEC, and Treasury provided technical comments, which we incorporated into the report where appropriate.

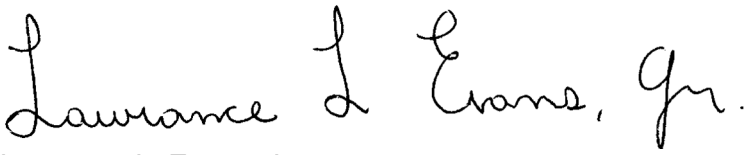
In its letter, CFPB concurred with our recommendation to identify and participate in pertinent interagency working groups addressing virtual currencies. CFPB stated that, to date, these groups have primarily focused on BSA concerns, anti-money-laundering controls, and the investigation of crimes involving virtual currencies. CFPB said that, as a result, its participation in these working groups has been limited. CFPB also stated that as consumer protection concerns have increased in recent months, its own work on virtual currencies and the work of other financial regulators in this area could benefit from a collaborative approach.

In its letter, NCUA said that the report provides a clear discussion of the risks related to virtual currencies as well as a survey of current efforts in the regulatory community to address the related policy issues. NCUA also

expressed support for increasing emphasis on consumer protection issues pertaining to virtual currencies.

As agreed with your offices, unless you publicly announce the contents of this report earlier, we plan no further distribution until 30 days from the report date. At that time, we will send copies of this report to CFPB, CFTC, DOJ, DHS, FDIC, the Federal Reserve, NCUA, OCC, SEC, Treasury, interested congressional committees and members, and others. This report will also be available at no charge on our website at http://www.gao.gov.

If you or your staff have any questions concerning this report, please contact me at (202) 512-8678 or evansl@gao.gov. Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff who made major contributions to this report are listed in appendix V.

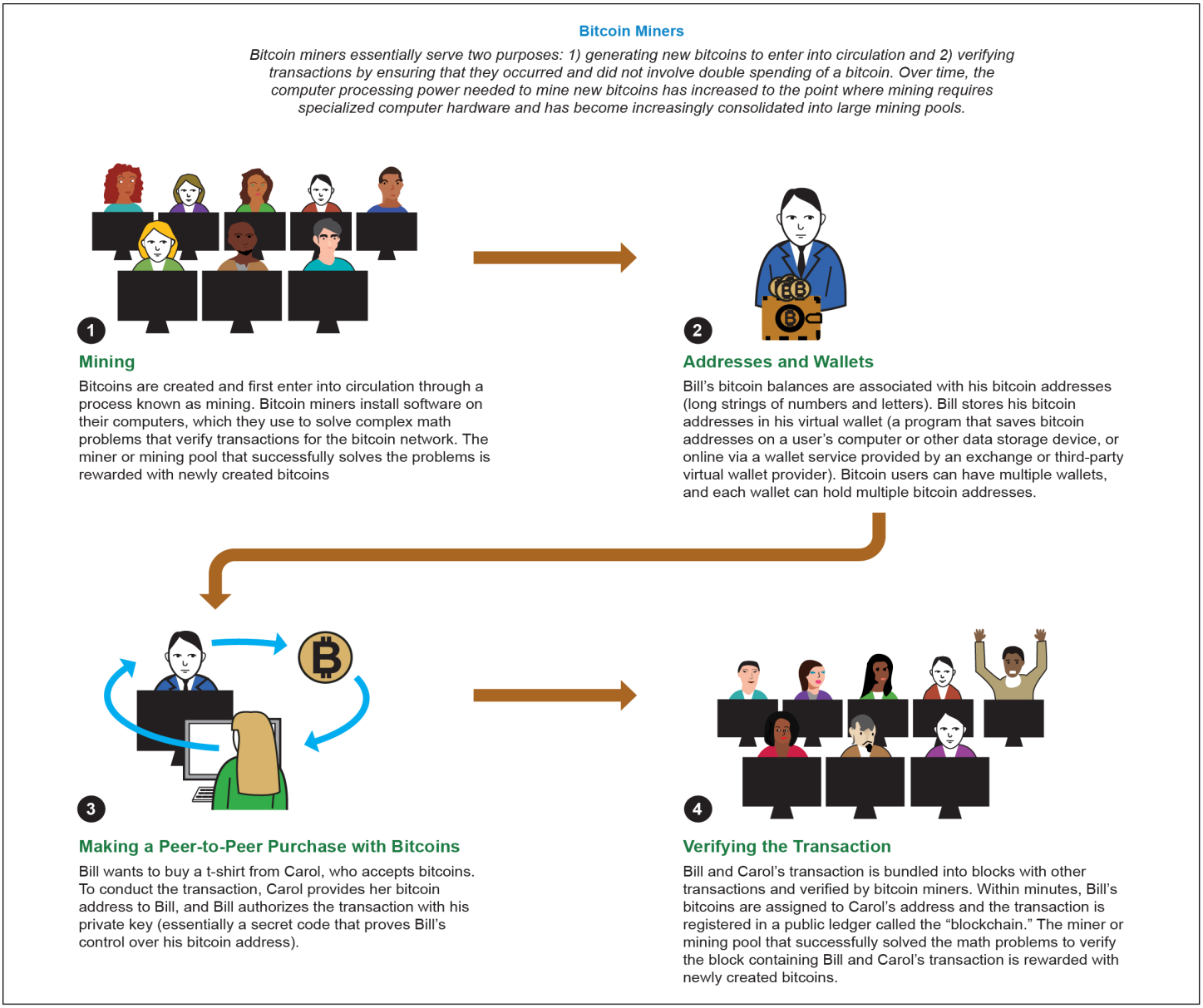


Lawrance L. Evans, Jr.
Director, Financial Markets and Community Investment

Appendix I: How Bitcoins Enter into Circulation and Are Used in Transactions

This appendix shows how bitcoins enter into circulation through "mining," how transactions are conducted, and how miners verify transactions (see fig. 4).

Figure 4: How Bitcoins Enter into Circulation and Are Used in Transactions



Source: GAO.

Appendix II: Interagency Working Groups that Have Addressed Virtual Currency Issues

In this appendix, we present some of the interagency working groups (including task forces and other interagency collaborative bodies) that have discussed virtual currency issues, and in some cases, taken specific actions. This list is based on information we obtained from the federal financial regulatory and law enforcement agencies we met with and is not intended to be an exhaustive list.

Table 1: Interagency Working Groups that Have Addressed Virtual Currency Issues, as of April 2014

Working group	Participating agencies	Mission and goals	Ways in which group addressed virtual currencies
Bank Secrecy Act Advisory Group (BSAAG)	FinCEN (lead); CFTC; DEA; DOJ Criminal Division; FBI; FDIC; Federal Reserve; ICE-HSI; IRS; NCUA; OCC; Office of National Drug Control Policy; SEC; Secret Service; and U.S. Postal Service; as well as representatives of financial institutions; trade groups; self-regulatory organizations; and state regulatory agencies.	This public-private group serves as a means by which the Secretary of the Treasury receives advice on the manner in which reporting requirements in BSA should be modified to enhance the ability of law enforcement agencies to use the information. It also informs private sector representatives of law enforcement's uses of BSA reports provided by financial institutions.	Meetings have covered issues related to virtual currencies: • The May 2013 meeting included a briefing on the bitcoin virtual currency system. • The December 2013 meeting included a panel of virtual currency industry representatives who discussed business models and regulatory compliance challenges. • In April 2014, a meeting of the BSAAG Illicit Finance Committee included a presentation on vulnerabilities and challenges related to virtual currencies, as well as opportunities to enhance collective anti-money-laundering efforts and information sharing. In addition, BSAAG invited a representative of the virtual currency industry to join the group in 2014.
Digital Economy Task Force	Thomson Reuters and the International Centre for Missing & Exploited Children (lead); FBI; ICE-HSI; Secret Service; Department of State; and United States Agency for International Development (USAID); as well as members of the private sector and academia.	This group's mission is to educate the public, work collaboratively across stakeholder groups, and balance the convenience of the digital currencies with controls to combat illegal activity.	Created in September 2013, this task force has formed working groups on such issues as safeguarding human rights; regulation; interagency coordination; and law enforcement. In March 2014, the task force published a report on the benefits and challenges of the digital economy.[a] Among other things, the report recommended private and public sector efforts to continue research into the digital economy and illegal activities; investing in law enforcement training; rethinking investigative techniques; fostering cooperation between agencies; and promoting a national and global dialogue on policy.

Working group	Participating agencies	Mission and goals	Ways in which group addressed virtual currencies
Electronic Crimes Task Forces (ECTF) and Working Groups	35 Secret Service field offices (lead) and federal law enforcement agencies such as ICE-HSI, as well as members of the private sector, academia, and state and local law enforcement.	The mission of these groups is to prevent, detect, and investigate various forms of electronic crime, including potential terrorist attacks against critical infrastructure and financial payment systems.	ECTFs address issues concerning virtual currencies as one of a variety of subjects related to the investigations into electronic crime. Specifically, ECTFs have: • conducted computer forensics and other investigative activity concerning various virtual currencies; • made arrests of individuals who have used virtual currencies as part of their criminal activities; and • discussed virtual currencies at quarterly meetings, covering topics such as types of virtual currencies and related legal and regulatory issues, trends in criminal uses, and methods for conducting investigations.
Federal Financial Institutions Examination Council (FFIEC) BSA/Anti-Money-Laundering Working Group[b]	OCC (rotating chair), CFPB; FDIC; Federal Reserve; NCUA; and the State Liaison Committee are voting members.[c]	FFIEC prescribes uniform principles, standards, and report forms for the federal examination of financial institutions by the prudential banking regulators—FDIC, Federal Reserve, NCUA, and OCC—and makes recommendations to promote uniformity in the supervision of financial institutions. Within this context, the FFIEC BSA/Anti-Money-Laundering Working Group's mission is to enhance coordination of BSA/anti-money-laundering training, guidance, and policy.	The BSA/Anti-Money-Laundering Working Group is leading the revision of the current (2010) FFIEC BSA/Anti-Money Laundering Examination Manual. Revisions related to virtual currencies may include information on FinCEN's March 2013 guidance; a brief note describing Internet-based electronic cash, which includes virtual currency; and regulatory expectations that banks should undertake a risk assessment with a particular focus on the money-laundering risks posed by new products, services, and technologies.

Working group	Participating agencies	Mission and goals	Ways in which group addressed virtual currencies
Financial Action Task Force (FATF)	FATF is an international intergovernmental organization with 36 member countries, including the U.S. Treasury as the lead agency of the U.S. delegation. Other U.S. delegation participants include DOJ's Asset Forfeiture and Money Laundering Section; DHS (including ICE-HSI); SEC; IRS; and the Department of State.	This group sets standards and promotes effective implementation of legal, regulatory, and operational measures for combating money laundering, and the financing of terrorism and proliferation.	• In February 2014, FATF developed a discussion paper on virtual currencies, which described virtual currency systems, participants, and some of the major virtual currencies such as bitcoin, and proposed a common set of terms and conceptual framework for analyzing virtual currencies. The paper also discussed the potential legitimate uses of virtual currencies, the risks these currencies may pose, and the different regulatory approaches countries are taking to address virtual currencies. The U.S. delegation prepared the paper together with delegations from Australia, Canada, Russia, and the United Kingdom. As of April 2014, the discussion paper was not yet public. • In March 2014, FATF included a discussion of virtual currencies as part of the Private Sector Consultative Forum, which included experts on virtual currencies. The group discussed how virtual currencies and their exchangers operate; the associated money laundering and terrorist financing risks; what measures countries and financial institutions are taking to assess and mitigate those risks; and what regulatory approaches are currently being taken.

Working group	Participating agencies	Mission and goals	Ways in which group addressed virtual currencies
Interagency Bank Fraud Enforcement Working Group	DOJ (Criminal Division lead, as well as the Asset Forfeiture and Money Laundering Section, Executive Office for U.S. Attorneys, Executive Office for U.S. Trustees, and FBI); CFPB; CFTC; Department of Housing and Urban Development; DHS (ICE-HSI and Secret Service); Export-Import Bank; Farm Credit Administration; FDIC; Federal Housing Finance Agency; Federal Reserve; IRS; NCUA; OCC; SEC; Treasury (Bureau of Public Debt, FinCEN, Office of Inspector General, Office of General Counsel, Office of Critical Infrastructure Protection, Office of Financial Stability, and Special Inspector General for the Troubled Asset Relief Program); U.S. Postal Inspection Service; and the District of Columbia Department of Insurance, Securities, and Banking.	This group's mission is to share information on significant trends, developments, and other issues in financial institution fraud and, as appropriate, identify and carry out projects of common interest to the working group's members.	The working group has occasionally discussed virtual currencies in the past year. Discussions to date have aimed to educate and inform members about virtual currencies. Planned activities include a presentation on the IRS notice addressing the status of virtual currencies under federal tax law. Within the Interagency Bank Fraud Working Group, the Payments Fraud Working Group has also addressed virtual currencies. The June 2013 meeting included presentations on e-Gold, the Liberty Reserve indictment, and FinCEN's guidance on how BSA regulations apply to participants in certain virtual currency systems.

Working group	Participating agencies	Mission and goals	Ways in which group addressed virtual currencies
International Organized Crime Intelligence and Operations Center (IOC-2)	DOJ (lead, including the Bureau of Alcohol, Firearms and Explosives; Criminal Division, DEA, and FBI); DHS (ICE-HSI and Secret Service); IRS-Criminal Investigation; Department of Labor (Office of Inspector General); Department of State (Bureau of Diplomatic Security); and U.S. Postal Inspection Service.	This group's mission is to significantly disrupt and dismantle transnational criminal organizations posing the greatest threat to the United States. The group does so by (1) deconflicting and analyzing transnational organized crime information and intelligence; (2) disseminating information and intelligence to support law enforcement operations, investigations, prosecutions, and forfeiture proceedings; and (3) coordinating jurisdictional and multiagency operations, investigations and prosecutions.	IOC-2 supports member-agency investigations of both virtual currency administrators that are suspected of violating U.S. law and individuals who are suspected of using virtual currencies to commit crimes. Specifically, IOC-2 assists its member agencies by: • sharing investigative details that will serve to deconflict current investigative and prosecutorial targets; • identifying current trends in the illicit use of virtual currencies; • sharing best practices in developing investigative and prosecutorial strategies; • discussing investigative challenges and solutions; • identifying tools, points of contact, and other areas of interest that offer assistance and serve as force multipliers in supporting virtual currency investigations and prosecutions; and • creating cross-agency relationships for future cooperation and coordination on virtual currency issues, investigations, and prosecutions.

Working group	Participating agencies	Mission and goals	Ways in which group addressed virtual currencies
Terrorist Finance Working Group's New Payments Systems Ad Hoc Working Group	Department of State (lead, including the Bureaus of Economic and Business Affairs, Counterterrorism, and International Narcotics and Law Enforcement Affairs); Department of Defense; DOJ (Asset Forfeiture and Money Laundering Section; Criminal Division; DEA; FBI; National Security Division; and Office of Overseas Prosecutorial Development, Assistance and Training); FDIC; Federal Trade Commission; ICE-HSI; IRS-Criminal Investigation; Treasury (FinCEN, Office of Terrorism and Financial Intelligence, and Office of Technical Assistance), and USAID.	The larger working group's mission is to coordinate counter-terrorism-financing and anti-money-laundering training and technical assistance programs to countries deemed most vulnerable to terrorist financing. Within this context, the New Payments Ad Hoc Working Group's mission is two-fold: (1) to help ensure that foreign partners providing assistance and capacity building have a baseline understanding of new payment systems and the counter-terrorism-financing and anti-money-laundering risks and vulnerabilities that they may pose, and (2) to collaborate with other federal agencies and appropriate public and private sector entities to develop training and technical assistance programs in line with international standards set by groups such as FATF.	The New Payments Ad Hoc Working Group, which formed in 2013 and meets every two to three months, has addressed the use of virtual currencies at several meetings. Topics have included: • briefings on virtual currencies, how they operate, and risks; • the set of common virtual currency vocabulary terms proposed in the FATF's discussion paper on virtual currencies; • trainings that ad hoc working group participants plan to offer through 2015 on counter-terrorism-financing and anti-money-laundering risks associated with virtual currencies. • workshops that the Department of State, USAID, and other ad hoc working group participants offered in 2013 and 2014 on new payment systems—including virtual currencies—to foreign partners in the East Africa, Southeast Asia, Latin America, and the Caribbean. • the ways in which other interagency collaborative groups—such as the Egmont Group, which is composed of FinCEN and financial intelligence units from other countries—are addressing virtual currencies.
Virtual Currencies Emerging Threats Working Group	DOJ (FBI lead and other DOJ components); FinCEN; ICE-HSI; SEC; Treasury; Secret Service; and other relevant federal partners.	To address the illicit use of virtual currencies.	This group leverages members' expertise to address new virtual currency trends, address potential implications for law enforcement and the U.S. intelligence community, and mitigate the cross-programmatic threats arising from illicit actors' use of virtual currency systems.

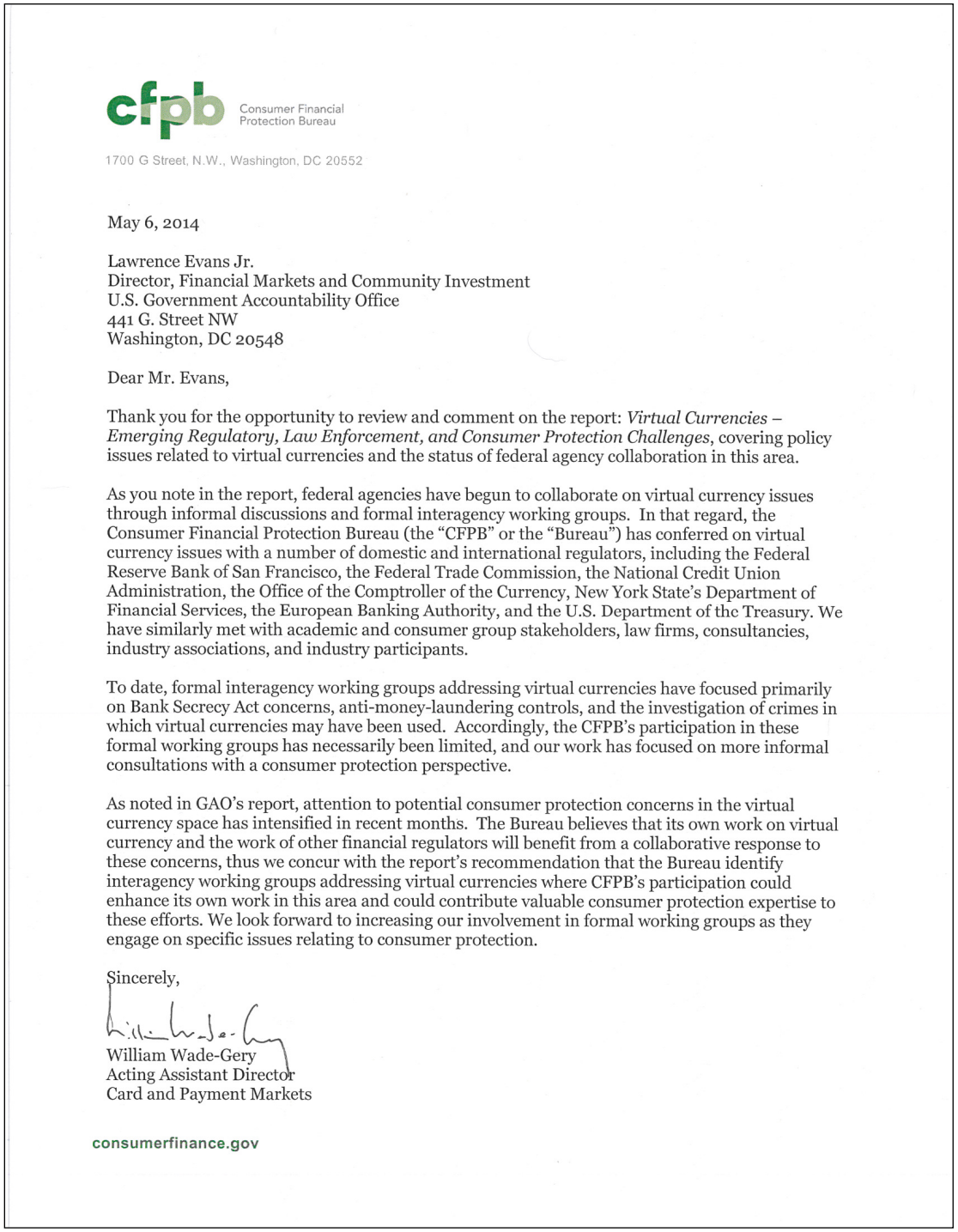
Source: GAO analysis of agency interviews and documents, as well as websites of interagency collaborative efforts.

[a]Digital Economy Task Force, *The Digital Economy: Potential, Perils, and Promises* (Mar. 2014).

[b]FDIC, the Federal Reserve, and NCUA told us that the FFIEC Taskforce on Supervision, and the Taskforce's Information Technology Subgroup, have also discussed virtual currencies.

[c]The FFIEC State Liaison Committee includes representatives from the Conference of State Bank Supervisors, the American Council of State Savings Supervisors, and the National Association of State Credit Union Supervisors. Other FFIEC BSA/Anti-Money-Laundering Working Group non-voting members include CFTC; FinCEN; IRS; SEC; Treasury's Office of Foreign Assets Control; and Treasury's Office of Terrorist Financing and Financial Crimes.

Appendix III: Comments from the Consumer Financial Protection Bureau



cfpb Consumer Financial Protection Bureau

1700 G Street, N.W., Washington, DC 20552

May 6, 2014

Lawrence Evans Jr.
Director, Financial Markets and Community Investment
U.S. Government Accountability Office
441 G. Street NW
Washington, DC 20548

Dear Mr. Evans,

Thank you for the opportunity to review and comment on the report: *Virtual Currencies – Emerging Regulatory, Law Enforcement, and Consumer Protection Challenges*, covering policy issues related to virtual currencies and the status of federal agency collaboration in this area.

As you note in the report, federal agencies have begun to collaborate on virtual currency issues through informal discussions and formal interagency working groups. In that regard, the Consumer Financial Protection Bureau (the "CFPB" or the "Bureau") has conferred on virtual currency issues with a number of domestic and international regulators, including the Federal Reserve Bank of San Francisco, the Federal Trade Commission, the National Credit Union Administration, the Office of the Comptroller of the Currency, New York State's Department of Financial Services, the European Banking Authority, and the U.S. Department of the Treasury. We have similarly met with academic and consumer group stakeholders, law firms, consultancies, industry associations, and industry participants.

To date, formal interagency working groups addressing virtual currencies have focused primarily on Bank Secrecy Act concerns, anti-money-laundering controls, and the investigation of crimes in which virtual currencies may have been used. Accordingly, the CFPB's participation in these formal working groups has necessarily been limited, and our work has focused on more informal consultations with a consumer protection perspective.

As noted in GAO's report, attention to potential consumer protection concerns in the virtual currency space has intensified in recent months. The Bureau believes that its own work on virtual currency and the work of other financial regulators will benefit from a collaborative response to these concerns, thus we concur with the report's recommendation that the Bureau identify interagency working groups addressing virtual currencies where CFPB's participation could enhance its own work in this area and could contribute valuable consumer protection expertise to these efforts. We look forward to increasing our involvement in formal working groups as they engage on specific issues relating to consumer protection.

Sincerely,

William Wade-Gery
Acting Assistant Director
Card and Payment Markets

consumerfinance.gov

Appendix IV: Comments from the National Credit Union Administration

National Credit Union Administration

Executive Director

May 1, 2014

Lawrance L. Evans, Jr.
Director, Financial Markets and Community Investment
U.S. Government Accountability Office
441 G Street, NW
Washington, D.C. 20548

Dear Mr. Evans:

We reviewed the U.S. General Accountability Office's report entitled *Virtual Currencies: Emerging Regulatory, Law Enforcement, and Consumer Protection Challenges (GAO-14-496)*.

The report provides clear discussion of the risks related to virtual currencies as well as a survey of current efforts in the regulatory community to address the related policy issues. We support the report's recommendation to increase emphasis on consumer protection issues going forward. In NCUA's limited dealings with virtual currencies, we have consistently focused on consumer protection as well as safety and soundness.

Thank you for the opportunity to comment.

Sincerely,

Mark Treichel
Executive Director

1775 Duke Street – Alexandria, VA 22314-3428 - 703-518-6320

Appendix V: GAO Contact and Staff Acknowledgments

GAO Contact

Lawrance L. Evans, Jr. (202) 512-8678 or evansl@gao.gov.

Staff Acknowledgments

In addition to the contact named above, Steve Westley (Assistant Director), Bethany Benitez, Chloe Brown, Anna Chung, Tonita Gillich, José R. Peña, and Robert Pollard made key contributions to this report. Also contributing to this report were Jennifer Schwartz, Jena Sinkfield, Ardith Spence, Andrew Stavisky, and Sarah Veale.

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Congressional Relations	Katherine Siggerud, Managing Director, siggerudk@gao.gov, (202) 512-4400, U.S. Government Accountability Office, 441 G Street NW, Room 7125, Washington, DC 20548
Public Affairs	Chuck Young, Managing Director, youngc1@gao.gov, (202) 512-4800 U.S. Government Accountability Office, 441 G Street NW, Room 7149 Washington, DC 20548

Exhibit G

UNITED STATES OF AMERICA
Before the
COMMODITY FUTURES TRADING COMMISSION

In the Matter of:	)	
Coinflip, Inc., d/b/a Derivabit, and Francisco Riordan,	)	**CFTC Docket No. 15-29**
Respondents.	)	

ORDER INSTITUTING PROCEEDINGS PURSUANT TO SECTIONS 6(c) AND 6(d) OF THE COMMODITY EXCHANGE ACT, MAKING FINDINGS AND IMPOSING REMEDIAL SANCTIONS

I.

The Commodity Futures Trading Commission ("Commission") has reason to believe that from in or about March 2014 to at least August 2014 (the "Relevant Period"), Coinflip, Inc., d/b/a Derivabit ("Coinflip") and Francisco Riordan ("Riordan") (the "Respondents") violated Sections 4c(b) and 5h(a)(1) of the Commodity Exchange Act, as amended (the "Act"), 7 U.S.C. §§ 6c(b) and 7b-3(a)(1) (2012), and Commission Regulations 32.2 and 37.3(a)(1), 17 C.F.R. § 32.2 and 37.3(a)(1) (2014). Therefore, the Commission deems it appropriate and in the public interest that public administrative proceedings be, and hereby are, instituted to determine whether the Respondents engaged in the violations set forth herein and to determine whether any order should be issued imposing remedial sanctions.

II.

In anticipation of the institution of an administrative proceeding, the Respondents have submitted an Offer of Settlement ("Offer"), which the Commission has determined to accept. Without admitting or denying any of the findings or conclusions herein, Respondents consent to the entry of this Order Instituting Proceedings Pursuant to Sections 6(c) and 6(d) of the Commodity Exchange Act, Making Findings and Imposing Remedial Sanctions ("Order") and acknowledge service of this Order.[1]

[1] Respondents consent to the entry of this Order and to the use of these findings in this proceeding and in any other proceeding brought by the Commission or to which the Commission is a party; provided, however, that Respondents do not consent to the use of the Offer, or the findings or conclusions in the Order consented to in the Offer, as the sole basis for any other proceeding brought by the Commission, other than in a proceeding in bankruptcy or to enforce the terms of this Order. Nor do Respondents consent to the use of the Offer or the Order, or the findings or conclusions in this Order consented to in the Offer, by any other party in any other proceeding.

III.

The Commission finds the following:

A. Summary

During the Relevant Period, Respondents violated Sections 4c(b) and 5h(a)(1) of the Act and Commission Regulations 32.2 and 37.3(a)(1) by conducting activity related to commodity options contrary to Commission Regulations and by operating a facility for the trading or processing of swaps without being registered as a swap execution facility or designated contract market. Specifically, during the Relevant Period, Respondents operated an online facility named Derivabit, offering to connect buyers and sellers of Bitcoin option contracts.[2]

B. Respondents

Coinflip, Inc. is a Delaware corporation with a principal place of business in San Francisco, California. During the Relevant period, Coinflip operated Derivabit and its website derivabit.com. Coinflip has never been registered with the Commission.

Francisco Riordan is an individual residing in San Francisco, California. Riordan is a founder, the chief executive officer, and controlling person of Coinflip. Riordan has never been registered with the Commission.

C. Facts

Coinflip Conducted Activity Related to Illegal Commodity Options

Beginning in March 2014, Coinflip advertised Derivabit as a "risk management platform . . . that connects buyers and sellers of standardized Bitcoin options and futures contracts." During this period, Coinflip designated numerous put and call options contracts as eligible for trading on the Derivabit platform.[3] For these contracts, Coinflip listed Bitcoin as the asset underlying the option and denominated the strike and delivery prices in US Dollars. According to the derivabit.com website, a customer could place orders by registering as a user and depositing Bitcoin into an account in the user's name. Premiums and payments of settlement of the option contracts were to be paid using Bitcoin at a spot rate determined by a designated third-party Bitcoin currency exchange. Users had the ability to, and in fact did, post bids or offers for

[2] Bitcoin is a "virtual currency," defined here as a digital representation of value that functions as a medium of exchange, a unit of account, and/or a store of value, but does not have legal tender status in any jurisdiction. Bitcoin and other virtual currencies are distinct from "real" currencies, which are the coin and paper money of the United States or another country that are designated as legal tender, circulate, and are customarily used and accepted as a medium of exchange in the country of issuance.

[3] Although referenced it its solicitation materials, Coinflip did not offer any futures contracts during the Relevant Period.

the designated options contracts. Coinflip confirmed the bid or offer by communicating it to all users through its website.[4]

During the Relevant Period, Derivabit had approximately 400 users.

Riordan Controlled Coinflip and Directed Its Operations

Riordan was the founder, engineer and Chief Executive Officer of Coinflip. He exercised control over Coinflip's daily operations and possessed the power or ability to control all aspects of the Derivabit platform. Riordan participated in key aspects of Coinflip's illegal activity, including designing and implementing the Derivabit trading platform. Riordan's control enabled him to make design and substantive changes to Coinflip's operations, including the transition from offering Bitcoin options to OTC Bitcoin Forward Contracts. Ultimately, Riordan possessed the power and ability to direct Coinflip to cease operating the Derivabit platform.

LEGAL DISCUSSION

A. Virtual Currencies Such as Bitcoin are Commodities

Section 1a(9) of the Act defines "commodity" to include, among other things, "all services, rights, and interests in which contracts for future delivery are presently or in the future dealt in." 7 U.S.C. § 1a(9). The definition of a "commodity" is broad. *See, e.g.*, *Board of Trade of City of Chicago v. SEC*, 677 F. 2d 1137, 1142 (7th Cir. 1982). Bitcoin and other virtual currencies are encompassed in the definition and properly defined as commodities.

B. Coinflip Violated Sections 4c(b) Act and Commission Regulation 32.2

Section 4c(b) of the Act makes it unlawful for any person to "offer to enter into, enter into or confirm the execution of, any transaction involving any commodity . . . which is of the character of, or is commonly known to the trade as, an 'option' . . . , 'bid', 'offer', 'put', [or] 'call' . . . contrary to any rule, regulation, or order of the Commission prohibiting any such transaction." Section 1.3(hh) defines a "commodity option transaction" and "commodity option" to "mean any transaction or agreement in interstate commerce which is or is held out to be of the character of, or is commonly known to the trade as, an 'option,' 'privilege,' 'indemnity,' 'bid,' 'offer,' 'call,' 'put,' 'advance guaranty,' or 'decline guaranty,' and which is subject to regulation under the Act and these regulations." Section 32.2 of the Commission's Regulations, in turn,

[4] In July 2014, Coinflip began to offer what it characterized as "OTC Bitcoin Forward Contracts" for trading. Under this model, a Derivabit user would be matched through competitive bidding with a counterparty to execute a contract to exchange US Dollars for Bitcoins at a predetermined price and date. As part of its services, Coinflip would calculate and hold initial and maintenance margin payments and would also calculate and facilitate the transfer of final settlements at maturity or early termination. Coinflip advertised that the users could choose to institute an early termination at any time if its position was "in the money." Although the price would be expressed as an exchange rate between US Dollars and Bitcoins, Coinflip required all settlements and margin payments to be transacted in Bitcoins. No bids or offers were posted by Derivabit users for these contracts. Although these activities may have violated, or led to violations of, the Commodity Exchange Act, the Commission does not address this conduct here.

provides that it shall be unlawful for any person to "offer to enter into, enter into, confirm the execution of, maintain a position in, or otherwise conduct activity related to any transaction in interstate commerce that is a commodity option transaction unless: (a) [s]uch transaction is conducted in compliance with and subject to the provisions of the Act, including any Commission rule, regulation, or order thereunder, otherwise applicable to any other swap, or (b) [s]uch transaction is conducted pursuant to [Regulation] 32.3."

Between at least March 2014 and July 2014, Respondents conducted activity related to commodity option transactions, offered to enter into commodity option transactions and/or confirmed the existence of commodity option transactions. The options transactions were not conducted in compliance with Section 5h(a)(1) of the Act or Regulation 37.3(a)(1), a section of the Act and a Commission regulation otherwise applicable to swaps (*see infra* Section C) and were not conducted pursuant to Regulation 32.3.[5] Accordingly, Coinflip violated Section 4c(b) of the Act and Commission Regulation 32.2.

C. Coinflip Violated Section 5h(a)(1) of the Act

Section 5h(a)(1) of the Act forbids any person from operating "a facility for the trading or processing of swaps unless the facility is registered as a swap execution facility or as a designated contract market . . . ." 7 U.S.C. § 7b-3(a)(1). Section 1a(47) of the Act's definition of "swap" includes option contracts. 7 U.S.C. § 1a(47)(A)(i). Regulation 37.3(a)(1) similarly requires that any "person operating a facility that offers a trading system or platform in which more than one market participant has the ability to execute or trade swaps with more than one other market participant on the system or platform shall register the facility as a swap execution facility under this part or as a designated contract market under part 38 of this chapter." 17 C.F.R. § 37.3(a)(1) (2014).

During the Relevant Period, Coinflip operated a facility for the trading of swaps. However, Coinflip did not register the facility as a swap execution facility or designated contract market. Accordingly, Coinflip violated Section 5h(a)(1) of the Act and Regulation 37.3(a)(1).

D. Riordan Is Liable for Coinflip's Violations as Its Controlling Person Under Section 13(b) of the Act

Riordan controlled Coinflip, directly or indirectly, and did not act in good faith or knowingly induced, directly or indirectly, Coinflip's acts in violation of the Act and Regulations; therefore, pursuant to Section 13(b) of the Act, 7 U.S.C. § 13c(b) (2012), Riordan is liable for Coinflip's violations of Sections 4c(b) and 5h(a)(1) of the Act, 7 U.S.C. §§ 6c(b) and 7b-3(a)(1) (2012) and Regulations 32.2 and 37.3(a)(1), 17 C.F.R. §§ 32.2 and 37.3(a)(1) (2014).

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[5] To take advantage of the "trade option" exemptions set forth in Regulation 32.3, the offeror of the option must be an eligible contract participant as defined in Section 1a(18) of the Act or "producer, processor, or commercial user of, or a merchant handling the commodity," and have a reasonable basis to believe that the offeree was a "producer, processor, or commercial user of, or a merchant handling the commodity that is the subject of the commodity option transaction, or the products or by-products thereof, and such offeree is offered or entering into the commodity option transaction solely for purposes related to its business as such." 17 C.F.R. §§ 32.3(a)(1)(i)-(ii) and 32.3(a)(2).

IV.

FINDINGS OF VIOLATIONS

Based on the foregoing, the Commission finds that, during the Relevant Period, Respondents violated Sections 4c(b) and 5h(a)(1) of the Act, 7 U.S.C. §§ 4c(b) and 7b-3(a)(1) (2012), and Commission Regulations 32.2 and 37.3(a)(1), 17 C.F.R. §§ 32.2 and 37.3(a)(1) (2014).

V.

OFFER OF SETTLEMENT

Respondents have submitted an Offer in which they, without admitting or denying the findings and conclusions herein:

A. Acknowledge receipt of service of this Order;

B. Admit the jurisdiction of the Commission with respect to all matters set forth in this Order and for any action or proceeding brought or authorized by the Commission based on violation of or enforcement of this Order;

C. Waive:

1. the filing and service of a complaint and notice of hearing;

2. a hearing;

3. all post-hearing procedures;

4. judicial review by any court;

5. any and all objections to the participation by any member of the Commission's staff in the Commission's consideration of the Offer;

6. any and all claims that they may possess under the Equal Access to Justice Act, 5 U.S.C. § 504 (2012) and 28 U.S.C. § 2412 (2012), and/or the rules promulgated by the Commission in conformity therewith, Part 148 of the Commission's Regulations, 17 C.F.R. §§ 148.1-30 (2014), relating to, or arising from, this proceeding;

7. any and all claims that they may possess under the Small Business Regulatory Enforcement Fairness Act of 1996, Pub. L. No. 104-121, §§ 201-253, 110 Stat. 847, 857-868 (1996), as amended by Pub. L. No. 110-28, § 8302, 121 Stat. 112, 204-205 (2007), relating to, or arising from, this proceeding; and

8. any claims of Double Jeopardy based on the institution of this proceeding or the entry in this proceeding of any order imposing a civil monetary penalty or any other relief;

D. Stipulate that the record basis on which this Order is entered shall consist solely of the findings contained in this Order to which Respondents have consented in the Offer;

E. Consent, solely on the basis of the Offer, to the Commission's entry of this Order that:

1. makes findings by the Commission that Respondents violated Sections 4c(b) and 5h(a)(1) of the Act, 7 U.S.C. §§ 6c(b) and 7b-3(a)(1) (2012), and Commission Regulations 32.2 and 37.3(a)(1), 17 C.F.R. §§ 32.2 and 37.3(a)(1) (2014);

2. orders Respondents to cease and desist from violating Sections 4c(b) and 5h(a)(1) of the Act and Commission Regulations 32.2 and 37.3(a)(1); and

3. orders Respondents and their successors and assigns to comply with the conditions and undertakings consented to in the Offer and as set forth in Part VI of this Order.

Upon consideration, the Commission has determined to accept Respondents' Offer.

VI.

ORDER

Accordingly, IT IS HEREBY ORDERED THAT:

A. Respondents shall cease and desist from violating Sections 4c(b) and 5h(a)(1) of the Act, 7 U.S.C. §§ 6c(b) and 7b-3(a)(1) (2012), and Commission Regulations 32.2 and 37.3(a)(1), 17 C.F.R. §§ 32.2 and 37.3(a)(1) (2014).

B. Respondents and their successors and assigns shall comply with the following conditions and undertakings set forth in the Offer:

1. Public Statements: Respondents agree that neither they nor any of their successors and assigns, agents, or employees under their authority or control shall take any action or make any public statement denying, directly or indirectly, any findings or conclusions in the Order or creating, or tending to create, the impression that the Order is without a factual basis; provided, however, that nothing in this provision shall affect Respondents' (i) testimonial obligations; or (ii) right to take legal positions in other proceedings to which the Commission is not a party. Respondents and their successors and assigns shall undertake all steps necessary to ensure that all of their agents and/or employees under their authority or control understand and comply with this agreement.

2. Cooperation with the Commission: Respondents shall cooperate fully and expeditiously with the Commission, including the Commission's Division of

Enforcement, and any other governmental agency in this action, and in any investigation, civil litigation, or administrative matter related to the subject matter of this action or any current or future Commission investigation related thereto.

The provisions of this Order shall be effective as of this date.

By the Commission.

Christopher J. Kirkpatrick
Secretary of the Commission
Commodity Futures Trading Commission

Dated: September 17, 2015

Exhibit H

2019 ANNUAL REPORT

FSOC

FINANCIAL STABILITY OVERSIGHT COUNCIL

Financial Stability Oversight Council

The Financial Stability Oversight Council (Council) was established by the Dodd-Frank Wall Street Reform and Consumer Protection Act (Dodd-Frank Act) and is charged with three primary purposes:

1. To identify risks to the financial stability of the United States that could arise from the material financial distress or failure, or ongoing activities, of large, interconnected bank holding companies or nonbank financial companies, or that could arise outside the financial services marketplace.

2. To promote market discipline, by eliminating expectations on the part of shareholders, creditors, and counterparties of such companies that the U.S. government will shield them from losses in the event of failure.

3. To respond to emerging threats to the stability of the U.S. financial system.

Pursuant to the Dodd-Frank Act, the Council consists of ten voting members and five nonvoting members and brings together the expertise of federal financial regulators, state regulators, and an insurance expert appointed by the President.

The voting members are:

- the Secretary of the Treasury, who serves as the Chairperson of the Council;
- the Chairman of the Board of Governors of the Federal Reserve System;
- the Comptroller of the Currency;
- the Director of the Consumer Financial Protection Bureau;
- the Chairman of the Securities and Exchange Commission;
- the Chairperson of the Federal Deposit Insurance Corporation;
- the Chairperson of the Commodity Futures Trading Commission;
- the Director of the Federal Housing Finance Agency;
- the Chairman of the National Credit Union Administration; and
- an independent member having insurance expertise who is appointed by the President and confirmed by the Senate for a six-year term.

The nonvoting members, who serve in an advisory capacity, are:

- the Director of the Office of Financial Research;
- the Director of the Federal Insurance Office;
- a state insurance commissioner designated by the state insurance commissioners;
- a state banking supervisor designated by the state banking supervisors; and
- a state securities commissioner (or officer performing like functions) designated by the state securities commissioners.

The state insurance commissioner, state banking supervisor, and state securities commissioner serve two-year terms.

Statutory Requirements for the Annual Report

Section 112(a)(2)(N) of the Dodd-Frank Act requires that the annual report address the following:

i. the activities of the Council;
ii. significant financial market and regulatory developments, including insurance and accounting regulations and standards, along with an assessment of those developments on the stability of the financial system;
iii. potential emerging threats to the financial stability of the United States;
iv. all determinations made under Section 113 or Title VIII, and the basis for such determinations;
v. all recommendations made under Section 119 and the result of such recommendations; and
vi. recommendations—
    I. to enhance the integrity, efficiency, competitiveness, and stability of United States financial markets;
    II. to promote market discipline; and
    III. to maintain investor confidence.

Approval of the Annual Report

This annual report was unanimously approved by the voting members of the Council on December 4, 2019.

Abbreviations for Council Member Agencies and Member Agency Offices

- Department of the Treasury (Treasury)
- Board of Governors of the Federal Reserve System (Federal Reserve)
- Office of the Comptroller of the Currency (OCC)
- Consumer Financial Protection Bureau (CFPB)
- Securities and Exchange Commission (SEC)
- Federal Deposit Insurance Corporation (FDIC)
- Commodity Futures Trading Commission (CFTC)
- Federal Housing Finance Agency (FHFA)
- National Credit Union Administration (NCUA)
- Office of Financial Research (OFR)
- Federal Insurance Office (FIO)

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1 Member Statement

The Honorable Nancy Pelosi
Speaker of the House
United States House of Representatives

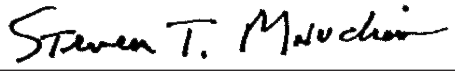
The Honorable Kevin McCarthy
Republican Leader
United States House of Representatives

The Honorable Michael R. Pence
President of the Senate
United States Senate

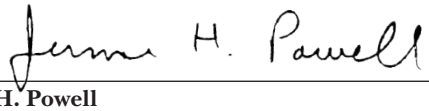
The Honorable Mitch McConnell
Majority Leader
United States Senate

The Honorable Charles E. Schumer
Democratic Leader
United States Senate

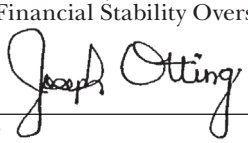
In accordance with Section 112(b)(2) of the Dodd-Frank Wall Street Reform and Consumer Protection Act, for the reasons outlined in the annual report, I believe that additional actions, as described below, should be taken to ensure financial stability and to mitigate systemic risk that would negatively affect the economy: the issues and recommendations set forth in the Council's annual report should be fully addressed; the Council should continue to build its systems and processes for monitoring and responding to emerging threats to the stability of the U.S. financial system, including those described in the Council's annual report; the Council and its member agencies should continue to implement the laws they administer, including those established by, and amended by, the Dodd-Frank Act, through efficient and effective measures; and the Council and its member agencies should exercise their respective authorities for oversight of financial firms and markets so that the private sector employs sound financial risk management practices to mitigate potential risks to the financial stability of the United States.



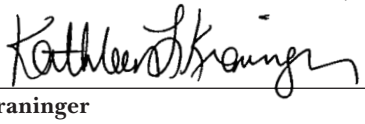
Steven T. Mnuchin
Secretary of the Treasury
Chairperson, Financial Stability Oversight Council



Jerome H. Powell
Chairman
Board of Governors of the Federal Reserve System



Joseph Otting
Comptroller of the Currency
Office of the Comptroller of the Currency

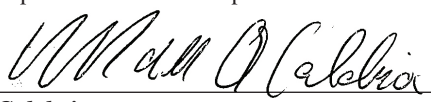


Kathleen Kraninger
Director
Consumer Financial Protection Bureau

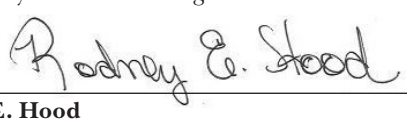
Jay Clayton
Chairman
Securities and Exchange Commission

Jelena McWilliams
Chairman
Federal Deposit Insurance Corporation

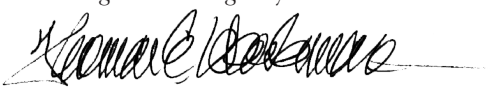
Heath P. Tarbert
Chairman
Commodity Futures Trading Commission



Mark A. Calabria
Director
Federal Housing Finance Agency



Rodney E. Hood
Chairman
National Credit Union Administration



Thomas E. Workman
Independent Member Having Insurance Expertise
Financial Stability Oversight Council

2 Executive Summary

The U.S. economy has continued to perform well since the publication of the previous report of the Council in December 2018. Economic growth remains robust, unemployment rates are at a fifty-year low, corporate and consumer delinquency and default rates are low, and financial conditions are broadly stable. Stock prices have increased over the past year. Prices for commercial and residential real estate have also increased albeit at a somewhat slower rate than in previous years. However, some uncertainty regarding future economic performance has emerged. This uncertainty prompted the Federal Reserve to shift to a more accommodative monetary policy stance over the past year.

Overall, risks to U.S. financial stability remain moderate. Much of the uncertainty in the economic outlook stems from events overseas. A slowdown in economic growth in the euro area and China may affect economic conditions in the United States though the effects on financial stability, if any, are likely to be modest. The potential for a disorderly withdrawal of the United Kingdom from the European Union (EU) remains. Such an event could impact global markets and have a further negative impact on European economic growth. Domestically, the growth in corporate borrowing remains a key area of focus for the Council. While firms are able to service their obligations in the current economic environment, high levels of debt and leverage in the corporate sector could exacerbate the effects of a sharp reversal in economic conditions.

Maintaining a resilient financial system is important. The economic well-being of Americans depends on the ability of the financial system to provide capital to businesses and individuals, to provide vehicles for savings, and to intermediate financial transactions even in the face of adverse events. Post-crisis regulatory reforms have strengthened the ability of the financial system to withstand a shock or an economic downturn. However, the financial services industry and financial regulators must continue to adapt to changing circumstances. One change in the near future is the anticipated cessation or degradation of LIBOR as a reference rate for financial contracts. Widespread failure of market participants to adequately adapt could result in a reduction in liquidity in markets for several types of financial contracts and could potentially adversely impact financial stability. The Council is closely monitoring developments in this area and remains vigilant regarding other potential emerging threats to financial stability.

The Council and member agencies use a wide range of tools to identify and address risks in the financial system. These include supervisory and company-run stress tests; supervisory review and feedback on the resolution plans of large banking organizations; on-site examinations and off-site monitoring; and economic analysis. The Council and member agencies are continuously working to improve the financial regulatory and supervisory framework.

Over the past year, Council member agencies have taken steps to enhance the efficiency of financial regulation by tailoring regulation to the risks posed by firms and activities. These actions reduce the costs of the provision of financial services as well as better utilize the resources of regulatory agencies. During the past year, the Federal Reserve adopted a new regulatory framework for large bank holding companies (BHCs), consistent with the Economic Growth, Regulatory Relief, and Consumer Protection Act (EGRRCPA), that would tailor capital, liquidity, and stress testing requirements to the risks that an institution poses to the financial system, and the Federal Reserve and the FDIC modified their resolution plan requirements for large firms. The banking agencies also adopted several changes to regulations to better align requirements for community banks with the risks of those institutions. The SEC adopted a rule that will permit exchange-traded funds that satisfy certain conditions to operate within the scope of the Investment Company Act of 1940 and come directly

to market without the cost and delay of obtaining an exemptive order.

Council member agencies continue to pursue initiatives aimed at increasing the amount and quality of information available to financial regulators to identify and analyze emerging risks in the financial system. In 2019, the OFR finalized rules and commenced the collection of data on centrally cleared repurchase agreement (repo) transactions. The CFTC took steps to improve the accuracy of data collected by swap data repositories. In addition, the SEC began to receive enhanced reporting on investment fund liquidity levels and portfolio holdings under the SEC's new reporting requirements.

Member agencies have also taken actions to reduce systemic risk in the financial system. In 2019, the banking agencies issued a proposal whereby unsecured debt instruments issued by another global systemically important banking organization would be subject to a deduction from the holder's regulatory capital. This capital treatment would provide a significant incentive for large banking organizations to reduce their crossholdings of debt and thereby reduce interconnectedness within the financial system and systemic risk. Also in 2019, several member agencies adopted and invited comment on an interim final rule intended to address concerns regarding the status of certain swaps in the event of a disorderly Brexit. Member agencies have also been actively engaged in facilitating the transition away from LIBOR; the Alternative Reference Rates Committee (ARRC) has been active in the introduction of the Secured Overnight Financing Rate (SOFR) as an alternative reference rate.

Separately, the Council notes the potential for an increasing federal government debt burden to negatively impact long-term financial stability. U.S. federal government debt held by the public was estimated to be 79 percent of GDP in 2019. The Congressional Budget Office (CBO) projects that the debt burden could increase in an accelerating manner in the coming decades. High levels of indebtedness could limit the latitude of the federal government in responding to a future financial crisis. Achieving long-term sustainability of the national budget is important to maintaining global market confidence in U.S. Treasury securities and the financial stability of the United States.

The Council remains focused on promoting market discipline to reduce the risk of future financial crises. While financial institutions may be more resilient to market disruptions due in part to increased capital and liquidity requirements since the financial crisis, market discipline reduces the likelihood of future market disruptions resulting from unwarranted risk-taking. The Council will continue to work with regulators to analyze ways to promote market discipline and reduce any lingering perceptions that some institutions are too big to fail.

Cybersecurity

The increasing reliance of financial firms on information technology increases the risk that a cybersecurity event could have severe negative consequences for the U.S. economy, potentially impacting financial stability. The Council recommends that member agencies continue to conduct cybersecurity examinations of financial institutions and financial infrastructures to ensure, among other things, robust and comprehensive cybersecurity monitoring. At the same time, the unique and complex threats posed by cyber risks require the public and private sectors to cooperate to identify, understand, and protect against these risks. The Council supports the use and development of public and private partnerships, including efforts to increase coordination of cybersecurity examinations across regulatory authorities.

Large, Complex, Interconnected Financial Institutions

Large financial institutions have become more resilient since the crisis. Bank capital levels have increased. Large BHCs engaged in the resolution planning process have made important changes to their structure and operations in order to improve resolvability. The banking and financial regulatory agencies have adopted rules intended to further increase the robustness of large BHCs and enhance financial stability. The Council recommends that agencies ensure that the largest financial institutions maintain sufficient capital and liquidity to ensure

their resiliency against economic and financial shocks. The Council also recommends that agencies continue to review recovery and resolution plans and monitor and assess the impact of rules on financial institutions and markets.

Central Counterparties

Central counterparties (CCPs) play a critical role in the financial system. Effective regulation and risk management of CCPs is essential for financial stability. Consistent with the requirements adopted by financial regulators, CCPs, including CCPs that have been designated by the Council as systemically important financial market utilities (FMUs), have made progress in improving risk management practices and providing greater transparency in their functioning. The Council recommends that relevant agencies continue to coordinate their supervision of CCPs. Member agencies should continue to evaluate whether existing rules and standards for CCPs and their clearing members are sufficiently robust to mitigate potential threats to financial stability. Agencies should also continue working with international standard-setting bodies to identify and address areas of common concern as additional derivatives clearing requirements are implemented in other jurisdictions. Supervisory agencies should continue to conduct evaluations of the performance of CCPs in stress scenarios. Agencies should continue to monitor and assess interconnections among CCPs, their clearing members, and other financial institutions. Agencies should also promote further recovery planning and development of resolution plans for systemically important FMUs.

Short-Term Wholesale Funding Markets

Since the financial crisis, considerable progress has been made in the reduction of counterparty risk exposures in repo markets; nonetheless, the potential for post-default fire sales of collateral in these markets remains a vulnerability. The Council recommends that financial regulators continue to closely monitor the repo markets, including an assessment of the increased concentration risk in the tri-party repo market. Understanding of the bilateral repo market can be improved considerably and will be aided by the OFR's data collection on centrally cleared repo transactions. Overnight repo markets experienced unexpectedly high volatility in mid-September 2019. Given the importance of these markets, the Council recommends that relevant authorities undertake a focused review of the September 2019 events in wholesale funding markets and assess the broader implications for financial stability. Separately, the Council recommends that financial regulators monitor developments concerning short-term cash management vehicles that use stable net asset values (NAVs) for any financial stability risk implications.

Investment Funds

The SEC has issued new rules, a new reporting form, and rule amendments designed to promote effective liquidity risk management across the open-end fund industry, including a limit on registered open-end investment funds' investments in illiquid assets. The Council recommends that the SEC monitor the implementation and evaluate the effectiveness of rules intended to reduce liquidity and redemption risks in investment funds. The Council also recommends that relevant agencies continue to review the available data on private funds to assess whether and how private funds may pose a risk to financial stability.

Financial Market Structure

The evolution of financial markets has been driven by technological advances and regulatory developments. While new technologies have reduced transaction costs and made financial data more widely available, the increased use of technology and the entry of new types of market participants have created new types of risks. The increased use of automated trading systems and the ability to quote and execute transactions at higher speeds increase the potential for severe market disruptions from operational events at market makers or other participants. In some markets, economies of scale associated with new technologies have led to higher concentration and greater dependency for liquidity on a small number of participants. The emergence of new trading venues has fragmented trading and required the implementation of technological solutions to connect markets. The Council recommends that regulators continue to evaluate structural changes in financial markets and consider their impact on the efficiency and stability of the

financial system. Regulators should also assess the complex linkages among markets, examine factors that could cause stress to propagate across markets, and consider potential ways to mitigate these risks.

Data Gaps and Challenges

The financial crisis revealed gaps in the data needed for effective oversight of the financial system and of internal firm risk management and reporting capabilities. Since the financial crisis, important steps have been taken, including developing and implementing new identifiers for financial data. Significant gaps remain, however, as some market participants continue to use legacy processes that rely on data that are not aligned to definitions from relevant consensus-based standards. Gaps and legacy processes inhibit data sharing. The Council recommends that regulators and market participants continue to work together to improve the coverage, quality, and accessibility of financial data, as well as improve data sharing among relevant agencies.

Alternative Reference Rates

The cessation or degradation of LIBOR has the potential to significantly disrupt trading in many important types of financial contracts. The Council commends the progress of the ARRC in identifying SOFR as an alternative reference rate and its subsequent work to facilitate a transition from LIBOR. The Council recommends that the ARRC continue its work to facilitate an orderly transition from LIBOR. The Council also recommends that market participants formulate and execute transition plans so that they are prepared for the anticipated discontinuation or degradation of LIBOR. New issuance of instruments that continue to reference LIBOR should include appropriate contract fallback language to mitigate risk that the contract's interest rate benchmark becomes unavailable. Council member agencies should work closely with market participants to identify and mitigate risks from potential dislocations during the transition process. Council member agencies should also use their supervisory authority to understand the status of regulated entities' transition from LIBOR.

Managing Vulnerabilities amid Prolonged Credit Expansion

Increased borrowing by nonfinancial businesses and continued appreciation in asset prices reflect, in part, the strong performance of the U.S. economy and expectations for continued economic growth. However, several metrics indicate that nonfinancial corporate debt and leverage are elevated relative to historical norms. Likewise, there are indications that valuations of many important asset types, including equities, corporate debt, and some types of commercial and residential real estate, are above historical levels. High levels of nonfinancial business leverage could intensify the impact of a sharp reversal in business conditions and have spillover effects to other sectors of the economy. Similarly, large declines in the value of one type of financial asset could impact other markets or cause a decline in real investment and economic activity. The Council recommends that agencies continue to monitor levels of nonfinancial business leverage, trends in asset valuations, and potential implications for the entities they regulate in order to assess and reinforce the ability of financial institutions to manage severe, simultaneous losses.

Nonbank Mortgage Origination and Servicing

The share of residential mortgages originated and serviced by nonbanks has increased significantly over the past decade. Nonbanks have a particularly important role as providers of mortgage credit and servicing to low-income and riskier borrowers. However, most nonbank mortgage companies have fewer resources to absorb adverse shocks and are more dependent on short-term funding than banks. The Council recommends that federal and state regulators continue to coordinate closely to collect data, identify risks, and strengthen oversight of nonbank companies involved in the origination and servicing of residential mortgages.

Financial Innovation

New financial products and practices can offer substantial benefits to consumers and businesses by meeting unfilled or emerging needs or by reducing costs. New products and practices may also create new risks and vulnerabilities. The Council encourages agencies to continue to monitor and analyze the effects of new financial

products and services on consumers, regulated entities, and financial markets, and evaluate their potential effects on financial stability. In particular, the Council recommends that federal and state regulators continue to examine risks to the financial system posed by new and emerging uses of digital assets and distributed ledger technologies.

Housing Finance Reform

Fannie Mae and Freddie Mac (the Enterprises) are now into their twelfth year of conservatorship. Although some progress has been made to reform the housing finance system and to end the Enterprises' conservatorships, the Enterprises' capital levels remain low, and signs of increased credit risk have begun to emerge. The Council reaffirms its view that housing finance reform is urgently needed to address the present conservatorships of the Enterprises, codify existing reforms, and implement a more durable and vibrant housing finance system.

3 Annual Report Recommendations

3.1 Cybersecurity

The increasing reliance of the financial sector on information technology across a broadening array of interconnected platforms increases the risk that a cybersecurity event will have severe consequences for financial institutions. Financial institutions are making significant investments in cybersecurity, but the risk remains that a cyber event could materially impact a single institution or the broader financial system. Sustained senior-level commitment to mitigate cybersecurity risks and their potential systemic implications is necessary at both member agencies and private firms.

Improving the cybersecurity and operational resilience of the financial sector requires continuous assessment of cyber vulnerabilities and critical connections across firms. Financial institutions often rely on each other to provide critical operations. The interdependency of the networks and technologies supporting these critical operations magnifies cyber vulnerabilities, threatening the operational risk capabilities not just at individual institutions, but also of the financial sector as a whole. Critical vendors often provide key services to many institutions and an event at such a vendor could simultaneously undermine the business continuity and disaster recovery capabilities of several financial institutions. Maintaining confidence in the security practices of critical vendors is therefore increasingly important to preserving stability and preventing contagion.

The Council recommends that member agencies continue to conduct cybersecurity examinations of financial institutions and infrastructures to, among other things, ensure robust and comprehensive cybersecurity monitoring. However, the authority to supervise third-party service providers varies across financial regulators. To further enhance third-party service provider information security, the Council recommends that Congress pass legislation that ensures that FHFA, NCUA, and other relevant agencies have adequate examination and enforcement powers to oversee third-party service providers. The Council also recommends that federal banking regulators continue to work together to coordinate third-party service provider oversight and work with the Conference of State Bank Supervisors to identify additional ways to support information sharing among state and federal regulators.

The Council encourages continued cooperation across government agencies and private firms to enhance firms' ability to mitigate the risk of a cybersecurity incident and maintain the financial sector's strong cybersecurity posture. The Council supports the ongoing work of partnerships between government agencies and private firms, including the Financial and Banking Information Infrastructure Committee (FBIIC), the Financial Services Sector Coordinating Council (FSSCC), and the Financial Services Information Sharing and Analysis Center (FS-ISAC). These partnerships focus on improving the financial sector's ability to rapidly respond to and recover from significant cybersecurity incidents, thereby reducing the potential for such incidents to threaten the stability of the financial system and the broader economy.

The Council recommends that the FBIIC continue to promote processes to strengthen response and recovery efforts, including efforts to address the systemic implications of significant cybersecurity incidents. The FBIIC should continue to work closely with the Department of Homeland Security (DHS), law enforcement, and industry partners to carry out regular cybersecurity exercises recognizing interdependencies with other sectors, such as telecommunications and energy.

The Council further recommends that agencies work to improve information sharing among private firms and government partners. Sharing timely and actionable cybersecurity information can reduce the risk that cybersecurity incidents

occur and can mitigate the impacts of those that do occur. Treasury and relevant agencies should carefully consider how to appropriately share information and, where possible, continue efforts to declassify (or downgrade classification) to the extent practicable, consistent with national security imperatives. The Council encourages efforts to enhance information sharing with the FS-ISAC and its growing community of financial sector institutions.

Financial institutions are rapidly adopting new technologies, including cloud computing and artificial intelligence. The Council supports the efforts of the FBIIC Technology Working Group, which examines the extent to which financial services firms using emerging technologies introduce new cyber vulnerabilities into the financial services critical infrastructure. The Council recommends agencies consider how such emerging technologies will be addressed in supervision and regulation.

3.2 Ongoing Structural Vulnerabilities

3.2.1 Large, Complex, Interconnected Financial Institutions

Large and complex U.S. financial institutions have become more resilient since the crisis. They have done so, in part, by raising more capital; holding higher levels of liquid assets to meet peak demands for funding withdrawals; improving loan portfolio quality for residential real estate; implementing better risk management practices; and developing plans for recovery and orderly resolution. Financial regulatory agencies have developed and implemented rules intended to further increase the robustness of these institutions and enhance financial stability **(see Section 5.1)**. The Council recommends that financial regulators ensure that the largest financial institutions maintain sufficient capital and liquidity to ensure their resiliency against economic and financial shocks **(see Section 6.2.1)**. The Council further recommends that the appropriate regulatory agencies continue to review resolution plans submitted by large financial institutions; provide feedback and guidance to such institutions; and ensure there is an effective mechanism for resolving large, complex institutions.

The Council also recommends that regulators continue to monitor and assess the impact of rules on financial institutions and financial markets—including, for example, on market liquidity and capital—and ensure that BHCs are appropriately monitored based on their size, risk, concentration of activities, and offerings of new products and activities.

3.2.2 Central Counterparties

Central counterparties can improve financial stability by reducing counterparty risk and increasing transparency. CCPs must be robust and resilient to deliver these benefits. CCPs have made progress in strengthening their risk management practices and providing greater transparency regarding their operations. This includes CCPs that have been designated by the Council as systemically important FMUs. Due to the critical role CCPs play in financial markets and their interconnectedness, effective regulation and risk management of CCPs is essential to financial stability **(see Section 6.2.2)**.

The Council recommends that the CFTC, Federal Reserve, and SEC continue to coordinate in the supervision of all CCPs designated by the Council as systemically important FMUs. Relevant agencies should continue to evaluate whether existing rules and standards for CCPs and their clearing members are sufficiently robust to mitigate potential threats to financial stability. Member agencies have recently done work on CCP default management auctions and should continue working with global counterparts and international standard-setting bodies to identify and address areas of common concern. The Council encourages engagement by Treasury, CFTC, and SEC with foreign counterparts to address the potential for inconsistent regulatory requirements or supervision to pose risks to U.S. financial stability and encourages cooperation in the oversight and regulation of FMUs across jurisdictions **(see Sections 5.2.1 and 6.2.2)**.

The Council also encourages agencies to continue to monitor and assess interconnections among CCPs, their clearing members, and other financial institutions. Agencies should consider the potential effects of distress of one or more of these entities on other stakeholders in the clearing system and on

financial stability, with an eye toward identifying measures that would enhance the resiliency of the financial system.

Finally, the Council encourages regulators to continue to focus on recovery and resolution planning for systemically important FMUs.

3.2.3 Short-Term Wholesale Funding Markets

Repurchase Agreement Markets

Repo markets play an important role in facilitating the flow of cash and securities in the U.S. financial system. In recent years, tri-party repo infrastructure reform contributed to the reduction and clarification of counterparty risk exposures that arise in repo transactions. These reforms were aimed at reducing reliance on discretionary extensions of intraday credit and fostering improvements in the liquidity and credit risk management practices of market participants. Because the possibility of fire sales of collateral by creditors of defaulted repo counterparties remains a vulnerability, the Council recommends that financial regulators continue to closely monitor the repo markets and assess the degree to which recent reforms have mitigated risk in these markets. The Council also recommends assessing the potential risks from increased concentration in the tri-party repo market, where a single private financial institution is now effectively responsible for all settlements **(see Section 6.2.3)**.

Key to mitigating vulnerabilities in the repo market is bolstering the understanding of policymakers and market participants of how these markets function, how participants interact, and how risks are changing. Although visibility into the tri-party repo market has improved since the financial crisis, understanding of the bilateral market can be improved considerably. Following the Council's recommendation in its 2016 annual report, the OFR proposed rules in 2018 for the collection of data on centrally cleared repo transactions **(see Section 5.4.1)**. These rules were finalized in February 2019. Data collection began in October 2019. The data collection will allow monitoring of potential risks to financial stability in an important segment of the repo market and will also support the calculation of one of the alternative reference rates that could replace U.S. dollar LIBOR.

Overnight repo markets experienced unexpectedly high volatility in mid-September 2019 **(see Section 4.9.2)**. Given the importance of these markets, the Council recommends that relevant authorities undertake a focused review of the September 2019 events in wholesale funding markets and assess the broader implications for financial stability.

Money Market Mutual Funds and Other Cash Management Vehicles

In July 2010, the SEC implemented money market fund (MMF) reforms designed to make MMFs more resilient by reducing interest rate, credit, and liquidity risk in their portfolios. SEC reforms adopted in July 2014 were also designed to make MMFs less susceptible to heavy redemptions in times of stress (or more able to manage and mitigate potential contagion from redemptions). The 2014 reforms required the use of floating NAVs by institutional prime and tax-exempt MMFs to price their shares, while retaining stable NAVs for retail funds and funds consisting primarily of U.S. government issued holdings.

Other types of cash management vehicles, such as bank-sponsored short-term investment funds, local government investment pools, and private liquidity funds, continue to use stable NAVs. These cash management vehicles are not regulated by the SEC and are not subject to the SEC reforms, but are subject to similar interest rate, liquidity, and credit risks. As such, these types of cash management vehicles can also be susceptible to destabilizing redemptions during times of market stress. The adoption of new strategies by sponsors of cash management vehicles in response to regulatory or market developments could also introduce new risks and vulnerabilities. The Council recommends that financial regulators monitor developments concerning short-term cash management vehicles that use stable NAVs for any financial stability risk implications.

3.2.4 Investment Funds

The Council supports initiatives by the SEC and other agencies to address risks in investment funds.

Recent areas of Council focus include liquidity and redemption risks at investment funds and risks that arise from the use of leverage by certain fund types.

In 2016, the SEC adopted rules that require funds to maintain a minimum level of highly liquid investments, place limits on illiquid investments, and require disclosures by mutual funds and exchange-traded funds (ETFs) of their liquidity risk management practices **(see Section 6.2.4)**. The Council recommends that the SEC monitor the implementation and evaluate the effectiveness of rules intended to reduce liquidity and redemption risk in investment funds.

The Council also supports data collection and analytical work by member agencies aimed at the identification of potential emerging risks. The SEC initiated several data collection efforts and has established additional reporting requirements for investment funds during the past three years. As a result, there is now significantly more data available to regulators to monitor and analyze developments concerning fund liquidity, leverage, and risk-taking.

With respect to private funds, the Council recommends that relevant agencies continue to review the available data to assess whether and how private funds may pose a risk to financial stability.

3.2.5 Financial Market Structure

Financial market structures, driven by rapid technological change and regulatory developments, have continued to evolve. Certain new and emerging characteristics of financial markets—including, among other things, the increasingly significant role of non-traditional market participants, concentration of liquidity providers, fragmentation of execution venues, importance and availability of data, and interdependencies among various segments of the financial markets—pose both benefits and threats. Financial regulators are evaluating how changes in market structure are impacting market performance and liquidity and, more broadly, the stability of the financial system. Market participants should also regularly assess how these developments affect the risk profile of their institutions. The Council recommends that financial regulators continue to monitor and evaluate ongoing changes that might have adverse effects on markets, including on market integrity and liquidity. As markets are global in nature, there should be active collaboration among regulators across jurisdictions to ensure coordination of efforts.

The Council encourages member agencies to continue to evaluate the use of coordinated tools such as trading halts across interdependent markets in periods of overall market stress, operational failure, or other incidents that might pose threats to financial stability, while being mindful of the potential costs and other tradeoffs associated with such tools. Additionally, Council member agencies should work collaboratively to monitor and analyze developments concerning market liquidity.

3.2.6 Data Gaps and Challenges

High-quality financial data is an essential input into the financial regulatory process. The Council and member agencies rely on data collected from market participants to monitor developments in the financial system, identify potential risks to financial stability, and prioritize and execute supervisory and examination work. The Council encourages member agencies to collaborate and expand their data resources and analytical capabilities to assess interconnectedness and concentration risks in their respective areas of responsibility.

The establishment of uniform standards for reporting and collection enhances the usefulness of market data and reduces the reporting burdens on market participants. The absence of broadly shared standards on financial transaction and entity data can lead to unnecessary costs and inefficiencies, such as duplicate reporting, and may impede the ability to aggregate data for risk-management and reporting purposes. The Council recommends that regulators and market participants continue to partner to improve the scope, quality, and accessibility of financial data, as well as data sharing among relevant agencies. These partnership efforts include developing and implementing new identifiers such as the Unique Transaction Identifier (UTI), Unique Product Identifier (UPI), and Critical Data Elements (CDEs); developing and linking data inventories; and implementing industry

standards, protocols, and security for secure data sharing.

Broader adoption of the Legal Entity Identifier (LEI) by financial market participants continues to be a Council priority. The LEI enables unique and transparent identification of legal entities participating in financial transactions. Universal Loan Identifiers (ULIs) will make it possible to track loan records through a loan's life cycle. The Council recommends that member agencies update their regulatory mortgage data collections to include LEI and ULI fields. The Council also recommends that member agencies support adoption and use of standards in mortgage data, including consistent terms, definitions, and data quality controls, which will make transfers of loans or servicing rights less disruptive to borrowers and investors.

Important initiatives are underway at member agencies that will improve the functioning of financial markets. Among these is the collection of repo transaction data, which is used to create SOFR benchmark rates for use by market participants. The Council recommends that member agencies continue to work to harmonize domestic and global derivatives data for aggregation and reporting, and ensure that appropriate authorities have access to trade repository data needed to fulfill their mandates **(see Section 5.4.2)**.

The Council supports efforts by pension regulators and accounting standards boards to improve the quality, timeliness, and depth of disclosures of pension financial statements.

3.3 Alternative Reference Rates

As further discussed in **Section 6.3**, the cessation of LIBOR without adequate preparation could cause significant disruptions across financial markets and to borrowers given the widespread use of LIBOR in a variety of financial instruments.

The UK Financial Conduct Authority (FCA) has stated publicly that it has voluntary agreements with LIBOR panel banks to continue submissions through year-end 2021 and that the FCA expects some banks to stop submissions around that time. If a bank leaves the LIBOR submission panel, the FCA must assess whether LIBOR continues to be representative of the underlying market. The FCA could deem LIBOR "unrepresentative," at which time EU-regulated financial institutions would no longer be able to rely on the rate for new transactions. Additionally, if enough banks leave the LIBOR panel, LIBOR may cease to be published. Even if LIBOR continues for some period with diminished submissions, its performance may become increasingly unpredictable and unstable.

The Council recommends that market participants formulate and execute transition plans so that they are fully prepared for the anticipated discontinuation or degradation of LIBOR. Because of the uncertainty around the exact timing of the cessation of LIBOR, including the potential of LIBOR to be deemed non-representative by the FCA under EU regulations, market participants should formulate and execute plans to transition prior to year-end 2021 taking into account their business requirements and other considerations. Market participants must understand the exposure of their firm to LIBOR in every business and function, assess the impact of LIBOR's cessation or degradation on existing contracts, and remediate risks from existing contracts that do not have robust fallback provisions to transition the contract to an alternate rate. Market participants should evaluate whether any new agreements contain sufficiently robust fallback provisions, such as those endorsed by the ARRC, to mitigate risk that the contract's interest rate benchmark becomes unavailable.

The Council commends the efforts of the ARRC and recommends that the ARRC continue its work to facilitate an orderly transition to alternative reference rates. Council member agencies should determine whether further guidance or regulatory relief is required to encourage market participants to address legacy LIBOR portfolios. Council member agencies should also use their supervisory authority to understand the status of regulated entities' transition from LIBOR, including their legacy LIBOR exposure and plans to address that exposure.

3.4 Managing Vulnerabilities amid Prolonged Credit Expansion

Nonfinancial business borrowing has increased significantly since the crisis and leverage is elevated relative to historical norms **(see Section 4.3 and Box A)**. Prices for residential and some types of commercial real estate have increased significantly since the crisis **(see Section 4.5)**. By several measures, valuations of corporate equities are also near the high end of their historical range **(see Section 4.7)**.

Currently, default rates among corporate borrowers are relatively low, companies are reporting strong levels of interest coverage and liquidity, and equity volatility has generally remained subdued. However, these conditions could change as a result of macroeconomic or sectoral shocks to the economy. A decline in one market may be transmitted to other markets and may have spillover effects on real investment and economic activity. The impact of a correction on financial stability depends on the severity of market losses, speed of contagion, whether participants are sufficiently capitalized and liquid, and participants' risk management practices. It is important that financial regulators, financial intermediaries, and investors assess and reinforce their ability to manage risks in stress conditions. Such an analysis should consider the ability to absorb risk and the incentives of the major types of investors and intermediaries active in a market **(see Box A)**.

The Council recommends that agencies continue to monitor levels of nonfinancial business leverage, trends in asset valuations, and potential implications for the entities they regulate, in order to assess and reinforce the ability of the financial sector to manage severe, simultaneous losses. Regulators and market participants should continue to monitor and analyze the exposures, loss-absorbing capacity, and incentives of different types of holders. This includes the direct and indirect exposures of holders of U.S. nonfinancial corporate credit, the effects of potential liquidity risks in certain mutual funds, the effects of easing loan covenant and documentation requirements, and the potential effects of mark-to-market losses and credit rating downgrades, among other considerations. Regulators and market participants should also continue to assess ways in which leveraged nonfinancial corporate borrowers and elevated asset prices may amplify stresses in the broader market in the event of a rapid repricing of risk or a slowdown in economic activity.

3.5 Nonbank Mortgage Origination and Servicing

Nonbanks have increased their share of residential mortgage originations and servicing over the last decade. Nonbank mortgage companies play an important part in the extension of credit to certain key market segments, such as borrowers requiring Federal Housing Administration (FHA) insurance; in providing additional liquidity in the market for servicing rights; and in providing greater competition in the market for mortgage servicing. Though their business models vary, many of the largest nonbank mortgage companies are subject to similar fragilities and could transmit risk to the financial system should they experience financial stress **(see Box B)**.

The Council recommends that federal and state regulators continue to coordinate closely to collect data, identify risks, and strengthen oversight of nonbank companies involved in the origination and servicing of residential mortgages. Regulators and market participants have taken steps to address the potential risks stemming from nonbanks, including additional sharing of data and strengthening prudential requirements. The Council encourages regulators to take additional steps to address the potential risks of nonbank mortgage companies.

3.6 Financial Innovation

Financial innovation can benefit firms, households, and financial institutions by reducing the cost of financial services, increasing the convenience of payments, and potentially increasing the availability of credit. Financial innovation has been especially important in the post-crisis period, particularly in the realm of technology-enabled products and services **(see Sections 4.14 and 6.6)**.

Financial innovation can also create new risks. The Council encourages financial regulators to continue to be vigilant in identifying new products and services; in evaluating how innovation is used and can be misused; and in monitoring how innovation affects investors and consumers, regulated entities, and financial markets. The Council encourages relevant authorities to evaluate the potential effects of new financial products and services on financial stability, including operational risk. Because financial innovations are new, they may not be identified by agencies' existing monitoring and data collection systems. To ensure comprehensive visibility into innovation across the financial system, regulators should share relevant information on financial innovation with the Council and appropriate agencies. The Council also encourages regulators to consider appropriate approaches to regulation to reduce regulatory fragmentation while supporting the benefits of innovation.

The Council recommends that federal and state regulators continue to examine risks to the financial system posed by new and emerging uses of digital assets and distributed ledger technologies. The market capitalization of digital assets has grown rapidly in recent years, but so far, digital assets have not been widely adopted as a means of payment or store of value. Most recently, so-called stablecoins—digital assets designed to maintain a stable value relative to another asset (typically a unit of currency or commodity) or a basket of assets—have experienced growth in market capitalization and received increased public attention **(see Section 4.14.1)**. If a stablecoin became widely adopted as a means of payment or store of value, disruptions to the stablecoin system could affect the wider economy. Financial regulators should review existing and planned digital asset arrangements and their risks, as appropriate. These include risks to financial stability, including via both direct and indirect connections with banking services, financial markets, and financial intermediaries; risks to consumers, investors, and businesses associated with potential losses or instability in market prices; illicit financing risks; risks to national security; cybersecurity and privacy risks; and risks to international monetary and payment system integrity.

The Council encourages coordination among U.S. financial regulators to address potential issues that arise from financial innovation and will continue to use the Council's digital assets and distributed ledger technology working group to promote consistent regulatory approaches and to identify and address potential risks.

3.7 Housing Finance

The domestic housing market has improved over the past several years as sales of new and existing homes have increased, prices have risen, the share of mortgages with negative home equity has declined, and mortgage loan performance has improved. The federal government continues to back the majority of new mortgages, either directly through the FHA, U.S. Department of Veterans Affairs (VA), and U.S. Department of Agriculture (USDA), or indirectly through the Enterprises.

The Enterprises are now into their twelfth year of conservatorship. Although some progress has been made to reform the housing finance system and to end the Enterprises' conservatorships, the capital levels of the Enterprises remain low and signs of increased credit risk have begun to emerge. The Council reaffirms its view that housing finance reform is urgently needed to address the conservatorships, codify existing reforms, and implement a durable and vibrant housing finance system.

In September 2019, Treasury and the FHFA agreed to modifications to the Preferred Stock Purchase Agreements (PSPAs) that will permit Fannie Mae and Freddie Mac to retain additional earnings in excess of the $3 billion capital reserves previously permitted by their PSPAs. Under these modifications, Fannie Mae and Freddie Mac will be permitted to maintain capital reserves of $25 billion and $20 billion, respectively. Treasury and Fannie Mae and Freddie Mac also agreed to negotiate an additional amendment to the PSPAs adopting covenants that are intended to further enhance taxpayer protections.

In 2018, the FHFA issued a proposed rule on capital requirements for the Enterprises. Under

the proposal, the Enterprises would be subject to new risk-based capital requirements and a revised minimum leverage capital requirement. Any final rule would be suspended while the Enterprises remain in conservatorship. The Council recommends that the FHFA continue to develop capital and other prudential requirements for the Enterprises, which may help inform their application to future secondary market housing finance entities upon completion of housing finance reform.

Since 2013, the Enterprises have engaged in a credit risk transfer program to transfer mortgage credit risk to private market participants. The Enterprises have transferred a portion of the credit risk on over $3.1 trillion in unpaid principal balance. The Council recommends that regulators and market participants continue to take steps to encourage private capital to play a larger role in the housing finance system.

3.8 Regulatory Efficiency and Effectiveness

Actions taken by Council member agencies since the crisis have made individual financial institutions more resilient and improved the stability of the U.S. financial system. However, new regulations have also raised concerns about increased compliance costs and regulatory burdens for financial institutions, especially for smaller institutions.

Over the last year, Council member agencies have made financial services regulation more efficient and effective. Actions taken by Council member agencies to enhance regulatory efficiency include: the adoption of a final rule by the Federal Reserve that tailors capital, liquidity and stress testing requirements to the risk that large BHCs pose to the financial system **(see Sections 4.11.1 and 5.1.1)**; adoption of rules by the Federal Reserve, FDIC and OCC to simplify capital requirements and extend examination cycles for certain community banking organizations **(see Section 5.1.1)**; adoption of rules by the OCC, FDIC, Federal Reserve, SEC and CFTC that simplify requirements under the Volcker Rule **(see Section 5.1.4)**; adoption by the SEC of a new rule to modernize the regulation of ETFs **(see Section 5.2.2)**; and issuance by the FHFA of a final rule intended to improve the liquidity of agency mortgage-backed securities **(see Section 5.3.1)**.

The Council recommends that federal and state financial regulators continue to work together to evaluate regulatory overlap and duplication, modernize outdated regulations, and, where authority exists, tailor regulations based on the size and complexity of financial institutions.

4 Financial Developments

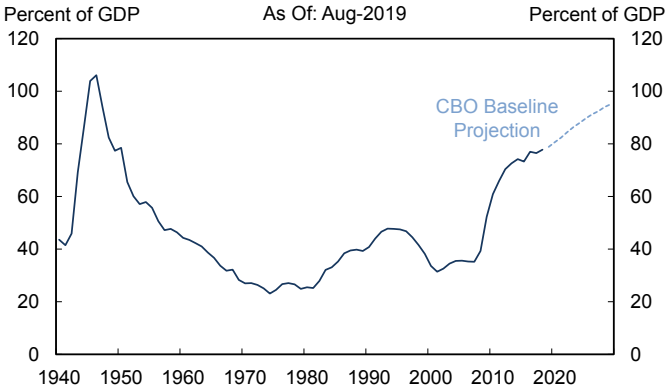
4.1 U.S. Treasury Markets

Publicly held U.S. sovereign debt outstanding grew to $16.8 trillion as of September 2019, up from $15.8 trillion in September 2018. The ratio of federal debt held by the public to U.S. GDP is estimated to be 79 percent in 2019, up from 78 percent in 2018. The CBO projects the ratio of debt held by the public to GDP will increase to 95 percent by 2029 **(Chart 4.1.1)**. The average maturity of outstanding marketable debt was 70 months in September 2019, unchanged from the past year. During the same period, foreign holdings of U.S. sovereign debt increased by 6.0 percent to $6.6 trillion. China and Japan continue to be the largest foreign holders of U.S. sovereign debt each with approximately $1.1 trillion in holdings.

Long- and short-term Treasury yields declined over the past year. The declines more than reversed the increases in the first three quarters of 2018 **(Chart 4.1.2)**. Over the past year, the yield on the 2-year Treasury has decreased by 118 basis points and the yield on the 10-year Treasury decreased by 137 basis points for the twelve months ended September 30, 2019. The already-low spread between the 10- and 2-year Treasury became negative in brief periods in August, the first time the yield spread has turned negative since 2007. The spread between the 3-month and 10-year Treasury yields briefly inverted in March 2019, inverted again in July, and remained inverted as of September 30, 2019. The yield on the 30-year Treasury fell to an all-time low of 1.94 percent in late August but has since increased to around 2.1 percent by September.

Market participants attributed the decline in rates to expectations of lower rates of economic growth and inflation and the shift to a more accommodative monetary policy by central banks both domestically and abroad. The

4.1.1 Federal Debt Held by the Public



Source: CBO, Haver Analytics

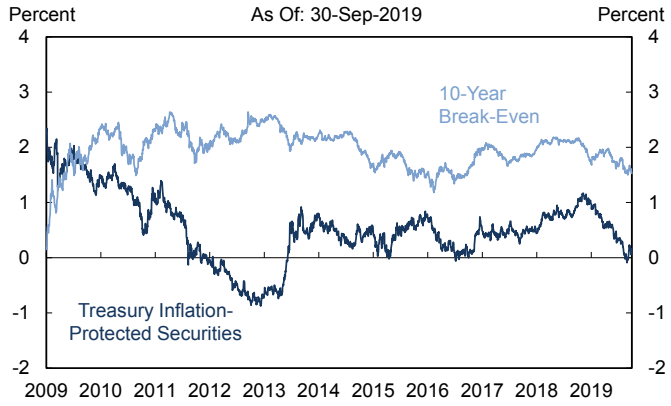
Note: Data for fiscal years. Years after 2018 are projected.

4.1.2 U.S. Treasury Yields and Yield Curve

Source: U.S. Department of the Treasury

Note: Spread equals the difference between the yield on the 10-year U.S. Treasury and 2-year U.S. Treasury.

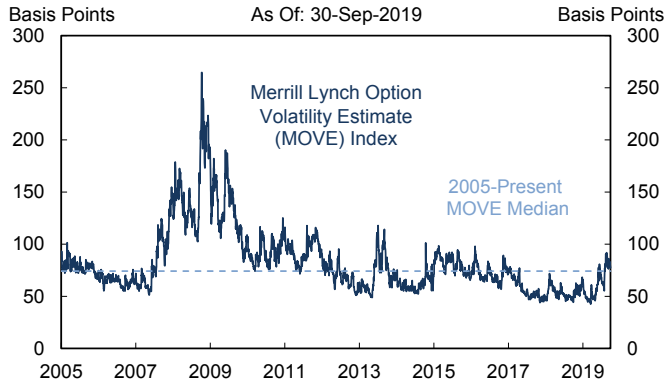
4.1.3 10-Year Treasury Yields



Source: U.S. Department of the Treasury

Note: Break-even represents the difference between the nominal and TIPS yield.

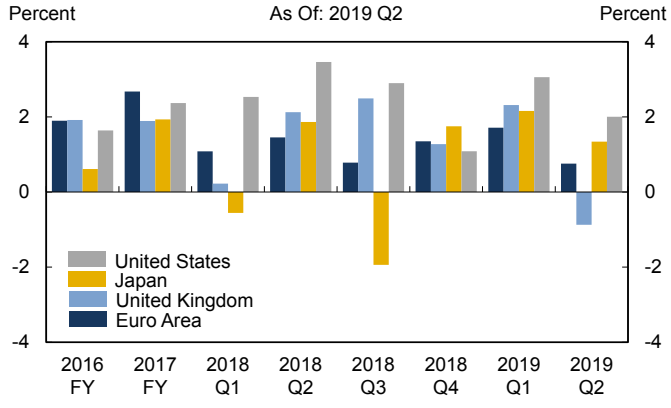
4.1.4 Fixed Income Implied Volatility



Source: Bloomberg, L.P.

Note: Implied volatility is calculated using a yield curve-weighted index of the normalized implied volatility on 1-month Treasury options.

4.2.1 Advanced Economies Real GDP Growth



Source: Eurostat, CAO, BEA, Haver Analytics

Note: Data represents seasonally adjusted quarter-over-quarter annualized real GDP growth rates.

Federal Open Market Committee (FOMC) lowered the federal funds target range on three occasions in the first eleven months of 2019, each time reducing the target range by 25 basis points. The third reduction, which took place on October 30, 2019, set the target range between 1.50 to 1.75 percent. In contrast, the FOMC increased the target range on four occasions in 2018 by a total of 100 basis points. Further interest rate reductions by the European Central Bank (ECB) coupled with the resumption of net purchases under its asset purchase program may also have contributed to the decline in U.S. Treasury yields as investors reportedly sought the comparatively attractive returns on U.S. sovereign debt relative to the very low and, in many cases, negative sovereign yields in advanced foreign economies.

From October 2018 to September 2019, the yield on 10-year Treasury Inflation-Protected Securities (TIPS) declined by 76 basis points to 0.15 percent **(Chart 4.1.3)**. Break-even inflation compensation, the difference between nominal and TIPS yields, declined by 61 basis points. Implied fixed-income volatility, as measured by prices of options on U.S. Treasury securities, increased in mid-2019 but remained slightly below its long-term average. Rising implied volatility may be attributable to increased uncertainty about short- and long-term interest rates **(Chart 4.1.4)**.

The three major credit ratings for U.S. sovereign debt were AA+, Aaa, and AAA. These ratings did not change since the Council's last annual report.

4.2 Sovereign Debt Markets

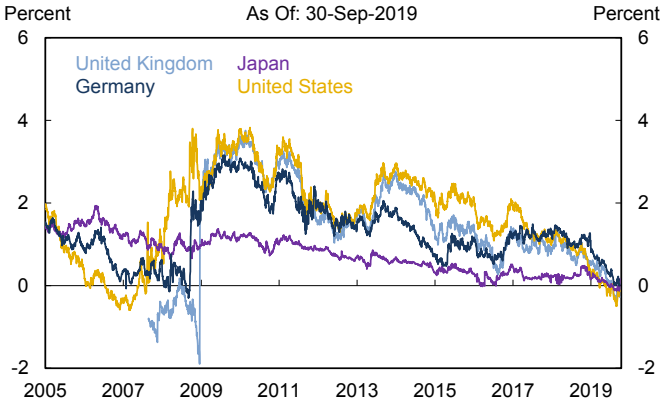
4.2.1 Developed Economies

Economic growth in most developed economies decelerated in the second half of 2018 and the first half of 2019. U.S. economic growth continued to outpace growth in other advanced economies. From the third quarter of 2018 through the second quarter of 2019, U.S. annualized growth averaged 2.3 percent, which

is substantially higher than in other developed economies **(Chart 4.2.1)**.

The slowdown in global economic growth, coupled with falling inflation expectations and increased political uncertainty, pushed long-term global interest rates lower in 2019. In mid-2019, yield curves in the largest developed economies inverted for the first time since the 2008 financial crisis **(Chart 4.2.2)**. Additionally, the supply of negative-yielding debt increased significantly, hitting a record $17 trillion in August 2019 before falling to $15 trillion at the end of September 2019 **(Chart 4.2.3)**. As of September 30, 2019, global sovereign bonds with negative yields totaled $11 trillion—approximately 50 percent of global sovereign bonds when U.S. Treasury securities are excluded. Negative-yielding sovereigns were reported in over twenty countries and, on September 30, 2019, German, Dutch, Danish, and Swiss debt was trading with negative yields through at least 20 years **(Chart 4.2.4)**.

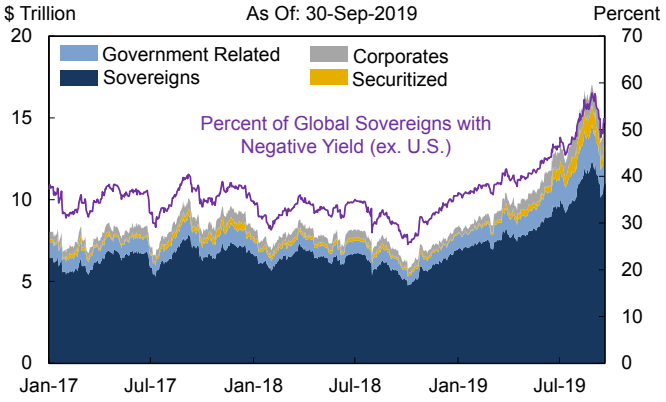
4.2.2 Sovereign Yield Spreads



Source: Bloomberg, L.P.

Note: Represents the spread between the 10-year and 3-month yield for select sovereign markets.

4.2.3 Outstanding Negative Yielding Debt



Source: Bloomberg, L.P.

Note: Market value of the Bloomberg Barclays Global Aggregate Negative Yielding Debt Index. Sovereigns include securities classified as Treasuries.

4.2.4 Sovereign Negative Yielding Debt

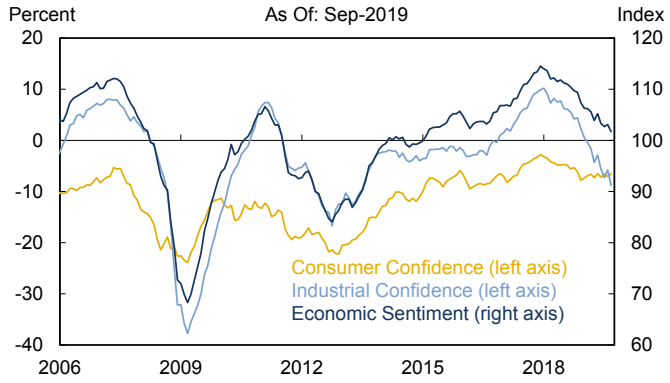
As Of: 30-Sep-2019

Country	S&P Rating	Negative Thru	Value ($B)	Country	S&P Rating	Negative Thru	Value ($B)
Euro Area			**4,932**	**Euro Area (Cont.)**			
France	AA	15 Yrs.	1,454	Latvia	A	9 Yrs.	5
Germany	AAA	31 Yrs.	1,202	Lithuania	A	10 Yrs.	5
Spain	A	8 Yrs.	589	Cyprus	BBB-	5 Yrs.	4
Italy	BBB	3 Yrs.	470	Malta	A-	2 Yrs.	1
Netherlands	AAA	27 Yrs.	353				
Belgium	AA-	15 Yrs.	302	**Japan**	A+	14 Yrs.	**5,931**
Austria	AA+	17 Yrs.	216				
Finland	AA+	15 Yrs.	93	**Other Europe**			**249**
Ireland	A+	10 Yrs.	90	Denmark	AAA	20 Yrs.	105
Portugal	BBB	7 Yrs.	89	Switzerland	AAA	45 Yrs.	83
Slovakia	A+	11 Yrs.	33	Sweden	AAA	13 Yrs.	59
Slovenia	AA-	9 Yrs.	20	Hungary	BBB	2 Yrs.	2
Luxembourg	AAA	8 Yrs.	7				

Source: Bloomberg, L.P.

Note: Includes securities classified as Treasuries in the Bloomberg Barclays Global Aggregate Negative Yielding Debt Index.

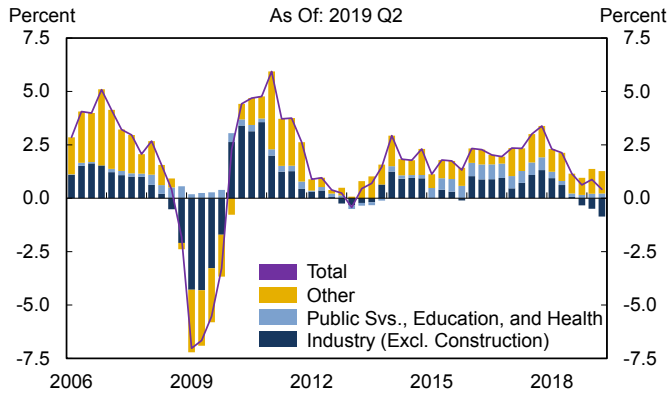
4.2.5 Euro Area Business and Consumer Surveys



Source: European Commission, Haver Analytics

Note: Confidence surveys calculated as the difference between positive and negative responses. For economic sentiment index, 100 = long-term average.

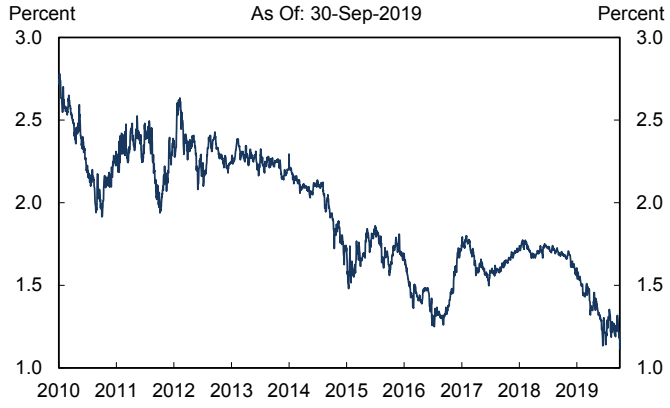
4.2.6 Sectoral Contributions to German GDP Growth



Source: FSO, Haver Analytics, Staff Calculations

Note: Select sectoral contributions to year-over-year real GDP growth rates.

4.2.7 Euro 5-Year, 5-Year Inflation Swap Rate



Source: Bloomberg, L.P.

Note: A market-based measure of the expected inflation rate over a 5-year period starting in five years' time.

Euro Area

Euro area real GDP growth remained positive through the third quarter of 2019, though economic sentiment has deteriorated considerably. In September 2019, the euro area industrial confidence index fell to its lowest level since 2013 **(Chart 4.2.5)**. The slowdown in economic activity has been particularly pronounced in export-driven economies such as Germany where the industrial sector has been contracting on a year-over-year basis since the third quarter of 2018 **(Chart 4.2.6)**.

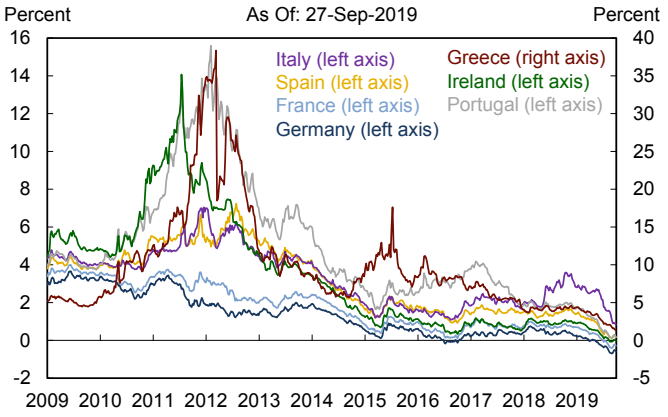
Euro area inflation expectations have declined considerably as the 5-year, 5-year forward swap rate, a key market-based indicator of euro area inflation expectations, fell to a record low of 1.1 percent in June 2019 **(Chart 4.2.7)**. In response to the deteriorating economic outlook and lower inflation expectations, the ECB eased its monetary policy stance at its September 2019 meeting. At the meeting, the ECB announced it would cut its deposit facility rate to -0.50 percent, introduce deposit tiering (whereby some EU commercial bank excess reserves will be exempt from the negative deposit facility rate), resume asset purchases at €20 billion per month for as long as necessary, and lower interest rates and lengthen the maturities on targeted longer-term refinancing operations.

As of the end of the second quarter of 2019, euro area central government debt totaled €8.7 trillion, up from €8.4 trillion at year-end 2017. Within the euro area, Italian, French, and German debt outstanding totaled €2.4 trillion, €2.0 trillion, and €1.3 trillion, or 134 percent, 86 percent, and 39 percent of GDP, respectively. Between the fourth quarter of 2017 and the second quarter of 2019, German central government debt outstanding has fallen by €30 billion, while Italian and French debt has risen by €117 billion and €142 billion, respectively.

Euro area sovereign debt yields fell significantly through 2019, and by August, the German 10-year yield approached -0.75 percent **(Chart 4.2.8)**. At the same time, spreads between German and other euro area sovereigns compressed substantially, and spreads for European Stability Mechanism and European Financial Stability Facility recipients (Greece, Spain, Portugal, and Ireland) were at or near levels prior to the euro area debt crisis **(Chart 4.2.9)**.

Year-to-date, the amount of negative yielding, euro-denominated public and private-sector debt has nearly tripled, from €3.0 trillion at year-end 2018 to €8.9 trillion as of September 30, 2019. Negative yielding sovereigns increased from €2.1 trillion to €5.0 trillion, while other negative yielding euro debt increased from just under €1 trillion to €3.8 trillion **(Chart 4.2.10)**. The stock of negative-yielding BBB-rated sovereigns (Italy, Cyprus, and Portugal) grew significantly in the third quarter of 2019, from €74 billion in June 2019 to €430 billion in September 2019. By late August, this negative yielding 'phenomenon' spilled over to lower quality credit, and in early September 2019, seven non-investment grade euro-corporates with a combined par value of €3 billion were trading with negative yields.

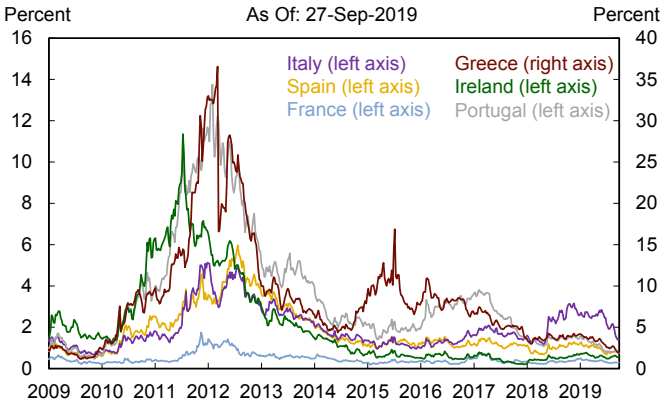
4.2.8 Euro Area 10-Year Sovereign Yields



Source: Reuters, Haver Analytics

Note: Weekly averages.

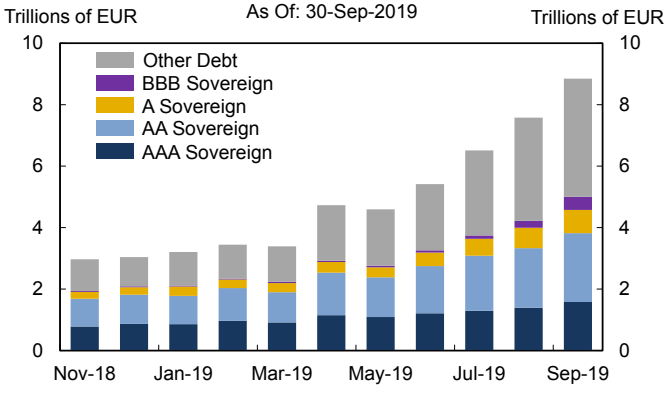
4.2.9 Euro Area 10-Year Spreads



Source: Reuters, Haver Analytics

Note: Calculated as the weekly average spread between local 10Y and German 10Y.

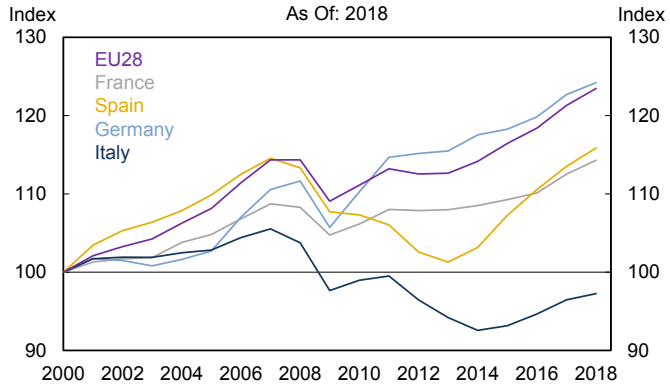
4.2.10 Euro Denominated Negative Yielding Debt



Source: Bloomberg, L.P.

Note: AAA = Germany, Netherlands, Luxembourg; AA = France, Austria, Belgium, Slovenia; A = Ireland, Latvia, Lithuania, Malta, Slovakia, Spain; BBB = Italy, Portugal, Cyprus; other debt includes government-related, securitized, and corporate debt.

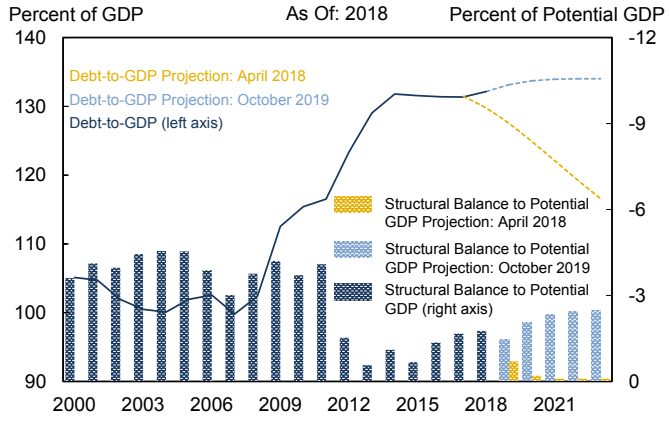
4.2.11 EU Real GDP Per Capita



Source: Eurostat, Haver Analytics

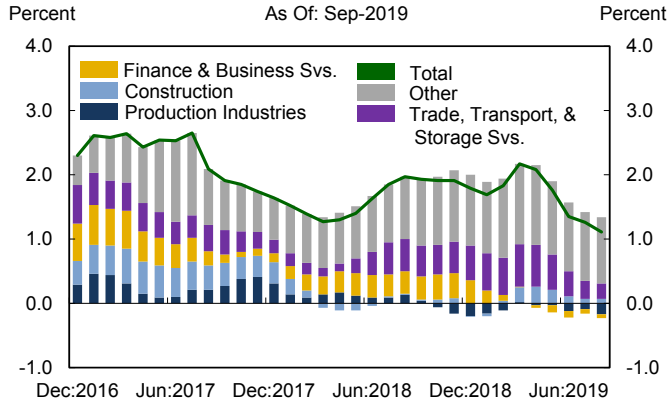
Note: 2000 = 100. EU28 includes the 28 member states of the European Union.

4.2.12 Italy Fiscal Projections



Source: IMF WEO, Haver Analytics

4.2.13 Contributions to UK Real Gross Value Added



Source: UK Office of National Statistics, Haver Analytics

Note: Contribution to year-over-year percent change in rolling 3 months real GVA.

In 2018, the Italian economy fell into a technical recession after annualized quarter-over-quarter GDP contracted by 0.3 percent and 0.5 percent in the second and third quarters of 2018, respectively. While Italy has since edged out of a recession, its economy continues to underperform. Real GDP per capita was lower in 2018 than it was in 2000 **(Chart 4.2.11)**. In 2018, Italian authorities announced plans to increase public investment. This spending program would have shifted the trajectory of Italy's public debt burden and could have led to disciplinary actions under the European Commission's Excessive Debt Procedure (EDP) **(Chart 4.2.12)**. Italian spreads tightened in July 2019 after the European Commission determined that an EDP was not warranted and a compromise was reached with the Commission on spending. Spreads tightened further in September 2019 when a new coalition government was formed. Nonetheless, Italian spreads have remained elevated in part due to political uncertainty. Italy is targeting to maintain its general government balance target as a percentage of GDP at 2019 levels in 2020.

United Kingdom

UK underlying growth rates were volatile in 2019 based in large part on uncertainty around the United Kingdom's withdrawal from the European Union. Stock-building before the original March 29, 2019, Brexit deadline lifted first quarter output by 2.3 percent, while inventory drawdowns and automobile factory shutdowns pulled second quarter output down by 0.9 percent on an annualized basis. Output from capital intensive sectors or those most likely to be affected by a disorderly Brexit has decelerated meaningfully. On a year-over-year basis, contraction in industrial production, construction, and the financial and business services sectors reduced GDP growth by an average of 0.2 percentage points in the three months ended September 2019, compared to an average contribution of 0.8 percentage points in the three months ended September 2017 **(Chart 4.2.13)**.

Despite continued economic uncertainty, the UK labor market has remained tight, and the UK unemployment rate remains near historic lows. At the same time, inflation has remained broadly in line with the Bank of England's (BoE's) 2 percent target and the BoE has maintained its base policy rate at 0.75 percent. Gilt yields have followed other sovereign yields lower and in August 2019, the 2-year/10-year portion of the Gilt yield curve inverted for the first time since 2008.

Japan

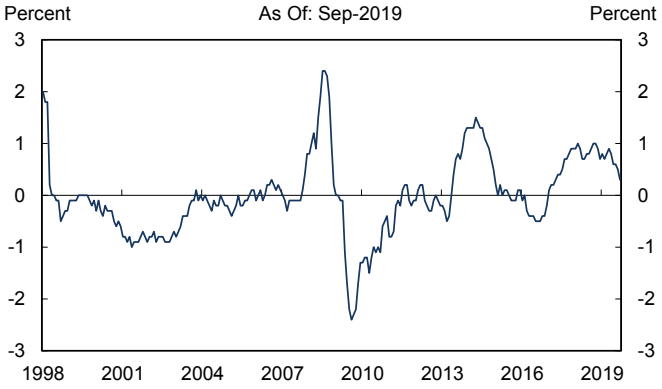
Despite the recent weakness in global manufacturing activity, Japanese real GDP growth has remained fairly stable in recent quarters; between the fourth quarter of 2018 and the second quarter of 2019, quarter-over-quarter GDP growth ranged from 1.3 percent to 2.2 percent on an annual basis. Inflation fell in 2019, but remained positive and ranged from an annual rate of 0.3 percent to 0.9 percent in the first nine months of 2019 **(Chart 4.2.14)**.

Yields on 10-year Japanese government bonds (JGBs) hovered just above zero throughout 2018 before turning negative in 2019 **(Chart 4.2.15)**. By September 30, 2019, the market value of JGBs with negative yields totaled approximately ¥640 trillion, up from ¥515 trillion at year-end 2018. Over the same period, the yield on 10-year JGBs fell from +1 to -21 basis points, slightly lower than the Bank of Japan's (BoJ's) target rate of zero percent. In October 2019, the BoJ revised its forward guidance. While policy rates did not change, the BoJ signaled a bias towards easing indicating that it intended to keep policy rates at present or lower levels as long as necessary to reach its inflation target. Previously, the BoJ had stated that it expected that rates would remain low until 2020 without discussing the potential for further easing.

4.2.2 Emerging Market Economies

According to the International Monetary Fund (IMF), economic growth in emerging market and developing economies slowed in 2018 and is projected to further decelerate in 2019, reflecting slower growth expectations in

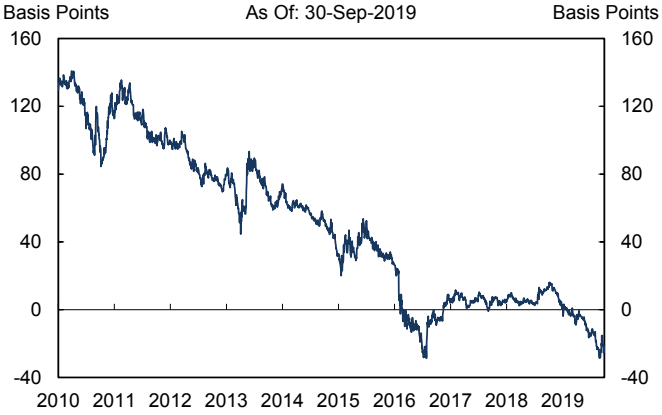
4.2.14 Japanese Consumer Price Inflation



Source: Bank of Japan, Haver Analytics

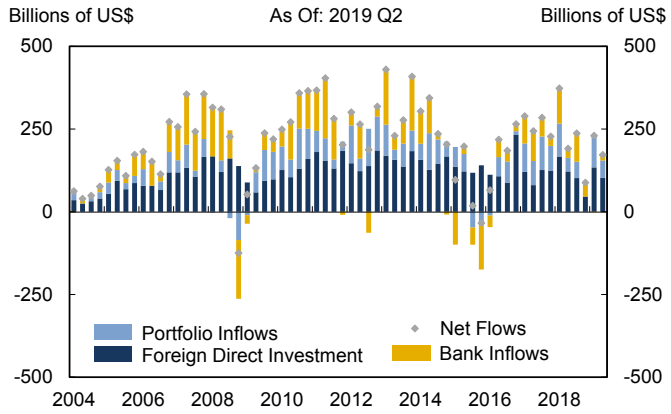
Note: Data represents year-over-year percent change. CPI excludes fresh food and is adjusted for the consumption tax increase that took effect in April 2014.

4.2.15 Japan 10-Year Government Bond Yield



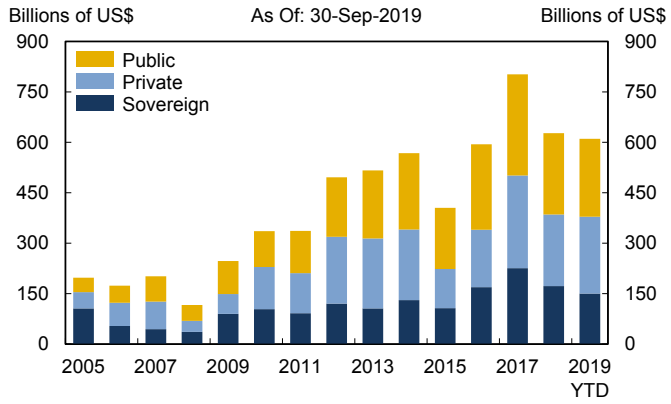
Source: Bloomberg, L.P.

4.2.16 Gross Foreign Investor Capital Inflows to EMEs



Source: IMF, Haver Analytics

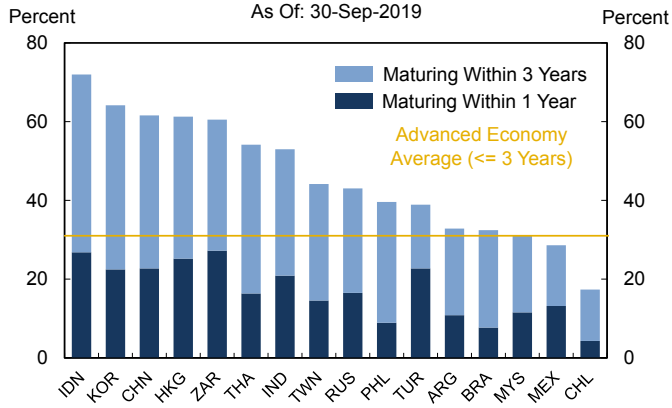
4.2.17 Emerging Market Gross Global Bond Issuance



Note: Bonds have maturities greater than one year and have been internationally marketed or placed. "Public" includes issuance by municipal and state-owned enterprises.

Source: Dealogic

4.2.18 EME Nonfinancial Corporate Debt Maturity Profile



Source: Bloomberg, L.P, Staff Calculations

Note: Represents percent of private nonfinancial corporate debt maturing within 3 years.

China and Mexico, disruptions from the unrest in Hong Kong, and uncertainty in Turkey and Argentina. While developing Asian economies continue to outpace other emerging economies, the region's annual growth rate was projected to fall below 6 percent for the first time since 1998. Economic growth in Latin American economies remained subdued in 2018 and was projected to remain below 1 percent in 2019 amid idiosyncratic challenges, including policy uncertainty in some countries.

Foreign investor capital flows to emerging market economies (EMEs) fell sharply in the fourth quarter of 2018, which can be largely attributed to a significant drop in net portfolio flows to China and large net portfolio outflows from Korea. Capital flows to EMEs recovered in the first half of 2019, with net capital inflows totaling $230 billion in the first quarter of 2019 and $172 billion in the second quarter of 2019 **(Chart 4.2.16)**.

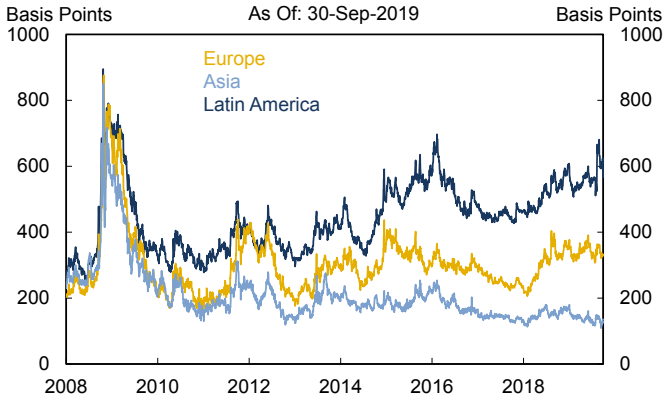
Since hitting a record pace in 2017, gross bond issuances moderated in 2018, averaging $52 billion per month **(Chart 4.2.17)**. As of September 30, 2019, gross EME debt issuances totaled $591 billion for the first nine months of 2019, a 19 percent increase compared to the same time last year. The pace of issuances by private nonfinancial corporations picked up significantly, and in the first nine months of 2019, issuances for the sector totaled a record $147 billion, compared to $129 billion and $103 billion for the first nine months of 2017 and 2018, respectively. Emerging market nonfinancial businesses continue to rely heavily on shorter-term funding, and in certain countries, over 50 percent of corporate debt is due to mature within three years **(Chart 4.2.18)**.

Sovereign bond spreads in Latin America and emerging Europe widened in late 2018 but stabilized in the first half of 2019 **(Chart 4.2.19)**. Latin American spreads widened to multi-year highs in August 2019, which was primarily attributed to stress in Argentine bond markets as well as broader risk-negative sentiment in EME assets due to U.S.-China trade tensions.

In 2018, Turkish financial conditions rapidly tightened; over the year, the Turkish lira depreciated by over 25 percent, credit default swap (CDS) spreads doubled, and inflation, as measured by the consumer price index, exceeded 20 percent. In 2019, the Turkish economy underwent a significant adjustment, and between the first quarter of 2018 and the second quarter of 2019, domestic demand fell by 8 percent while the current account balance shifted from a 6 percent deficit to a 1 percent surplus. However, financial headwinds remain given the elevated levels of dollar- and euro-denominated nonfinancial corporate debt, deteriorating asset quality at Turkish banks, and a high net borrowing requirement.

Argentina's macroeconomic outlook continued to deteriorate in 2019. Stubbornly high inflation, coupled with fiscal tightening, sapped public support for economic reforms. Financial conditions deteriorated sharply following Frente de Todos candidate Alberto Fernandez's significant outperformance in the August 11, 2019 national primaries. The following day, the Argentine peso depreciated by as much as 25 percent against the U.S. dollar, 5-year CDS spreads jumped almost 1,000 basis points, and the Merval index fell by 38 percent. While the peso and the stock index marginally retraced some of their losses, credit conditions continued to deteriorate, and on September 30, 2019 one-year dollar denominated bonds were trading at 50 cents on the dollar and 5-year CDS spreads were quoted at 4,000 basis points **(Chart 4.2.20)**.

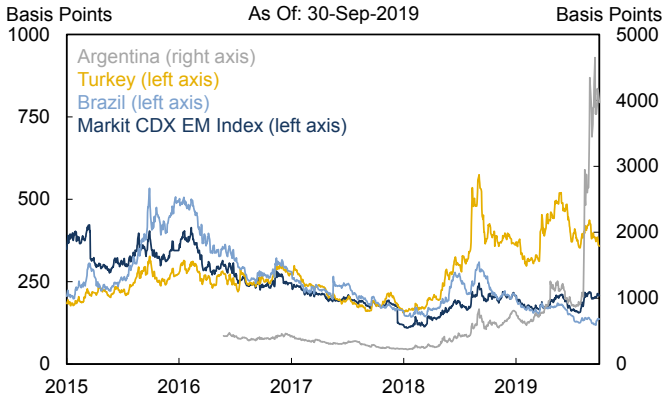
4.2.19 Emerging Market Bond Spreads



Source: JP Morgan, Haver Analytics

Note: JP Morgan EMBI+ Sovereign Spreads indices for each region.

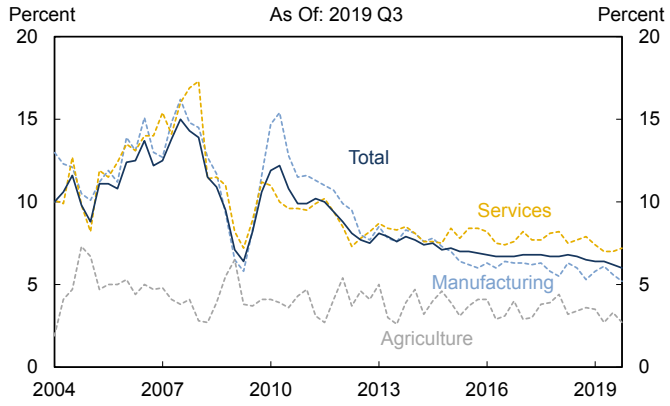
4.2.20 Emerging Market Sovereign CDS Spreads



Source: Bloomberg, L.P.

Note: 5-year USD spreads.

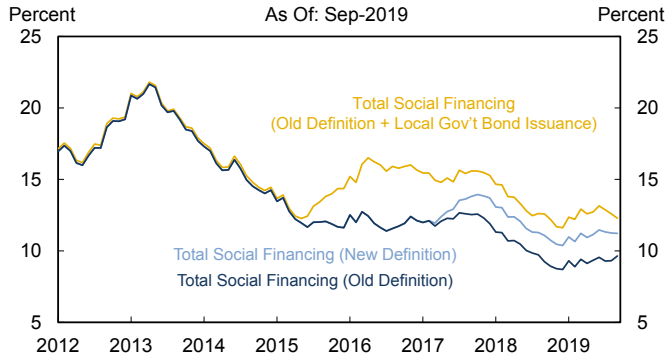
4.2.21 Chinese Real GDP Growth and its Components



Source: China National Bureau of Statistics, Haver Analytics

Note: Year-over-year percentage change.

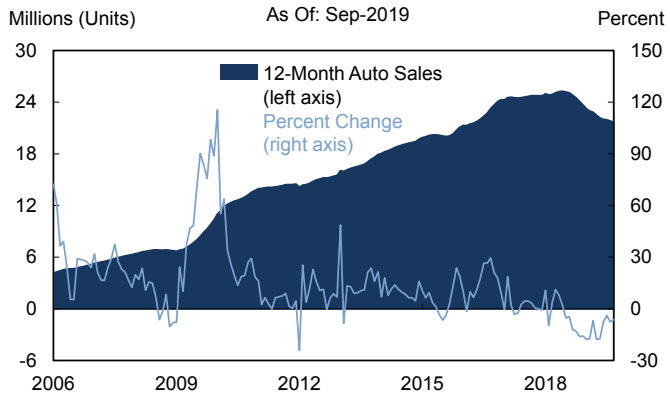
4.2.22 Chinese Credit Growth



Source: PBOC, CCDC, Haver Analytics, Staff Calculations

Note: Calculated as the year-over-year percent change total social financing (TSF) flows since 2002. TSF refers to the total volume of financing provided by the financial system to the real economy. TSF (old definition) excludes loan write-offs, ABS of depository institutions, and local gov't special bonds.

4.2.23 12-Month Chinese Auto Sales



Source: CAAM, Haver Analytics

Note: Total passenger car sales over the preceding 12 months. Percent change shows the number of passenger cars sold in a given month compared to the same month one year ago.

In late August, Argentina entered into a technical default when it delayed $7 billion of payments on its short-term local bonds while announcing an intention to pursue a voluntary restructuring of $50 billion of longer-dated debt, primarily held by foreign investors. The decision to postpone repayments came amid Argentina's inability to sell new short-term bonds while facing large payments due this year. Given capital flight fears and decreasing central bank international reserves, the government has implemented capital controls. Fernandez defeated President Macri in the October 2019 general election. Market reaction was muted, as the result was expected, but the central bank significantly tightened capital controls to safeguard international reserves. Markets are attentive to Fernandez's policy signals, including a plan to address the debt. Thus far, contagion risk to other emerging markets has been largely contained, given the idiosyncratic risks related to Argentina.

China

Chinese economic growth decelerated in 2019, with year-over-year real GDP growth slowing to 6.0 percent in the third quarter of 2019, compared to 6.5 percent in the third quarter of 2018 **(Chart 4.2.21)**. The deceleration has primarily been driven by slower credit growth and weaker external demand. Manufacturing sector growth fell to 5.2 percent in the third quarter of 2019. Service sector growth, which had been stable at around 8.0 percent over the past several years, also trended lower, ranging from 7.0 to 7.2 percent in the first three quarters of 2019.

The rate of Chinese credit growth continued to slow through 2018 as authorities undertook policies aimed at deleveraging **(Chart 4.2.22)**. Tighter credit conditions, however, negatively impacted consumer spending, and year-over-year auto sales fell by over 15 percent in late 2018 and early 2019 **(Chart 4.2.23)**. Authorities eased their deleveraging campaign in early 2019, and the rate of credit growth increased in early 2019 amid the slower economic growth.

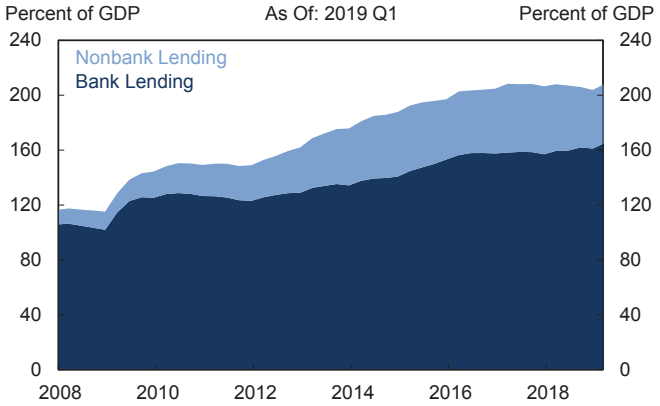
Similarly, the stock of nonfinancial private credit as a percent of GDP leveled off in 2017 and 2018 after experiencing significant growth in the first half of the decade **(Chart 4.2.24)**. Nonfinancial private lending resumed in the first quarter of 2019, with total lending nearing 210 percent of GDP. Nonbank lending has remained fairly stable at around 45 percent of GDP since the second quarter of 2018. In contrast, bank lending has picked up more significantly and exceeded 165 percent of GDP by the first quarter of 2019.

On May 24, 2019, the People's Bank of China (PBOC) and the China Banking and Insurance Regulatory Commission took over Baoshang Bank, citing serious credit risks. Baoshang Bank, which had an estimated $80 billion in assets, was the first Chinese bank taken over by regulators in more than 20 years. The authorities announced that while retail depositors will be protected, some corporate depositors and interbank lenders would face minor losses. Following the news, larger Chinese financial institutions reevaluated their credit and counterparty risk exposure, which led to small and mid-sized regional banks (SMBs) facing tighter credit conditions. For example, spreads between AAA and AA+ rated negotiable certificates of deposit (a money market instrument used by banks to obtain access to interbank funding) widened significantly following the takeover of Baoshang Bank **(Chart 4.2.25)**. In July, the authorities facilitated the takeovers of Bank of Jinzhou and Hengfeng Bank, which combined had an estimated $315 billion in assets. The PBOC has provided other support to SMBs, but liquidity in the interbank market remains thin due to continued uncertainty regarding the underlying asset quality of SMBs.

4.2.3 U.S. Municipal Markets

Total state and local government tax revenues in the first half of 2019 were 4.3 percent higher than in the first half of 2018 **(Chart 4.2.26)**. In 2018, tax revenues for the full year were 6.2 percent higher than in 2017. Municipal bond ratings continued to improve in 2018, with

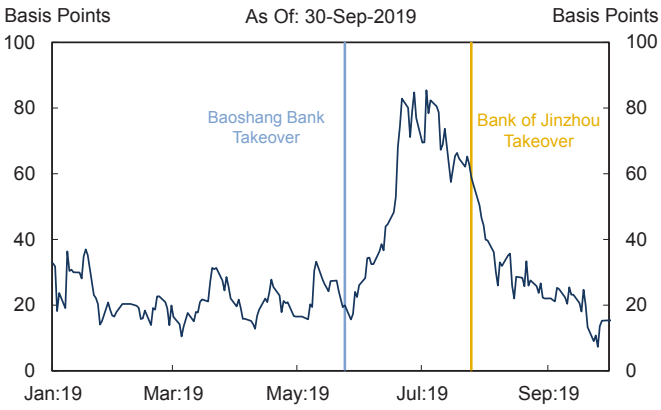
4.2.24 Credit to the Chinese Nonfinancial Private Sector



Source: China National Bureau of Statistics, BIS, Haver Analytics

Note: Rolling 4-quarter sum of GDP.

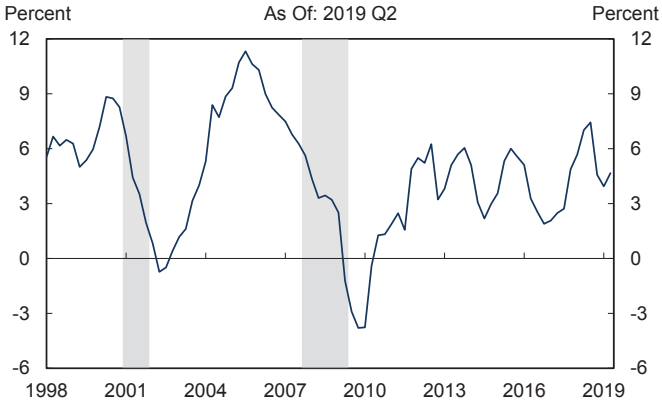
4.2.25 China Negotiable Certificate of Deposit Credit Spread



Source: Bloomberg, L.P.

Note: Spread between AAA and AA+ 6-month negotiable certificate of deposit.

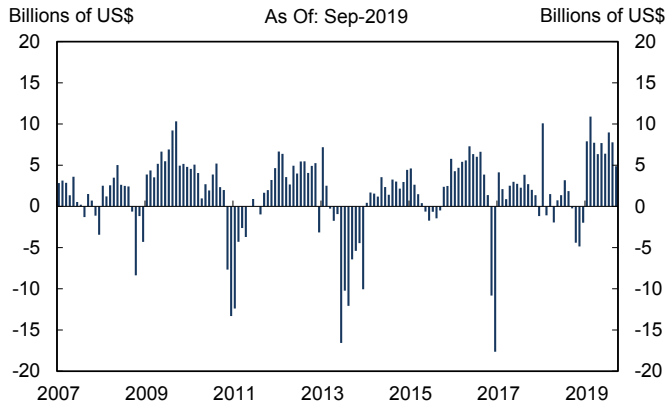
4.2.26 Change in State and Local Government Tax Revenues



Source: Census Bureau

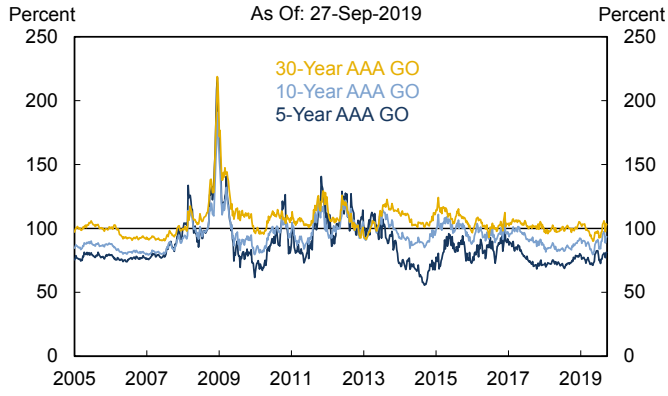
Note: Data represents year-over-year change. Revenue measures includes revenues from property, individual income, corporate income, and sales taxes. Gray bars signify NBER recessions.

4.2.27 Municipal Bond Mutual Fund Flows



Source: ICI, Haver Analytics

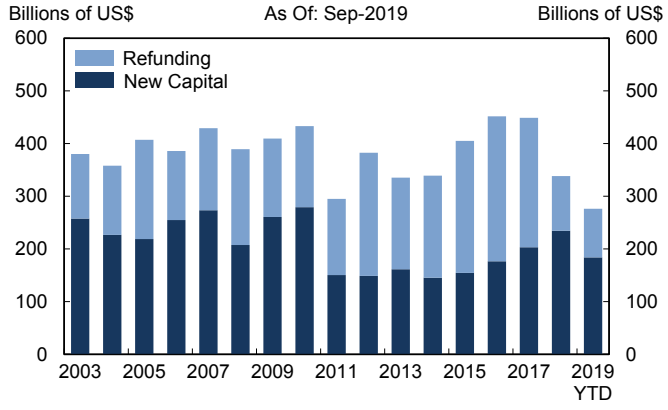
4.2.28 Municipal Bonds to U.S. Treasuries



Source: Municipal Market Analytics, Bloomberg, L.P.

Note: Calculated as the ratio between municipal general obligation bonds and U.S. Treasury securities of comparable maturities.

4.2.29 Municipal Bond Issuance



Source: Thomson Reuters, SIFMA

Note: Excludes maturities of 13 months or less.

upgrades outpacing downgrades. State reserve fund balances across the country increased in 2018, with the median rainy day fund balance as a share of general fund expenditures at a 20 year high of 6.4 percent, based on data aggregated from all 50 state budget offices. Strong retail demand, combined with constrained supply, has led to further increases in municipal bond prices.

Long-term municipal credit challenges remain due in part to health care expenses, public pension obligations, and the cost of repairs to declining infrastructure. Benefit liabilities and rising mandatory expenditures raise the risk of long-term fiscal imbalances for many state and local governments.

Municipal bond funds experienced record net inflows in the first nine months of 2019. By September 2019, net fund inflows totaled $69 billion compared to $4 billion of net inflows for the full-year of 2018 **(Chart 4.2.27)**. Market observers point to a post-tax reform shift toward additional retail flows. Credit spreads for tax-exempt general obligation bonds remained low in 2019 **(Chart 4.2.28)**.

From January to September 2019, municipal debt issuance was up 9.1 percent from issuance over the same period in 2018. In a change from the previous four years, issuance of new capital outpaced refunding in 2018 and through the first nine months of 2019, a dynamic driven by changes to the tax code eliminating the tax exemption for advance refunding of tax-exempt bonds **(Chart 4.2.29)**.

The fiscal crisis of Puerto Rico is distinctive in a sector with few defaults historically. The Puerto Rico Oversight, Management, and Economic Stability Act (PROMESA), enacted in June 2016, provided for the establishment of the financial oversight and management board and a resolution process for Puerto Rico's $74 billion in public sector debt (excluding pension liabilities). In 2017, the Commonwealth and four of its instrumentalities filed to pursue debt

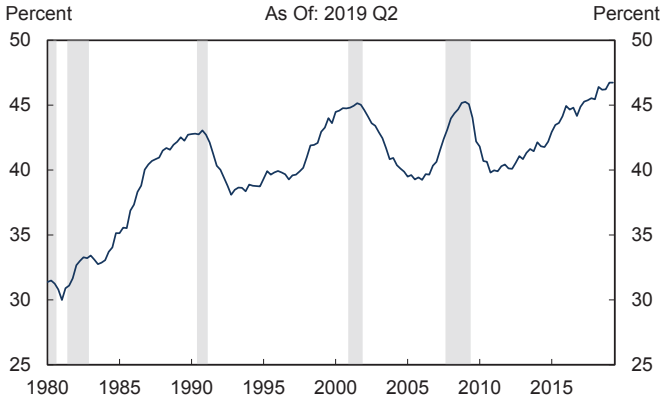
restructuring under Title III of PROMESA, followed by the filing of the Puerto Rico Public Buildings Authority (PBA) in September 2019. The Puerto Rico Urgent Interest Fund Corporation—a government-owned corporation created to securitize Puerto Rican sales and use tax proceeds—is the only Commonwealth entity to have reached a resolution of its debt obligations. In September 2019, the Federal Oversight and Management Board filed a draft Plan of Adjustment to restructure more than $50 billion of pension liabilities and $35 billion of debt and other claims against the Commonwealth, PBA, and the Employee Retirement System. If approved, the plan would reduce $35 billion of debt and other claims by more than 60 percent to $12 billion.

The Commonwealth's multi-year fiscal plan approved in 2019 requires fiscal measures and structural reforms expected to contribute to an average annual surplus of $2.1 billion between 2020 and 2024, before debt service payments. However, the Commonwealth projects a return to annual deficits by 2038. While federal disaster-related funds are having an ameliorative effect, Hurricane Maria highlighted weaknesses in the island's electric, water, and transport infrastructure that undermine the island's manufacturing base and feed outmigration.

4.3 Corporate Credit

Nonfinancial corporate debt grew faster than GDP over the past year, pushing the debt-to-GDP ratio to historically high levels **(Chart 4.3.1)**. Debt levels are also relatively high when compared to corporate earnings. The median ratio of gross debt-to-EBITDA (earnings before interest, taxes, depreciation, and amortization) for publicly-traded nonfinancial firms in the United States is near the high end of its historical range **(Chart 4.3.2)**. Nonetheless, firms continue to be able to service their debt, with default rates at moderate levels supported by strong interest coverage, low interest rates,

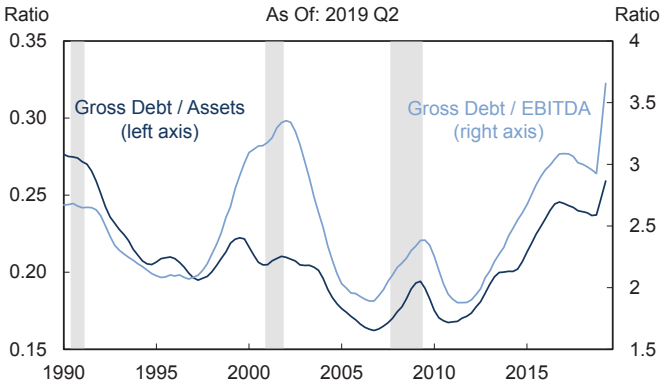
4.3.1 Nonfinancial Corporate Credit as a Percent of GDP



Source: Federal Reserve, Haver Analytics

Note: Gray bars signify NBER recessions.

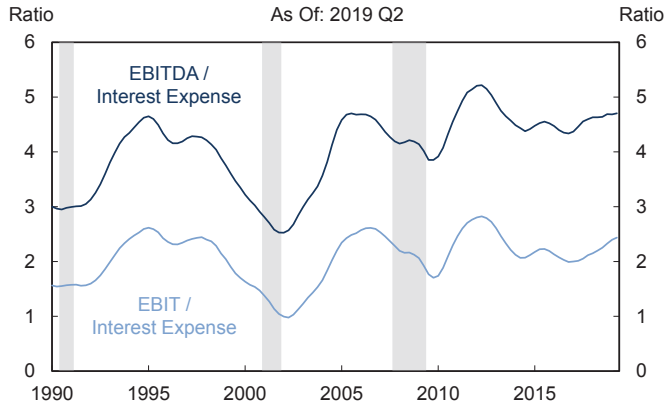
4.3.2 U.S. Nonfinancial Business Leverage



Note: Four-quarter moving average of the median ratio. Includes rated and unrated nonfinancial businesses. Gray bars signify NBER recessions. In 2019 FASB ASC 842 took effect. ASC 842 required companies to record operating leases on their balance sheets, resulting in higher reported debt levels.

Source: Compustat

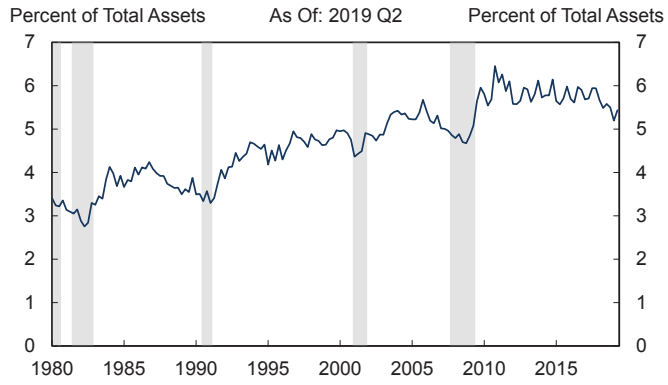
4.3.3 U.S. Nonfinancial Business Interest Coverage Ratios



Source: Compustat

Note: Four-quarter moving average of median ratio. Includes rated and unrated nonfinancial businesses. Gray bars signify NBER recessions.

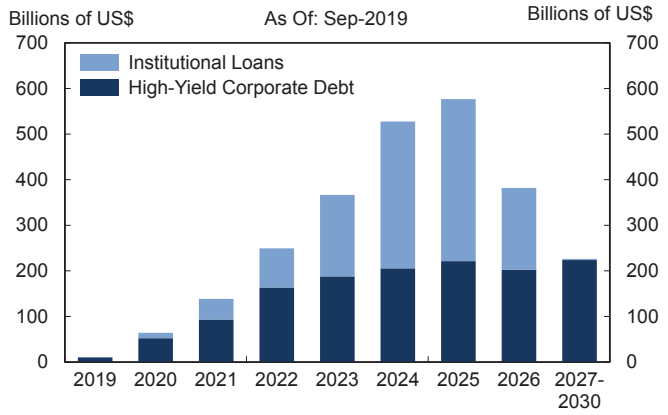
4.3.4 Nonfinancial Corporations Liquid Assets



Source: Federal Reserve, Haver Analytics

Note: Liquid assets includes foreign deposits, checkable deposits and currency, time and savings deposits, money market fund shares, security repurchase agreements, debt securities, and mutual fund shares. Gray bars signify NBER recessions.

4.3.5 Maturity Profile of Leveraged Debt



Source: Bank of America/Merrill Lynch Global High-Yield Strategy and S&P Capital IQ LCD

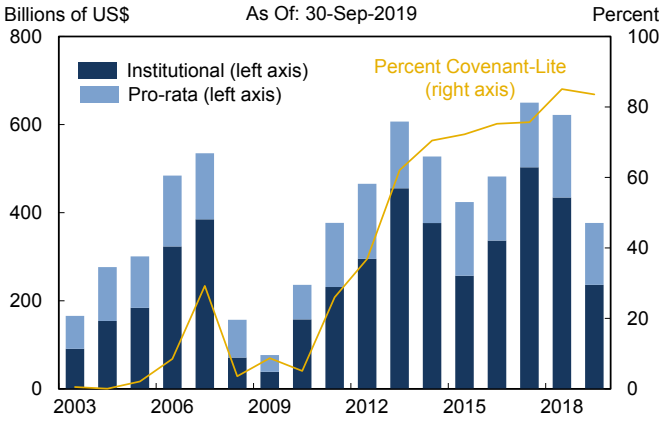
and the still-high, though declining, ratio of liquid assets to total assets **(Charts 4.3.3, 4.3.4)**.

Firms with high levels of debt may be vulnerable to unexpected financial or economic events that may negatively affect their repayment and refinancing capacity. Difficulties in servicing or refinancing outstanding debt could, if widespread, adversely impact the overall health of the economy. However, immediate rollover risk for leveraged corporations appears low, as less than 20 percent of high-yield bonds and leveraged loans mature before 2023 **(Chart 4.3.5)**.

Leveraged loan growth was particularly strong in 2018, in part reflecting investors' appetite for floating rate instruments amid a rising rate cycle **(Chart 4.3.6)**. Leveraged loan growth remained robust in the first nine months of 2019. However the pace of issuance slowed compared to 2017 and 2018 partially because of expectations of declining interest rates.

Concerns regarding deteriorating underwriting standards have been noted as some institutional leveraged loan deals have weaker credit and structure characteristics, coupled with increased reliance on optimistic projections of revenue growth and cost savings synergies to support borrower repayment capacity **(Chart 4.3.7)**. Notably, the number of large corporate highly leveraged deals—as measured by total debt to EBITDA of six times or higher—is well above pre-crisis highs **(Chart 4.3.8)**. In addition, the share of institutional leveraged loans that are covenant-lite has continued to grow. Institutional leveraged loans that are covenant-lite generally lack financial maintenance covenants, which reduce the ability of lenders to take actions if credit quality deteriorates. Covenant-lite loans accounted for 84 percent of leveraged loans issued in 2019 through September. By comparison, the share of leveraged loans that were covenant-lite did not exceed 30 percent in the pre-crisis period. While default rates are currently moderate and recovery rates are in line with historical averages, weaker financial maintenance covenants in leveraged loans, when combined with weaker credit quality, may mean that recovery rates could be lower; this implies that principal losses on leveraged loans in future downturns could exceed those experienced historically.

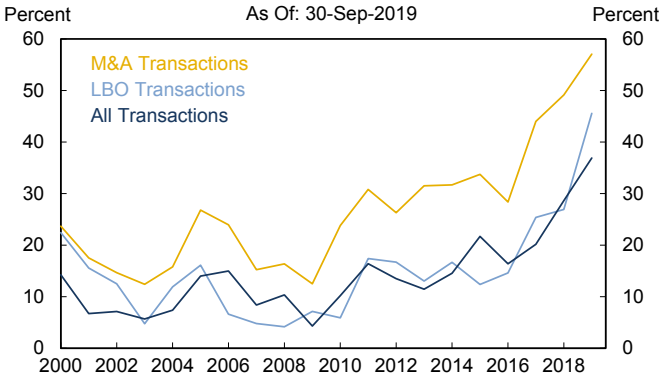
4.3.6 Leveraged Loan Issuance



Source: S&P LCD

Note: Percent covenant-lite limited to institutional loans.

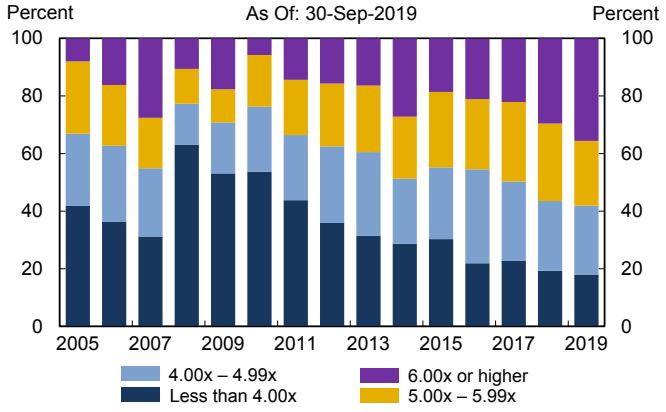
4.3.7 Leveraged Loan Transactions with EBITDA Adjustments



Source: S&P LCD

Note: Media and telecom loans excluded prior to 2011. Excludes existing tranches of add-ons, amendments & restatements with no new money, as well as DIPs, second liens and unsecured transactions. EBITDA adjusted for prospective cost savings or synergies.

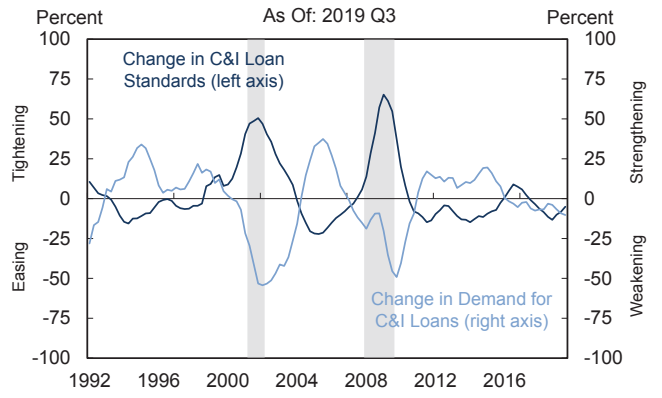
4.3.8 Distribution of Leveraged Loan Debt/EBITDA Ratios



Source: S&P LCD

Note: Includes issuers with EBITDA of more than $50M. Media and telecom loans excluded prior to 2011.

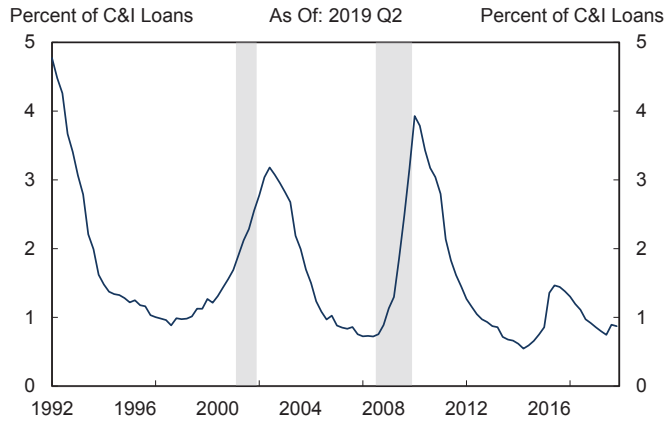
4.3.9 Bank Business Lending Standards and Demand



Source: Federal Reserve Senior Loan Officer Opinion Survey

Note: Represents net percent of banks reporting tightening standards or stronger demand for medium and large C&I loans; four period moving average. Gray bars signify NBER recessions.

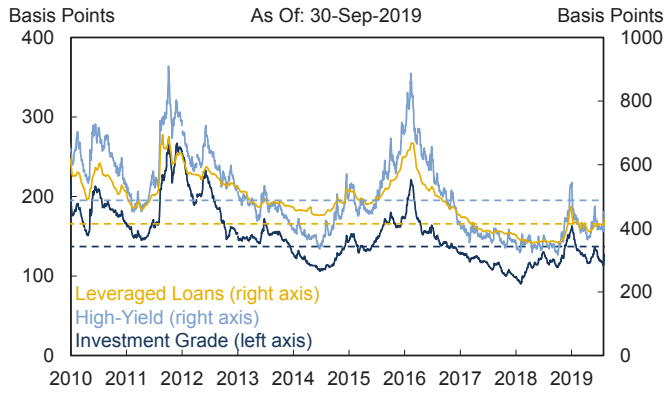
4.3.10 Non-Performing C&I Loans



Source: FRBNY, Haver Analytics

Note: Gray bars signify NBER recessions.

4.3.11 U.S. Corporate Credit Spreads



Source: Bank of America Merrill Lynch, Federal Reserve, S&P LCD

Note: Secondary market spreads. Investment grade and high-yield data represent option-adjusted spreads. Dotted lines represent 1997-present median.

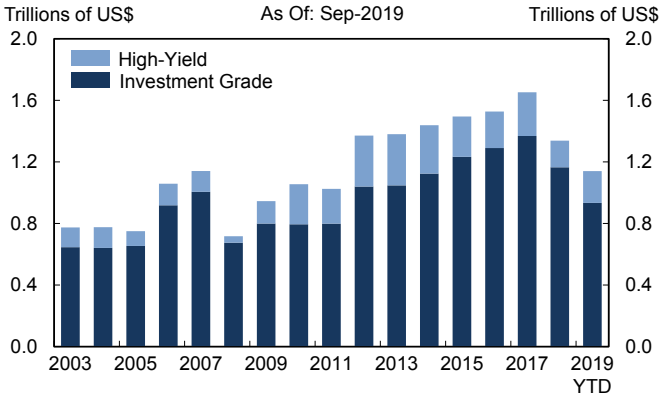
According to the Federal Reserve's Financial Accounts of the United States, commercial and industrial (C&I) lending to nonfinancial businesses by depository institutions grew 7.5 percent in calendar year 2018 to $1.1 trillion. Loan growth has slowed in 2019. In the first two quarters of 2019, C&I lending to nonfinancial businesses grew by 3.7 percent at an annual rate. Over the last year, more respondents to the Federal Reserve's Senior Loan Officer Opinion Survey on Bank Lending Practices reported experiencing weaker demand for C&I loans by firms and reported loosening or unchanged underwriting standards **(Chart 4.3.9)**. Following a small increase in the delinquency rate on C&I loans in the first quarter of 2019, the rate improved in the second quarter of 2019, although delinquencies remained higher than in most of 2018 **(Chart 4.3.10)**.

Corporate credit spreads have, on average, remained near the low end of their post-crisis range over the past year **(Chart 4.3.11)**. After spiking notably in December 2018, investment grade and high-yield bond spreads have since decreased to levels below their historical medians. Also, spreads on leveraged loans increased notably at the end of 2018 but have since decreased and were close to their long-term median.

Bond issuances from January through September 2019 amounted to $1.1 trillion, similar to that seen during the same period last year **(Chart 4.3.12)**. Bond issuances dropped sharply in late 2018 amid notable widening in corporate bond spreads. The amount of outstanding corporate bonds that are rated BBB—at the lower range of investment grade—is roughly 2.5 times the size of the entire high-yield market, and, as a share of investment-grade bonds, is at a record high.

Collateralized loan obligation (CLO) issuance in 2018 was strong. Issuances during the first nine months of 2019 were slightly lower than during the same period last year **(Chart 4.3.13)**. In 2018, CLOs continued to be the largest buyers of newly issued leveraged loans with an approximately 62 percent share of primary market issuances **(see Box A)**, followed by mutual funds that primarily invest in leveraged loans at approximately 19 percent, and banks at roughly 8 percent, respectively **(Chart 4.3.14)**. Through 2019, mutual funds have reduced their overall share of the leveraged loan primary market, while banks and hedge funds have stepped in. Mutual funds and ETFs that hold most of their assets in leveraged loans experienced cumulative outflows from November 2018 through September 2019 of $49 billion.

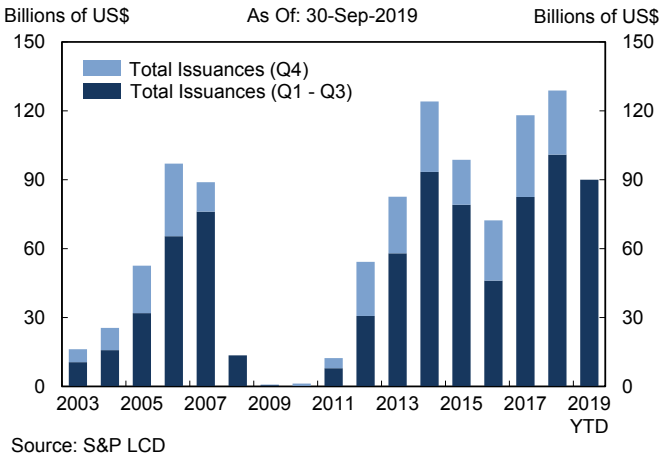
4.3.12 Gross Issuance of Corporate Bonds



Source: Thomson Reuters, SIFMA

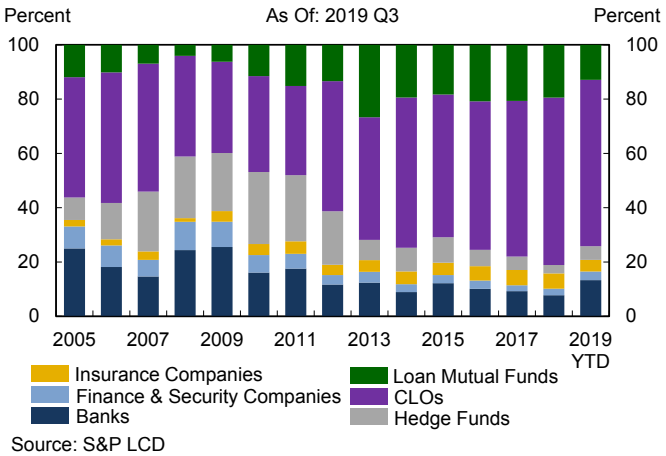
Note: Includes all non-convertible corporate debt, MTNs, and Yankee bonds, but excludes all issues with maturities of 1 year or less and CDs.

4.3.13 CLO Issuance



Source: S&P LCD

4.3.14 Leveraged Loan Primary Market by Investor Type



Source: S&P LCD

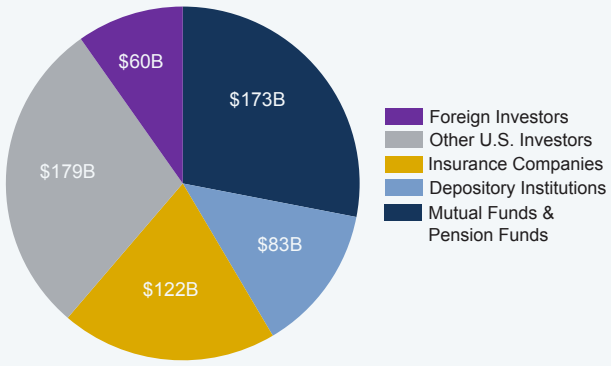
Box A: Nonfinancial Corporate Credit

U.S. nonfinancial corporate credit markets play an important role in supporting business investment and economic activity. As discussed in **Section 4.3**, U.S. nonfinancial corporate credit relative to GDP is now at historically high levels. According to the Federal Reserve Board's Financial Accounts of the United States, as of the second quarter of 2019, there was $10.0 trillion of U.S. nonfinancial corporate credit outstanding. Of this amount, corporate bonds were the largest component at roughly $5.7 trillion. Leveraged loans are also important sources of credit for business borrowers. Institutional leveraged loans, which are term loans originated by bank syndicates that are sold to institutional investors, totaled roughly $1.1 trillion as of the fourth quarter of 2018. However, a more comprehensive accounting of the leveraged loan market would include loans that are originated and held by banks, including the undrawn portion of revolving credit facilities, which is estimated at $500 billion to $600 billion; private debt fund assets of approximately $530 billion; and business development company loans of approximately $100 billion.

In evaluating how potential stress on corporate borrowers could impact the financial sector in a downturn, it is important to understand the financial condition of nonfinancial corporate credit investors and their ability to withstand downgrades on their debt holdings, mark-to-market losses, and credit losses, among other potential stress factors. The holders of leveraged loans are diverse and their composition has changed since the financial crisis. The share of the term portion of newly issued leveraged loans held by banks has shrunk from 18 percent in 2006 to approximately 13 percent in 2019, while the share in CLOs increased from 48 percent to roughly 60 percent **(see Section 4.3)**. Of the $1.1 trillion in outstanding institutional leveraged loans, CLOs hold about half, or roughly $617 billion. Estimates from Federal Reserve Board staff indicate that U.S. investors account for about $556 billion of CLO exposures, and U.S. depository institutions account for about 15 percent of total CLO exposures **(Chart A.1)**.

Banks hold a significant amount of the revolving portion of leveraged loans in addition to their direct holdings of institutional leveraged loans. Banks also play an important role in the origination and distribution of loans, though pipelines today are generally less than one-third of pre-crisis peak levels and banks have the ability to manage syndicated loan pipeline risk through the use of flexes and discounts. Banks are also indirectly exposed through financing of non-bank market participants, including in the context of leveraged loans, CLOs, mutual funds, and derivatives referencing leveraged credits.

A.1 CLO Investors as of Year-End 2018



Source: Federal Reserve, NAIC, TIC Data, Staff Calculations

Note: Other U.S. Investors includes holding companies, broker-dealers, private funds, nonfinancial companies, and households.

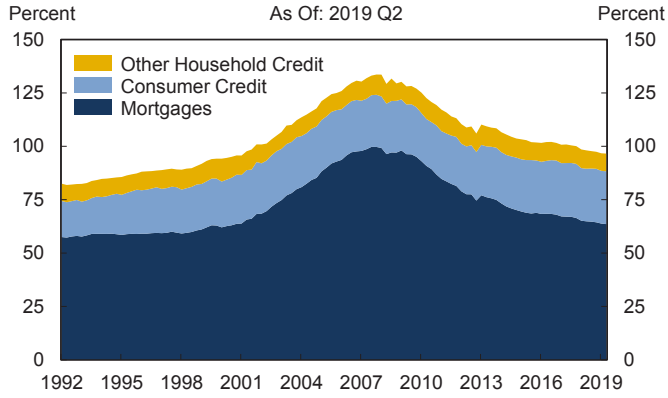
CLO structures today are more robust than they were prior to the crisis. The underlying loans in CLOs are generally marked at par by the CLO manager and are therefore generally not subject to mark-to-market volatility, except under certain circumstances. This is in contrast to pre-crisis collateralized debt obligations (CDOs) and some CLOs where the underlying assets were marked-to-market. These types of vehicles were forced to sell portfolio assets into a deteriorating market during the crisis. The capital structure of CLOs has also improved since the financial crisis. CLOs today have a greater share of subordinated tranches that would face principal losses before more senior tranches, such as the AAA tranches in which banks are primarily invested, experience a loss. While CLO capital structures are more robust, the underlying loans held in these portfolios are more vulnerable because borrowers generally have less subordinated debt outstanding that could serve as a cushion against potential losses.

A more diversified investor base could reduce the risk that losses and market dislocations will be borne by any particular type of holder. However, if credit markets deteriorate, investors—including those invested in CLOs and certain investment vehicles holding most of their assets in leveraged loans—may face liquidity risks or shortfalls in loss-absorbing capacity. How these holders will fare in a stressed environment and the impact of potential spillover effects to market liquidity and prices remains a key uncertainty.

Some mutual funds are also significant holders of institutional leveraged loans (though funds with higher concentrations of bank loans tend to be funds with lower amounts of total assets). The aggregate holdings of leveraged loans by mutual funds stood at roughly $165 billion at the end of 2018 but have declined since then. In contrast to CLOs, which do not generally have liquidity risk, mutual funds that have significant holdings of leveraged loans permit daily investor redemptions and may face liquidity risk. These funds are subject to a number of SEC requirements designed to mitigate liquidity risk **(see Section 6.2.4)**. However, if funds experienced significant redemptions during a period of market stress, funds with ineffective liquidity risk management programs could be forced to sell assets to meet redemptions, which, if significant in the aggregate, could contribute to loan pricing distortions.

The growth in nonfinancial corporate credit and the increased participation and diversity of nonbank holders of corporate loans are trends that warrant continued monitoring. There are several areas where information in this market is incomplete, including data on direct and indirect exposures of various holders of U.S. nonfinancial corporate credit and the effects of potential liquidity risk in certain mutual funds, easing covenant and documentation requirements, potential mark-to-market losses, credit derivative exposures, and potential credit rating downgrades, among other potential considerations. It is also important to continue to assess ways in which leverage may amplify the economic effects of a rapid repricing of risk or a slowdown in economic activity.

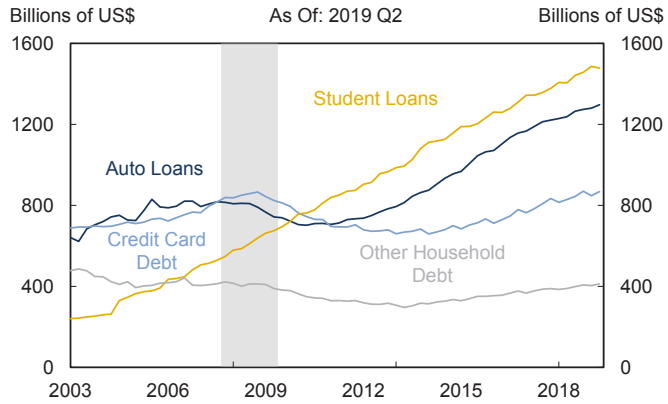
4.4.1 Household Debt as a Percent of Disposable Personal Income



Source: BEA, Federal Reserve, Haver Analytics

Note: Other Household Credit includes debts of both households and nonprofits.

4.4.2 Components of Consumer Credit



Source: FRBNY Consumer Credit Panel/Equifax, Haver Analytics

4.4 Household Credit

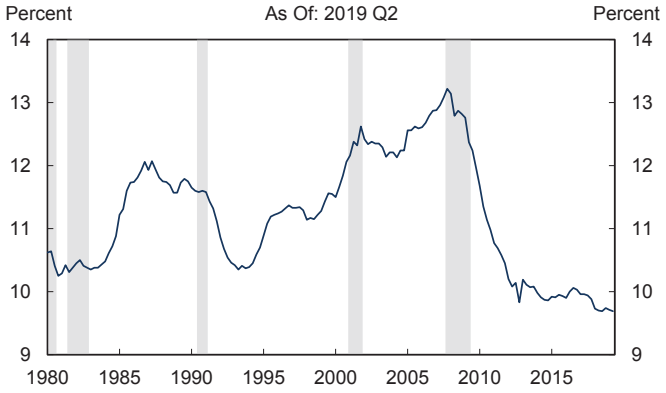
Following a sharp decline between 2008 and 2011, household debt has grown since 2012. As of the second quarter of 2019, total household debt grew by 3.1 percent year-over-year, in line with household debt growth in recent years. The ratio of household debt-to-disposable-personal-income continues to decline moderately and is well below the peak levels recorded in the last decade **(Chart 4.4.1)**. Aggregate household net worth increased over the past year with the increase primarily concentrated among upper-income households.

The rate of growth in non-mortgage consumer credit outpaced the growth in mortgage debt over the past year. Consumer credit now constitutes about one-quarter of household debt. This share is higher than the 18 percent it represented just before the financial crisis and comparable to its share before the rapid increase in house prices of the early and mid-2000s. The growth rate of the major components of consumer credit—student loans, auto loans, and credit card debt—in 2019 was similar to 2018, with student loans and auto loans continuing to predominantly drive the growth in consumer credit **(Chart 4.4.2)**. Student loan debt, estimated to be almost $1.5 trillion by the Federal Reserve Bank of New York (FRBNY) Consumer Credit Panel, remains the largest category of non-mortgage consumer debt. Approximately 14 percent of U.S. consumers owe student loan debt.

Continuing the trend that began in 2013, increases in loan balances of all types were driven by borrowers with prime credit scores. Total loan balances for borrowers with subprime credit scores remain well below the pre-crisis peak. These trends may reflect an increase in household credit from migration of subprime consumers to prime, as well as credit availability remaining somewhat tight for higher-risk borrowers.

Rising incomes and years of very low interest rates have helped move the household debt service ratio—the ratio of debt service payments to disposable personal income—to a 30-year low. The household debt service ratio was little changed in 2018 and the first half of 2019 **(Chart 4.4.3)**. Similarly, the household financial obligation ratio, which includes rent and auto-lease payments, is relatively low by historical standards. Other measures of household financial conditions also show continued improvement. The share of owners' equity in household real estate has increased by over 20 percentage points since 2009 and has returned to the range prevailing before the financial crisis **(Chart 4.4.4)**. These figures represent national trends and do not necessarily reflect local conditions, such as areas with notably higher housing costs.

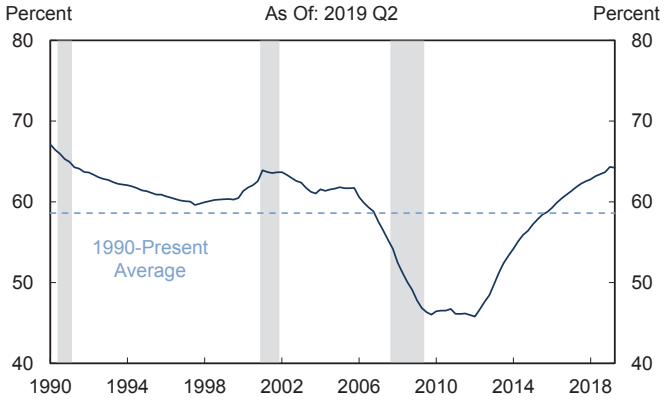
4.4.3 Household Debt Service Ratio



Source: Federal Reserve, Haver Analytics

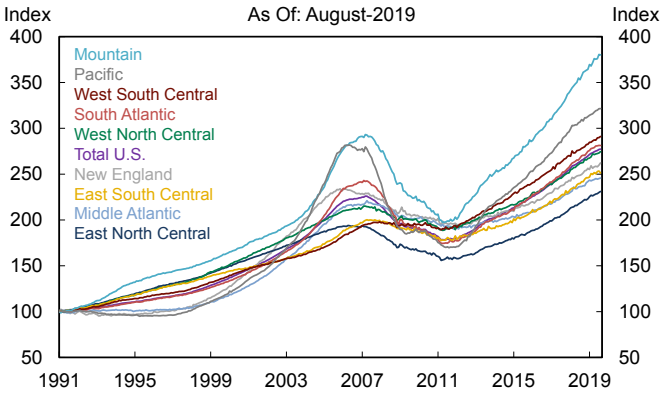
Note: Ratio of debt-service payments to disposable personal income. Seasonally adjusted. Gray bars signify NBER recessions.

4.4.4 Owners' Equity as Share of Household Real Estate



Source: Federal Reserve, Haver Analytics

4.5.1 House Prices by Census Region



Source: FHFA, Haver Analytics

Note: Purchase-only price index. Jan-1991 = 100.

4.5 Real Estate Markets

4.5.1 Residential Housing Markets

U.S. home prices continued to rise in 2019, buoyed by record-low unemployment, a healthy economy, and a limited inventory of homes. Home prices have increased steadily since 2011, the low point of the post-2007 housing downturn. However, signs point to a gradually slowing housing sector.

As of August 2019, FHFA's seasonally-adjusted purchase-only House Price Index grew 4.6 percent from one year earlier **(Chart 4.5.1)**. Each census division posted positive home price appreciation albeit at a slower pace compared to one year prior.

Housing affordability—as measured by the National Association of Realtors (NAR) Housing Affordability Index—increased in the first eight months of 2019. This is a reversal of the trend from 2013 to 2018 when the median monthly mortgage payment grew faster than median family income. The increase in housing affordability in 2019 is primarily attributable to the decline in the average 30-year fixed mortgage rate, which fell from 4.99 percent in December 2018 to 3.66 percent in August 2019. However, home price growth continues to outpace income growth. In August 2019 the ratio of the twelve month average home sale price to family income reached 3.4, the highest level since February 2008.

As has been the case for several years, most local housing markets remain tight, with demand generally outpacing supply. According to the NAR, in September 2019 there was 4.1 months of inventory of existing homes for sale nationwide, down from 4.4 months of inventory in September 2018. This remains well below the six months of inventory typically associated with a housing market in normal conditions.

The trends for the sales of existing and new homes diverged in the past year. According to the NAR, existing single family home sales totaled 4.7 million in the twelve months ended

September 2019. Sales were 2.4 percent lower compared to the same period one year earlier. In contrast, new home sales rose over the twelve months ended September 2019. Census data indicates that new single family home sales totaled 652,000 for this period, which was a 2.5 percent increase compared to the twelve month period ended September 2018.

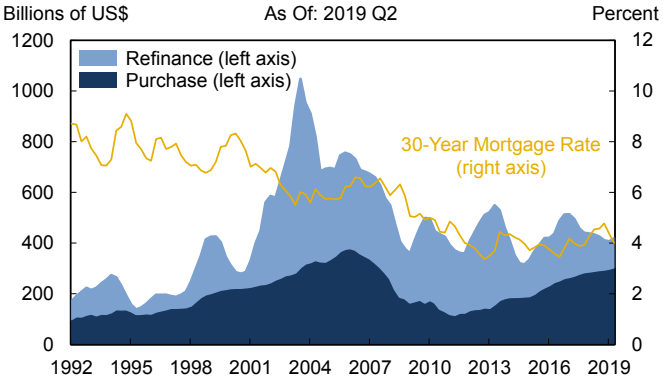
New single family construction starts have been increasing since the financial crisis, and reached 876,000 starts in the twelve months ended September 2019, though this remains below historic averages. The sluggish pace of housing development is particularly notable when considering the dramatic increase in house prices over recent years, which typically spurs new home construction. As in recent years, labor shortages and increasing land prices contributed to the slow pace. Costs and uncertainty created by lengthy local regulatory processes may have reduced the profit incentive for homebuilders.

The national homeownership rate rose slightly, from 64.4 percent in the third quarter of 2018 to 64.8 percent in the third quarter of 2019. For comparison, the U.S. homeownership rate rose from around 64 percent in the early 1990s, which was close to the average homeownership rate for the preceding 30 years, to an all-time high of 69.2 percent in 2004. Following the financial crisis, the homeownership rate fell precipitously to 62.9 percent in the second quarter of 2016—the lowest rate in decades.

Mortgage Originations, Servicing, and Loan Performance

Mortgage originations fell in 2017 and 2018, as higher rates made refinancing a less attractive option for many borrowers **(Chart 4.5.2)**. In the second quarter of 2019, falling rates have helped stabilize and boost overall mortgage originations, and, in particular, refinances. Refinances fell to a low in the first quarter of 2019 before rising again to a volume of $146 billion in the following quarter.

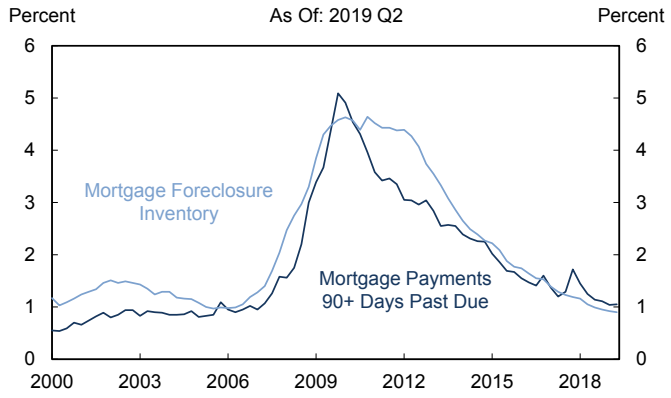
4.5.2 Mortgage Originations and Rates



Source: Mortgage Bankers Association, Freddie Mac Primary Mortgage Market Survey

Note: Originations represent all 1-4 family homes. Originations calculated as 4-quarter moving averages. Mortgage rates calculated as quarterly averages.

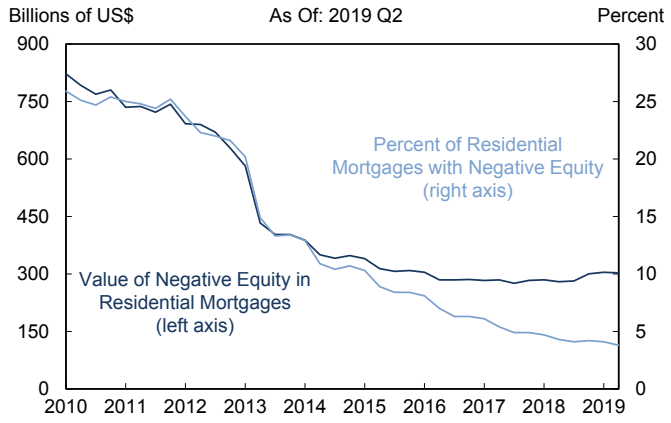
4.5.3 Mortgage Delinquency and Foreclosure



Source: Mortgage Bankers Association, Haver Analytics

Note: Percent of all mortgages.

4.5.4 Mortgages with Negative Equity



Source: CoreLogic

The share of mortgage loans originated and serviced by nonbanks continued its upward trend from late 2018 through the first half of 2019 **(see Box B)**.

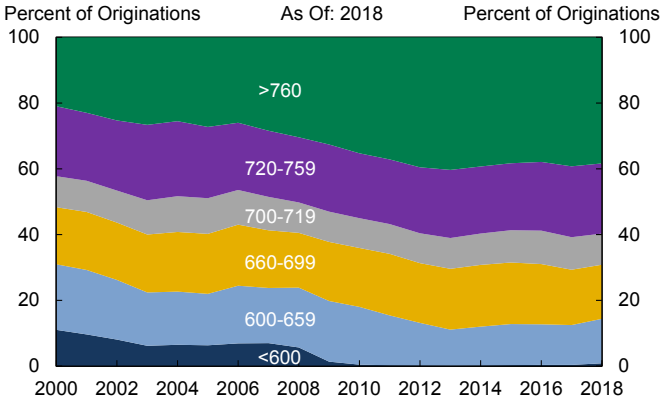
Delinquencies and foreclosures remain at very low levels by historical standards due to favorable economic conditions, rising home prices, and the use of conservative underwriting standards in recent years. Between the second quarter of 2018 and the second quarter of 2019, the percentage of borrowers who were more than 90-days delinquent, but not in foreclosure, fell from 1.3 percent to 1.1 percent **(Chart 4.5.3)**. Foreclosure activity also declined over this period, with the foreclosure rate falling from 1.1 percent to 0.9 percent. Hurricanes Irma, Harvey, and Maria caused an increase in delinquencies in 2017, but the effects of these weather-related events on delinquency rates have now passed.

The percentage of residential mortgages with negative equity continued its decade-long decline, falling from 4.3 percent in the second quarter of 2018 to 3.8 percent one year later. The actual dollar value of negative equity, however, increased over this period from $282 billion in the second quarter of 2018 to $303 billion in the second quarter of 2019 **(Chart 4.5.4)**. In comparison, near the low point of the last housing cycle in the fourth quarter of 2011, the negative equity rate was 25 percent, with a total value of $742 billion.

Credit quality, as measured by Fair Isaac Corporation (FICO) scores, remained relatively strong in 2018 **(Chart 4.5.5)**. Borrower credit quality has improved significantly since 2000, even when considering the lower underwriting standards leading up to the financial crisis. However, nearly all of this change occurred prior to 2012. Since then, the FICO score distribution for new mortgage borrowers has remained fairly constant. The highest FICO score category, above 760, has grown from approximately 20 percent of mortgage borrowers in 2000, to 30 percent in 2008, to nearly 40 percent of the market in recent years. Conversely, the lowest FICO score category, below 600, went from making up over 11 percent of borrowers in 2000, to 6 percent in 2008, and then fell to nearly zero in 2010. In the past year, the below-600 share of the market has increased slightly.

Similar trends in borrower credit quality are also apparent from the stressed default rate **(Chart 4.5.6)**. The stressed default rate is a metric that provides a loan's expected default rate if it experiences severely stressed conditions similar to the financial crisis shortly after the loan is originated. This metric shows much lower levels of credit risk for home purchase loans since 2006. The improvement is due in part to the near elimination of no-income-documentation loans and reductions in other products associated with high levels of credit risk. The stressed default rate reached its low point in 2013 and has increased moderately since then, primarily due to increases in average debt-to-income.

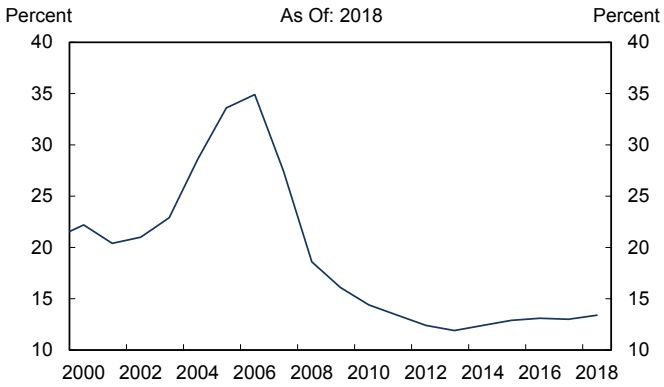
4.5.5 Purchase Origination Volume by Credit Score



Source: Black Knight's McDash Dataset, FHFA calculations

Note: Includes first lien purchases only.

4.5.6 Average Stressed Default Rate for Home Purchase Loans

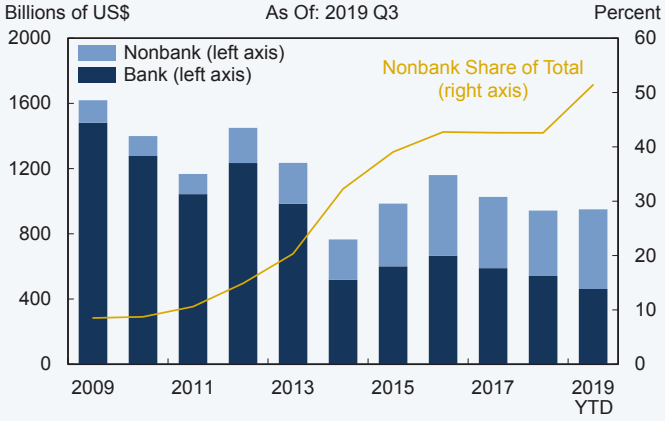


Source: Davis, Larson, Oliner, and Smith, *A Quarter Century of Mortgage Risk*, FHFA, (Oct. 2019).

Note: The sample reported includes all first-lien purchase mortgages originated in a given year.

Box B: Nonbank Mortgage Origination and Servicing

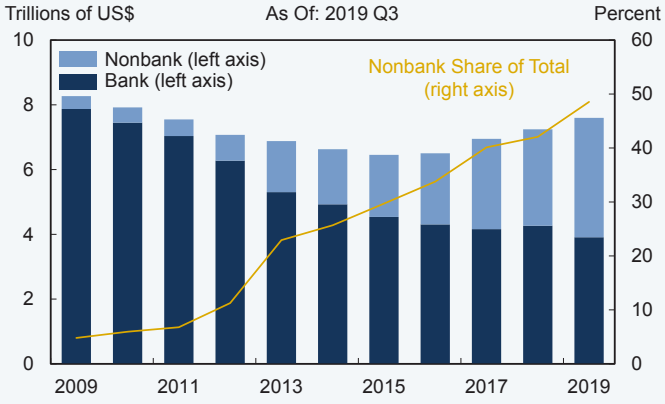
B.1 Mortgage Origination Market



Source: Inside Mortgage Finance

Note: Data covers top 25 originators in each year.

B.2 Mortgage Servicing Market



Source: Inside Mortgage Finance

Note: Data is as of fourth quarter each year except 2019, which is as of the third quarter. Data covers top 25 servicers in each quarter.

Nonbank mortgage companies have assumed a larger role in the origination and servicing of residential mortgages over the past decade. The typical nonbank mortgage company is a monoline specializing in mortgage origination, servicing, or both. Among the 25 largest originators and servicers, nonbanks currently originate approximately 51 percent of mortgages and service approximately 47 percent, up from just 10 percent and 6 percent in 2009, respectively **(Charts B.1, B.2)**. Nonbanks are particularly heavily involved in the origination of mortgages that are securitized by Ginnie Mae and the Enterprises, accounting for 85 percent of Ginnie Mae MBS, 60 percent of Fannie Mae MBS, and 53 percent of Freddie Mac MBS in 2019. As with originations, nonbank servicers have a larger market share for Ginnie Mae than for the Enterprises.

Several factors have driven the increased nonbank share of originations and servicing. Some large banks have reduced their share of mortgage lending to riskier borrowers in recent years. As a result, loans originated by nonbank lenders have, on average, marginally higher debt-to-income ratios and lower borrower credit scores than those originated by banks. Various hypotheses have been offered for the change in large bank mortgage origination market share, such as an aversion to potentially significant legal and reputational risks that may arise from delinquencies and foreclosures. These risks may be more salient for banks than nonbanks because banks have multiple business lines into which investment may be shifted, whereas nonbanks are often monolines. In addition, some research has found that banks have higher overhead costs for loan origination compared to

nonbanks and that nonbanks have been more aggressive in adopting financial technology to lower origination and servicing costs and increase consumer convenience. Banks also face a different regulatory regime than nonbanks, and, in some cases, the more stringent capital treatment of certain mortgage-related assets may discourage their growth.

Risks in Nonbank Origination and Servicing

Though their business models vary, most nonbanks do not have a stable funding base, and instead rely heavily on short-term funding for both originations and servicing advances. Analysis of nonbank financial statements by the Conference of State Bank Supervisors (CSBS) found that, in general, the largest nonbank servicers have limited liquidity, often just enough cash and securities held for sale to cover a few months of operating and interest expenses. Nonbank liquidity levels are significantly below those maintained by banks. Nonbanks often obtain liquidity from warehouse lines provided by banks, and these lines can be a significant portion of nonbank liabilities. In times of significant stress, warehouse lenders may face strong incentives to cancel the lines and seize the collateral as quickly as contractually permitted.

In some cases, servicers have the obligation to make payments to the investor even when a borrower does not make a mortgage payment ("servicing advances") or to repurchase a mortgage out of the MBS pool. The servicer may also have to satisfy tax and insurance obligations for the delinquent borrower. The servicer may have to fund these advances until the loan is brought current, the property is liquidated, or the servicer is reimbursed. These obligations can be costly for delinquent loans, especially for a delinquent mortgage in a Ginnie Mae MBS, given the higher default rates and the extended time until the servicer is reimbursed by the FHA or another agency. Financing servicing advances can also be challenging for servicers of Ginnie Mae MBS because of Ginnie Mae's first claim on servicing advances. Nonbanks' significant role in the Ginnie Mae segment makes them particularly exposed to these issues.

Nonbanks also have relatively few resources to absorb adverse economic shocks. Their largest assets, mortgages held for investment or sale and mortgage servicing rights (MSRs), are often pledged as collateral or partially monetized for upfront cash. The value of MSRs can move dramatically with changes in interest rates, and MSRs can be particularly illiquid and difficult to price when default rates are high or uncertain. Analysis by the CSBS shows that the largest nonbank servicers have an average ratio of MSRs to total equity of 151 percent and that this ratio has increased in recent years. In addition, nonbanks typically have relatively low capital levels. CSBS data reports that, among the largest nonbank mortgage originators/servicers, nonbanks have approximately four times as much debt as equity. Though this asset-liability structure may be a function of their business models, it raises questions about nonbanks' ability to perform during a downturn in the housing or mortgage markets.

Box B: Nonbank Mortgage Servicing and Originations (continued)

Given these fragilities, the nonbank sector could potentially be a source of weakness as a contraction in the largest nonbanks' ability to originate and service mortgages may transmit risk to the broader financial system through several channels. Nonbanks are significant counterparties to the FHA, to Ginnie Mae, and to the Enterprises. If delinquency rates rise or nonbanks otherwise experience solvency or liquidity strains, Ginnie Mae and the Enterprises could experience losses and operational challenges associated with transferring servicing to a financially sound servicer, especially the servicing of delinquent mortgages. The FHA and the Enterprises may also have difficulty enforcing contractual provisions that require nonbank originators to remedy defective loans. With their lines of credit to nonbanks, banks are also exposed to losses should a nonbank fail, though the exposures are somewhat limited in size and are generally well-secured by collateral.

Nonbanks could also transmit risk through contagion. During a period of significant market stress, strains in one nonbank could cause counterparties to question the viability of others. This could cause stress to spread among market participants. Broader contagion could lead to dislocation in the housing and mortgage markets during periods of stress.

Nonbanks are important providers of mortgage credit and mortgage servicing. It is unclear whether substitutes would be available if the largest nonbanks experienced stress or widespread failure during a market downturn. Nonbanks are disproportionately large players in key market segments, such as FHA lending, which is often used by low-income, minority, and first-time homebuyer segments. Should nonbanks not be able to extend credit, these market segments could potentially experience significant changes in the terms of available loans. Banks may also be reluctant to step in to assume servicing from a failing nonbank servicer, creating significant challenges if multiple nonbank servicers simultaneously experienced financial stress.

4.5.2 Government-Sponsored Enterprises and Secondary Mortgage Market

The federal government continues to back the majority of new mortgages either directly through the FHA, the VA, and the USDA, or indirectly through the Enterprises, although the federal government share of mortgage originations—which had been stable at around 70 percent in recent years—fell to 62 percent in the first three quarters of 2019 **(Chart 4.5.7)**.

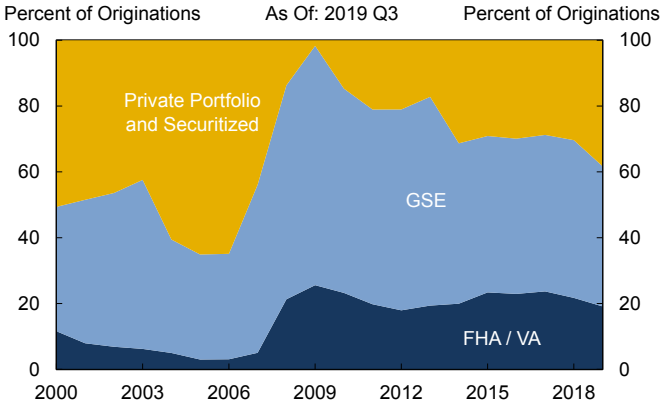
New mortgages not securitized by Ginnie Mae or the Enterprises continue to be held mostly in lender portfolios rather than securitized in the private-label market, with nonagency residential mortgage-backed securities (RMBS) accounting for less than 25 percent of outstanding mortgages (excluding agency MBS). Nonagency RMBS issuance totaled $49 billion in the first nine months of 2019, a 65 percent decline compared to the same period in 2018 **(Chart 4.5.8)**. In contrast, agency RMBS issuance totaled $1.1 trillion in the first nine months of 2019, up 14 percent compared to the same period in 2018.

Fannie Mae and Freddie Mac

Fannie Mae and Freddie Mac have been among the most active issuers of SOFR-linked notes **(see Box C)**. After issuing the first-ever SOFR securities in July 2018, Fannie Mae has returned to the market five additional times to issue a total of $22 billion in SOFR-linked securities. Freddie Mac issued its first SOFR-linked securities in November 2018 and has issued $66 billion of SOFR-linked securities through September 2019. Maturities on Fannie Mae securities range from 6 to 18 months while maturities on Freddie Mac securities range from 3 months to 3 years.

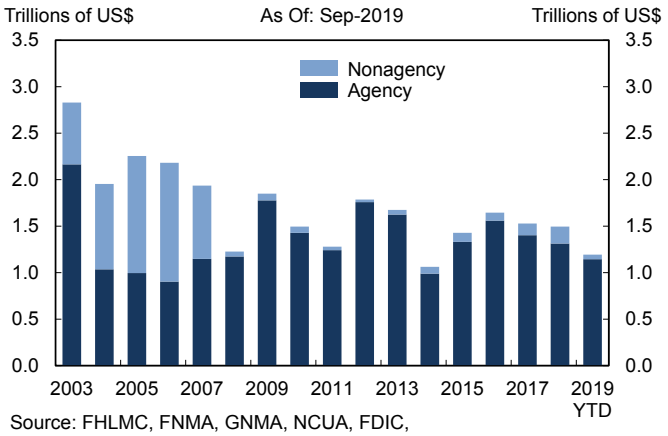
Fannie Mae continues to lay off risk to private capital in the mortgage market and reduce taxpayer risk through its credit risk transfer transactions. This is done primarily through its issuance of Connecticut Avenue Securities and Credit Insurance Risk Transfer transactions. For the six months ended June 30, 2019, Fannie Mae transferred a portion of the credit risk

4.5.7 Mortgage Originations by Product



Source: Inside Mortgage Finance

4.5.8 RMBS Issuance



Source: FHLMC, FNMA, GNMA, NCUA, FDIC, Bloomberg, L.P., Dealogic, Thomson Reuters, SIFMA

on single-family mortgages with unpaid principal balance (UPB) of $154 billion. Since inception of its risk transfer programs, Fannie Mae has transferred a portion of the credit risk on single-family mortgages with UPB of over $1.7 trillion.

Freddie Mac transferred a portion of the credit risk on $311 billion in UPB of single family mortgage loans in the first half of 2019, primarily through its issuance of Structured Agency Credit Risk securities and through its Agency Credit Insurance Structure transactions. Since it began undertaking credit risk transfers, as of the second quarter of 2019, Freddie Mac has executed transactions covering $1.3 trillion in UPB.

As discussed in **Section 5.3.1**, Treasury and the FHFA have agreed to modifications to the PSPAs that will permit Fannie Mae and Freddie Mac to retain earnings that had previously been paid out to the Treasury as dividends. Through September 30, 2019, dividends to the Treasury have totaled $301 billion, with cumulative dividends paid by Fannie Mae and Freddie Mac totaling $181 billion and $120 billion, respectively.

The credit profile of the Enterprises' books of business have generally improved in recent years, but signs of increased credit risk have begun to emerge. For example, the Enterprises' serious delinquency rates have decreased and the median borrower credit score for Enterprise mortgage acquisitions has been relatively unchanged in recent years, but the share of the Enterprises' purchase money mortgage acquisitions with debt-to-income ratios above 43 percent increased to 32 percent in the first quarter of 2019 compared to 16 percent in 2013. Similarly, the Enterprises' share of purchase money mortgage acquisitions with loan-to-value ratios greater than 95 percent increased to 11 percent from 3.5 percent in the same time period.

Federal Home Loan Banks

The Federal Home Loan Banks (FHLBs) continued to be an important source of liquidity for the mortgage market and to exhibit strong financial performance. The FHLBs reported aggregate net income of $3.6 billion in 2018, an all-time high for the FHLB System. While net income in 2016 and 2017 was also strong, results in these two years reflected significant litigation settlement gains related to private-label MBS investments. Conversely, 2018 earnings were driven more by traditional business functions at the FHLBs. The FHLBs' aggregate net income totaled $2.3 billion for the first three quarters of 2019. These high levels of earnings have also led to significant dividends to FHLB members. The FHLBs paid a dividend rate of 5.7 percent in 2018, which corresponds to a 61 percent payout ratio.

The total assets of the FHLBs have increased from $970 billion at year-end 2015 to $1,086 billion as of September 30, 2019. Advances are the largest component of FHLB holdings. Advances are a credit product FHLBs extend to their members to help them meet short- and long-term liquidity and housing finance needs. They carry a yield slightly higher than a FHLB debt obligation of similar maturity. Advances reached their post-crisis peak of $735 billion in June 2018. Since then, demand has subsided. As of September 30, 2019, the FHLBs had $659 billion in outstanding advances to member institutions.

Increased holdings of liquid assets also contributed to growth in FHLB balance sheets in the first three quarters of 2019. The FHFA released new liquidity guidance in 2018, advising the FHLBs to hold more days of liquid assets beginning on March 31, 2019. As a result, the FHLBs added $41 billion of Treasury securities in the first nine months of 2019. The FHLBs have been regular issuers of SOFR-linked debt securities, issuing approximately $140 billion as of September 2019.

4.5.3 Commercial Real Estate

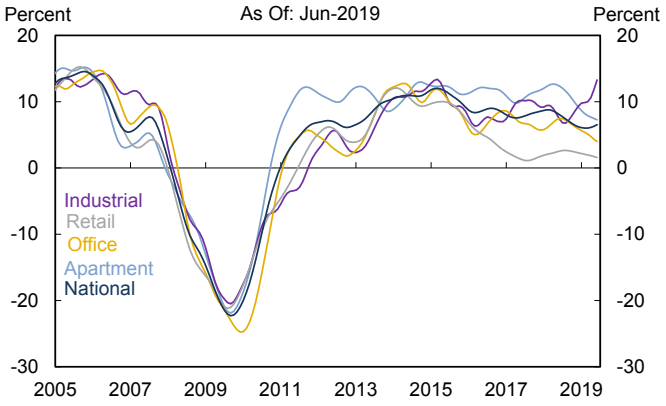
Commercial real estate (CRE) prices increased in 2018 and in the first half of 2019. However, the rate of increase has slowed recently, with national CRE price growth increasing by 6.6 percent year-over-year as of June 2019 versus 8.0 percent the previous year. Price growth was led by the industrial sector. Price growth for retail properties continue to lag other CRE sectors **(Chart 4.5.9)**.

CRE capitalization rates—the ratio of a property's annual net operating income to its price—remain very low by historical standards **(Chart 4.5.10)**. One measure of the risk premium in CRE—the spread between CRE capitalization rates and the 10-year Treasury yield—remains notably higher than the lows reached prior to the financial crisis, when Treasury yields were higher.

The volume of CRE property sales increased 15 percent year-over-year in 2018. Sales have slowed modestly in the first half of 2019. Sales by property type have diverged, with transactions involving office and retail properties generally declining from prior years.

As of the second quarter of 2019, outstanding CRE loans totaled $4.4 trillion, a 5.2 percent increase year-over-year. The total amount of outstanding CRE loans is approximately 21 percent of GDP, up from 19 percent in the second quarter of 2014, but below the 24 percent level reached in the second quarter of 2009. The Enterprises continue to be a major player in multifamily lending and hold a collective share of more than 46 percent of total outstanding multifamily mortgages, inclusive of agency MBS. CRE loans held by life insurance companies continued to increase, with CRE loan percentage growth at insurance companies outpacing that of banks. As of June 2019, CRE loans outstanding at U.S. chartered banks were $2.2 trillion (a 3.9 percent increase year-over-year) and the corresponding total for life insurers was $540 billion (a 9.5 percent increase year-over-year).

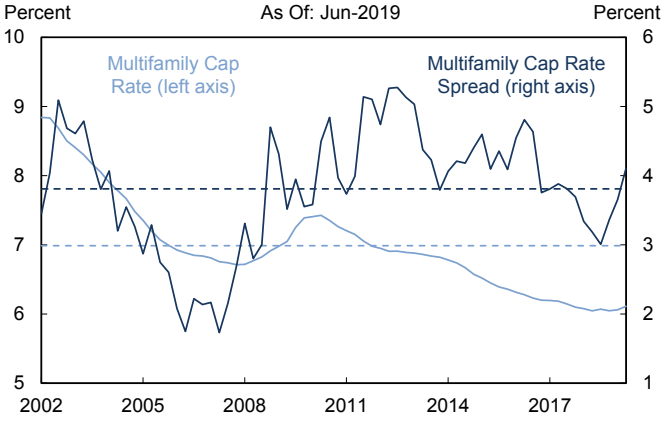
4.5.9 Commercial Property Price Growth



Source: Real Capital Analytics, Bloomberg, L.P.

Note: Year-over-year price change.

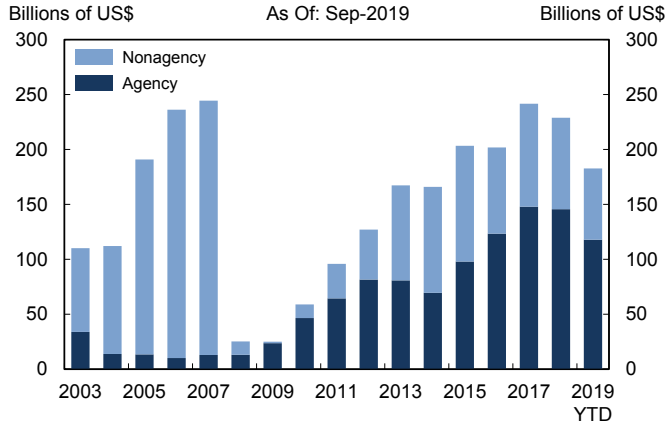
4.5.10 Multifamily Capitalization Rates and Spreads



Source: Real Capital Analytics

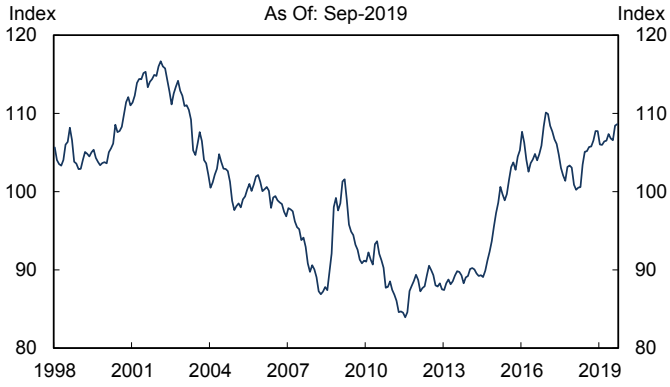
Note: Dotted lines represent 2002-present avg.

4.5.11 CMBS Issuance



Source: Inside Mortgage Finance

4.6.1 Real U.S. Dollar Trade-Weighted Index



Source: Federal Reserve, Haver Analytics

Note: Index shown as a share of its 1998-present average. Real USD Trade-Weighted Index is a weighted average of the FX value of the USD against the currencies of a broad group of major U.S. trading partners.

Overall, CRE delinquency rates remained stable in 2018. However, one area that showed notable improvement was the delinquency rate of the CRE loans held in commercial mortgage-backed securities (CMBS), as problem loans that were originated at the peak of the previous credit cycle in 2006 and 2007 have been resolved.

As of the second quarter of 2019, nonagency CMBS constituted approximately 13 percent of the CRE market, unchanged over the prior two years. Overall CMBS issuance was 14 percent higher year-to-date through September 2019 compared to the same period in 2018. Agency CMBS issuance by the Enterprises, which is predominantly multifamily, showed continued growth in 2019, as the GSEs continued to expand their securitization programs. Agency CMBS issuance accounted for 64 percent of total CMBS issuance in 2019 to date. Nonagency CMBS issuance increased 2.7 percent as of September 2019, compared to the same period in 2018 **(Chart 4.5.11)**.

4.6 Foreign Exchange

The U.S. dollar appreciated modestly in the first nine months of 2019 after strengthening notably over 2018. As of the end of September, the nominal trade-weighted dollar exchange rate was 2.1 percent higher year-to-date. Dollar appreciation in 2019 was concentrated between late July and early September, when a deterioration in global risk appetite generated a flight to safety that pushed the dollar higher against most currencies other than the Japanese yen and Swiss franc. The dollar remained elevated from a longer-term perspective, with the real trade-weighted dollar standing 9 percent above its 20-year average as of the end of September **(Chart 4.6.1)**. The dollar was supported in 2018 and 2019 by continued outperformance of the U.S economy and the associated interest rate differentials between the U.S. and other large economies.

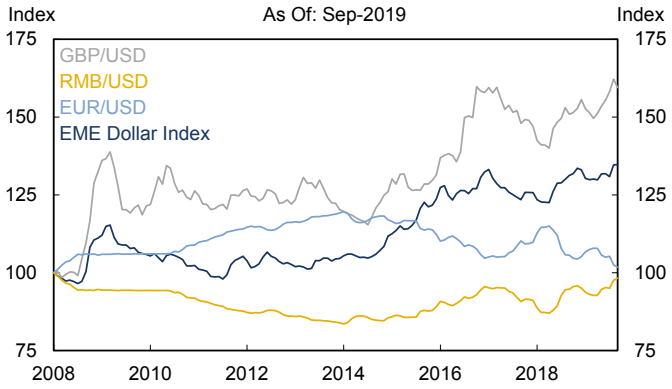
The euro continued its depreciation trend that started in early 2018 as economic data across the euro area generally disappointed and

the ECB announced that interest rates would remain at or below current low levels until it saw the inflation outlook robustly converge to a level sufficiently close to, but below, 2 percent **(Chart 4.6.2)**. Broader concerns about the global growth outlook—an important factor for the export-oriented euro area economy—have also weighed on the currency. Pound sterling remained volatile in 2019, on the back of Brexit and negative second quarter economic growth in the United Kingdom. In early August 2019, the pound sterling closed at its lowest level against the U.S. dollar since 1985, after losing about 5 percent of its value from January 2019. Pound sterling retraced some of the losses in October, following the announcement of a potential new Brexit deal between the United Kingdom and the European Union. However, investors remained cautious given ongoing Brexit uncertainty and the December 2019 UK general election.

After considerable depreciation between May and November 2018, the Chinese renminbi (RMB) fell modestly through the first seven months of 2019. On August 5, 2019, amid heightened concerns about the U.S.-China trading relationship and a lack of PBOC action to defend the currency, the RMB depreciated through seven RMB to the dollar for the first time since 2008. Volatility of the RMB since mid-2018 came in the context of concerns about the Chinese domestic growth outlook and trade tensions. While capital outflow pressures in China were significantly diminished relative to the heightened level they reached in 2015, outflows picked up in late 2018 and early 2019.

Emerging market currencies continued to depreciate in the first nine months of 2019, albeit at a slower pace relative to 2018 with a few exceptions **(Chart 4.6.3)**. The Argentine peso depreciated by 50 percent in 2018 and a further 35 percent in the first nine months of 2019 amidst renewed sovereign credit concerns and political uncertainty **(see Section 4.2.2)**. The Turkish lira, which depreciated by nearly 30 percent in 2018, fell a further 6.4 percent over the first nine months of 2019 due to continued political uncertainty.

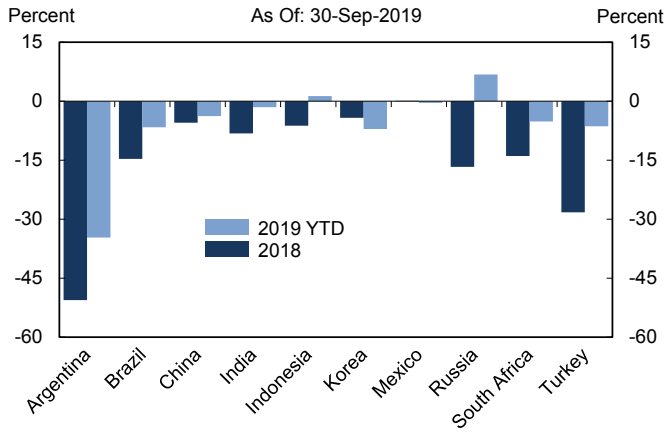
4.6.2 Nominal Value of the U.S. Dollar



Source: Federal Reserve, Haver Analytics

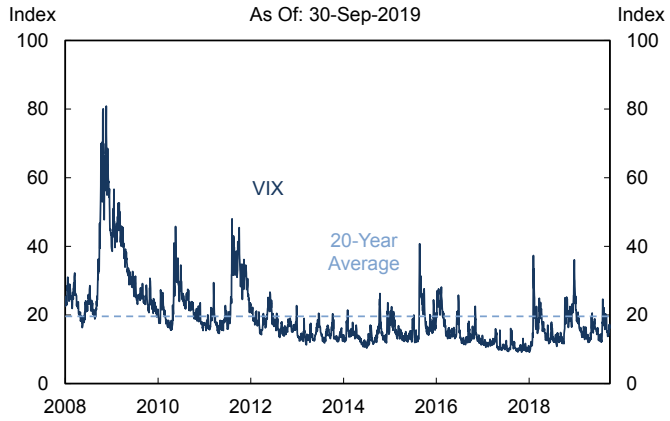
Note: Jan 2008 = 100. Above 100 indicates dollar strengthening, while below 100 indicates dollar weakening. EME dollar index is a weighted average of the FX value of the USD against a subset of the broad index currencies that are EMEs.

4.6.3 Change in U.S. Dollar Exchange Rates



Source: Wall Street Journal, Haver Analytics

4.7.1 S&P 500 Volatility



Source: Bloomberg, L.P.

4.7.2 Returns in Selected Equities Indices

As Of: 30-Sep-2019

	6 Month Returns	1 Year Returns	5 Year Annualized Returns
Major Economies			
U.S. (S&P 500)	5.0%	2.2%	8.6%
Euro (Euro Stoxx 50)	6.5%	5.0%	2.0%
Japan (Nikkei 225)	2.6%	(9.8%)	6.1%
U.K. (FTSE 100)	1.8%	(1.4%)	2.3%
Selected Europe			
Germany (DAX)	7.8%	1.5%	5.6%
France (CAC 40)	6.1%	3.4%	5.2%
Italy (FTSE MIB)	3.9%	6.7%	1.1%
Spain (IBEX 35)	0.0%	(1.5%)	(3.1%)
Emerging Markets			
MSCI Emerging Market Index	(5.4%)	(4.5%)	(0.1%)
Brazil (Bovespa)	9.8%	32.0%	14.1%
India (S&P BSE Sensex)	(0.0%)	6.7%	7.7%
China (Shanghai SE Composite)	(6.0%)	3.0%	4.2%
Hong Kong (Hang Seng)	(10.2%)	(6.1%)	2.6%
Taiwan (TAIEX)	1.8%	(1.6%)	3.8%
South Korea (KOSPI)	(3.6%)	(12.0%)	0.4%

Source: Bloomberg, L.P.

4.7.3 U.S. Stock Valuations

As Of: 2019 Q3

Metric	Current	Historical Percentile
CAPE Ratio	29.3	95%
Buffett Indicator	146%	96%
Price-to-Book	3.4	83%
Trailing Price-to-Earnings	19.6	77%
Forward Price-to-Earnings	17.5	77%

Source: Bloomberg, L.P., Wilshire Associates, Haver Analytics, OFR

Note: Percentiles are based on historical data since, respectively, 1881, 1970, 1990, 1954, and 1990. CAPE, price-to-book, and price-to-earnings ratios are based on the S&P 500 aggregate index. Buffett Indicator is based on the Wilshire 5000 and is as of 2019 Q2.

4.7 Equities

While U.S. equity markets saw strong performances in recent years, they have been largely flat between January 2018 and September 2019. The S&P 500 gained over 9 percent in the first three quarters of 2018 before falling sharply at the end of 2018 on broadening concerns about global growth, trade tensions, and less accommodative monetary policy from the Federal Reserve. As a result, the index was little changed on net for the year. Despite some softening global economic data and a slowdown in corporate earnings growth, the S&P 500 was up nearly 20 percent for the first nine months of 2019 amid more accommodative monetary policy communications from the Federal Reserve and central banks in other advanced nations. Equity market volatility was low for much of 2019, with fluctuating global trade tensions leading to brief spikes **(Chart 4.7.1)**.

European equities were more resilient compared to Japanese and emerging market equities. As of September 2019, the Euro Stoxx and DAX indices were up 5.0 percent and 1.5 percent year-over-year, respectively, despite the weaker growth outlook and escalating trade risks. However, equity returns presented a mixed picture in EMEs, and markets with large exposures to global supply chains—namely, Korea and Taiwan—underperformed other markets **(Chart 4.7.2)**.

U.S. equity market valuations remain elevated relative to historical levels **(Chart 4.7.3)**. The cyclically adjusted price-to-earnings (CAPE) ratio, in which market price is divided by the moving average of the last ten years of earnings, and the Buffett Indicator, in which market capitalization is presented relative to the U.S. gross national product, are both at or above the 95th percentile relative to historical levels. Valuation measures using current corporate earnings are high relative to historical levels.

4.8 Commodities

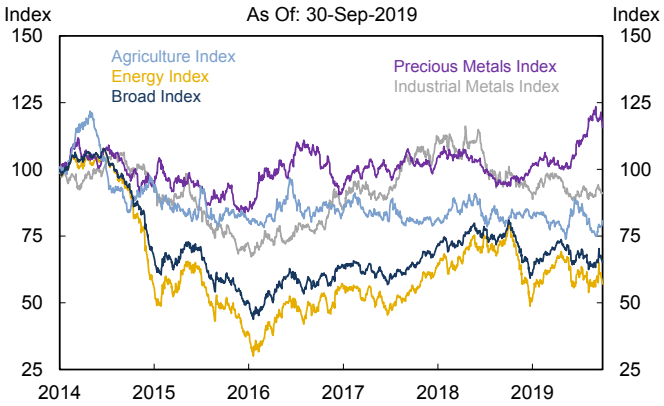
Over the past year, commodity prices broadly declined as expectations of slowing global growth cut into demand. The S&P GSCI Index of global commodity prices fell by 17 percent over the twelve months ended September 2019, though performance varied across commodity types for idiosyncratic reasons **(Chart 4.8.1)**.

On the back of production limits agreed upon by the Organization of Petroleum Exporting Countries (OPEC) countries plus other major oil producers like Russia (OPEC+), Brent crude oil prices reached a four-year high of $86 per barrel in October 2018. However, crude prices fell substantially in late 2018 because of concerns about a slowdown in global growth and idiosyncratic supply-demand imbalances in the oil market. Crude oil prices steadily rebounded in the first half of 2019 as some OPEC+ countries limited production. In September 2019, oil prices moved sharply higher in response to an attack on a Saudi oil facility. However, the increase was short lived as production was restored and prices soon moved below pre-attack levels.

Industrial metals fell sharply over the past year. The S&P GSCI Industrial Metals Spot Index was down 7.5 percent for the twelve months ended September 2019. Similar to other commodity prices, industrial metal prices fell as uncertainty from trade tensions and slowing global growth reduced demand. One major outlier was iron ore, a commodity for which supply disruptions, including a major dam disaster at the Vale SA operation in Brazil, helped push prices up by over 100 percent between mid-2018 and mid-2019.

Agricultural prices also trended lower because of trade tensions and concerns about the global economy. Over the past year, prices for the basket of commodities in the S&P GSCI Agriculture Index approached ten-year lows. As of September 2019, corn and soybean prices were more than 20 percent lower than historical averages **(Chart 4.8.2)**. In addition to being affected by low prices, U.S. farm incomes were depressed by unprecedented flooding

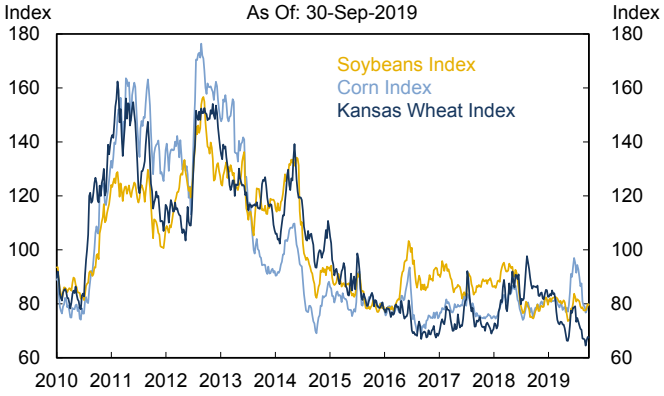
4.8.1 Commodities



Source: S&P GSCI Spot Indices, Haver Analytics

Note: 01-Jan-2014 = 100.

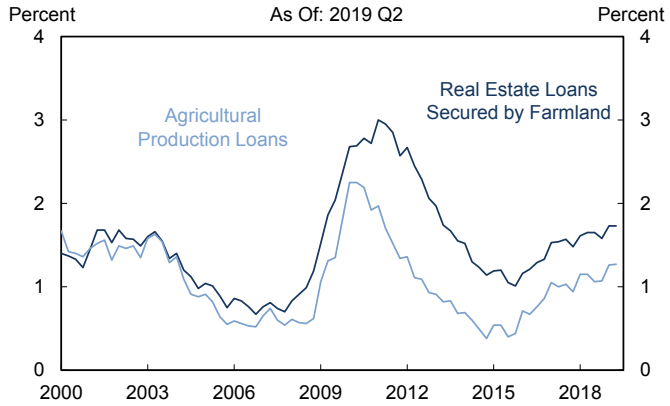
4.8.2 Agricultural Prices



Source: S&P GSCI Spot Indices, Haver Analytics

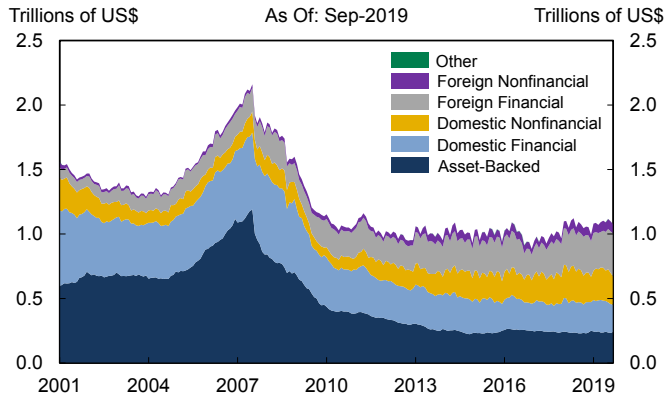
Note: Index shown as a share of its 2010-present average.

4.8.3 Agricultural Loans: Noncurrent Rate



Source: FDIC, Haver Analytics

4.9.1 Commercial Paper Outstanding



Source: Federal Reserve, Haver Analytics

Note: Not seasonally adjusted. Domestic includes CP issued in the U.S. by entities with foreign parents.

impacting spring planting, which resulted in lower yields and reduced quality for both grain and oilseed crops. As a result these factors, overall net farm income was nearly 50 percent below its 2013 peak.

Farm banks are a large source of financing to the agricultural sector, and represented approximately 25 percent of banks in the United States and $127 billion of loans in June 2019. According to USDA projections, farm debt was expected to rise by 3.4 percent in 2019 to $416 billion. Last year, farm debt-to-income was at the highest level since 1984. Delinquency rates for commercial agricultural loans for both real estate and agricultural production were at a six-year high **(Chart 4.8.3)**. Farm bankruptcies were at their highest levels since 2012, up 13 percent year-over-year, with 535 farms filing for Chapter 12 bankruptcy over the past twelve months.

4.9 Wholesale Funding Markets

4.9.1 Unsecured Borrowing

Commercial Paper

After reaching a multi-decade low of $885 billion in December 2016, commercial paper (CP) outstanding increased to $1.1 trillion in January 2018 and remained at approximately the same level through September 2019 **(Chart 4.9.1)**. During the same period, foreign financial CP outstanding has nearly doubled, increasing from a low of $198 billion in November 2016 to $337 billion in September 2019. Asset-backed CP outstanding has remained at approximately $240 billion since the beginning of 2017.

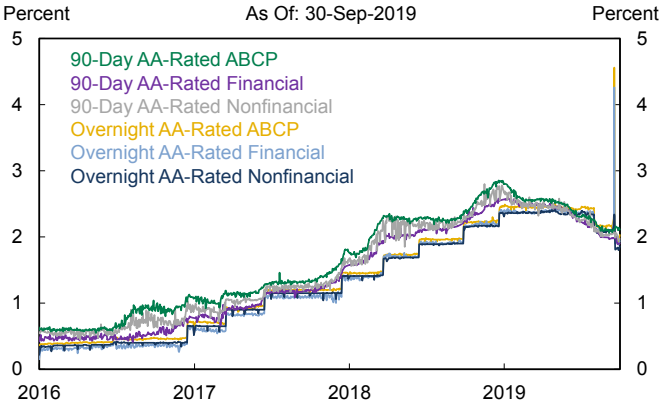
Over the past year, domestic financial CP outstanding declined slightly, from $220 billion in September 2018 to $214 billion in September 2019. Domestic financial issuers with a foreign bank parent continue to be the largest issuers in this segment of the market, accounting for over 50 percent of domestic financial CP outstanding.

Interest rates on overnight, AA-rated CP trended up through July 2019, in tandem with the effective federal funds rate. However, in June 2019, three-month AA-rated CP rates began moving below overnight CP, reflecting market participants' expectations of a future decline in short-term rates **(Chart 4.9.2)**. In mid-September, certain overnight CP rates temporarily spiked along with other short-term interest rates, notably overnight repo rates **(see Section 4.9.2)**.

Deposits

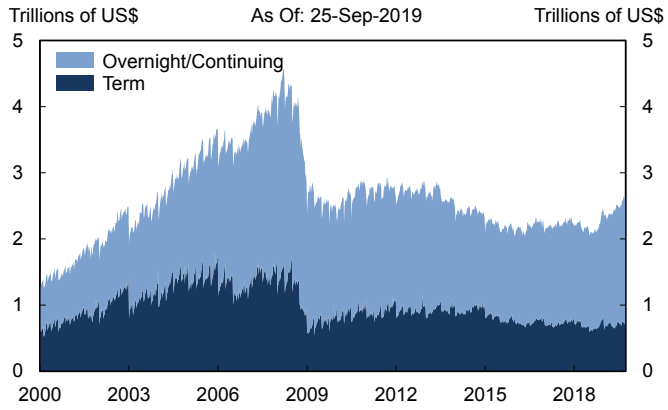
Large time deposits at commercial banks, which include wholesale certificates of deposit (CDs), stood at $1.8 trillion in September 2019, up from a low of $1.5 trillion in October 2016. The current total is around 20 percent higher than October 2016 but 14 percent below the 2008 peak of $2.1 trillion.

4.9.2 Commercial Paper Interest Rates



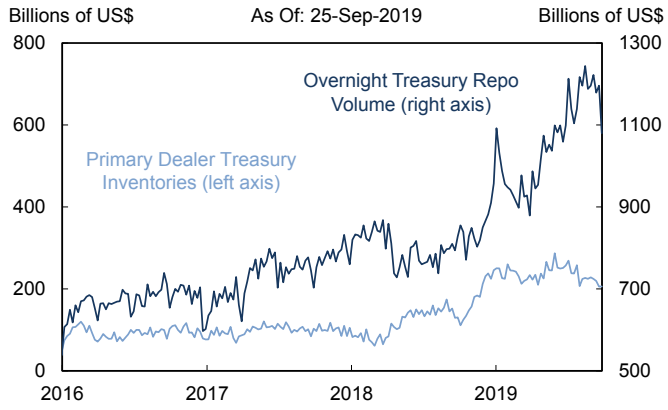
Source: Federal Reserve, Haver Analytics

4.9.3 Primary Dealer Repo Agreements



Source: FRBNY, Haver Analytics

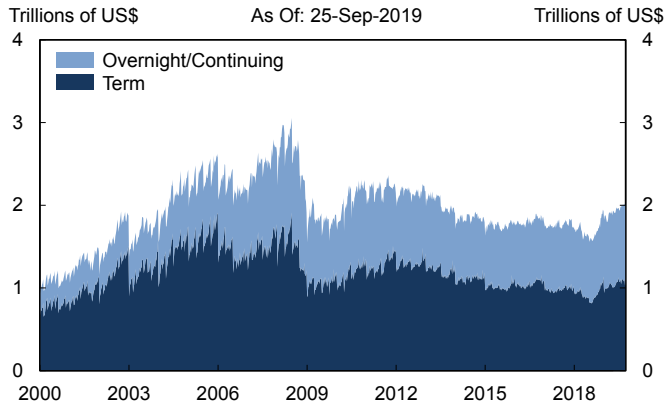
4.9.4 Overnight Repo Volumes and Dealer Inventories



Source: FRBNY, Haver Analytics

Note: Overnight Treasury repo volume includes published volumes for SOFR.

4.9.5 Primary Dealer Reverse Repo Agreements



Source: FRBNY, Haver Analytics

4.9.2 Secured Borrowing

Repo Markets

Activity in the U.S. repo market has increased over the past year. The market consists of two segments: tri-party repo, in which settlement occurs within the custodial accounts of a clearing bank (Bank of New York Mellon), and bilateral repo, which typically refers to all activity not settled within the tri-party system. Primary dealers, which are trading counterparties of FRBNY and are expected to bid in all Treasury auctions, are active in both segments of the market.

Total repo borrowing, as reported in the Federal Reserve Board's Financial Accounts of the United States, exceeded $4.2 trillion as of the second quarter of 2019, up from $3.4 trillion as of the first quarter of 2018. Within the tri-party repo market, repo volumes increased to $2.4 trillion in September 2019, up from $1.6 trillion in 2010, but short of the $2.7 trillion peak before the crisis. The total repo volumes reference all tenors and collateral types.

Primary dealer cash borrowing in the repo market increased from $2.1 trillion in September 2018 to $2.6 trillion in September 2019, the highest level since July 2013 **(Chart 4.9.3)**. The recent increase can be primarily attributed to an increase in overnight cash borrowing as a result of several factors, including primary dealers financing elevated Treasury inventories via repo markets **(Chart 4.9.4)**.

Similarly, cash lending by primary dealers in the repo market (reverse repo) increased over the past year, from $1.6 trillion in September 2018 to $2.0 trillion in September 2019, the highest level since June 2013 **(Chart 4.9.5)**. The share of overnight reverse repo has remained fairly stable at just under 50 percent. Lending at maturities of one month or longer continues to account for approximately two-thirds of term reverse repo lending.

Over the twelve months ended September 25, 2019, the proportion of high-quality collateral backing primary dealer and tri-party repo

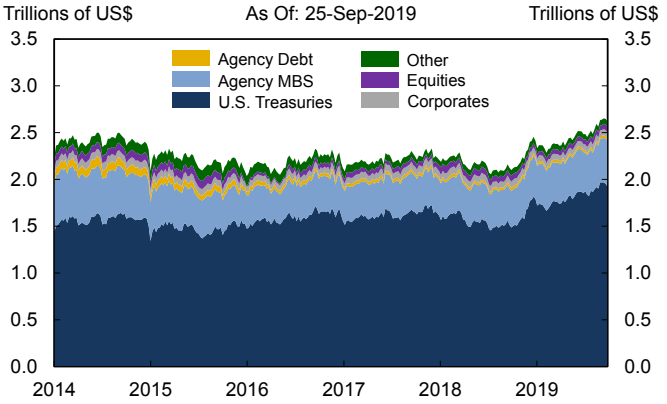
transactions recorded a modest increase **(Charts 4.9.6, 4.9.7)**. Median haircuts on collateral used in tri-party repo transactions were relatively flat for the year across most collateral classes.

Over the past twelve months, overnight Treasury repo rates experienced notable spikes, particularly at year-end 2018 and in mid-September 2019 **(Chart 4.9.8)**. On December 31, 2018, SOFR spiked by 54 basis points. The year-end impact of some banks making temporary balance sheet adjustments may have been exacerbated by relatively elevated demand for repo borrowing, in part reflecting a high volume of Treasury auction settlements and large dealer inventories. While year-end repo volatility was higher than expected, repo rates quickly returned to more normal levels, and spillovers to other benchmark short-term funding rates were negligible.

In mid-September 2019, overnight repo rates again spiked, with SOFR increasing by approximately 300 basis points. The unexpectedly high volatility in September appeared to be attributed to technical factors, including an increase in demand for funds (for example, to finance new Treasury settlements and margin calls from oil market volatility), and a decline in funds available, as corporations withdrew assets from MMFs to make quarterly tax payments. However, unlike at year-end, repo volatility spilled over to other short-term rates, including the effective federal funds rate.

In accordance with the FOMC's directive, beginning on September 17, the Open Market Trading Desk (the Desk) at the FRBNY began to conduct a series of overnight and term repo operations to help maintain the federal funds rate within the target range by adding reserves to the system. The operations have been effective in stabilizing conditions in funding markets. In October, the Desk committed to continuing these open market operations through at least January 2020. Additionally, the Federal Reserve announced it will increase the overall size of reserves to help ensure an ample

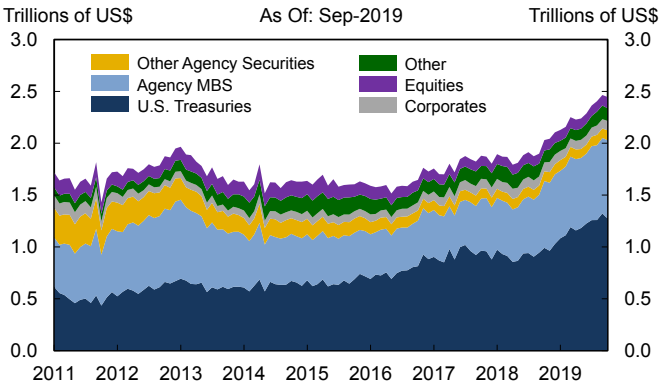
4.9.6 Primary Dealer Repo Collateral



Source: FRBNY, Haver Analytics

Note: U.S. Treasuries includes TIPS; other includes ABS.

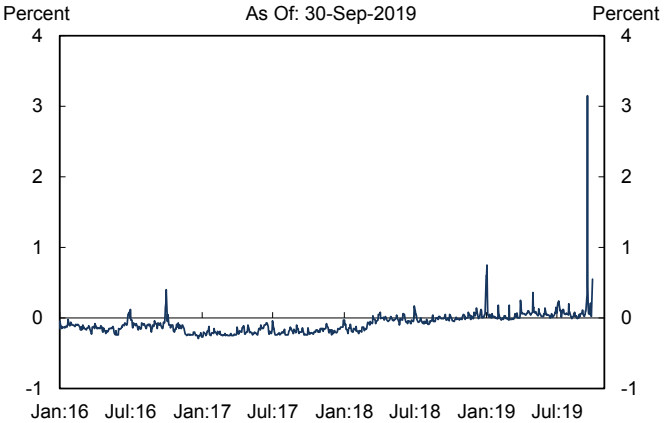
4.9.7 Collateral in the Tri-Party Repo Market



Source: FRBNY, Haver Analytics

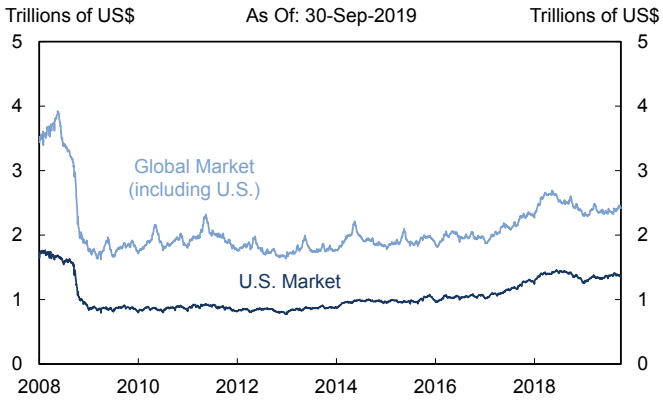
Note: Other includes ABS, CDOs, private label CMOs, international securities, money markets, municipal debt, and whole loans.

4.9.8 SOFR Spread to IOER



Source: Federal Reserve, Haver Analytics

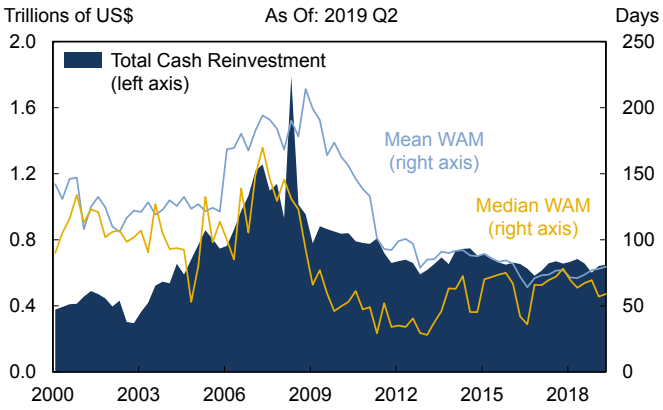
4.9.9 Value of Securities on Loan



Source: Markit Group Limited

Note: Data is based on a survey of agent-based lenders.

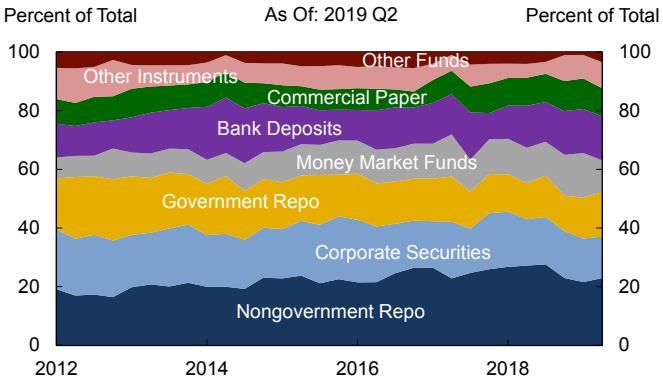
4.9.10 U.S. Securities Lending Cash Reinvestment



Source: The Risk Management Association

Note: Data is based on a survey of agent-based lenders.

4.9.11 U.S. Securities Lending Cash Reinvestment



Source: The Risk Management Association, Office of Financial Research

Note: Nongovernment repos have collateral of whole loans, equity, and corporate debt. Data is based on a survey of agent-based lenders.

level by purchasing Treasury bills, with an initial pace of $60 billion per month starting in October 2019.

Securities Lending

The value of securities on loan globally declined slightly, from $2.5 trillion in September 2018 to $2.4 trillion in September 2019 **(Chart 4.9.9)**. This decrease can largely be attributed to a decline in government bond and equity lending, which fell by $84 billion and $46 billion, respectively. The estimated U.S. share of the global activity has remained relatively flat at approximately 55 percent.

Government bonds and equities continue to account for the majority of the securities on loan globally. In September 2019, the share represented by equities was around 43 percent, while government securities accounted for approximately 45 percent of the total securities on loan.

Reinvestment of cash collateral from securities lending fell slightly over the past year, from $684 billion in second quarter of 2018 to $649 billion in the second quarter of 2019 **(Chart 4.9.10)**. The mean weighted average maturity (WAM) of cash reinvestment portfolios steadily increased while the median WAM fell over this period. This data indicates that a growing number of cash reinvestment managers are comfortable extending portfolio duration, against the backdrop of low interest rates.

The share of cash reinvestment portfolios allocated to repos backed by non-government collateral declined modestly over the past twelve months but remained over 20 percent as of the second quarter of 2019. The share of government repos increased slightly to 15 percent, while the share of corporate securities, which primarily consist of floating rate notes, fell slightly to 14 percent **(Chart 4.9.11)**.

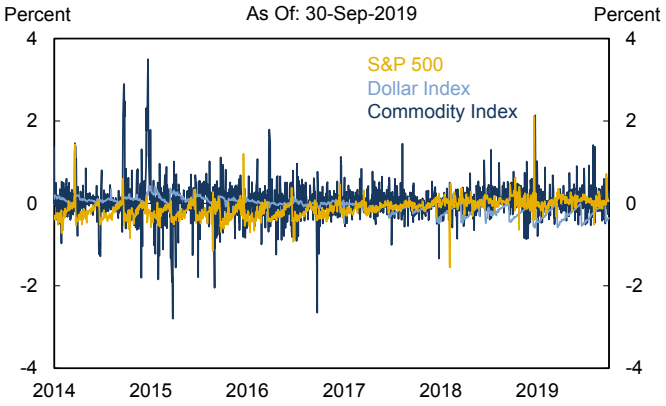
4.10 Derivatives Markets

4.10.1 Futures

Over the past year, prices for futures contracts moved in tandem with their counterparts in the underlying cash markets, and front-month futures generally traded within 1 percent of cash market prices **(Chart 4.10.1)**. However, in late December 2018, E-mini S&P 500 futures traded at a 2 percent premium, the largest spread to the cash market in over five years.

Broadly speaking, cross-market volatility rose in late 2018 and 2019 amid increased global economic and policy uncertainty **(Chart 4.10.2)**. Equity market volatility, as measured by the Chicago Board Options Exchange Volatility Index (VIX), peaked in early and late 2018 with the sell-offs in the U.S. stock market. Volatility in crude oil rose to its highest level in the past year as prices contracted in the late fall of 2018. Interest rate volatility, as measured by the 10-year U.S. Treasury Volatility Index (TYVIX), hit an all-time low of 3.16 in September 2018. Since then, interest rate volatility rose during periods of increased economic uncertainty, and in August 2019, the TYVIX reached its highest level since 2016. At the same time, speculative traders have increased their directional positions in rates futures products, and in August 2019, leveraged funds held record net short positions in longer-term Treasury futures **(Chart 4.10.3)**.

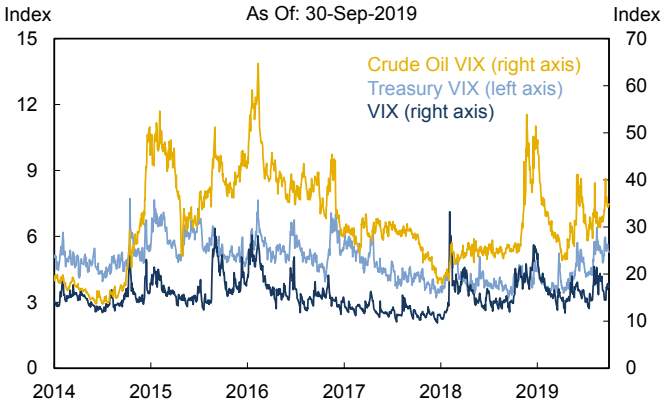
4.10.1 Futures-Spot Price Spread



Source: Bloomberg, L.P.

Note: Represents the percent spread between the front-month future and the spot price.

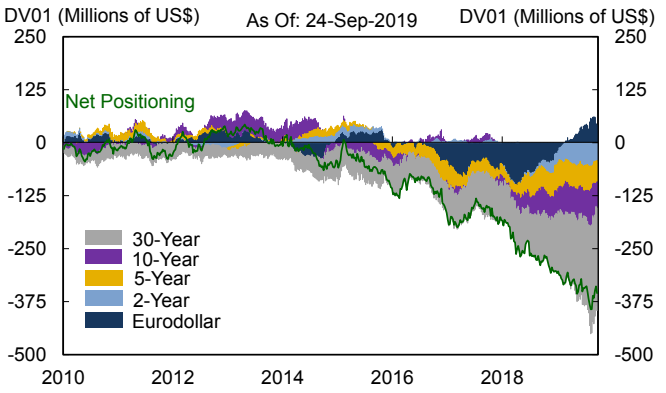
4.10.2 Market Volatility Indices



Source: Bloomberg, L.P.

Note: Crude VIX and Treasury VIX are implied volatility measures. VIX is the 1-month VIX future.

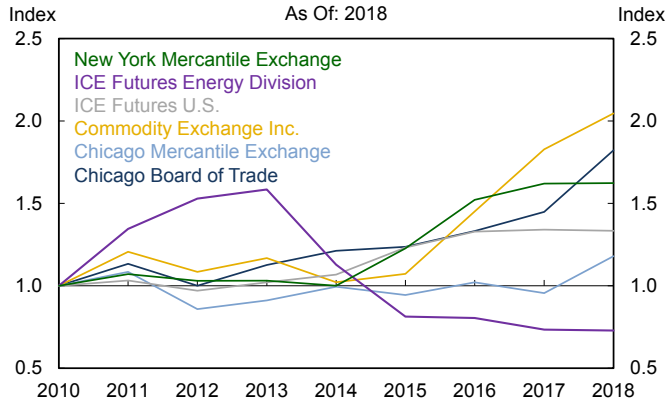
4.10.3 Leveraged Funds Net Position: Treasury & Eurodollar Futures



Source: CFTC Commitment of Traders Report, Bloomberg, L.P., Staff Calculations

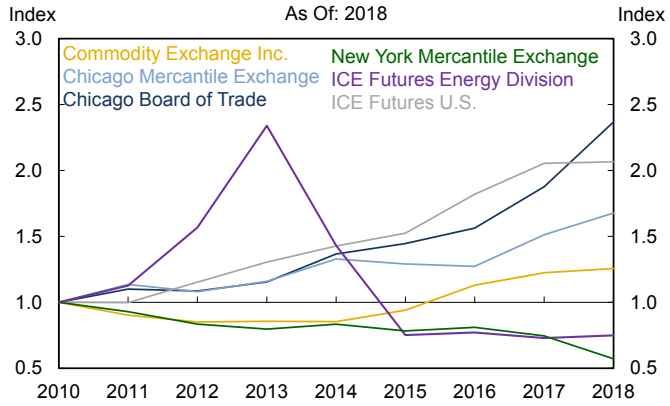
Note: Futures contracts adjusted to represent the estimated dollar value per one basis point (DV01); 10-year includes 10-Year and 10-Year Ultra Treasury Note futures; 30-Year includes Treasury Bond and Ultra Treasury Bond futures.

4.10.4 Normalized Futures Exchange Volume



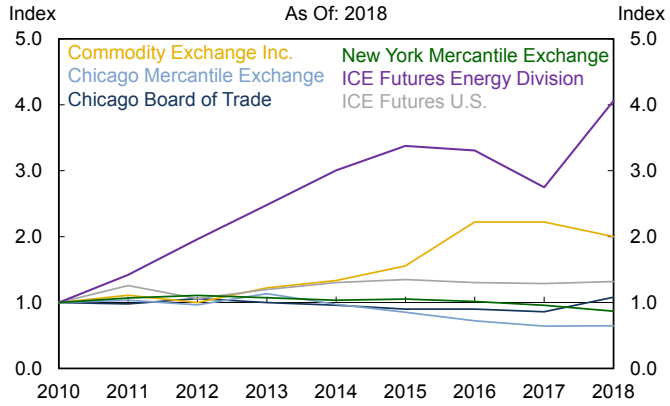
Source: CFTC

4.10.5 Normalized Futures Exchange Open Interest



Source: CFTC

4.10.6 Normalized Futures Exchange Number of Products



Source: CFTC

Volume and open interest increased on most U.S. futures exchanges in 2018, especially those where interest rate and equity index derivatives are traded **(Charts 4.10.4, 4.10.5)**. On exchanges that focus on physical commodity contracts—like energy—volume was relatively flat and open interest declined.

The number of products listed on U.S. futures exchanges was generally flat from 2017 to 2018 **(Chart 4.10.6)**. However, one exchange saw a nearly 50 percent increase in the amount of products offered, primarily in the energy sector.

4.10.2 Options

Exchange-Traded Options

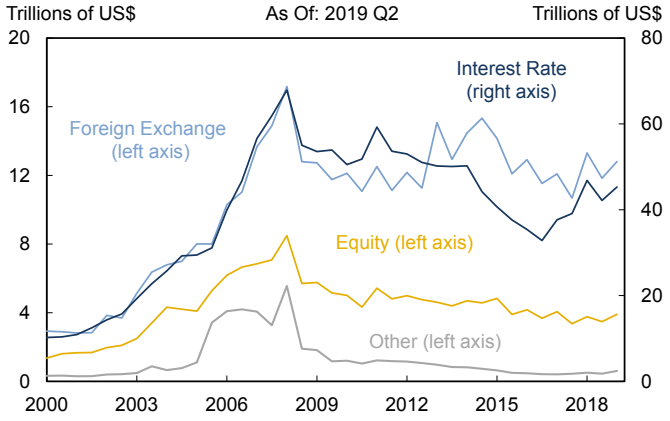
There are sixteen registered national securities exchanges that list and trade standardized equity options. About half of these exchanges (or options facilities of existing exchanges) were established in the last decade. Transactions in securities-based standardized options are all centrally cleared by the Options Clearing Corporation. The Options Clearing Corporation required approximately $46 billion in total initial margin against those transactions as of June 2019. The Options Clearing Corporation is also the issuer and guarantor of each standardized options contract. Total exchange-traded equity option volume increased by almost 24 percent in 2018. As of June 2019, there were over 4,300 equity securities underlying exchange-traded equity options.

OTC Options

Bank for International Settlements (BIS) data shows that the global notional amount outstanding of over-the-counter (OTC) options increased slightly to $63 trillion as of June 2019 **(Chart 4.10.7)**. The increase in notional amount outstanding can primarily be attributed to an increase in the notional amount of interest rate options, which have been trending upward since year-end 2016. In contrast, the amount of OTC equity options continued to trend downwards, and as of the fourth quarter of 2018, the notional amount of equity options outstanding totaled $3.5 trillion, down 60 percent from the peak of $8.5 trillion in the second quarter of 2008. It should be noted that the definition of an OTC option can vary among jurisdictions. In particular, while an OTC equity option is a derivative in the United States, these types of options (either referencing broad-based or single-name) generally are securities under the Securities Exchange Act of 1934.

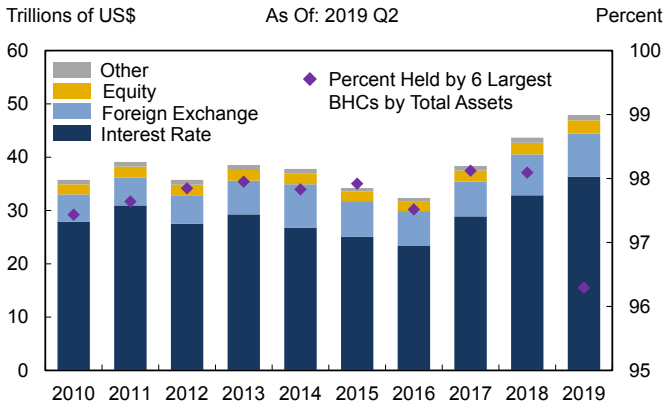
In recent years, BHCs have increased their exposure to OTC options and as of the second quarter of 2019, the notional amount of purchased and written options held by BHCs totaled $48 trillion **(Chart 4.10.8)**. Between the fourth quarter of 2016 and the second quarter of 2019, BHC exposures to OTC interest rate options (swaptions) increased by 55 percent, while exposures to OTC FX, equity, and other options increased by 26, 33, and 69 percent, respectively. At the same time, BHC net notional exposures to options—as measured by written minus purchased options—have increased from $0.9 trillion to $2.7 trillion. This increase can primarily be attributed to certain large BHCs increasing net exposures to swaptions and OTC equity options **(Chart 4.10.9)**. OTC option exposures continue to be concentrated in a small number of major institutions. According to Y-9C data, the six largest BHCs continue to account for over 95 percent of total OTC option exposures.

4.10.7 OTC Options: Global Notional Outstanding



Source: BIS, Haver Analytics

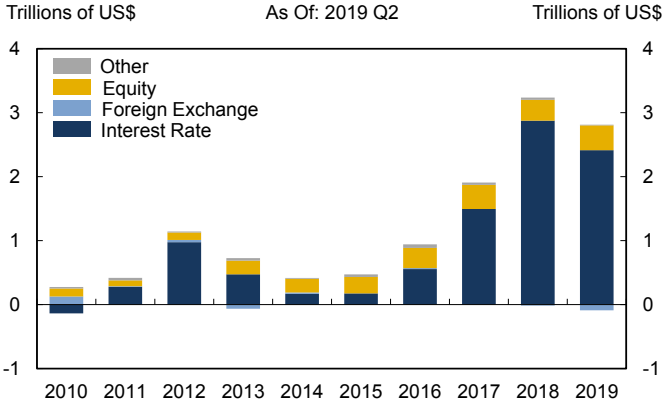
4.10.8 OTC Options: BHC Gross Notional Outstanding



Source: FR Y-9C, Staff Calculations

Note: Other includes credit, commodity, and other OTC options.

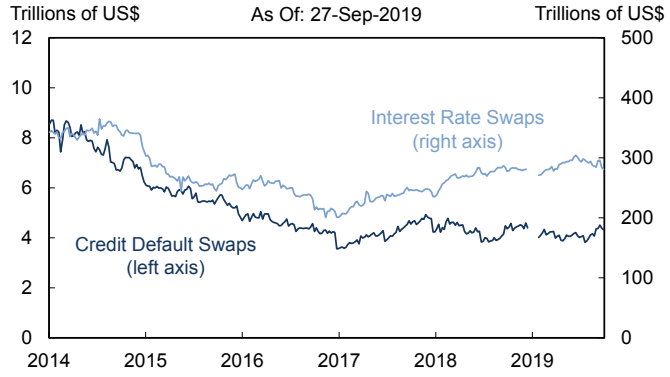
4.10.9 OTC Options: BHC Net Notional Outstanding



Source: FR Y-9C, Staff Calculations

Note: Other includes credit, commodity, and other OTC options.

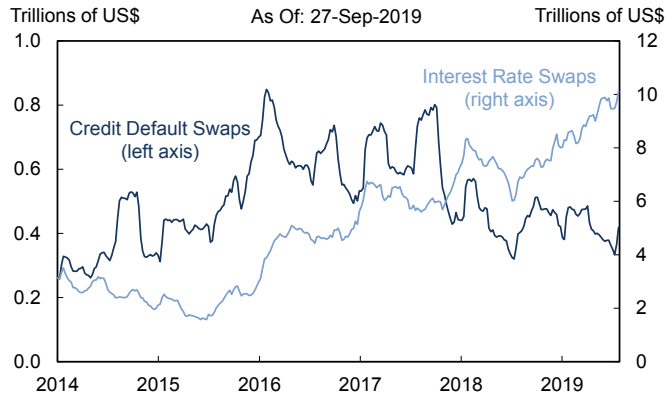
4.10.10 Derivatives Notional Amount Outstanding



Source: CFTC Weekly Swaps Report, Haver Analytics

Note: Weekly Swaps Report not issued between Dec. 22, 2018 and Jan. 26, 2019 due to a lapse in government funding; excludes security-based swaps.

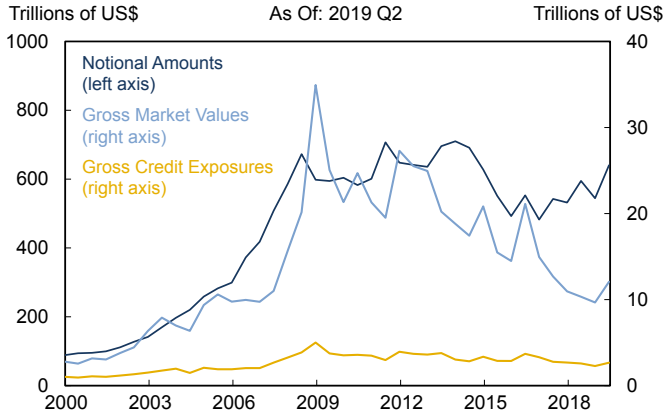
4.10.11 Derivatives Notional Volume



Source: CFTC Weekly Swaps Report, Haver Analytics

Note: 12-week moving-averages; excludes security-based swaps.

4.10.12 Global OTC Positions



Source: BIS, Haver Analytics

4.10.3 OTC Derivatives

Trends in U.S. OTC activity during the last year generally followed those seen in 2018. The notional amount of interest rate swaps outstanding continued to rise through the period, peaking at just over $300 trillion in June 2019 **(Chart 4.10.10)**. Positions on a risk-adjusted basis grew less rapidly than this gross notional trend. Outstanding interest rate swap risk, as measured on an entity-netted notional basis, increased by just over 1 percent from the end of 2018 through the first half of 2019, from $14.3 trillion to $14.5 trillion. During the same period, the notional amount of CDS outstanding remained roughly flat at just over $4 trillion. Similarly, interest rate swap volumes continued to increase through 2019, while CDS volumes were flat or falling **(Chart 4.10.11)**.

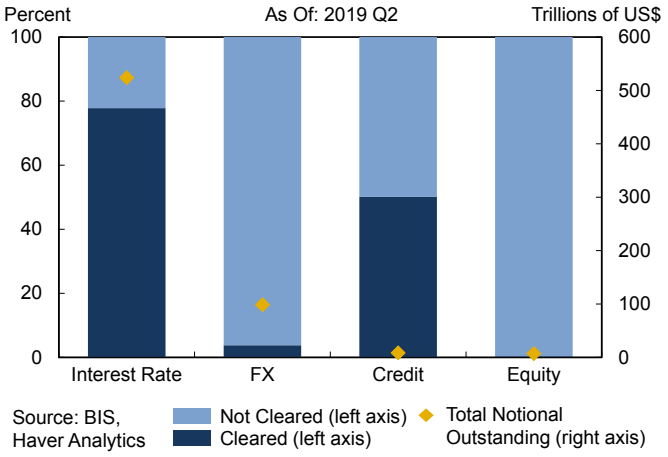
Global OTC derivative positions increased over the past year, with the total notional amount of derivatives increasing from $595 trillion in June 2018 to $640 trillion in June 2019. Market values experienced a similar increase, from $10.3 trillion in June 2018 to $12.1 trillion in June 2019 **(Chart 4.10.12)**.

4.10.4 Central Counterparty Clearing

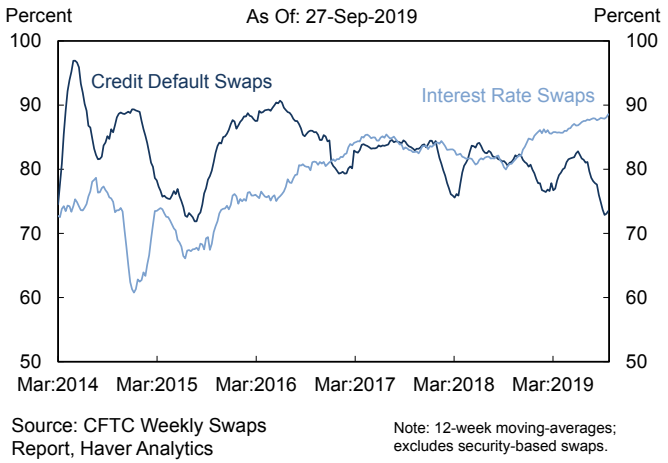
Measured by gross notional outstanding, approximately 78 percent of global OTC interest rate derivatives and 50 percent of OTC credit derivatives were centrally cleared as of June 2019. OTC equity and FX derivatives continue to have lower clearing rates. As of June 2019, less than 4 percent of outstanding OTC equity and FX derivatives were centrally cleared globally, while approximately $408 trillion in notional outstanding OTC interest rate derivatives and $4.2 trillion in notional outstanding OTC credit derivatives were centrally cleared **(Chart 4.10.13)**.

U.S. clearing rates were broadly similar to global clearing rates, and as of September 2019, 81 percent of outstanding OTC interest rate derivatives were centrally cleared, while 44 percent of OTC credit derivatives were centrally cleared. Nearly 90 percent of new U.S. interest rate swap volumes were centrally cleared as of the third quarter of 2019, slightly higher than in the previous year **(Chart 4.10.14)**. Clearing rates on new OTC credit derivative transactions fell below 75 percent in the third quarter of 2019, the lowest level in four years. This decline can primarily be attributed to an increase in the volume of products with low clearing rates. These include exotic credit products, credit swaptions, and credit total return swaps. New index CDS products continue to report clearing rates above 95 percent.

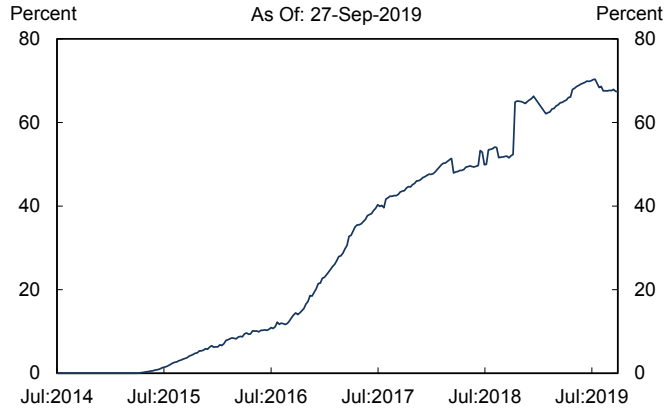
4.10.13 Global OTC Central Clearing Market Share



4.10.14 Average Clearing Rates for OTC Trading

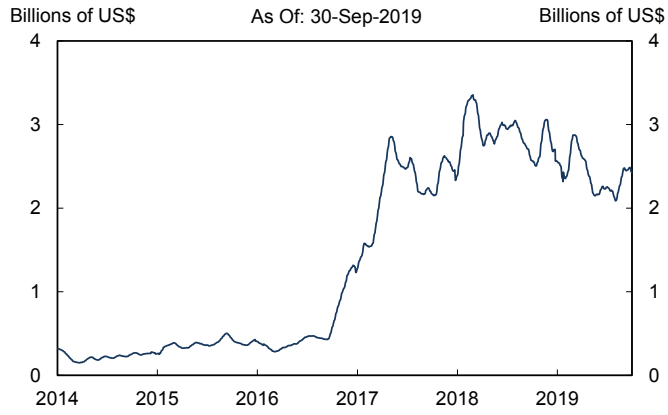


4.10.15 Clearing Rates for U.S. Inflation Swap Positions



Source: CFTC

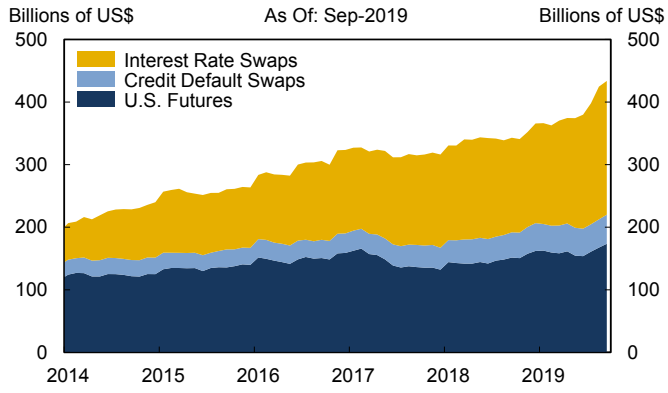
4.10.16 Initial Margin Posted against Cleared FX Positions



Source: CFTC

Note: 20-day moving-average.

4.10.17 Cleared Initial Margin Requirements



Note: Includes house and customer margin requirements. Futures margin include CME, ICEU, and ICUS. Interest rate swap margin include CME and LCH Ltd. Credit default swap margin include CME, ICC, ICEU, and LCH SA). All data are as of month-end.

Source: CFTC

Central clearing has become more prevalent throughout the world as clearing mandates have been introduced in a number of jurisdictions for the most standardized products such as fixed-float rate swaps and major credit index swaps. In addition, and more recently, margin requirements for uncleared swaps have led some market participants to centrally clear swaps voluntarily in cases where central clearing is more cost efficient. As a result, clearing rates and the amount of margin posted for centrally clearable, but not mandated, products like inflation swaps and non-deliverable forwards are significantly higher than they were a few years ago, prior to the uncleared margin requirements **(Charts 4.10.15, 4.10.16)**.

As of September 30, 2019, futures and swap initial margin held at CCPs totaled $434 billion, nearly double the amount of initial margin held by CCPs five years ago **(Chart 4.10.17)**. Much of the recent growth in initial margin held at CCPs has been margin for cleared interest rate swap products. These products now account for nearly 50 percent of total margin at CCPs, up from about 30 percent in early 2014. As of September 30, 2019, total futures customer initial margin held at CCPs was $141 billion, with $80 billion at the top five firms; total swaps (primarily interest rate and CDS) customer initial margin was $156 billion, with $95 billion held by the top five firms.

4.10.5 Futures Commission Merchants

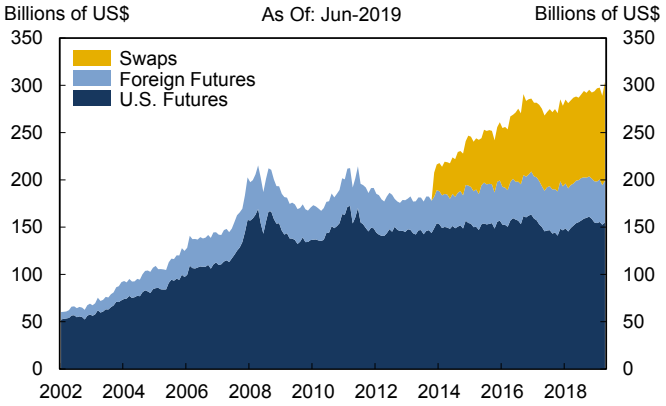
Futures Commission Merchants (FCMs) are market intermediaries registered with the CFTC. FCMs provide customers with a mechanism for access to the centrally cleared derivatives market. FCMs collect funds from customers to margin centrally cleared futures, options on futures, and swap transactions. Margin funds collected by FCMs from customers are deposited with CCPs to support customer positions and to protect the CCP in the event of customer losses.

The increased use of central clearing for certain derivative products has highlighted the critical role performed by FCMs in the reduction of systemic risk. In addition to managing the deposit and withdrawal of customer margin funds with CCPs, FCMs provide a financial guarantee to the CCP for their customers' futures, options on futures, and swap positions. Accordingly, in the event of a customer default, the FCM carrying the customer's account is obligated to use its own capital or other proprietary source of funds to satisfy the customer's financial obligation to the CCP. FCMs also may have contingent financial obligations under a CCP's mutualized loss allocation protocols.

With respect to the more established businesses of centrally cleared futures and options on futures, the level of customer margin funds held by FCMs has remained fairly flat since the financial crisis **(Chart 4.10.18)**. For the centrally cleared swaps business, where customer clearing and associated data collection have been more recently introduced, the level of customer margin funds held by FCMs has increased from about $44 billion at year-end 2014 to $109 billion as of June 2019.

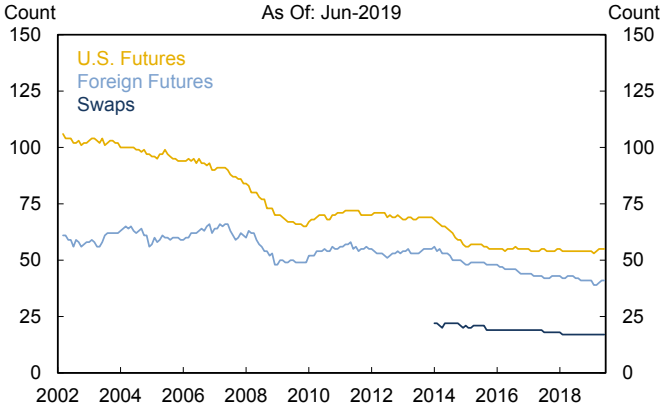
For futures and options on futures (including foreign futures traded under Part 30 of CFTC regulations), the number of FCMs registered with the CFTC holding customer funds has fallen from just over 100 in 2002 to 55 (of which 26 are bank-affiliated FCMs) as of June 2019 **(Chart 4.10.19)**. The total number of FCMs holding customer funds has remained stable over the past year. The number of FCMs reporting holding segregated client funds for the centrally cleared swaps business decreased from 23 at year-end 2014 to 17 (of which 15 are bank-affiliated FCMs) as of June 2019. The number of FCMs clearing swaps for customers remained consistent between 2018 and 2019.

4.10.18 Margin Funds Held at CFTC Registered FCMs



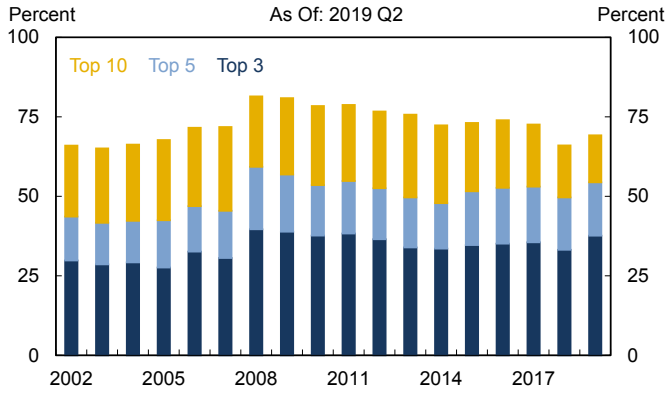
Source: CFTC

4.10.19 CFTC Registered FCMs Holding Client Funds



Source: CFTC

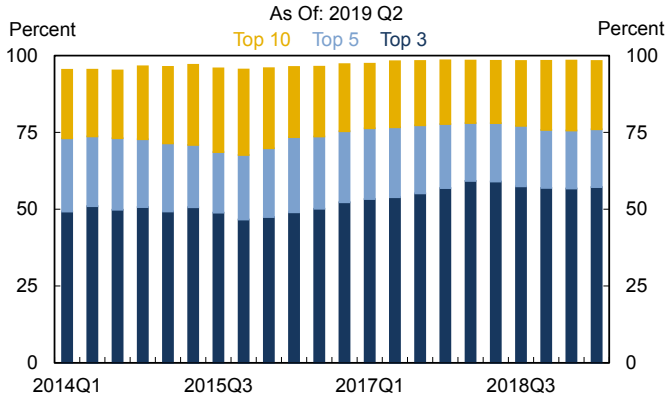
4.10.20 FCM Concentration: Customer Future Balances



Source: CFTC financial data for FCMs

Note: Represents total amount of funds that an FCM is required to segregate on behalf of customers who are trading futures and options on futures at U.S. exchanges.

4.10.21 FCM Concentration: Customer Swap Balances



Source: CFTC financial data for FCMs

Note: Represents the amount of funds an FCM is required to segregate for customers who trade cleared swaps.

Although the number of registered FCMs has fallen considerably since 2002, the clearing business has remained highly concentrated over a long period. Between 2002 and 2019, the top five clearing members at futures exchanges held 40 to 60 percent of client margin for futures products, and since 2014, the top five swap clearing members have held between 70 and 80 percent of client margin for swaps products **(Charts 4.10.20, 4.10.21)**.

The decline in the number of FCMs reflects a long-term trend of business consolidation due to technology and changes in market structure. In addition, some bank-affiliated FCMs have stated that Basel-based bank capital requirements, including the supplementary leverage ratio (SLR), have impacted their decisions regarding providing client clearing services. On June 26, 2019, the Basel Committee on Banking Supervision released a revision to the SLR's treatment of client-cleared derivatives that would allow a bank to recognize cash and non-cash initial and variation margin posted by customers in determining the bank's exposure for purposes of computing the SLR. Commenters noted that such treatment, if adopted by U.S. banking regulators, may incentivize new market entrants or expansion of clearing services that may help alleviate the concentration of client clearing services noted above. As the structure of OTC derivatives markets and clearing continues to evolve, regulators continue to monitor FCM industry trends and the possible implications for financial stability, particularly in stressed market conditions.

4.10.6 Swap Dealers

Section 1a(49) of the Commodity Exchange Act defines the term "swap dealer" (SD) to include any person who: (1) holds itself out as a dealer in swaps; (2) makes a market in swaps; (3) regularly enters into swaps with counterparties as an ordinary course of business for its own account; or (4) engages in any activity causing the person to be commonly known in the trade as a dealer or market maker in swaps. Registered SDs must comply with regulations

that address, among other things, registration, internal and external business conduct standards, reporting, recordkeeping, risk management, and margin.

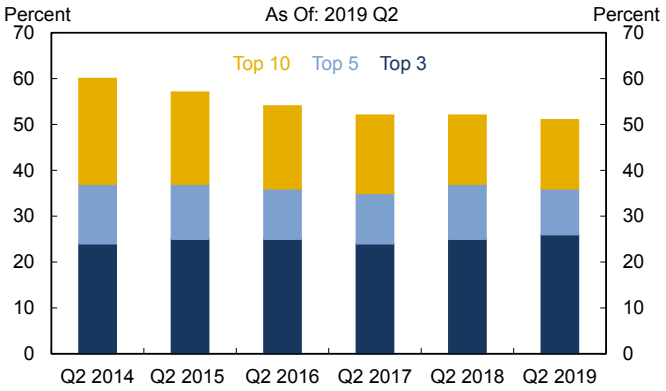
In lieu of certain CFTC and SEC requirements, registered SDs, security-based SDs, major swap participants, and major security-based swap participants for which one of the banking agencies is the prudential regulator, are subject to the margin and capital requirements of that banking agency. Additionally, in some circumstances, non-U.S. SDs may comply with foreign jurisdiction regulations rather than CFTC regulations (for example, margin requirements of a foreign jurisdiction for which a substituted compliance determination has been made by the CFTC).

SDs began registering with the CFTC in December 2012. As of September 2019, there were 107 registered SDs, an increase from the 80 provisionally registered SDs as of the end of 2013. The number of registered SDs has remained relatively steady, at approximately 90 or greater, since the end of 2014.

The swaps activity of registered SDs is relatively concentrated. For example, as of the end of the second quarter of 2019, the top three SDs by number of swap positions outstanding accounted for 26 percent of the total swap positions of registered SDs **(Chart 4.10.22)**.

Additionally, in calendar year 2017—the latest period for which this analysis was conducted—ten financial institutions were party to 78 percent of all swaps, after aggregating activity by corporate family. Registered SDs were party to over 99 percent of swaps in calendar year 2017. In both instances, the statistics do not include interaffiliate transactions or transactions between two non-U.S. persons.

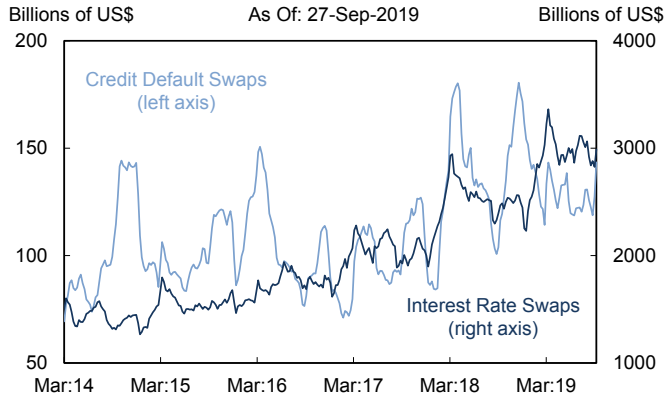
4.10.22 Concentration of Swap Positions for Registered SDs



Source: CFTC

Note: Positions between two Swap Dealers (SDs) in the same category (*e.g.*, Top 3 or Top 5) are double-counted (*i.e.*, a trade between the #1 SD and #3 SD would be counted twice).

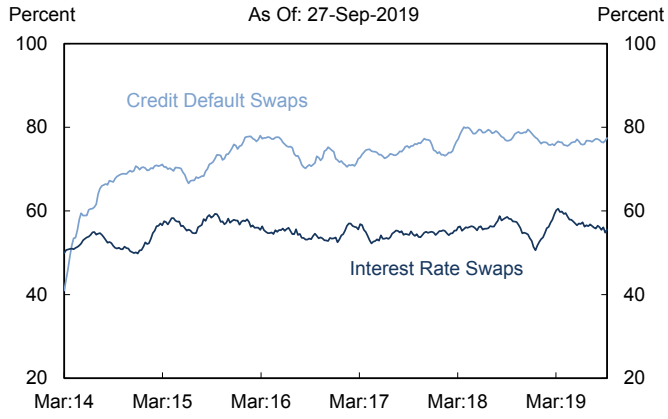
4.10.23 On-SEF Weekly Trading Volume



Source: ISDA SwapsInfo

Note: 12-week moving averages. Excludes security-based swaps.

4.10.24 On-SEF Trading Share



Source: ISDA SwapsInfo

Note: Share of notional volume. Excludes security-based swaps. 12-week moving averages.

4.10.7 Regulated Platform Trading

Similar to trends in swap clearing, the level of U.S.-regulated swaps executed on a centralized platform (that is, a Swap Execution Facility, or SEF) has continued to rise. In 2019, the average weekly notional volume for interest rate swaps was up approximately 15 percent during the first nine months of 2019 as compared to the same period in 2018. Though trading volumes for CDS indices trended down through the first nine months of 2018, the average weekly notional CDS volume on SEFs has remained at approximately the same level **(Chart 4.10.23)**. The share of interest rate swap trading that occurred on SEFs versus off SEFs decreased slightly in 2018, though it has generally returned to prior levels in 2019; the share of CDS index trading that occurred on SEFs versus off SEFs also appeared relatively unchanged in 2019 **(Chart 4.10.24)**.

Although SEF trading has increased over time, the number of fully registered SEFs decreased from 2018 to 2019, with certain SEFs going dormant as a result of a lack of trading activity. Certain interest rate swaps and CDS indices have been "made available to trade," and therefore are required to be executed on a SEF, an exempt SEF, or a designated contract market. Combined with mandatory central clearing, these regulated trading platforms have increased pre-trade price transparency, reduced operational risk due to electronic execution, and improved end-to-end processing.

4.11 Bank Holding Companies and Depository Institutions

4.11.1 Bank Holding Companies and Dodd-Frank Act Stress Tests

BHCs, including financial holding companies (FHCs), are companies that typically own at least one commercial bank subsidiary. BHCs may also include nonbank subsidiaries such as broker-dealers, investment advisers, or insurance companies. There are eight U.S. global systemically important banks (G-SIBs) (Category I BHCs) and two groups of large BHCs: large complex BHCs (Category II and III BHCs) and large noncomplex BHCs (Category IV BHCs) **(Chart 4.11.1)**. As of the second quarter of 2019, BHCs in the United States, excluding the U.S. intermediate holding companies (IHCs) of foreign banking organizations (FBOs), held approximately $17 trillion in assets. U.S. G-SIBs account for 65 percent of this total. Large complex BHCs account for 8 percent. Large noncomplex BHCs account for 10 percent. All other BHCs account for the remaining 17 percent of assets **(Chart 4.11.2)**.

Capital Adequacy

Equity capital provides a buffer to absorb losses that may result from losses on loans, securities, or trading portfolios, or other operational and legal risks. Regulatory capital at BHCs has risen significantly since the 2008 financial crisis. The ratio of common equity tier 1 (CET1) capital to risk-weighted assets of U.S. G-SIBs has more than doubled since the crisis. The groups of large complex and large noncomplex BHCs rapidly built up regulatory capital in line with U.S. G-SIBs until 2014. From 2014 through the first quarter of 2018, the CET1 ratios for these two groups of large BHCs declined. But while the CET1 ratio for the large noncomplex group continued to decline through the second quarter of 2019, the CET1 ratio for the large complex group has been rising. Both remain about 2 percentage points below the average U.S. G-SIB CET1 ratio. This difference is largely explained by the additional capital surcharges imposed on the U.S. G-SIBs. Finally, the CET1

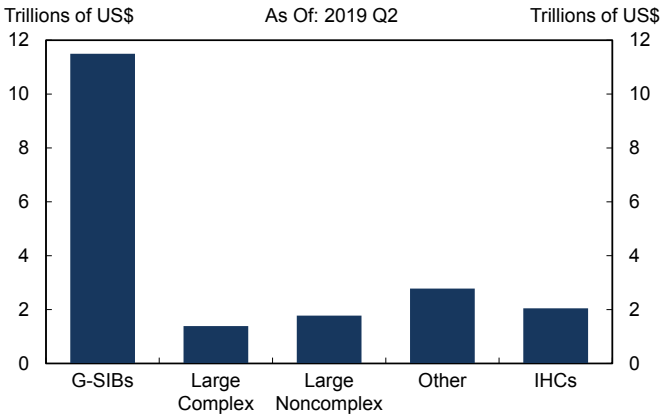
4.11.1 Categorization of Large U.S. BHCs

Description	U.S. Domestic Banking Org.	
Category 1 (U.S. G-SIBs)	Bank of America Bank of New York Mellon Citigroup Goldman Sachs	JPMorgan Chase Morgan Stanley State Street Wells Fargo
Category II (≥$700b total assets or ≥ $75b in cross-jurisdictional activity)	Northern Trust	
Category III (≥$250b total assets or ≥ $75b in nonbank assets, wSTWF, or off-balance sheet exposure)	Capital One Charles Schwab	PNC Financial U.S. Bancorp
Category IV (Other firms with $100b to $250b total assets)	Ally Financial American Express BB&T Corp. Citizens Financial Discover First Third	Huntington KeyCorp M&T Bank Regions Financial SunTrust Inc. Synchrony Financial
Other firms ($50b to $100b total assets)	Comerica Inc. CIT Group Inc. E*TRADE Financial	NY Community Bancorp Silicon Valley Bank

Source: Federal Reserve

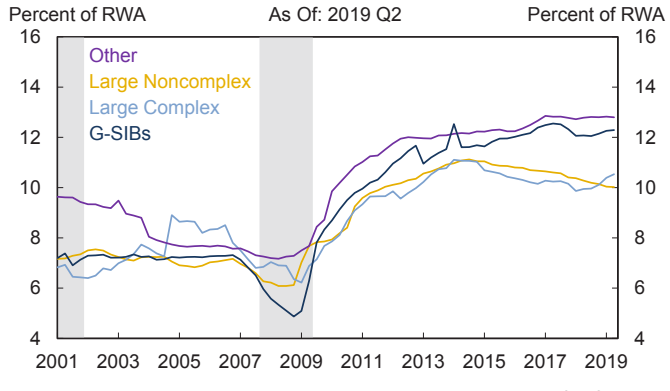
Note: Northern Trust is included in Category II because of its large cross-jurisdictional activity.

4.11.2 Total Assets by BHC Type



Source: FR Y-9C

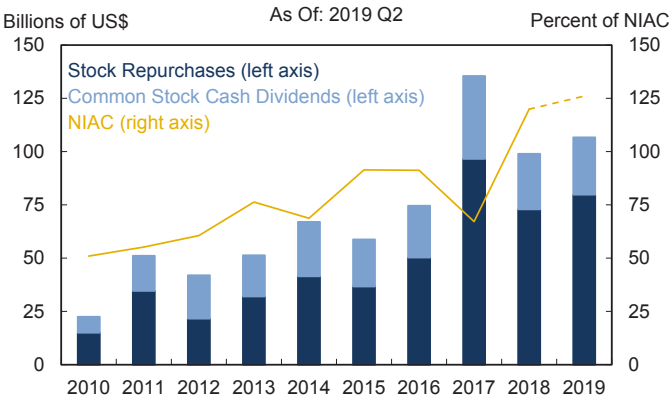
4.11.3 Common Equity Tier 1 Ratios



Note: Tier 1 common capital is used as the numerator of the CET1 ratio prior to 2014:Q1 for G-SIBs and large complex BHCs, and prior to 2015:Q1 for large noncomplex and other BHCs. The denominator is risk-weighted assets (RWA). Shaded areas indicate NBER recessions.

Source: FR Y-9C

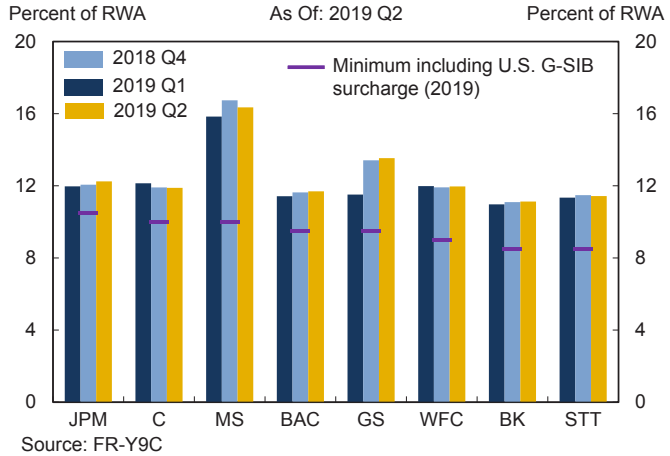
4.11.4 Payout Rates at U.S. G-SIBs



Note: Payout rates are the ratios of stock repurchases plus cash dividends to net income available to common shareholders (NIAC). NIAC is net income minus preferred dividends. 2019 data are through Q2 and are annualized.

Source: FR Y-9C

4.11.5 Common Equity Tier 1 Ratios at U.S. G-SIBs



Source: FR-Y9C

ratio of the group of other BHCs has increased by over 50 percent since the financial crisis and remains slightly above the average domestic G-SIB CET1 ratio **(Chart 4.11.3)**.

The Federal Reserve, in consultation with the FDIC and the OCC, announced on March 6, 2019, that it had voted to affirm the countercyclical capital buffer (CCyB) at the current level of 0 percent. The buffer is a macroprudential tool that would be activated when systemic vulnerabilities are meaningfully above normal and would be removed or reduced when the conditions that led to its activation abate or lessen and when the release of CCyB capital would promote financial stability.

U.S. G-SIBs meet the domestically implemented Basel III standards for the minimum risk-weighted capital ratios, the enhanced supplementary leverage ratio, capital conservation buffers, and surcharges. In addition, the stress test results show that BHCs are well capitalized and would be able to continue lending to households and firms during a severe economic downturn.

High levels of regulatory capital, coupled with improving bank profitability over the past several years, allowed U.S. G-SIBs to increase their overall payout rates, including both cash dividends and stock repurchases, above their pre-2017 averages. The overall payout rates were close to 100 percent of the net income available to common equity in 2018 and exceeded 100 percent for some firms in the first two quarters of 2019 **(Charts 4.11.4, 4.11.5)**. Public statements by some of the firms suggest capital levels may continue to decline. For example, some U.S. G-SIBs reported medium-term target CET1 ratios that are 1 to 2 percentage points below current levels. In part, the projected declines in capital ratios are driven by higher payouts.

Profitability

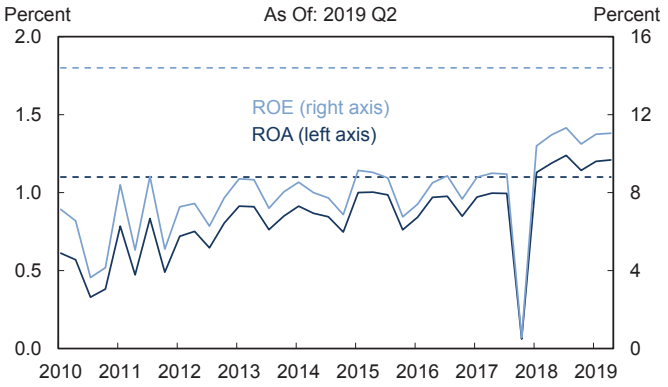
Bank profitability as measured by return on assets (ROA) and return on equity (ROE) continued to increase in 2018 and reached its highest post-crisis levels before declining in the fourth quarter of 2018. Profitability flattened in the first two quarters of 2019 **(Chart 4.11.6)**. While ROA is now around its pre-crisis average, the higher levels of capital have kept ROE about 30 percent below the average BHC ROE between 2003 and 2007.

Net interest margins (NIMs) remain near historical lows for U.S. G-SIBs. Although interest income has been rising, those gains were almost entirely offset by increasing interest expenses. In contrast, NIMs at BHCs other than U.S. G-SIBs have reached pre-crisis levels **(Chart 4.11.7)**. Growth in NIMs and bank profitability are expected to be negatively impacted by low interest rates. Deposit rates at certain BHCs have declined in recent months along with the decline in the federal funds rate.

Funding Sources

During the 2008 financial crisis, BHCs experienced disruptions in access to short-term wholesale funding. Since then, the ratio of this unstable funding source to total assets has declined to well below its 2007 level and has remained largely unchanged for the past four years. At the same time, BHCs attracted large inflows of more stable sources of funding such as core deposits. BHCs also maintained a steady share of long-term debt in recent years, including at U.S. G-SIBs, for the purposes of meeting the minimum long-term debt requirement under total loss-absorbing capacity **(Chart 4.11.8)**.

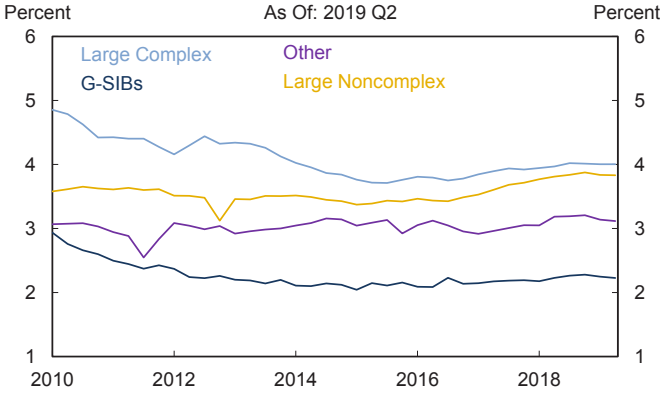
4.11.6 Return on Equity and Return on Assets



Source: FR Y-9C

Note: Dashed lines represent 2001 – 2007 averages. Return on equity is equal to net income divided by average equity. Return on assets is equal to net income divided by average assets.

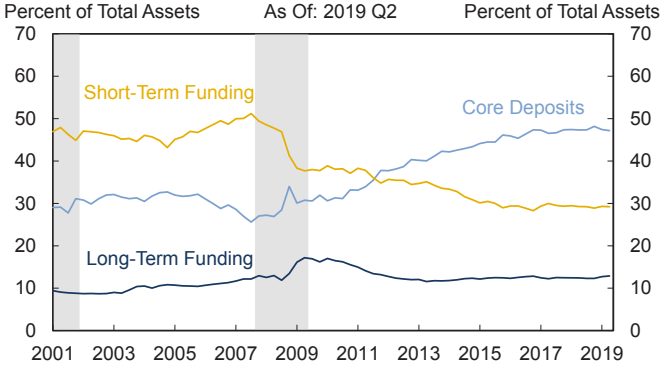
4.11.7 Net Interest Margins



Source: FR Y-9C

Note: Net interest margin is equal to net interest income divided by the quarterly average of interest-earning assets.

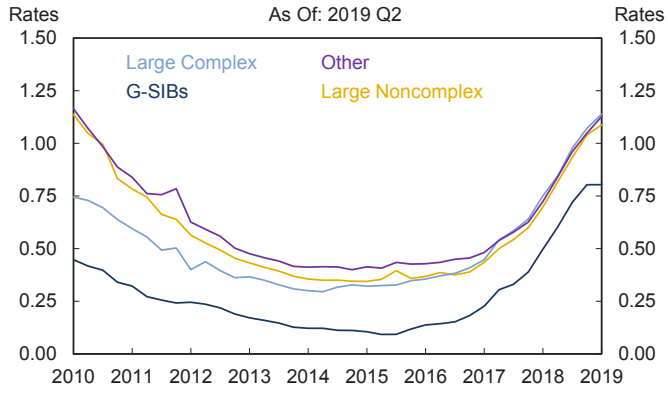
4.11.8 Selected Sources of Funding at CCAR BHCs



Source: FR Y-9C

Note: ST funding: liabilities with maturities =< 1 yr, trading liabilities, repos, CP and foreign deposits. LT funding: other borrowed money, subordinated notes and large time deposits with maturities > 1 yr. Core deposits: demand deposits, non-interest bearing balances, transaction accts, money mkt deposits and time deposits < $250K. Gray bars signify NBER recessions.

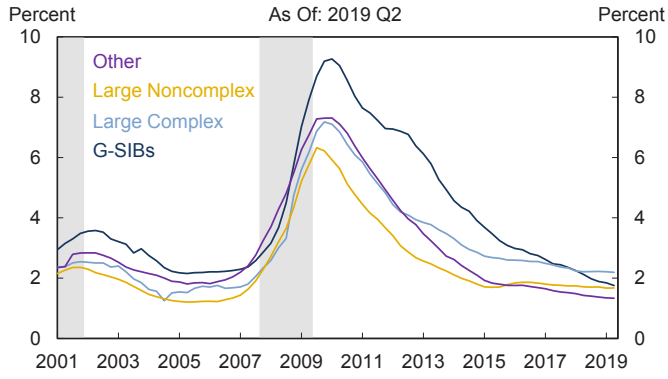
4.11.9 Effective Deposit Rates by BHC Category



Source: Call Report

Note: Quarterly, Annualized.

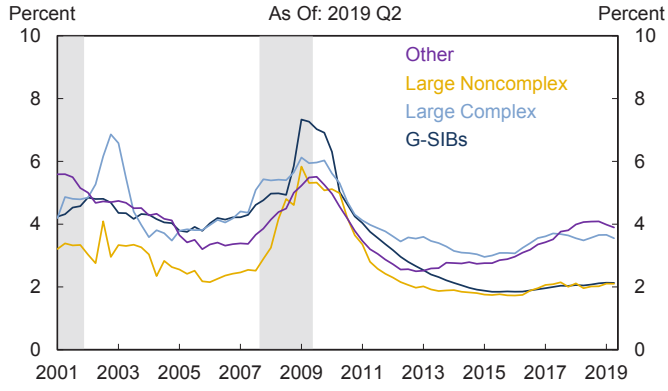
4.11.10 Delinquency Rates



Source: FR Y-9C

Note: Includes all loans in foreign and domestic offices. Delinquent loans are loans 30 days or more past due or in nonaccrual status. Gray bars signify NBER recessions.

4.11.11 Credit Card Delinquency Rates



Source: Call Report

Note: Delinquencies are determined using nonaccrual loans and loans that are past due 30 days or more. Gray bars signify NBER recessions.

Rates on interest-bearing deposits increased sluggishly following the Federal Reserve rate hikes since December 2015, the beginning of the post-crisis monetary policy normalization. Although the effective federal funds rate increased by more than 200 basis points from December 2015 to January 2019, the cumulative increase in effective deposit rates at the U.S. G-SIBs has been approximately 80 basis points. This slow pass-through of market rates into deposit rates has supported net interest rate margins at BHCs with large shares of core deposit funding **(Chart 4.11.9)**.

Asset Quality

Overall delinquency rates on all loans at U.S. G-SIBs and other BHCs continued to decline in the first half of 2019, reaching their lowest levels since 2001 **(Chart 4.11.10)**. However, disaggregated data show that delinquency rates on consumer loans continued the upward trend that started in 2014. In particular, delinquencies for credit card loans have increased notably at large noncomplex BHCs. Newer vintages of credit cards are showing higher loss rates. Delinquency rates on auto loans remained stable or recently declined at U.S. G-SIBs, while continuing to grow at a few large complex and large noncomplex BHCs **(Charts 4.11.11, 4.11.12)**.

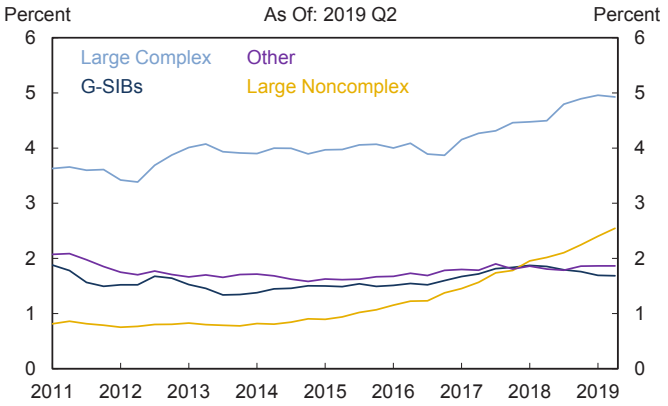
Since 2010, lending to nondepository financial institutions by U.S. G-SIBs has seen a notable increase, significantly outpacing the growth rates in commercial loans to nonfinancial firms. Loans to nondepository financial institutions at U.S. G-SIBs make up roughly 8.5 percent of their total loans as of the second quarter of 2019 **(Chart 4.11.13)**.

On a quarterly basis, the adequacy of loan loss reserves as measured by the ratio of loan loss reserves to delinquent loans has continued to improve to near its pre-crisis values. Alternatively, the ratio of reserves to net charge-offs has gradually declined since 2013 **(Chart 4.11.14)**.

The Current Expected Credit Loss (CECL) is an accounting standard issued in 2016 affecting the methods used to establish allowance for credit losses. While it is scheduled to be implemented on January 1, 2020, for SEC filers, excluding smaller reporting companies as defined by the SEC, the Financial Accounting Standards Board (FASB) proposed that the new effective date for all other calendar-year-end entities be delayed to January 1, 2023.

CECL replaces multiple impairment approaches in existing U.S. GAAP. In addition, CECL would apply to additional types of financial assets that are not covered under the incurred-loss methodology. For example, CECL applies to credit losses on held-to-maturity (HTM) debt securities. Because CECL could lead to reductions in regulatory capital, banks were given the option to phase in the regulatory capital effects of the updated accounting standard over a period of three years. In addition, the supervisory stress test modeling framework as it relates to CECL will not be revised for the 2020 and 2021 cycles.

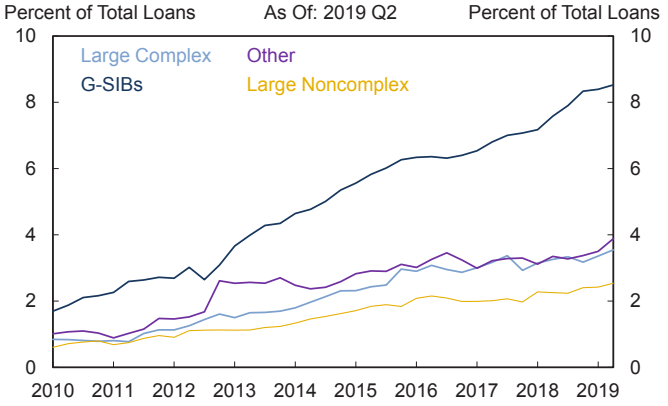
4.11.12 Auto Loan Delinquency Rates



Source: Call Report

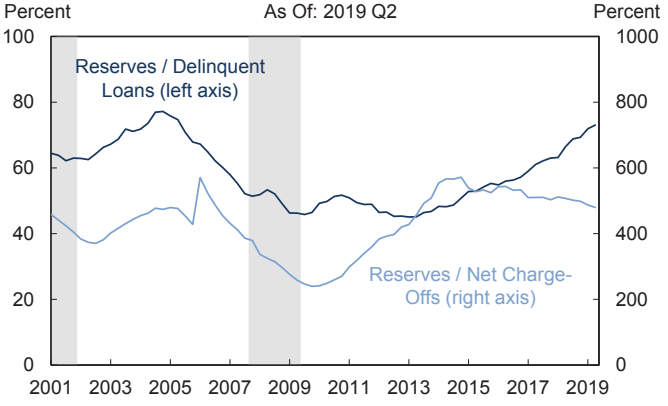
Note: Delinquencies are determined using nonaccrual loans and loans that are past due 30 days or more.

4.11.13 Loans to Nondepository Financial Institutions



Source: FR Y-9C

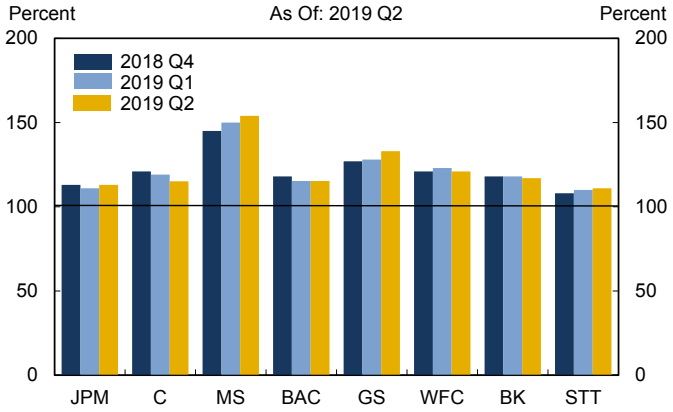
4.11.14 Loan-Loss Reserves



Source: FR Y-9C

Note: Gray bars signify NBER recessions.

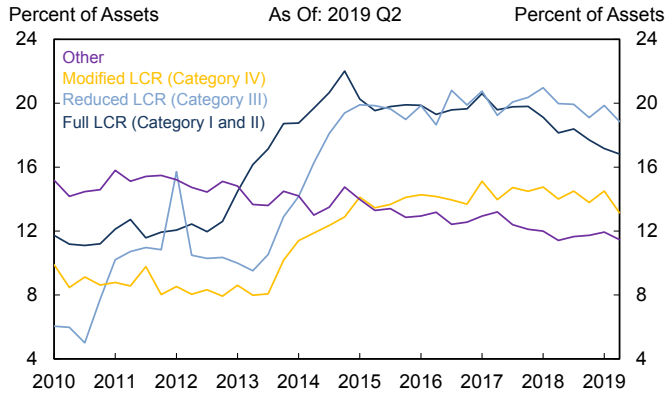
4.11.15 Liquidity Coverage Ratio



Source: LCR Disclosures from banks' websites

Note: The solid line represents the regulatory minimum.

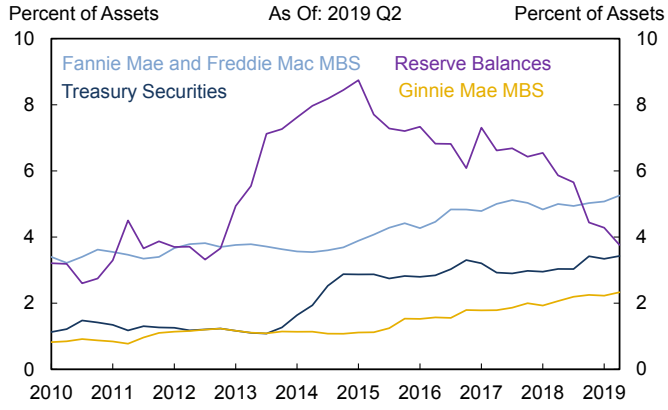
4.11.16 High-Quality Liquid Assets by BHC Type



Source: FR Y-9C, FR 2900

Note: HQLA is estimated by adding excess reserves to an estimate of securities that qualify for HQLA. Haircuts and level 2 asset limitations are incorporated into the estimate.

4.11.17 Selected Liquid Assets at All BHCs



Source: FR Y-9C, FR 2900

Liquidity Management

All U.S. G-SIBs were in compliance with the liquidity coverage ratio (LCR) as of the second quarter of 2019 **(Chart 4.11.15)**. Holdings of high-quality liquid assets (HQLA) at BHCs subject to the standard LCR remained relatively flat at around 20 percent of assets from the time the rule went into effect in 2015 until 2017, but have declined since 2017, reaching 17 percent of assets in the second quarter of 2019 **(Chart 4.11.16)**. Under the final tailoring rule, U.S. G-SIBs and Category II BHCs will continue to be subject to the full (standard) LCR. Category III BHCs will be subject to a reduced 85 percent LCR if their weighted short-term funding is below $75 billion and to the full LCR otherwise. Category IV BHCs will be exempted from the LCR if their weighted short-term wholesale funding is less than $50 billion and will face a reduced 70 percent LCR otherwise.

The declines in HQLA at the largest BHCs are primarily driven by declines in reserves that began to shrink before the start of the normalization of the Federal Reserve's balance sheet. BHCs have used the decrease in reserves to increase their holdings of Treasury securities, agency debt, and agency MBS **(Chart 4.11.17)**.

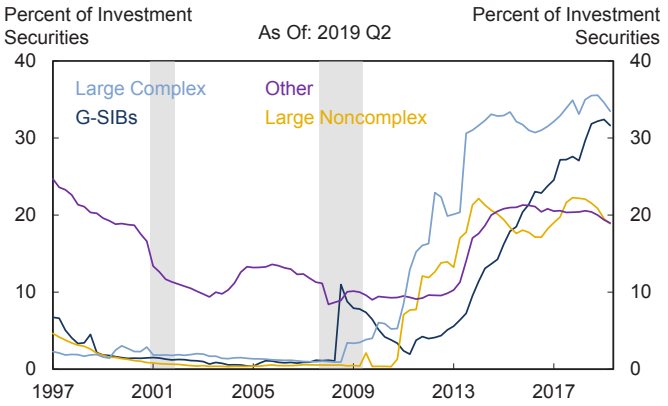
U.S. G-SIBs and large complex BHCs have increased the proportion of their investment securities that are categorized as HTM since 2011. This ratio now exceeds 30 percent of their investment securities portfolio. The accounting treatment of HTM securities allows BHCs to avoid the volatility associated with incorporating market gains and losses on securities for regulatory capital calculations **(Chart 4.11.18)**.

The estimated duration gap between the timing of cash inflows from assets and cash outflows from liabilities—a measure of interest rate risk at BHCs—has slightly declined at U.S. G-SIBs over the past two years but remains at the high end of its post-crisis distribution. Institutions with higher duration gaps, which derive a higher share of income from interest-earning assets and fund their operations with a larger share of wholesale short-term funding, are more susceptible to interest rate risk. Therefore, earnings and capital of those institutions are likely to be more sensitive to changes in the yield curve. The flattening of the yield curve and expectations for lower interest rates are likely to negatively impact profitability and capital at such firms **(Chart 4.11.19)**.

Market Perception of Value and Risk

After rapid appreciation in late 2016 and 2017, stock prices of U.S. G-SIBs erased much of their gains at the end of 2018. The stock prices of U.S. G-SIBs partially retraced 2017 gains by the third quarter of 2019 and remain well above early 2016 levels. The appreciation observed in late 2016 and 2017 was driven by market expectations of higher bank earnings and higher capital distributions resulting from the effects of the recently enacted tax reform and the reforms of supervisory and regulatory requirements by federal bank regulatory agencies. However, concerns about economic slowdown and lower interest rates weakened the BHC profit outlook at the end of 2018 **(Chart 4.11.20)**.

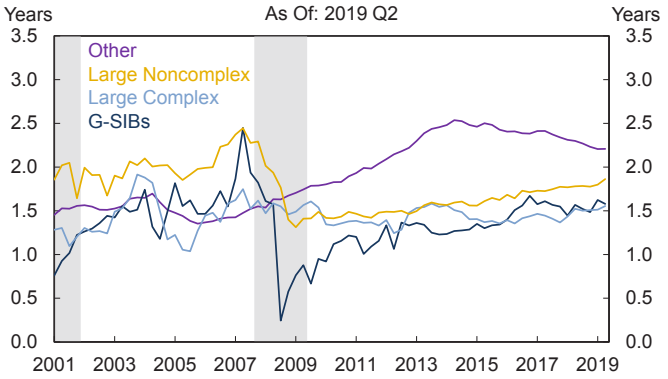
4.11.18 Held-to-Maturity Securities



Source: Call Report

Note: Investment securities are held-to-maturity securities plus available-for-sale securities. Gray bars signify NBER recessions.

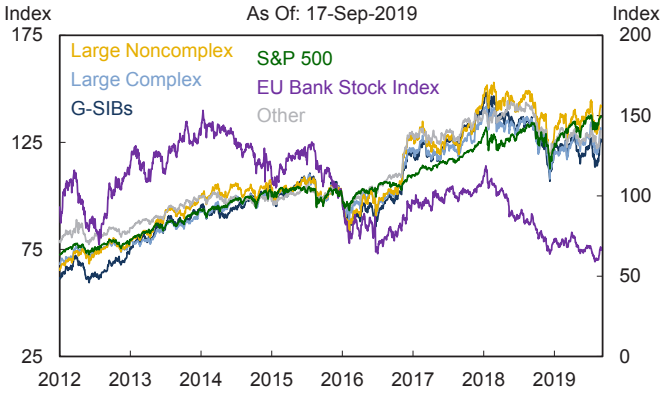
4.11.19 Duration Gap



Source: Call Report

Note: Duration gap is the approximate weighted-average time of cash inflows less the approximate weighted-average time of cash outflows. Gray bars signify NBER recessions.

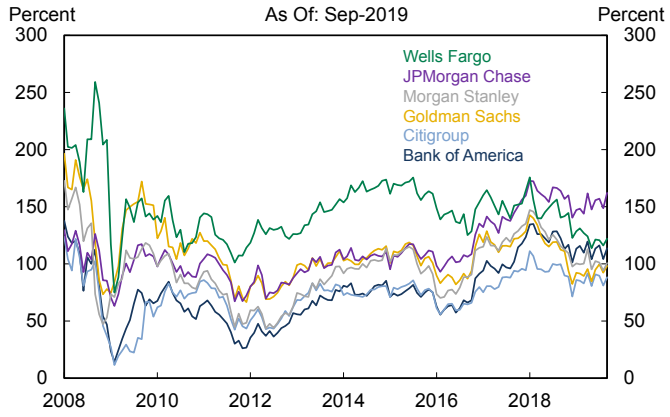
4.11.20 Bank Stock Performance



Source: Bloomberg, L.P.

Note: January 2, 2016 = 100. EU Bank Stock Index created from stock price information for the following banks: BCS, BNPQY, CS, ACA, DB, SAN, UBS. All indexes are created by equally weighting banks.

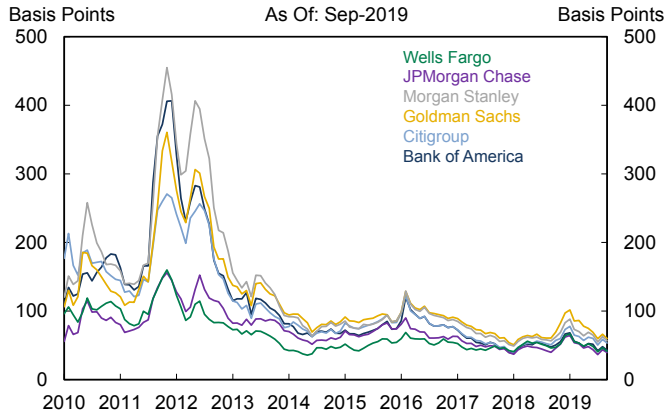
4.11.21 Price-to-Book



Source: SNL Financial

Note: Month-end values.

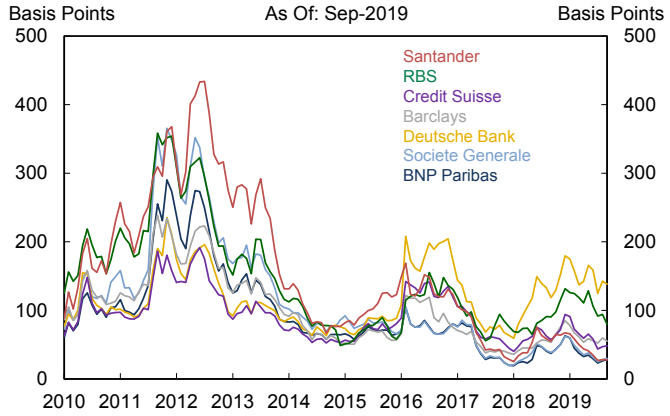
4.11.22 U.S. Banks 5-Year CDS Spreads



Source: Bloomberg, L.P.

Note: Monthly averages.

4.11.23 Foreign Banks 5-Year CDS Spreads



Source: Bloomberg, L.P.

Note: Monthly averages.

The stock prices of European banks continued to underperform relative to U.S institutions and in September 2019 the EU Bank Stock Index approached its July 2016 lows. The underperformance of Deutsche Bank's stock price weighed on the broader EU Bank Stock Index, and in May 2019 Deutsche Bank's stock price hit a record low following the breakdown of its merger talks with Commerzbank. In June 2019, the firm announced a major restructuring that includes a significant reduction in investment banking activities and major overhauls in its operations, including the creation of a so-called bad bank to hold up to €50 billion of poorly performing assets. In addition, Deutsche Bank announced the reorganization of its Treasury function in August 2019. As part of this reorganization, Deutsche Bank combined all treasury market and investment operations into a single unit to streamline liquidity management operations and help offset the impact of continued negative rates in Europe.

Price-to-book ratios for six of the U.S. G-SIBs followed similar patterns to their stock performance, trending higher in 2017 and decreasing in the second half of 2018 **(Chart 4.11.21)**. The market turmoil at the end of 2018 pushed the price-to-book ratios of Citigroup, Goldman Sachs, and Morgan Stanley below 100. While price-to-book ratios have begun to recover, most remain below the levels in the first half of 2018. As of September 2019, Bank of America, JPMorgan Chase, Morgan Stanley, and Wells Fargo had price-to-book ratios above 100 percent.

CDS spreads, which measure the cost of insurance against credit default risk, remained at very low levels in 2017 for six of the U.S. G-SIBs and select foreign banks. Such premiums moved up at the end of 2018 in response to episodes of equity market volatility but have reverted in 2019 to low levels by historical standards for U.S. G-SIBs. FBOs such as Deutsche Bank and Royal Bank of Scotland saw their credit spreads increase in 2018 and the spreads remain elevated **(Charts 4.11.22, 4.11.23)**.

Dodd-Frank Act Stress Tests and Comprehensive Capital Analysis and Review

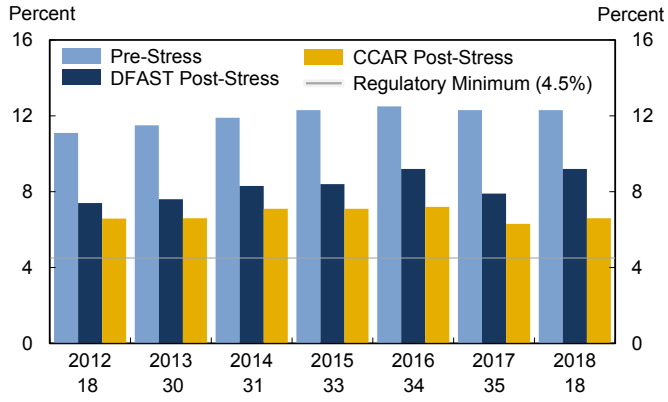
The Dodd-Frank Act Stress Tests (DFAST), a forward-looking exercise conducted by the Federal Reserve, evaluates whether participating BHCs and IHCs have sufficient capital to absorb losses over a nine-quarter period resulting from stressful economic and financial market conditions in hypothetical supervisory scenarios. As part of DFAST, firms must report their company-run stress test results to the Federal Reserve, their primary regulator, and the public.

In the 2019 stress test cycle, EGRRCPA exempted firms with less than $100 billion in total assets from enhanced prudential standards, including supervisory stress test requirements. Only BHCs and IHCs with total consolidated assets of $250 billion or more are subject to periodic company-run stress-testing requirements. EGRRCPA provides that banks with between $100 billion and $250 billion in total consolidated assets are automatically subject only to supervisory stress tests, while the Federal Reserve has discretion to apply other individual enhanced prudential provisions to these banks. The Federal Reserve proposed a two-year stress test cycle and did not apply individual enhanced prudential provisions to any firm with total consolidated assets between $100 billion and $250 billion. As a result, although 35 BHCs and IHCs continue to be subject to supervisory stress test requirements because they have over $100 billion in total consolidated assets, only 18 of these firms (those with total consolidated assets exceeding $250 billion) were subjected to both supervisory and company-run stress tests in 2019.

In March 2019, the Federal Reserve published an enhanced disclosure of the methodology behind its supervisory models and modified the use of "qualitative objection" in its Comprehensive Capital Analysis and Review (CCAR) exercise. The enhanced disclosure is designed to improve the public's understanding of stress test results and strengthen the credibility of the test. The use of the qualitative objection in the CCAR exercise was modified starting with the 2019 cycle. Specifically, firms must have participated in four CCAR exercises and successfully passed the qualitative evaluation in the fourth year to no longer be subject to a potential qualitative objection. While the qualitative objection no longer applies to certain firms, all BHCs and IHCs subject to the Federal Reserve's capital plan rule continue to be subject to a rigorous evaluation of their capital planning processes as part of CCAR.

In June 2019, the Federal Reserve released the results of DFAST and CCAR. The severely adverse scenario used in DFAST 2019 reflected conditions of a severe downturn in the U.S. economy with a large increase in unemployment; a severe recession in the euro area, the United Kingdom, and Japan; and a shallow recession in developing Asia.

4.11.24 Initial and Stressed Capital Ratios



Note: For DFAST, 2013-2015 bars show Tier 1 Common Capital Ratio and 2016-2018 bars show CET1 Ratio. The x-axis labels represent the number of banks tested within a given year.

Source: Federal Reserve

4.11.25 Federal Reserve's Actions in CCAR 2019

Non-Objection to Capital Plan	
Bank of America	Morgan Stanley
Bank of New York Mellon	Northern Trust
Barclays USA	PNC
Capital One Financial	State Street
Citigroup	TD Group U.S.
DB USA	UBS Americas
Goldman Sachs	US Bancorp
HSBC North America Holdings	Wells Fargo
JPMorgan Chase	

Conditional Non-Objection to Capital Plan
Credit Suisse Holdings (USA)

Source: Federal Reserve

In the DFAST 2019 severely adverse scenario, the aggregate projected CET1 ratio for the 18 BHCs fell from 12.3 percent to a minimum level of 9.2 percent, which was still well above the minimum requirement of 4.5 percent. The loss rates in DFAST 2019 were well in line with the loss rates in the 2015 to 2017 stress test exercises. Aggregate loan losses as a percent of average loan balances in the severely adverse scenario have declined since early stress test exercises largely as a result of improvements in firms' portfolio quality **(Chart 4.11.24)**.

In the qualitative assessment of BHCs through CCAR, the Federal Reserve evaluates the capital adequacy and the capital planning processes of the BHCs and IHCs, including the quality of the risk-management frameworks and the proposed capital actions such as dividend payments and stock repurchases.

The Federal Reserve issued a conditional non-objection to Credit Suisse based on identified weaknesses in its capital adequacy process that can be addressed in the near term. Specifically, the Federal Reserve identified weaknesses in the assumptions used by the firm to project stressed trading losses that raise concerns about the firm's capital adequacy and capital planning process **(Chart 4.11.25)**. Capital One and JPMorgan Chase had to revise their capital plans in order to maintain their post-stress regulatory capital ratios above minimum requirements in the severely adverse scenario. Under the proposed and revised capital distribution plans, the weighted-average CET1 ratio for the 18 firms fell from 12.3 percent to a minimum level of 6.6 percent under the severely adverse scenario.

4.11.2 Insured Commercial Banks and Savings Institutions

As of the second quarter of 2019, the banking industry included 5,303 FDIC-insured commercial banks and savings institutions with total assets of $18.3 trillion. There were 1,230 institutions with assets under $100 million and 792 institutions with assets over $1 billion.

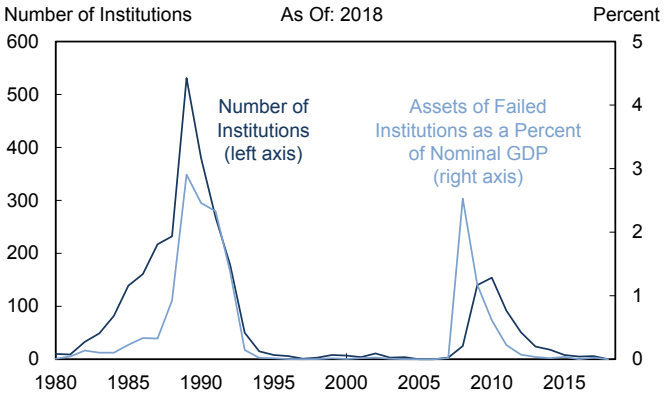
During 2018, 259 institutions were absorbed by mergers while eight new charters were added. Failures of insured depository institutions are down significantly since the financial crisis, and no institutions failed in 2018 **(Chart 4.11.26)**.

As of year-end 2018, the FDIC's "problem bank" list included 60 institutions—1.1 percent of all institutions—in comparison to 95 banks the prior year. Banks on this list have financial, operational, or managerial weaknesses that require corrective action in order to operate in a safe and sound manner.

The total assets of U.S. commercial banks and savings institutions increased by $852 billion between the fourth quarter of 2017 and the second quarter 2019. Loans and leases increased by $579 billion during that period. All major loan categories grew over this period, with C&I, CRE, 1-4 family residential mortgages, and consumer loans growing by 10.3 percent, 5.9 percent, 4.0 percent, and 4.2 percent, respectively. Banks increased their investment securities by $147 billion since year-end 2017, with MBS up by 7.0 percent and U.S. Treasury securities balances up by 15.0 percent.

Full-year 2018 net income for all U.S. commercial banks and savings institutions totaled $237 billion, representing a 44 percent increase from full-year 2017, driven by a rise in net interest income and lower income tax expenses and loan loss provisions **(Chart 4.11.27)**. Net interest income rose by 8.5 percent in 2018 due to interest income outpacing interest expense. Interest-earning assets grew 3.1 percent in 2018.

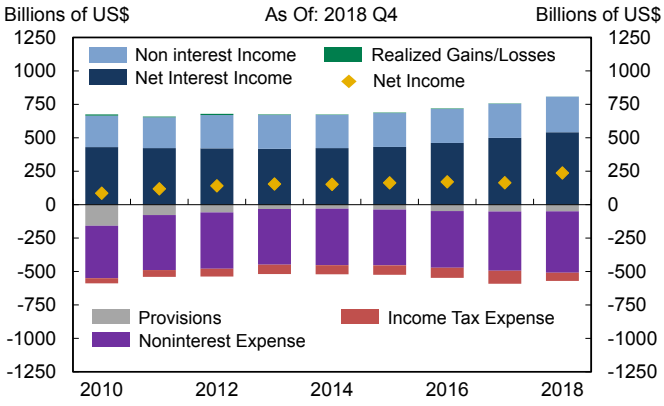
4.11.26 FDIC-Insured Failed Institutions



Source: BEA, FDIC, Haver Analytics

Note: No FDIC-insured institutions failed during 2005, 2006, and 2018.

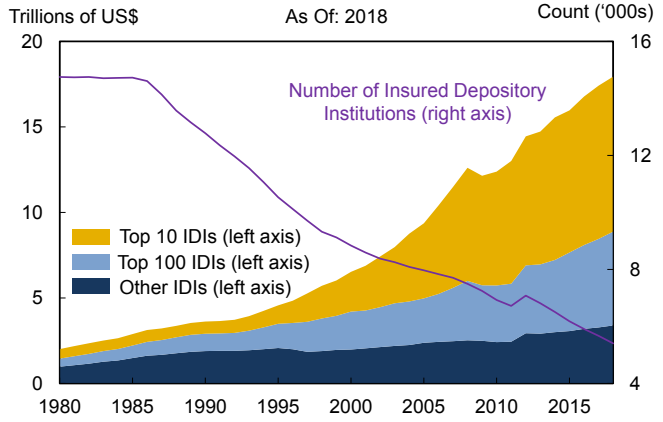
4.11.27 Commercial Bank and Thrift Net Income



Source: FDIC

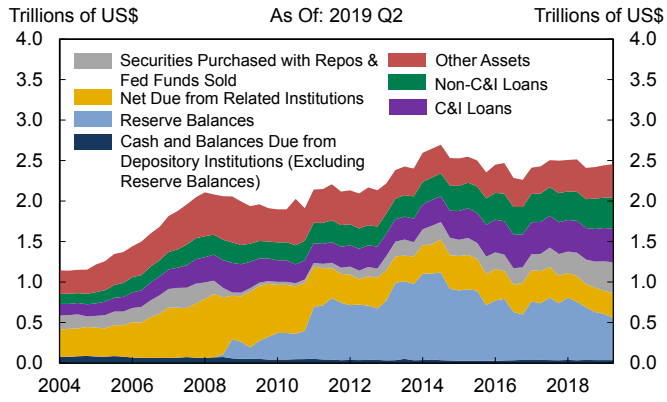
Note: Includes all FDIC-insured commercial banks and thrifts.

4.11.28 Total Assets of Largest Insured Depository Institutions



Source: FFIEC Call Report

4.11.29 U.S. Branches and Agencies of Foreign Banks: Assets



Source: Federal Reserve, Haver Analytics

Note: Other assets includes government securities, asset-backed securities, and other trading assets.

Nearly 80 percent of commercial banks and savings institutions reported higher earnings in 2018. Credit quality continues to improve. The noncurrent ratio declined to below 1 percent (0.99 percent) of total loans. Loan loss provisions declined 2.2 percent from year-end 2017.

The long-term trend of banking industry consolidation continued in 2018, as the 10 largest institutions continued to hold over 50 percent of total industry assets **(Chart 4.11.28)**. The 100 largest institutions hold over 81 percent of total industry assets, which is an historical high. In 2018, the total number of banks and savings associations decreased to 5,406, which was a historical low.

4.11.3 U.S. Branches and Agencies of Foreign Banks

As of June 30, 2019, assets of U.S. branches and agencies of foreign banks totaled $2.5 trillion, unchanged from June 30, 2018, and roughly 14 percent of total U.S. banking assets **(Chart 4.11.29)**. Reserve balances for U.S. branches and agencies of foreign banks totaled 21 percent of total assets as of June 30, 2019, a decrease of 28 percent from the prior year. Recent declines in reserve balances were associated with increases in the federal funds rate as compared to the interest rate on excess reserves (IOER rate). This change in spread made it less attractive for FBOs to maintain excess reserves. The changing composition of liquidity buffers, from reserves to securities holdings, also impacted reserve balances at U.S. branches and agencies of foreign banks.

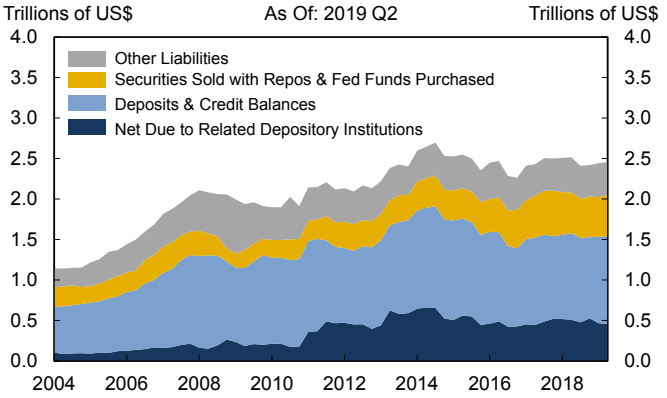
Securities purchased under agreement to resell (reverse repos) at U.S. branches and agencies of foreign banks increased by 32 percent from June 30, 2018 to June 30, 2019. Reverse repos represented 16 percent of total assets at U.S. branches and agencies of foreign banks as of June 30, 2019, compared to 12 percent of total assets one year prior. Increases in reverse repos were linked to declines in reserve balances, as U.S. branches and agencies of foreign banks generally shifted excess liquidity from reserves

to reverse repos to take advantage of higher yields in the repo market.

As of June 30, 2019, total loan balances accounted for approximately 33 percent of total assets at U.S. branches and agencies of foreign banks. C&I lending remained a significant portion of overall lending by U.S. branches and agencies of foreign banks, with a ratio of C&I loans to total loans of approximately 52 percent as of June 30, 2019. C&I loan levels rose 6 percent between June 30, 2018 and June 30, 2019.

Deposits and credit balances represented 44 percent of total liabilities for U.S. branches and agencies of foreign banks as of June 30, 2019 **(Chart 4.11.30)**. Federal funds purchased totaled 0.9 percent of total liabilities for U.S. branches and agencies of foreign banks as of June 30, 2019, and declined 35 percent year-over-year. U.S. branches and agencies of foreign banks generally reduced reliance on federal funds purchased as the cost of this funding source escalated from June 30, 2018 to June 30, 2019. Securities sold under agreement to repurchase for U.S. branches and agencies of foreign banks amounted to 20 percent of total liabilities as of June 30, 2019, and increased 4 percent year-over-year.

4.11.30 U.S. Branches and Agencies of Foreign Banks: Liabilities



Source: Federal Reserve, Haver Analytics

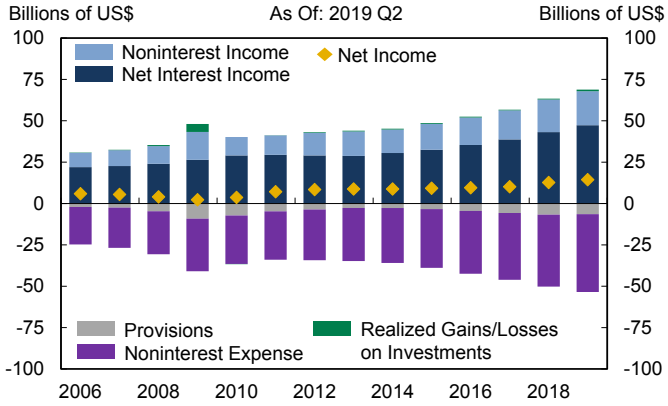
Note: Other liabilities includes transaction accounts, non-transaction accounts, and other borrowed money.

4.11.4 Credit Unions

Credit unions are member-owned, not-for-profit, depository institutions. As of the second quarter of 2019, there were 5,308 federally insured credit unions with aggregate assets of just over $1.5 trillion. Over 70 percent of credit unions had assets under $100 million, with 26 percent having less than $10 million in assets. Twenty four percent of credit unions had assets between $100 million and $1 billion, and 6 percent had assets over $1 billion.

Consistent with long-running trends among depository institutions, consolidation in the credit union industry continued this year, particularly among smaller institutions. The number of credit unions with less than $50 million in assets fell to 3,040 in the second quarter of 2019, bringing the cumulative

4.11.31 Credit Union Income



Source: NCUA

Note: Federally-insured credit unions. Values are annualized.

decline over the past five years to 27 percent. At the same time, total industry assets grew at an annual average rate of 6.6 percent over the five years ending in the second quarter of 2019. Membership in federally insured credit unions grew 21 percent over the past five years, reaching over 118 million members as of the second quarter of 2019.

Financial performance at credit unions was solid in the first half of 2019, at least partially reflecting the continued resilience of the economy and moderate, though slowing, growth in loan demand, according to NCUA data. Net income at consumer credit unions increased to $14 billion on an annualized basis in the second quarter of 2019, an increase of 13 percent from the second quarter of 2018 **(Chart 4.11.31)**. The amount of outstanding loans at credit unions increased by 6.4 percent in the second quarter of 2019, representing a notable slowdown from the nearly 10 percent pace registered during the same period a year earlier. NCUA reported moderating loan growth over the past two years, generally reflecting slower growth in mortgage and auto lending, with the latter being a function of shrinking sales for new vehicles. Credit union real estate loans, roughly half of all credit union lending, grew 6.9 percent over the year ending in the second quarter of 2019, down from 9.6 percent during the same period a year earlier. Auto loans, just over one-third of the credit union loan portfolio, grew 5.2 percent in the second quarter of 2019, a downshift from the 11 percent pace registered over the same period in 2018.

Overall loan performance remained healthy in early 2019, aided by low unemployment and reasonably strong income growth. The system-wide delinquency rate edged lower over the year ended June 30, 2019, to 63 basis points. However, the delinquency rate on credit cards, 6 percent of total credit union loans, remained elevated at 122 basis points.

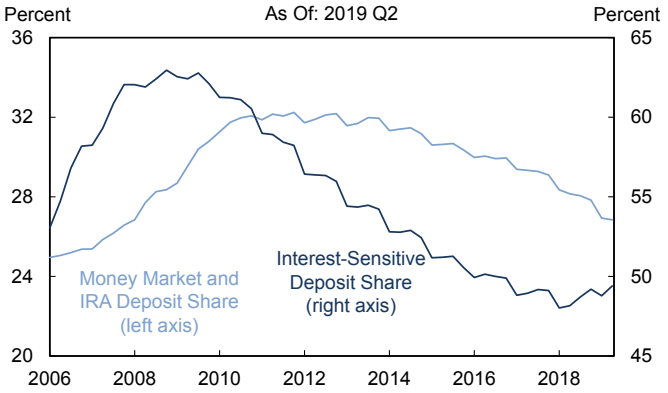
The credit union system experienced a return on average assets (ROAA) of 97 basis points at an annual rate in the second quarter of 2019, up from 90 basis points one year prior. Interest income jumped from its year-earlier level, noninterest income edged up modestly, and the NIM among all credit unions increased to 318 basis points from 307 basis points.

While credit union financial performance has been relatively strong overall, smaller credit unions have not performed as well as larger credit unions, based on a number of standard measures. Smaller institutions account for the bulk of institutions but a very modest, and shrinking, share of assets and members. For example, credit unions with less than $100 million in assets account for 70 percent of the number of institutions but only 6.4 percent of assets, while credit unions with more than $1 billion in assets account for 67 percent of system-wide assets and 61 percent of credit union members. ROAA at the smaller institutions averaged 53 basis points on an annualized basis in the second quarter of 2019, while ROAA at credit unions with more than $1 billion in assets was twice as much at 108 basis points. At the same time, the loan delinquency rate for smaller credit unions was 117 basis points in the second quarter of 2019, compared with 61 basis points at the $1 billion-plus institutions.

Credit unions continue to contend with interest rate risk and this year's flattening and inversion of the yield curve. Interest-sensitive deposits as a share of total liabilities have fallen below pre-crisis levels, and the share of money market accounts and individual retirement account (IRA) deposits has also been trending lower **(Chart 4.11.32)**.

A measure of long-term assets—fixed-rate first mortgages and investments with a term longer than three years—has been relatively steady at roughly 27 percent of total assets in recent years. That share remains elevated compared to the pre-crisis period **(Chart 4.11.33)**.

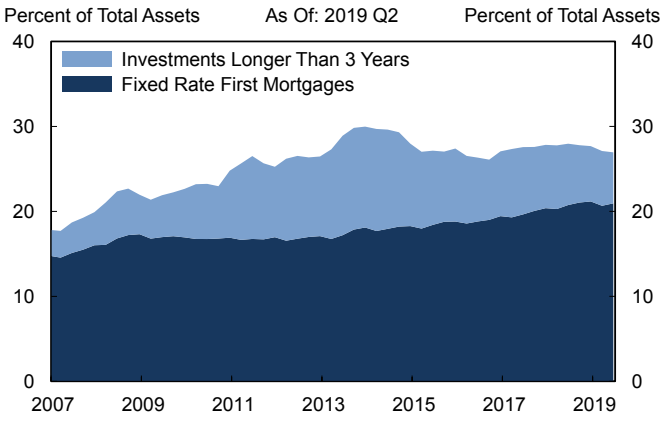
4.11.32 Credit Union Deposits



Note: Federally-insured credit unions. Interest-sensitive deposit share includes money market and IRA deposit share, share certificates, and certain other deposits.

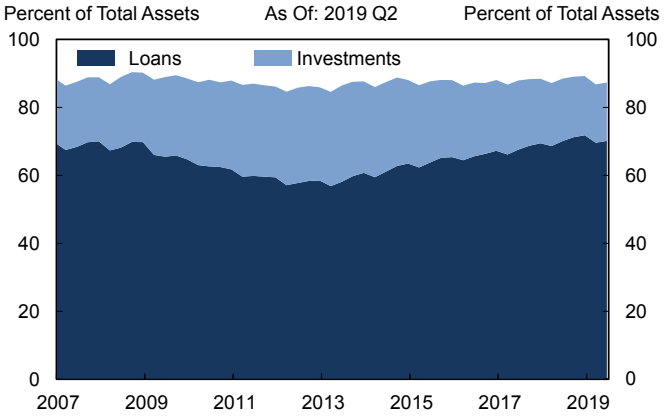
Source: NCUA

4.11.33 Credit Union Net Long-Term Assets



Source: NCUA

4.11.34 Credit Union Composition of Assets



Source: NCUA

The overall investment share of the asset side of credit union balance sheets has decreased in recent years, while the loan share has increased. Over the past five years, the share of investments has declined from 26 percent of total assets to 17 percent. Over the same period, the share of assets in loans rose nearly 10 percentage points to 70 percent **(Chart 4.11.34)**. Likewise, the loan-to-deposit ratio at credit unions was 83 percent in the second quarter of 2019, which is high by historical standards. The elevated loan share has helped support credit union profitability.

The credit union industry remains well capitalized. Over the most recent four quarters, the industrywide net worth ratio has averaged over 11.2 percent, marking the most robust level of capitalization since before the financial crisis. Under statutory guidelines, a credit union is considered "well capitalized" if it holds a net worth ratio at or above 7 percent. Currently, over 98 percent of federally insured credit unions fall within this category.

Last year, the NCUA liquidated three credit unions that were experiencing significant losses as a result of particularly high concentrations of taxi medallion loans. The failure of these credit unions contributed to a $765 million loss at the National Credit Union Share Insurance Fund. As the liquidating agent, the NCUA is modifying these loans, when possible, consistent with its statutory obligation to minimize losses to the National Credit Union Share Insurance Fund.

4.12 Nonbank Financial Companies

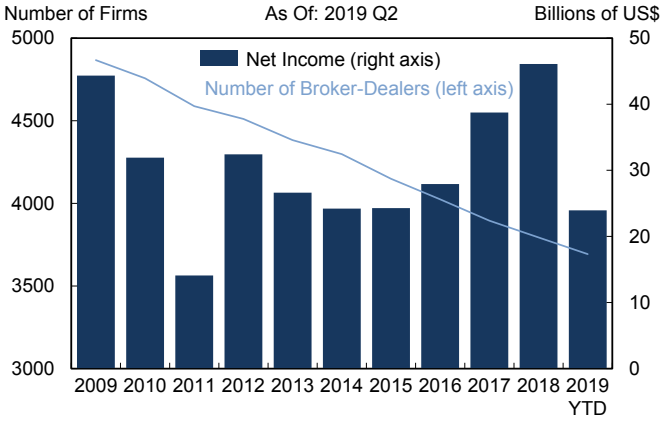
4.12.1 Securities Broker-Dealers

As of June 2019, there were approximately 3,700 securities broker-dealers registered with the SEC, a decline of 3.2 percent from year-end 2017. The number of broker-dealers registered with the SEC has declined steadily since 2009. Aggregate net income in the sector increased by approximately 19 percent in 2018 on increasing revenues relative to 2017 **(Charts 4.12.1, 4.12.2)**.

The U.S. broker-dealer sector remains relatively concentrated. Approximately 56 percent of industry assets were held by the 10 largest broker-dealers as of June 2019, largely unchanged from previous years. The 10 largest broker-dealers account for approximately one-third of industry total revenues and one-fourth of industry net income.

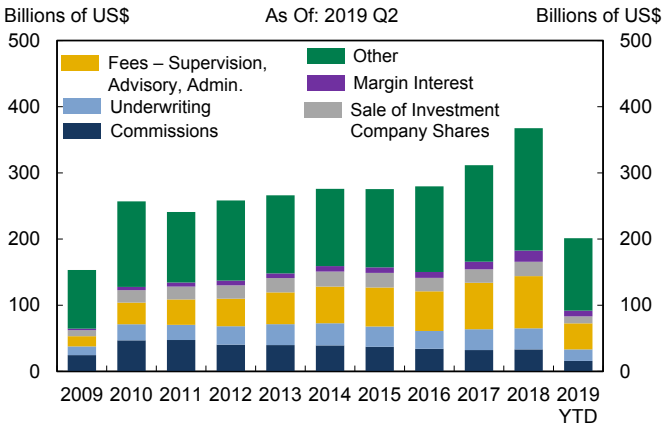
Total assets in the U.S. broker-dealer industry increased to $4.5 trillion as of June 2019, but were well below the peak of $6.8 trillion in 2007 **(Chart 4.12.3)**. Broker-dealers typically obtain leverage through the use of secured lending arrangements such as repos and securities lending transactions. Broker-dealer leverage, measured in various ways, has declined markedly since 2007. For example, leverage measured as total assets over regulatory capital (defined as ownership equity qualified for net capital and allowable subordinated liabilities) increased slightly to 11.2 percent in aggregate as of June 2019, up from 10.9 percent as of year-end 2017, but still remains well below the pre-crisis peak of 21 percent in 2006.

4.12.1 Number of Broker-Dealers and Industry Net Income



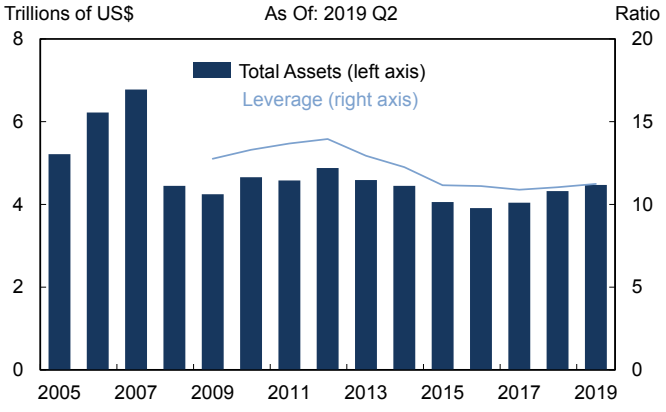
Source: FINRA

4.12.2 Broker-Dealer Revenues



Source: FINRA

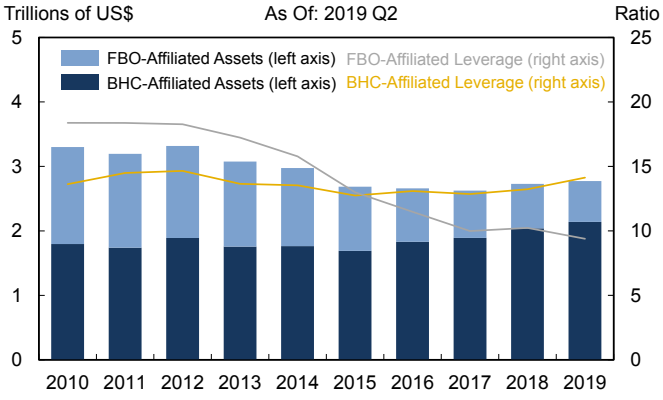
4.12.3 Broker-Dealer Assets and Leverage



Source: FINRA

Note: Leverage is the ratio of total assets to total regulatory capital.

4.12.4 Large Broker-Dealer Assets and Leverage by Affiliation



Source: FINRA

Note: Covers bank holding company (BHC) and foreign banking organization (FBO) affiliated broker-dealers that are among the 25 largest broker-dealers by assets as of Q2 2019.

Most large U.S. broker-dealers are affiliated with U.S. BHCs or FBOs. Among this group of broker-dealers, aggregate assets for BHC-affiliated broker-dealers have increased steadily since 2015. Aggregate assets for broker-dealers affiliated with FBOs have continued to decrease significantly since 2010. BHC-affiliated broker-dealers had an aggregate leverage ratio of 14.1 as of June 2019, while FBO-affiliated broker-dealers had an aggregate leverage ratio of 9.4 **(Chart 4.12.4)**.

4.12.2 Insurance Companies

The U.S. insurance industry is divided between a life and health ("life") sector and a property and casualty ("P&C") sector. The risk profiles of the life and P&C insurance companies differ substantially. Life and P&C insurers are subject to different licensing, regulatory, and financial reporting requirements.

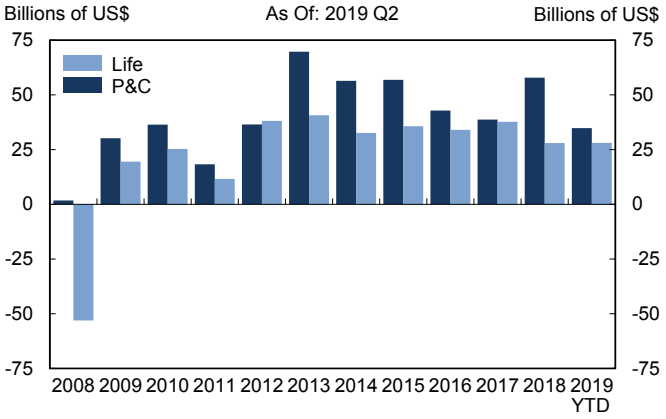
Life insurer portfolios are divided into general and separate account assets. General account assets typically back contracts with a payout that is not linked to investment returns. The general account assets of domestic life insurance companies totaled $4.4 trillion at year-end 2018. This total increased by 2.8 percent to $4.5 trillion by the end of the second quarter of 2019. Separate account assets are assets for which policyholders typically bear most or all of the investment risk. The separate account assets of life insurers totaled $2.5 trillion at year-end 2018. Separate account assets increased to $2.7 trillion by the end of the second quarter of 2019. The 7.6 percent increase in separate account assets was largely due to increases in stock prices during the first half of 2019.

The life insurance sector reported $400 billion in equity, reported as "capital and surplus", at year-end 2018. Capital and surplus increased to $419 billion in the first half of 2019. Net investment income increased by 2.0 percent to $180 billion in 2018 versus $177 billion in 2017. Net investment income was $96 billion in the first half of 2019. Although revenue increased in 2018, net income decreased by 26 percent to $28 billion, driven by higher expenses in surrender benefits and withdrawals for life contracts and aggregate reserves for life and accident and health contracts. Overall, the life sector has managed to consistently operate with positive profits and growth in equity for each of the past 10 years.

U.S. P&C insurance companies remained relatively stable at year-end 2018, reporting $1.9 trillion in assets. Capital and surplus was $780 billion, an increase of 2.8 percent from the year before. The industry increased its net written premiums in 2018 by 11 percent to $621 billion. That resulted in the highest degree of leverage, measured as net written premium over capital, in over ten years. Net income from the P&C insurance sector has been consistently positive though somewhat variable since 2008. This has been attributed to the consistent growth in the capitalization of P&C insurers over the past decade **(Charts 4.12.5, 4.12.6)**.

Insurance companies are significant holders of corporate bonds, commercial mortgages, agency securities, and municipal bonds. Insurance companies are the largest investors among U.S. financial institutions in corporate bonds, and are just behind banks and mutual funds in amounts invested in municipal bonds. Insurers are the second largest holder of commercial mortgages, exceeding that of real estate investment trusts (REITs) or asset-backed securities (ABS) issuers. Through life insurers' separate accounts, they are the largest investors in mutual funds after households and private pension funds.

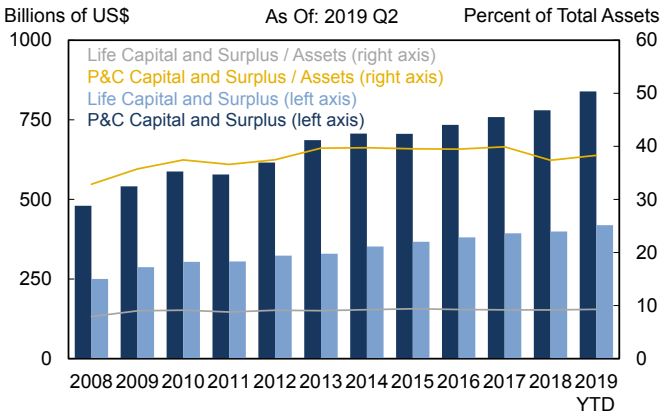
4.12.5 Insurance Industry Net Income



Source: NAIC

Note: Life includes accident and health.

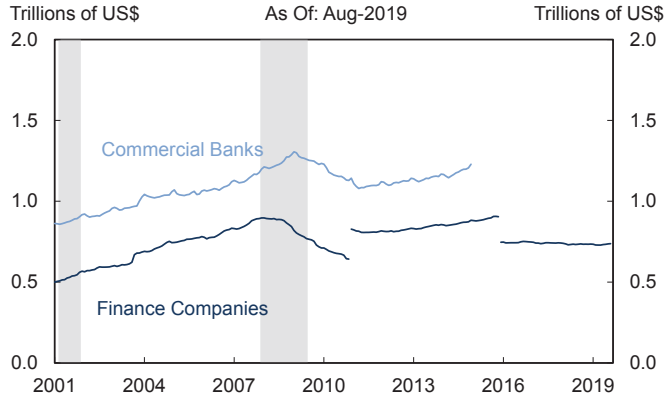
4.12.6 Insurance Industry Capital and Surplus



Source: NAIC

Note: Total assets includes net admitted assets less net admitted separate account assets. Life includes accident and health.

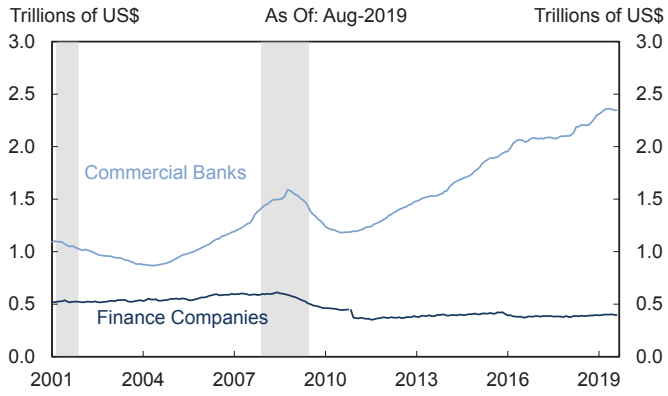
4.12.7 Consumer Loans and Leases Outstanding



Source: Federal Reserve, Haver Analytics

Note: Loans and leases owned and securitized. Series breaks in December 2010 and December 2015 due to change in data collection methodology. Gray bars signify NBER recessions.

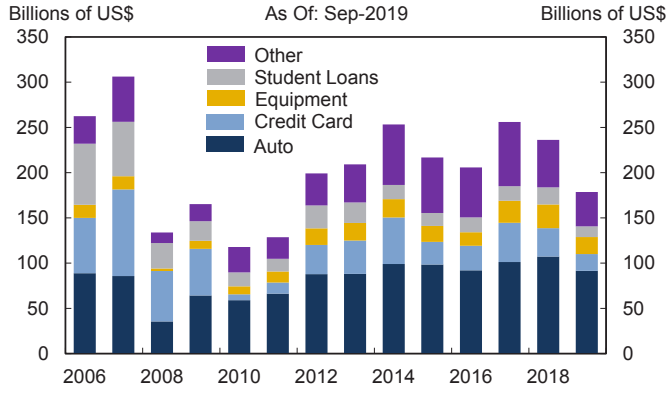
4.12.8 Business Loans and Leases Outstanding



Source: Federal Reserve, Haver Analytics

Note: Loans and leases owned and securitized. Series break in December 2010 due to change in data collection methodology. Gray bars signify NBER recessions.

4.12.9 ABS Issuance



Source: Thomson Reuters, SIFMA

Note: Figures are as of year end through 2018. 2019 figures are through September.

4.12.3 Specialty Finance

Specialty finance companies are non-depository institutions that provide loans to consumers and businesses. The amount of financing activity by specialty finance companies was little changed over the past year. Specialty finance companies held approximately $738 billion of consumer loans and leases and $400 billion of business loans and leases as of August 2019 **(Charts 4.12.7, 4.12.8)**. Specialty finance companies' ownership of real estate loans and leases remained relatively stable from year-end 2018 to August 2019 at approximately $115 billion and is more than 80 percent below its pre-crisis peak.

While specialty finance companies trail commercial banks in overall consumer lending volume, constituting 13 percent of overall consumer lending, these firms do maintain an outsized market share in certain types of activity. For example, finance companies held 27 percent of consumer auto loans in July 2019. As opposed to banks, which generally have more stable sources of funding such as deposits, specialty finance companies are more reliant on wholesale funding and the securitization market.

Asset-Backed Securities

Total issuance of ABS, excluding CDOs and CLOs, totaled $179 billion through September 2019 **(Chart 4.12.9)**. Issuance in this period of 2019 was 7.5 percent lower than during the same period in 2018. Issuance of most ABS products have declined relative to the same period in 2018. This decline was partially offset by continued strong auto loan and lease ABS issuance. Student loan ABS issuance declined 27 percent to $12 billion and credit card ABS issuance declined 35 percent to $19 billion. Auto ABS issuance, on the other hand, increased 12 percent to $92 billion.

Compared to the pre-crisis period, the use of securitization has declined for both credit cards and student loans. Credit card issuers, primarily banks, have cheaper and more stable sources of funding. The balance of loans originated in the legacy Federal Family Education Loans

Program continues to decline and most of the student loans originated today are originated and funded by the Department of Education. In addition, private student loans remain a small share of the overall student loan origination volume. However, specialty finance companies originating auto loans and leases actively issue ABS to fund their loan origination activities.

Amid the market volatility in late 2018 and early 2019, spreads for most ABS products gradually widened since the first quarter of 2018 **(Chart 4.12.10)**. However, spreads remain tighter than in the first quarter of 2016.

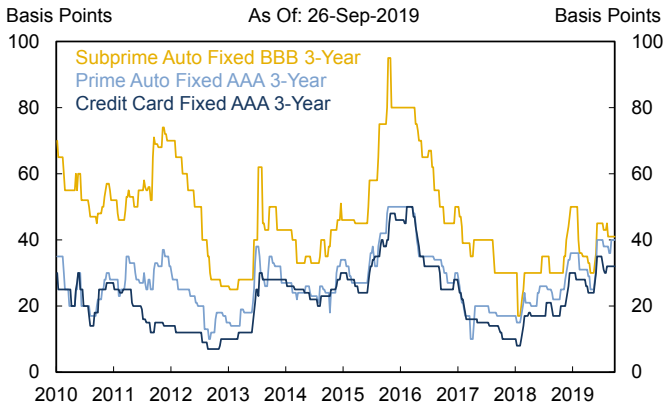
4.12.4 Agency REITs

Total assets of agency REITs increased from $279 billion in the second quarter of 2018 to $365 billion in the second quarter of 2019, the fastest growth since 2012 **(Chart 4.12.11)**. This marked a continuation of the upward trend that began in 2017, which reversed five years of steady declines. The market remains highly concentrated, with two REITs accounting for a 65 percent share of total assets. Leverage, as measured by total assets to total equity, increased from 7.2 to 8.5 between June 2018 and June 2019, but remains below pre-crisis levels of 10 to 12. Leverage ratios among individual agency REITs continue to vary widely, with a range of 3.9 to 12.5 in the second quarter of 2019.

Share prices of agency REITs continued to recover in the second quarter of 2019, but still trail levels seen in mid-2017. The aggregate price-to-book (P/B) ratio for agency REITs continues to be around 1.0 **(Chart 4.12.12)**. Prior to 2017, the sector had an aggregate P/B ratio below 1.0 for 16 consecutive quarters dating back to mid-2013.

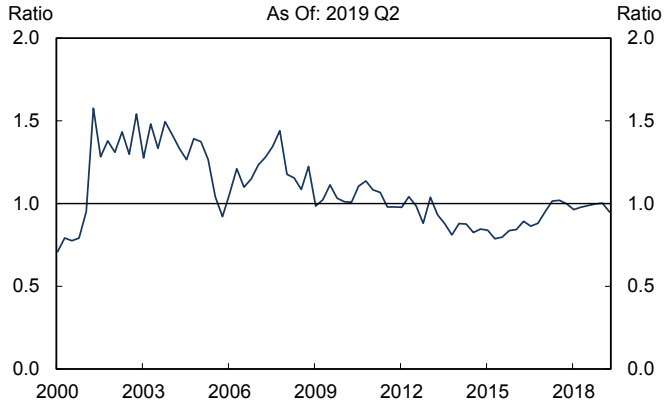
Despite these developments, a flattening or inverted yield curve could present challenges for agency REITs. Agency REITs use short-term debt in the form of repos to fund the purchase of agency MBS. They then earn the difference between the yield on the underlying MBS and the cost of financing. Consequently, near-term

4.12.10 Select ABS Spreads



Source: J.P. Morgan

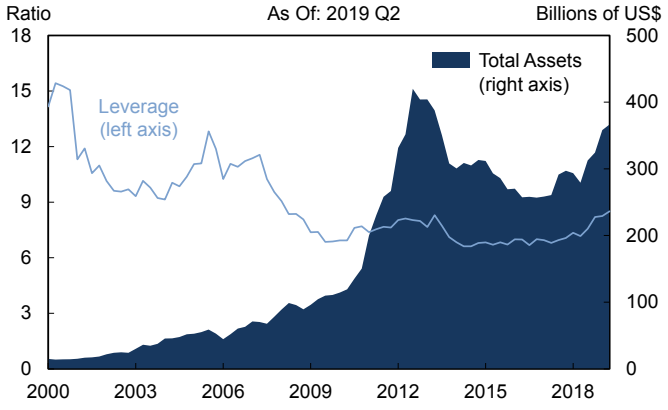
4.12.11 Agency REIT Assets and Leverage



Source: Bloomberg, L.P.

Note: P/B ratio is weighted by market capitalization. Not all agency REITs existed in all time periods in the figure.

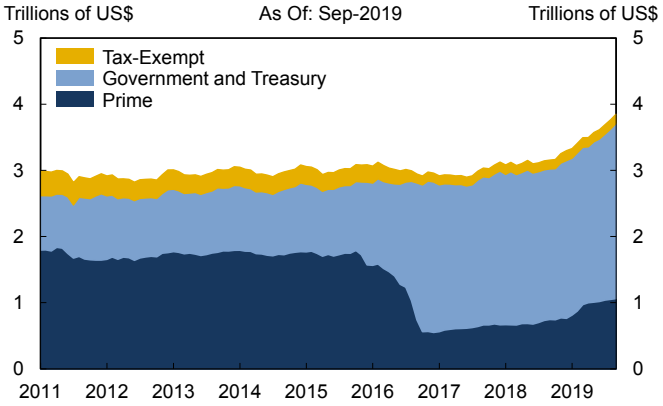
4.12.12 Agency REIT Price-to-Book Ratio



Source: Bloomberg, L.P.

Note: Leverage is the ratio of total assets to equity. Not all agency REITs existed in all time periods in the figure.

4.13.1 MMF Assets by Fund Type



Source: SEC

returns on assets for agency REITs are linked to the slope of the yield curve; agency REITs typically generate larger profits when the yield curve steepens and face losses when the yield curve flattens or inverts. Their use of repos makes agency REITs particularly vulnerable to disruptions in the repo market, which could pose a risk to refinancing activities.

4.13 Investment Funds

4.13.1 Money Market Mutual Funds

According to the SEC's Money Market Fund Statistics, MMF assets totaled $3.8 trillion in September 2019, a 22 percent increase year-over-year. Over the twelve months ended September 2019, prime fund assets increased by $317 billion, or 42 percent, while assets at government MMFs increased by $373 billion, or 16 percent. In contrast, total assets at tax-exempt MMFs have remained stable at around $140 billion. Prime funds' share of total assets increased to 28 percent in September 2019, up from the 24 percent in September 2018. Government MMFs' share of total assets fell to 69 percent in September 2019 versus 72 percent in September 2018 **(Chart 4.13.1)**.

The long-term trend since 2016 towards consolidation in the MMF sector has slowed down in 2019. As of September 2019, there were 369 MMFs, down from 502 funds at year-end 2015, but almost unchanged since 2018. Over the past several years, concentration in the MMF industry has gradually increased. As of September 2019, the five largest MMF complexes managed nearly 55 percent of total assets, up from approximately 45 percent at year-end 2015.

Since SEC money market fund reforms in October 2016, prime institutional and tax exempt institutional MMFs have been required to price their shares at market, known as Floating Net Asset Value (FNAV), rather than at amortized cost, known as Constant Net Asset Value. The portion of MMFs with FNAVs has grown to 17 percent in September 2019, from 13

percent in December 2018, and from 10 percent in December 2016.

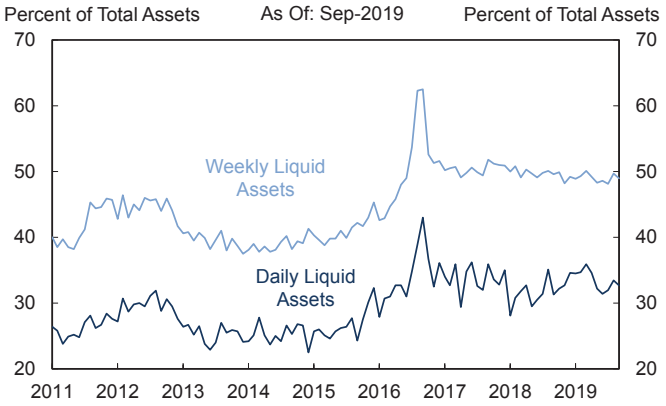
Yields on MMFs declined after the Federal Reserve cut its benchmark rate twice in the third quarter of 2019. The average gross 7-day yield on prime MMFs dropped slightly to 2.15 percent in September 2019 from 2.60 percent at the end of 2018. The average gross 7-day yield on government MMFs was 2.03 percent in September 2019, down from 2.45 percent in December 2018. Average gross 7-day yields for tax-exempt MMFs were 1.56 percent in September 2019 and 1.76 percent in December 2018.

Prime MMFs' daily liquidity—the share of assets convertible to cash within one business day—averaged 33 percent of assets through September 2019, which is somewhat higher than the average of 32 percent during 2018. This exceeds the 10 percent required by SEC rules. Weekly liquid assets (the share of assets convertible to cash within five business days) for prime funds averaged 49 percent through September 2019, little changed from 2018 and well above the 30 percent minimum required under SEC rules **(Chart 4.13.2)**.

The WAM of fund assets provides an indication of the sensitivity of fund returns to changes in market interest rates. MMF managers tend to maintain a lower WAM during periods of rising rates and extend their WAMs in anticipation of falling rates. Prime MMF WAM averaged 29 days in 2018, when interest rates were expected to rise. Managers extended their average WAM to 35 days in September 2019, when rates were expected to fall. These averages were well below the 60-day maximum permitted under SEC rules **(Chart 4.13.3)**.

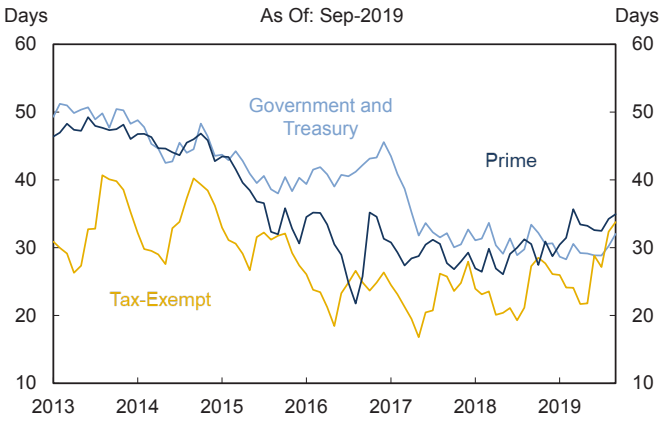
The Federal Reserve's overnight reverse repurchase agreement (ON RRP) facility is a supplementary policy tool that the Federal Reserve uses to help keep the federal funds rate in the target range set by the FOMC. Eligible MMFs have loaned cash to the FRBNY through the facility since regular testing began

4.13.2 Liquid Asset Shares of Prime MMFs



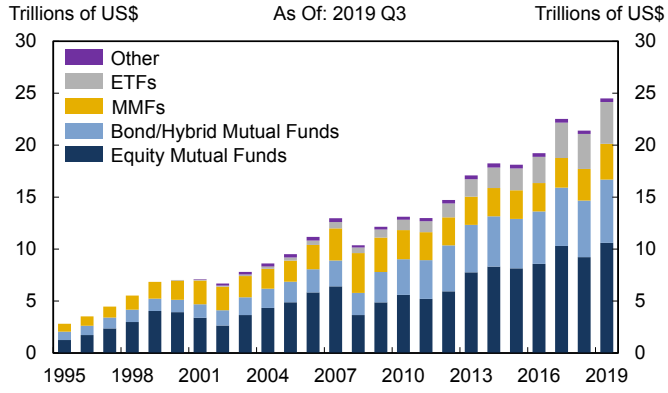
Source: SEC

4.13.3 Weighted Average Maturity by Fund Type



Source: SEC

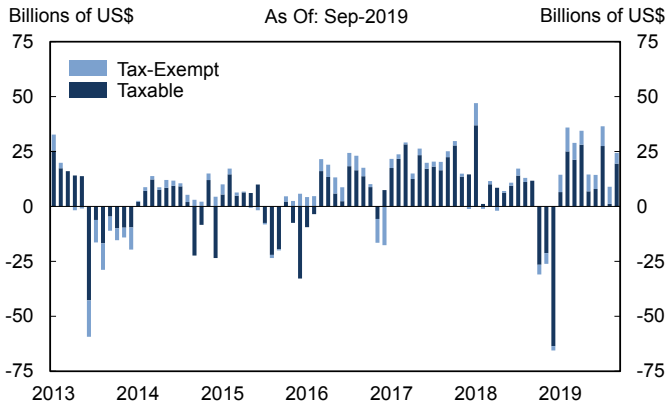
4.13.4 Net Assets of the Investment Company Industry



Note: Other is composed of unit investment trusts and closed-end funds. Q3 2019 figures include 2018 UIT data, which is reported annually.

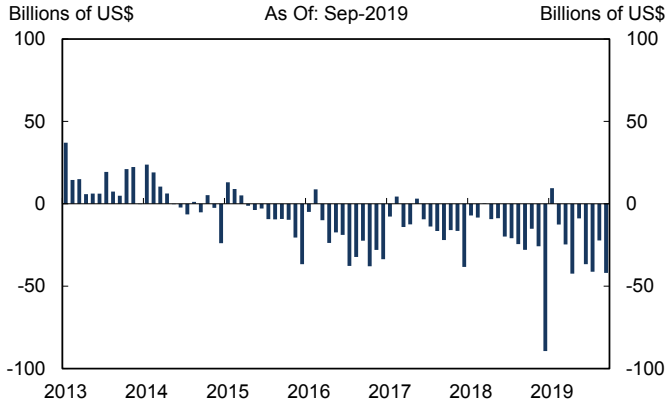
Source: ICI, Haver Analytics

4.13.5 Monthly Bond Mutual Fund Flows



Source: ICI, Haver Analytics

4.13.6 Monthly Equity Mutual Fund Flows



Source: ICI, Haver Analytics

in September 2013. Over the past several years, ON RRP investments have been an important part of MMF portfolio holdings, especially in periods when traditional repo counterparties did not offer attractive opportunities. However, as opportunities improved elsewhere, MMFs reduced their use of the ON RRP. MMFs averaged $8.5 billion in lending through the ON RRP facility through September 2019, down from an average of $28 billion during all of 2018 and $226 billion in 2017. Around the same time, Fixed Income Clearing Corporation (FICC) expanded its sponsored repo service, which permitted banks to sponsor qualified institutional buyers onto its cleared repo platform. MMF exposures to FICC have increased significantly—from less than $1 billion in early 2017 to approximately $200 billion in mid-2019—and the clearinghouse is now the largest counterparty to MMFs in Treasury repos.

4.13.2 Mutual Funds

The aggregate net asset value of U.S. mutual funds increased 14 percent in the first nine months of 2019 after decreasing 8 percent in 2018. Industry assets totaled $16.7 trillion in September 2019. Mutual fund assets constituted approximately 68 percent of total U.S. investment company assets **(Chart 4.13.4)**. In recent years, the vast majority of mutual fund growth has been due to capital appreciation rather than investor inflows.

Mutual fund flow trends continued for most of 2018 and 2019, with bond funds experiencing net inflows for 18 of the last 21 months and equity funds recording net outflows for 19 of the last 21 months. Both equity and bond funds experienced unusually large outflows in December 2018, totaling a combined $155 billion. In the first nine months of 2019, bond funds experienced $212 billion in net inflows while equity funds had $221 billion in net outflows **(Charts 4.13.5, 4.13.6)**.

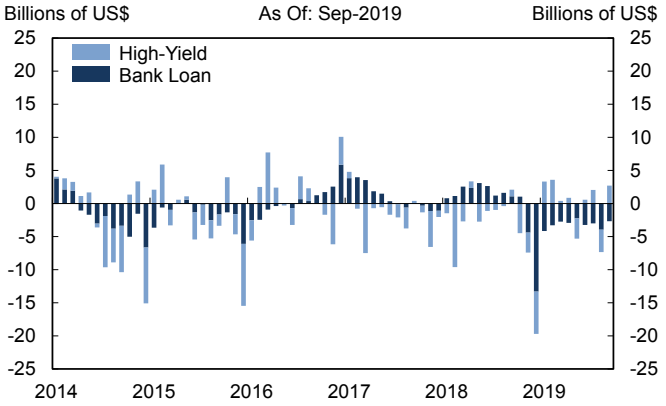
In December 2018, bank loan mutual funds experienced record net outflows amidst significant market turmoil **(Chart 4.13.7)**. These funds offer investors daily redemptions and hold assets with lengthy settlement periods and may during times of significant market stress take longer to sell and settle than the redemption period offered. Selling by mutual funds may have contributed to price declines in the secondary leveraged loan market in December 2018. Cumulative bank loan fund outflows continued through 2019, as floating rate notes became less attractive relative to high-yield bonds, given the anticipation for stable or falling interest rates. Between November 2018 and September 2019, cumulative outflows from bank loan mutual funds totaled $46 billion, or 33 percent of assets under management (AUM). Over the same period, high-yield bond funds had outflows of $2.4 billion, or 1.0 percent of AUM.

Investors continued to gravitate away from actively-managed equity mutual funds and towards lower-cost, index-based equity funds. As of September 2019, index-based mutual funds and ETFs represented 51 percent of U.S. equity fund assets, up from 26 percent in 2009. In the twelve months ended September 2019, inflows to index-based U.S. and international equity funds totaled $312 billion, while their actively managed counterparts saw outflows of $301 billion **(Chart 4.13.8)**. In fixed-income mutual funds, both actively-managed and index-based funds have continued to experience inflows.

4.13.3 Exchange-Traded Products

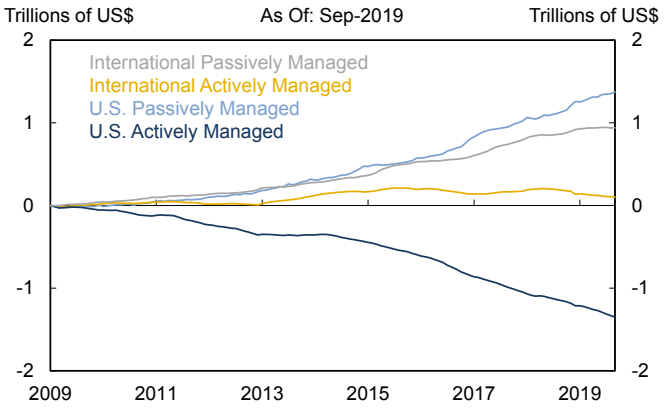
Exchange-traded products (ETPs) include 1940 Act registered ETFs, non-1940 Act registered ETPs (such as those that primarily hold commodities or physical metals), and exchange-traded notes. ETFs registered under the 1940 Act, which account for approximately 90 percent of listed ETPs, continue to grow at a faster pace than mutual funds and other SEC-registered investment vehicles. By June 2019, these funds accounted for 16 percent of U.S. investment company assets, up from 12 percent in 2015 and 7.6 percent in 2010.

4.13.7 Monthly Bank Loan and High-Yield Fund Flows



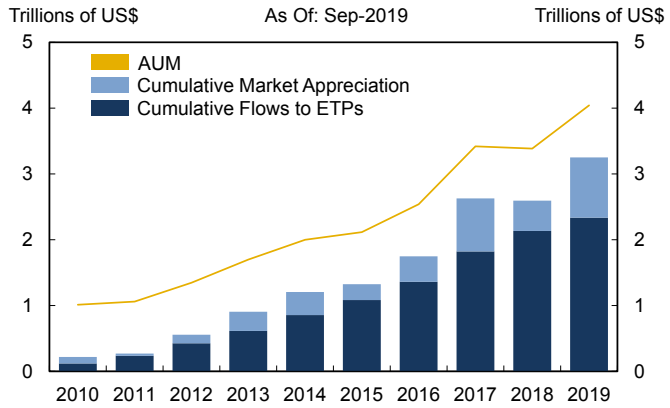
Source: Morningstar, Inc.

4.13.8 Cumulative Equity Fund Flows



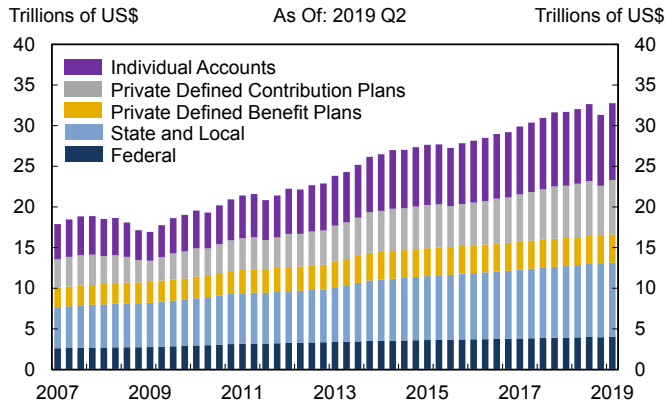
Source: Morningstar, Inc. Note: Includes ETFs and mutual funds.

4.13.9 U.S.-Listed ETP AUM



Source: Morningstar, Inc.

4.13.10 Retirement Fund Assets by Plan Type



Source: Federal Reserve, Haver Analytics

Note: Individual accounts as of 2019 Q1.

In 2018, ETP assets fell by 1.1 percent; however, net inflows partially offset market losses. ETP assets increased 19 percent over the first nine months of 2019, reaching a record $4.1 trillion in September. Recent years' asset growth has been driven primarily by inflows, which totaled $2.3 trillion **(Chart 4.13.9)**.

A large source of ETP inflows continues to be taxable bond and domestic equity ETPs. In the first nine months of 2019, taxable bond and domestic equity ETPs accounted for nearly all net inflows, while international equity funds recorded modest net outflows. In 2018, inflows into ETPs largely offset market losses, with taxable bond and domestic equity ETPs, respectively, accounting for 29 percent and 46 percent of total ETP inflows.

The industry remains concentrated, as the three largest managers account for 81 percent of ETP assets and the top ten managers account for 95 percent. Over the first nine months of 2019, the number of available ETPs increased 3.8 percent in addition to the 7.6 percent increase in 2018.

4.13.4 Pension Funds

Pension funds are significant holders of financial assets. As of the second quarter of 2019, the total assets of U.S. private and public pensions were $24 trillion, 3.4 percent higher than one year earlier. Including estimated IRAs, retirement fund assets totaled $33 trillion **(Chart 4.13.10)**. Risk taking by pension funds is difficult to assess given data limitations, including lack of uniformity, timeliness, and granularity of reporting on plan assets, liabilities, and return assumptions. Declines in the value of pension assets may impact economic activity. Sponsors of underfunded plans may be required to increase contributions, which could necessitate reductions in other types of expenditures or investments. Sponsors of underfunded plans may also opt to assume greater levels of investment risk to increase the likelihood of meeting longer-term funding targets; however, these strategies often entail greater downside risks.

Corporate Plans

The funded status of single employer corporate defined benefit pension plans improved in 2018. The funded percentage of a plan is plan assets relative to the estimated value of plan liabilities. According to the Milliman Corporate Pension Funding Study, the 100 largest corporate defined benefit pension plans in the United States had an aggregate funded status of 87 percent at year-end 2018, slightly up from 86 percent at year-end 2017 **(Chart 4.13.11)**.

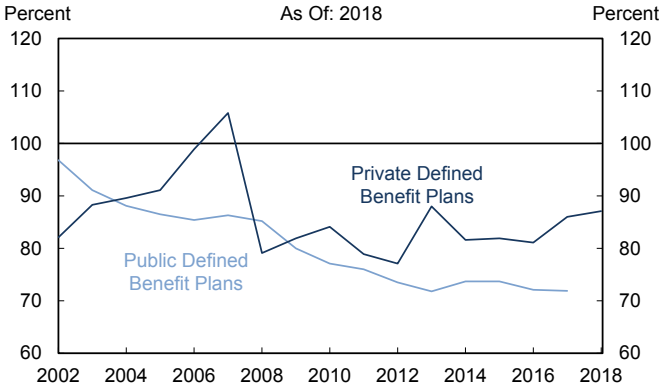
Multiemployer Plans

Milliman estimates that the aggregated funded percentage of multiemployer plans as of year-end 2018 was 74 percent, down from 81 percent at year-end 2017. While the Pension Benefit Guaranty Corporation (PBGC) projects the majority of multiemployer plans will remain solvent, a core group of plans appears unable to raise contributions sufficiently to avoid insolvency. According to the PBGC 2018 projections report, 125 plans—representing more than 1.4 million participants—have declared that they will likely face insolvency over the next 20 years.

The PBGC projects that its Multiemployer Insurance Program will have insufficient funds to cover the projected future demands from multiemployer plans requiring financial assistance, and that there is a very high likelihood that the program will become insolvent by 2025. If so, the PBGC will be unable to provide financial assistance to pay the full level of guaranteed benefits in insolvent multiemployer plans.

The Kline-Miller Multiemployer Pension Reform Act allows multiemployer plans projected to become insolvent in less than 20 years (15 years in some cases) to apply to Treasury for permission to reduce pension benefits. They may apply if reducing benefits would allow the plan to remain solvent over the long-term and continue to provide benefits at least 10 percent higher than the level of the PBGC guarantee, with further protections for the aged and disabled. As of October 2019, 27 plans have filed

4.13.11 Public and Private Pension Funding Levels



Source: NASRA Public Fund Survey, Milliman 2018 Corporate Pension Funding Study

38 applications with Treasury. Of these applications, 14 have been approved, five have been denied, and 15 have been withdrawn. The four remaining applications are in the process of being evaluated.

Public Plans

In 2017, the aggregate funded status of U.S. public pension plans was 72 percent, in line with the prior year. Also of note, public pension funds generally use a different set of accounting rules than private pension funds. These rules enable public plan sponsors to assume investment returns based on their own long-run expectations, which are significantly higher than average post-crisis returns, and thus could overstate funded status. Several large public plans have revised long-term investment return expectations downward. Underfunded public plans are a significant source of fiscal pressure on several U.S. states and the territories of Puerto Rico and the U.S. Virgin Islands, as well as municipalities such as Dallas and Chicago.

4.13.5 Alternative Funds

Hedge Funds

The aggregate net asset value of hedge funds in the United States was $3.8 trillion in the fourth quarter of 2018, a 2.3 percent decrease from the prior year. The gross asset value (GAV) of hedge funds—which reflects the effect of leverage obtained through cash and securities borrowing—totaled $7.6 trillion, a 4.8 percent increase year-over-year. These figures cover the approximately 9,200 hedge funds and 1,700 hedge fund advisers that file the SEC's Form PF. The data in this section is from the SEC's Private Funds Statistics for the fourth quarter of 2018 unless otherwise noted.

Various measures of leverage at the largest hedge funds, including measures of off-balance sheet exposures, show increasing leverage. GAV divided by NAV, one balance sheet leverage measure, showed aggregate hedge fund leverage of 2.0 for the fourth quarter of 2018, slightly higher than in 2017. Gross notional exposure divided by NAV, a measure including notional derivatives, showed aggregate hedge fund leverage ranging from 6.4 to 7.1 during 2018, somewhat higher than in 2017, which averaged over 6. Removing interest rate derivatives from gross notional exposure yields ratios of between 4.6 and 5.2 times during 2018, also somewhat higher than in 2017. The largest hedge funds are notably more leveraged than the industry aggregate; the most highly leveraged funds also increased their ratios since 2017.

The hedge fund industry remains concentrated. The top 5 percent of funds filing Form PF, sorted by GAV, account for about 68 percent of all filers' GAV and 92 percent of all filers' gross notional exposure. These figures were little changed from 2017 to 2018.

According to Hedge Fund Research data (which does not cover the entire universe of hedge funds reported in Form PF), the hedge fund industry experienced modest net outflows of $34 billion in 2018 and outflows of $22 billion in the first half of 2019. Outflows have been concentrated in equity hedge funds, which recorded nearly $40 billion in outflows during 2018 and the first half of 2019. In contrast, event-driven funds have been drawing investor capital, which reported $10 billion of net inflows over the same period.

While hedge funds recorded losses in the fourth quarter of 2018, they managed to outperform equity indices; over this period, the HFRX Global Hedge Fund Index was down 5.6 percent, while the S&P 500 was down 14 percent. Since then, hedge funds have underperformed equity indices, and, as of September 30, 2019, the HFRX Global Hedge Fund Index was up 5.9 percent year-to-date, far below the 19 percent increase for the S&P 500 stock index.

Private Equity

The GAV of private equity funds in the United States totaled $3.2 trillion in the fourth quarter of 2018, a 16 percent increase from the fourth quarter of 2017. The funds' NAV totaled $2.8 trillion, a 15 percent increase. These figures cover approximately 12,700 private equity funds, for which approximately 1,200 private equity advisers filed information on Form PF. Data from Preqin, which covers less of the industry but provides a longer time series for comparison, show a similar growth rate in 2018 **(Chart 4.13.12)**.

The private equity industry remains concentrated. Large private equity advisers filing Form PF—those with $2 billion or more in AUM—made up 25 percent of all private equity advisers filing Form PF in the fourth quarter of 2018, and managed 73 percent of gross assets.

For funds managed by large private equity advisers, pension funds remain the largest beneficial owners, accounting for 30 percent of net assets; other private funds account for 19 percent, foreign official sector investors account for 11 percent, and insurance companies account for 6 percent.

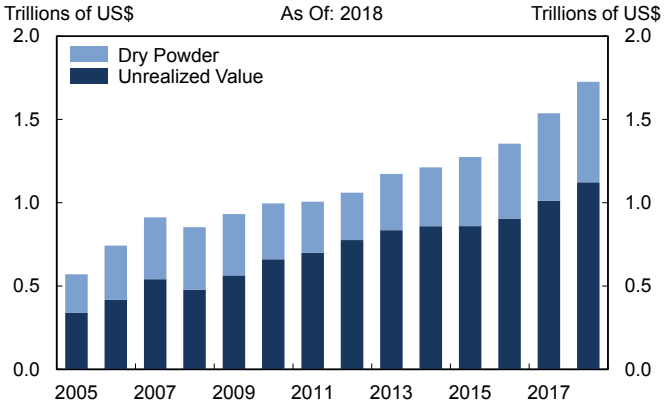
Acquisition-related activity backed by private equity continued to trend upwards and total merger and acquisition (M&A) loan volume hit a record $230 billion in 2018 **(Chart 4.13.13)**. M&A activity slowed, but remained robust in 2019, with issuances totaling $126 billion through September 30, 2019.

The private equity industry continues to attract investor inflows, in part because the sector is viewed as an attractive alternative to hedge funds. According to Preqin survey data, 90 percent of investors felt private equity investment met or exceeded their expectations in 2018, with nearly half planning to increase their allocation to private equity over the long-run. By allocating to private equity funds, investors are thus opting for less liquidity in that portion of their portfolios. Private equity funds outperformed the public market in 2018, with the Preqin Private Equity Index finishing 2018 up 10.9 percent and the S&P 500 Total Return Index finishing 2018 down 4.4 percent. This relative outperformance was concentrated in the fourth quarter of 2018, when private equity outperformed the S&P by over 13 percent.

Private Debt

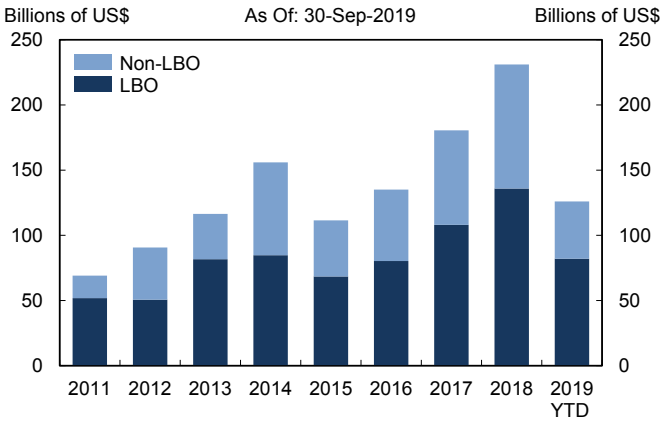
According to Preqin data, North American private debt fund AUM totaled $560 billion as of March 2019, a 62 percent increase since 2014. Dry powder, or uncalled committed capital, at private debt funds increased by 68 percent since

4.13.12 North American Private Equity AUM



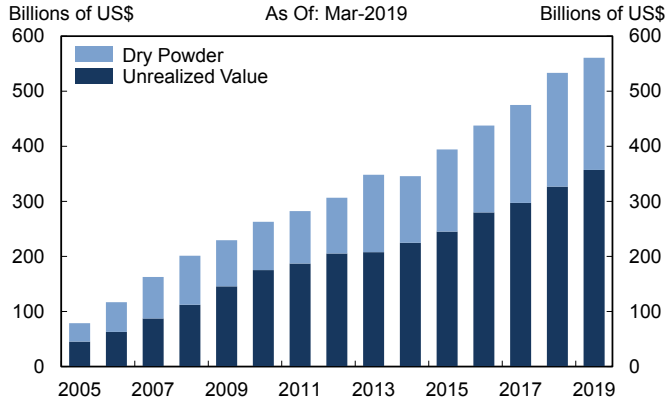
Source: Preqin

4.13.13 M&A Loan Volume for Private Equity-Backed Issuers



Source: S&P LCD

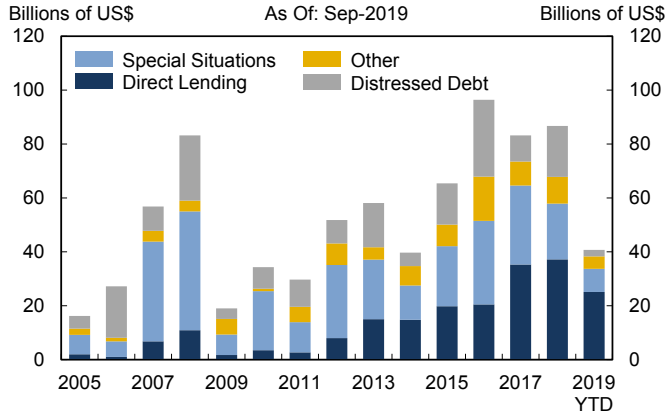
4.13.14 North American Private Debt AUM



Source: Preqin

Note: 2005-2018 figures as of year-end. Includes all North American private debt funds (excluding funds of funds).

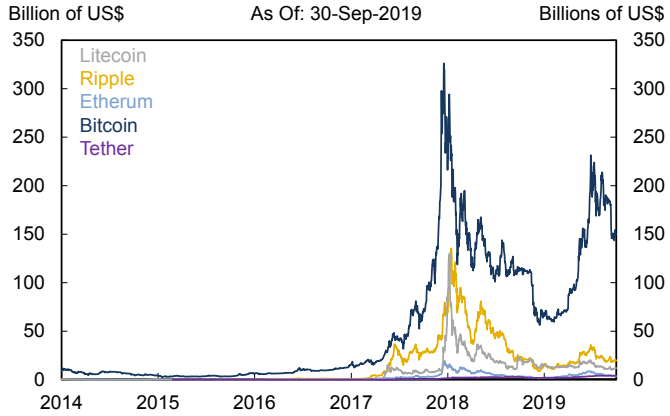
4.13.15 North American Private Debt Fundraising



Source: Preqin

Note: Includes all North American private debt funds (excluding funds of funds).

4.14.1 Market Capitalization of Blockchain-Based Digital Assets



Source: Coinmarketcap.com, Office of Financial Research

2014, while unrealized value increased by 59 percent during the same period **(Chart 4.13.14)**. Since 2017, direct lending has been the most popular strategy among private debt investors, attracting $98 billion or nearly 50 percent of all capital over this period **(Chart 4.13.15)**.

4.14 New Financial Products and Services

4.14.1 Digital Assets and Distributed Ledger Technology

The market capitalization of digital assets, such as Bitcoin, Ethereum, XRP, and Litecoin, has increased in recent years and has been highly volatile **(Chart 4.14.1)**. Digital assets trading data is sparse and may be unreliable. CoinMarketCap estimated that after reaching $800 billion in early 2018, the market capitalization of digital assets declined to $209 billion by the end of September 2019. Stablecoins—digital assets designed to maintain a stable value relative to another asset (typically a unit of currency or commodity) or a basket of assets—grew in market capitalization in 2019.

Many digital assets are enabled by blockchains or other distributed ledger technologies. Such systems share data across a network, creating identical copies of their ledger that are then often stored at and synchronized across multiple locations. Distributed ledger technology may have applications that extend well beyond the simple transfer of value. In recent years, an increasing number of financial institutions have initiated proof of concept projects to evaluate the potential for applications of distributed ledger technology in areas such as interbank and intrabank settlement, derivatives processing, repo clearing, and trade finance. The ultimate success of the technology, including applications in the financial sector, is not yet certain. Some early efforts have not resulted in the anticipated efficiency gains and other promised benefits, and as a result, have been scaled back, refocused, or abandoned.

4.14.2 Peer-to-Peer Payments

Consumers continue to embrace peer-to-peer payment services. Peer-to-peer transfers allow consumers to make payments to other consumers, usually through a mobile device app. The apps are typically linked to debit or credit card accounts or bank accounts, thereby allowing the funding transfers to proceed through bank-maintained payment networks. Although some service providers are relatively new companies, banks and other financial service providers are also entering the market and have reported significant consumer participation and transaction volume as well. In addition, partnerships between peer-to-peer payment systems and vendors are becoming increasingly popular.

4.14.3 Marketplace Lending

Marketplace lending is the provision of loans through online, electronic platforms. Initially, marketplace lending focused on retail investors providing funding to individual borrowers, and was called peer-to-peer lending. This model has evolved to one that uses significant capital from institutional investors to finance primarily consumer and small business loans. Some of the largest marketplace lenders in the consumer finance area concentrate on providing debt consolidation loans and refinancing existing student loans. Banks and credit unions, in some cases, participate in marketplace lending in partnership with other firms. This may provide for increases in efficiencies and effectiveness, but there is also potential for risks to consumers.

4.14.4 Large Technology Firms in Financial Services

Large technology and e-commerce firms continue to enter, or explore entering, financial services markets. These firms offer financial products or services such as providing loans to small businesses or individuals. Such services are often offered to customers that already have relationships with the firm. Some of these technology and e-commerce companies have assets that could allow them to grow quickly in the financial services space, including large customer networks, broad name recognition, and client data. Additionally, while these firms are still subject to regulations that may limit the activities in which they can engage, they may not be subject to the full set of regulations and oversight applicable to other financial institutions. These technology firms can promote the development of new products and services, but could also increase risks. For example, new technology and systems to evaluate and determine the creditworthiness of potential borrowers may add complexity, limit transparency, and create potential harm to consumers.

4.14.5 Reliance of Financial Institutions on Third-Party Service Providers

Financial institutions have become increasingly reliant on third-party service providers to perform important business functions. Relationships with external providers often allow an institution to take advantage of advanced or proprietary technologies including recent fintech innovations. Due to economies of scale or access to lower cost labor, external providers are often able to perform services at a lower cost than institutions can perform them in-house. In addition, as specialists, external providers may be able to perform functions for a financial institution more efficiently, more accurately, or at higher quality than if they were performed internally.

While outsourcing can have advantages, reliance on third-party service providers also has risks. For instance, many institutions have increased their use of cloud computing services to supplement their existing data storage capacity, to provide redundancy, and to gain access to additional computational capacity. While cloud providers may offer superior cost or technological solutions, there have also been recent instances of unauthorized access to client data at cloud providers. The reliance of many institutions on a single vendor to provide a critical service creates concentration risk. A service interruption or cyber event at a critical vendor with a large number of clients could result in widespread disruption in access to financial data and could impair the flow of financial transactions.

5 Regulatory Developments and Council Activities

5.1 Safety and Soundness

5.1.1 Enhanced Capital and Prudential Standards and Supervision

On December 17, 2018, the Federal Reserve, FDIC, and OCC issued a notice of proposed rulemaking (NPRM) inviting comment on a proposal that would implement a new approach for calculating the exposure amount of derivative contracts under the agencies' regulatory capital rule. The proposed approach, called the standardized approach for counterparty credit risk (SA-CCR), would replace the current exposure methodology (CEM) as an additional methodology for calculating advanced approaches total risk-weighted assets (RWAs) under the capital rule. An advanced approaches banking organization also would be required to use SA-CCR to calculate its standardized total RWAs; a non-advanced approaches banking organization could elect to use either CEM or SA-CCR for calculating its standardized total RWAs. In addition, the proposal would modify other aspects of the capital rule to account for the proposed implementation of SA-CCR. Specifically, the proposal asked about the potential treatment of the customer initial margin for the purpose of supplementary leverage ratio calculation. The proposal also would incorporate SA-CCR into the cleared transactions framework and would make other amendments, generally with respect to centrally cleared transactions. The proposed introduction of SA-CCR would indirectly affect the Federal Reserve's single counterparty credit limit rule, along with other rules.

On December 28, 2018, the OCC, Federal Reserve, and FDIC adopted interim final rules, previously issued on August 29, 2018, as final without change. The interim final rules were issued to implement section 210 of EGRRCPA, which amended Section 10(d) of the Federal Deposit Insurance Act (FDI Act) to permit the agencies to examine qualifying insured depository institutions (IDIs) with under $3 billion in total assets not less than once during each 18-month period. The final rules increase, from $1 billion to $3 billion, the total asset threshold under which an agency may apply an 18-month on-site examination cycle for qualified IDIs that have an "outstanding" composite rating. The agencies also exercised their discretionary authority under section 10(d)(10) of the FDI Act to extend eligibility for an 18-month examination cycle, by regulation, to qualifying IDIs with an "outstanding" or "good" composite rating with total assets under $3 billion. In addition, the final rules adopt as final the parallel changes to the agencies' regulations governing the on-site examination cycle for U.S. branches and agencies of foreign banks, consistent with the International Banking Act of 1978.

On January 1, 2019, the Federal Reserve's finalized requirements for the minimum total loss absorbing capacity (TLAC) for U.S. G-SIB holding companies and IHCs of foreign G-SIBs became effective. Those entities are required to maintain a minimum level of TLAC and to fund a percentage of the TLAC requirement with long-term debt (LTD). TLAC depends on the size, systemic importance and related characteristics of an institution, and is designed to improve both the resiliency and resolvability of covered entities.

On April 8, 2019, the OCC, Federal Reserve, and FDIC issued an NPRM inviting comment on a proposed rule that would address an advanced approaches banking organization's regulatory capital treatment of an investment in unsecured debt instruments issued by foreign or U.S. G-SIBs for the purposes of meeting minimum TLAC and, where applicable, LTD requirements, or unsecured debt instruments issued by G-SIBs that are pari passu or subordinated to such debt instruments. Under the proposal, investments by an advanced approaches banking organization in such unsecured debt instruments generally would be subject to deduction from the advanced approaches banking organization's own regulatory capital. The proposal would provide a significant incentive for large banking organizations to reduce both

interconnectedness within the financial system and systemic risk. The Federal Reserve proposal includes changes to regulatory reporting requirements concerning these investments. The Federal Reserve also proposed to require that banking organizations subject to minimum TLAC and LTD requirements under Federal Reserve regulations publicly disclose their TLAC and LTD issuances in a manner described in this proposal.

On April 30, 2019, the OCC, Federal Reserve, and FDIC issued a joint NPRM inviting comment on a proposal to implement Section 402 of EGRRCPA. Section 402 directs these agencies to amend the supplementary leverage ratio of the regulatory capital rule to exclude certain funds of banking organizations deposited with central banks if the banking organization is predominantly engaged in custody, safekeeping, and asset servicing activities.

On May 15, 2019, the Federal Reserve issued an NPRM inviting comment on a proposal that would revise the framework for applying the enhanced prudential standards applicable to FBOs under section 165 of the Dodd-Frank Act, as amended by EGRRCPA. The proposal would establish categories that would be used to tailor the stringency of enhanced prudential standards based on the risk profile of a FBO's U.S. operations. The proposal also would amend certain enhanced prudential standards, including standards relating to liquidity, risk management, stress testing, and single-counterparty credit limits, and would make corresponding changes to reporting forms. The proposal would make clarifying revisions and technical changes to the Federal Reserve's October 31, 2018 proposal for large U.S. BHCs and certain savings and loan holding companies relating to the Federal Reserve's internal liquidity stress testing requirements and G-SIB surcharge rule.

On May 24, 2019, the OCC issued a final rule to implement a new section of the Home Owners' Loan Act (HOLA). EGRRCPA amended HOLA by adding a new section that allows a federal savings association with total consolidated assets equal to or less than $20 billion, as of December 31, 2017, to elect to operate as a covered savings association. A covered savings association has the same rights and privileges as a national bank and is subject to the same duties, restrictions, penalties, liabilities, conditions, and limitations as a national bank. A covered savings association retains its federal savings association charter and existing governance framework. The new section of HOLA requires the OCC to issue rules that, among other things, establish streamlined standards and procedures for elections to operate as covered savings associations and clarify requirements for the treatment of covered savings associations.

On June 5, 2019, the OCC, Federal Reserve, and FDIC jointly adopted as a final rule, without change, the August 31, 2018, interim final rule, which amended the agencies' LCR rule to treat liquid and readily-marketable, investment grade municipal obligations as HQLA. This treatment was required by Section 403 of EGRRCPA.

On June 21, 2019, the OCC, Federal Reserve, and FDIC issued a final rule to implement Section 205 of EGRRCPA by expanding the eligibility to file the agencies' most streamlined report of condition, the Federal Financial Institutions Examination Council (FFIEC) 051 Call Report, to include certain IDIs with less than $5 billion in total consolidated assets that meet other criteria, and establishing reduced reporting requirements for the FFIEC 051 Call Report filings for the first and third quarters of a year. The OCC and Federal Reserve also finalized similar reduced reporting for certain uninsured institutions that they supervise with less than $5 billion in total consolidated assets that otherwise meet the same criteria.

On July 22, 2019, the OCC, Federal Reserve, and FDIC issued a final rule that simplified several requirements in the agencies' regulatory capital rules. The simplifications apply only to banking organizations that do not use the advanced approaches capital framework, which are generally firms with less than $250 billion in total consolidated assets and with less than $10 billion in total foreign exposure. Specifically, the final rule simplifies the capital treatment for mortgage servicing assets, certain deferred tax assets, investments in the capital instruments of unconsolidated financial institutions, and minority

interests. The final rule also allows BHCs and savings and loan holding companies to redeem common stock without prior approval unless otherwise required. The final rule is consistent with the changes proposed in the Economic Growth and Regulatory Paperwork Reduction Act report issued by the agencies in 2017. In that report, the agencies committed to meaningfully reducing regulatory burden, especially on community banking organizations, while at the same time maintaining safety and soundness and the quality and quantity of regulatory capital in the banking system. The final rule amendments that simplify capital rules will be effective as of January 1, 2020, based on a subsequent rulemaking modifying the effective date. Revisions to the pre-approval requirements for the redemption of common stock and other technical amendments became effective on October 1, 2019.

On July 23, 2019, the OCC, Federal Reserve, and FDIC issued an NPRM inviting public comment on a proposal to clarify the treatment of land development loans under the agencies' capital rules. This proposal expands on the agencies' September 2018 proposal to revise the definition of high volatility commercial real estate (HVCRE) as required by EGRRCPA. The land development proposal would clarify that loans that solely finance the development of land for residential properties would meet the revised definition of HVCRE, unless the loan qualifies for another exemption. The land development proposal would apply to all banking organizations subject to the agencies' capital rules.

On September 17, 2019, the FDIC adopted a final rule that amends its deposit insurance assessment regulations to apply the community bank leverage ratio (CBLR) framework, discussed below, to the deposit insurance assessment system. The final rule does not make any changes to the FDIC's assessment methodology, but could affect which pricing model is used, resulting in a change to assessments for a very limited subset of banks, including one institution as of March 31, 2019. Assessments will remain unchanged for all other institutions that adopt the CBLR framework.

On October 29, 2019, the OCC, Federal Reserve, and FDIC adopted a final rule that provides for a simple measure of capital adequacy for certain community banking organizations, consistent with Section 201 of EGRRCPA. Under the final rule, depository institutions and depository institution holding companies that have less than $10 billion in total consolidated assets and meet other qualifying criteria, including a leverage ratio (equal to tier 1 capital divided by average total consolidated assets) of greater than 9 percent, will be eligible to opt into the CBLR framework (qualifying community banking organizations). Qualifying community banking organizations that elect to use the CBLR framework and that maintain a leverage ratio of greater than 9 percent will be considered to have satisfied the generally applicable risk-based and leverage capital requirements in the agencies' capital rules and, if applicable, will be considered to have met the well-capitalized ratio requirements for purposes of Section 38 of the FDI Act.

On November 1, 2019, the OCC, Federal Reserve, and FDIC issued a final rule to revise the criteria for determining the applicability of regulatory capital and liquidity requirements for large U.S. banking organizations and the U.S. IHCs of certain FBOs. The final rule establishes four risk-based categories for determining the applicability of requirements under the agencies' regulatory capital rule and LCR rule. Under the final rule, such requirements increase in stringency based on measures of size, cross-jurisdictional activity, weighted short-term wholesale funding, nonbank assets, and off-balance sheet exposure. The final rule applies tailored regulatory capital and liquidity requirements to depository institution holding companies and U.S. IHCs with $100 billion or more in total consolidated assets, as well as to certain depository institutions.

5.1.2 Dodd-Frank Act Stress Tests and Comprehensive Capital Analysis and Review

Section 165(i)(2) of the Dodd-Frank Act requires certain financial companies to conduct annual stress tests.

On February 5, 2019, the OCC released economic and financial market scenarios for use in upcoming stress tests for covered institutions. The supervisory scenarios include baseline, adverse, and severely adverse scenarios, as described in the OCC's final

rule that implements stress test requirements of the Dodd-Frank Act. The OCC's stress test rule states that the OCC will provide scenarios to covered institutions by February 15 of each year. Covered institutions are required to use the scenarios to conduct annual stress tests. The results of the company-run stress tests will assist the agency in assessing the company's risk profile and capital adequacy.

On March 13, 2019, the Federal Reserve issued a final rule amending the capital plan rule to limit the scope of potential objections to a firm's capital plan on the basis of qualitative deficiencies in the firm's capital planning process (qualitative objection). The Federal Reserve announced that, as of the publication date, it would no longer issue a qualitative objection under the capital plan rule to a firm if the firm has been subject to a potential qualitative objection for four consecutive years, and the firm does not receive a qualitative objection in the fourth year of that period. In addition, except for certain firms that have received a qualitative objection in the immediately prior year, the Federal Reserve will no longer issue a qualitative objection to any firm effective January 1, 2021.

On October 2, 2019, October 10, 2019, and October 15, 2019, respectively, the OCC, Federal Reserve and FDIC adopted parallel final rules that, consistent with EGRRCPA, revise the minimum asset threshold for firms to conduct stress tests, revise the frequency by which firms would be required to conduct stress tests, and remove the adverse scenario from the list of required scenarios in the stress test rules. The Federal Reserve's final rule also makes conforming changes to the Federal Reserve's Policy Statement on the Scenario Design Framework for Stress Testing.

5.1.3 Resolution Planning and Orderly Liquidation

Under the framework of the Dodd-Frank Act, resolution under the U.S. Bankruptcy Code is the statutory first option in the event of the failure of a financial company. Section 165(d) of the Dodd-Frank Act requires nonbank financial companies designated by the Council for supervision by the Federal Reserve and certain BHCs—including certain FBOs with U.S. operations—to periodically submit plans to the Federal Reserve, the FDIC, and the Council for their rapid and orderly resolution under the U.S. Bankruptcy Code in the event of material financial distress or failure. These reports are also referred to as living wills. The Federal Reserve and FDIC review each plan and may jointly determine that a plan is not credible or would not facilitate an orderly resolution of the company under the U.S. Bankruptcy Code. Since the resolution planning requirements took effect in 2012, U.S. G-SIBs and certain other firms have improved their resolution strategies and governance, refined their estimates of liquidity and capital needs in resolution, and simplified their legal structures. These changes have made these firms more resilient and resolvable.

On February 4, 2019, the Federal Reserve and FDIC published final guidance for U.S. G-SIBs regarding their 2019 resolution plan submissions and subsequent plan submissions. The final guidance, which is largely based on prior guidance issued to these firms, describes the agencies' expectations regarding a number of key vulnerabilities in plans for an orderly resolution under the U.S. Bankruptcy Code, including capital; liquidity; governance mechanisms; operational; legal entity rationalization and separability; and derivatives and trading activities. The final guidance also updates certain aspects of prior guidance based on the agencies' review of these firms' most recent resolution plan submissions, including areas of the guidance regarding payment, clearing, and settlement services as well as derivatives and trading activities.

On July 1, 2019, the U.S. G-SIBs submitted public and confidential sections of their resolution plans to the Federal Reserve and FDIC. On July 23, 2019, the Federal Reserve and FDIC released the public sections of these firms' resolution plans on the agencies' respective websites. The agencies will review both the confidential and public portions of the resolution plans to consider the credibility of such plans, as discussed above.

There were several other important developments related to the orderly resolution of large banking organizations occurring at the end of 2018 and in 2019. In December 2018, the Federal Reserve and FDIC jointly announced that their review of the

2018 resolution plans of four foreign firms found no "deficiencies" in these plans. Deficiencies are weaknesses severe enough to trigger a resubmission process that could result in more stringent requirements. However, the agencies announced that the firms' resolution plans had "shortcomings," which are less-severe weaknesses that require additional work in the firms' next plans. In March 2019, the Federal Reserve and FDIC jointly announced that their review of the 2017 resolution plans of 14 domestic banking organizations found no shortcomings or deficiencies.

In July 2019, the Federal Reserve and FDIC jointly announced they completed their evaluations of the 2018 resolution plans for 82 foreign firms and did not identify shortcomings or deficiencies in the plans. The agencies also announced that they extended the deadline for the next resolution plans from those firms, as well as 15 domestic firms and four other foreign firms. These four foreign firms remain required to submit limited plans by July 1, 2020, describing how they have addressed the shortcomings identified in December 2018 and providing updates concerning certain resolution projects.

On November 1, 2019, the Federal Reserve and FDIC issued a final rule that modifies their resolution plan requirements for large firms. The rule retains resolution plan elements in place for the largest firms while reducing requirements for smaller firms that pose less risk to the financial system. The final rule uses the separate framework developed by the federal banking agencies for application of prudential requirements, and establishes resolution planning requirements tailored to the level of risk a firm poses to the financial system. Consistent with EGRRCPA, the final rule would affect domestic and foreign firms with more than $100 billion in total consolidated assets.

In addition, in 2019, the Federal Reserve and FDIC hosted Crisis Management Group (CMG) meetings for U.S. G-SIBs to discuss home and host resolvability assessments for the firms to facilitate cross-border resolution planning.

5.1.4 Volcker Rule

On July 22, 2019, the OCC, Federal Reserve, FDIC, SEC, and CFTC issued final rules to amend the regulations implementing the Bank Holding Company Act's prohibitions and restrictions on proprietary trading and certain interests in, and relationships with, hedge funds and private equity funds (commonly known as the Volcker Rule) in a manner consistent with EGRRCPA. EGRRCPA amendments and the final rules exclude from these prohibitions and restrictions certain firms that have total consolidated assets equal to $10 billion or less and total trading assets and liabilities equal to 5 percent or less of total consolidated assets. EGRRCPA and the final rules also revise the restrictions applicable to the naming of a hedge fund or private equity fund to permit an investment adviser that is a banking entity to share a name with the fund under certain circumstances.

In addition, the Volcker rule-writing agencies approved a final rule in 2019 that tailors and simplifies the regulations implementing the Volcker Rule. The final rule incorporates a risk-based approach that relies on a set of clearly articulated standards for both prohibited and permitted activities and investments. Among other changes, the final rule revises the definition of "trading account," streamlines the requirements of certain permitted activities, and revises the compliance program requirements associated with the Volcker Rule.

5.1.5 Insurance

Covered Agreements

In anticipation of Brexit, the United States entered into a covered agreement with the United Kingdom on December 18, 2018. Pursuant to the Federal Insurance Office Act of 2010 (FIO Act), a covered agreement is a written bilateral or multilateral agreement regarding prudential measures with respect to the business of insurance or reinsurance. The terms and scope of this covered agreement are substantially the same as those of the covered agreement currently in force with the EU. Consistent with its approach with the U.S.-EU covered agreement, the United States also released a policy statement to provide additional clarity for the domestic insurance sector on certain terms of the agreement and address how the United

States intends to implement the agreement. The agreement "affirms the United States system of insurance regulation, including the role of state insurance regulators as the primary supervisors of the business of insurance" in the United States and recognizes the key implementation role that state insurance regulators will play in meeting U.S. obligations under the agreement.

In June 2019, in response to the covered agreements with the EU and the United Kingdom, the National Association of Insurance Commissioners (NAIC) adopted changes to the Credit for Reinsurance Model Law and Credit for Reinsurance Model Regulation intended to provide states with a model law and regulation aligning state law with the U.S. obligations under the agreements. The NAIC has also included provisions in the models that are intended to provide similar treatment to insurers and reinsurers from jurisdictions not party to a covered agreement (provided that such jurisdictions comply with similar conditions as those under the covered agreements). In the event that a state does not conform its laws to the terms of the covered agreements, the FIO Director has the ability, subject to the timing provisions in the agreements and the procedures set forth in the FIO Act, to preempt inconsistent state insurance measures.

NAIC Initiatives

The NAIC's Macroprudential Initiative is focused on liquidity, recovery and resolution, capital stress testing, and exposure concentrations. As part of this initiative, state insurance regulators, through the NAIC, implemented changes to life insurer reporting to allow regulators to identify potential liquidity risks more quickly and easily. The formal requirement goes into effect for the 2019 annual statements, which are filed in March 2020.

The NAIC continues to develop its group capital calculation, which is an analytical tool designed to give regulators information relating to the capital across an insurance group. Field testing of the group capital calculation began in May 2019, with completed templates submitted in August, and review and analysis completed by the 15 lead states and NAIC staff by October. The NAIC anticipates that it will adopt the calculation during 2020, with state adoption to follow. In addition, earlier this year, the NAIC implemented changes in determining the reported credit risk assessment for certain instruments, including CLOs, to capture their risk more accurately.

The state insurance regulators, through the NAIC, continue to make progress in implementing principle-based reserving, which became effective in 2017 with an optional three-year transition period before mandatory implementation in 2020. In 2019, the NAIC formed a Long-Term Care Insurance (EX) Task Force that is charged with: (1) developing a consistent national approach for reviewing long-term care insurance rates that results in actuarially appropriate increases being granted by the states in a timely manner; and (2) identifying appropriate options that afford consumers choices regarding modifications to their long-term care insurance benefits, where policies are no longer affordable due to rate increases.

Cybersecurity

States have begun to adopt the NAIC's Insurance Data Security Model Law, which updates state insurance regulatory requirements relating to data security, the investigation of a cyber event, and the notification to state insurance commissioners of cybersecurity events at regulated entities. As of November 2019, eight states had adopted the model or comparable legislation. In August 2019, the NAIC adopted insurance data security pre-breach and post-breach checklists, based on the model law, for its Market Regulation Handbook to provide guidance for market conduct examinations. Further, state insurance regulators and the NAIC collaborate with Treasury to facilitate tabletop exercises with insurers to explore cybersecurity incident response and recovery across the insurance sector.

Other

On September 6, 2019, the Federal Reserve approved an NPRM proposing risk-based capital requirements for depository institution holding companies that are significantly engaged in insurance activities. The proposed methodology, termed the Building Block Approach (BBA), would adjust and aggregate existing legal entity capital requirements to determine an enterprise-wide

capital requirement. This NPRM follows a 2016 advance notice of proposed rulemaking (ANPR) that conceptually described the BBA and invited comment on key aspects. The Federal Reserve is also conducting a quantitative impact study of this proposal.

In mid-November 2019, the International Association of Insurance Supervisors (IAIS) holistic framework for the assessment and mitigation of systemic risk in the insurance sector ("holistic framework") was adopted at the IAIS Annual General Meeting and implementation is expected to begin in 2020. The holistic framework is intended to move away from policy measures applied to a relatively small group of insurers to an approach that addresses activities and exposures across a broader portion of the insurance sector.

The IAIS is currently working on an International Insurance Capital Standard for insurance firms. A number of questions have been raised regarding its compatibility with the business model and regulation of U.S. insurance firms and the potential impact on certain retirement products offered in the United States.

5.2 Financial Infrastructure, Markets, and Oversight

5.2.1 Derivatives, Swap Data Repositories, Regulated Trading Platforms, and Central Counterparties

On March 19, 2019, the OCC, Federal Reserve, FDIC, FCA, and FHFA adopted and invited comment on an interim final rule in anticipation of the possibility of a disorderly Brexit. The rule amends the agencies' regulations that require SDs and security-based swap (SBS) dealers under the agencies' respective jurisdictions to exchange margin with their counterparties for swaps that are not centrally cleared (Swap Margin Rule). The Swap Margin Rule takes effect under a phased compliance schedule stretching from 2016 through 2020, and the dealers covered by the rule continue to hold swaps in their portfolios that were entered into before the effective dates of the rule. Those swaps are grandfathered from the Swap Margin Rule's requirements until they expire according to their terms. Certain financial services firms located within the United Kingdom conduct swap dealing activities subject to the Swap Margin Rule. In the event of a disorderly Brexit, these UK entities may not be authorized to provide full-scope financial services to swap counterparties located in the EU. The agencies' policy objective in developing the interim final rule is to address one aspect of the scenario likely to ensue, whereby entities located in the United Kingdom might transfer their existing swap portfolios that face counterparties located in the EU over to an affiliate or other related establishment located within the United States or the EU. The agencies seek to address industry concerns about the status of grandfathered swaps in this scenario so the industry can focus on making preparations for swap transfers. These transfers, if carried out in accordance with the conditions of the interim final rule, will not trigger the application of the Swap Margin Rule to grandfathered swaps that were entered into before the compliance dates of the Swap Margin Rule.

On October 28, 2019, the OCC, Federal Reserve, FDIC, FCA, and FHFA announced an NPRM proposing amendments to the Swap Margin Rule. The NPRM would permit swaps entered into prior to an applicable compliance date (legacy swaps) to retain their legacy status in the event that they are amended to replace an interbank offered rate or other discontinued rate, repeal the interaffiliate initial margin provisions, introduce an additional compliance date for initial margin requirements, clarify the time at which trading documentation must be in place, and permit legacy swaps to retain their legacy status in the event that they are amended due to technical amendments, notional reductions, or portfolio compression exercises, among other changes.

On April 1, 2019, the CFTC issued a final rule amending the de minimis exception within the SD definition in the CFTC's regulations. The final rule established as a factor in the de minimis threshold determination whether a given swap has specified characteristics of swaps entered into by IDIs in connection with loans to customers. Under the final rule, IDIs could exclude certain swaps entered into with customers in connection with originating

loans to those customers from the IDIs' de minimis calculation.

On April 1, 2019, the CFTC adopted and invited comments on an interim final rule intended to prepare for the possibility of a disorderly Brexit. To the extent there is a disorderly Brexit, affected SDs and major swap participants (MSPs) may need to effect legal transfers of uncleared swaps that were entered into before the relevant compliance dates under the CFTC Margin Rule or Prudential Margin Rule and that are not now subject to such rules, in whole or in part. The interim final rule amended the CFTC Margin Rule, which sets forth the CFTC's margin requirements for uncleared swaps for SDs and MSPs for which there is no prudential regulator. As a result of the amendments, the date used for purposes of determining whether an uncleared swap was entered into prior to an applicable compliance date will not change under the CFTC Margin Rule if the swap is transferred, and thereby amended, in accordance with the terms of the interim final rule in respect of any such transfer, including that the transfer be made solely in connection with a party to the swap's planning for or response to a disorderly Brexit. The interim final rule is designed to allow an uncleared swap to retain its legacy status under the CFTC Margin Rule or Prudential Margin Rule when so transferred.

On May 13, 2019, the CFTC issued an NPRM proposing amendments to Parts 23, 43, 45, and 49 of the CFTC's regulations to improve the accuracy of data reported to, and maintained by, swap data repositories (SDRs). Among other changes, the proposed amendments would update requirements for SDRs to verify the accuracy of swap data with reporting counterparties. The proposed amendments would also update requirements to correct errors and omissions in swap data for SDRs, reporting counterparties, and other market participants.

In June 2019, the Committee on Payments and Market Infrastructures (CPMI) and the International Organization of Securities Commissions (IOSCO) issued a consultative "Discussion Paper on Central Counterparty Default Management Auctions." The purpose of the discussion paper is to facilitate the sharing of existing practices and views on default management auctions and to advance industry efforts and foster dialogue on the key concepts, processes and operational aspects used by CCPs in planning and executing default management auctions. The paper presents a number of questions and invites comments on the benefits and challenges of various approaches, as well as potential ways to overcome such challenges. The discussion in the paper reflects the current practices at one or more CCPs and identifies the types of factors that one or more CCPs take into account when planning and conducting default management auctions. Additionally, the discussion paper identifies certain considerations that may be useful for CCPs to take into account when planning for auctions.

In October 2019 the European Council finalized adoption of amendments to the European Market Infrastructure Regulation, with publication in the Official Journal forthcoming. Referred to as "EMIR 2.2," the amendments set out a revised framework for the supervision of CCPs domiciled outside of the EU (third-country CCPs), particularly responding to Brexit. EMIR 2.2 distinguishes, among third-country CCPs, between those that are systemically important or likely to become so (Tier 2 CCPs), and those that are not (Tier 1 CCPs). Depending on how this regulation is implemented, EMIR 2.2 could result in one or more U.S. CCPs being designated by the EU as systemically important to the EU financial system, which would subject the U.S. CCP to the supervision of the European Securities and Markets Authority. Supervision of U.S. CCPs by multiple regulators has the potential to introduce inconsistent or incompatible regulation or supervision. U.S. regulators and market participants have raised concerns about potential negative consequences associated with inconsistent regulation or supervision, citing examples such as liquidity risk management and default management.

CMGs continued to coordinate resolution planning for two U.S. CCPs that are considered systemically important in more than one jurisdiction, consistent with international standards. Processes for cooperation and sharing information, both during

a crisis and for purposes of resolution planning, are set forth in cooperation arrangements that are specific to the CMG for each CCP. Work remains in finalizing the cooperation arrangements.

5.2.2 Securities and Asset Management

On February 6, 2019, the SEC issued a final rule to implement Section 955 of the Dodd-Frank Act. The rule requires a company to describe any practices or policies it has adopted regarding the ability of its employees (including officers) or directors to purchase financial instruments, or otherwise engage in transactions, that hedge or offset, or are designed to hedge or offset, any decrease in the market value of equity securities granted as compensation, or held directly or indirectly by the employee or director. The rule requires a company to describe the practices or policies and the categories of persons they affect. If a company does not have any such practices or policies, the company must disclose that fact or state that hedging transactions are generally permitted.

On February 15, 2019, the SEC issued an NPRM proposing rules that would require the application of specific risk mitigation techniques to portfolios of security-based swaps not submitted for clearing. In particular, the proposal would establish requirements for each registered SBS dealer and each registered major SBS participant with respect to, among other things, reconciling outstanding SBSs with applicable counterparties on a periodic basis; engaging in certain forms of portfolio compression exercises, as appropriate; and executing written SBS trading relationship documentation with each of its counterparties prior to, or contemporaneously with, executing an SBS transaction. In addition, the SEC proposed an interpretation to address the application of the portfolio reconciliation, portfolio compression, and trading relationship documentation requirements to cross-border SBS activities and proposed to amend Rule 3a71-6 to address the potential availability of substituted compliance in connection with those requirements. Moreover, the proposed rules would make corresponding changes to the recordkeeping, reporting, and notification requirements applicable to SBS dealers and major SBS participants.

On June 21, 2019, in accordance with the Dodd-Frank Act, the SEC issued a final rule pursuant to the Exchange Act, adopting: (1) capital and margin requirements for SBS dealers and major SBS participants; (2) segregation requirements for SBS dealers; and (3) notification requirements with respect to segregation for SBS dealers and major SBS participants. The SEC also increased the minimum net capital requirements for broker-dealers authorized to use internal models to compute net capital, and prescribed certain capital and segregation requirements for broker-dealers that are not registered as SBS dealers, to the extent they trade these instruments and SBSs. The SEC also made substituted compliance available with respect to capital and margin requirements under Section 15F of the Exchange Act and the rules thereunder and adopted a rule that specifies when a foreign SBS dealer or foreign major SBS participant need not comply with the segregation requirements of Section 3E of the Exchange Act and the rules thereunder.

On July 5, 2019, the SEC issued a final rule adopting amendments to its auditor independence rules to refocus the analysis that must be conducted to determine whether an auditor is independent when the auditor has a lending relationship with certain shareholders of an audit client at any time during an audit or professional engagement period. The amendments: focus the analysis on beneficial ownership rather than on both record and beneficial ownership; replace the existing 10 percent bright-line shareholder ownership test with a "significant influence" test; add a "known through reasonable inquiry" standard with respect to identifying beneficial owners of the audit client's equity securities; and, for a fund under audit, exclude from the definition of "audit client" any other funds that otherwise would be considered affiliates of the audit client under the rules for certain lending relationships. The amendments are intended to more effectively identify debtor-creditor relationships that could impair an auditor's objectivity and impartiality.

On July 12, 2019, the SEC issued a final rule adopting a new rule under the Exchange Act, establishing a standard of conduct for broker-dealers

and natural persons who are associated persons of a broker-dealer when they make a recommendation to a retail customer of any securities transaction or investment strategy involving securities (Regulation Best Interest). Regulation Best Interest requires broker-dealers, among other things, to act in the best interest of the retail customer at the time the recommendation is made, without placing the financial or other interest of the broker-dealer ahead of the interests of the retail customer. Additionally, the final rule requires broker-dealers to address conflicts of interest by establishing, maintaining, and enforcing policies and procedures reasonably designed to identify and fully and fairly disclose material facts about conflicts of interest. In instances where the SEC has determined that disclosure is insufficient to reasonably address the conflict, the final rule requires broker-dealers to mitigate or, in certain instances, eliminate the conflict. The standard of conduct established by Regulation Best Interest cannot be satisfied through disclosure alone. The standard of conduct draws from key principles underlying fiduciary obligations, including those that apply to investment advisers under the Investment Advisers Act of 1940. Regardless of whether a retail investor chooses a broker-dealer or an investment adviser (or both), the retail investor will be entitled to a recommendation (from a broker-dealer) or advice (from an investment adviser) that is in the best interest of the retail investor and that does not place the interests of the firm or the financial professional ahead of the interests of the retail investor.

On September 26, 2019 the SEC adopted a new rule and form amendments designed to modernize the regulatory framework for ETFs. The new rule will permit ETFs that satisfy certain conditions to operate within the scope of the Investment Company Act of 1940, and come directly to market without the cost and delay of obtaining an exemptive order. This is intended to facilitate greater competition and innovation in the ETF marketplace by lowering barriers to entry. The new rule also will replace hundreds of individualized exemptive orders with a single rule. The rule's standardized conditions are designed to level the playing field among most ETFs and protect ETF investors, while disclosure amendments adopted by the SEC will provide investors who purchase and sell ETF shares on the secondary market with new information. In addition, the SEC issued an exemptive order that further harmonizes related relief from certain provisions of the Securities Exchange Act of 1934. On May 20, 2019, the SEC approved an order for exemptive relief that will allow for the active management of an ETF without the daily portfolio transparency requirement that until now has facilitated ETF arbitrage. The ETF would sell and redeem shares to authorized participants only through an agent that will know, but keep confidential, the ETF's portfolio holdings. The ETF would invest only in certain securities that trade on a U.S. exchange contemporaneously with the ETF's shares, and would disseminate a verified intraday indicative value, reflecting the value of the ETF's holdings, that would be updated every second.

5.2.3 Operational Risks for Technological Systems and Cybersecurity

In June 2019, IOSCO's Cyber Task Force issued a final report that compiles information from IOSCO member jurisdictions regarding their existing frameworks for cyber regulation. It is intended to serve as a resource for financial market regulators and firms to raise awareness of existing international cyber guidance, and to encourage the adoption of good practices among the IOSCO community. The report examines how IOSCO member jurisdictions are using three prominent and internationally recognized cyber frameworks: (1) National Institute of Standards and Technology Cybersecurity Framework; (2) CPMI-IOSCO Guidance on Cyber Resilience for Financial Market Infrastructures (CPMI-IOSCO Guidance); and (3) International Organization for Standardization (ISO) and International Electrotechnical Commission Information Security Management System standards. The report focuses on these existing cyber frameworks instead of proposing a new framework. The report also indicates how such existing cyber frameworks could help address any gaps identified in members' current regimes. Lastly, the report provides a set of core questions that firms and regulators may use to promote awareness of cyber good practices or enhance their existing practices.

5.2.4 Accounting Standards

In June 2019, the FASB proposed accounting relief for companies and organizations required to modify contracts as a result of transition to global reference rates. The FASB tentatively decided that for certain contracts, changes due to the contract's reference interest rate would be accounted for as a continuation of that contract rather than the creation of a new contract. Under normal circumstances, modifications made to loan, debt, and lease contracts would require assessments regarding whether the modification would qualify as an extinguishment or a troubled debt restructuring. This proposal follows the decision by the FASB, in late 2018, to add the SOFR as a permissible benchmark rate for hedge accounting purposes. On September 5, 2019, the FASB issued a proposed Accounting Standards Update (ASU), entitled Reference Rate Reform (Topic 848): Facilitation of the Effects of Reference Rate Reform on Financial Reporting.

In October 2019, the FASB also approved targeted transition relief to delay effective dates for certain companies for accounting for leases, credit losses, hedging, and long-duration insurance contracts. Under the FASB's decision, the effective date for implementation of ASU 2016-13, Financial Instruments-Credit Losses (Topic 326); Measurement of Credit Losses on Financial Instruments, commonly referred to as the CECL methodology, for calendar-year-end SEC filers, excluding smaller companies as defined by SEC, will remain January 1, 2020, but the new effective date for all other calendar-year-end entities will be January 1, 2023.

Under CECL, when estimating credit losses for the contractual life of the loan, collection expectations are updated at each reporting period such that the net amount recognized on the balance sheet represents the amount expected to be collected. The standard also requires consideration of a broader range of supportable information to determine credit loss estimates, including relevant information about past events, historical experience, current conditions, and reasonable and supportable forecasts with expectations for how future conditions might affect losses. CECL does not change the ultimate cash flows or a borrower's ability to repay, and does not change when to charge off a loan. It changes only the timing of when loss provisions are recognized in net income. The scope includes financial asset instruments carried at amortized costs, such as loans, HTM debt securities, reinsurance receivables, and commitments to extend credit. The guidance allows an institution to apply methods that reasonably reflect its expectations of the credit loss estimate. An institution is permitted to revert to historical loss information that is reflective of the contractual term (considering the effect of prepayments) for periods that are beyond the timeframe for which the entity is able to develop reasonable and supportable forecasts of loss. In other words, the allowance model considers events that have not occurred but can be expected in the future. A cumulative-effect adjustment for the changes in the allowance for credit losses will be recorded to retained earnings when an institution transitions from the current incurred loss methodology to CECL. A banking organization's implementation of CECL will likely affect its retained earnings, deferred tax assets, and allowances and, as a result, its regulatory capital ratios.

5.2.5 Bank Secrecy Act/Anti-Money Laundering Regulatory Reform

The FDIC, Federal Reserve, NCUA and OCC ("Federal Banking Agencies") have joined with the Treasury and its Financial Crimes Enforcement Network (FinCEN) in an executive-level working group to improve the effectiveness and the efficiency of bank compliance with the Bank Secrecy Act (BSA). Since October 2018, the working group has clarified the legal requirements and supervisory expectations in the BSA area relating to resource sharing, the application of innovative technology solutions and the risk-focused approach to BSA/Anti-Money Laundering (AML) supervision through the publication of joint statements. In addition, the Federal Banking Agencies and FinCEN granted an exemption to the Customer Identification Program rule for loans extended by banks (and their subsidiaries) subject to the Federal Banking Agencies' jurisdiction to commercial customers to facilitate purchases of property and casualty insurance policies, thus reducing regulatory burden.

In June 2019, the Financial Action Task Force (FATF), an international intergovernmental organization that developed international standards for combating money laundering and the financing of terrorism and proliferation of weapons of mass destruction, revised its international standards to cover "virtual assets" and "virtual asset service providers." Over two hundred countries around the world, including the United States, have committed to comply with the FATF standards. The new standards require countries to: (1) assess and mitigate their risks associated with "virtual asset" financial activities and providers; (2) license or register providers; (3) subject providers to supervision or monitoring by competent national authorities (not a self-regulatory body); (4) implement sanctions and other enforcement measures, when providers fail to comply with their AML/Countering the Financing of Terrorism (CFT) obligations, in addition to international cooperation measures; and (5) work to ensure that providers in this space also assess and mitigate their money laundering and terrorist financing risks and implement the full range of AML/CFT preventive measures.

5.3 Mortgages and Consumer Protection

5.3.1 Mortgages and Housing Finance

On February 20, 2019, the FHFA issued a final rule to adopt as its own portions of the regulations of the Federal Housing Finance Board (Finance Board) pertaining to the capital requirements for the FHLBs. The final rule carries over most of the existing Finance Board regulations without material change, but substantively revises the credit risk component of the risk-based capital requirement, as well as the limitations on extensions of unsecured credit. The principal revisions to those provisions remove requirements that the FHLBs calculate credit risk capital charges and unsecured credit limits based on ratings issued by a nationally recognized statistical rating organization, and instead require that the FHLBs use their own internal rating methodology. The final rule also revises the percentages used in the tables to calculate the credit risk capital charges for advances and non-mortgage assets. The FHFA retains the percentages used in the existing table to calculate the capital charges for mortgage-related assets but revises the approach to identify the appropriate percentage within the table.

On March 5, 2019, the FHFA issued a final rule to improve the liquidity of the Enterprises' To Be Announced (TBA)-eligible MBS by requiring the Enterprises to maintain policies that promote aligned investor cash flows both for current TBA-eligible MBS and, upon its implementation, for the Uniform Mortgage-Backed Security (UMBS)—a common, fungible MBS that will be eligible for trading in the TBA market for fixed-rate mortgage loans backed by one-to-four unit (single-family) properties. The final rule codifies alignment requirements that the FHFA implemented under the Fannie Mae and Freddie Mac conservatorships. The rule is integral to the transition to and ongoing fungibility of the UMBS. The Enterprises began issuing UMBS in place of their current TBA-eligible securities on June 3, 2019.

In September 2019, Treasury and the FHFA agreed to modifications to the PSPAs that will permit Fannie Mae and Freddie Mac to retain additional earnings in excess of the $3 billion capital reserves previously permitted by their PSPAs. Under these modifications, Fannie Mae and Freddie Mac will be permitted to maintain capital reserves of $25 billion and $20 billion, respectively. Treasury and each of Fannie Mae and Freddie Mac also agreed to negotiate an additional amendment to the PSPAs adopting covenants that are intended to further enhance taxpayer protections.

5.3.2 Consumer Protection

In 2017, the CFPB issued a payday, vehicle title, and certain high-cost installment loans rule to establish consumer protections for short-term, small-dollar and other loans. On February 14, 2019, the CFPB issued an NPRM proposing to rescind the Mandatory Underwriting Provisions of that rule. On June 17, 2019, the CFPB also issued a final rule delaying the compliance date for these provisions from August 19, 2019 to November 19, 2020.

On July 31, 2019, the CFPB issued an ANPR to request information about possible revisions to Regulation Z. With certain exceptions, Regulation Z requires creditors to make a reasonable, good

faith determination of a consumer's ability to repay any residential mortgage loan, and loans that meet Regulation Z's requirements for "qualified mortgages" (QMs) obtain certain protections from liability. One category of QMs is loans that are eligible for purchase or guarantee by either Fannie Mae or Freddie Mac. Under Regulation Z, this category of QMs is scheduled to expire no later than January 10, 2021. The CFPB currently plans to allow this QM loan category to expire in January 2021 or after a short extension, if necessary, to facilitate a smooth and orderly transition.

5.4 Data Scope, Quality, and Accessibility

5.4.1 Data Scope

Repo Data Collection and Alternative Reference Rate Activities

The repo market is the largest short-term wholesale funding market in the United States. This market facilitates low-risk cash investment, monetization of assets, transformation of collateral, and hedging.

The OFR finalized rules in February 2019 for a collection of data on centrally cleared repo transactions comprising approximately one-quarter of all U.S. repo market transactions. The OFR collection, which began in October 2019, has two primary purposes: (1) to identify and monitor financial stability risks; and (2) to support the calculation of reference rates, including SOFR. SOFR relies on data relating to repo transactions backed by Treasury securities in the U.S. repo market. Data on certain of these transactions will be collected under the OFR rule. The OFR collection will provide a reliable source of data inputs for the computation of alternative rates.

The Federal Reserve Bank of New York, in cooperation with the OFR, began publishing SOFR in April 2018. Centrally cleared futures and swaps referencing SOFR were launched in May and July 2018, respectively; the first SOFR-linked debt was issued in July 2018 and the first preferred stock issuance referencing SOFR was reported in July 2019.

5.4.2 Data Quality

Legal Entity Identifier

During the past year, global adoption of the LEI continued to expand. Further, starting in 2020, all EU repo collateral financing will also require an LEI. The LEI enables unique and transparent identification of legal entities. As of August 2, 2019, more than 1.45 million LEIs had been issued by 33 approved operational issuers. Approximately 36 percent of these were issued in the United States, and approximately 13 percent were issued to U.S.-based entities. The total number of LEIs issued represents a 9 percent increase from year-end 2018, which follows a 37 percent increase in 2018. This expansion continues to be driven primarily by the LEI's use in regulation, particularly in the EU, where, beginning in January 2018, regulations under the revised Markets in Financial Instruments Directive and Regulation required entities involved in securities and OTC derivatives transactions to have an LEI and to use that LEI in these transactions.

Reporting of Standardized Derivatives Data

During 2019, the CFTC, OFR, SEC, and Federal Reserve continued to lead and participate in the development of international standards for the reporting of OTC derivatives transaction data to SDRs. The agencies engaged in this work as members of the Working Group on Unique Transaction Identifier (UTI) and Unique Product Identifier (UPI) Governance (GUUG) of the Financial Stability Board (FSB) and the Working Group for the Harmonisation of Key OTC Derivatives Data Elements (Harmonisation Group) of the CPMI and IOSCO.

In 2019, several U.S. regulators provided input and support for the FSB GUUG decision to approve the transfer of further UTI development as a standard to the ISO. The UTI (ISO 23897) standard is expected to be available for use in 2020.

In addition, the FSB designated the Association of National Numbering Agencies (ANNA) Derivative Service Bureau (DSB) as the sole service provider for the UPI. In this role, the ANNA DSB will issue UPI codes and manage and provide access to the UPI reference data library. It is anticipated that the UPI will also become an ISO standard.

In 2019, several Council member agencies continued to participate in the work of the CPMI-IOSCO Data

Harmonisation Group's Critical Data Elements workstream, completing the analysis of governance arrangements for the standards for the more than 100 data elements (other than the UTI and UPI) identified as critical for reporting derivatives transactions. In October 2019, the Harmonisation Group published its final report, recommending that these data elements be incorporated into the ISO 20022 standard.

5.5 Council Activities

5.5.1 Risk Monitoring and Regulatory Coordination

The Dodd-Frank Act charges the Council with responsibility to identify risks to U.S. financial stability, promote market discipline, and respond to emerging threats to the stability of the U.S. financial system. The Council also has a duty to facilitate information sharing and coordination among member agencies and other federal and state agencies regarding financial services policy and other developments. The Council regularly examines significant market developments and structural issues within the financial system. This risk monitoring process is facilitated by the Council's Systemic Risk Committee (SRC), whose participants are primarily member agency staff in supervisory, monitoring, examination, and policy roles. The SRC serves as a forum for member agency staff to identify and analyze potential risks, which may extend beyond the jurisdiction of any one agency. The Council's Regulation and Resolution Committee (RRC) also supports the Council in its duties to identify potential gaps in regulation that could pose risks to U.S. financial stability.

In late 2017, the Council established a digital asset and distributed ledger technology working group. The working group brings together federal financial regulators whose jurisdictions are relevant to the oversight of digital assets and their underlying technologies. The group seeks to enable the agencies to collaborate regarding these issues, including to promote consistent regulatory approaches and to identify, assess, and address potential risks. The working group has also conducted outreach to state regulators, law enforcement authorities, and market participants. The working group continues to review potential risks associated with digital assets to evaluate whether these instruments, if widely adopted, could potentially transmit risks to the economy.

5.5.2 Determinations Regarding Nonbank Financial Companies

One of the Council's statutory authorities is to subject a nonbank financial company to supervision by the Federal Reserve and enhanced prudential standards if the company's material financial distress—or the nature, scope, size, scale, concentration, interconnectedness, or mix of its activities—could pose a threat to U.S. financial stability. The Dodd-Frank Act sets forth the standard for the Council's determinations regarding nonbank financial companies and requires the Council to take into account 10 specific considerations and any other risk-related factors that the Council deems appropriate when evaluating those companies.

Under Section 113 of the Dodd-Frank Act, the Council is required at least annually to reevaluate each previous determination and rescind any determination if the company no longer meets the statutory standards. The Council's rule and interpretive guidance and its supplemental procedures with respect to nonbank financial company determinations provide the public with additional information regarding the process for the Council's determinations and annual reevaluations.

As of the date of this report, no nonbank financial companies are subject to a final determination by the Council under Section 113 of the Dodd-Frank Act. Since 2010, the Council has voted to advance a total of four companies to Stage 3 of the Council's process for evaluating nonbank financial companies and voted not to advance five nonbank financial companies to Stage 3. Since the Council's last annual report, the Council has not advanced any nonbank financial companies to Stage 3 or made a proposed or final determination regarding any nonbank financial company.

On March 13, 2019, the Council issued for public comment proposed interpretive guidance that would replace the Council's existing interpretive guidance on nonbank financial company determinations, which was issued in 2012. The proposed interpretive

guidance describes the activities-based approach the Council intends to take in prioritizing its work to identify and address potential risks to U.S. financial stability. The proposed guidance would also help ensure that the Council's analyses of nonbank financial companies for potential designation are clear, transparent, and analytically rigorous.

5.5.3 Operations of the Council

The Dodd-Frank Act requires the Council to convene no less than quarterly. The Council held five meetings in 2019, including at least one each quarter. The meetings bring Council members together to discuss and analyze market developments, potential threats to financial stability, and financial regulatory issues. Although the Council's work frequently involves confidential supervisory and sensitive information, the Council is committed to conducting its business as openly and transparently as practicable. Consistent with the Council's transparency policy, the Council opens its meetings to the public whenever possible. The Council held a public session at two of its meetings in 2019. Approximately every two weeks, the Council's Deputies Committee, which is composed of senior representatives of Council members, convenes to discuss the Council's agenda and to coordinate and oversee the work of the Council's five other committees. The other committees are the Data Committee; the Financial Market Utilities and Payment, Clearing, and Settlement Activities Committee; the Nonbank Financial Companies Designations Committee; the RRC; and the SRC. The Council adopted its tenth budget in 2019.

6 Potential Emerging Threats and Vulnerabilities

6.1 Cybersecurity: Vulnerabilities to Attacks on Financial Services

Financial institutions continue to invest in and expand their reliance on information technology to increase efficiency. Greater reliance on technology, particularly across a broader array of interconnected platforms, increases the risk that a cybersecurity event will have severe consequences for financial institutions.

Cyber vulnerabilities in the financial system include vulnerabilities to malware attacks, ransomware attacks, denial of service attacks, data breaches, and other events. Such incidents have the potential to impact tens or even hundreds of millions of Americans and result in financial losses of billions of dollars due to disruption of operations, theft, and recovery costs.

The Council recognizes that the potential for a destabilizing cybersecurity failure is a key financial stability vulnerability. A cybersecurity event could threaten the stability of the U.S. financial system through at least three channels:

- The event could disrupt a key financial service or utility for which there is little or no substitute; this could include attacks on central banks; sovereign and sub-sovereign creditors, including U.S. state and local governments; custodian banks; payment, clearing, and settlement systems; or other firms or services that lack substitutes or are sole service providers.

- The event could cause a loss of confidence among a broad set of customers or market participants. If the event causes customers or participants to question the safety of their assets or transactions, and leads to significant withdrawal of assets or activity, the effects could be destabilizing to the broader financial system.

- The event could compromise the integrity of critical data. Accurate and usable information is critical to the stable functioning of financial firms and the system; if such data is corrupted on a sufficiently large scale, it could disrupt the functioning of the system. The loss of such data also has privacy implications for consumers and could lead to identity theft and fraud.

6.2 Ongoing Structural Vulnerabilities

6.2.1 Large, Complex, Interconnected Financial Institutions

Large BHCs play a central role in the U.S. economy through the provision of credit to commercial and retail borrowers. Losses on bank loan portfolios and other types of negative shocks to bank capital or liquidity can result in a reduction in the availability of credit in the economy and, in turn, a reduction in investment and real economic activity.

Banks also have a central role in the retail and wholesale payment systems. Operational failures affecting retail or interbank payment systems could disrupt commercial activity throughout the economy and, in an extreme case, could cause failures among financial institutions that suddenly find themselves short on liquidity.

BHCs have an important role in derivatives markets. The derivatives activities of large BHCs enable financial and nonfinancial firms to hedge their risk exposures. However, these transactions also expose counterparties to the risk of loss should a large, complex BHC default.

Finally, large BHCs are also providers of specialized types of financial services. The provision of several critical types of services, such as tri-party repo and custody services for asset managers, are concentrated in a few large BHCs. The smooth functioning of the financial system depends on the

ability of these institutions to continue to provide these services under stressful conditions.

During the financial crisis, the failure or near-failure of several large banks and investment banks had a destabilizing effect on the financial system. Following the crisis, Congress enacted and agencies implemented measures intended to enhance the safety and soundness of large BHCs. Large BHCs are now better capitalized and hold more high-quality liquid assets than before the financial crisis **(see Section 4.11.1)**. Moreover, because of regulatory and accounting changes, capital held by BHCs today is of higher quality than before the crisis. The largest BHCs that operate in the United States are subject to both company-run and supervisory stress testing requirements and periodically submit resolution plans to the Federal Reserve and FDIC **(see Sections 5.1.2 and 5.1.3)**. Market-based measures currently indicate low risk of distress or failure among the largest U.S. BHCs **(see Section 4.11.1)**. The financial performance of large BHCs has steadily improved over the past ten years, with ROAs now around pre-crisis levels and ROEs at the highest levels since the crisis.

Nonetheless, the Council continues to examine and assess potential threats that large, complex, and interconnected institutions may pose to financial stability.

6.2.2 Central Counterparties

The potential benefits of CCPs to financial stability include improved transparency, the promotion of enhanced risk management practices among clearing members, the application of standardized margin methodologies by clearing members, expanded multilateral netting, and strict procedures for the orderly management of counterparty credit losses. However, while CCPs provide significant benefits, they can potentially be a source of risk to financial stability due to the large volume of transactions they process and the interconnectedness of CCPs with large financial institutions. The inability of a CCP to perform could cause its members to face losses, and interdependencies raise the potential for disruptions to spread across multiple markets. Consequently, CCPs must be robust and resilient.

Supervisory stress tests of CCPs can be an important tool in the assessment of systemic risk. Supervisory stress tests can, for example, help shed light on the risks and vulnerabilities related to potential failures of the largest clearing members of a CCP, including, in particular, exposures posed by such firms across multiple CCPs. Such tests analyze the extent to which one or more failures could have an adverse impact across markets and institutions. In May 2019, the CFTC published its third supervisory stress test of CCPs, examining the ability of CCPs under its jurisdiction, both U.S. and foreign, to absorb severe shocks to the system. In addition to supervisory stress tests, some authorities regularly monitor risk exposures at CCPs pursuant to their regulatory regime. Both the CFTC and SEC maintain active risk surveillance programs of CCPs' risk management and receive daily or weekly reports of positions, risk measures, margins, collateral, and default resources.

As noted in **Sections 3.2.2 and 5.2.1**, CCPs can improve financial stability by reducing counterparty risk and increasing transparency. Since the introduction of the CPMI-IOSCO Principles for Financial Market Infrastructures (PFMI), which sets forth 24 standards related to CCPs and other types of financial market infrastructures, CCPs have made progress in the development and implementation of more robust risk management practices. In particular, pursuant to jurisdictions' implementation of the PFMI, CCPs have enhanced governance frameworks, introduced more robust stress testing and margin models, and increased financial resources available to cover one or more clearing member defaults.

The implementation of the PFMI has helped raise risk management standards and encouraged market participants to continue to have confidence in the CCPs. However, jurisdictional variations in implementing the PFMI can pose challenges if conflicting expectations are applicable simultaneously to a single CCP. At times, inconsistencies among jurisdictions' implementation of the PFMI may be reconcilable by authorities, but some jurisdiction-to-jurisdiction inconsistencies could increase financial stability risk.

There have also been advances in the development of plans for CCP recovery and resolution. With respect to those CCPs designated as systemically important FMUs by the Council, the CFTC has reviewed and provided guidance on recovery plans of the CCPs it supervises, and the SEC recently approved recovery and orderly wind-down plans for the CCPs it supervises. The CFTC and FDIC have jointly established CMGs for two U.S. CCPs that are considered systemically important in more than one jurisdiction, consistent with international standards **(see Section 5.2.1)**. In 2019, the FDIC and CFTC hosted CMG meetings for both of these CCPs.

Ongoing developments in the swaps market may reduce complexity in that market and the financial system as a whole. Specifically, swaps trade compression, access to swaps data, increased clearing volumes for various products, enhanced operational and liquidity policies and procedures, and publicly reported monthly cleared margin information **(see Sections 4.10.4 and 5.2.1)** should help reduce risk and increase transparency.

6.2.3 Short-Term Wholesale Funding

Repo Markets

Progress has been made in recent years in reducing counterparty risk exposure in repo markets. However, the risk of fire sales of collateral by creditors of a defaulted repo counterparty remains.

Concentration risk has increased in the tri-party repo market as just one institution is now responsible for all clearing in that important market segment. This increases the financial stability risks that would be associated with distress at that institution. Even a temporary service disruption, such as an operational failure, could impair the market, as participants may not have ready access to an alternative platform to clear and settle transactions.

A better understanding of the interdependencies among firms and market participants in the repo market is needed. The unexpected volatility in repo markets in September 2019 underscores the need for more research and analysis in this area. Additional information would help regulators and supervisors better assess potential risks and vulnerabilities. To this end, in October 2019 the OFR began the collection of data on centrally cleared repo transactions **(see Section 5.4.1)**. This data collection will facilitate the monitoring of an important segment of the centrally cleared repo market.

Money Market Mutual Funds and Other Cash Management Vehicles

Money market mutual funds and other cash management vehicles that offer a stable NAV can be subject to runs. Runs on these funds could disrupt short-term funding markets more broadly and have other adverse effects on related markets and firms. The MMF reforms implemented by the SEC in October 2016 were an important development in minimizing this risk. While the adoption of a floating NAV minimized first-mover advantage incentives in MMFs, likely reducing the risk of runs and related disruptions in short-term lending markets, the extent of that reduction is not clear.

Other types of cash management vehicles also invest in private assets and offer a stable NAV but are not regulated by the SEC and are not subject to the SEC's reforms. This includes certain short-term investment funds, local government investment pools, and private liquidity funds that attempt to maintain a stable NAV. Even at their current size, runs on these vehicles in stressed economic conditions might amplify or transmit stresses to the broader financial system.

In the current market and regulatory environment, some firms that offer short-term funds with stable NAVs may attempt to distinguish themselves by using new strategies that could increase credit, interest rate, or liquidity risks. More generally, regulations may have unintended consequences, and market participants and regulators should be alert to the emergence of new, unanticipated risks.

6.2.4 Investment Funds

The asset management industry is an important component of the U.S. financial system **(see Section 4.13)**. The sector is diverse and includes investment funds with a wide variety of sizes, strategies, and investment objectives. The Council has focused on potential vulnerabilities in the areas of liquidity and redemption risk that may arise in certain types

of investment funds, and the use of leverage by investment funds.

Vulnerabilities relating to liquidity and redemption can arise in mutual funds that offer daily redemption and hold mostly assets that may become less liquid in stressed markets. In a period of significant financial stress, mutual funds that have not effectively managed their liquidity risk and that face significant redemptions may be forced to sell less-liquid assets in unfavorable circumstances to meet redemption requests. If widespread, those sales could contribute to negative price pressure on correlated investments and the potential transmission of stress to other market participants.

The SEC has taken several steps to address these potential vulnerabilities in investment funds. In October 2016, the SEC adopted rules intended to enhance liquidity risk management by mutual funds and ETFs and to allow mutual funds to adopt swing pricing to pass on transaction costs to entering and exiting investors. These rules require, for example, open-end funds to adopt a liquidity risk management program, invest no more than 15 percent of their assets in illiquid investments, maintain a minimum percentage of highly liquid investments, and disclose information about their liquidity risk management programs in reports to shareholders. In addition, the SEC adopted rules to increase the transparency of registered investment company portfolio holdings; large registered investment companies began reporting to the SEC under these rules on April 1, 2019. In June 2018, the SEC amended Form N-PORT to enhance the portfolio liquidity information that the funds report to the SEC. These disclosures will provide the SEC with better visibility into the liquidity levels and portfolio holdings of registered investment companies, as well as the use of leverage by these funds. This information will be important in monitoring, for example, potential liquidity risk in open-end funds that invest primarily in leveraged loans **(see Section 4.13.2)**.

Leverage can be a useful component of an investment strategy and can allow investment funds to hedge risk or increase exposures, depending on the activities and strategies of the fund. However, leverage introduces counterparty risk, and in a period of stress, if leveraged investment funds are forced to sell assets on a significant scale, it could contribute to negative asset price movements.

The use of leverage is most widespread among hedge funds, but varies significantly among hedge funds of different sizes and investment strategies **(see Section 4.13.5)**. The SEC uses data collected on Form PF about certain hedge funds, private equity funds, and other private funds to support its monitoring of private funds and private fund advisers. These data include certain elements that can be used to provide insight into the amount and nature of hedge funds' use of leverage. Research and analysis of data on the use of leverage by hedge funds is ongoing. In addition, the SEC has re-proposed a new rule designed to enhance the regulation of the use of derivatives by registered investment companies.

6.2.5 Financial Market Structure

Advances in information and communications technologies, as well as regulatory developments, have altered the structure of financial markets. The Council and member agencies are closely monitoring how changes in market structure have affected the robustness and efficiency of capital markets and the stability of the financial system. Five developments of particular interest to the Council are: 1) the increasingly important role of non-traditional participants; 2) an increased concentration of liquidity providers; 3) the growing fragmentation of execution venues; 4) the importance and availability of data across markets; and 5) interdependencies among different segments of the markets.

1. *Role of non-traditional market participants:* Non-traditional market participants, including principal trading firms, play an increasingly important role in securities and other markets. These firms may improve liquidity and improve investor outcomes under normal circumstances, but they may also introduce new potential risks. For instance, the trading strategies that non-traditional market participants employ and the incentives and constraints

that they operate under may not be as well understood, leading to uncertainty concerning how these firms might behave during periods of market stress.

2. *Concentration of liquidity providers:* The high cost of maintaining the most advanced information technology and concentrated ownership of market data has changed the nature of competition in some markets by raising entry costs and increasing economies of scale. These, and other factors, have led to increased concentration among liquidity providers so that a small number of firms now carry out a significant proportion of trades. While economies of scale may allow the largest providers to reduce transaction costs, a limited number of liquidity providers heightens the risk of a sudden withdrawal of liquidity (due to, for example, operational disruptions) which has the potential to result in sudden, large price movements.

3. *Fragmentation of execution venues:* Technological advances, regulatory structures, and competition have resulted in a proliferation of execution venues in many markets. The multiplicity of venues is particularly notable in equity and equity options markets, where there currently are 23 national securities exchanges, 31 national market system stock alternative trading systems, and other market centers. There are benefits to having many different execution venues, including enhanced competition and innovation, greater choice in execution options, and enhanced resiliency to the system if, for example, trading can shift to other venues when one venue has systems problems. Fragmentation, however, can increase complexity, which could undermine resiliency during the spikes in transaction volume that often accompany stressed market conditions. Fragmentation may also impair or reduce efficiencies in the interaction of order flow.

4. *Importance and availability of data:* Technology has increased the importance and availability of financial data. Certain sophisticated market participants have used advances in the speed of data acquisition and processing and the availability of alternative data to enhance their algorithmic trading strategies. These participants also are developing businesses that rely on data to support advanced analytical tools, such as artificial intelligence and machine learning. The high fixed costs associated with accessing and processing data more quickly than competitors can contribute to increased concentration of liquidity providers and inhibit new entrants. The dominant role of data in modern markets can also lead to market inefficiencies. The cost to gain access to important data sources can lead to greater concentration and information asymmetries as some participants may be required to purchase access to data feeds and low-latency connectivity from a wide range of trading venues.

5. *Interdependence among financial markets:* Trading in one asset class can have spillover effects on pricing, liquidity, and volatility in other asset classes. For this reason, the Council and member agencies have a keen interest in understanding transmission channels between markets and across asset classes. The unusually high level of volatility in the U.S. Treasury market on October 15, 2014, led to the formation of the Treasury Market Practices Group's working group on clearance and settlement practices **(see Box D)**. Other recent events include the volatility on February 5, 2018, that impacted both futures and equities markets, and more recently, in September 2019, when volatility in the Treasury repo market contributed to a notable rise in the federal funds rate. There are benefits from interdependencies among markets, including enhanced price discovery and more options for hedging risks. At the same time, interdependencies create transmission risks from volatile or inaccurate pricing, which has the potential to amplify market shocks across different markets.

6.2.6 Data Gaps and Challenges

The financial crisis exposed several major gaps and deficiencies in the range and quality of data available to financial regulators to identify emerging risks in the financial system. These gaps and shortcomings included firm-level structure and ownership information; transaction data in certain important financial markets, including OTC derivatives and repo contracts; and limitations in financial statement reporting for certain types of institutions. The usefulness of data was often limited by institutional or jurisdictional differences in reporting requirements. These types of inconsistencies created challenges for data sharing and increased the reporting burden on market participants.

Council member agencies have been actively engaged with each other, regulators in other jurisdictions, and firms in the financial sector to develop standards and protocols and to execute on data collection initiatives. Staff of the OFR, CFTC, SEC, and Federal Reserve meet regularly with their international regulatory counterparts from the Financial Stability Board and CPMI-IOSCO to implement UTIs, UPIs, and CDE standards for OTC derivatives, and are now developing a governance structure for oversight. Member agencies have also been working to facilitate the adoption of LEIs and ULIs for mortgage loans.

6.3 Alternative Reference Rates

U.S. dollar LIBOR continues to be a widely used reference rate in a variety of financial instruments. With more than $200 trillion of LIBOR-based contracts outstanding, the transition from LIBOR, given its anticipated cessation or degradation, will require significant effort from market participants. The failure of market participants to adequately analyze their exposure to LIBOR and transition ahead of LIBOR's anticipated cessation or degradation could expose market participants to significant legal, operational, and economic risks that could adversely impact U.S. financial markets.

In 2014, the Federal Reserve Board and the Federal Reserve Bank of New York convened the ARRC to facilitate the transition from LIBOR and toward an alternative reference rate **(see Box C)**. The ARRC has made significant progress toward these objectives: analyzing and adopting an alternative rate (the Secured Overnight Financing Rate (SOFR)), creating robust contract fallback language for a variety of products, and building the infrastructure for the development of SOFR markets. Despite this progress, market participants with significant exposure to USD LIBOR remain vulnerable if they do not sufficiently prepare prior to the end of 2021.

Legacy cash products and new transactions without robust fallback language present a particular difficulty for transition. Contractual fallback provisions may not contemplate the need for an alternative rate or may include provisions that cannot be operationalized in the event of LIBOR's cessation, like the polling of LIBOR panel banks by the issuer. While many new floating rate note issuances include more robust contract fallback language, some new issuances still do not include these provisions, putting issuers and investors at risk. Securitized products are further complicated, as legacy contracts may require the consent of all parties and new issuance continues to use legacy language that may not be feasible to implement. Re-documenting these products will require significant effort and expense, and in most cases it may not be possible to contact and obtain the required consent from all parties involved; the slow uptake of more robust fallback language in these instruments therefore presents a particular vulnerability.

Consumer exposures to LIBOR, most commonly through adjustable rate mortgages, present a special set of considerations in addition to those discussed. Noteholders will need to take care in working to ensure that consumers are treated fairly and that the transition is explained in a clear and understandable way. The ARRC is working with consumer groups, lenders, investors, and regulators to achieve such an outcome.

The ARRC released a practical implementation checklist to help market participants in the transition away from LIBOR. Market participants must analyze their exposure to U.S. dollar

LIBOR, assess the impact of LIBOR's cessation or degradation on existing contracts, and remediate risk from existing contracts that do not have robust fallback arrangements to transition the contract to an alternate rate. Participation in the International Swaps and Derivatives Association's upcoming protocol will be especially important in remediating risks to existing derivatives contracts referencing LIBOR. Market participants who do not sufficiently prepare for this inevitable transition could face significant legal, operational, and economic risks. Market participants should not wait for future developments, such as the introduction of a possible forward-looking SOFR term rate, to begin the transition process and instead should begin their transition process immediately.

6.4 Managing Vulnerabilities amid Prolonged Credit Expansion

Asset prices have increased during the long economic expansion. Equity valuations relative to corporate earnings are above historical averages **(see Section 4.7)**. Credit spreads on corporate debt are near their post-crisis lows **(see Section 4.3)**. The value of residential and most types of commercial real estate has also increased significantly since the end of the financial crisis **(see Section 4.5)**. However, broad-based declines in asset prices could occur if there is a sharp decline in economic activity or significantly reduced expectations of future growth. Elevated valuations in U.S. equity, corporate bond, and certain residential and commercial real estate markets would make them susceptible to larger price declines should a major correction occur. A fall in asset values would weaken the balance sheets of financial and nonfinancial businesses and potentially make the financial system less stable. Lower valuations would reduce the collateral value of real and financial assets and thereby negatively impact liquidity, increase borrowing costs, and heighten rollover risk.

The use of borrowing and leverage by nonfinancial businesses has increased during the economic expansion **(see Section 4.3)**. Since 2011, the rate of growth in nonfinancial business borrowing has exceeded the growth in nominal GDP. The ratio of nonfinancial business debt to GDP is now at the upper end of its historical range. A large share of the increase in the use of debt has been by borrowers of relatively low credit quality **(see Box A)**.

The potential risk to financial stability from nonfinancial business borrowing depends on the ability of businesses to service their obligations, and the ability of the financial sector to absorb losses from defaults and downgrades. Currently, strong interest coverage and liquidity positions have allowed businesses to service their debts with low delinquency rates. Credit spreads and other market measures of default risk indicate that market participants do not expect a significant rise in defaults in the short- or medium-term **(see Section 4.3)**. Moreover, because capital and liquidity levels are significantly above pre-crisis levels **(see Section 4.11)**, commercial banks are better positioned to absorb losses from the extension of credit to nonfinancial businesses. However, if credit markets deteriorate, investors—including those invested in CLOs and certain investment vehicles holding most of their assets in leveraged loans—may face liquidity risks or shortfalls in loss-absorbing capacity **(see Box A)**.

6.5 Nonbank Mortgage Origination and Servicing

Nonbank mortgage companies have assumed a larger role in the origination and servicing of residential mortgages **(see Section 4.5 and Box B)**. The business models of nonbanks vary. However, most nonbanks rely heavily on short-term funding sources and generally have relatively limited resources to absorb financial shocks. Nonbanks are heavily involved in servicing mortgages held in Enterprise and Ginnie Mae mortgage-backed securities. Servicers of these mortgages often have the obligation to make payments to investors even if the borrower does not make mortgage payments.

If delinquency rates rise or nonbanks otherwise experience solvency or liquidity strains, their distress could transmit risk to the financial system **(see Box B)**. Many nonbanks specialize in the origination and servicing of mortgages to low-income and higher-risk borrowers and those mortgages that are insured by the FHA. Widespread defaults or

financial difficulties among nonbank mortgage companies could result in a decline in mortgage credit availability among these borrowers. Similarly, the Enterprises and Ginnie Mae may have difficulty transferring servicing from failed nonbank servicers to healthy servicers if multiple large nonbank servicers simultaneously face distress—which may be a risk given the similarities in their business models—and if other firms are unwilling or unable to assume the servicing responsibilities.

6.6 Financial Innovation

Financial innovation offers considerable benefits to consumers and providers of financial services by reducing the cost of certain financial services, increasing the convenience of payments, and potentially increasing the availability of credit. Innovation can also create new risks that are not well understood, and it can undermine oversight if it fosters financial activities in areas that are not subject to appropriate regulation.

As discussed in **Section 4.14.1**, the market value and adoption of digital assets have grown rapidly in recent years, including through innovations such as stablecoins, but their use for payments remains very limited. If a stablecoin became widely adopted as a means of payment or store of value, disruptions to the stablecoin system could affect the financial system and the wider economy, warranting greater regulatory scrutiny. A decline in the value of certain digital assets could result in the transmission of risk to the financial sector through financial institution exposures, risks to the payment system, wealth effects, and confidence effects. Consumers, investors, and businesses could also face losses if the market price of such assets is unstable. Risks to the payment system, if not properly managed, could present financial stability risks, given the importance of a well-functioning payments system in facilitating commercial activities.

Regulatory attention and coordination are critically important in light of the quickly evolving market for digital assets. Digital asset arrangements vary widely. The risks each poses depend, among other things, on the structure of the asset and its consensus mechanism, and the risk management practices of participants. Indeed, the potential risks presented by different stablecoin systems may vary according to the mechanism by which they are made stable and the governance policies of the administrator.

Digital asset networks can be international in scope and include a diverse set of participants, including nonfinancial institutions, heightening illicit financing and national security risks. The significant number of counterparties could introduce complexities in governance structures and incentives, as well as transfer risk to other components of the system. Digital asset networks may also be subject to operational risks, including disruptions to the technologies that underlie the platform and cybersecurity. These events could prove disruptive to users and, in an extreme case, undermine confidence in the system as a whole.

As discussed in **Section 4.14.4**, large technology and e-commerce companies providing financial services may increasingly seek to compete directly with incumbent financial service providers, and their market presence could grow significantly. These firms currently may not be subject to many types of financial services regulation with which incumbent financial service providers are required to comply.

Financial firms' rapid adoption of fintech innovations in recent years may increase operational risks associated with financial institutions' use of third-party service providers. Market concentration among third-party service providers may create financial stability risks, because operational failures or faults at a key service provider could disrupt the activities of multiple financial institutions or financial markets.

6.7 Global Economic and Financial Developments

Downside risks to global economic growth have increased since the Council's last annual report. Of particular concern is the slowdown in growth in export-driven economies. Rising trade tensions have increased business uncertainty and pose downside risks to global growth. A sustained slowdown in global trade could have spillover effects to the economy and financial markets. Macroeconomic

policymakers in many advanced economies have less unused capacity to stimulate economic growth than they did before the financial crisis. A modest slowdown in global economic growth is unlikely to materially affect U.S. financial stability. However, a severe downturn overseas could impact U.S. financial stability through direct financial exposures or effects on economic and financial confidence.

There continues to be a considerable amount of uncertainty regarding the United Kingdom's withdrawal from the European Union. Withdrawal was originally planned for March 29, 2019, but has been delayed to January 31, 2020. Regulators in Europe and the United States have taken steps to lessen potential disruptions to the financial system of a disorderly Brexit. The UK government and the European Commission have arrived at temporary or permanent arrangements that allow for continued access to UK and EU derivatives CCPs, addressed servicing of cross-border insurance contracts, and authorized asset management firms to continue to operate and market in each jurisdiction. U.S. regulators have issued interim final rules to lessen the impact of a disorderly Brexit on swap dealers and participants **(see Section 5.2.1)**. While these steps lessen risks to financial stability, a disorderly Brexit still has significant downside risk for UK and EU macroeconomic performance. For example, a disorderly Brexit could lead to disruptions in cross-border trade and certain financial activities, potential reductions in investor confidence in the UK economy, increased foreign exchange volatility, and a decline in UK asset values.

In addition to the challenges from a slowdown in economic growth, many euro area economies also face structural vulnerabilities. Public sector indebtedness and near-term refinancing requirements are high in many euro area economies. Moreover, in some EU member states, domestic financial institutions hold large amounts of sovereign debt. This leaves both fiscal agencies and the financial sector vulnerable to sudden shifts in investor sentiment. Low or negative policy rates limit the ability of policymakers to use monetary policy tools to stimulate economic activity. Though market measures do not indicate immediate solvency concerns among large euro area banks **(see Section 4.11)**, profitability continues to lag, raising questions regarding the business models of several large institutions. Banks in several euro area nations are still burdened by large amounts of non-performing loans and many have meaningful exposures to emerging markets.

After a rapid increase in debt and leverage following the global financial crisis, Chinese authorities began taking steps to encourage financial deleveraging in 2016. However, the recent slowdown in domestic economic growth has caused Chinese authorities to pull back on these measures somewhat. China has sufficient fiscal space to employ stimulus measures that could moderate a slowdown in economic growth. Economic stimulus by authorities may encourage a renewed expansion of private credit that may increase already high levels of household and business debt. Moreover, a loosening of lending standards could exacerbate moral hazard problems surrounding highly indebted state-owned enterprises and local governments, whose failure could raise solvency issues among Chinese financial institutions. Increased trade tensions could also further slow the Chinese economy and, in a severe case, negatively impact the Chinese financial system. Potential direct spillovers from a slowing Chinese economy to the U.S. financial system appear to be manageable, but indirect effects on global economic and market confidence could adversely impact U.S. economic performance.

Economic growth rates in EMEs have declined in part due to a slowing of the Chinese economy, a major market for EME exports. A slowdown in growth and a stronger dollar could increase refunding risk for EME corporates. Much of the debt issued by businesses in EMEs is short-term and due to be rolled over in the next three years **(see Section 4.2.2)**. The two economies of immediate concern are Argentina and Turkey. However, spillovers from stress in Argentine and Turkish markets to the U.S. financial system will likely be limited as U.S. financial institutions do not have significant direct or indirect exposures to these economies.

Box C: The Continued Transition to Alternative Reference Rates

Referenced in more than $200 trillion dollars of financial instruments, U.S. dollar LIBOR continues to be the most widely used interest rate benchmark in the world. Due to the decline of transactions in the wholesale, unsecured funding markets as financial institutions show greater reliance on secured funding, LIBOR panel banks must increasingly rely on expert judgement rather than on observable market transactions. For example, in 3-month LIBOR, the most commonly referenced tenor, a median of six daily transactions totaling about $700 million, underlies the rate. The lack of observable transactions creates fundamental concerns about LIBOR's construction and long-term viability.

While the exact timing and nature of LIBOR's cessation remains unclear, the UK FCA, the regulator of ICE Benchmark Administration, LIBOR's administrator, has stated that it has voluntary agreements with LIBOR panel banks to continue submissions through year-end 2021 and that the FCA expects at least some banks currently submitting to LIBOR to depart from LIBOR panels around that time. When banks leave the LIBOR panel, the FCA is required to assess whether the rate is representative of the underlying market. If the FCA finds LIBOR to be "unrepresentative" of the underlying market it is meant to measure, EU-supervised entities will no longer be able to utilize LIBOR in new debt and derivatives transactions. The FCA has urged market participants to be prepared for a scenario in which LIBOR is declared "unrepresentative," which would lead to EU regulatory restriction on the use of LIBOR for new contracts. Additionally, if enough banks leave the LIBOR panel, LIBOR may cease to be published. Industry participants should accordingly determine their most appropriate transition strategies based on their business requirements and other considerations.

In response to recommendations and objectives set forth by the Council and the Financial Stability Board, the Federal Reserve Board and FRBNY convened the ARRC to identify an alternative to U.S. dollar LIBOR and facilitate the voluntary acceptance and use of its recommended alternative. The ARRC has made significant progress to date in facilitating the transition from LIBOR. The ARRC analyzed options for alternate rates, adopted SOFR as its recommended alternative, and developed a paced transition plan that includes specific steps and timelines designed to encourage adoption of SOFR. SOFR is a near risk-free rate that reflects the cost of overnight borrowing in the repo market collateralized by Treasury securities. SOFR is fully based on transactions and incorporates more robust trading volumes than LIBOR, with transactions now regularly exceeding $1 trillion daily.

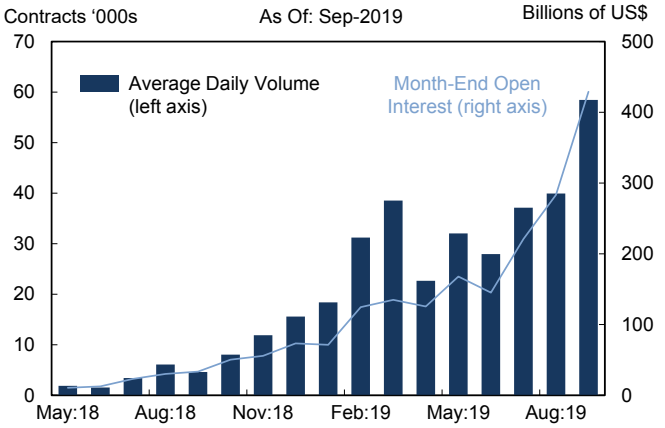
SOFR has been published by the FRBNY in cooperation with the OFR on a daily basis since April 3, 2018, and the ARRC helped coordinate the development of SOFR derivatives and bond markets. As shown in the chart below, activity in SOFR futures markets continues to grow, with daily trading volumes averaging nearly 60,000 contracts ($400 billion notional) in September 2019 **(Chart C.1)**. SOFR has been used by more than 30 issuers of floating-rate notes that exceed $280 billion in volume **(Charts C.2 and C.3)**.

Greater development of SOFR markets is anticipated as other market structure changes are implemented. In the derivatives markets, CME Group Inc. and LCH Ltd. have announced their intention to modify the methodology for price alignment interest and discounting from the current convention of the daily effective federal funds rate to SOFR. These central counterparties have tentatively proposed October 16, 2020, as the date on which

these modifications would take place. Changing price alignment interest and discounting to SOFR creates greater SOFR exposure, which in turn is expected to foster greater liquidity in SOFR derivatives. Further, the development and adoption of an International Swaps and Derivatives Association (ISDA) protocol for bilaterally uncleared derivatives that reference LIBOR will create a clear path to transition legacy LIBOR derivatives to SOFR in the event of LIBOR's cessation. Current fallbacks in derivatives contracts covered by ISDA documentation are not tenable, and derivatives users would face significant risks in the absence of this protocol.

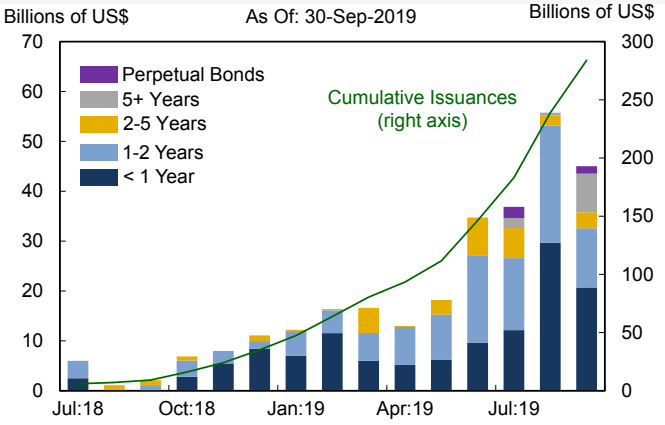
The ARRC has made progress in identifying best practices for robust contractual fallback language. The ARRC published recommended contractual fallback language for new issuance of business loans, floating rate notes, securitizations, and syndicated loans and has consulted on recommendations for new adjustable rate mortgages. Where adopted, the ARRC-recommended fallback language will provide marked improvements in contract robustness for new issuance. ARRC-recommended language has been adopted in securitizations and floating rate note issuances. As covered in **Section 6.3**, risk remains in both new and legacy issuance of cash products referencing LIBOR without robust contract fallback language. For example, debt and securitization terms are often longer dated and contain provisions that are difficult to operationalize, such as conducting a poll of banks. And, in most cases, these contracts would convert to fixed-rate instruments at the last published value of LIBOR. Although the unplanned conversion of these floating-rate instruments

C.1 SOFR Futures



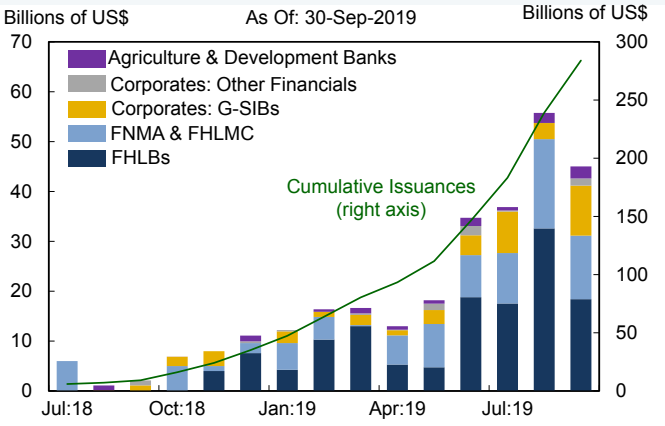
Source: CME

C.2 Issuance of SOFR Linked Notes by Tenor



Source: Bloomberg, L.P., Staff Calculations

C.3 Issuance of SOFR Linked Notes by Issuer



Source: Bloomberg, L.P., Staff Calculations

Box C: The Continued Transition to Alternative Reference Rates (continued)

to fixed-rate instruments would be disruptive, amendment of these legacy contracts requires the consent of all parties, which would require significant effort and expense and in most cases may not be possible.

The ARRC also developed and adopted a model for an adjustable rate mortgage (ARM) product based on SOFR. Fannie Mae and Freddie Mac have announced they are working to operationalize the securitization of SOFR ARMs. The ARRC is working with consumer groups and lenders to provide clear information to consumers about this transition.

While the ARRC has achieved significant progress in facilitating the transition from LIBOR, it must continue its work with market participants and regulators to address other known issues that could impede the transition. The ARRC plans to continue to assess risks for legacy contracts and request further regulatory relief, where appropriate, to support the transition. The ARRC plans to also undertake significant work to address operational issues related to the transition and the associated changes to market conventions. This includes analysis and adoption of an ARRC-endorsed spread adjustment or product-specific spread adjustments and monitoring SOFR derivatives markets for sufficient liquidity that would be needed to develop a forward-looking SOFR term rate.

Council member agencies have engaged on the issues relating to the transition, and certain member agencies have provided significant regulatory relief to remove hurdles that may otherwise impede the transition. Treasury has issued guidance to address potential income tax liability associated with modifying legacy instruments with an alternate rate. In September 2019, the prudential regulators issued a notice of proposed rulemaking to address the treatment of margin for legacy bilaterally uncleared swap transactions **(see Section 5.2.1)**. The CFTC is working closely with the ARRC to address issues related to Dodd-Frank swap requirements for margin, clearing, trading, and reporting. The SEC issued a staff statement encouraging market participants to actively manage their transition from LIBOR in several specific areas. The FHFA has encouraged the GSEs' participation in the ARRC and has supported floating-rate note issuance by Fannie Mae, Freddie Mac, and the FHLBs. The FHFA has also issued risk management guidance to the FHLBs limiting their use of new LIBOR-referencing financial assets, liabilities and derivatives.

Through this relief and other actions, Council member agencies have communicated that market participants should analyze their LIBOR exposure and seek to reduce that exposure by using alternate rates in new transactions, incorporating robust fallback provisions in new contracts that do reference LIBOR, and addressing LIBOR risk in their legacy contracts to the extent possible. As LIBOR's anticipated end nears, Council member agencies may consider additional regulatory and supervisory actions to encourage regulated entities' transition to alternate rates. Given the global nature of this issue, Council members will continue to closely coordinate with international counterparts.

Box D: The Treasury Market Practices Group – Clearing and Settlement Work

The Treasury Market Practices Group (TMPG) is a collection of market professionals sponsored by the Federal Reserve Bank of New York that focuses on market integrity and promotion of voluntary best practice guidelines it develops in the Treasury, agency debt and agency mortgage-backed securities (MBS) markets. Following the uncharacteristic and inexplicable price volatility on October 15, 2014, and subsequent Joint Staff Report on the U.S. Treasury Market (2015) and the Treasury's Request for Information (2016), the TMPG formed a working group to study and report on current clearing and settlement practices in the secondary market for U.S. Treasury securities. In July 2019, the TMPG issued recommendations and guidance for market participants summarized in *Best Practices for Treasury, Agency Debt, and Agency Mortgage-Backed Securities Markets*.

The structure of the U.S. Treasury securities market has undergone significant change since 2000 with the increased use of advanced technology, innovations in execution venues, and the wide use of automated execution strategies. There has been a marked increase in sophisticated and highly automated electronic trading across multiple execution venues that has significantly increased the speed of trade execution on some venues and likely improved overall liquidity through enhanced order flow and competition. New types of market participants—known as principal trading firms (PTFs)—have emerged, which have successfully developed and deployed high-speed and other algorithmic trading strategies. Traditional broker-dealers also engage in automated trading and consume pricing and liquidity offered by PTFs for themselves and their customers.

The TMPG found that market participants lack a common understanding of the implications of these structural changes for clearing and settlement processes in the Treasury market. This is important because, given the Treasury market's global importance and benchmark status, any disruption has the potential to create systemic risks that may be transmitted to other domestic and international capital markets. While the likelihood of such a disruption in the Treasury market is remote, the TMPG believes that discussions of the clearing and settlement processes and practices is prudent and could help improve the Treasury market's resiliency to stress events.

The TMPG working group identified several potential risk and resiliency issues for consideration, but, as an overarching risk, the group found that market participants may not be applying the same risk management rigor to the clearance and settlement of U.S. Treasury transactions as they do to other aspects of risk taking. This may be due in part to the risk-free nature of the underlying instrument and to the typically short settlement cycle.

In response to the risks identified by the working group, the TMPG strengthened certain existing best practice recommendations and added several new practice recommendations. The TMPG called on market participants in the Treasury, agency debt, and agency MBS markets to apply rigorous risk management to clearing and settlement practices for all products, including instruments with high credit quality or a short settlement cycle. For the full list of TMPG's findings and recommendations please see the TMPG's related white paper and updated best practice recommendations.

7 Abbreviations

ABS	Asset-Backed Security
AML	Anti-Money Laundering
ANNA DSB	Association of National Numbering Agencies, Derivatives Service Bureau
ANPR	Advance Notice of Proposed Rulemaking
ARM	Adjustable Rate Mortgage
ARRC	Alternative Reference Rates Committee
ASU	Accounting Standards Update
AUM	Assets Under Management
BBA	Building Block Approach
BHC	Bank Holding Company
BIS	Bank for International Settlements
BoE	Bank of England
BoJ	Bank of Japan
BSA	Bank Secrecy Act
C&I	Commercial and Industrial
CAPE	Cyclically Adjusted Price-to-Earnings Ratio
CBLR	Community Bank Leverage Ratio
CBO	Congressional Budget Office
CCAR	Comprehensive Capital Analysis and Review
CCP	Central Counterparty
CCyB	Countercyclical Capital Buffer
CD	Certificate of Deposit
CDE	Critical Data Element
CDO	Collateralized Debt Obligation
CDS	Credit Default Swap
CECL	Current Expected Credit Losses
CEM	Current Exposure Method
CET1	Common Equity Tier 1
CFPB	Consumer Financial Protection Bureau
CFT	Countering the Financing of Terrorism
CFTC	Commodity Futures Trading Commission
CLO	Collateralized Loan Obligation
CMBS	Commercial Mortgage-Backed Security
CMG	Crisis Management Group
Council	Financial Stability Oversight Council
CP	Commercial Paper
CPI	Consumer Price Index
CPMI	Committee on Payments and Market Infrastructures
CRE	Commercial Real Estate
CSBS	Conference of State Bank Supervisors
Desk	Open Market Trading Desk
DFAST	Dodd-Frank Act Stress Tests
DHS	Department of Homeland Security

Dodd-Frank Act
: Dodd-Frank Wall Street Reform and Consumer Protection Act

EBITDA
: Earnings Before Interest, Taxes, Depreciation, and Amortization

ECB
: European Central Bank

EDP
: Excessive Debt Procedure

EGRRCPA
: Economic Growth, Regulatory Relief, and Consumer Protection Act

EME
: Emerging Market Economy

Enterprises
: Fannie Mae and Freddie Mac

ETF
: Exchange-Traded Fund

ETN
: Exchange-Traded Note

ETP
: Exchange-Traded Product

EU
: European Union

FASB
: Financial Accounting Standards Board

FATF
: Financial Action Task Force

FBIIC
: Financial and Banking Information Infrastructure Committee

FBO
: Foreign Banking Organization

FCA
: Financial Conduct Authority

FCM
: Futures Commission Merchant

FDI Act
: Federal Deposit Insurance Act

FDIC
: Federal Deposit Insurance Corporation

Federal Reserve
: Board of Governors of the Federal Reserve System

FFIEC
: Federal Financial Institutions Examination Council

FHA
: Federal Housing Administration

FHC
: Financial Holding Company

FHFA
: Federal Housing Finance Agency

FHLB
: Federal Home Loan Bank

FICC
: Fixed Income Clearing Corporation

FICO
: Fair Isaac Corporation

FinCEN
: Financial Crimes Enforcement Network

FIO
: Federal Insurance Office

FMI
: Financial Market Infrastructure

FMU
: Financial Market Utility

FOMC
: Federal Open Market Committee

FNAV
: Floating Net Asset

FRBNY
: Federal Reserve Bank of New York

FSB
: Financial Stability Board

FS-ISAC
: Financial Services Information Sharing and Analysis Center

FSOC
: Financial Stability Oversight Council

FSSCC
: Financial Services Sector Coordinating Council

FX
: Foreign Exchange

G-SIB
: Global Systemically Important Bank

GAV
: Gross Asset Value

GDP
: Gross Domestic Product

Gilt
: UK Government Bond

GSE
: Government-Sponsored Enterprise

GUUG
: FSB's Working Group on UTI and UPI Governance

Harmonisation Group	CPMI-IOSCO Working Group for the Harmonisation of Key OTC Derivatives Data Elements
HOLA	Home Owners' Loan Act
HQLA	High-Quality Liquid Asset
HTM	Held-to-Maturity
HVCRE	High Volatility Commercial Real Estate
IAIS	International Association of Insurance Supervisors
ICI	Investment Company Institute
IDI	Insured Depository Institution
IHC	Intermediate Holding Company
IMF	International Monetary Fund
IOER	Interest on Excess Reserves
IOSCO	International Organization of Securities Commissions
IRA	Individual Retirement Account
IRS	Interest Rate Swap
ISDA	International Swaps and Derivatives Association
ISO	International Organization for Standardization
JGB	Japanese Government Bond
LBO	Leveraged Buyout
LCR	Liquidity Coverage Ratio
LTD	Long-Term Debt
LEI	Legal Entity Identifier
M&A	Merger and Acquisition
MBS	Mortgage-Backed Security
MMF	Money Market Mutual Fund
MOVE	Merrill Lynch Option Volatility Estimate
MSP	Major Swap Participant
MSR	Mortgage Servicing Right
NAIC	National Association of Insurance Commissioners
NAR	National Association of Realtors
NAV	Net Asset Value
NCUA	National Credit Union Administration
NIM	Net Interest Margin
NPRM	Notice of Proposed Rulemaking
OCC	Office of the Comptroller of the Currency
OFR	Office of Financial Research
ON RRP	Overnight Reverse Repurchase Agreement
OPEC	Organization of Petroleum Exporting Countries
OPEC+	OPEC and non-OPEC Participating Countries
OTC	Over-the-Counter
P/B	Price-to-Book
P&C	Property and Casualty
PBA	Puerto Rico Public Buildings Authority
PBGC	Pension Benefit Guaranty Corporation
PBOC	People's Bank of China
PFMI	Principles for Financial Market Infrastructures
PROMESA	Puerto Rico Oversight, Management, and Economic Stability Act
PSPA	Preferred Stock Purchase Agreement
PTF	Principal Trading Firm

QM	Qualified Mortgage
REIT	Real Estate Investment Trust
Repo	Repurchase Agreement
RMB	Renmimbi
RMBS	Residential Mortgage-Backed Security
ROA	Return on Assets
ROAA	Return on Average Assets
ROE	Return on Equity
RRC	Regulation and Resolution Committee
RWA	Risk-Weighted Asset
S&P	Standard & Poor's
SA-CCR	Standardized Approach for Counterparty Credit Risk
SBS	Security-Based Swap
SD	Swap Dealer
SDR	Stressed Default Rate
SEC	Securities and Exchange Commission
SEF	Swap Execution Facility
SIFMA	Securities Industry and Financial Markets Association
SLR	Supplementary Leverage Ratio
SMBs	Small and Mid-sized Regional Banks
SOFR	Secured Overnight Financing Rate
SRC	Systemic Risk Committee
TBA	To Be Announced
TIPS	Treasury Inflation-Protected Securities
TLAC	Total Loss Absorbing Capital
Treasury	Department of the Treasury
TYVIX	10-Year U.S. Treasury Volatility Index
UK	United Kingdom
ULI	Universal Loan Identifier
UMBS	Uniform Mortgage-Backed Security
UPB	Unpaid Principal balance
UPI	Unique Product Identifier
USD	U.S. Dollar
USDA	U.S. Department of Agriculture
UTI	Unique Transaction Identifier
VA	U.S. Department of Veterans Affairs
VIX	Chicago Board Options Exchange Volatility Index
WAM	Weighted-Average Maturity
YTD	Year-to-Date

8 Glossary

Additional Tier 1 Capital
A regulatory capital measure which may include items such as noncumulative perpetual preferred stock and mandatory convertible preferred securities which satisfy the eligibility criteria in the Revised Capital Rule, as well as related surplus and minority interests.

Advanced Approaches Capital Framework
The Advanced Approaches capital framework requires certain banking organizations to use an internal ratings-based approach and other methodologies to calculate risk-based capital requirements for credit risk and advanced measurement approaches to calculate risk-based capital requirements for operational risk. The framework applies to large, internationally active banking organizations—generally those with at least $250 billion in total consolidated assets or at least $10 billion in total on-balance sheet foreign exposure—and includes the depository institution subsidiaries of those firms.

Affiliate
In general, a company is an affiliate of another company if: (1) either company consolidates the other on financial statements prepared in accordance with U.S. Generally Accepted Accounting Principles, the International Financial Reporting Standards, or other similar standards; (2) both companies are consolidated with a third company on financial statements prepared in accordance with such principles or standards; (3) for a company that is not subject to such principles or standards, consolidation as described above would have occurred if such principles or standards had applied; or (4) a primary regulator determines that either company provides significant support to, or is materially subject to the risks or losses of, the other company.

Asset-Backed Commercial Paper (ABCP)
Short-term debt which has a fixed maturity of up to 270 days and is backed by some financial asset, such as trade receivables, consumer debt receivables, securities, or auto and equipment loans or leases.

Asset-Backed Security (ABS)
A fixed-income or other type of security which is collateralized by self-liquidating financial assets that allows the holder of the security to receive payments that depend primarily on cash flows from the assets.

Bilateral Repo
A repo between two institutions in which negotiations are conducted directly between the participants or through a broker, and in which the participants must agree on the specific securities to be used as collateral. The bilateral repo market includes both non-cleared trades and trades cleared through Fixed Income Clearing Corporation's delivery versus payment repo service.

Central Counterparty (CCP)
An entity which interposes itself between counterparties to contracts traded in one or more financial markets, becoming the buyer to every seller and the seller to every buyer, thereby ensuring the performance of open contracts.

Clearing Bank
A BHC subsidiary that facilitates payment and settlement of financial transactions, such as check clearing, or facilitates trades between the sellers and buyers of securities or other financial instruments or contracts.

Collateral
Any asset pledged by a borrower to guarantee payment of a debt.

Collateralized Loan Obligation (CLO)
A securitization vehicle backed predominantly by commercial loans.

Commercial Mortgage-Backed Security (CMBS)
A security which is collateralized by a pool of commercial mortgage loans and makes payments derived from the interest and principal payments on the underlying mortgage loans.

Commercial Paper (CP)
Short-term (maturity of up to 270 days), unsecured corporate debt.

Common Equity Tier 1 Capital (CET1)
A regulatory capital measure which includes capital with the highest loss-absorbing capacity, such as common stock and retained earnings.

Common Equity Tier 1 Capital Ratio
A ratio which divides common equity tier 1 capital by total risk-weighted assets. The ratio applies to all banking organizations subject to the Revised Capital Rule.

Comprehensive Capital Analysis and Review (CCAR)
An annual exercise by the Federal Reserve to ensure that institutions have robust, forward-looking capital planning processes which account for their unique risks and sufficient capital to continue operations throughout times of economic and financial stress.

Consumer Price Index (CPI)
A monthly index containing data on changes in the prices paid by urban consumers for a representative basket of goods and services.

Covenant-Lite Loan
A loan with fewer restrictions on the borrower. Covenant-lite loans generally lack financial maintenance covenants. Financial maintenance covenants that require the borrower periodically meet specific tests of its debt-service capabilities.

Credit Default Swap (CDS)
A financial contract in which one party agrees to make a payment to the other party in the event of a specified credit event, in exchange for one or more fixed payments.

Defined Benefit Plan
A retirement plan in which the cost to the employer is based on a predetermined formula to calculate the amount of a participant's future benefit. In defined benefit plans, the investment risk is borne by the plan sponsor.

Defined Contribution Plan
A retirement plan in which the cost to the employer is limited to the specified annual contribution. In defined contribution plans, the investment risk is borne by the plan participant.

Digital Asset
An electronic currency that can be used to make payments. Many digital asset payment networks are enabled by blockchains or distributed ledger technologies that record the ownership of the underlying asset.

Dodd-Frank Act Stress Tests (DFAST)
Annual stress tests required by the Dodd-Frank Act for national banks and federal savings associations with total consolidated assets of more than $10 billion.

Dry Powder
The amount of capital that has been committed to a private capital fund minus the amount that has been called by the general partner for investment.

Duration
The sensitivity of the prices of bonds and other fixed-income securities to changes in the level of interest rates.

Emerging Market Economy (EME)
Although there is no single definition, emerging market economies are generally classified according to their state of economic development, liquidity, and market accessibility. This report has grouped economies based on the classifications used by significant data sources such as the MSCI and Standard & Poor's, which include, for example, Brazil, China, India, and Russia.

Entity-Netted Notional (ENN)
A risk-based measure of size for the interest rate swap market. To describe ENNs intuitively, imagine that each pair of swap counterparties established its net interest rate risk position with bonds instead of swaps. More precisely, within each pair of counterparties, the counterparty that is net long has purchased a 5-year equivalent risk position in bonds from the counterparty that is net short. Then, the sum of those hypothetical bond positions across all pairs of counterparties is a measure of the size of the market and is equal to ENNs.

Exchange-Traded Product (ETP)
An investment fund or note that is traded on an exchange. ETPs offer continuous pricing—unlike mutual funds, which offer only end-of-day pricing. ETPs are often designed to track an index or a portfolio of assets. ETPs include: (1) exchange-traded funds (ETFs), which are registered as investment companies under the Investment Company Act of 1940 (1940 Act); (2) non-1940 Act pooled investment vehicles, which are generally trust or partnership vehicles that do not invest in securities; and (3) exchange-traded notes (ETNs), which are senior debt instruments issued by financial institutions that pay a return based on the performance of a "reference asset".

Federal Funds Rate
The interest rate at which depository institutions lend reserve balances to other depository institutions overnight. The FOMC sets a target range for the level of the overnight federal funds rate. The Federal Reserve Bank of New York then uses open market operations to influence the rate so that it trades within the target range.

FICO Score
A measure of a borrower's creditworthiness based on the borrower's credit data; developed by the Fair Isaac Corporation.

Financial and Banking Information Infrastructure Committee (FBIIC)
The FBIIC consists of 18 member organizations from across the financial regulatory community, both federal and state. It was chartered under the President's Working Group on Financial Markets following September 11, 2001 to improve coordination and communication among financial regulators, enhance the resiliency of the financial sector, and promote public-private partnership.

Financial Market Infrastructure (FMI)
A multilateral system among participating financial institutions, including the operator of the system, used for the purposes of recording, clearing, or settling payments, securities, derivatives, or other financial transactions. Under the Dodd-Frank Act, certain FMIs are recognized as FMUs.

Financial Market Utility (FMU)
A Dodd-Frank defined entity, which, subject to certain exclusions, is "any person that manages or operates a multilateral system for the purpose of transferring, clearing, or settling payments, securities, or other financial transactions among financial institutions or between financial institutions and the person."

Fire Sale
The disorderly liquidation of assets to meet margin requirements or other urgent cash needs. Such a sudden sell-off drives down prices, potentially below their intrinsic value, when the quantities to be sold are large relative to the typical volume of transactions. Fire sales can be self-reinforcing and lead to additional forced selling by some market participants which, subsequent to an initial fire sale and consequent decline in asset prices, may also need to meet margin or other urgent cash needs.

Fiscal Year
Any 12-month accounting period. The fiscal year for the federal government begins on October 1 and ends on September 30 of the following year; it is named after the calendar year in which it ends.

Futures Contract
An agreement to purchase or sell a commodity for delivery in the future: (1) at a price that is determined at initiation of the contract; (2) that obligates each party to the contract to fulfill the contract at the specified price; (3) that is used to assume or shift price risk; and (4) that may be satisfied by delivery or offset.

General Collateral Finance (GCF)
An interdealer repo market in which the Fixed Income Clearing Corporation plays the role of CCP. Trades are netted at the end of each day and settled at the tri-party clearing bank. See Tri-party Repo.

Government-Sponsored Enterprise (GSE)
A corporate entity with a federal charter authorized by law, but which is a privately owned financial institution. Examples include the Federal National Mortgage Association (Fannie Mae) and the Federal Home Loan Mortgage Corporation (Freddie Mac).

Gross Domestic Product (GDP)
The broadest measure of aggregate economic activity, measuring the total value of all final goods and services produced within a country's borders during a specific period.

Gross Notional Exposure
The sum of the absolute values of long and short notional amounts. The "notional" amount of a derivative contract is the amount used to calculate payments due on that contract, just as the face amount of a bond is used to calculate coupon payments.

Haircut
The discount, represented as a percentage of par or market value, at which an asset can be pledged as collateral. For example, a $1,000,000 bond with a 5 percent haircut would collateralize a $950,000 loan. The purpose of a haircut is to provide a collateral margin for a secured lender.

Held-to-Maturity (HTM)
An accounting term for debt securities accounted for at amortized cost, under the proviso that the company can assert that it has the positive intent and ability to hold the securities to maturity.

High-Quality Liquid Asset (HQLA)
An asset—such as a government bond—which is considered eligible as a liquidity buffer in the U.S. banking agencies'

liquidity coverage ratio. High-quality liquid assets should be liquid in markets during times of stress and, ideally, be central bank-eligible.

Institutional Leveraged Loan
The term portion of a leveraged loan that is sold to institutional investors.

Interest Rate Swap
A derivative contract in which two parties swap interest rate cash flows on a periodic basis, referencing a specified notional amount for a fixed term. Typically one party will pay a predetermined fixed rate while the other party will pay a short-term variable reference rate which resets at specified intervals.

Index Tranche Credit Default Swaps (CDS)
A synthetic collateralized debt obligation (CDO) based on a CDS index where each tranche (equity, mezzanine, senior, and super senior) references a different segment of the loss distribution of the underlying CDS index.

Intermediate Holding Company (IHC)
A company established or designated by a FBO under the Federal Reserve Board's Regulation YY. Regulation YY requires that a FBO with U.S. non-branch assets of $50 billion or more must hold its entire ownership interest in its U.S. subsidiaries, with certain exclusions, through a U.S. IHC.

Legal Entity Identifier (LEI)
A 20-character alpha-numeric code that connects to key reference information which enables clear and unique identification of companies participating in global financial markets. The LEI system is designed to facilitate many financial stability objectives, including improved risk management in firms; better assessment of microprudential and macroprudential risks; expedition of orderly resolution; containment of market abuse and financial fraud; and provision of higher-quality and more accurate financial data.

Leveraged Buyout (LBO)
An acquisition of a company financed by a private equity contribution combined with borrowed funds, with debt constituting a significant portion of the purchase price.

Leveraged Loan
While numerous definitions of leveraged lending exist throughout the financial services industry, generally a leveraged loan is understood to be a type of loan that is extended to companies that already have considerable amounts of debt and/or have a non-investment grade credit rating or are unrated and/or whose post-financing leverage significantly exceeds industry norms or historical levels.

LIBOR
A rate based on submissions from a panel of banks. LIBOR is intended to reflect the rate at which large, globally-active banks can borrow on an unsecured basis in wholesale markets.

Liquidity Coverage Ratio (LCR)
A standard to ensure that covered companies maintain adequate unencumbered, high-quality liquid assets to meet anticipated liquidity needs for a 30-day horizon under a standardized liquidity stress scenario.

Loan-to-Value Ratio
The ratio of the amount of a loan to the value of the asset that the loan funds, typically expressed as a percentage. This is a key metric when considering the level of collateralization of a mortgage.

Major Swap Participant
A person that is not a swap dealer and maintains a substantial position in swaps, creates substantial counterparty exposure, or is a financial entity that is highly leveraged and not subject to federal banking capital rules.

Money Market Mutual Fund (MMF)
A type of mutual fund which invests in short-term, high-quality, liquid securities such as government bills, CDs, CP, or repos.

Mortgage-Backed Security (MBS)
An ABS backed by a pool of mortgages. Investors in the security receive payments derived from the interest and principal payments on the underlying mortgages.

Mortgage Servicing Company
A company which acts as an agent for mortgage holders by collecting and distributing mortgage cash flows. Mortgage servicers also manage defaults, modifications, settlements, foreclosure proceedings, and various notifications to borrowers and investors.

Mortgage Servicing Right (MSR)
The right to service a mortgage loan or a portfolio of mortgage loans.

Municipal Bond
A bond issued by states, cities, counties, local governmental agencies, or certain nongovernment issuers to finance certain general or project-related activities.

Net Asset Value (NAV)
An investment company's total assets minus its total liabilities.

Net Interest Margin (NIM)
Net interest income as a percent of interest-earning assets.

Net Stable Funding Ratio (NSFR)
A liquidity standard to promote the funding stability of internationally active banks, through the maintenance of stable funding resources relative to assets and off-balance sheet exposures.

Open Market Operations
The purchase and sale of securities in the open market by a central bank to implement monetary policy.

Operational Resilience
The ability to adapt to changing conditions and withstand and rapidly recover from disruption due to emergencies. It can be resilience towards acts of terrorism, cyber attacks, pandemics, and catastrophic natural disasters.

Option
A financial contract granting the holder the right but not the obligation to engage in a future transaction on an underlying security or real asset. The most basic examples are an equity call option, which provides the right but not the obligation to buy a block of shares at a fixed price for a fixed period, and an equity put option, which similarly grants the right to sell a block of shares.

Over-the-Counter (OTC)
A method of trading which does not involve a registered exchange. An OTC trade could occur on purely a bilateral basis or could involve some degree of intermediation by a platform that is not required to register as an exchange. An OTC trade could, depending on the market and other circumstances, be centrally cleared or bilaterally cleared. The degree of standardization or customization of documentation of an OTC trade will depend on the whether it is cleared and whether it is traded on a non-exchange platform (and, if so, the type of platform).

Part 30 Accounts
Accounts which are for U.S. customers who trade futures and options on exchanges outside the U.S.

Primary Dealer
A financial institution that is a trading counterparty of the Federal Reserve Bank of New York. Primary dealers are expected to make markets for the Federal Reserve Bank of New York on behalf of its official accountholders as needed, and to bid on a pro-rata basis in all Treasury auctions at reasonably competitive prices.

Prudential Regulation
Regulation aimed at ensuring the safe and sound operation of financial institutions, set by both state and federal authorities.

Public Debt
All debt issued by Treasury and the Federal Financing Bank, including both debt held by the public and debt held in intergovernmental accounts, such as the Social Security Trust Funds. Not included is debt issued by government agencies other than Treasury.

Qualifying Hedge Fund
A hedge fund advised by a Large Hedge Fund Adviser that has a net asset value (individually or in combination with any feeder funds, parallel funds, and/or dependent parallel managed accounts) of at least $500 million as of the last day of any month in the fiscal quarter immediately preceding the adviser's most recently completed fiscal quarter. Large Hedge Fund Advisers are advisers that have at least $1.5 billion in hedge fund assets under management.

Real Estate Investment Trust (REIT)
An operating company which manages income-producing real estate or real estate-related assets. Certain REITs also operate real estate properties in which they invest. To qualify as a REIT, a company must have three-fourths of its assets and gross income connected to real estate investment and must distribute at least 90 percent of its taxable income to shareholders annually in the form of dividends.

Repurchase Agreement (Repo)
The sale of a security combined with an agreement to repurchase the security, or a similar security, on a specified future date at a prearranged price. A repo is a secured lending arrangement.

Residential Mortgage-Backed Security (RMBS)
A security which is collateralized by a pool of residential mortgage loans and makes payments derived from the interest and principal payments on the underlying mortgage loans.

Risk-Based Capital
An amount of capital, based on the risk-weighting of various asset categories, which a financial institution holds to help protect against losses.

Risk-Weighted Assets (RWAs)
A risk-based concept used as the denominator of risk-based capital ratios (common equity tier 1, tier 1, and total). The total RWAs for an institution are a weighted total asset value calculated from assigned risk categories or modeled analysis. Broadly, total RWAs are determined by calculating RWAs for market risk and operational risk, as applicable, and adding the sum of RWAs for on-balance sheet, off-balance sheet, counterparty, and other credit risks.

Rollover Risk
The risk that as an institution's debt nears maturity, the institution may not be able to refinance the existing debt or may have to refinance at less favorable terms.

Run Risk
The risk that investors lose confidence in an institution—stemming from concerns about counterparties, collateral, solvency, or related issues—and respond by pulling back their funding.

Secured Overnight Financing Rate (SOFR)
A broad measure of the cost of borrowing cash overnight collateralized by Treasury securities. The rate is calculated as a volume-weighted median of transaction-level tri-party repo data as well as GCF Repo transaction data and data on bilateral Treasury repo transactions.

Securities Lending/Borrowing
The temporary transfer of securities from one party to another for a specified fee and term, in exchange for collateral in the form of cash or securities.

Securitization
A financial transaction in which assets such as mortgage loans are pooled, securities representing interests in the pool are issued, and proceeds from the underlying pooled assets are used to service and repay the securities.

Security-Based Swap Dealer
A person that holds itself out as a dealer in security-based swaps, makes a market in security-based swaps, regularly enters into security-based swaps with counterparties, or engages in any activity causing it to be known as a dealer or market maker in security-based swaps; does not include a person entering into security-based swaps for such person's own account.

Short-Term Wholesale Funding
Short-term funding instruments not covered by deposit insurance which are typically issued to institutional investors. Examples include large checkable and time deposits, brokered CDs, CP, Federal Home Loan Bank borrowings, and repos.

Supplementary Leverage Ratio (SLR)
Tier 1 capital of an advanced approaches banking organization divided by total leverage exposure. All advanced approaches banking organizations must maintain an SLR of at least 3 percent. The SLR is effective January 1, 2018, and organizations must calculate and publicly disclose their SLRs beginning March 31, 2015.

Swap
An exchange of cash flows with defined terms and over a fixed period, agreed upon by two parties. A swap contract may reference underlying financial products across various asset classes including interest rates, credit, equities, commodities, and FX.

Swap Data Repository (SDR)
A person that collects and maintains information or records with respect to transactions or positions in, or the terms and conditions of, swaps entered into by third parties for the purpose of providing a centralized recordkeeping facility for swaps. In certain jurisdictions, SDRs are referred to as trade repositories. The Committee on Payments and Settlement Systems and IOSCO describe a trade repository as "an entity that maintains a centralized electronic record (database) of transaction data."

Swap Dealer
Section 1a(49) of the Commodity Exchange Act (CEA) defines the term "swap dealer" (SD) to include any person who: (1) holds itself out as a dealer in swaps; (2) makes a market in swaps; (3) regularly enters into swaps with counterparties as an ordinary course of business for its own account; or (4) engages in any activity causing the person to be commonly known in the trade as a dealer or market maker in swaps.

Swap Execution Facility (SEF)
A term defined in the Dodd-Frank Act as a trading system or platform which market participants use to execute and trade swaps by accepting bids and offers made by other participants, through any means of interstate commerce.

Swap Future
A futures contract which mimics the economic substance of a swap.

Swaption
An option granting the right to enter into a swap. See Option and Swap.

Syndicated Loan
A loan to a commercial borrower in which financing is provided by a group of lenders. The loan package may have a revolving portion, a term portion, or both.

Tier 1 Capital
A regulatory capital measure comprised of common equity tier 1 capital and additional tier 1 capital. See Common Equity Tier 1 Capital and Additional Tier 1 Capital.

Tier 2 Capital
A regulatory capital measure which includes subordinated debt with a minimum maturity of five years and satisfies the eligibility criteria in the Revised Capital Rule.

Time Deposits
Deposits which the depositor generally does not have the right to withdraw before a designated maturity date without paying an early withdrawal penalty. A CD is a time deposit.

Total Capital
A regulatory capital measure comprised of tier 1 capital and tier 2 capital. See Tier 1 Capital and Tier 2 Capital.

Tri-Party Repo
A repo in which a clearing bank acts as third-party agent to provide collateral management services and to facilitate the exchange of cash against collateral between the two counterparties.

Underwriting Standards
Terms, conditions, and criteria used to determine the extension of credit in the form of a loan or bond.

VIX (Chicago Board Options Exchange Market Volatility Index)
A standard measure of market expectations of short-term volatility based on S&P equity index option prices.

Weighted-Average Maturity (WAM)
A weighted average of the time to maturity on all loans in an asset-backed security.

Yield Curve
A graphical representation of the relationship between bond yields and their respective maturities.

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FINANCIAL STABILITY
OVERSIGHT COUNCIL

1500 PENNSYLVANIA AVENUE, NW | WASHINGTON, D.C. 20220

Exhibit I

BAILARD, INC. CODE OF ETHICS

Updated as of January 4, 2021

A. INTRODUCTION

As mandated by the Securities and Exchange Commission (the "SEC"), this Code of Ethics (this "Code") sets forth legal and ethical standards of conduct for the employees of Bailard, Inc. and its Affiliated Entities (the "Firm/Bailard"). This Code has been adopted by the Firm and is intended to set forth our policies and procedures concerning personal trading and other matters as well as to state the Firm's broader policies regarding our duty of loyalty to clients. This Code is intended to promote the conduct of each employee and the Firm with high standards of integrity and compliance with all applicable laws and regulations.

Bailard is required to adopt a code of ethics in accord with Rule 204A-1 under the Investment Advisers Act of 1940 (the "Advisers Act") and in accord with Rule 17j-1 under the Investment Company Act of 1940 (the "1940 Act") as it is a SEC registered investment adviser and serves as a sub-adviser to certain registered investment companies.

The investment management industry is closely regulated under the provisions of the Advisers Act and the 1940 Act, and by the regulations and interpretations of the SEC under those statutes. Transactions in securities are also governed by applicable provisions of the Securities Act of 1933 (the "Securities Act"), the Securities Exchange Act of 1934 (the "Exchange Act"), and the Commodity Exchange Act, as well as by state laws. The rules of conduct outlined in this Code are based in large part on rules of law and legal concepts developed under those statutes. These legal concepts do not remain static, and further developments of the law in these areas may be expected. We believe that it is our job to conduct our business to avoid not only any violation of law but also to avoid any appearance of violation or grounds for criticism.

B. APPLICABILITY OF THE CODE

This Code applies to all employees of Bailard, Inc. and its Affiliated Entities, including temporary employees, interns, and certain consultants that have access to Bailard's investment recommendations or trading.

This Code does not apply to independent directors of the Bailard Biehl &Kaiser Holdings Inc. ("BB&K Holdings Inc") Board of Directors, the Bailard Real Estate Investment Trust ("REIT") Board of Directors, the Scientific Advisory Council Members, or contractors and consultants with no access to Bailard's investment recommendations or trading.

C. STATEMENT OF ETHICAL PRINCIPLES AND STANDARD OF BUSINESS CONDUCT

The Firm holds all employees to a high standard of integrity and business practice. To properly serve our clients, the Firm strives to avoid or to manage conflicts of interest or the appearance of conflicts of interest. The Firm requires that you hold yourself to its high standards to protect its reputation for ethical conduct. Thus, you must, at all times, conduct yourself in a lawful, honest, and ethical manner; place the interest of clients first; display loyalty, honesty, fairness, and good faith toward clients; avoid

taking inappropriate advantage of any position of trust or responsibility; and maintain the confidentiality of client and proprietary information. At all times, you must place the interest of clients first and avoid activities and relationships that might interfere with the duty to make decisions in the best interests of our clients. When trading, conduct all personal securities transactions in full compliance with this Code, including these ethical principles and standards of business conduct.

We have complete confidence in the integrity and good faith of all of our employees; however, we also recognize that the knowledge of, and power to influence, investment recommendations could create potential conflicts with the interest of clients in that employees could use the information for their own personal benefit. This Code establishes reporting requirements and other restrictions or procedures on personal trading to monitor and enforce the provisions of this Code. Additionally, the Firm reserves the right to prohibit personnel from trading activities that are not explicitly prohibited under this Code.

Violations of the Code must be reported promptly to the CCO (the "CCO"), or to the President of the Firm (the "President"), or the CRO of the Firm (the "CRO"), who will report it to the CCO. Failure to comply with the Code may result in sanctions, including termination.

You are required to certify, on an annual basis, that you have complied with the provisions of this Code. By acknowledging receipt of this Code, you agree to comply with all applicable federal securities laws. This Code may be revised, changed, or amended at any time. Following any material revisions or updates, an updated version of this Code will be distributed to you and will supersede the prior version of this Code effective upon distribution. We will ask you to sign an acknowledgement confirming that you have read and understood the revised version of the Code, and that you agree to comply with the provisions.

The Code covers the most important rules of conduct currently in place and/or foreseen. Compliance with the letter and the spirit of this Code is a fundamental requirement. If you have any doubts about whether any conduct complies with the spirit of this Code, please consult with the CCO, the President, or the CRO. We will make every effort to preserve the confidentiality of such discussions, and in no event will there be retaliation for any report of a possible violation of this Code. As a rule of thumb, when in doubt, please err on the side of caution and ask questions, disclose information, and report any concerns.

For your guidance, some of the most important legal concepts within which we operate are mentioned below.

a. Fiduciary Duty

Bailard and Bailard employees owe a fiduciary duty to our clients and stockholders. This means a duty of loyalty, fairness and good faith, and a corresponding duty not to do anything prejudicial to or in conflict with the interests of our clients and stockholders. We owe our clients the highest duty of loyalty and rely on you to avoid conduct that is or may be inconsistent with that duty. It is also important for you to avoid actions that, while they may not actually involve a conflict of interest or an abuse of a client's trust, may have the appearance of impropriety. All transactions of employees shall be conducted consistent with this Code and in such a manner as to avoid any actual or potential conflict of interest or any abuse of an individual's position of trust and responsibility. Neither the Firm nor its employees shall take any inappropriate advantage of their position. This is a higher standard than that applicable to ordinary arm's length business transactions between persons who do not owe a fiduciary duty to the other parties, and it is a duty and standard of conduct that is required of Bailard and all Bailard employees.

b. Fraud and Deceit; Inside Information

The various laws administered by the SEC and the Commodity Futures Trading Commission ("CFTC") contain very broad provisions prohibiting fraud, deceit or "any manipulative or deceptive device or contrivance" in connection with securities and commodities transactions and the giving of investment advice. It is under these broad general provisions that the SEC, CFTC, and private individuals have successfully brought many of the important cases in the securities field that have received so much publicity in recent years, including cases on improper use of material nonpublic ("inside") information.

You are prohibited from using any material nonpublic information, no matter how acquired, in your own transactions or in the discharge of your responsibilities to clients. Please see the Insider Trading section of Bailard's Compliance Manual for additional information.

c. Manipulation

Care must always be taken to avoid market manipulation of securities and commodities trading. Such manipulation is strictly prohibited by law. The Firm and its employees are prohibited from knowingly spreading false and/or malicious rumors about securities with the intent of influencing the price of the securities.

d. Confidentiality

Information about the actual purchase or sale decisions, contemplated purchases or sales, or other transactions under consideration for clients whether or not actually authorized, must be kept confidential. Information about clients, investors, and prospects is confidential and must not be disclosed to persons who do not have a need to know such information in connection with their employment by the Firm.

You must maintain the confidentiality of confidential information entrusted to you by the Firm, except when disclosure is authorized by the CCO, the CRO, or the President or legally mandated. Confidential information includes but is not limited to lists of clients, investors, prospects, personal information about employees, proprietary formulas, business plans, or financial information. Unauthorized disclosure of any confidential information is prohibited.

Third parties may ask you for information concerning the Firm. All responses to inquiries on behalf of the Firm must be approved by the CCO, the CRO, or the President. If you receive any inquiries of this nature, you must decline to comment and refer the inquirer to the CCO, CRO, or the President.

e. Federal Securities and Other Laws

Bailard and its employees are required to comply with all applicable Federal Securities Laws and all other applicable rules and regulations.

f. Penalties

Under the various federal and state securities and commodities statutes, penalties that may be imposed for violations include civil liability for damages, temporary suspension, or permanent prohibition from engaging in various aspects of the securities, commodities, or investment advisory businesses as well as and criminal penalties.

D. DEFINITIONS

"ACCESS PERSON" is defined under the SEC's Code of Ethics Rule as an adviser's supervised person who has access to nonpublic information regarding the adviser's clients' and Bailard Funds' purchase or sale of securities, is involved in making investment and/or securities recommendations to clients and Bailard Funds, or has access to such recommendations that are nonpublic. Rather than classifying the Firm employees into access and non-access categories, we treat all firm employees as Access Persons. Unless and until the CCO determines otherwise, certain personnel who are not supervised by Bailard are not considered Access Persons and are excluded from the requirements of the Code. This includes such parties as the independent directors of the BB&K Holdings, Inc. Board of Directors, the Bailard REIT Board of Directors, and Scientific Advisory Council Members. Contractors and consultants are also excluded from the requirements of the Code, but under certain circumstances, consultants with access to Bailard's investment recommendations or trading will be considered Access Persons and subject to the requirements of the Code.

"AFFILIATED ENTITIES" are BB&K Holdings, Inc., the Bailard Funds; and Bailard's affiliated general partners.

"AUTOMATIC INVESTMENT PLAN" means a program in which regular periodic purchases or sales (to cover withdrawals) are made automatically in (or from) investment accounts by a predetermined schedule and allocation. Automatic Investment Plans include dividend reinvestment plans.

"AUTOMATED COMPLIANCE SYSTEM" means an online vendor generally used by the Firm for monitoring various components of the Compliance Manual. Currently, the Firm uses a web-based compliance system to help employees manage their compliance requirements. This system is used to track and approve employee personal transactions, political contributions, external communications, as well as other activities. This system also stores policies and procedures and facilitates employee certifications and other compliance requirements.

"BAILARD FUND" means any private investment fund that the Firm sponsors and for which the Firm serves as the investment adviser.

"BAILARD ADVISED MUTUAL FUND" means any mutual fund for which Bailard serves as an investment adviser (or sub-adviser) and any mutual fund whose investment adviser or principle underwriter controls Bailard, is controlled by Bailard, or is under common control with Bailard.

"BENEFICIAL OWNERSHIP" shall be interpreted in the same manner as it would be under Rule 16a-1(a)(2) under Section 16 of the Exchange Act. Generally, you have "Beneficial Ownership" of any Security in which you have a direct or indirect pecuniary interest. "Beneficial Ownership" includes accounts of another person if by reason of any contract, understanding, relationship, agreement or other arrangement, you can share in any profit from the Securities, including Securities held by a Household Family Member(s) sharing the same household, by a partnership, corporation or other entity controlled by you, or by a trust of which you are a trustee, beneficiary, or settlor.

Common examples of Beneficial Ownership include joint accounts, spousal accounts, uniform transfer to minor accounts ("UTMAs"), partnerships, and beneficiaries of trusts. A person is generally deemed to have indirect Beneficial Ownership of a Security if he or she has the right to acquire a Security through the exercise or conversion of any derivative Security, whether or not presently exercisable.

It may be possible for you to exclude accounts held personally or by Household Family Members if you do not have any direct or indirect influence or control over the accounts, or if you can rebut the presumption of beneficial ownership over your Household Family Member's accounts. You should consult with the CCO before deciding not to report any accounts held by Household Family Members.

"CLIENT ACCOUNT" means an account for any client for which the Firm provides investment advisory services and any investment vehicle for which the Firm provides investment advisory or sub-advisory services.

"CONTROL" means the power to exercise a controlling influence over the management or policies of a company unless such power is solely the result of an official position with such company. Any person who owns beneficially, either directly or through one or more controlled companies, more than 25% of the voting Securities of a company is presumed to control such company.

"COVERED SECURITY" means a Security as defined in Section 2(a)(36) of the 1940 Act or Section 202(a)(18) of the Advisers Act (a "Security"), for example- individual stocks, bonds, Bailard-managed private funds, third party-managed private funds, and Bailard-advised mutual funds. Covered Securities **do not include**:

"NON-COVERED SECURITIES"

i. Direct obligations of the Government of the United States;

ii. Bankers' acceptances, bank certificates of deposit, commercial paper and high quality short term debt instruments (i.e., any instrument having a maturity at issuance of less than 366 days and that is rated in one of the highest two rating categories by a Nationally Recognized Statistical Organization or that is unrated but is of comparable quality), including repurchase agreements;

iii. Shares issued by money market funds;

iv. Shares issued by open-end funds other than Bailard Advised Mutual Funds; and

v. Shares issued by unit investment trusts that are invested exclusively in one or more open-end funds, none of which are Bailard Advised Mutual Funds.

Exchange-traded funds shall be considered Covered Securities for the purposes of this Code of Ethics.

"DE MINIMIS TRANSACTIONS" are defined as follows:

a. Equity transactions of 1,000 shares or less with a dollar value of $20,000 or less

b. Fixed-income Security transactions with a par value of $50,000 or less

c. Options transactions where the underlying value of the investment qualifies for either the equity or fixed-income de minimis exemption from preclearance.

"FAMILY MEMBER(S)" of a person means the members of his or her immediate family living in the same household, including but not limited to the following living relatives: (i) parents, step-parents, grandparents, and step-grandparents; (ii) siblings and half-siblings; (iii) the spouses of siblings and half-siblings; (iv) spouse; (v) children, grandchildren, and great-grandchildren; (vi) the spouse of each of the children, grandchildren and great-grandchildren; (vii) in-laws, and (viii) adoptive relationship.

"FIRM" means Bailard, Inc. and each of its Affiliated Entities that is engaged in the business of providing investment advisory and portfolio management services, or serves as general partner to or manages a private investment vehicle.

"FEDERAL SECURITIES LAWS" means the Securities Act, the Exchange Act, the Sarbanes-Oxley Act of 2002, the 1940 Act, the Advisers Act, Title V of the Gramm- Leach-Bliley Act, any rules adopted by the SEC under any of these statutes, the Bank Secrecy Act as it applies to funds and investment advisers, and any rules adopted thereunder by the SEC or the Department of the Treasury.

"INITIAL PUBLIC OFFERING" ("IPO") means an offering of securities registered under the Securities Act, the issuer of which, immediately before the registration, was not subject to the reporting requirements of sections 13 or 15(d) of the Exchange Act.

"INTERESTED PARTY" means a broker-dealer or other companies or persons involved in the securities or financial services industries or any other non-client entity that does business with or seeks to do business with or on behalf of the Firm.

"LIMITED OFFERING" means an offering that is exempt from registration under the Securities Act pursuant to section 4(2) or section 4(6) or pursuant to Rule 504, Rule 505, or Rule 506 under the Securities Act. Limited offerings include private placements and other offerings that are not public.

"MANAGED ACCOUNT" means a Personal Account over which you or your Household Family Member(s) have Beneficial Ownership but where neither you nor your Household Family Member(s) have the authority to direct specific transactions in the account and where you have no influence or control over specific transactions. In other words, these are accounts where an investment manager or someone else who is not your Household Family Member has full investment discretion over the accounts.

"PERSONAL ACCOUNT" means a trading account, Security, or investment vehicle over which you or your Household Family Member(s) have Beneficial Ownership, influence, and control. Our personal trading policy and the associated preclearance requirements generally do not apply to accounts, Securities, or investment vehicles where you/your Household Family Member(s) do not have Beneficial Ownership, influence, and control, except that you are required to obtain preclearance for IPOs and Private Placements even if you only have Beneficial Ownership without any influence or control, e.g., IPO's and Private Placements in Managed Accounts. "PERSONAL ACCOUNTS" include:

i. Any account in or through which Covered Securities can be purchased or sold. This includes, but is not limited to, a brokerage account, 401k account, 529 Programs, or an HSA account;

ii. Accounts in your name or accounts in which you have a direct or indirect Beneficial Ownership **and** influence/control;

iii. Accounts in which your Household Family Member(s) have a direct or indirect Beneficial Ownership **and** influence/control.

iv. Accounts in the name of your children under the age of 18, whether or not living with you (you are presumed to have beneficial ownership **and** control over these accounts).

For purposes of this Policy, Personal Accounts **do not include**:

i. Accounts where investment options are limited to Non-Covered Securities. This can include certain 401(K), 529 Programs, and HSA accounts;

ii. Accounts where you or your Household Family Member(s) have neither beneficial ownership nor influence or control, for example, Donor Advised Funds.

iii. Accounts in which you or your Household Family Member(s) have a beneficial interest but where you or your Household Family Member(s) do not have influence or control, for example:

a. Estate or trust accounts where you or your Family Member(s) are the beneficiary but where you or your Family Member(s) do not have influence or control

b. Fully discretionary accounts managed by Bailard, another registered investment adviser, or a registered representative of a registered broker-dealer over which you have no influence or control

iv. Direct investment programs, which allow the purchase of Securities directly from the issuer without the intermediation of a broker-dealer, provided that the timing and size of the purchases are established by a pre-arranged schedule (e.g., dividend reinvestment plans); or

v. Bailard's 401(K) Plan.

"PRIVATE PLACEMENT" means an offering of a Security through a limited offering, as opposed to a public offering, that is exempt from registration under various current laws and rules. Examples of Private Placements include offerings of interests in private investment funds, startups, private companies, and privately offered investment-type crowdfunding.

"PURCHASE OR SALE OF A COVERED SECURITY" includes, among other acts, the writing or acquisition of an option to purchase or sell a Covered Security.

"RESTRICTED SECURITY" means Securities listed on Bailard's Intranet under "Restricted Securities List". Employees are prohibited from executing a transaction in a Covered Security on Bailard's Restricted Securities List, regardless of the size of the trade.

"SECURITY" means a Security as defined in Section 2(a)(18) of the Advisers Act and includes all investment instruments commonly viewed as Securities, including, but not limited to, any note, stock, treasury stock, security future, bond, debenture, evidence of indebtedness, certificate of interest or participation in any profit sharing agreement, collateral trust certificate, pre-organization certificate or subscription, transferable share, investment contract, voting trust certificate, certificate of deposit for Security, fractional undivided interest in oil, gas, or other mineral rights, any put, call, straddle, option or privilege entered into a on a national securities exchange relating to foreign currency, or, in general, any interest or instrument commonly known as a security, or any certificate of interest or participation in, temporary or interim certificate for, receipt for, guarantee of, or warrant or right to subscribe to or purchase, any of the foregoing.

Note that the definition of a security is very broad, and includes shares of both private and public pooled investment vehicles. Public pooled investment vehicles include, among others, open-end mutual funds, close-end mutual funds, exchange-traded funds, and exchange-traded notes. Private pooled investment vehicles include, among others, private equity funds, hedge funds, and fund of funds.

"SUPERVISED PERSON" means any partner, officer, director (or other person occupying a similar status or performing similar functions), or employee of Bailard, or other person who provides investment advice on behalf of Bailard and is subject to Bailard's supervision and control.

E. GENERAL RESTRICTIONS AGAINST FRAUDULENT CONDUCT

You are prohibited to generally, or in connection with the purchase or sale, directly or indirectly, by a Firm or person:

i. employ any device, scheme, or artifice to defraud a client;

ii. make to a client any untrue statement of a material fact or omit to state a material fact necessary to make the statements, in light of the circumstances under which they are made, not misleading;

iii. engage in any act, practice, or course of business that operates or would operate as fraud or deceit on a client; or

iv. engage in any manipulative practice concerning a client.

F. SPECIFIC PERSONAL SECURITY TRANSACTION RULES

The following rules are intended to prevent any suggestion or inference that you are using your relationship with Bailard to obtain personal advantageous treatment to the detriment of the interests of any client. The restrictions in this Section apply to transactions for accounts in which you have a direct or indirect Beneficial Ownership interest. Unless expressly exempt, all transactions in Covered Securities in these accounts are covered under the provisions of this policy. Except as otherwise provided, these restrictions do not apply to the following transactions:

i. Purchases or sales effected in any account over which you have no direct or indirect influence or control;

ii. Purchases or sales that are non-volitional on your part;

iii. Purchases which are part of an Automatic Investment Plan (please note that any changes to the Automatic Investment Plan must be precleared); or

iv. Purchases that are effected upon the exercise of rights issued by an issuer pro rata to all holders of a class of its Securities, to the extent such rights were acquired from such issuer, and sales of such rights so acquired.

1. Initial Public Offerings

You are prohibited from directly or indirectly acquiring a Beneficial Ownership interest in any Security in an Initial Public Offering without the prior approval by the CCO or the President.

2. Limited Offerings

You are prohibited from directly or indirectly acquiring a Beneficial Ownership interest in any Security in a Limited Offering without the prior approval by the CCO or the President. Employees that hold a direct or indirect Beneficial Ownership interest in Securities acquired in a Limited Offering must disclose that investment if they participate in the Firm's subsequent consideration of an investment in the same issuer, and the decision to make such an investment must be reviewed independently by investment personnel with no personal interest in the issuer.

3. Preclearance

The general rule is that, in your Personal Accounts, you and your Household Family Member(s) must preclear all purchases and sales of Covered Securities (including derivatives) occurring in all accounts in which you have direct or indirect beneficial interest, influence, or control, before the transaction may take place. You must preclear IPOs and Private Placement transactions in all accounts in which you have direct or indirect beneficial interest, including Managed Accounts. To request preclearance, you must submit a preclearance request using our Automated Compliance System. The Trading Department will review all pending trades to see if any conflict may exist. The Trading Department will authorize or deny the trade (generally in less than 24 hours). Preclearance for IPOs and Private Placements is reviewed by the CCO or the President on a case-by–case basis, and the response time will vary.

4. Preclearance Window

Approvals remain in effect for the same day until the market close (1pm PST/4pm EST) unless otherwise stated. If you submit a request after market close, your preclearance is good for the next trading day. For limit orders and stop loss orders, your preclearance window is valid for 60 days. Approval for IPOs and Private Placements is valid until the time of the proposed transaction.

Trading after the approval expires is a violation of the preclearance requirement. It is your responsibility to renew your preclearance for orders that were not executed during the preclearance window.

Trading more than the quantity precleared is a violation.

The Firm reserves the right to require you to reverse, cancel, or freeze (at your expense) any transaction or position in any Security if the Firm believes such transaction or position might violate this Code or appears improper.

5. Restricted Securities List

You are prohibited from trading in Securities listed on the Firm's Restricted Securities List, regardless of the size of the trade. Please check the Restricted Securities List posted on the Intranet before placing any trades.

6. Securities Held by the Bailard Emerging Opportunities Fund

You must seek preclearance for trading any securities held by the Emerging Opportunities Fund. The names of these Securities are posted on the Compliance Section of the Intranet and transactions in these Securities must always be precleared by the Trading Department before the transactions may take place, regardless of the size of the trade.

7. Derivatives

Derivative transactions are treated as Covered Securities, regardless of the underlying asset. You must seek preclearance for the underlying value of the investment.

8. **Exceptions**

The pre-clearance requirements do not apply to:

a) Transactions in Non-Covered Securities;

b) Transactions in Bailard Advised Mutual Funds;

c) Transactions in Exchange-traded funds ("ETF") and Exchange-traded notes ("ETN"); this exception does not apply to ETFs that are traded as part of Bailard's Tactical Asset Allocation model "TAA Model" on the day of the trade;

d) Transactions in Bailard's 401(K);

e) Transactions in BB&K Holdings, Inc. stock;

f) De Minimis Transactions that are defined as follows:

i. Equity transactions of 1,000 shares or less with a dollar value of $20,000 or less

ii. Fixed-income Security transactions with a par value of $50,000 or less; or

iii. Options transactions where the underlying value of the equity investment is 1,000 shares or less with a dollar value of $20,000 or less

iv. Options transactions where the underlying fixed income investment has a par value of $50,000 or less.

g) Transactions in a Compliance approved Managed Account or similar Compliance approved vehicles, for all Securities except for IPOs and Private Placements.

In applying the De Minimis Transactions exceptions, you must aggregate your trading of the same Security, in the same direction, over a five (5) business day period across all your Personal Accounts for which you deemed to have Beneficial Ownership, influence, and control, including your Household Family Member's(s)' accounts.

9. Receipt of Securities

You and your Household Family Member(s) are allowed to accept, without preclearance, Covered Securities that you receive via:

1. A private fund distribution;
2. An inheritance or other types of bona fide gifts;
3. A corporate action;
4. A dividend distribution;
5. Company Employee Stock Options for accounts where you have Beneficial Ownership, (e.g., stocks or stock options)
    a. Preclearance is not required for the receipt of a stock option grant or the subsequent vesting of the grant.
    b. **Preclearance is required prior to the exercise of stock option grants and prior to sales of stocks which have been granted**; or
6. Other non-volitional events, such as assignment of options or exercise of an option at expiration.

These transactions do not require preclearance but you must adjust your holdings record in the Automated Compliance System prior to submitting your annual holding certification.

10. Gifting of Securities

If you wish to make a gift of Covered Securities (where you would relinquish any Beneficial Ownership you may have), you do not need to preclear the transaction but you must adjust your holdings records in the Automated Compliance System prior to submitting your annual holding certification.

G. APPLICABILITY OF PERSONAL TRADING POLICY TO HOUSEHOLD FAMILY MEMBERS

If you live in the same house with any Household Family Member(s), please inform Compliance, as they are subject to our personal trading policy. You are required to disclose their reportable accounts and request preclearance, when necessary, for their trades.

H. OUTSIDE DIRECTORS AND EOF SCIENTIFIC ADVISORY COUNCIL MEMBERS

Unless the CCO and the President determine otherwise, Outside Directors of BB&K Holdings Inc., Outside Directors of the Bailard REIT, and the EOF Scientific Advisory Council Members are not deemed to be Access Persons under the Code because they do not have information, or access to information, that would make them Access Persons. Accordingly, they are not subject to personal trading restrictions and requirements described above.

Outside Directors and the EOF Scientific Advisory Council Members must not seek, and Access Persons may not disclose to any such person, nonpublic information about portfolio holdings, transactions or recommendations that the Firm is considering for client accounts, except for client accounts where the Outside Directors or EOF Scientific Advisory Council Members are the client or the investor. If an Outside Director or an EOF Scientific Advisory Council Member is a client of the Firm, he/she is allowed to receive information specifically relating to his/her client relationship with the Firm.

If an Outside Director or an EOF Scientific Advisory Council Member becomes aware of Firm recommendation information unrelated to his/her relationship as a client of the Firm, he/she must notify the CCO immediately and not use or disclose that information. The CCO will determine the necessary action for that situation. When deemed appropriate, Bailard will ask Outside Directors and EOF Scientific Advisory Council Members to certify annually that they are complying with this policy.

I. DEALINGS WITH CLIENTS

You are prohibited to knowingly sell any Covered Security to any client or knowingly purchase any Covered Security from any client.

J. CRYPTOCURRENCIES

In light of the extremely complex nature of the legal analysis regarding cryptocurrencies to determine which ones are securities and which ones are not, Bailard has decided to allow investments in three cryptocurrencies - Bitcoin, Ethereum, and XRP - that are generally accepted to be currencies and are not currently subject to regulation by the SEC. These three cryptocurrencies are treated as Non-Covered Securities. Outside of these cryptocurrencies, investment in other cryptocurrencies is prohibited. Please note the following:

- You may not use the three allowed cryptocurrencies to invest in other cryptocurrencies.

- Crypto-based derivatives are treated as Covered Securities.
- Participation in an initial coin offering ("ICO") is treated as participation in IPOs and Private Placements. Participation in ICOs, IPOs, and Private Placements require prior approval by the CCO or the President.

K. SAME DAY TRADING BAN

You are not allowed to trade in a Covered Security on a day during which the Covered Security is being actively traded, or actively considered for trading, on behalf of client accounts.

This restriction will not be deemed to be violated when you trade a Covered Security on the same day as a client buys or sells the same Security if:

i. The client's trade order was drafted after you traded the same Security and had already obtained the appropriate preclearance from the Trading Department;

ii. Neither you nor the Trading Department knew that trade in that Security was actively considered for execution in a client's account on that day;

iii. Neither you nor the Trading Department knew that trade in that Security was actively considered as part of a strategy change across all relevant accounts; or

iv. Neither you nor the Trading Department knew that trade in that Security would be considered for clients' immediate liquidity needs.

This restriction does not apply to the purchase or sale of Bailard Advised Mutual Funds, ETFs, or to De Minimis Transactions. This restriction does apply to ETFs that are traded as part of the TAA Model on the day of the trade.

L. SPECIAL SEVEN DAY TRADING BAN FOR INVESTMENT COUNSELORS AND PORTFOLIO MANAGERS

Bailard investment counselors and portfolio managers are prohibited from trading a Covered Security within seven calendar days before and after a client account **that he or she manages** trades in the same (or a related) Security. This restriction will not be deemed to be violated if after the investment counselor or portfolio manager executes his or her trade:

i. The client independently requests the Firm to buy or sell the Security during the seven calendar day period; and

The investment counselor or portfolio manager had no reason to know that the client would make such a request; or

ii. The investment counselor or portfolio manager did not know that the Bailard Research team would recommend a trade in that Security across all relevant accounts.

This restriction does not apply to the purchase or sale of Bailard Advised Mutual Funds or ETFs. It also does not apply to De Minimis Transactions.

M. THREE DAY TRADING BAN RELATING TO RESEARCH RECOMMENDATION MEMOS

You are prohibited from trading a Covered Security for three trading days following the receipt of a Bailard's research recommendation notification covering such Security. For calculation purposes, the first day of that three-day period is the day that the notification is distributed to everyone within the Firm. The purpose of this prohibition is to better assure that the investment counselors and portfolio managers have ample opportunity to trade for Client Accounts promptly following the distribution of the notification. Under special circumstances, a trading ban of more than three days may be announced.

This restriction does not apply to the purchase or sale of Bailard Advised Mutual Funds or ETFs. It also does not apply to De Minimis Transactions.

N. REPORTING REQUIREMENTS

1. Initial Holdings Report

Within ten calendar days after you become an Access Person, you must prepare and file with the CCO an Initial Holdings Report that must contain the following information (information must be current as of a date no more than 45 days before the date the person becomes an Access Person):

i. The title and type of Security, and as applicable, the exchange ticker symbol or CUSIP number, number of shares and the principal amount of each Covered Security in which you have any direct or indirect Beneficial Ownership interest;

ii. The name of any broker, dealer or bank with which you maintained an account in which any Securities were held for the direct or indirect benefit of you or your Household Family Member(s); and

iii. The date that the report is submitted by you.

You must identify all accounts and Securities over which you and your Household Family Member(s) have Beneficial Ownership, influence, or control. You must report any Managed Accounts that you or your Household Family Member(s) may have. Compliance will assist you in determining which accounts meet the definition of a Personal Account and which Securities (including any Private Placement interest) must be reported on the Initial Holdings Report, which will then determine what will be subject to our Personal Trading Policy and preclearance requirements.

2. Quarterly Transaction Reports

You are required to certify within 30 days after each quarter end that the transactions captured in the Firm's Automated Compliance System and that the transactions shown in duplicate statements provided to Compliance team, represent all the "Reportable Transactions" (defined below). You may also be required to certify other information on a quarterly basis.

Reportable Transactions are:

a. All transactions in your Personal Accounts except for transactions in Non-Covered Securities; and

b. Any purchase of IPOs or Private Placement interests in Managed Accounts or similar vehicles in which you or your Family Members have Beneficial Ownership.

You must report all De Minimis Transactions and all purchases or sales of Bailard Advised Mutual Funds, ETFs, and ETNs. However, you are not required to report transactions in your Bailard's 401(k) Plan. Such transactions are independently reviewed by the CRO quarterly. You are also not required to report transactions in the stock of BB&K Holdings, Inc., as Bailard already maintains records of these transactions. You are also not required to report transactions in Non-Covered Securities.

3. Annual Holdings Reports

Annually, you must submit a report of all Covered Securities (including any interest in a Private Placement, Bailard Funds, Bailard Advised Mutual Funds) ETFs, ETNs, and De Minimis holdings in all your Personal Accounts through our Automated Compliance System and submit duplicate account statements for any Personal Accounts not connected with our Automated Compliance System. The information provided must be as of a date within 45 days prior to when the report is submitted.

Generally, we require the annual holding data to be current as of December 31 of the previous year and for the report and duplicate statements to be submitted to Compliance by late-January of each year. The Annual Holding Report includes the following information:

i. The title, number of shares, and the principal amount of each Covered Security in which you or your Household Family Member(s) have any direct or indirect Beneficial Ownership interest;

ii. The name of any broker, dealer, or bank with whom you maintain an account in which any Securities are held for the direct or indirect benefit of you or your Household Family Member(s); and

iii. The date that the report is submitted by you.

You are required to report on the Annual Holdings Report your IPOs and Private Placement interests in Managed Accounts.

You are not required to report on the Annual Holdings Report your Bailard 401(K) investments or your investments in BB&K Holdings, Inc. stock, as the Firm already maintains records of these investments.

4. New Personal Accounts

You must submit a preapproval request using our Automated Compliance System that will be approved by Compliance in conjunction with opening any new account, vehicle, or structure where you or your Household Family Member(s) have Beneficial Ownership and/or control.

In addition, you must notify Compliance of any new Managed Accounts and other vehicles or structures in which you or your Household Family Member(s) have Beneficial Ownership.

5. Confirmations and Statements

You are required to provide duplicate account statements and trade confirmations to Compliance within 30 days after the end of each quarter if your Personal Account is not held at a Broker that is connected to our Automated Compliance System.

6. Annual Certification and Periodic Written Acknowledgement

Bailard will provide you with a copy of the Code and with any amendments to the Code. You will be required to certify via our Automated Compliance System that you have read and understood this Code, that you have complied with the requirements of this Code and that you have reported all personal Securities transactions and Security holdings required to be reported pursuant to the requirements of this Code, generally, on an annual basis.

O. VIOLATIONS

You are required to report any violations of this Code promptly to the CCO or the President. Such reports may be submitted anonymously.

P. WHISTLEBLOWER POLICY

For the avoidance of doubt, nothing in this Code prohibits Employees or Supervised Persons from reporting potential violations of federal law or regulation to any governmental agency or entity, including but not limited to the Department of Justice, the SEC, or any agency's inspector general, or from making other disclosures that are protected under the whistleblower provisions of federal law or regulation. Employees or Supervised Persons do not need prior authorization from their supervisor, the President, the CCO, or any other person or entity affiliated with Bailard to make any such reports or disclosures and do not need to notify Bailard that they have made such reports or disclosures. Additionally, nothing in this Code prohibits Employees or Supervised Persons from recovering an award pursuant to a whistleblower program of a government agency or entity.

Q. GIFTS AND ENTERTAINMENT POLICY

Offers of gifts and entertainment between Bailard, Inc. and its clients, investors, and prospects or business partners may be an acceptable part of doing business and a way to build goodwill. Providing or accepting occasional meals and tickets to sporting and cultural events may be appropriate in certain circumstances. However, if offers of gifts or entertainment are frequent or of substantial value, they may create an actual or perceived conflict of interest and could call into question the independence of our judgment as a fiduciary to our clients. If you are uncertain on any gift matters, you should discuss with your supervisor, Compliance, the CRO or President before accepting said gifts.

This Gifts and Entertainment policy applies where Pay to Play Policies and Procedures and Foreign Corrupt Practices Act Policies and Procedures are not applicable. Where Pay to Play Policies and Procedures and Foreign Corrupt Practices Act Policies and Procedures are applicable, those policies govern. Gifts and entertainment of political officials or candidates are covered by Pay to Play Policies and Procedures and Foreign Corrupt Practices Act Policies and Procedures.

This policy applies to gifts and entertainment given to or received from any current client, Bailard Fund investors only, prospective client (collectively, the "Client"), or any individual or entity (the "Interested Party") that is doing or is seeking to do business with the Firm.

1. Entertainment

You may accept from, or give to, a Client or an Interested Party meals, entertainment, or tickets to events of a reasonable value. We expect you to use reasonable judgment under the circumstances.

You may accept an invitation to a business entertainment event, such as dinner or a sporting event, of a reasonable value if the person or entity providing the entertainment is present. You should seek pre-approval from your direct manager under circumstances where you are unsure about the value of proposed entertainment or whether the value of the proposed entertainment is reasonable.

You may accept an invitation to stay at the client's residence if this visit is for business purposes and the client providing the lodging arrangements is present. You are prohibited from accepting a gift of travel or lodging in connection with any entertainment opportunity.

2. Gifts

You may not accept from, or give to, Clients or Interested Parties gifts that are valued over $250 (either one single gift, or in aggregate on an annual basis) or may be deemed as excessive.

Gifts that can be shared with others in the Firm, such as holiday baskets or lunches delivered to Bailard's offices, should be placed in the common area.

If you receive a gift that is prohibited under this policy, you must decline or return it in order to protect the reputation and integrity of the Firm. If the gift has already been received and cannot be returned, it will be donated to a charity chosen by the President and/or the CRO. Any question as to the appropriateness of any gift should be directed to our CCO or the President.

You should be certain that the gift does not give rise to a conflict with client interests, or the appearance of a conflict, and that there is no reason to believe that the gift violates any applicable code of conduct of the recipient. Gifts are permitted only when made in accordance with applicable laws, regulations, and generally accepted business practices.

3. Donations

You must always get preapproval from your direct manager for corporate charitable donations.

4. Exceptions

- ERISA - You must submit a preclearance request using our Automated Compliance System before giving any gifts or entertainment, regardless of value, to any ERISA plan fiduciary. Under the U.S. Department of Labor guidelines, gifts, gratuities, meals, and entertainment for ERISA fiduciaries are limited to an aggregate annual value of $250 per plan fiduciary.
- Taft-Hartley Union Plan Clients – You must submit a preclearance request using our Automated Compliance System before giving any gifts or entertainment, regardless of value, to labor unions or union representatives. Gifts and entertainment for Taft-Hartley plan officers and/or employees in excess of $250 per fiscal year are required to be reported on Department Labor Form LM-10 within 90 days following the end of our fiscal year.

5. PROHIBITIONS

- Cash- You may not give or accept, directly or indirectly, cash or cash equivalents, including gift cards, to or from any clients or Interested Parties.

- Solicitation of Gifts- All solicitation of gifts or gratuities is unprofessional and is strictly prohibited. You may not use your position to obtain or seek a gift for yourself.
- Client Complaints- You may not make any payments or other account adjustments to Clients in order to resolve any type of complaint. All client complaints must be immediately reported to your direct manager and the CCO.
- Employees or Agents of Bailard Advised Mutual Funds - Gifts to fund advisory personnel must be in compliance with the mutual funds rules approved by fund's board and SEC regulations. Therefore, you are to avoid giving or accepting, directly or indirectly, any gifts or entertainment to or from fund advisory personnel or the broker-dealers through which Bailard places their trades or the intermediaries, including broker-dealers that distribute these funds.
- State and Local Pension Officials - You may not give or accept, directly or indirectly, any gifts or entertainment to State and Local Pension officials.
- Compensation from Others- You may not, without the prior written consent from the CRO or the President, accept, directly or indirectly, from any person or entity other than Bailard, compensation of any nature such as a bonus, commission, fee, gratuity, or other consideration.

6. REPORTING AND CERTIFICATIONS

On a quarterly basis, you must report all gifts and entertainment received or given of any amount through our Automated Compliance System. You are not required to report meals given and received. Each quarter you will be required to certify compliance with this policy. The President will review the CCO's certifications.

Any questions as to the appropriateness of gifts, travel, and entertainment opportunities must be discussed with the CCO, the CRO, or the President of the Firm.

The CCO, the CRO, or the President may require that an item or the event be declined or that you reimburse the person providing the item for the value of the item or the event.

This rule does not apply to bona fide personal relationships established before the individual became a client, a prospect, or an interested party of the Firm.

R. FINDER'S FEES

You should not become involved in negotiations for corporate financing, acquisitions, or other transactions for outside companies (whether or not held by Clients) without the prior permission of the CCO, the CRO, or the President. Specifically, no finder's or similar fee in connection with any such transactions may be negotiated or accepted without prior permission of the CCO, the CRO, or the President. Notify Compliance when you are seeking approval to accept such fees.

S. SERVICE AS A DIRECTOR

You are prohibited from serving on the board of directors of a publicly-traded company without prior authorization by the CCO, the CRO, or the President, which authorization shall be based upon a determination that the board service would not be in conflict with the interests of the Firm or any client. Notify Compliance when you are seeking approval to serve as a Director.

T. OUTSIDE ACTIVITIES

You must request written preapproval from the President or the CCO prior to serving as an employee, officer, consultant, director, adviser, or trustee of any other entity, trust, or organization. Approval of such activities might be withheld if the President or the CCO determines that your service would not be in the best interest of the Firm or its clients. The CCO will request preapproval from the President or the CRO. The President will review the CCO's certifications.

U. SANCTIONS

Careful adherence to this Code is one of the primary conditions of employment of every employee of Bailard, Inc. You may be required to give up any profit or other benefit realized from any transaction in violation of this Code, and, in appropriate cases, be subject to other sanctions up to and including reprimands, trading restrictions, or fines. Suspensions or termination of employment may be imposed for conduct inconsistent with this Code as well. Retaliation against persons reporting violations will not be tolerated and may be grounds for sanctions. In addition, as pointed out in the preamble to this Code, certain violations of this Code may also involve violations of law with the possibility of civil or criminal penalties.

V. COMPLIANCE WITH LAWS, RULES, AND REGULATIONS

Bailard requires you to comply with all laws, rules, and regulations applicable to the Firm whenever and wherever it does business. You are expected to use good judgment and common sense in seeking to comply with all applicable laws, rules, and regulations and to ask for advice when you are uncertain about them.

If you become aware of the violation of any law, rule, or regulation by the Firm, whether by its employees or any third party doing business on behalf of the Firm, or if you become aware of any violation of this Code, it is your responsibility to report the matter to the CCO or the President. While it is Bailard's desire to address matters internally, nothing in this Code should discourage you from truthfully reporting any illegal activity to the appropriate regulatory authority, including the SEC. Employees shall not discharge, demote, suspend, threaten, harass or in any other manner discriminate or retaliate against an employee because he or she reports any such violation. This Code should not be construed to prohibit you from testifying, participating, or otherwise assisting in any state or federal administrative, judicial, or legislative proceeding or investigation.

W. COMPLIANCE REVIEW AND REPORTING

The CCO or her designee will review all reports submitted pursuant to Sections 4 and 5 of this Code. The CCO will submit at least annually to the Board of the Bailard Advised Mutual Funds a written report from the Firm that (a) describes any issues arising under this Code or under any procedures

adopted to implement this Code since the last such report to the Board including, but not limited to, information about material violations of this Code or such procedures and any sanctions imposed in response to such material violations; and (b) certifies that the Firm has adopted procedures reasonably necessary to prevent Access Persons from violating this Code.

X. DISSEMINATION AND AMENDMENT

This Code shall be distributed to each employee, and Supervised Persons of the Firm upon commencement of his or her employment or other relationship with the Firm. Bailard reserves the right to amend, alter or terminate this Code at any time. Following any material revisions or updates, an updated version of this Code will be distributed to you and will supersede the prior version of this Code effective upon distribution.

Exhibit J

FORBES DIGITAL ASSETS

Ripple (XRP) Overtakes Ethereum As Second Largest Cryptocurrency On CEO's Bullish Bet

Billy Bambrough Senior Contributor
I write about how bitcoin, crypto and blockchain can change the world.

Follow

Sep 26, 2018, 08:29am EDT

This article is more than 4 years old.

Ripple (XRP) has powered back to retake its position as the world's second largest cryptocurrency by total market capitalization — a spot it briefly took from ethereum at the end of last week before falling back.

Ripple has risen more than 100% so far this month as investors bet it will become the defacto way the world's established banks and financial services firms move money across borders.

A visual representation of the digital cryptocurrency, ripple. (Photo by S3studio/Getty Images)

Ripple (the informal name of the XRP digital token) now boasts a market capitalisation of $22.2 billion, slightly beating out ethereum's $22.1 billion, according to CoinMarketCap data at 8:30am New York time. Bitcoin, the original cryptocurrency, still holds the top spot by a wide margin however, with a total market value of $113 billion.

Ethereum, which is traded through the digital token ether, has been heavily sold off this year. Many believe this is because of the huge number of so-called altcoins that were built on the ethereum blockchain last year, only to be sold off throughout 2018.

Top 100 Cryptocurrencies By Market Capitalization

Cryptocurrencies ▾ Exchanges ▾ Watchlist USD ▾ Next 100 → View All

#	Name	Market Cap	Price	Volume (24h)	Circulating Supply	Change (24h)	Price Graph (7d)
1	Bitcoin	$112,978,106,958	$6,534.48	$4,277,679,534	17,289,525 BTC	1.58%	
2	XRP	$22,358,939,931	$0.560783	$2,036,255,250	39,870,907,279 XRP *	23.66%	
3	Ethereum	$22,142,642,380	$216.67	$1,747,265,719	102,197,546 ETH	3.18%	
4	Bitcoin Cash	$7,745,782,101	$445.95	$342,737,911	17,369,300 BCH	1.92%	
5	EOS	$4,909,755,432	$5.42	$664,933,551	906,245,118 EOS *	4.67%	

Ripple (XRP) has now become the second biggest cryptocurrency in the world, according to... [+] COINMARKETCAP

Ethereum is down some 84% so far this year, falling from around $1,400 to just $215. Ripple meanwhile has decreased by about the same amount, peaking at $3.71 at the beginning of the year and dropping as low as $0.26 earlier this month. Ripple began 2017 at just $0.006.

Today's latest surge, which has pushed ripple up by almost 25% in 24 hours, was sparked by the announcement U.S. cryptocurrency

exchange and wallet provider Coinbase is considering listing more cryptocurrencies.

"Today we're announcing a new process that will allow us to rapidly list most digital assets that are compliant with local law, by satisfying listing requests in a jurisdiction-by-jurisdiction manner," Coinbase said in a blog post. "In practice, this means some new assets listed on our platform may only be available to customers in select jurisdictions for a period of time."

Many have taken this to mean ripple could be listed on the platform, though it is far from guaranteed, opening up a whole new segment of the market to trade the token on what is the number one U.S. cryptocurrency exchange.

The price was given a further boost by Nigel Green, founder and CEO of investment advisor deVere Group, predicting ripple will rise to $1 per token by the end of 2018.

Green said:

> Cryptocurrencies are the future of money and, clearly, XRP is proving to be one of the most useful cryptocurrencies for businesses, organizations, and individuals. The use of XRP is set to increase, and naturally, this will positively impact its price. I think it is likely that we'll see it hit the $1.00 price level before year-end. It could even be double this in 12 months' time as XRP adoption and usage soars.

"XRP has been cleverly positioning itself to become a leading international facilitator of global remittances and inflows," Green added. "This is a huge and growing market, especially in the emerging economies of Latin America, Asia and Africa."

The ripple price fell earlier in the week after more than doubling in price last week.
COINDESK

Last week's more than doubling of the ripple price was brought on by the company behind the tradable token, Ripple Labs, saying it's close to launching a new product that could help banks speed up transactions using XRP — amongst other developments that boosted sentiment.

Ripple, which was created back in 2012 by Ripple Labs (making it one of the oldest cryptocurrencies), sets itself apart from many other major digital tokens by working directly with the established financial services sector.

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Billy Bambrough

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I am a journalist with significant experience covering technology, finance, economics, and business... **Read More**

Editorial Standards

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Exhibit K

CoinMarketCap(/web/20180103125710/https://coinmarketcap.com/)

Market Cap: **$385,601,968,891(/web/20180103125710/https://coinmarketcap.com/charts/)**

USD

Next 100 →(2) | View All(/web/20180103125710/https://coinmarketcap.com/all/views/all/)

All | Coins | Tokens

#	Name	Market Cap	
1	BTC(/web/20180103125710/https://coinmarketcap.com/currencies/bitcoin/) Bitcoin(/web/20180103125710/https://coinmarketcap.com/currencies/bitcoin/)	$250,838,606,480	$14949.20(/web/20180103125710/https://coinm
2	XRP(/web/20180103125710/https://coinmarketcap.com/currencies/ripple/) Ripple(/web/20180103125710/https://coinmarketcap.com/currencies/ripple/)	$106,286,267,368	$2.74(/web/20180103125710/https://coin
3	ETH(/web/20180103125710/https://coinmarketcap.com/currencies/ethereum/) Ethereum(/web/20180103125710/https://coinmarketcap.com/currencies/ethereum/)	$84,850,009,375	$877.06(/web/20180103125710/https://coinmar
4	BCH(/web/20180103125710/https://coinmarketcap.com/currencies/bitcoin-cash/) Bitcoin Cash(/web/20180103125710/https://coinmarketcap.com/currencies/bitcoin-cash/)	$46,453,671,504	$2750.17(/web/20180103125710/https://coinmarket
5	ADA(/web/20180103125710/https://coinmarketcap.com/currencies/cardano/) Cardano(/web/20180103125710/https://coinmarketcap.com/currencies/cardano/)	$25,763,781,848	$0.993702(/web/20180103125710/https://coinma
6	LTC(/web/20180103125710/https://coinmarketcap.com/currencies/litecoin/) Litecoin(/web/20180103125710/https://coinmarketcap.com/currencies/litecoin/)	$13,626,722,189	$249.59(/web/20180103125710/https://coinm
7	XLM(/web/20180103125710/https://coinmarketcap.com/currencies/stellar/) Stellar(/web/20180103125710/https://coinmarketcap.com/currencies/stellar/)	$13,529,659,757	$0.756811(/web/20180103125710/https://coin
8	XEM(/web/20180103125710/https://coinmarketcap.com/currencies/nem/) NEM(/web/20180103125710/https://coinmarketcap.com/currencies/nem/)	$11,508,659,999	$1.28(/web/20180103125710/https://coi
9	MIOTA(/web/20180103125710/https://coinmarketcap.com/currencies/iota/) IOTA(/web/20180103125710/https://coinmarketcap.com/currencies/iota/)	$11,210,985,239	$4.03(/web/20180103125710/https://cc
10	DASH(/web/20180103125710/https://coinmarketcap.com/currencies/dash/) Dash(/web/20180103125710/https://coinmarketcap.com/currencies/dash/)	$9,064,199,101	$1162.70(/web/20180103125710/https://coi
11	XMR(/web/20180103125710/https://coinmarketcap.com/currencies/monero/) Monero(/web/20180103125710/https://coinmarketcap.com/currencies/monero/)	$6,224,316,910	$400.07(/web/20180103125710/https://coinm
12	NEO(/web/20180103125710/https://coinmarketcap.com/currencies/neo/) NEO(/web/20180103125710/https://coinmarketcap.com/currencies/neo/)	$6,043,004,500	$92.97(/web/20180103125710/https://cc
13	TRX(/web/20180103125710/https://coinmarketcap.com/currencies/tron/) TRON(/web/20180103125710/https://coinmarketcap.com/currencies/tron/)	$5,402,542,125	$0.082170(/web/20180103125710/https://co

#	Name	Market Cap	
14	EOS(/web/20180103125710/https://coinmarketcap.com/currencies/eos/) EOS(/web/20180103125710/https://coinmarketcap.com/currencies/eos/)	$5,205,513,340	$8.96(/web/20180103125710/https://cc
15	BTG(/web/20180103125710/https://coinmarketcap.com/currencies/bitcoin-gold/) Bitcoin Gold(/web/20180103125710/https://coinmarketcap.com/currencies/bitcoin-gold/)	$4,600,774,234	$274.79(/web/20180103125710/https://coinmarke
16	QTUM(/web/20180103125710/https://coinmarketcap.com/currencies/qtum/) Qtum(/web/20180103125710/https://coinmarketcap.com/currencies/qtum/)	$4,329,273,198	$58.68(/web/20180103125710/https://coir
17	ETC(/web/20180103125710/https://coinmarketcap.com/currencies/ethereum-classic/) Ethereum Classic(/web/20180103125710/https://coinmarketcap.com/currencies/ethereum-classic/)	$3,380,372,551	$34.20(/web/20180103125710/https://coinmarketcap.
18	XRB(/web/20180103125710/https://coinmarketcap.com/currencies/raiblocks/) RaiBlocks(/web/20180103125710/https://coinmarketcap.com/currencies/raiblocks/)	$3,333,579,050	$25.02(/web/20180103125710/https://coinma
19	BCC(/web/20180103125710/https://coinmarketcap.com/currencies/bitconnect/) BitConnect(/web/20180103125710/https://coinmarketcap.com/currencies/bitconnect/)	$2,627,995,483	$426.78(/web/20180103125710/https://coinmark
20	ICX(/web/20180103125710/https://coinmarketcap.com/currencies/icon/) ICON(/web/20180103125710/https://coinmarketcap.com/currencies/icon/)	$2,488,206,580	$6.59(/web/20180103125710/https://co
21	LSK(/web/20180103125710/https://coinmarketcap.com/currencies/lisk/) Lisk(/web/20180103125710/https://coinmarketcap.com/currencies/lisk/)	$2,451,205,040	$21.02(/web/20180103125710/https://co
22	XVG(/web/20180103125710/https://coinmarketcap.com/currencies/verge/) Verge(/web/20180103125710/https://coinmarketcap.com/currencies/verge/)	$2,079,545,736	$0.144155(/web/20180103125710/https://coin
23	BTS(/web/20180103125710/https://coinmarketcap.com/currencies/bitshares/) BitShares(/web/20180103125710/https://coinmarketcap.com/currencies/bitshares/)	$2,069,037,685	$0.793784(/web/20180103125710/https://coinma
24	SNT(/web/20180103125710/https://coinmarketcap.com/currencies/status/) Status(/web/20180103125710/https://coinmarketcap.com/currencies/status/)	$1,993,279,305	$0.574352(/web/20180103125710/https://coin
25	OMG(/web/20180103125710/https://coinmarketcap.com/currencies/omisego/) OmiseGO(/web/20180103125710/https://coinmarketcap.com/currencies/omisego/)	$1,991,911,427	$19.52(/web/20180103125710/https://coinma
26	ARDR(/web/20180103125710/https://coinmarketcap.com/currencies/ardor/) Ardor(/web/20180103125710/https://coinmarketcap.com/currencies/ardor/)	$1,924,522,577	$1.93(/web/20180103125710/https://coir
27	STEEM(/web/20180103125710/https://coinmarketcap.com/currencies/steem/) Steem(/web/20180103125710/https://coinmarketcap.com/currencies/steem/)	$1,733,938,182	$7.04(/web/20180103125710/https://coin
28	ZEC(/web/20180103125710/https://coinmarketcap.com/currencies/zcash/) Zcash(/web/20180103125710/https://coinmarketcap.com/currencies/zcash/)	$1,703,496,676	$572.46(/web/20180103125710/https://coin
29	PPT(/web/20180103125710/https://coinmarketcap.com/currencies/populous/) Populous(/web/20180103125710/https://coinmarketcap.com/currencies/populous/)	$1,585,700,261	$42.85(/web/20180103125710/https://coinmar
30	STRAT(/web/20180103125710/https://coinmarketcap.com/currencies/stratis/) Stratis(/web/20180103125710/https://coinmarketcap.com/currencies/stratis/)	$1,517,130,441	$15.37(/web/20180103125710/https://coin
31	USDT(/web/20180103125710/https://coinmarketcap.com/currencies/tether/) Tether(/web/20180103125710/https://coinmarketcap.com/currencies/tether/)	$1,385,026,789	$1.01(/web/20180103125710/https://coin

#	Name	Market Cap	
32	WAVES(/web/20180103125710/https://coinmarketcap.com/currencies/waves/) Waves(/web/20180103125710/https://coinmarketcap.com/currencies/waves/)	$1,269,490,000	$12.69(/web/20180103125710/https://coinr
33	BCN(/web/20180103125710/https://coinmarketcap.com/currencies/bytecoin-bcn/) Bytecoin(/web/20180103125710/https://coinmarketcap.com/currencies/bytecoin-bcn/)	$1,123,335,004	$0.006130(/web/20180103125710/https://coinmarketc
34	HSR(/web/20180103125710/https://coinmarketcap.com/currencies/hshare/) Hshare(/web/20180103125710/https://coinmarketcap.com/currencies/hshare/)	$1,039,729,380	$24.49(/web/20180103125710/https://coinr
35	DOGE(/web/20180103125710/https://coinmarketcap.com/currencies/dogecoin/) Dogecoin(/web/20180103125710/https://coinmarketcap.com/currencies/dogecoin/)	$1,021,497,131	$0.009071(/web/20180103125710/https://coinmar
36	KMD(/web/20180103125710/https://coinmarketcap.com/currencies/komodo/) Komodo(/web/20180103125710/https://coinmarketcap.com/currencies/komodo/)	$1,000,220,808	$9.63(/web/20180103125710/https://coinma
37	SC(/web/20180103125710/https://coinmarketcap.com/currencies/siacoin/) Siacoin(/web/20180103125710/https://coinmarketcap.com/currencies/siacoin/)	$946,317,521	$0.030141(/web/20180103125710/https://coinr
38	GNT(/web/20180103125710/https://coinmarketcap.com/currencies/golem-network-tokens/) Golem(/web/20180103125710/https://coinmarketcap.com/currencies/golem-network-tokens/)	$891,267,122	$1.07(/web/20180103125710/https://coinmarketcap.com/c
39	BNB(/web/20180103125710/https://coinmarketcap.com/currencies/binance-coin/) Binance Coin(/web/20180103125710/https://coinmarketcap.com/currencies/binance-coin/)	$865,617,023	$8.74(/web/20180103125710/https://coinmarketc
40	REP(/web/20180103125710/https://coinmarketcap.com/currencies/augur/) Augur(/web/20180103125710/https://coinmarketcap.com/currencies/augur/)	$838,248,400	$76.20(/web/20180103125710/https://coin
41	VEN(/web/20180103125710/https://coinmarketcap.com/currencies/vechain/) VeChain(/web/20180103125710/https://coinmarketcap.com/currencies/vechain/)	$773,996,055	$2.79(/web/20180103125710/https://coinm
42	VERI(/web/20180103125710/https://coinmarketcap.com/currencies/veritaseum/) Veritaseum(/web/20180103125710/https://coinmarketcap.com/currencies/veritaseum/)	$742,954,000	$364.79(/web/20180103125710/https://coinmark
43	ARK(/web/20180103125710/https://coinmarketcap.com/currencies/ark/) Ark(/web/20180103125710/https://coinmarketcap.com/currencies/ark/)	$721,578,267	$7.36(/web/20180103125710/https://c
44	KCS(/web/20180103125710/https://coinmarketcap.com/currencies/kucoin-shares/) KuCoin Shares(/web/20180103125710/https://coinmarketcap.com/currencies/kucoin-shares/)	$675,508,669	$7.42(/web/20180103125710/https://coinmarketc
45	DCR(/web/20180103125710/https://coinmarketcap.com/currencies/decred/) Decred(/web/20180103125710/https://coinmarketcap.com/currencies/decred/)	$656,271,754	$101.21(/web/20180103125710/https://coinm
46	SALT(/web/20180103125710/https://coinmarketcap.com/currencies/salt/) SALT(/web/20180103125710/https://coinmarketcap.com/currencies/salt/)	$646,767,567	$11.86(/web/20180103125710/https://cc
47	DGB(/web/20180103125710/https://coinmarketcap.com/currencies/digibyte/) DigiByte(/web/20180103125710/https://coinmarketcap.com/currencies/digibyte/)	$637,040,396	$0.066060(/web/20180103125710/https://coinma
48	DRGN(/web/20180103125710/https://coinmarketcap.com/currencies/dragonchain/) Dragonchain(/web/20180103125710/https://coinmarketcap.com/currencies/dragonchain/)	$622,123,905	$2.61(/web/20180103125710/https://coinmarket
49	PIVX(/web/20180103125710/https://coinmarketcap.com/currencies/pivx/) PIVX(/web/20180103125710/https://coinmarketcap.com/currencies/pivx/)	$607,023,073	$10.98(/web/20180103125710/https://co

#	Name	Market Cap	
50	NXT(/web/20180103125710/https://coinmarketcap.com/currencies/nxt/) Nxt(/web/20180103125710/https://coinmarketcap.com/currencies/nxt/)	$596,516,851	$0.597114(/web/20180103125710/https://c
51	AION(/web/20180103125710/https://coinmarketcap.com/currencies/aion/) Aion(/web/20180103125710/https://coinmarketcap.com/currencies/aion/)	$562,714,287	$9.18(/web/20180103125710/https://co
52	FCT(/web/20180103125710/https://coinmarketcap.com/currencies/factom/) Factom(/web/20180103125710/https://coinmarketcap.com/currencies/factom/)	$560,472,713	$64.09(/web/20180103125710/https://coinm
53	MONA(/web/20180103125710/https://coinmarketcap.com/currencies/monacoin/) MonaCoin(/web/20180103125710/https://coinmarketcap.com/currencies/monacoin/)	$553,841,717	$9.81(/web/20180103125710/https://coinmar
54	GBYTE(/web/20180103125710/https://coinmarketcap.com/currencies/byteball/) Byteball Bytes(/web/20180103125710/https://coinmarketcap.com/currencies/byteball/)	$549,653,053	$851.88(/web/20180103125710/https://coinm
55	BAT(/web/20180103125710/https://coinmarketcap.com/currencies/basic-attention-token/) Basic Attenti...(/web/20180103125710/https://coinmarketcap.com/currencies/basic-attention-token/)	$548,472,000	$0.548472(/web/20180103125710/https://coinmarketcap.com
56	MAID(/web/20180103125710/https://coinmarketcap.com/currencies/maidsafecoin/) MaidSafeCoin(/web/20180103125710/https://coinmarketcap.com/currencies/maidsafecoin/)	$502,278,871	$1.11(/web/20180103125710/https://coinmarketc
57	ENG(/web/20180103125710/https://coinmarketcap.com/currencies/enigma-project/) Enigma(/web/20180103125710/https://coinmarketcap.com/currencies/enigma-project/)	$494,322,845	$6.61(/web/20180103125710/https://coinmarketca
58	REQ(/web/20180103125710/https://coinmarketcap.com/currencies/request-network/) Request Network(/web/20180103125710/https://coinmarketcap.com/currencies/request-network/)	$489,712,707	$0.764245(/web/20180103125710/https://coinmarketcap
59	XZC(/web/20180103125710/https://coinmarketcap.com/currencies/zcoin/) ZCoin(/web/20180103125710/https://coinmarketcap.com/currencies/zcoin/)	$486,770,513	$128.05(/web/20180103125710/https://coir
60	POWR(/web/20180103125710/https://coinmarketcap.com/currencies/power-ledger/) Power Ledger(/web/20180103125710/https://coinmarketcap.com/currencies/power-ledger/)	$458,323,778	$1.28(/web/20180103125710/https://coinmarketc
61	XP(/web/20180103125710/https://coinmarketcap.com/currencies/experience-points/) Experience Po...(/web/20180103125710/https://coinmarketcap.com/currencies/experience-points/)	$457,253,575	$0.002306(/web/20180103125710/https://coinmarketcap.c
62	BTCD(/web/20180103125710/https://coinmarketcap.com/currencies/bitcoindark/) BitcoinDark(/web/20180103125710/https://coinmarketcap.com/currencies/bitcoindark/)	$455,925,976	$353.74(/web/20180103125710/https://coinmarke
63	ETN(/web/20180103125710/https://coinmarketcap.com/currencies/electroneum/) Electroneum(/web/20180103125710/https://coinmarketcap.com/currencies/electroneum/)	$434,227,427	$0.086889(/web/20180103125710/https://coinmarket
64	CVC(/web/20180103125710/https://coinmarketcap.com/currencies/civic/) Civic(/web/20180103125710/https://coinmarketcap.com/currencies/civic/)	$427,113,822	$1.25(/web/20180103125710/https://coi
65	PAY(/web/20180103125710/https://coinmarketcap.com/currencies/tenx/) TenX(/web/20180103125710/https://coinmarketcap.com/currencies/tenx/)	$424,426,731	$4.06(/web/20180103125710/https://coi
66	KNC(/web/20180103125710/https://coinmarketcap.com/currencies/kyber-network/) Kyber Network(/web/20180103125710/https://coinmarketcap.com/currencies/kyber-network/)	$418,704,603	$3.12(/web/20180103125710/https://coinmarketca

#	Name	Market Cap	
67	RDD(/web/20180103125710/https://coinmarketcap.com/currencies/reddcoin/) ReddCoin(/web/20180103125710/https://coinmarketcap.com/currencies/reddcoin/)	$418,213,960	$0.014566(/web/20180103125710/https://coinma
68	ZRX(/web/20180103125710/https://coinmarketcap.com/currencies/0x/) 0x(/web/20180103125710/https://coinmarketcap.com/currencies/0x/)	$410,552,295	$0.861628(/web/20180103125710/https://c
69	SYS(/web/20180103125710/https://coinmarketcap.com/currencies/syscoin/) Syscoin(/web/20180103125710/https://coinmarketcap.com/currencies/syscoin/)	$408,319,759	$0.770434(/web/20180103125710/https://coinm
70	WAX(/web/20180103125710/https://coinmarketcap.com/currencies/wax/) WAX(/web/20180103125710/https://coinmarketcap.com/currencies/wax/)	$397,266,639	$0.805889(/web/20180103125710/https://co
71	FUN(/web/20180103125710/https://coinmarketcap.com/currencies/funfair/) FunFair(/web/20180103125710/https://coinmarketcap.com/currencies/funfair/)	$392,081,866	$0.092257(/web/20180103125710/https://coinr
72	SAN(/web/20180103125710/https://coinmarketcap.com/currencies/santiment/) Santiment Net...(/web/20180103125710/https://coinmarketcap.com/currencies/santiment/)	$387,554,599	$6.40(/web/20180103125710/https://coinmar
73	RHOC(/web/20180103125710/https://coinmarketcap.com/currencies/rchain/) RChain(/web/20180103125710/https://coinmarketcap.com/currencies/rchain/)	$382,918,182	$2.09(/web/20180103125710/https://coinr
74	ETHOS(/web/20180103125710/https://coinmarketcap.com/currencies/ethos/) Ethos(/web/20180103125710/https://coinmarketcap.com/currencies/ethos/)	$375,893,109	$4.99(/web/20180103125710/https://coin
75	BTM(/web/20180103125710/https://coinmarketcap.com/currencies/bytom/) Bytom(/web/20180103125710/https://coinmarketcap.com/currencies/bytom/)	$357,805,266	$0.362518(/web/20180103125710/https://coinr
76	KIN(/web/20180103125710/https://coinmarketcap.com/currencies/kin/) Kin(/web/20180103125710/https://coinmarketcap.com/currencies/kin/)	$345,225,073	$0.000457(/web/20180103125710/https://c
77	DGD(/web/20180103125710/https://coinmarketcap.com/currencies/digixdao/) DigixDAO(/web/20180103125710/https://coinmarketcap.com/currencies/digixdao/)	$339,498,000	$169.75(/web/20180103125710/https://coinma
78	QASH(/web/20180103125710/https://coinmarketcap.com/currencies/qash/) QASH(/web/20180103125710/https://coinmarketcap.com/currencies/qash/)	$337,943,200	$0.965552(/web/20180103125710/https://coi
79	AE(/web/20180103125710/https://coinmarketcap.com/currencies/aeternity/) Aeternity(/web/20180103125710/https://coinmarketcap.com/currencies/aeternity/)	$322,553,928	$1.38(/web/20180103125710/https://coinma
80	XBY(/web/20180103125710/https://coinmarketcap.com/currencies/xtrabytes/) XTRABYTES(/web/20180103125710/https://coinmarketcap.com/currencies/xtrabytes/)	$320,381,390	$0.745073(/web/20180103125710/https://coinmar
81	GAS(/web/20180103125710/https://coinmarketcap.com/currencies/gas/) Gas(/web/20180103125710/https://coinmarketcap.com/currencies/gas/)	$317,507,210	$34.75(/web/20180103125710/https://cc
82	VTC(/web/20180103125710/https://coinmarketcap.com/currencies/vertcoin/) Vertcoin(/web/20180103125710/https://coinmarketcap.com/currencies/vertcoin/)	$301,478,161	$7.12(/web/20180103125710/https://coinma
83	GAME(/web/20180103125710/https://coinmarketcap.com/currencies/gamecredits/) GameCredits(/web/20180103125710/https://coinmarketcap.com/currencies/gamecredits/)	$299,018,133	$4.65(/web/20180103125710/https://coinmarket
84	GNO(/web/20180103125710/https://coinmarketcap.com/currencies/gnosis-gno/) Gnosis(/web/20180103125710/https://coinmarketcap.com/currencies/gnosis-gno/)	$289,624,603	$262.20(/web/20180103125710/https://coinmarke

#	Name	Market Cap	
85	GXS(/web/20180103125710/https://coinmarketcap.com/currencies/gxshares/) GXShares(/web/20180103125710/https://coinmarketcap.com/currencies/gxshares/)	$284,532,113	$7.02(/web/20180103125710/https://coinma
86	ICN(/web/20180103125710/https://coinmarketcap.com/currencies/iconomi/) Iconomi(/web/20180103125710/https://coinmarketcap.com/currencies/iconomi/)	$280,203,591	$2.81(/web/20180103125710/https://coinm
87	STORJ(/web/20180103125710/https://coinmarketcap.com/currencies/storj/) Storj(/web/20180103125710/https://coinmarketcap.com/currencies/storj/)	$279,324,278	$2.11(/web/20180103125710/https://coi
88	QSP(/web/20180103125710/https://coinmarketcap.com/currencies/quantstamp/) Quantstamp(/web/20180103125710/https://coinmarketcap.com/currencies/quantstamp/)	$278,413,012	$0.451007(/web/20180103125710/https://coinmarke
89	DENT(/web/20180103125710/https://coinmarketcap.com/currencies/dent/) Dent(/web/20180103125710/https://coinmarketcap.com/currencies/dent/)	$274,026,423	$0.025816(/web/20180103125710/https://coi
90	SUB(/web/20180103125710/https://coinmarketcap.com/currencies/substratum/) Substratum(/web/20180103125710/https://coinmarketcap.com/currencies/substratum/)	$273,577,436	$1.21(/web/20180103125710/https://coinmarke
91	UBQ(/web/20180103125710/https://coinmarketcap.com/currencies/ubiq/) Ubiq(/web/20180103125710/https://coinmarketcap.com/currencies/ubiq/)	$271,845,181	$6.97(/web/20180103125710/https://coi
92	MANA(/web/20180103125710/https://coinmarketcap.com/currencies/decentraland/) Decentraland(/web/20180103125710/https://coinmarketcap.com/currencies/decentraland/)	$270,556,459	$0.118991(/web/20180103125710/https://coinmarket
93	ELF(/web/20180103125710/https://coinmarketcap.com/currencies/aelf/) aelf(/web/20180103125710/https://coinmarketcap.com/currencies/aelf/)	$265,567,500	$1.06(/web/20180103125710/https://cc
94	SKY(/web/20180103125710/https://coinmarketcap.com/currencies/skycoin/) Skycoin(/web/20180103125710/https://coinmarketcap.com/currencies/skycoin/)	$263,682,178	$38.58(/web/20180103125710/https://coinm
95	CTR(/web/20180103125710/https://coinmarketcap.com/currencies/centra/) Centra(/web/20180103125710/https://coinmarketcap.com/currencies/centra/)	$261,064,240	$3.84(/web/20180103125710/https://coinr
96	WTC(/web/20180103125710/https://coinmarketcap.com/currencies/walton/) Walton(/web/20180103125710/https://coinmarketcap.com/currencies/walton/)	$257,758,388	$10.35(/web/20180103125710/https://coinr
97	RDN(/web/20180103125710/https://coinmarketcap.com/currencies/raiden-network-token/) Raiden Networ...(/web/20180103125710/https://coinmarketcap.com/currencies/raiden-network-token/)	$251,547,564	$5.02(/web/20180103125710/https://coinmarketcap.com
98	BNT(/web/20180103125710/https://coinmarketcap.com/currencies/bancor/) Bancor(/web/20180103125710/https://coinmarketcap.com/currencies/bancor/)	$241,663,251	$5.93(/web/20180103125710/https://coinr
99	BAY(/web/20180103125710/https://coinmarketcap.com/currencies/bitbay/) BitBay(/web/20180103125710/https://coinmarketcap.com/currencies/bitbay/)	$237,155,318	$0.235095(/web/20180103125710/https://coinr
100	POE(/web/20180103125710/https://coinmarketcap.com/currencies/poet/) Po.et(/web/20180103125710/https://coinmarketcap.com/currencies/poet/)	$232,631,091	$0.105905(/web/20180103125710/https://coi

* *Not Mineable*

Next 100 →(2) | View All(/web/20180103125710/https://coinmarketcap.com/all/views/all/)

Total Market Cap: $693,639,125,841

Last updated: Jan 03, 2018 12:55 PM UTC

Exhibit L

Modern Consensus.

Blockchain and Cryptocurrency: People, Culture and Tech

Ripple wants to get remittances to Mexico faster with XRP (Photo: Shutterstock).

XRP

Coinbase announces acceptance of XRP, ripple ensues

Coinbase Pro to start accepting XRP transfers Tuesday

By Lawrence Lewitinn / February 25, 2019

It seems like the #RippleArmy has won at least one major battle: acceptance by Coinbase. One of the biggest names in retail crypto trading announced on Monday that its Coinbase Pro platform will start accepting inbound transfers of XRP Tuesday morning.

That doesn't mean Tyler or Kaiden or whatever Millennials are called can start trading XRP with their regular Coinbase accounts from the comfort of their campus safe space. As the company posted on their blog Monday:

"Once sufficient supply of XRP is established on the platform, trading on the XRP/USD, XRP/EUR, and XRP/BTC order books will start in phases, beginning with post-only mode and proceeding to full trading should our metrics for a healthy market be met. XRP trading will initially be accessible for Coinbase Pro users in the US (excluding NY), UK, supported European Union member nations, Canada, Singapore, and Australia. Additional jurisdictions may be added at a later date."

So not only did New York residents lose Amazon's HQ2, they also can't trade XRP from Coinbase Pro. Thanks for nothing, Alexandria Occasio-Cortez.

According to that same blog post, there will be a four-stage rollout:

1. **Transfer-only**. Starting after 10am PT on Feb. 25, customers will be able to transfer XRP into their Coinbase Pro account. Customers will not yet be able to place orders and no orders will be filled on these order books. Order books will be in transfer-only mode for at least 12 hours.
2. **Post-only**. In the second stage, customers can post limit orders but there will be no matches (completed orders). Order books will be in post-only mode for a minimum of one minute.
3. **Limit-only**. In the third stage, limit orders will start matching but customers are unable to submit market orders. Order books will be in limit-only mode for a minimum of ten minutes.
4. **Full trading**. In the final stage, full trading services will be available, including limit, market, and stop orders.

Getting XRP to trade on Coinbase has been one of the big stories behind the third-most valuable cryptocurrency for quite some time. The exchange indicated that they were reluctant to add tokens like XRP to its platforms because they weren't sure if they would be considered securities and not cryptocurrencies. Last year, a report by Bloomberg claimed Ripple tried to entice Coinbase and rival exchange Gemini with a stack of cash and XRP tokens; Ripple told Modern Consensus that Bloomberg's story was inaccurate.

As of publication time, XRP was up 8 percent over the previous 24 hours. That's a far cry from some of the more fevered dreams XRP cheerleaders predicted would happen with acceptance by Coinbase but, then again, perhaps the market figured it was just about time it would happen.

You May Also Like

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Coinbase | Coinbase Pro | Gemini | Ripple | XRP

LAWRENCE LEWITINN

Lawrence Lewitinn, CFA was the founding editor in chief of Modern Consensus. Disclosure: Lewitinn owns no cryptocurrencies in his portfolio.

Exhibit M

Exhibit 10.1

SECURITIES PURCHASE AGREEMENT

BY AND BETWEEN

MONEYGRAM INTERNATIONAL, INC.

AND

RIPPLE LABS INC.

DATED AS OF JUNE 17, 2019

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EXHIBITS

Exhibit A Warrant Agreement
Exhibit B Registration Rights Agreement
Exhibit C Form of Additional Closing Officer's Certificate
Exhibit D Form of Purchaser Observer/Director NDA

This **SECURITIES PURCHASE AGREEMENT** (the "**Agreement**") is made and entered into as of June 17, 2019 (the "**Effective Date**"), by and between MoneyGram International, Inc., a Delaware corporation (the "**Company**"), and Ripple Labs Inc., a Delaware corporation ("**Purchaser**"). Purchaser and the Company are each referred to herein as a "**Party**" and, together, as the "**Parties**."

WHEREAS, the Company and Purchaser desire to enter into this Agreement to set forth the terms and conditions by which the Company shall issue, and Purchaser shall purchase, from time to time as provided herein, shares of common stock, $0.01 par value, of the Company ("**Common Stock**") and Warrants (as defined below);

WHEREAS, simultaneously with the execution of this Agreement, Silicon Valley Bank (the "**LOC Bank**") is issuing a letter of credit (the "**Letter of Credit**") on behalf of Purchaser for the benefit of the Company in a face amount equal to $20 million (the "**LOC Amount**"), which backstops a commitment by Purchaser to purchase shares of Common Stock and Warrants up to an amount equal to the LOC Amount and which may be drawn by the Company subject to and in accordance with the terms and conditions set forth in the Letter of Credit and this Agreement;

WHEREAS, simultaneously with the execution of this Agreement, Purchaser and the Company are entering into that certain commercial agreement (the "**Commercial Agreement**"), pursuant to which the Company and its Subsidiaries will (a) obtain access to, and specified support from, Purchaser, for implementation and use of Purchaser's xRapid platform (the "**Platform**") relating to transfer and receipt of cross-border payments in agreed corridors and (b) agree to use its commercially reasonable efforts to deploy the Platform for such purpose;

WHEREAS, simultaneously with the execution of this Agreement, Purchaser and THL (as defined below) are entering into that certain Letter Agreement (the "**THL Letter Agreement**"), pursuant to which THL will agree to enter into, in the event a Purchaser Director (as defined below) is appointed to the Company Board, a customary voting and support agreement (the "**THL Voting Agreement**"), pursuant to which THL will agree to vote its Equity Securities (as defined below) in favor of the Purchaser Director at each meeting of stockholders of the Company at which such Purchaser Director is nominated for election; *provided*, *that*, in each case, the voting and support obligations set forth therein shall only be effective if and so long as Purchaser has the right to designate a Purchaser Director; and *provided*, *further*, that the voting and support obligations set forth therein shall terminate upon THL and its Affiliates ceasing to own, in the aggregate, 10% or more of any class of Equity Securities of the Company registered pursuant to Section 12 of the Securities Exchange Act of 1934; and

WHEREAS, upon the terms and subject to the conditions contained herein, the Company shall issue and sell to Purchaser, from time to time as provided herein, and Purchaser shall purchase from the Company, (i) shares of Common Stock on the Effective Date and (ii) after the Effective Date, an amount of Common Stock up to an amount equal to the LOC Amount or to the extent applicable as set forth herein, Warrants.

NOW, **THEREFORE**, the parties hereto agree as follows:

ARTICLE 1.
DEFINITIONS; INTERPRETATION

Section 1.1 Defined Terms. As used in this Agreement, the following terms shall have the following meanings.

"**Additional Closing Company Representations**" shall mean the representations and warranties of the Company contained in Section 4.1 (Existence); Section 4.2 (Power; Authorization; Enforceable Obligations); Section 4.3 (No Conflict or Violation); Section 4.4 (Valid Issuance); and Section 4.5 (Listing).

"**Additional Closing Date**" shall mean with respect to any Additional Closing, the date on which such Additional Closing occurs, which shall be the fifth Business Day following the delivery by the Company of a Draw Notice with respect to such Additional Closing.

"**Additional Closing Purchaser Representations**" shall mean the representations and warranties of Purchaser contained in Section 3.1 (Existence); Section 3.2 (Power; Authorization; Enforceable Obligations); and Section 3.3 (No Conflict or Violation).

"**Additional Closings**" shall have the meaning set forth in Section 2.2(a).

"**Affiliate**" shall mean, with respect to any Person, any other Person that directly, or indirectly through one or more intermediaries, controls, is controlled by or is under common control with, such specified Person.

"**Agreement**" shall have the meaning set forth in the preamble.

"**Alternative Ownership Threshold**" shall have the meaning set forth in Section 6.4(d).

"**Anti-Bribery Laws**" means anti-bribery and anti-corruption Laws, including (i) the Foreign Corrupt Practices Act, (ii) the United Kingdom Bribery Act 2010, (iii) anti-bribery legislation promulgated by the European Union and implemented by its member states and (iv) legislation adopted in furtherance of the OECD Convention on Combating Bribery of Foreign Public Officials in International Business Transactions.

"**Anti-Money Laundering Laws**" means anti-money laundering-related Laws, including, (i) the European Union Anti-Money Laundering Directives and any Laws, circulars or instructions implementing or interpreting the same and (ii) the applicable financial recordkeeping and reporting requirements of the U.S. Currency and Foreign Transaction Reporting Act of 1970, as amended.

"**Applicable Board Committee**" shall mean any committee of the Company Board.

"**Beneficial Ownership**" by a Person of any securities includes ownership by any Person who, directly or indirectly, through any contract, arrangement, understanding, relationship or otherwise, has or shares (a) voting power which includes the power to vote, or to direct the voting of, such security; and/or (b) investment power which includes the power to dispose, or to direct the disposition, of such security; and shall otherwise be interpreted in accordance with the term "beneficial ownership" as defined in Rule 13d-3 adopted by the SEC under the Exchange Act. The term "**Beneficially Own**" shall have a correlative meaning.

"**Board Compliance Requirements**" shall have the meaning set forth in Section 6.4(a).

"**Business Day**" means any day that is not a Saturday, a Sunday or other day on which banking organizations in New York, New York, San Francisco, California or Dallas, Texas are required or authorized by Law to be closed.

"**Change of Control**" shall mean any transaction in which any Person (i) becomes the beneficial owner, directly or indirectly, of more than fifty percent (50%) of the outstanding voting power (including securities exercisable, convertible or exchangeable into voting securities) of the Company by means of merger, stock sale, recapitalization, exchange, consolidation or other similar transaction or (ii) acquires all or substantially all of the Company's assets.

"**Claim**" shall mean any civil, criminal, or administrative actions, suits, demands, claims, hearings, investigations, petitions, grievances, proceedings, settlements, or enforcement actions commenced, brought, conducted or heard by or before otherwise involving, a Governmental Authority or any arbitrator or arbitration panel.

"**Commercial Agreement**" shall have the meaning set forth in the recitals.

"**Commitment Period**" shall mean the period commencing on the Effective Date and expiring on the earliest to occur of: (a) the date on which Purchaser shall have purchased Common Stock or Warrants pursuant to this Agreement for an aggregate purchase price amount equal to $50,000,000.00, (b) June 30, 2020 and (c) a Termination Event.

"**Common Stock**" shall have the meaning set forth in the recitals.

"**Common Stock Purchase Price**" shall mean, with respect to any Letter of Credit Draw, the greater of (a) $4.10 and (b) in the event the price of the Common Stock on NASDAQ exceeds $4.10 per share as of the close of regular trading on the Trading Day immediately prior to the date the Company delivers a Draw Notice to the LOC Bank, the lesser of (i) 150% of the 30-Trading-Day VWAP of the Common Stock as of the close of regular trading on the Trading Day immediately prior to the date the Company delivers a Draw Notice to the LOC Bank and (ii) $6.40.

"**Company**" shall have the meaning set forth in the preamble.

"**Company Board**" shall mean the board of directors of the Company.

"**Company Charter**" shall mean the Amended and Restated Certificate of Incorporation of the Company, as amended, modified or supplemented from time to time.

"**Company Indemnitees**" shall have the meaning set forth in Section 5.1(c).

"**Company Option**" shall mean an outstanding option to purchase shares of Common Stock.

"**Company Reports**" shall mean all reports, registration statements and other documents required to be filed or furnished by the Company with the SEC, each as may be supplemented, modified or amended from time to time.

"**Company RSUs**" shall mean restricted stock units granted pursuant to the Company Stock Plan, whether vested or unvested, representing the right to receive shares of Common Stock, whether subject to performance-based vesting requirements or time-based vesting requirements.

"**Company Stock Plan**" shall mean the Company's 2005 Omnibus Incentive Plan, as amended, restated, modified or supplemented from time to time.

"**Competitive Product**" shall mean any product or solution that utilizes a cryptocurrency as a bridge currency for cross-border settlement.

"**Contractual Obligation**" shall mean, as to any Person, any provision of any contract, agreement, instrument or other undertaking to which such Person is a party or by which it or any of its property is bound.

"**Creditors' Rights**" shall mean applicable bankruptcy, insolvency, reorganization or other laws affecting creditors' rights and remedies generally and general equitable principles.

"**Derivative Securities**" shall mean any right, option, warrant or other security convertible into or exercisable for Common Stock, including the Series D Preferred Stock.

"**Disclosure Schedules**" shall have the meaning set forth in Section 8.9.

"**Draw Notice**" shall mean a written notice to the LOC Bank setting forth the Letter of Credit Draw that the Company requests from the LOC Bank pursuant to the Letter of Credit and which identifies the Additional Closing Date and which includes the Draw Notice Representation.

"**Draw Notice Representation**" means the following representation, which the Company is required to make to the LOC Bank to validly deliver a Draw Notice: "MoneyGram represents that (a) that delivery of this demand is permitted by the terms of the Agreement, (b) no Termination Event has occurred and is continuing under the Agreement and (c) no event has occurred and is continuing since the date of the Agreement which, but for the lapse of time or the giving of notice, or both, would constitute an Event of Default under MoneyGram's senior secured first lien term facility (or any successor debt facility) or senior secured second lien term facility (or any successor debt facility)."

"**Effective Date**" shall have the meaning set forth in the preamble.

"**Equity Securities**" shall mean Common Stock and any Derivative Security of Common Stock.

"**Exchange Act**" shall mean the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated thereunder.

"**Event of Default**" (or, if not defined, such analogous term) shall have the meaning set forth in the applicable agreement governing the Company's senior secured first lien term facility (or any successor debt facility) or senior secured second lien term facility (or any successor debt facility).

"**Foreign Corrupt Practices Act**" shall have the meaning set forth in Section 4.12(b)(ii).

"**Financial Statements**" shall have the meaning set forth in Section 4.7.

"**Fraud**" shall mean common law fraud under Delaware law.

"**Fundamental Representations**" shall mean the representations and warranties of the Company contained (i) in the first sentence of Section 4.1 (Existence); (ii) Section 4.2 (Power; Authorization), but not including the last sentence of Section 4.2; and (iii) Section 4.4 (Valid Issuance).

"**GAAP**" shall mean United States generally accepted accounting principles.

"**Governmental Authority**" shall mean any multinational, national, federal, state, local or foreign court, administrative agency or commission or other governmental or regulatory authority or instrumentality or self-regulatory organization.

"**GS**" shall mean Goldman Sachs & Co. LLC and funds affiliated with Goldman Sachs & Co. LLC that own Series D Preferred Stock.

"**Holdco Entity**" shall mean an entity, if any, (i) that owns all of Purchaser's outstanding stock and (ii) whose stockholders are the same Persons who were Purchaser's stockholders immediately prior to such time that such entity acquired all of Purchaser's outstanding stock and who own stock in such entity in the same relative percentages as they owned stock in Purchaser.

"**Indemnified Liabilities**" shall have the meaning set forth in Section 5.1(b).

"**Initial Closing**" shall have the meaning set forth in Section 2.1(b).

"**Initial Investment**" shall have the meaning set forth in Section 2.1(a).

"**Initial Purchase Price**" shall have the meaning set forth in Section 2.1(a).

"**Initial Shares**" shall have the meaning set forth in Section 2.1(a).

"**Initial Warrant**" shall have the meaning set forth in Section 2.1(a).

"**Key Corridors**" shall mean the European Union and the United States to and from Mexico and the Philippines.

"**Law**" shall mean any law, statute, code, ordinance, rule, regulation, judgment, order, award, writ, decree, administrative order, code of practice or injunction issued, promulgated or entered into by or with any Governmental Authority.

"**Letter of Credit**" shall have the meaning set forth in the recitals.

"**Letter of Credit Draw**" shall mean the portion of the LOC Amount requested by the Company in the Draw Notice.

"**Lien**" shall mean any mortgage, deed of trust, hypothecation, lien, pledge, encumbrance, charge, security interest, judgment lien, easement, servitude or, in each case, any other similar encumbrance.

"**LOC Amount**" shall have the meaning set forth in the recitals.

"**LOC Bank**" shall have the meaning set forth in the recitals.

"**Lock-Up Period**" shall mean the period beginning on the Effective Date and ending on the earlier to occur of (a) June 30, 2020 and (b) a Termination Event.

"**Lock-Up Securities**" shall have the meaning set forth in Section 6.2(a).

"**Market Price**" means, with respect to any particular measurement date, the closing price of a share of Common Stock as reported on NASDAQ for the Trading Day immediately preceding such measurement date.

"**Material Adverse Effect**" shall mean any fact, circumstance, event, change, effect or occurrence that, individually or in the aggregate with all other facts, circumstances, events, changes, effects, or occurrences, has or would be reasonably expected to have a material adverse effect on the business, results of operations or financial condition of the Company and its Subsidiaries taken as a whole; *provided, however*, that in determining whether a Material Adverse Effect has occurred or would be reasonably expected to occur, there shall be excluded any effect on the Company and its Subsidiaries to the extent caused by, resulting from or relating to (i) any change after the date of this Agreement in laws of general applicability (including any change in immigration, tariff or trade policies) or published interpretations thereof by Governmental Authorities or in GAAP; (ii) the announcement, disclosure or execution of this Agreement or the transactions contemplated hereby, including the identity of Purchaser and the Platform, including any effect on the Company's relationships (whether contractual or otherwise) with its customers, suppliers, licensors, landlords, joint venture partners, financing sources, agents or employees; (iii) any changes after the date of this Agreement in general political, economic or business conditions in the United States or any country or region in the world in which the Company or any of its Subsidiaries does business (including any changes resulting from the impending withdrawal of the United Kingdom from the European Union), or any changes in securities, credit or capital market conditions, including interest rates or exchange rates; (iv) the failure by the Company and its Subsidiaries to meet internal projections or forecasts or published revenue or earnings predictions for any period ending on or after the date of this Agreement or a decrease in the market price of shares of Common Stock; *provided, that*, the exception in this clause (iv) shall not prevent the underlying facts giving rise or contributing to such failure or decrease from being taking into account in determining whether a Material

Adverse Effect has occurred; (v) hurricanes, earthquakes, floods or other natural disasters; (vi) the commencement, continuation or escalation of a war (whether or not declared), armed hostilities or acts of terrorism; (vii) any change or effect generally affecting the money transmission industry; (viii) the performance by the Company or any of its affiliates of its or their express obligations under this Agreement; or (ix) any action or omission by the Company taken at the express written request of Purchaser; *provided, that*, the effect of any change or event described in clauses (i), (iii), (v), (vi) or (vii) shall be taken into account in determining whether a Material Adverse Effect has occurred or would be reasonably expected to occur to the extent that such change or event has a disproportionate impact on the Company and its Subsidiaries relative to other participants in the money transmission industry.

"**Money Transmitter License**" shall mean any approval that is necessary under any and all legal requirements relating to the business of transmitting money or other payment or money services businesses to entitle the Company or any of its Subsidiaries to carry on and conduct its businesses as currently conducted.

"**NASDAQ**" shall mean The Nasdaq Stock Market.

"**Order**" shall mean any award, decision, injunction, judgment, order, ruling, subpoena, demand, request, writ, decree or verdict entered, issued, made or rendered by any Governmental Authority.

"**Ownership Threshold**" shall have the meaning set forth in Section 6.4(d).

"**Party**" or "**Parties**" shall have the meaning set forth in the preamble.

"**Person**" shall mean any individual, corporation, limited liability company, limited or general partnership, joint venture, government or any agency or political subdivision thereof, or any other entity or any group (as defined in Section 13(d) of the Exchange Act) composed of two or more of the foregoing.

"**Platform**" shall have the meaning set forth in the recitals.

"**Purchaser**" shall have the meaning set forth in the preamble.

"**Purchaser Director**" shall have the meaning set forth in Section 6.4(b)(i).

"**Purchaser Indemnitees**" shall have the meaning set forth in Section 5.1(b).

"**Purchaser Observer**" shall have the meaning set forth in Section 6.4(a).

"Purchaser Operating Executive" shall mean the Operating Executive (as defined in the Commercial Agreement).

"**Purchaser Voting Agreement**" shall have the meaning set forth in Section 6.4(c).

"**Registration Rights Agreement**" shall have the meaning set forth in Section 6.1.

"**Regulatory Ownership Cap**" shall mean 9.95% of the Voting Securities of the Company (not including shares of Common Stock underlying unexercised Warrants) or such other amount of the securities of the Company the acquisition of which would require either Purchaser or the Company to obtain prior approval or non-objection of any Governmental Authority, as may be reasonably determined by the Parties and mutually agreed in good faith.

"**Representatives**" shall mean, with respect to a Person, the officers, employees and agents and representatives of such Person, including any investment banker, financial advisor, attorney, accountant or other authorized advisor, agent or representative retained by such Person in connection with the transactions contemplated by this Agreement.

"**Required Regulatory Approvals**" shall mean approvals or confirmations of non-objections related to Money Transmitter Licenses of the Company or its Subsidiaries permitting the acquisition by Purchaser of securities in excess of the Regulatory Ownership Cap and the appointment by Purchaser of a Purchaser Director, as applicable, in accordance with this Agreement.

"**SEC**" shall mean the Securities and Exchange Commission.

"**Securities Act**" shall mean the Securities Act of 1933, as amended, and the regulations promulgated thereunder.

"**Series D Preferred Stock**" shall mean the Series D Participating Convertible Preferred Stock, par value $0.01 per share, of the Company.

"**Subsidiary**" shall mean, with respect to any person, any other corporation, partnership, joint venture, limited liability company or any other entity (a) of which such first person or a Subsidiary of such first person is a general partner or managing member or (b) at least a majority of the securities or other interests of which having by their terms ordinary voting power to elect a majority of the board of directors or persons performing similar functions with respect to such entity is directly or indirectly owned or controlled by such first person.

"**Termination Event**" shall mean the occurrence of any of the following:

(a) the Commercial Agreement is terminated pursuant to the terms thereof by Purchaser due to a material breach by the Company or by the Company other than due to a material breach by Purchaser, including due to a Termination Event;

(b) (i) the Company commences any Claim (A) under any existing or future Law relating to bankruptcy, insolvency, reorganization or relief of debtors, seeking to have an order for relief entered with respect to it, or seeking to adjudicate it bankrupt or insolvent, or seeking reorganization, arrangement, adjustment, winding-up, liquidation, dissolution, composition or other relief with respect to its debts, or (B) seeking appointment of a receiver, trustee, custodian or other similar official for it or for all or any substantial part of its assets, (ii) the Company makes a general assignment for the benefit of its creditors or (iii) a court shall have entered a decree or order for relief against the Company in any involuntary case under Title 11 of the United States Code, as amended from time to time, or any applicable bankruptcy or similar Law now or hereafter in effect, which decree or order is not stayed, vacated, discharged, or bonded pending appeal within 90 days from the entry thereof;

(c) an Event of Default occurs and is continuing under the Company's senior secured first lien term facility (or any successor debt facility) or senior secured second lien term facility (or any successor debt facility) that is not cured or waived for a period exceeding 45 days (provided that the Company will not draw under the Letter of Credit to cure such an Event of Default);

(d) the Company experiences a material adverse regulatory action that prevents or materially impairs the Company from providing money transfer services in Key Corridors or that otherwise would reasonably be expected to materially impair the Company's ability to attain the transaction volumes contemplated in the Commercial Agreement and that is not resolved for a period exceeding 45 days; or

(e) the Company undergoes a Change of Control.

provided, that, to the extent that an event described in (a) through (e) above occurs and Purchaser elects (in its sole discretion) to deliver a writing to the Company waiving the occurrence of such event as a "Termination Event", then the occurrence of such event shall not be considered a "Termination Event" for purposes of this Agreement.

"**THL**" shall mean Thomas H. Lee Partners, L.P. and funds affiliated with Thomas H. Lee Partners, L.P.

"**THL Letter Agreement**" shall have the meaning set forth in the recitals.

"**THL Voting Agreement**" shall have the meaning set forth in the recitals.

"**Trading Day**" shall mean any day on which the Common Stock is listed or quoted and traded on NASDAQ.

"**Transaction Agreement**" shall mean the Registration Rights Agreement, the Warrant Agreement, any Warrant and the Letter of Credit and any certificate (including any Draw Notice), instrument or document contemplated by this Agreement or the transactions contemplated hereby or thereby. For the avoidance of doubt, the Commercial Agreement and Voting Agreements are not Transaction Agreements.

"**Voting Agreements**" shall mean the THL Voting Agreement and Purchaser Voting Agreement.

"**Voting Securities**" shall mean Equity Securities the holders of which, at the time of determination, are entitled to vote for the election of directors of the Company.

"**VWAP**" per share of Common Stock for any specified period of determination shall mean the per share volume-weighted average Market Price over such period.

"**Warrant**" shall mean a warrant in the form attached to the Warrant Agreement as Exhibit A issued by the Company to Purchaser pursuant to this Agreement, and which has a per share exercise price of $0.01 per share.

"**Warrant Agent**" shall mean Equiniti Trust Company, a limited trust company organized under the laws of the State of New York.

"**Warrant Agreement**" shall mean that certain Warrant Agreement attached hereto as Exhibit A hereto, dated as of the Effective Date, by and between the Company and the Warrant Agent.

"**Warrant Purchase Price**" shall mean, with respect to any Letter of Credit Draw, the greater of (a) $4.10 and (b) in the event the price of the Common Stock on NASDAQ exceeds $4.10 per share as of the close of regular trading on the Trading Day immediately prior to the date the Company delivers a Draw Notice to the LOC Bank, the lesser of (i) 100% of the 30-Trading-Day VWAP of the Common Stock as of the close of regular trading on the Trading Day immediately prior to the date the Company delivers a Draw Notice to the LOC Bank and (ii) $6.40.

Section 1.2 Interpretation. The words "hereof," "herein" and "hereunder" and words of similar import when used in this Agreement shall refer to this Agreement as a whole and not to any particular provision of this Agreement, and Section references are to this Agreement unless otherwise specified. Whenever the words "include," "includes" or "including" are used in this Agreement, they shall be deemed to be followed by the words "without limitation." The word "from" means "from and including." The table of contents and headings contained in this Agreement are for reference purposes only and shall not affect in any way the meaning or interpretation of this Agreement. The meanings given to terms defined herein will be equally applicable to both the singular and plural forms of such terms. References to any Law include references to any associated rules and regulations with respect thereto. In this Agreement, all references to "dollars" or "$" are to United States dollars. This Agreement and any Transaction Agreement shall be construed without regard to the identity of the person who drafted the various provisions of the same. Each and every provision of this Agreement and such other documents and instruments shall be construed as though all of the parties participated equally in the drafting of the same. Consequently, the parties acknowledge and agree that any rule of construction that a document is to be construed against the drafting party shall not be applicable either to this Agreement or such other documents and instruments.

ARTICLE 2.
SALE AND PURCHASE

Section 2.1 Initial Investment.

(a) Initial Purchase and Sale. The Company shall issue and sell to Purchaser, and Purchaser shall purchase and acquire from the Company (the "**Initial Investment**"), (i) 5,610,923 shares (the "**Initial Shares**") of Common Stock for $4.10 per share and (ii) a Warrant exercisable for 1,706,151 shares of Common Stock (the "**Initial Warrant**") with a per share reference price of $4.10 per share of Common Stock, for an aggregate purchase price of $30,000,003.40 (the "**Initial Purchase Price**").

(b) Initial Closing. The closing of the Initial Investment (the "**Initial Closing**") shall occur by electronic exchange of documents at 10:00 A.M. Central Time on the Effective Date. All items delivered by Purchaser and the Company at the Initial Closing (including pursuant to Section 2.1(c) and Section 2.1(d)) shall be deemed to have been delivered simultaneously, and no items will be deemed delivered or waived until all have been delivered or waived.

(c) Initial Closing Deliverables of the Company. Subject to the terms and conditions set forth in this Agreement, on the Effective Date, the Company shall deliver to Purchaser:

(i) a copy of the Registration Rights Agreement, duly executed by the Company;

(ii) a copy of the Warrant Agreement, duly executed by the Company and the Warrant Agent;

(iii) a copy of the THL Letter Agreement, duly executed by THL;

(iv) a certificate in the name of Purchaser representing the Initial Shares, free and clear of any Liens other than those created or incurred by Purchaser (provided that in lieu of delivering a certificate for the Initial Shares, the Company may cause such shares to be registered in book-entry form by the Company's transfer agent for Common Stock);

(v) a copy of the Commercial Agreement, duly executed by the Company; and

(vi) the Initial Warrant, duly executed by the Company and free and clear of any Liens other than those created or incurred by Purchaser.

(d) Initial Closing Deliverables of Purchaser. Subject to the terms and conditions set forth in this Agreement, on the Effective Date, Purchaser shall deliver to the Company:

(i) the Initial Purchase Price for the Initial Shares and the Initial Warrant to the Company by wire transfer of U.S. dollars in immediately available funds to an account specified by the Company in writing at least two Business Days prior to the date hereof;

(ii) a copy of the Registration Rights Agreement, duly executed by Purchaser;

(iii) an original Letter of Credit, duly executed by Purchaser, the LOC Bank and the other parties thereto, which Letter of Credit shall (A) expire upon the earlier to occur of June 30, 2020 and a Termination Event and (B) provide for multiple drawings thereunder; and

(iv) a copy of the Commercial Agreement, duly executed by Purchaser; and

(v) a copy of the THL Letter Agreement, duly executed by Purchaser.

Section 2.2 Additional Closings.

(a) General. Subject to Section 6.3 and the satisfaction or waiver of the conditions set forth in Article 7, the Company may from time to time elect to issue and sell additional shares of Common Stock and Warrants to Purchaser in accordance with the terms set forth herein on the applicable Additional Closing Date (each, an "**Additional Closing**" and together, the "**Additional Closings**"), by delivering at least five Business Days' written notice to Purchaser, which notice shall be accompanied by the certificate contemplated by Section 7.1(d), and by requesting a Letter of Credit Draw from the LOC Bank by the delivery of a Draw Notice to the LOC Bank, with a copy to Purchaser. Each Additional Closing shall occur by electronic exchange of documents at 10:00 A.M. Central Time on the Additional Closing Date of such Additional Closing. Subject to the terms and conditions set forth in this Agreement, including Section 2.2(c), the number of shares of Common Stock that Purchaser shall receive for each Letter of Credit Draw shall be determined by dividing the amount of the Letter of Credit Draw by the Common Stock Purchase Price. No fractional shares shall be issued. Fractional shares shall be rounded to the next higher whole number of shares. The maximum amount of all Letter of Credit Draws that the Company may make under this Agreement (and the maximum consideration Purchaser is obligated to pay for Common Stock and/or Warrants hereunder at Additional Closings) shall not exceed the LOC Amount.

(b) Draw Notice. Subject to Section 2.2(a) and Section 6.3, at any time during the Commitment Period, in order to exercise its right to issue and sell additional Common Stock or Warrants to Purchaser and request a Letter of Credit Draw, the Company shall concurrently deliver (i) a Draw Notice to the LOC Bank at least five Business Days prior to the applicable Additional Closing Date and (ii) a copy of any Draw Notice to Purchaser. Notwithstanding anything to the contrary in this Agreement, the Company shall not deliver a Draw Notice to the LOC Bank unless the conditions precedent set forth in Section 7.1 and Section 7.2 are satisfied or waived at such time (based on the Company's knowledge at such time and other than those to be satisfied or waived at the applicable Additional Closing itself, but subject to such conditions being satisfied at the Additional Closing), and delivery of a Draw Notice shall be deemed to constitute a representation to Purchaser and the LOC Bank that such conditions have been satisfied or waived at such time (other than those to be satisfied or waived at the applicable Additional Closing itself, but subject to such conditions being satisfied at the Additional Closing). If the Company becomes aware, at any time after a Draw Notice is delivered, that the related Additional Closing will not occur promptly upon funding of the Letter of Credit Draw for any reason (including because the conditions set forth in Section 7.1 and Section 7.2 will not be satisfied or waived as of the applicable Additional Closing), then (x) the Company shall promptly deliver written notice to the LOC Bank rescinding such Draw Notice and, (y) if the applicable Letter of Credit Draw is funded, the Company shall be deemed to receive such funds in trust for the benefit of Purchaser, and shall promptly remit such funds to Purchaser. The Company acknowledges and agrees that its obligation to remit funds in accordance with the preceding sentence is not to be subject to setoff or counterclaim of any kind.

(c) Regulatory Ownership Cap; Warrants. If the Company delivers a Draw Notice with respect to a Letter of Credit Draw and (x) the applicable number of shares of Common Stock to be acquired by Purchaser in connection with such Letter of Credit Draw would result in Purchaser Beneficially Owning more than the Regulatory Ownership Cap, and (y) the Required Regulatory Approvals have not been obtained as of the date of such Letter of Credit Draw, then:

(i) to the extent Purchaser Beneficially Owns a number of shares of Common Stock less than the Regulatory Ownership Cap, the Company shall issue, and Purchaser shall receive, a number of shares of Common Stock that would result in Purchaser owning a number of shares of Common Stock equal to the Regulatory Ownership Cap minus the number of shares of Common Stock Purchaser Beneficially Owns immediately prior to such Letter of Credit Draw; and

(ii) the Company shall issue a Warrant exercisable for a number of shares of Common Stock equal to (1)(A) the amount of such Letter of Credit Draw minus (B) (x) the number of shares of Common Stock issued pursuant to Section 2.2(c)(i) (if any) multiplied by (y) the Common Stock Purchase Price divided by (2) the Warrant Purchase Price.

(d) Additional Closings. On each Additional Closing, the Company shall deliver to Purchaser the applicable number of shares of Common Stock in certificated form (provided that in lieu of delivering a certificate for such shares, the Company may cause such shares to be registered in book-entry form by the Company's transfer agent for Common Stock), or, to the extent applicable pursuant to Section 2.2(c), a Warrant exercisable for the applicable number of shares of Common Stock in certificated form (provided that in lieu of delivering a certificate for such shares, the Company may cause such shares to be registered in book-entry form by the Company's transfer agent for Common Stock), in each case free and clear of all Liens other than those created or incurred by Purchaser representing the amount of shares of Common Stock or Warrants purchased at such Additional Closing, registered in the name of Purchaser. In addition, on or prior to the Additional Closing, each of the Company and Purchaser shall deliver to each other all documents, instruments and writings required to be delivered by either of them pursuant to this Agreement in order to implement and effect the transactions contemplated herein.

Section 2.3 Conditions to Additional Closings. Each of the Company and Purchaser agree that (a) the obligation of Purchaser to purchase shares of Common Stock or Warrants, as applicable (and to cause the LOC Bank to provide payment for such purchase), at an Additional Closing, is subject to the satisfaction or waiver of the conditions set forth in Section 7.1 and Section 7.2 and (b) the obligation of the Company to deliver shares of Common Stock or Warrants, as applicable, at an Additional Closing is subject to the satisfaction or waiver of the conditions set forth in Section 7.1 and Section 7.2.

Section 2.4 Notice of Termination Event; Reasonable Cooperation.

(a) In the event (i) a Termination Event occurs or (ii) an Event of Default occurs under the Company's senior secured first lien term facility (or any successor debt facility) or senior secured second lien term facility (or any successor debt facility), the Company shall, in either case, promptly after becoming aware or having knowledge of such event (and in any event within two Business Days after becoming aware or having knowledge of such event), notify Purchaser in writing of the occurrence of such event, together with a reasonable description thereof.

(b) In the event that the Company and Purchaser mutually agree that a Termination Event has occurred and is continuing, the Company shall cooperate in good faith with Purchaser to terminate the Letter of Credit, including by, upon Purchaser's request, returning the Letter of Credit for cancellation, notifying the LOC Bank that a Termination Event has occurred and requesting that the LOC Bank terminate the Letter of Credit.

Section 2.5 Legends.

(a) Common Stock. Each certificate evidencing shares of Common Stock issued hereunder shall be stamped or otherwise imprinted with a legend, in substantially the following form:

THE SECURITIES REPRESENTED HEREBY ARE SUBJECT TO THE PROVISIONS OF A SECURITIES PURCHASE AGREEMENT, DATED AS OF JUNE 17, 2019, AS MAY BE AMENDED FROM TIME TO TIME, INCLUDING CERTAIN RESTRICTIONS ON TRANSFER SET FORTH THEREIN. A COPY OF THE SECURITIES PURCHASE AGREEMENT IS ON FILE AT THE PRINCIPAL EXECUTIVE OFFICES OF MONEYGRAM INTERNATIONAL, INC. (THE "COMPANY").

THE SECURITIES REPRESENTED HEREBY HAVE NOT BEEN REGISTERED UNDER THE UNITED STATES SECURITIES ACT OF 1933, AS AMENDED (THE "1933 ACT"), OR UNDER ANY U.S. STATE OR FOREIGN SECURITIES LAWS, IN RELIANCE UPON APPLICABLE EXEMPTIONS FROM THE REGISTRATION REQUIREMENTS OF THE 1933 ACT AND SUCH STATE AND FOREIGN SECURITIES LAWS. THE SECURITIES REPRESENTED HEREBY HAVE BEEN ACQUIRED FOR INVESTMENT AND NOT WITH A VIEW TO DISTRIBUTION OR RESALE IN CONTRAVENTION OF THE 1933 ACT OR ANY U.S. STATE OR FOREIGN SECURITIES LAWS. THE SECURITIES REPRESENTED HEREBY MAY NOT BE SOLD, TRANSFERRED, OR OTHERWISE DISPOSED OF UNLESS REGISTERED UNDER THE 1933 ACT AND ANY APPLICABLE U.S. STATE OR FOREIGN SECURITIES LAWS, OR THE HOLDER HEREOF PROVIDES EVIDENCE REASONABLY SATISFACTORY TO THE COMPANY (WHICH, IN THE DISCRETION OF THE COMPANY, MAY INCLUDE AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY) THAT NO SUCH REGISTRATION IS REQUIRED.

(b) Warrant. Each Warrant issued hereunder shall bear the legend in substantially the form set forth on the form of Warrant attached to the Warrant Agreement as Exhibit A.

ARTICLE 3.
REPRESENTATIONS AND WARRANTIES OF PURCHASER

Except in each case as set forth in the corresponding section or subsection of the Disclosure Schedules, Purchaser hereby represents and warrants to the Company that the following are true as of the Effective Date and, with respect to the Additional Closing Purchaser Representations, as of each Additional Closing Date:

Section 3.1 Existence. Purchaser: (a) is duly incorporated, validly existing and in good standing under the laws of the State of Delaware and (b) has the power and authority, and the legal right, to own and operate its property, to lease the property it operates as lessee and to conduct the business in which it is currently engaged.

Section 3.2 Power; Authorization; Enforceable Obligations. Purchaser: (a) has the power and authority to execute, deliver and perform its obligations under this Agreement and each Transaction Agreement to which it is or will be a party, including to purchase Common Stock and Warrants issuable hereunder, (b) has taken all necessary corporate action to authorize the execution, delivery and performance of this Agreement, and the purchase of Common Stock and Warrants on the terms and conditions of this Agreement. No consent or authorization of, filing with, notice to or other similar act by or in respect of, any Governmental Authority or any other Person is required to be obtained or made by or on behalf of Purchaser in connection with the execution, delivery, performance, validity or enforceability of this Agreement or the purchase of Common Stock and Warrants on the terms and under the circumstances provided for herein. This Agreement has been, and each Transaction Agreement to which Purchaser is or will be a party has been or will be at or prior to the applicable Additional Closing, duly executed and delivered by Purchaser and (assuming the due authorization, execution and delivery by the other parties hereto and thereto) this Agreement constitutes, and each such Transaction Agreement when so executed and delivered will constitute, the legal, valid and binding agreement of Purchaser, enforceable against Purchaser in accordance with its and their terms, subject to Creditors' Rights.

Section 3.3 No Conflict or Violation. Assuming receipt of the Required Regulatory Approvals to acquire securities in excess of the Regulatory Ownership Cap, the execution, delivery and performance of this Agreement and each Transaction Agreement to which it is or will be a party by Purchaser and the purchase of Common Stock and Warrants pursuant hereto by Purchaser do not and will not violate any applicable Law or Contractual Obligation of Purchaser or permit the acceleration of any material obligation of Purchaser pursuant to any such Contractual Obligation except, in each case, as would not have a material adverse effect on Purchaser's ability to consummate such Additional Closing.

Section 3.4 Ownership of Equity Securities. As of the Effective Date, neither Purchaser nor any of its controlled Affiliates (a) Beneficially Own any Equity Securities of the Company, excluding the shares of Common Stock acquired pursuant to the Initial Investment or (b) has an open short position in the Common Stock of the Company.

Section 3.5 Foreign Ownership. No Person residing or domiciled outside of the United States of America Beneficially Owns, directly or indirectly, more than 10% of the outstanding voting interests of Purchaser or any of its Subsidiaries.

Section 3.6 Brokers. No broker or finder is entitled to any brokerage or finder's fees or other commission payable by the Company in respect of the transactions contemplated by this Agreement and the Transaction Agreements based in any way on agreements, arrangements or understandings made by or on behalf of Purchaser or its Affiliates.

Section 3.7 No Other Representations or Warranties; Disclaimer.

(a) Purchaser acknowledges and agrees that it (a) has had an opportunity to discuss the business of the Company and its Subsidiaries with the management of the Company; (b) has been afforded the opportunity to ask questions of and receive answers from officers of the Company; and (c) has conducted its own independent investigation of the Company and its Subsidiaries, their respective businesses and the transactions contemplated hereby and, except for the representations and warranties contained in Article 4 or in any Transaction Agreement to which the Company is or will be a party, Purchaser has not relied on and none of the Company, its Subsidiaries or any of their respective affiliates or Representatives makes or has made any representation or warranty, either express or implied, whether written or oral, concerning the Company, its Subsidiaries or any of their respective affiliates or any of their respective businesses, operations, assets, liabilities, results of operations, securities, condition (financial or otherwise) or prospects, the transactions contemplated by this Agreement and the Transaction Agreements or otherwise with respect to any information provided by or on behalf of the Company, its Subsidiaries or any of their respective affiliates or Representatives. Without limiting the foregoing, Purchaser further acknowledges and agrees that none of the Company nor any of its stockholders, directors, officers, employees, affiliates, advisors, agents or other Representatives has made any representation or warranty concerning any estimates, projections, forecasts, business plans or other forward-looking information regarding the Company, its Subsidiaries or their respective businesses and operations. Purchaser hereby acknowledges that there are uncertainties inherent in attempting to develop such estimates, projections, forecasts, business plans and other forward-looking information with which Purchaser is familiar, that Purchaser is taking full responsibility for making its own evaluation of the adequacy and accuracy of all estimates, projections, forecasts, business plans and other forward-looking information furnished to it (including the reasonableness of the assumptions underlying such estimates, projections, forecasts, business plans and other forward-looking information), and that Purchaser will have no Claim against the Company or any of its stockholders, directors, officers, employees, affiliates, advisors, agents or other Representatives with respect thereto.

(b) Purchaser understands that the Common Stock and Warrants issuable hereunder will not have been registered pursuant to the Securities Act or any applicable state securities laws, that the Common Stock and Warrants issuable hereunder shall be characterized as "restricted securities" under federal securities laws and that under such laws and applicable regulations the Common Stock and Warrants issuable hereunder cannot be sold or otherwise disposed of without registration under the Securities Act or an exemption therefrom. Purchaser is acquiring the Common Stock and Warrants solely for Purchaser's own account for investment purposes as a principal and not with a view to the resale or distribution of all or any part thereof. Purchaser is aware that there may be legal and practical limits on Purchaser's ability to sell or dispose of any of the Common Stock and Warrants and, therefore, that Purchaser should be prepared to bear the economic risk of its investment for an indefinite period of time.

ARTICLE 4.
REPRESENTATIONS AND WARRANTIES OF THE COMPANY

Except in each case (a) as disclosed in the Company Reports filed on or after January 1, 2018 and prior to the date of this Agreement (excluding all disclosures (other than statements of historical fact) in any "Risk Factors" section or "forward looking statements" and any disclosures included in any such Company Reports that are predictive or forward looking in nature) or (b) as set forth in the corresponding section or subsection of the Disclosure Schedules, the Company hereby represents and warrants to Purchaser that the following are true as of the Effective Date and, with respect to the Additional Closing Company Representations, as of each Additional Closing Date:

Section 4.1 Existence. The Company: (a) is duly incorporated, validly existing and in good standing under the laws of the State of Delaware and (b) has the corporate power and authority to own and operate its property, to lease the property it operates as lessee and to conduct the business in which it is currently engaged. Each of the Company's Subsidiaries is a corporation or limited liability company duly incorporated or formed, validly existing and (in the jurisdictions where such concept is recognized) in good standing under the laws of the jurisdiction of its incorporation or formation and has the corporate or company power and authority to own and operate its property, to lease the property it operates as lessee and to conduct the business in which it is currently engaged, in each case except where failure to be so duly incorporated or formed, validly existing or in good standing or where failure to have such corporate or company power would not, either individually or in the aggregate, have, or would not reasonably be expected to have, a Material Adverse Effect. Each of the Company and its Subsidiaries is duly licensed or qualified to do business as a foreign corporation or limited liability company and (in the jurisdictions where such concept is recognized) is in good standing in each jurisdiction wherein the character of its property or the nature of the activities presently conducted by it, makes such qualification necessary, except where the failure to so qualify, either individually or in the aggregate, would not have, or would not reasonably be expected to have, a Material Adverse Effect.

Section 4.2 Power; Authorization; Enforceable Obligations. The Company: (a) has the power and authority to execute, deliver and perform its obligations under this Agreement and each Transaction Agreement to which it is or will be a party, including to issue Common Stock and Warrants (including all Common Stock issuable upon the exercise of each Warrant in accordance with its terms) issuable hereunder and (b) has taken all necessary corporate action to authorize the execution, delivery and performance of this Agreement and each Transaction Agreement to which the Company is or will be a party and the issuance of Common Stock and Warrants (including all Common Stock issuable upon the exercise of each Warrant in accordance with its terms) on the terms and conditions of this Agreement. No consent, approval, declaration, or authorization of, filing with, notice to or other similar act by or in respect of, any Governmental Authority or any other Person is or will be required to be obtained or made by or on behalf of the Company in connection with the execution, delivery,

performance, validity or enforceability of this Agreement and each Transaction Agreement to which the Company is or will be a party or the issuance of Common Stock and Warrants (including all Common Stock issuable upon the exercise of each Warrant in accordance with its terms) on the terms and under the circumstances provided for herein except, in each case, as would not be, or would not reasonably be expected to be, either individually or in the aggregate, material to the Company's performance of its obligations under this Agreement or the Transaction Agreements to which it is or will be a party. This Agreement has been, and each such other Transaction Agreements to which the Company is or will be a party has been or will be at or prior to the applicable Additional Closing, duly executed and delivered by the Company and (assuming the due authorization, execution and delivery by the other parties hereto and thereto other than THL) this Agreement constitutes, and each such Transaction Agreement when so executed and delivered will constitute, the legal, valid and binding agreement of the Company, enforceable against the Company in accordance with its and their terms, subject to Creditors' Rights.

Section 4.3 No Conflict or Violation.

(a) The execution, delivery and performance of this Agreement by the Company or any Transaction Agreement to which the Company is or will be a party and the issuance of Common Stock and Warrants (including all Common Stock issuable upon the exercise of each Warrant in accordance with its terms) hereunder, whether after the giving of notice or the lapse of time or both: (i) do not and will not violate, conflict with or result in the breach of any provision of any organizational document of the Company or any of its Subsidiaries (including the Company Charter), (ii) (A) do not and will not conflict with, violate, constitute a breach of or a default under, give rise to any right of termination, cancellation or acceleration under any applicable Contractual Obligation of the Company or any license, permit or other governmental authorization to which the Company or any of its Subsidiaries is, or any of their respective assets are, bound, (B) do not and will not violate any provision of, constitute a breach of, or default under, or result in or permit the cancellation, termination or acceleration of any Order of any Governmental Authority having jurisdiction over the Company or its properties or assets, (C) do not and will not violate any provision of, constitute a breach of, or default under, any applicable Law (including any rule or regulation of FINRA or NASDAQ) and (D) do not and will not result in, or require, the creation or imposition of any material Lien on any on the Company's properties or revenues pursuant to any such Law or Contractual Obligation, except, in each case for such violations, conflicts, breaches or defaults that, either individually or in the aggregate, would not have, or would not reasonably be expected to have, a Material Adverse Effect.

(b) (i) No Termination Event has occurred since January 1, 2018 and is continuing and (ii) no event has occurred since January 1, 2018 and is continuing, which, but for the lapse of time or the giving of notice, or both, would constitute an Event of Default under the Company's senior secured first lien term facility (or any successor debt facility) or senior secured second lien term facility (or any successor debt facility).

Section 4.4 Valid Issuance. The Common Stock and Warrants (including all Common Stock issuable upon the exercise of each Warrant in accordance with its terms) issuable hereunder have been duly authorized and reserved for issuance and, when issued and delivered to Purchaser against full payment for such shares of Common Stock and Warrants (including all Common Stock issuable upon the exercise of each Warrant in accordance with its terms), as applicable, in accordance with the terms of this Agreement, will be validly issued, fully paid and non-assessable and will not have been issued in violation of or subject to any preemptive or similar rights created under the organizational documents of the Company or any of its Subsidiaries (including under the Company Charter) or under applicable Law.

Section 4.5 Listing. The Common Stock is registered pursuant to Section 12(b) of the Exchange Act, and are listed for trading on the NASDAQ under the symbol "MGI" and no event has occurred that would result in the Common Stock being delisted from NASDAQ.

Section 4.6 Capitalization. As of May 31, 2019, the authorized capital stock of the Company consists of 162,500,000 shares of Common Stock and 7,000,000 shares of preferred stock, $0.01 par value per share. As of May 31, 2019, there were (1) 56,391,177 shares of Common Stock outstanding (and 2,432,390 shares of Common Stock held in treasury), (2) 71,282 shares of Series D Preferred Stock outstanding, (3) Company Options to purchase an aggregate of 1,109,709 shares of Common Stock (with a weighted average exercise price per share of $19.54), (iv) 3,156,907 shares of Common Stock underlying Company RSUs and (v) 3,262 Common Stock appreciation rights. All of the issued and outstanding shares of capital stock of the Company are duly authorized and validly issued and are fully paid and nonassessable. When issued in accordance with the terms hereof, the Common Stock and Warrants (including all Common Stock issuable upon the exercise of each Warrant in accordance with its terms) will be free and clear of all Liens other than those created or incurred by Purchaser. The designations, powers, preferences, rights, qualifications, limitations and restrictions in respect of each class or series of capital stock of the Company are as set forth in the Company Charter. No Person is entitled to any anti-dilution right, preemptive right or right of first refusal granted by the Company with respect to the issuance of the Common Stock and Warrants (including all Common Stock issuable upon the exercise of each Warrant in accordance with its terms) pursuant to this Agreement or any Transaction Agreement to which the Company is or will be a party that has not been properly waived.

Section 4.7 Financial Statements. The financial statements of the Company (including any related notes and schedules thereto) included in the Company Reports (the "**Financial Statements**") complied as to form, as of their respective dates of filing with the SEC (or, if amended or superseded by a subsequent filing prior to the date hereof, as of the date of such subsequent filing), in all material respects, and have been prepared in accordance with GAAP applied on a consistent basis during the periods involved (except as may be disclosed therein and, in the case of the unaudited financial statements, as permitted by the SEC, and except that the unaudited financial statements are subject to normal year-end and audit adjustments), and fairly present, in all material respects, as of their respective dates, the consolidated financial position of the Company and its Subsidiaries and the consolidated results of operations, changes in stockholders' equity and cash flows of such companies as of the dates and for the periods shown in conformity with GAAP (except as may be noted therein).

Section 4.8 Absence of Certain Changes or Events. Since December 31, 2018 through the date of this Agreement, no event, change, effect or occurrence has occurred or fact or circumstance has arisen which has had or would reasonably be expected to have, individually or in the aggregate, a Material Adverse Effect.

Section 4.9 SEC Documents. Since January 1, 2018, the Company has timely filed or furnished all material Company Reports. As of their respective dates (or, if amended or superseded by a subsequent filing prior to the date hereof, as of the date of such subsequent filing), the Company Reports complied in all material respects with the requirements of the Securities Act, the Exchange Act and the Sarbanes-Oxley Act of 2002, as the case may be, and the rules and regulations thereunder applicable to such Company Reports, and none of the Company Reports contained any untrue statement of a material fact or omitted to state a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading. Since January 1, 2018, the Company has been in compliance in all material respects with the applicable listing and corporate governance rules and regulations of NASDAQ. As of the date hereof, there are no outstanding or unresolved comments in a comment letter received from the SEC staff with respect to any Company Report and, to the knowledge of the Company, none of the Company Reports is the subject of any ongoing review by the SEC.

Section 4.10 Undisclosed Events, Liabilities or Developments; Off Balance Sheet Arrangements. Since the date of the latest audited Financial Statements, except as specifically disclosed in a subsequent Company Report (excluding all disclosures (other than statements of historical fact) in any "Risk Factors" section or "forward looking statements" and any disclosures included in any such Company Reports that are predictive or forward looking in nature) filed prior to the date hereof each of the Company and its Subsidiaries has not incurred any liability (contingent or otherwise) other than liabilities (a) incurred in the ordinary course of business consistent with past practice; (b) not required by GAAP to be reflected on a consolidated balance sheet (or the notes thereto) or disclosed in filings made with the SEC; (c) reflected or reserved against in the most recent balance sheet included in the Company Reports; (d) which have been discharged or paid in full; (e) incurred pursuant to the transactions contemplated by this Agreement or any of the Transaction Agreements to which the Company is or will be a party; or (f) that would not, individually or in the aggregate, have, or reasonably be expected to have, a Material Adverse Effect. There is no transaction, arrangement or other relationship between the Company or any of its Subsidiaries and an unconsolidated or other off balance sheet entity that is required to be disclosed by the Company in the Company Reports and is not so disclosed, other than as would not, individually or in the aggregate, have or reasonably be expected to have, a Material Adverse Effect.

Section 4.11 Litigation. There is no Claim pending or, to the knowledge of the Company, threatened, against the Company or its Subsidiaries or affecting any of the properties or assets of the Company or its Subsidiaries that, either individually or in the aggregate, would have, or would reasonably be expected to have, a Material Adverse Effect. Neither the Company nor its Subsidiaries is in default with respect to any Order or Law that is expressly applicable to the Company or its Subsidiaries or any of their assets or property, except in each case as would not have, or would not reasonably be expected to have, either individually or in the aggregate, a Material Adverse Effect.

Section 4.12 Compliance with Laws.

(a) The business of the Company and its Subsidiaries is not being, and has not been since the date that is one year prior to the date of this Agreement, conducted in violation of any Law, except for violations that, either individually or in the aggregate, would not have, or would not reasonably be expected to have, a Material Adverse Effect. Since the date that is one year prior to the date of this Agreement, neither the Company nor any Subsidiary has received notification from any Governmental Authority (a) asserting a violation of any Law or Order applicable to its business, (b) threatening to revoke any licenses, permits and other authorizations, authorizations or any other governmental certificates or (c) restricting or in any way limiting its operations as currently conducted or proposed to be conducted, except, in each case, that, either individually or in the aggregate, would not have, or would not reasonably be expected to have, a Material Adverse Effect.

(b) The Company and each of its Subsidiaries is, and has been since the date that is one year prior to the date of this Agreement, in compliance with all applicable Anti-Bribery Laws and Anti-Money Laundering Laws. Since the date that is one year prior to the date of this Agreement, neither the Company and nor any of its Subsidiaries has, nor, to the knowledge of the Company, agent, employee or other Person associated with or acting on behalf of the Company or any Company Subsidiary has, directly or indirectly:

(i) made any unlawful contributions, gifts, entertainment or other unlawful expenses relating to political activity and related in any way to the Company's or any Company Subsidiary's business;

(ii) violated any applicable provision of the United States Foreign Corrupt Practices Act of 1977, 15 U.S.C. § 78dd-1, et seq. (the "**Foreign Corrupt Practices Act**"), or any other applicable Anti-Bribery Laws; or

(iii) directly or indirectly, paid or delivered any fee, commission or other sum of money or item of property, however characterized, to any finder, agent, or other party acting on behalf of or under the auspices of a governmental official or Governmental Authority which is in any manner illegal under any Laws of the United States or any other country having jurisdiction.

Section 4.13 Application of Takeover Protections. There is no control share acquisition, business combination, poison pill (including any distribution under a rights agreement) or other similar anti-takeover provision under the Company's organizational documents (including the Company Charter) or the Laws of Delaware in effect as of the date hereof that is or would become applicable to Purchaser as a result of Purchaser and the Company fulfilling their obligations or exercising their rights under this Agreement and each of the Transaction Agreements to which the Company is or will be a party.

Section 4.14 No Other Representations or Warranties. Except for the representations and warranties contained in Article 3 or in any Transaction Agreement to which Purchaser is or will be a party, the Company has not relied on and none of Purchaser, its Subsidiaries or any of their respective Affiliates or Representatives makes or has made any representation or warranty, either express or implied, whether written or oral, concerning Purchaser, its Subsidiaries or any of their respective Affiliates or any of their respective

businesses, operations, assets, liabilities, results of operations, securities, condition (financial or otherwise) or prospects, the transactions contemplated by this Agreement and the Transaction Agreements or otherwise with respect to any information provided by or on behalf of Purchaser, its Subsidiaries or any of their respective Affiliates or Representatives.

Section 4.15 Brokers. No broker or finder has acted for the Company in connection with this Agreement or any Transaction Agreement to which the Company is a party or the transactions contemplated thereby, and no broker or finder is entitled to any brokerage or finder's fees in respect of such transactions based in any way on agreements, arrangements or understandings made by or on behalf of the Company.

ARTICLE 5.
INDEMNIFICATION

Section 5.1 Indemnification.

(a) Subject to the limitations and other provisions of this Agreement and except in the case of Fraud, (a) the representations and warranties contained herein and in any Transaction Agreement (other than the Fundamental Representations) made as of the Effective Date shall survive the Initial Closing and shall remain in full force and effect until the date that is twelve (12) months following the Effective Date, (b) the Additional Closing Company Representations (other than the Fundamental Representations) and Additional Closing Purchaser Representations made as of or in connection with each Additional Closing shall survive such Additional Closing and shall remain in full force and effect until the date that is twelve (12) months following the date of such Additional Closing, and (c) the Fundamental Representations made as of the Effective Date and each Additional Closing shall survive the Initial Closing and the applicable Additional Closing, respectively, and shall remain in full force and effect until the date that is thirty-six (36) months following the Effective Date. The covenants of the Parties shall survive the Initial Closing and each Additional Closing and shall remain in full force and effect until fully performed or for such shorter period as specified herein.

(b) In consideration of Purchaser's execution and delivery of this Agreement, and in addition to all of the Company's other obligations under this Agreement and each of the Transaction Agreements to which the Company is or will be a party, the Company shall defend, protect, indemnify and hold harmless Purchaser, and its officers, directors, partners, employees and agents (collectively, the "**Purchaser Indemnitees**") from and against any and all actions, causes of action, suits, claims, losses, costs, penalties, fees, liabilities and damages, and expenses in connection therewith (irrespective of whether any such Purchaser Indemnitee is a party to the action for which indemnification hereunder is sought), and including reasonable attorneys' fees and disbursements (the "**Indemnified Liabilities**"), incurred by Purchaser Indemnitees or any of them as a result of, or arising out of, or relating to: (i) any misrepresentation or breach of any representation or warranty made by the Company in this Agreement or any other Transaction Agreement, (ii) any breach of any covenant, agreement or obligation of the Company contained in this Agreement or any other Transaction Agreement, or (iii) actions of the Company that cause Purchaser's total ownership of Voting Securities of the Company to exceed the Regulatory Ownership Cap prior to such time that all Required Regulatory Approvals have been obtained (including as a result of a share buyback program) (assuming for purposes of this Section 5.1(b)(iii) that the representation contained in Section 3.4 is true and correct in all respects and that Purchaser, its controlled Affiliates, any Holdco Entity and its and their Representatives have performed, satisfied and complied with the covenants contained in Section 6.2).

(c) In consideration of the Company's execution and delivery of this Agreement, and in addition to all of Purchaser's other obligations under this Agreement and the Transaction Agreements to which Purchaser is or will be a party, Purchaser shall defend, protect, indemnify and hold harmless the Company and its officers, directors, shareholders (other than Purchaser), employees and agents (collectively, the "**Company Indemnitees**") from and against any and all Indemnified Liabilities incurred by the Company Indemnitees or any of them as a result of, or arising out of, or relating to: (i) any misrepresentation or breach of any representation or warranty made by Purchaser in this Agreement or any Transaction Agreement, (ii) any breach of any covenant, agreement or obligation of Purchaser contained in this Agreement or any Transaction Agreement or (iii) Purchaser acquiring additional shares of Common Stock or Warrants (other than pursuant to the Initial Investment and a Letter of Credit Draw) that would result in Purchaser's total ownership of Voting Securities of the Company exceeding the Regulatory Ownership Cap prior to such time that all Required Regulatory Approvals have been obtained (other than as a result of a breach or misrepresentation by the Company).

(d) The Company, on the one hand, and Purchaser, on the other hand, will have no liability with respect to any indemnification obligation arising under Section 5.1(b) or Section 5.1(c), as applicable, unless on or before the expiration of the applicable survival period set forth in Section 5.1(a) a Purchaser Indemnitee or Company Indemnitee, as applicable, notifies the Company or Purchaser, as applicable, of a claim specifying the factual basis of that claim prior to the applicable survival period set forth in Section 5.1(a). If a claim for indemnification is timely asserted, the indemnification obligation in respect thereof shall survive until such claim is finally and fully resolved.

(e) The aggregate amount of all payments made by (i) the Company in satisfaction of claims for indemnification pursuant to Section 5.1(b) shall not exceed an amount equal to the sum of the amount of the Initial Investment plus any amounts paid to the Company pursuant to a Letter of Credit Draw (the "**Cap**") and (ii) Purchaser in satisfaction of claims for indemnification pursuant to Section 5.1(c) shall not exceed the Cap. In no event shall the Company or Purchaser be liable to any Purchaser Indemnitee or Company Indemnitee, respectively, for any punitive, consequential or indirect damages, except to the extent awarded to a third-party. Each Purchaser Indemnitee and Company Indemnitee shall take, and cause its respective Affiliates to take, commercially reasonable efforts to mitigate any Indemnified Liability upon becoming aware of any event or circumstance that would reasonably be expected to, or does, give rise thereto, including incurring costs but only to the minimum extent necessary to remedy the breach that gives rise to such Indemnified Liability.

(f) Each Party acknowledges and agrees that, except in the case of Fraud, the provisions of this Article 5 shall be the sole and exclusive remedy for monetary damages under this Agreement.

ARTICLE 6.
ADDITIONAL AGREEMENTS

Section 6.1 Registration Rights. Simultaneously with the execution of this Agreement, the Company and Purchaser shall enter into the Registration Rights Agreement (the "**Registration Rights Agreement**") attached hereto as Exhibit B, pursuant to which the Company will grant Purchaser certain registration rights with respect to the shares of Common Stock and Warrants issued hereunder and the shares of Common Stock issuable upon exercise of any Warrants issued hereunder.

Section 6.2 Lock-Up; Standstill.

(a) Lock-Up. During the Lock-Up Period, Purchaser shall not, without the prior written consent of the Company, directly or indirectly, (i) offer, sell, contract to sell, pledge, or otherwise dispose of (or enter into any transaction which is designed to, or would reasonably be expected to, result in the disposition (whether by actual disposition or effective economic disposition due to cash settlement or otherwise)), or establish or increase a put equivalent position or liquidate or decrease a call equivalent position within the meaning of Section 16 of the Exchange Act, any Common Stock or Warrants issued hereunder, including any Common Stock issuable upon exercise of any Warrant (collectively, the "**Lock-Up Securities**") or (ii) enter into any swap or any other agreement or any transaction that transfers, in whole or in part, directly or indirectly, the economic consequence of ownership of the Lock-Up Securities, whether any such swap or transaction is to be settled by delivery of Common Stock, Warrants or other securities, in cash or otherwise.

(b) Standstill. Purchaser agrees that for a period beginning on the Effective Date and ending on June 30, 2020, neither Purchaser, its controlled Affiliates, any Holdco Entity, nor any of its or their Representatives acting on behalf of or in concert with Purchaser, any of its controlled Affiliates or any Holdco Entity in this regard will, without the prior written consent of the Company, directly or indirectly, in any manner:

(i) except to the extent resulting from a stock dividend, stock split, subdivision of Common Stock or analogous transaction by the Company, acquire, agree to acquire or make any proposal or offer to acquire: (a) any Equity Securities (other than shares of Common Stock (including shares of Common Stock issuable upon exercise of any Warrant) or Warrants issuable pursuant to the terms of this Agreement or Warrant Agreement or otherwise acquired directly from the Company or its Subsidiaries or Equity Securities acquired from THL or GS), (b) any short interest in Equity Securities whereby Purchaser or its Affiliates, directly or indirectly, through any contract, arrangement, understanding, relationship or otherwise, has the opportunity to profit or share in any profit derived from a decrease in the value of Equity Securities, (c) any rights to dividends or distributions on Equity Securities that are separated or separable from Equity Securities, or (d) any performance-related payments based on any increase or decrease in the value of Equity Securities other than from the Company, its Subsidiaries, THL or GS;

(ii) enter into, or make any proposal or offer with respect to, any merger, consolidation, business combination, reorganization or similar transaction involving the Company or any of its Subsidiaries; or

(iii) make, or in any way participate in, any "solicitation" of "proxies" (as such terms are used in Regulation 14A promulgated under the Exchange Act) to vote or consent, or seek to advise or influence any person with respect to the voting of or granting of a consent, with respect to any securities of or interests in the Company or any of its Subsidiaries.

Notwithstanding the foregoing, this Section 6.2(b) shall be of no further force and effect if (A) the Company or any of its Subsidiaries enters into a definitive agreement providing for a Change of Control of the Company, or (B) a tender or exchange offer is commenced and within ten business days of such commencement, the Company Board has not recommended that the Company's stockholders reject such tender or exchange offer and that, if consummated, would result in a Change of Control of the Company.

Notwithstanding anything contained in this Section 6.2(b) to the contrary, (x) Purchaser and its Subsidiaries shall not be prohibited from making any private proposal to the Company Board that would not reasonably be expected to require a public announcement by the Company, other than as may be required by Item 1005 of Regulation M-A in any Company proxy statement and (y) nothing in this Section 6.2(b) shall apply to or limit in any respect any Purchaser Observer or Purchaser Director acting in his or her capacity as such, and the actions of such Person acting in such capacity shall not be imputed to Purchaser (but only to the extent such Purchaser Observer or Purchaser Director is acting in such capacity).

Section 6.3 Ownership Limitations. Purchaser shall not acquire, and the Company shall not issue to Purchaser, additional shares of Common Stock if, as a result of such acquisition, Purchaser's total equity ownership in the Company would exceed the Regulatory Ownership Cap, unless and until Purchaser and the Company shall have obtained all Required Regulatory Approvals. The Company shall use its commercially reasonable efforts to assist and cooperate with Purchaser in obtaining all Required Regulatory Approvals. In no event shall Purchaser be required to purchase, and the Company shall not require that Purchaser purchase, any shares of Common Stock or Warrants if, in the reasonable written opinion of Purchaser's counsel, it would cause Purchaser to be in violation of any material Law or any material license, permit or other material authorization of a Governmental Authority.

Section 6.4 Company Board Matters.

(a) Purchaser Observer. Subject to the terms of this Section 6.4, Purchaser shall be entitled to appoint one individual to attend and observe meetings of the Company Board and any Applicable Board Committee in a non-voting capacity (such Person, a "**Purchaser Observer**"); *provided*, *that*, (i) the Purchaser Observer shall satisfy the governance requirements applicable to the Company Board and (ii) the Purchaser Observer agrees to execute a confidentiality agreement as reasonably requested by the Company Board in the form attached hereto as Exhibit D. Subject to the Company's satisfactory review of a completed director and officer questionnaire and other standard processes of the Company, including a background check, the initial Purchaser Observer shall be Kahina Van Dyke. The Parties hereby agree that

each of the persons set forth on Schedule 6.4 of this Agreement satisfy the governance requirements applicable to the Company Board, and the Company and the Company Board shall, subject to the Company's satisfactory review of a director and officer questionnaire completed by any such Person and other standard processes of the Company, including a background check of any such Person, accept any such Person as the Purchaser Observer if so designated by Purchaser. The Purchaser Observer will have the following rights: (i) to attend and participate at each meeting of the Company Board and any Applicable Board Committee, (ii) to receive notice of each meeting, each written consent in lieu of a meeting and copies of all materials delivered to or by the directors on the Company Board in connection therewith at the same time and in the same manner that such notice and such materials are provided to or by the directors on the Company Board or any Applicable Board Committee and (iii) to be provided with any other information and materials that are provided to or by the Company Board or any Applicable Board Committee in substantially the same manner and at substantially the same time as the Company Board or any Applicable Board Committee, as applicable, is provided with such information and materials. For the avoidance of doubt, in no circumstances shall any Purchaser Observer be counted for purposes of voting, quorum or any other reason or be considered a director on the Company Board. Purchaser may remove or replace any Purchaser Observer it appoints for any reason. The Company shall be permitted to exclude the Purchaser Observer from any portion of any meeting of the Company Board or any Applicable Board Committee or from receiving any portion of any notice, information or materials relating to any such meeting to the extent the Company has reasonably determined in good faith after consultation with counsel that the Purchaser Observer should be excluded from such portion of such meeting, or such portion of such notice, information or materials should not be made available, because (A) such participation or receipt by the Purchaser Observer is reasonably likely to result in a loss of attorney-client privilege, (B) such participation or receipt by the Purchaser Observer presents, or is reasonably expected to present, a conflict of interest between the Company or its Affiliates, on the one hand, and Purchaser, the Purchaser Observer or any of its or their respective Affiliates, on the other hand or (C) such participation or receipt is not appropriate, for competitive reasons, because the Company Board or the Applicable Board Committee, as applicable, will discuss at such portion of a meeting, or such notice, information or materials relates to, the implementation or consideration of a Competitive Product; *provided*, *that*, prior to so excluding such Purchaser Observer from such portion of a meeting or withholding any such notice, information or materials, the Company shall provide the Purchaser Observer written notice of such determination and a description of the rationale therefor. The Purchaser Observer shall be required to observe all policies applicable to the non-employee directors of the Company Board and shall complete all compliance training applicable to the non-employee directors of the Company Board ("**Board Compliance Requirements**"). Purchaser's right to appoint a Purchaser Observer shall not be assignable to any other Person.

(b) Purchaser Director.

(i) Subject to receipt of the Required Regulatory Approvals and the results of the Commercial Agreement meeting or exceeding the Company's reasonable expectations, if the Company Board decides to increase the number of directors on the Company Board, the Company shall strongly consider in good faith adding a designee of Purchaser to the Company Board (a "**Purchaser Director**") (and if a Purchaser Director is so appointed to the Company Board, Purchaser's right to designate a Purchaser Observer pursuant to Section 6.4(a)

shall terminate and, unless such individual is the Purchaser Director, any individual serving in such capacity shall immediately resign and cease all participation in Company Board meetings), who shall be reasonably satisfactory to and must satisfy the governance requirements applicable to the Company Board, and who shall serve on the Company Board until the then next annual meeting of the Company's stockholders. Thereafter, the Company shall nominate the Purchaser Director for election at each annual meeting of stockholders of the Company until the earlier of (i) Purchaser ceasing to satisfy the Ownership Threshold (as defined below) or (ii) Purchaser ceasing to satisfy the Alternative Ownership Threshold (as defined below). Notwithstanding the foregoing, Purchaser shall not be permitted to designate the Purchaser Operating Executive as a Purchaser Director. The parties hereby agree that each of the persons set forth on Schedule 6.4 of this Agreement are reasonably satisfactory, and satisfy the governance requirements applicable, to the Company Board, and the Company and the Company Board shall accept any such Person as the Purchaser Director if so designated by Purchaser, subject to the Company's satisfactory review of a director and officer questionnaire completed by such Person and other standard processes of the Company, including a background check of such Person.

(ii) Any Purchaser Director shall, subject to such nominee's compliance with the Board Compliance Requirements be afforded no less favorable treatment (but excluding the enhanced voting rights afforded THL's representatives on the Company Board under the Company Charter) than all other Company Board members are generally afforded with respect to all matters, including voting rights, access to the Company's information and management, equity grants and benefits. For the avoidance of doubt, any such Purchaser Director shall be required to comply with the Company's standard processes, including background checks, for determining director fitness and eligibility. Notwithstanding the foregoing, the Company shall be permitted to exclude the Purchaser Director from any portion of any meeting of the Company Board or any Applicable Board Committee or from receiving any portion of any information or materials relating to any such meeting to the extent the Company has reasonably determined in good faith after consultation with counsel that the Purchaser Director should be excluded from such portion of such meeting, or such portion of such information or materials should be made available, because (A) such participation or receipt presents, or is reasonably expected to present, a conflict of interest between the Company or its Affiliates, on the one hand, and Purchaser, the Purchaser Director or any of its or their respective Affiliates, on the other hand or (B) such participation or receipt is not appropriate, for competitive reasons, because the Company Board or the Applicable Board Committee, as applicable, will discuss at such portion of a meeting, or such information or materials relates to, the implementation or consideration of a Competitive Product; *provided*, *that*, prior to so excluding such Purchaser Observer from such portion of a meeting or withholding any such information or materials, the Company shall provide the Purchaser Observer written notice of such determination and a description of the rationale therefor. Purchaser's right to appoint a Purchaser Director shall not be assignable to any other Person.

(c) Voting Agreements. In the event a Purchaser Director is appointed to the Company Board, Purchaser shall enter into a customary voting and support agreement similar to the THL Voting Agreement (the "**Purchaser Voting Agreement**") to support the Company Board's other nominees for election that shall apply if and so long as Purchaser has the right to designate a Purchaser Director and THL is required to vote its shares in favor of the Purchaser Director.

(d) Termination of Company Board Matters. Purchaser's right to appoint a Purchaser Observer and, if applicable, to designate a Purchaser Director shall terminate upon the earlier of (i) the time that Purchaser ceases to hold at least 1,632,536 shares of Common Stock (the "**Ownership Threshold**") or (ii) the occurrence of all of the following: (a) the termination of the Commercial Agreement in accordance with its terms, (b) Purchaser ceasing to hold at least at least 2,448,803 shares of Common Stock and (c) the termination of the Letter of Credit in accordance with its terms (the "**Alternative Ownership Threshold**"). Upon termination of Purchaser's right to appoint a Purchaser Observer and, if applicable, to designate a Purchaser Director, Purchaser shall promptly cause the Purchaser Observer or Purchaser Director, as applicable, to resign.

ARTICLE 7.
CONDITIONS TO EACH ADDITIONAL CLOSING

Section 7.1 Conditions Precedent to the Obligations of Purchaser. The obligation of Purchaser to purchase shares of Common Stock or Warrants, as applicable, from the Company at each Additional Closing shall be subject to the satisfaction (or waiver by Purchaser), on or prior to the applicable Additional Closing Date of each of the following conditions:

(a) The Additional Closing Company Representations shall be true and correct as of such Additional Closing Date, with the same effect as though such Additional Closing Company Representations had been made on and as of such date (other than any Additional Closing Company Representation that is made by its terms as of a specified date, which shall be true and correct as of such specified date);

(b) The Company shall have performed, satisfied and complied in all material respects with the covenants, agreements and conditions required by this Agreement, and each Transaction Agreement to which the Company is or will be a party, to be performed, satisfied or complied with by the Company at or prior to such Additional Closing;

(c) there shall have not occurred any Material Adverse Effect since the date of this Agreement;

(d) The Company shall have delivered to Purchaser a certificate duly executed by an executive officer of the Company, dated as of such Additional Closing Date, in the form attached hereto as Exhibit C;

(e) The Company shall have delivered to the LOC Bank a Draw Notice and the Letter of Credit shall not have been terminated;

(f) The Company shall have delivered a certificate in the name of Purchaser representing the shares of Common Stock or a Warrant, as applicable, free and clear of any Liens other than those created or incurred by Purchaser (provided that in lieu of delivering a certificate for such shares, the Company may cause such shares to be registered in book-entry form by the Company's transfer agent for Common Stock); and

(g) (i) No Order shall have been entered by or with any Governmental Authority, and no other legal restraint or prohibition shall be in effect, preventing or rendering impossible or illegal the issuance or sale of Common Stock or Warrant, as applicable, to Purchaser and (ii) there shall be no Claim pending against the Company, Purchaser or any Subsidiary of the Company by any Governmental Authority of competent jurisdiction seeking to restrict, prohibit or otherwise prevent the consummation of the transactions provided for herein or rendering impossible or illegal the issuance or sale of the Common Stock or Warrants, as applicable, to Purchaser.

(h) (i) No Termination Event shall have occurred since the date of this Agreement and is continuing and (ii) no event shall have occurred since the date of this Agreement and is continuing which, but for the lapse of time or the giving of notice, or both, would constitute an Event of Default under the Company's senior secured first lien term facility (or any successor debt facility) or senior secured second lien term facility (or any successor debt facility).

Section 7.2 Conditions Precedent to the Obligations of the Company. The obligation of the Company to deliver the shares of Common Stock or Warrants, as applicable, to Purchaser at each Additional Closing shall be subject to the satisfaction (or waiver by the Company), on or prior to the applicable Additional Closing Date of each of the following conditions:

(a) The Additional Closing Purchaser Representations shall be true and correct as of such Additional Closing Date, with the same effect as though such Additional Closing Purchaser Representations had been made on and as of such date (other than any Additional Closing Purchaser Representation that is made by its terms as of a specified date, which shall be true and correct as of such specified date), except where the failure to be so true and correct would not have a material adverse effect on Purchaser's ability to consummate such Additional Closing;

(b) Purchaser shall have performed, satisfied and complied in all material respects with the covenants, agreements and conditions required by this Agreement and the Transaction Agreements to which Purchaser is or will be a party to be performed, satisfied or complied with by Purchaser at or prior to such Additional Closing;

(c) Purchaser shall have delivered to the Company a certificate duly executed by an executive officer of Purchaser, dated as of such Additional Closing Date, in customary form, to the effect that each of the conditions specified in Section 7.2(a) and Section 7.2(b) have been satisfied in all respects;

(d) The LOC Bank shall have delivered to the Company the funds payable for shares of Common Stock or Warrant, as applicable, issued pursuant to such Additional Closing by wire transfer of U.S. dollars in immediately available funds to an account specified by the Company in writing in the Draw Notice or such other manner as determined by the LOC Bank and the Company; and

(e) (i) No Order shall have been entered by or with any Governmental Authority, and no other legal restraint or prohibition shall be in effect, preventing or rendering impossible or illegal the issuance and sale of Common Stock or Warrant, as applicable, to Purchaser and (ii) there shall be no Claim pending against the Company, Purchaser or any Subsidiary of the Company by any Governmental Authority of competent jurisdiction seeking to restrict, prohibit or otherwise prevent the consummation of the transactions provided for herein or rendering impossible or illegal the issuance or sale the Common Stock or Warrant, as applicable, to Purchaser.

ARTICLE 8.
MISCELLANEOUS

Section 8.1 Termination. This Agreement may be terminated at any time: (a) by mutual written consent of the Company and Purchaser; (b) by the Company, if the Letter of Credit is terminated or dishonored; *provided*, *that*, the Company may not terminate this Agreement pursuant to Section 8.1(b) if, within five Business Days of the date Purchaser receives notice that the LOC Bank has dishonored the Letter of Credit (i) the LOC Bank honors the Letter of Credit, (ii) Purchaser funds an amount to the Company equal to the amount requested in the Letter of Credit Draw that the LOC Bank failed to honor and such funded amount equals the total remaining amount available pursuant to the Letter of Credit, or (iii) Purchaser obtains a replacement letter of credit (or reaffirmation of the Letter of Credit by the LOC Bank) reasonably satisfactory to the Company; or (c) by either the Company or Purchaser, if there shall be in effect a final nonappealable Order of a Governmental Authority of competent jurisdiction restraining, enjoining or otherwise prohibiting the consummation of the transactions contemplated hereby.

Section 8.2 Amendment. This Agreement and any terms hereof may not be amended, supplemented or modified except pursuant to a writing signed by both Purchaser and the Company.

Section 8.3 Notices. All notices and other communications hereunder shall be in writing and shall be deemed given (i) upon receipt if sent by facsimile or email (provided confirmation of transmission is mechanically or electronically generated and kept on file by the sending party); (ii) on the first Business Day following the date of dispatch if delivered by a recognized next day courier service; or (iii) on the third Business Day following the date of mailing if delivered by registered or certified mail, return receipt requested, postage prepaid. All notices hereunder shall be delivered as set forth below or pursuant to such other instructions as may be designated in writing by the party to receive such notice.

(a) If to Purchaser, to:

Ripple Labs Inc.
315 Montgomery St. Floor 2
San Francisco, CA 94104
Attn: General Counsel
Email: stu@ripple.com

with a copy to (which shall not constitute notice):

Skadden, Arps, Slate, Meagher & Flom LLP

525 University Avenue
Palo Alto, California 94301
Attention: Amr Razzak
Email: amr.razzak@skadden.com

and

Gunderson Dettmer Stough Villeneuve Franklin & Hachigian, LLP
One Bush Plaza
Suite 1200
San Francisco, CA 94104
Attention: Brooks Stough
Email: bstough@gunder.com

(b) If to the Company, to:

MoneyGram International, Inc.
2828 N. Harwood Street, 15th Floor
Dallas, Texas 75201
Attention: F. Aaron Henry; Robert L. Villaseñor
Email: ahenry@moneygram.com; rvillasenor@moneygram.com

with a copy to (which shall not constitute notice):

Vinson & Elkins LLP
Trammell Crow Center
2001 Ross Avenue
Suite 3900
Dallas, TX 75201-2975
Attention: Alan J. Bogdanow; Christopher R. Rowley
Emails: abogdanow@velaw.com; crowley@velaw.com

Section 8.4 Entire Agreement; No Third-Party Beneficiaries. This Agreement, together with that certain Mutual Confidentiality Agreement entered into between MoneyGram Payment Systems, Inc. and Ripple Services, Inc. on May 12, 2017 and the Transaction Agreements, constitute the entire agreement and supersede all prior agreements and understandings, both written and oral, among the parties with respect to the subject matter hereof. This Agreement and the Transaction Agreements do not create, and shall not be construed as creating, any rights enforceable by any person or entity not a party hereto.

Section 8.5 Waiver. Any waiver or any breach of any of the terms or conditions of this Agreement shall not operate as a waiver of any other breach of such terms or conditions or of any other term or condition, nor shall any failure to insist upon strict performance or to enforce any provision hereof on any one occasion operate as a waiver of such provision or of any other provision hereof or a waiver of the right to insist upon strict performance or to enforce such provision or any other provision on any subsequent occasion. Any waiver must be in writing signed by the Person exercising such waiver.

Section 8.6 Expenses. All costs and expenses incurred in connection with this Agreement and the transactions contemplated hereby shall be paid by the Party incurring such cost or expense.

Section 8.7 Successors and Assigns. Neither Party may assign its rights or obligations under this Agreement without the written consent of the other Party. This Agreement shall be binding upon and inure to the benefit of the Company and Purchaser and their respective successors and permitted assigns.

Section 8.8 Further Assurances. Each Party hereto, at the reasonable request of the other Party hereto, shall execute and deliver such other instruments and do and perform such other acts and things as may be necessary or desirable for effecting completely the consummation of this Agreement and the transactions contemplated hereby.

Section 8.9 Disclosure Schedules. The inclusion of any information (including dollar amounts) in any section of any schedule delivered by either Party in connection with this Agreement (the "**Disclosure Schedules**") shall not be deemed to be an admission or acknowledgment by such Party that such information is required to be listed on such section of the relevant Disclosure Schedule (except to the extent this Agreement expressly states that such applicable section of the Disclosure Schedules is required to include such information) or is material to or outside the ordinary course of the business of such Party. Each disclosure item set forth in the Disclosure Schedules shall relate to the specific Section of the Agreement that corresponds to the number of such Schedule and to any other Section of this Agreement to which it is reasonably apparent on the face of such disclosure, without any independent knowledge on the part of the reader regarding the matter disclosed and without the need for reference to any other document, that such disclosure relates to such other Section of this Agreement. The information contained in this Agreement, the Exhibits hereto and the Disclosure Schedules is disclosed solely for purposes of this Agreement, and no information contained herein or therein shall be deemed to be an admission by any Party to any third party of any matter whatsoever (including any violation of Law or breach of contract).

Section 8.10 Publicity; Confidentiality. Neither the Company nor Purchaser shall make any public disclosure of any nature with respect to this Agreement, the Transaction Agreements or the transactions contemplated hereby or thereby without the prior written consent of the other except: (i) as may be required by applicable Law (including the rules or regulations of any applicable securities exchange), in which case the Party proposing to make such public disclosure will, to the extent reasonably practicable under the circumstances, provide the other Party with a copy of the proposed public disclosure and consider in good faith any comments provided by the other Party and (ii) any public disclosure of information that is consistent in all material respects with previous press releases, public disclosures or public statements made by a Party hereto in accordance with this Agreement, including in investor conference calls, SEC filings, Q&As or other publicly disclosed documents, in each case under this clause (ii), to the extent such disclosure is still accurate in all material respects (and not misleading). The Parties shall use commercially reasonable efforts to maintain confidential treatment from the SEC with respect to the Commercial Agreement and the transactions contemplated thereby.

Section 8.11 Severability. Any provision of this Agreement which is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions hereof, and any such prohibition or unenforceability in any jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction.

Section 8.12 Governing Law. This Agreement shall be governed by, and construed in accordance with, the laws of the State of Delaware (without giving effect to choice of law or conflict of laws principles thereof that would cause the application of the Laws of any jurisdiction other than the State of Delaware).

Section 8.13 Waiver of Jury Trial. EACH OF PURCHASER AND THE COMPANY ACKNOWLEDGES AND AGREES THAT ANY CONTROVERSY WHICH MAY ARISE UNDER THIS AGREEMENT AND THE TRANSACTION AGREEMENTS IS LIKELY TO INVOLVE COMPLICATED AND DIFFICULT ISSUES AND THEREFORE, EACH OF PURCHASER AND THE COMPANY HEREBY IRREVOCABLY WAIVES ALL RIGHT TO TRIAL BY JURY IN ANY ACTION, CLAIM OR COUNTERCLAIM (WHETHER BASED ON CONTRACT, TORT OR OTHERWISE) DIRECTLY OR INDIRECTLY BASED UPON, ARISING OUT OF OR RELATING TO THIS AGREEMENT AND THE TRANSACTION AGREEMENTS, ANY OF THE TRANSACTIONS CONTEMPLATED BY THIS AGREEMENT OR THE TRANSACTION AGREEMENTS OR THE ACTIONS OF PURCHASER OR THE COMPANY IN THE NEGOTIATION, ADMINISTRATION, PERFORMANCE AND ENFORCEMENT HEREOF AND THEREOF. EACH PARTY HERETO (A) CERTIFIES THAT NO REPRESENTATIVE, AGENT OR ATTORNEY OF ANY OTHER PARTY HAS REPRESENTED, EXPRESSLY OR OTHERWISE, THAT SUCH OTHER PARTY WOULD NOT, IN THE EVENT OF LITIGATION, SEEK TO ENFORCE THE FOREGOING WAIVER, (B) UNDERSTANDS AND HAS CONSIDERED THE IMPLICATIONS OF THIS WAIVER AND MAKES THIS WAIVER VOLUNTARILY AND (C) ACKNOWLEDGES THAT IT AND THE OTHER PARTIES HERETO HAVE BEEN INDUCED TO ENTER INTO THIS AGREEMENT BY, AMONG OTHER THINGS, THE MUTUAL WAIVERS AND CERTIFICATIONS IN THIS SECTION.

Section 8.14 Consent to Jurisdiction. The Parties agree that any Claim seeking to enforce or interpret any provision of, or based on any matter arising out of or in connection with, this Agreement, the Transaction Agreements or the transactions contemplated hereby and thereby shall be brought exclusively in the Court of Chancery within New Castle County in the State of Delaware (and any appellate court thereof located within such county), and to the extent such Court of Chancery (or appellate court thereof located within such county) lacks jurisdiction over the matter, the federal courts of the United States of America located within New Castle County in the State of Delaware (or appellate court thereof located within such county). Each of the Parties hereby irrevocably and unconditionally (a) consents to the exclusive jurisdiction of such courts (and of the appropriate appellate courts therefrom) in any such Claim, (b) waives, to the fullest extent permitted by law, any objection that it may now or hereafter have to the laying of the venue of any such Claim in any such court or that any such Claim brought in any such

court has been brought in an inconvenient forum or that this Agreement may not be enforced by such courts and (c) agrees that a final judgement in any such Claim shall be conclusive and may be enforced in other jurisdictions by suit on the judgement or in any other manner provided by Law. Process in any such Claim may be served on any party anywhere in the world, whether within or without the jurisdiction of any such court. With respect to any such Claim, venue shall lie solely in New Castle County, Delaware. Without limiting the foregoing, each party agrees that service of process on such party as provided in Section 8.3 shall be deemed effective service of process on such party.

Section 8.15 Counterparts. This Agreement may be executed in two or more identical counterparts, all of which shall be considered an original and one and the same agreement and shall become effective when counterparts have been signed by each Party and delivered to the other Party, it being understood that all Parties need not sign the same counterpart. In the event that any signature is delivered by facsimile transmission or by an e-mail which contains a portable document format (.pdf) file of an executed signature page, such signature page shall create a valid and binding obligation of the party executing (or on whose behalf such signature is executed) with the same force and effect as if such signature page were an original thereof.

[Signature Page Follows]

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be duly executed and delivered on their behalf as of the date first above written.

COMPANY:

MONEYGRAM INTERNATIONAL, INC.

By: /s/ Lawrence Angelilli
Name: Lawrence Angelilli
Title: Chief Financial Officer

PURCHASER:

RIPPLE LABS INC.

By: /s/ Brad Garlinghouse
Name: Brad Garlinghouse
Title: Chief Executive Officer

Exhibit A

Warrant Agreement

[See attached.]

Execution Version

WARRANT AGREEMENT

This WARRANT AGREEMENT (this "***Agreement***") is made as of June 17, 2019, by and between MoneyGram International, Inc., a Delaware corporation (the "***Company***"), and Equiniti Trust Company, a limited trust company organized under the laws of the State of New York, as warrant agent (the "***Warrant Agent***"). Capitalized terms used herein but not otherwise defined shall have the meanings given them in Section 22 hereof.

RECITALS

WHEREAS, simultaneously with the execution of this Agreement, the Company is entering into that certain Securities Purchase Agreement (the "***SPA***") with Ripple Labs Inc., a Delaware corporation ("***Purchaser***"), pursuant to which the Company shall issue, and Purchaser shall purchase, from time to time as provided therein, shares of common stock, $0.01 par value, of the Company ("***Common Stock***") and warrants to purchase Common Stock ("***Warrants***");

WHEREAS, simultaneously with the execution of this Agreement, the Company and Purchaser are entering into that certain Registration Rights Agreement, pursuant to which the Company has agreed, under certain circumstances, to register for resale any Warrants and the shares of Common Stock issuable upon exercise of any Warrants;

WHEREAS, the Company desires the Warrant Agent to act on behalf of the Company, and the Warrant Agent is willing to so act, in connection with the issuance, registration, transfer, exchange, exercise and cancellation of the Warrants; and

WHEREAS, the Company desires to provide for the form and provisions of the Warrants, the terms upon which they shall be issued and exercised, and the respective rights, limitation of rights, and immunities of the Company, the Warrant Agent and the Holders (as defined below).

AGREEMENT

NOW, THEREFORE, in consideration of the mutual agreements herein contained, the parties hereto agree as follows:

Section 1. Appointment of the Warrant Agent. The Company hereby appoints the Warrant Agent to act as an agent for the Company for the Warrants, and the Warrant Agent hereby accepts such appointment and agrees to perform the same in accordance with the terms and conditions set forth herein.

Section 2. Warrants.

(a) Form of Warrant.

(i) Each Warrant shall be issued in certificated form in substantially the form attached as Exhibit A hereto, the provisions of which are incorporated herein, and shall be dated the date on which countersigned by the Warrant Agent, shall have such insertions as are appropriate or required or permitted by this Agreement and may have such letters, numbers or

other marks of identification and such legends and endorsements as the officers of the Company executing the same may approve (execution thereof to be conclusive evidence of such approval) and as are not inconsistent with the provisions of this Agreement, or as may be required to comply with any law or with any rule or regulation pursuant thereto or with any rule or regulation of any securities exchange on which the Warrants may be listed, or to conform to usage.

(ii) Each certificate representing a Warrant (each, a "***Warrant Certificate***") shall bear the legend in substantially the form set forth on Exhibit A.

(iii) Subject to the terms hereof, including without limitation, if applicable, the restrictions on exercise under securities law, this Agreement, each as may be amended from time to time, each Warrant shall be exercisable for the number of shares of Common Stock set forth thereon as the same may be adjusted from time to time as set forth herein.

(b) Execution and Delivery of Warrant Certificates.

(i) At any time and from time to time on or after the date of this Agreement, at the times and in the amounts provided for in the SPA, Warrant Certificates evidencing the Warrants shall be executed by the Company and delivered to the Warrant Agent for countersignature, and the Warrant Agent shall, as directed by the Company in writing, countersign and deliver such Warrant Certificates to the respective Persons entitled thereto, as specified by the Company. The Warrant Agent is further hereby authorized to countersign and deliver Warrant Certificates as required by this Section 2(b), Section 2(c), Section 3(b)(iii), Section 4(a), Section 9 and Section 10.

(ii) The Warrant Certificates shall be executed in the corporate name and on behalf of the Company by any of the Chairman of the Board, the Chief Executive Officer, the Chief Financial Officer, the Chief Global Operations Officer, the General Counsel or the Corporate Treasurer of the Company, either manually or by facsimile signature. The Warrant Certificates shall be countersigned by the Warrant Agent and shall not be valid for any purpose unless so countersigned.

(c) Register; Registered Holder.

(i) Warrant Register. The Warrant Agent shall maintain books (the "***Warrant Register***") for the registration of original issuance and the registration of transfer of the Warrants in accordance with the restrictions on transfer set forth herein. Upon the initial issuance of any Warrants, the Warrant Agent shall issue and register the Warrants in the names of the respective Holders thereof in such denominations and otherwise in accordance with instructions delivered to the Warrant Agent by the Company.

(ii) Registered Holder. The term "***Holder***" shall mean any Person in whose name ownership in the Warrants shall be registered upon the Warrant Register. Prior to due presentment for registration or transfer of any Warrant, the Company and the Warrant Agent may deem and treat the Holder as the absolute owner of such Warrant and of each Warrant (notwithstanding any notation of ownership or other writing on a Warrant Certificate made by anyone other than the Company or the Warrant Agent), for the purpose of any exercise thereof, and for all other purposes, and neither the Company nor the Warrant Agent shall be affected by any notice to the contrary.

Section 3. Exercise of Warrant.

(a) Subject to the provisions of the Warrant and this Agreement, including without limitation this Section 3 and Section 9, and securities law, each Warrant, when countersigned by the Warrant Agent, may be exercised, in whole or in part, on one or more occasions, on any Business Day by the Holder thereof during the Exercise Period applicable to such Warrant. Any exercise of a Warrant shall be effected by:

(i) delivery to the Warrant Agent at the office of the Warrant Agent, or, if applicable, at the office of its successor as Warrant Agent, of: (A) the Warrant Certificate evidencing the Warrant and (B) a written notice in the form attached as Exhibit B hereto (the "***Exercise Notice***"), properly completed and executed, stating that such Holder elects to exercise the Warrants in accordance with the provisions of this Section 3, specifying the name or names in which such Holder wishes the certificate or certificates for shares of Common Stock to be issued and making the appropriate securities law representation contained therein; and

(ii) payment of the Exercise Price for the shares of Common Stock issuable upon exercise of such Warrants. Such Exercise Price shall be payable (A) by a certified or official bank check payable to the order of the Company (or such other method as may be mutually agreed by the Warrant Agent and the exercising Holder) or (B) by the surrender (which surrender shall be evidenced by cancellation of the number of Warrants represented by any Warrant certificate presented in connection with a Cashless Exercise (as defined below)) of a Warrant or Warrants (represented by one or more relevant Warrant certificates), and without the payment of the Exercise Price in cash, in return for the delivery to the surrendering Holder of that number of shares of Common Stock equal to (I) the number of shares of Common Stock for which such Warrant is exercisable as of the date of exercise (assuming the Exercise Price were being paid in cash, wire transfer or certified or official bank check) reduced by (II) that number of shares of Common Stock equal to the quotient obtained by dividing (x) the aggregate Exercise Price to be paid in respect of such shares of Common Stock by (y) the Market Price of one share of Common Stock on the Business Day which next precedes the day of exercise of the Warrant. An exercise of a Warrant in accordance with clause (B) is herein referred to as a "***Cashless Exercise.***" The documentation and consideration, if any, delivered in accordance with this Section 3(a) are collectively referred to herein as the "***Warrant Exercise Documentation.***"

(b) As promptly as practicable, and in any event within five Business Days after receipt of the Warrant Exercise Documentation, the Company shall:

(i) deliver or cause to be delivered the number of validly issued, fully paid and non-assessable shares of Common Stock properly specified in the Warrant Exercise Documentation in certificated form (a "***Share Settlement***"), which shall bear a legend, that such shares of Common Stock have not been registered under the Securities Act;

(ii) if applicable, deliver or caused to be delivered cash in lieu of any fraction of a share of Common Stock, as hereinafter provided; and

(iii) if less than the full number of Warrants evidenced by a Warrant Certificate are being exercised, deliver or cause to be delivered (and the Warrant Agent shall so deliver or cause to be delivered at the request of the Company) a new Warrant Certificate(s), of like tenor, for the number of Warrants evidenced by such Warrant Certificate, less the number of Warrants then being exercised.

(c) An exercise shall be deemed to have been made at the close of business on the date of delivery of the Warrant Exercise Documentation so that, to the extent permitted by applicable law, the Person entitled to receive shares of Common Stock upon such exercise shall be treated for all purposes as having become the Holder of such shares of Common Stock at such time. A surrender of a Warrant Certificate for exercise during any period while the transfer books of the Company are closed shall become effective for exercise immediately upon the reopening of such books.

(d) The Company shall pay all expenses in connection with, and all taxes and other governmental charges (other than income taxes of the Holder) that may be imposed in respect of, the issue or delivery of any shares of Common Stock issuable upon the exercise of Warrants. The Company shall not be required, however, to pay any tax or other charge imposed in connection with any transfer involved in the issue of any certificate for shares of Common Stock in any name other than that of the Holder of the Warrants as recorded in the Warrant Register.

(e) In connection with the exercise of any Warrants, no fractions of shares of Common Stock shall be issued, but in lieu thereof the Company shall pay a cash adjustment in respect of such fractional interest in an amount equal to such fractional interest multiplied by the Market Price of a share of Common Stock on the Business Day which next precedes the day of exercise. If more than one such Warrant shall be exercised by the Holder thereof at the same time, the number of full shares of Common Stock issuable on such exercise shall be computed on the basis of the total number of Warrants so exercised.

Section 4. Adjustments.

(a) Adjustment of Number Issuable. The number of shares of Common Stock issuable upon the valid exercise of a Warrant (the "***Number Issuable***") shall be subject to adjustment from time to time as follows:

(i) In the event the Company shall at any time or from time to time after the Issue Date:

(A) pay a dividend or make a distribution of Equity Securities on the outstanding shares of Common Stock of the Company;

(B) forward split or subdivide the outstanding shares of Common Stock into a larger number of shares; or

(C) reverse split or combine the outstanding shares of Common Stock into a smaller number of shares;

then, and in each such case (A) through (C), the Number Issuable in effect immediately prior to such event shall be adjusted so that the Holder of any Warrant thereafter exercised shall be entitled to receive the number of shares of Common Stock or other securities of the Company which such Holder would have owned or had been entitled to receive upon or by reason of any of the events described above, had such Warrant been exercised immediately prior to the happening of such event. An adjustment made pursuant to this Section 4(a)(i) shall become effective retroactively (x) in the event of any such dividend or distribution, immediately prior to the close of business on the record date for the determination of holders of shares of Common Stock entitled to receive such dividend or distribution, or (y) in the event of any such split, subdivision, combination or reclassification, immediately prior to the close of business on the date upon which such corporate action becomes effective. For the avoidance of doubt, no adjustment shall be made pursuant to this Section 4(a)(i) for cash dividends or distributions of cash or property that are set aside, reserved and distributed pursuant to Section 7.

(ii) Notwithstanding anything to the contrary contained in this Section 4(a), the Company shall be entitled to make such upward adjustments in the Number Issuable, in addition to those otherwise required by this Section 4(a), as the Board in its discretion shall determine to be advisable in order that any stock dividend, split, subdivision or combination of shares, distribution of rights or warrants to purchase shares, stock or securities or distribution of securities convertible into or exchangeable for shares of Common Stock hereafter made the Company to its stockholders shall not be taxable; provided, however, that any such adjustment shall treat all holders of Warrants with similar protections on an equal basis.

(b) Reorganization, Reclassification. Consolidation. Merger or Sale of Assets. In the event of any capital reorganization or reclassification or other change of outstanding shares of Common Stock (other than a change in par value, or from par value to no par value, or from no par value to par value, or as a result of a split, subdivision or combination), or in the event of any exchange, stock sale, consolidation or merger or other similar transaction involving the Company (other than a consolidation or merger in which the Company is the resulting or surviving person and which does not result in any reclassification, conversion, exchange, extinguishment, cancellation or other change of outstanding Common Stock), or in case of any sale or other disposition to another Person of all or substantially all of the assets of the Company (any of the foregoing, a "***Transaction***"), each Holder of a Warrant outstanding immediately prior to the consummation of the Transaction shall receive in connection with the consummation of such Transaction, in lieu of the Common Stock underlying the Warrant, the kind and amount of shares, stock or other securities (of the Company or another issuer) or property or cash receivable upon such Transaction by a holder of the number of shares of Common Stock for which such Warrant could have been exercised immediately prior to such Transaction.

(c) Treatment of Expired or Terminated Equity Securities. Upon the expiration or termination of any unexercised, unconverted or unexchanged Equity Security (or portion thereof) for which any adjustment was made pursuant to this Section 4, the Number Issuable upon exercise of this Warrant shall forthwith be changed pursuant to the provisions of this Section 4 to the Number Issuable which would have been in effect at the time of such expiration or termination had such unexercised, unconverted or unexchanged Equity Security (or portion thereof), to the extent outstanding immediately prior to such expiration or termination, never been issued.

(d) Minimum Adjustment of Number Issuable. Notwithstanding anything to the contrary herein, if the amount of any adjustment of the Number Issuable required pursuant to this Section 4 would be less than one percent (1%) of the Number Issuable in effect at the time such adjustment is otherwise so required to be made, then such amount shall be carried forward and adjustment shall be made with respect thereto at the time of and together with any subsequent adjustment that, together with such amount and any other amount or amounts so carried forward, shall aggregate at least one percent (1%) of such Number Issuable.

(e) Exclusions to Adjustments. No adjustment to the Number Issuable shall be made pursuant to this Section 4 in the event of any Excluded Issuance.

Section 5. No Redemptions. The Company shall not have any right to redeem any of the Warrants evidenced hereby.

Section 6. Certain Covenants

(a) Authorized Shares. The Company covenants and agrees that all shares of capital stock of the Company which may be issued upon the exercise of the Warrants will be duly authorized, validly issued, reserved for issuance and fully paid and non-assessable upon issuance.

(b) Certificate as to Adjustments. The Company shall deliver to the Warrant Agent and each of the Holders at least five Business Days prior to the consummation of any transaction which would result in an increase or decrease in the Number Issuable pursuant to Section 4 (including, but not limited to, a Transaction) a notice thereof, setting forth, in reasonable detail, the event requiring the adjustment, the amount of the adjustment, the method by which such adjustment was calculated and the Number Issuable after giving effect to such adjustment, and shall cause a copy of such certificate to be mailed to each of the Holders. Failure to give such notice, or any defect therein, shall not affect the legality or validity of such event.

(c) No Avoidance. The Company will not amend or modify any provision of the Certificate of Incorporation or by-laws of the Company in any manner that would adversely affect in any way the ability of the Company to validly and legally issue fully paid and non-assessable shares of Common Stock, free and clear from all mortgage, deed of trust, hypothecation, lien, pledge, encumbrance, charge, security interest, judgment lien, easement, servitude or, in each case, any other similar encumbrance (other than as provided herein and restrictions created by a Holder).

Section 7. Dividends and Distributions. In the event the Company declares a dividend or distribution, whether payable in cash or other property, that would be distributed to such Holder if such Holder's Warrants had been converted in full into Common Stock immediately prior to the close of business on the record date for the determination of the stockholders entitled to receive such dividend or distribution, the Company shall set aside and reserve for the benefit of such Holder an amount of cash or other property, as applicable, that would have been distributed to such Holder, and such amounts shall be distributed to such Holder upon the exercise of such Holder's Warrants.

Section 8. Holder Not Deemed a Stockholder. Except as specifically provided for herein (including, without limitation, Section 7), nothing contained in this Agreement shall be construed to (a) grant any Holder any rights to vote or receive dividends or be deemed the holder of shares of Common Stock of the Company for any purpose, (b) confer upon any Holder any of the rights of a stockholder of the Company or any right to vote, give or withhold consent to any corporate action (whether any reorganization, issue of stock, reclassification of stock, consolidation, merger, conveyance or otherwise), receive notice of meetings, receive dividends or subscription rights, or otherwise, or (c) impose any liabilities on a Holder to purchase any securities or as a stockholder of the Company, whether asserted by the Company or creditors of the Company, prior to the issuance of the underlying shares of Common Stock.

Section 9. Certain Transfer and Exercise Restrictions.

(a) Transfer Restrictions Generally. For the avoidance of doubt, any Transfer of a Warrant shall be subject to the restrictions on Transfer set forth in Section 6.2 of the SPA.

(b) Limitations on Exercise.

(i) Notwithstanding anything to the contrary, no Warrant may be exercised in contravention of applicable law, including without limitation, if applicable, Section 5 of the Securities Act or any of the rules and regulations promulgated thereunder.

(ii) Notwithstanding anything to the contrary, no Warrant may be exercised (and the Company will have no obligation to effect any exercise) unless (i) all Required Regulatory Approvals (as defined in the SPA) have been obtained or (ii) after giving effect to the exercise, such Holder (together with such Holder's Affiliates) would not own Voting Securities (as defined in the SPA) of the Company exceeding the Regulatory Ownership Cap (as defined in the SPA).

Section 10. Replacement of Warrants. Upon receipt of evidence satisfactory to the Company and the Warrant Agent of the loss, theft, destruction or mutilation of a Warrant Certificate and, in the event of loss, theft or destruction, upon delivery of an indemnity reasonably satisfactory to the Company and the Warrant Agent, or, in the event of mutilation, upon surrender and cancellation thereof, the Warrant Agent will issue a new warrant certificate of like tenor for a number of Warrants equal to the number of Warrants evidenced by such Warrant Certificate.

Section 11. Governing Law. THIS AGREEMENT AND THE WARRANTS ISSUED HEREUNDER SHALL BE CONSTRUED AND ENFORCED IN ACCORDANCE WITH, AND THE RIGHTS OF THE PARTIES SHALL BE GOVERNED BY, THE LAWS OF THE STATE OF DELAWARE APPLICABLE TO AGREEMENTS MADE AND TO BE PERFORMED ENTIRELY WITHIN SUCH STATE (WITHOUT GIVING EFFECT TO CHOICE OF LAW OR CONFLICT OF LAWS PRINCIPLES THEREOF THAT WOULD CAUSE THE APPLICATION OF THE LAWS OF ANY JURISDICTION OTHER THAN THE STATE OF DELAWARE).

Section 12. Rights Inure to Holder. The Warrants evidenced by a Warrant Certificate will inure to the benefit of and be binding upon the Holder thereof and the Company and their respective successors and permitted assigns. Nothing in this Agreement shall be construed to give to any Person other than the Company and the Holder thereof any legal or equitable right, remedy or claim under a Warrant Certificate, and such Warrant Certificate shall be for the sole and exclusive benefit of the Company and such Holder. Nothing in this Agreement shall be construed to give a Holder any rights as a holder of shares of Common Stock until such time, if any, as the Warrants evidenced by its Warrant Certificate are exercised in accordance with the provisions hereof.

Section 13. Warrant Agent.

(a) Reliance on Company Statement. Whenever in the performance of its duties under this Agreement, the Warrant Agent shall deem it necessary or desirable that any fact or matter be proved or established by the Company prior to taking or suffering any action hereunder, such fact or matter (unless other evidence in respect thereof be herein specifically prescribed) may be deemed to be conclusively proved and established by a statement signed by any of the Chairman of the Board, the Chief Executive Officer, the Chief Financial Officer, the Chief Global Operations Officer, the General Counsel or the Corporate Treasurer of the Company and delivered to the Warrant Agent. The Warrant Agent may rely upon such statement for any action taken or suffered in good faith by it pursuant to the provisions of this Warrant Agreement.

(b) Compensation and Indemnity.

(i) For services rendered hereunder, the Warrant Agent shall be entitled to such compensation as shall be agreed to in writing between the Company and the Warrant Agent and the Company promises to pay such compensation and to reimburse the Warrant Agent for the out-of-pocket expenses incurred by it in connection with the services rendered by it hereunder. The provisions of this paragraph shall survive the termination of this Agreement and the resignation or removal of the Warrant Agent.

(ii) The Company agrees to indemnify the Warrant Agent and its Affiliates and their respective employees, officers or directors for, and to hold it harmless against, any and all loss, liability, damage, claim, cost or expense, including reasonable attorneys' fees and expenses (including the reasonable costs and expenses of defending against any claim of liability, regardless of who asserts such claim), incurred by the Warrant Agent that arises out of or in connection with its accepting appointment as, or acting as, Warrant Agent hereunder, except such losses, liabilities, damages, claims, costs or expenses as may result from the gross negligence, fraud or willful misconduct of, or material breach of this Agreement by, the Warrant Agent, its Affiliates or any of its or their officers, directors, employees, managers, agents and advisors (as determined by a court of competent jurisdiction in a final and non-appealable judgment). The Warrant Agent shall notify the Company, by letter or facsimile transmission, of a claim against the Warrant Agent or of any action commenced against the Warrant Agent, promptly after the Warrant Agent shall have received written notice thereof (to the extent not prohibited by applicable law). The failure of the Warrant Agent to so notify the Company shall not in any way relieve the Company of its obligations pursuant to this Section 13(b) except to the extent that the Company is prejudiced by such failure or delay. The provisions of this paragraph shall survive the termination of this Agreement and the resignation or removal of the Warrant Agent.

(c) Exclusions. The Warrant Agent shall have no responsibility with respect to the validity of this Agreement or with respect to the validity or execution of any Warrant Certificate (except its countersignature thereof); nor shall it be responsible for any breach by the Company of any covenant or condition contained in this Agreement or in any Warrant Certificate; nor shall it be responsible to make any adjustments required under the provisions of Section 4 hereof (other than in reliance upon and as directed by requests by the Company to make such adjustments) or responsible for the manner, method, or amount of any such adjustment or the ascertaining of the existence of facts that would require any such adjustment; nor shall it by any act hereunder be deemed to make any representation or warranty as to the authorization or reservation of any shares of Common Stock to be issued pursuant to this Agreement or any Warrant or as to whether any shares of Common Stock will when issued be valid and fully paid and nonassessable.

(d) Acceptance of Agency. The Warrant Agent hereby accepts the agency established by this Agreement and agrees to perform the same upon the terms and conditions herein set forth and among other things, shall account promptly to the Company with respect to Warrants exercised and concurrently account for, and pay to the Company, all moneys received by the Warrant Agent for the purchase of shares of the Company's Common Stock through the exercise of Warrants.

(e) Payment of Taxes. The Company shall from time to time promptly pay all taxes and charges that may be imposed upon the Company or the Warrant Agent in respect of the issuance or delivery of shares of Common Stock upon the exercise of Warrants, including any transfer taxes. The Company shall not be required, however, to pay any tax or other charge imposed in connection with any transfer involved in the issue of any certificate for shares of Common Stock in any name other than that of the Holder of the Warrants as recorded in the Warrant Register.

(f) Appointment of Successor Warrant Agent. The Warrant Agent, or any successor to it hereafter appointed, may resign its duties and be discharged from all further duties and liabilities hereunder after giving 90 days' notice in writing to the Company. If the office of the Warrant Agent becomes vacant by resignation or incapacity to act or otherwise, the Company shall appoint in writing a successor Warrant Agent in place of the Warrant Agent. If the Company shall fail to make such appointment within a period of 60 days after it has been notified in writing of such resignation or incapacity by the Warrant Agent or by the Holder of a Warrant (who shall, with such notice, submit his, her, or its Warrant for inspection by the Company or such other evidence reasonably satisfactory to the Company), then the Company may serve as the Warrant Agent. If the Company does not agree to serve as the Warrant Agent within 10 days after such 60-day period, then the Holder of any Warrant may apply to the Court of Chancery within New Castle County in the State of Delaware (and any appellate court thereof located within such county) for the appointment of a successor Warrant Agent at the Holder's cost. After appointment, any successor Warrant Agent shall be vested with all the authority, powers, rights, immunities, duties, and obligations of its predecessor Warrant Agent with like effect as if originally named as Warrant Agent hereunder, without any further act or deed; but if for any reason it becomes necessary or appropriate, the predecessor Warrant Agent shall execute and deliver, at the expense of the Company, an instrument transferring to such successor Warrant Agent all the authority, powers, and rights of such predecessor Warrant Agent hereunder; and upon request of any successor Warrant Agent the Company shall make, execute, acknowledge, and deliver any and all instruments in writing for more fully and effectually vesting in and confirming to such successor Warrant Agent all such authority, powers, rights, immunities, duties, and obligations.

(g) Merger or Consolidation of Warrant Agent. Any corporation into which the Warrant Agent may be merged or with which it may be consolidated or any corporation resulting from any merger or consolidation to which the Warrant Agent shall be a party shall be the successor Warrant Agent under this Agreement without any further action by any Person.

(h) The Warrant Agent shall not be liable for any act or omission by it unless such act or omission constitutes gross negligence, fraud or willful misconduct (as determined by a court of competent jurisdiction in a final and non-appealable judgment).

Section 14. Amendments; Waiver. Except as otherwise provided herein, this Agreement may not be modified or amended except pursuant to an instrument in writing signed by the Company, the Warrant Agent and the Holders of a majority of the then outstanding Warrants. No provision hereunder may be waived other than in a written instrument executed by the waiving party; provided, however, that the Company may take any action herein prohibited, or omit to perform any act herein required to be performed by it, if the Company shall have obtained the written consent of the Holders of a majority of the then outstanding Warrants.

Section 15. Headings. The section headings contained in this Agreement are inserted for convenience only and will not affect in any way the meaning or interpretation of this Agreement.

Section 16. Counterparts. This Agreement may be executed in multiple counterparts with the same effect as if all signing parties had signed the same document. All counterparts shall be construed together and constitute the same instrument. This Agreement, to the extent signed and delivered by means of a facsimile machine or electronic delivery (i.e., by email of a PDF signature page), shall be treated in all manner and respects as an original agreement or instrument and shall be considered to have the same binding legal effect as if it were the original signed version thereof delivered in person. At the request of any party hereto or to any such agreement or instrument, each other party hereto or thereto shall re-execute original forms thereof and deliver them to all other parties. No party hereto or to any such agreement or instrument shall raise the use of a facsimile machine or electronic delivery to deliver a signature or the fact that any signature or agreement or instrument was transmitted or communicated through the use of a facsimile machine or by electronic delivery as a defense to the formation or enforceability of a contract and each such party forever waives any such defense.

Section 17. Severability. If any provision of this Agreement is held to be illegal, invalid, or unenforceable under present or future applicable laws during the term thereof, such provision shall be fully severable, this Agreement shall be construed and enforced as if such illegal, invalid, or unenforceable provision had never comprised a part thereof, and the remaining provisions thereof shall remain in full force and effect and shall not be affected by the illegal, invalid, or unenforceable provision or by its severance therefrom. Furthermore, in lieu of such illegal, invalid, or unenforceable provision, there shall be added automatically as a part of this Agreement, a legal, valid, and enforceable provision as similar in terms to the illegal, invalid, or unenforceable provision as may be possible.

Section 18. Persons Benefitting. This Agreement shall be binding upon the Company and the Warrant Agent and shall inure to the benefit of, and the obligations created hereby shall be binding upon, the successors and assigns of each of the parties hereto and nothing in this Agreement, express or implied, is intended to or shall confer, except as otherwise provided in this Section 18, upon any other person any right, benefit or remedy of any nature whatsoever under or by reason of this Agreement. Each Holder, by acceptance of a Warrant Certificate, agrees to all of the terms and provisions of this Agreement applicable thereto, and each such Holder shall be deemed to be a third party beneficiary of this Agreement.

Section 19. Entire Agreement. This Agreement constitutes the entire agreement and understanding among the parties with respect to the subject matter hereof and supersedes all prior oral and written, and all contemporaneous oral, agreements and understandings relating to the subject matter hereof.

Section 20. Termination. This Agreement shall terminate upon the earlier of (i) one day after the end of the Exercise Period or, if and to the extent applicable, the delivery by the Company to the Holders of all shares of Common Stock and other securities or property in respect of all Warrants duly exercised during the Exercise Period and (ii) when all Warrants have been exercised upon the delivery to the Holders of all shares of Common Stock and other securities or property in respect of all Warrants duly exercised. Notwithstanding the foregoing, Section 13(b) shall survive the termination of this Agreement and the resignation or removal of the Warrant Agent.

Section 21. Notices. All notices and other communications hereunder will be in writing and will be deemed duly given (a) on the date of delivery if delivered personally, or by facsimile or e-mail (provided confirmation of transmission is mechanically or electronically generated and kept on file by the sending party), (b) on the first Business Day following the date of dispatch if delivered utilizing a next-day service by a recognized next-day courier service or (c) on the earlier of confirmed receipt or the fifth Business Day following the date of mailing if delivered by registered or certified mail, return receipt requested, postage prepaid. All notices hereunder will be delivered, if to the Company or the Warrant Agent, to the address set forth below, or if to any Holder, to the address set forth in the Warrant Register, or in each case pursuant to such other instructions as may be designated in writing by the party to receive such notice:

If to the Company:

MoneyGram International, Inc.
2828 N. Harwood St., 15th Floor
Dallas, Texas 75201
Attention: Aaron Henry; Robert Villaseñor
Electronic mail: ahenry@moneygram.com; rvillasenor@moneygram.com

with a copy (which shall not constitute notice) to:

Vinson & Elkins LLP
2001 Ross Ave.
Suite 3900
Dallas, TX 75201
Attention: Alan Bogdanow; Chris Rowley
Phone: (214) 220-7857; (214) 220-7972
Electronic mail: abogdanow@velaw.com; crowley@velaw.com

If to the Warrant Agent:

Equiniti Trust Company
c/o EQ Shareowner Services
1110 Centre Pointe Curve, Suite 101
Mendota Heights MN 55120-4100
Attention: Christopher Ward
Electronic mail: Christopher.Ward@equiniti.com

Section 22. Definitions. For the purposes of this Agreement, the following terms shall have the meanings indicated below:

"***Affiliate***" means with respect to any specified Person, any other Person directly or indirectly Controlling, Controlled by or under direct or indirect common Control with such specified Person.

"***Agreement***" has the meaning given it in the Preamble.

"***Beneficial Ownership***" by a Person of any securities includes ownership by any Person who, directly or indirectly, through any contract, arrangement, understanding, relationship or otherwise, has or shares (i) voting power which includes the power to vote, or to direct the voting of, such security; and/or (ii) investment power which includes the power to dispose, or to direct the disposition, of such security; and shall otherwise be interpreted in accordance with the term "beneficial ownership" as defined in Rule 13d-3 adopted by the SEC under the Exchange Act. The term "***Beneficially Own***" shall have a correlative meaning.

"***Board***" means the board of directors of the Company.

"***Business Day***" means any day other than a Saturday, Sunday or other day on which commercial banks in New York City are authorized or required by law or executive order to close.

"***Cashless Exercise***" has the meaning given it in Section 2.

"***Certificate of Incorporation***" means the Amended and Restated Certificate of Incorporation of the Company, dated June 28, 2004 (as amended, modified or supplemented from time to time).

"***Common Stock***" has the meaning given it in the Recitals.

"***Company***" has the meaning given it in the Preamble.

"***Control***" means the possession, direct or indirect, of the power to direct or cause the direction of the management and the policies of a Person (whether through ownership of securities or partnership or other ownership interests, by contract or otherwise), and the terms "***Controlled by***" and "***Controlling***" shall have correlative meanings.

"***Derivative Security***" means any right, option, warrant or other security convertible into or exercisable for Common Stock, including, without limitation, the Company's Series D Participating Convertible Preferred Stock.

"***Equity Incentive Plan***" means any compensation, severance or incentive plan for officers, employees, consultants or Directors of the Company.

"***Equity Securities***" means Common Stock and any Derivative Security of Common Stock.

"***Exchange Act***" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated from time to time thereunder.

"***Excluded Issuance***" means the issuance by the Company (and subsequent vesting, as applicable) of any (a) shares of Common Stock issued upon the exercise of the Warrants, (b) stock options issued to employees, consultants or non-employee directors pursuant to any Equity Incentive Plan, so long as the exercise price in respect of any such options is not less than the Market Price of the Company's Common Stock as of the date such option is granted, (c) shares of Common Stock issued upon the conversion or exercise of stock options, (d) restricted stock units or restricted shares issued to employees, consultants or non-employee directors pursuant to any Equity Incentive Plan, or (e) Equity Securities issued (i) to Persons in connection with a joint venture, strategic alliance or other commercial relationship with such Persons (including Persons that are customers, suppliers and strategic partners of the Company) relating to the operation of the Company's business and not for the primary purpose of raising equity capital, (ii) in connection with a transaction in which the Company, directly or indirectly, acquires another business or its tangible or intangible assets, or (iii) to lenders as equity kickers in connection with debt financings of the Company, in each case where such transactions have been approved by the Board.

"***Exercise Price***" is equal to $0.01 per share.

"***Exercise Period***" means, with respect to any Warrant, on any Business Day after the Issue Date and on or before the Expiration Date.

"***Expiration Date***" means, with respect to any Warrant, 5:00 p.m., New York City time, on the tenth anniversary of the Issue Date, or if such day is not a Business Day, then the first Business Day following such date.

"***Fair Market Value***" means the amount which a willing buyer, under no compulsion to buy, would pay a willing seller, under no compulsion to sell, in an arm's-length transaction but in all events without application of any minority, illiquidity, transfer or voting restriction, or similar discounts or reductions.

"***Fully Diluted Basis***" means the fully diluted weighted-average Common Stock and equivalents of the Company for the year-to-date period as of the most recent month-end calculated in accordance with GAAP and assuming the exercise or conversion of the Company's Series D Participating Convertible Preferred Stock.

"***GAAP***" means United States generally accepted accounting principles.

"***Governmental Entity***" means any U.S. or non-U.S. federal, national, supranational, state, provincial, local or similar government, governmental, regulatory or administrative authority, branch, agency or commission or any court, tribunal, or arbitral or judicial body.

"***Holder***" has the meaning given it in Section 2(c)(ii).

"***Issue Date***" means, with respect to any Warrant, the date such Warrant is issued in accordance with the terms of the SPA.

"***Law***" means any statute, law, ordinance, regulation, rule, code, executive order, injunction, judgment, decree or order of any Governmental Entity.

"***Market Price***" means, with respect to any particular measurement date, (a) the closing price of a share of Common Stock as reported on the Principal Market for the Trading Day immediately preceding such measurement date or (b) if, the foregoing clause (a) is not applicable, the Fair Market Value of a share of Common Stock determined by a third party valuation firm mutually acceptable to the Company and the Holder.

"***NASDAQ***" means the The Nasdaq Stock Market.

"***Number Issuable***" with respect to a Warrant has the meaning given it in Section 4(a).

"***NYSE***" means the New York Stock Exchange LLC.

"***Person***" means any individual, corporation, limited liability company, partnership, trust, incorporated or unincorporated association, joint venture, joint stock company, government (or an agency or political subdivision thereof) or other entity of any kind.

"***Principal Market***" means any of the national exchanges (i.e. NASDAQ, NYSE, NYSE MKT LLC), principal quotation systems (i.e. OTCQX, OTCQB, Pink (OTC Pink)) or other principal exchange or recognized quotation system which is at the time the principal trading platform or market for the Common Stock, which the parties acknowledge as of the date of this Agreement is the NASDAQ.

"***Purchaser***" has the meaning given it in the Recitals.

"***Regulation D***" means Regulation D promulgated under the Securities Act.

"***Securities Act***" means the Securities Act of 1933, as amended, and the rules and regulations promulgated from time to time thereunder.

"***Share Settlement***" has the meaning given it in Section 3(b)(i).

"***SPA***" has the meaning given it in the Recitals.

"***Subsidiary***" means, with respect to any Person (herein referred to as the "***parent***") (a) of which securities or other ownership interests representing more than 50% of the equity or more than 50% of the ordinary voting power or more than 50% of the general partnership interests are, at the time any determination is being made, owned, controlled or held, or (b) that is, at the time any determination is made, otherwise controlled, by the parent or one or more subsidiaries of the parent or by the parent and one or more subsidiaries of the parent.

"***Trading Day***" means (i) any day on which the Common Stock is listed or quoted and traded on its Principal Market or (ii) if the Common Stock is not then listed or quoted and traded on any national securities exchange, then a day on which trading occurs on any over-the-counter markets.

"***Transaction***" has the meaning given it in Section 4(b).

"***Transfer***" means any voluntary or involuntary attempt to, directly or indirectly through the transfer of interests in controlled Affiliates or otherwise, sell, assign, transfer, grant a participation in, pledge or otherwise dispose of any Warrants, or the consummation of any such transaction, or taking a pledge of, any of the Warrants. The term "***Transferred***" shall have a correlative meaning.

"***Transfer Agent***" has the meaning given it in Section 2.

"***VWAP***" per share of Common Stock for any specified period of determination shall mean the per share volume-weighted average Market Price over such period.

"***Warrant***" means a Warrant in substantially the form attached as Exhibit A hereto.

"***Warrant Agent***" has the meaning given it in the Preamble.

"***Warrant Certificate***" has the meaning given it in Section 2(a).

"***Warrant Exercise Documentation***" has the meaning given it in Section 2.

* * * * *

IN WITNESS WHEREOF, the undersigned have caused this Agreement to be duly executed as of the date first written above.

MONEYGRAM INTERNATIONAL, INC.

By: /s/ Lawrence Angelilli
Name: Lawrence Angelilli
Title: Chief Financial Officer

EQUINITI TRUST COMPANY, as Warrant Agent

By: /s/ Martin V. Knapp
Name: Martin V. Knapp
Title: Vice President

EXHIBIT A

FORM OF WARRANT

SPECIMEN WARRANT CERTIFICATE

**THIS WARRANT WILL BE VOID IF NOT EXERCISED PRIOR TO 5:00 P.M.
NEW YORK CITY TIME, [•], 20[•]**

THIS WARRANT AND THE SECURITIES TO BE ISSUED UPON ITS EXERCISE ARE SUBJECT TO THE PROVISIONS OF A SECURITIES PURCHASE AGREEMENT, DATED AS OF JUNE 17, 2019, AND A WARRANT AGREEMENT, DATED AS OF JUNE 17, 2019, EACH AS MAY BE AMENDED FROM TIME TO TIME, INCLUDING CERTAIN RESTRICTIONS ON TRANSFER AND EXERCISE SET FORTH THEREIN. COPIES OF THE SECURITIES PURCHASE AGREEMENT AND WARRANT AGREEMENT ARE ON FILE AT THE PRINCIPAL EXECUTIVE OFFICES OF MONEYGRAM INTERNATIONAL, INC. (THE "COMPANY").

THIS WARRANT AND THE SECURITIES TO BE ISSUED UPON ITS EXERCISE HAVE NOT BEEN REGISTERED UNDER THE UNITED STATES SECURITIES ACT OF 1933, AS AMENDED (THE "1933 ACT"), OR UNDER ANY U.S. STATE OR FOREIGN SECURITIES LAWS, IN RELIANCE UPON APPLICABLE EXEMPTIONS FROM THE REGISTRATION REQUIREMENTS OF THE 1933 ACT AND SUCH STATE AND FOREIGN SECURITIES LAWS. THE SECURITIES REPRESENTED BY THIS CERTIFICATE HAVE BEEN ACQUIRED FOR INVESTMENT AND NOT WITH A VIEW TO DISTRIBUTION OR RESALE IN CONTRAVENTION OF THE 1933 ACT OR ANY U.S. STATE OR FOREIGN SECURITIES LAWS. THE SECURITIES REPRESENTED BY THIS CERTIFICATE (INCLUDING THE SECURITIES TO BE ISSUED UPON THE EXERCISE OF THIS WARRANT) MAY NOT BE SOLD, TRANSFERRED, OR OTHERWISE DISPOSED OF UNLESS REGISTERED UNDER THE 1933 ACT AND ANY APPLICABLE U.S. STATE OR FOREIGN SECURITIES LAWS, OR THE HOLDER HEREOF PROVIDES EVIDENCE REASONABLY SATISFACTORY TO THE COMPANY (WHICH, IN THE DISCRETION OF THE COMPANY, MAY INCLUDE AN OPINION OF COUNSEL SATISFACTORY TO THE COMPANY) THAT NO SUCH REGISTRATION IS REQUIRED.

WARRANT TO PURCHASE COMMON STOCK

Company:	MoneyGram International, Inc.
Number of Shares:	[ ]

Class of Stock: Common stock of the Company, par value $0.01 per share (the "***Common Stock***")

Exercise Price:	$0.01 per share
Issue Date:	[[•], [•]]

Expiration Date: 5:00 p.m., New York City time, on [•], 20[•][1].

THIS CERTIFIES THAT, for value received [•] is entitled to purchase from the Company, until 5:00 p.m. New York City time on the Expiration Date, the number of fully paid and nonassessable shares of the Common Stock (the "***Warrant Shares***") at the Exercise Price, subject to the provisions and upon the terms and conditions set forth in this Warrant and in the Warrant Agreement, dated as of June 17, 2019, by and between the Company and the Warrant Agent, as in effect from time to time (the "***Warrant Agreement***").

Payment of the Exercise Price may be made, at the option of the holder of the Warrant and subject to conditions set forth herein and in the Warrant Agreement, by the following methods (or any combination thereof): (1) by a certified or official bank check payable to the order of the Company (or such other method as may be mutually agreed by the Warrant Agent and the exercising Holder); or (2) by means of a cashless exercise pursuant to Section 3(a)(ii)(B) of the Warrant Agreement. The Warrant Agreement provides that upon the occurrence of certain events the number of shares of Common Stock that may be purchased under this Warrant may be adjusted under certain conditions.

No fraction of a share of Common Stock will be issued upon any exercise of a Warrant. If, upon exercise of a Warrant, a holder would be entitled to receive a fractional interest in a share of Common Stock, the Company shall round down to the nearest whole number the number of shares of Common Stock to be issued to the Warrant holder and pay a cash adjustment in respect of such fractional interest in an amount equal to such fractional interest multiplied by the Market Price of a share of Common Stock on the Business Day preceding the day of exercise.

Upon any exercise of the Warrant for less than the total number of full shares of Common Stock provided for in this Warrant, there shall be issued to the registered holder (or such holder's assignee) a new Warrant Certificate bearing the same restrictive legends, if any, covering the number of shares of Common Stock for which the Warrant has not been exercised.

Warrant Certificates, when surrendered at the office or agency of the Warrant Agent by the registered holder hereof in person or by attorney duly authorized in writing, may be exchanged in the manner and subject to the limitations provided in the Warrant Agreement, but without payment of any service charge, for another Warrant Certificate or Warrant Certificates of like tenor and evidencing in the aggregate a like number of Warrants.

Upon due presentment for registration of transfer of the Warrant Certificate at the office or agency of the Warrant Agent, a new Warrant Certificate or Warrant Certificates of like tenor and evidencing in the aggregate a like number of Warrants shall be issued to the transferee in exchange for this Warrant Certificate, subject to the limitations provided in the Warrant Agreement, without charge except for any applicable tax or other government charge.

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1 Note to Draft: Expiration Date to be 10 years after the Issue Date.

The Company and the Warrant Agent may deem and treat the registered holder as the absolute owner of this Warrant Certificate (notwithstanding any notation of ownership or other writing hereon made by anyone), for the purpose of any exercise hereof, of any distribution to the registered holder, and for all other purposes, and neither the Company nor the Warrant Agent shall be affected by any notice to the contrary.

Except as set forth in the Warrant Agreement, this Warrant does not entitle the registered holder to any of the rights of a stockholder of the Company.

Capitalized terms used herein but not defined shall have the meaning set forth in the Warrant Agreement.

* * * * *

MONEYGRAM INTERNATIONAL, INC.

By: _____
Name: _____
Title: _____

By: _____
Name: _____
Title: _____

DATED:

Countersigned

EQUINITI TRUST COMPANY, as Warrant Agent

By: _____
Authorized Signatory

EXHIBIT B

EXERCISE NOTICE

TO BE EXECUTED BY THE REGISTERED HOLDER
TO EXERCISE WARRANTS

The undersigned holder hereby exercises the right to purchase [ ] shares of common stock, par value $0.01 per share ("**Warrant Shares**"), of MONEYGRAM INTERNATIONAL, INC., a Delaware corporation (the "**Company**"), evidenced by the attached Warrant Certificate (the "**Warrant**"). Capitalized terms used herein and not otherwise defined shall have the meanings set forth in the Warrant Agreement (the "**Agreement**"), dated as of June 17, 2019, by and between the Company and EQUINITI TRUST COMPANY, as Warrant Agent, as in effect from time to time.

1. Payment of Exercise Price (check applicable box).

   [ ] payment in the sum of $ **[is enclosed] [has been wire transferred** to the Company at the following account: **]** in accordance with the terms of the Warrant.

   [ ] Holder hereby elects to make the payment for the Warrant Shares in accordance with Section 3(a)(ii) of the Agreement.

2. Confirmation. The undersigned hereby represents and warrants that the Required Consents have been made or obtained, as applicable.

3. Delivery of Warrant Shares. The Company shall deliver the Warrant Shares in the name of the undersigned or in such other name as is specified below in accordance with Section 3(b) of the Agreement at the following address:

(PLEASE TYPE OR PRINT NAME AND ADDRESS)

(SOCIAL SECURITY OR TAX IDENTIFICATION NUMBER)

and be delivered to _____

and, if such number of Warrants delivered pursuant to Section 3 above shall not be all the Warrants evidenced by this Warrant Certificate, that a new Warrant Certificate bearing the same restrictive legends, if any, for the balance of such Warrants be registered in the name of, and delivered to, the registered holder at the address stated below its signature.

4. Representations and Warranties.

(i) The undersigned hereby certifies:

[*CHECK A OR B, AS APPLICABLE*]

□ A. that it is an "accredited investor" as defined in Regulation D promulgated under the Securities Act of 1933, as amended;

[*OR*]

□ B. enclosed herewith is an opinion of counsel to the effect that the Warrant and the securities delivered upon exercise thereof either (i) have been registered under the Securities Act or (ii) are exempt from registration thereunder.

* * * * *

Dated: _____

_____
(SIGNATURE)

(ADDRESS)

_____

(TAX IDENTIFICATION NUMBER)

ACKNOWLEDGMENT

The Company hereby acknowledges receipt of this Exercise Notice and hereby undertakes, in accordance with Section 3(b) of the Agreement, to issue the above indicated number of shares of Common Stock or cash in lieu thereof upon satisfactory receipt of the Warrant Exercise Documentation and the restrictions on exercise and transfer set forth in the Agreement (including as referenced therein the restrictions on exercise and transfer set forth in Warrant Agreement and in the Company's organizational documents as in effect from time to time), in the name and to the address set forth above by the exercising holder.

MONEYGRAM INTERNATIONAL, INC.

By: _____

Name:

Title:

Exhibit B

Registration Rights Agreement

[See attached.]

Execution Version

REGISTRATION RIGHTS AGREEMENT

By and Between

RIPPLE LABS INC.

and

MONEYGRAM INTERNATIONAL, INC.

Dated as of June 17, 2019

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REGISTRATION RIGHTS AGREEMENT

REGISTRATION RIGHTS AGREEMENT dated as of June 17, 2019, by and between MoneyGram International, Inc., a Delaware corporation (the "**Company**"), and Ripple Labs Inc., a Delaware corporation ("**Investor**").

WHEREAS, simultaneously with the execution of this Agreement, the Company and Investor are entering into that certain Securities Purchase Agreement (the "***SPA***"), pursuant to which the Company shall issue, and Investor shall purchase, from time to time as provided therein, shares of common stock, $0.01 par value, of the Company ("***Common Stock***") and warrants to purchase Common Stock ("***Warrants***");

WHEREAS, simultaneously with the execution of this Agreement, the Company and Equiniti Trust Company, a limited trust company organized under the laws of the State of New York, as warrant agent (the "***Warrant Agent***"), are entering into that certain Warrant Agreement, dated as of the date hereof (the "***Warrant Agreement***"), pursuant to which the Warrant Agent will act on behalf of the Company in connection with the issuance, registration, transfer, exchange, exercise and cancellation of the Warrants;

WHEREAS, the Company has agreed to provide the Holders (as defined below) with certain rights as set forth herein; and

NOW, THEREFORE, in consideration of the premises and of the mutual covenants and obligations hereinafter set forth, the parties hereto hereby agree as follows:

ARTICLE I
Definitions

Section 1.1 Certain Defined Terms. As used herein, the following terms shall have the following meanings:

"**Action**" means any legal, administrative, regulatory or other suit, action, claim, audit, assessment, arbitration or other proceeding, investigation or inquiry.

"**Affiliate**" shall mean, with respect to any Person, any other Person directly or indirectly controlling, controlled by or under common control with, such Person. For purposes of this definition, "control" when used with respect to any Person, means the possession, directly or indirectly, of the power to cause the direction of management and/or policies of such Person, whether through the ownership of voting securities by contract or otherwise.

"**Agreement**" means this Registration Rights Agreement as it may be amended, supplemented, restated or modified from time to time.

"**Beneficial Ownership**" by a Person of any securities includes ownership by any Person who, directly or indirectly, through any contract, arrangement, understanding, relationship or otherwise, has or shares (i) voting power which includes the power to vote, or to direct the voting of, such security; and/or (ii) investment power which includes the power to dispose, or to direct the disposition, of such security; and shall otherwise be interpreted in accordance with the term "beneficial ownership" as defined in Rule 13d-3 adopted by the SEC under the Exchange Act. The term "**Beneficially Own**" shall have a correlative meaning.

"**Business Day**" means any day, other than a Saturday, Sunday or a day on which banking institutions in New York, New York are authorized or obligated to close.

"**Common Stock**" means the common stock of the Company, par value $0.01 per share.

"**Exchange Act**" means the Securities Exchange Act of 1934, as amended, and the rules and regulations promulgated by the SEC from time to time thereunder.

"**Governmental Entity**" shall mean any court, administrative agency or commission or other governmental authority or instrumentality, whether federal, state, local or foreign and any applicable industry self-regulatory organization.

"**Holders**" means Investor and any permitted Transferee of Registrable Securities.

"**Holders' Representative**" means Investor or any other Holder designated by a majority of the Holders from time to time, in lieu of Investor, as the Holders' Representative.

"**Holding Period**" means the period from the date of this Agreement until the end of the Lock-Up Period (as defined in the SPA).

"**Issuer Free Writing Prospectus**" means an issuer free writing prospectus, as defined in Rule 433 under the Securities Act, relating to an offer of the Registrable Securities.

"**Law**" means any statute, law, code, ordinance, rule or regulation of any Governmental Entity.

"**Other Securities**" means shares of equity securities of the Company other than Registrable Securities.

"**Person**" means any individual, corporation, limited liability company, limited or general partnership, joint venture, association, joint stock company, trust, unincorporated organization, government or any agency or political subdivisions thereof or any group (within the meaning of Section 13(d)(3) of the Exchange Act) comprised of two or more of the foregoing.

"**Prospectus**" means the prospectus included in any Registration Statement (including a prospectus that discloses information previously omitted from a prospectus filed as part of an effective Registration Statement in reliance upon Rule 430A promulgated under the Securities Act), as amended or supplemented by any prospectus supplement with respect to the terms of the offering of any portion of the Registrable Securities covered by such Registration Statement, any Issuer Free Writing Prospectus related thereto, and all other amendments and supplements to such prospectus, including post-effective amendments, and all material incorporated by reference or deemed to be incorporated by reference in such prospectus.

"**Registrable Securities**" means (i) all shares of Common Stock issued under the SPA, (ii) all shares of Common Stock issuable upon exercise of the Warrants, (iii) all Warrants issued under the SPA, and (iv) any securities issued directly or indirectly with respect to such shares described in clauses (i), (ii) or (iii) because of stock splits, stock dividends, reclassifications, recapitalizations, mergers, consolidations, or similar events. As to any particular Registrable Securities, once issued such securities shall cease to be Registrable Securities when (i) a Registration Statement with respect to the sale of such securities shall have become effective under the Securities Act and such securities shall have been disposed of in accordance with such Registration Statement or (ii) (A) in the opinion of counsel to the Company, such securities may be sold within a three-month period following such opinion without registration or volume or other limitations under the Securities Act or any of the rules or regulations promulgated thereunder, including without limitation Rule 144 and (B) the Holder of such Registrable Securities ceases to own more than 2% of the outstanding Common Stock of the Company.

"**Registration Statement**" means any registration statement of the Company under the Securities Act which permits the public offering of any of the Registrable Securities pursuant to the provisions of this Agreement, including the Prospectus, amendments and supplements to such registration statement, including post-effective amendments, all exhibits and all material incorporated by reference or deemed to be incorporated by reference in such registration statement.

"**Rule 144**" means Rule 144 under the Securities Act, as such rule may be amended from time to time, or any successor rule that may be promulgated by the SEC.

"**Rule 144A**" means Rule 144A under the Securities Act, as such rule may be amended from time to time, or any successor rule that may be promulgated by the SEC.

"**SEC**" means the United States Securities and Exchange Commission.

"**Securities Act**" means the U.S. Securities Act of 1933, as amended, and the rules and regulations promulgated by the SEC from time to time thereunder.

"**Selling Holder**" means each Holder of Registrable Securities included in a registration pursuant to Article II.

"**Subsidiary**" of any Person shall mean those corporations and other entities of which such Person owns or controls more than 50% of the outstanding equity securities either directly or through an unbroken chain of entities as to each of which more than 50% of the outstanding equity securities is owned directly or indirectly by its parent; provided, however, that there shall not be included any such entity to the extent that the equity securities of such entity were acquired in satisfaction of a debt previously contracted in good faith or are owned or controlled in a bona fide fiduciary capacity.

"**Transfer**" means, directly or indirectly, to sell, transfer, assign, pledge, encumber, hypothecate or similarly dispose of, or to enter into any contract, option or other arrangement or understanding with respect to the sale, transfer, assignment, pledge, encumbrance, hypothecation or similar disposition.

"**Transferee**" means any of (i) the transferee of all or any portion of the Registrable Securities held by Investor or (ii) the subsequent transferee of all or any portion of the Registrable Securities held by any Transferee; provided, that no Transferee shall be entitled to any benefits of a Transferee hereunder unless such Transferee executes and delivers to the Company an instrument substantially in the form provided as Exhibit A attached hereto.

Section 1.2 Terms Generally. The definitions in Section 1.1 shall apply equally to both the singular and plural forms of the terms defined. Whenever the context may require, any pronoun shall include the corresponding masculine, feminine and neuter forms. The words "include", "includes" and "including" shall be deemed to be followed by the phrase "without limitation", unless the context expressly provides otherwise. All references herein to Sections, paragraphs, subparagraphs, clauses, Exhibits or Schedules shall be deemed references to Sections, paragraphs, subparagraphs or clauses of, or Exhibits or Schedules to this Agreement, unless the context requires otherwise. Unless otherwise expressly defined, terms defined in this Agreement have the same meanings when used in any Exhibit or Schedule hereto. Unless otherwise specified, the words "this Agreement", "herein", "hereof", "hereto" and "hereunder" and other words of similar import refer to this Agreement as a whole (including the Schedules and Exhibits) and not to any particular provision of this Agreement. The term "or" is not exclusive. The word "extent" in the phrase "to the extent" shall mean the degree to which a subject or other thing extends, and such phrase shall not mean simply "if". Unless expressly stated otherwise, any Law defined or referred to herein means such Law as from time to time amended, modified or supplemented, including by succession of comparable successor Laws and references to all attachments thereto and instruments incorporated therein. References to a Person are also to its permitted successors and assigns. The table of contents and headings contained in this Agreement are for reference purposes only and shall not affect in any way the meaning or interpretation of this Agreement.

ARTICLE II
Registration Rights

Section 2.1 Demand Registrations.

(a) At any time and from time to time following the last day of the Holding Period, the Holders' Representative shall have the right by delivering a written notice to the Company (a "**Demand Notice**") to require the Company to, pursuant to the terms of this Agreement, register under and in accordance with the provisions of the Securities Act the number of Registrable Securities Beneficially Owned by Holders and requested by such Demand Notice to be so registered (a "**Demand Registration**"); provided, however, that in respect of two out of the six Demand Registrations to which the Holders are entitled under this Agreement, a Demand Notice may only be made if the amount of Registrable Securities requested to be registered by the Holders' Representative is reasonably expected to generate aggregate gross proceeds (prior to deducting underwriting discounts and commissions and offering expenses) of at least $5 million. A Demand Notice shall also specify the expected method or methods of disposition of the applicable Registrable Securities. As promptly as practicable, but no later than 7 Business Days after receipt of a Demand Notice, the Company shall give written notice of such Demand Notice to all Holders of record of Registrable Securities. For purposes of determining the percentage and amount of Registrable Securities Beneficially Owned that are requested to be registered pursuant to this Section 2.1(a), Warrants requested to be registered shall be treated as the underlying shares of Common Stock for which such Warrants are exercisable.

(b) Following receipt of a Demand Notice, the Company shall use its reasonable best efforts to file, as promptly as reasonably practicable, but not later than 30 days after receipt by the Company of such Demand Notice (subject to paragraph (f) of this Section 2.1), a Registration Statement (including, without limitation, on Form S-3 (or any comparable or successor form or forms or any similar short-form registration) by means of a shelf registration pursuant to Rule 415 under the Securities Act, if so requested and the Company is then eligible to use such a registration and if there is no then-currently effective shelf registration statement on file with the SEC which would cover all the Registrable Securities requested to be registered) (a "**Demand Registration Statement**") relating to the offer and sale of the Registrable Securities requested to be included therein by the Holders' Representative and any other Holder of Registrable Securities which shall have made a written request to the Company for inclusion in such registration (which request shall specify the maximum number of Registrable Securities intended to be disposed of by such Selling Holder) within 20 days after the receipt of the Demand Notice (or 10 days if, at the request of the Holders' Representative, the Company states in such written notice or gives telephonic notice to all Holders, with written confirmation to follow promptly thereafter, that such registration will be on a Form S-3), in accordance with the method or methods of disposition of the applicable Registrable Securities elected by such Holders, and the Company shall use its reasonable best efforts to cause such Registration Statement to be declared effective under the Securities Act as promptly as practicable after the filing thereof.

(c) If any of the Registrable Securities registered pursuant to a Demand Registration are to be sold in a firm commitment underwritten offering, and the managing underwriter(s) of such underwritten offering advise the Holders in writing that it is their good faith opinion that the total number or dollar amount of Registrable Securities proposed to be sold in such offering, together with any Other Securities proposed to be included by holders thereof which are entitled to include securities in such Registration Statement, exceeds the total number or dollar amount of such securities that can be sold without having an adverse effect on the amount, price, timing or distribution of the Registrable Securities to be so included together with all such Other Securities, then there shall be included in such offering the number or dollar amount of Registrable Securities and such Other Securities that in the opinion of such managing underwriter(s) can be sold without so adversely affecting such offering, and such number of Registrable Securities and Other Securities shall be allocated for inclusion as follows:

(i) first, the Registrable Securities for which inclusion in such demand offering was requested by an Investor or its Affiliates, pro rata (if applicable), based on the number of Registrable Securities Beneficially Owned by each such Holder;

(ii) second, the Registrable Securities for which inclusion in such demand offering was requested by the other Holders, pro rata (if applicable), based on the number of Registrable Securities Beneficially Owned by each such Holder; and

(iii) third, among any holders of Other Securities, pro rata, based on the number of Other Securities Beneficially Owned by each such holder.

(d) The Holders collectively shall be entitled to request no more than six Demand Registrations on the Company, and in no event shall the Company be required to effect more than one Demand Registration in any nine-month period.

(e) In the event of a Demand Registration, the Company shall be use reasonable best efforts to maintain the continuous effectiveness of the applicable Registration Statement for a period of at least 180 days after the effective date thereof or such shorter period in which all Registrable Securities included in such Registration Statement have actually been sold; provided, however, that nothing in this Section 2.1(e) is intended to limit the Company's obligations to maintain the continuous effectiveness of Short Form Registrations in accordance with the provisions of Section 2.1(i).

(f) The Company shall be entitled to postpone (but not more than once in any six-month period), for a reasonable period of time not in excess of 75 days (and not for periods exceeding, in the aggregate, 100 days during any twelve-month period), the filing or initial effectiveness of a Demand Registration Statement if the Company delivers to the Holders' Representative a certificate signed by both the Chief Executive Officer and Chief Financial Officer of the Company certifying that, in the good faith judgment of the Board of Directors of the Company, such registration, offering or use would reasonably be expected to materially adversely affect or materially interfere with any bona fide and reasonably imminent material financing of the Company or any reasonably imminent material transaction under consideration by the Company or would require the disclosure of information that has not been, and is not otherwise required to be, disclosed to the public, the premature disclosure of which would materially adversely affect the Company.

(g) The Holders' Representative shall have the right to notify the Company that it has determined that the Registration Statement relating to a Demand Registration be abandoned or withdrawn, in which event the Company shall promptly abandon or withdraw such Registration Statement.

(h) No request for registration will count for the purposes of the limitations in Section 2.1(c) if (A) the Holders' Representative determines in good faith to withdraw the proposed registration prior to the effectiveness of the Registration Statement relating to such request due to marketing conditions or regulatory reasons relating to the Company, (B) the Registration Statement relating to such request is not declared effective within 60 days of the date such Registration Statement is first filed with the SEC (other than by reason of the applicable Holders having refused to proceed or a misrepresentation or an omission by the applicable Holders), (C) prior to the sale or distribution of at least 90% of the Registrable Securities included in the applicable registration relating to such request, such registration is adversely affected by any stop order, injunction or other order or requirement of the SEC or other Governmental Entity or court, or (D) the conditions to closing specified in any underwriting agreement or purchase agreement entered into in connection with the registration relating to such request are not satisfied (other than as a result of a material default or breach thereunder by the one or more Holders). Notwithstanding anything to the contrary, the Company will pay all expenses (in accordance with Section 2.9) in connection with any request for registration pursuant to this Agreement regardless of whether or not such request counts toward the limitation set forth above.

(i) Subject to Section 2.5, in addition to the Demand Registrations provided pursuant to this Section 2.1, at all times following the last day of the Holding Period, the Company will use its reasonable best efforts to qualify for registration on Form S-3 or any comparable or successor form or forms or any similar short-form registration (including pursuant to Rule 415 under the Securities Act) ("**Short-Form Registration**"); *provided*, *that,* the Company shall file such a Short-Form Registration prior to the expiration of the Holding Period and use reasonable efforts to cause such Short-Form Registration to be effective upon the expiration of the Holding Period and constitute an effective shelf registration statement providing for the registration of, and the sale on a continuous or delayed basis of, the Registrable Securities, pursuant to Rule 415 under the Securities Act, to permit the distribution of the Registrable Securities in accordance with the methods of distribution elected by the Holders as of immediately upon the expiration of the Holding Period. In no event shall the Company be obligated to effect any shelf registration other than pursuant to a Short-Form Registration. Upon filing a Short-Form Registration, the Company will use its reasonable best efforts to keep such Short-Form Registration effective with the SEC at all times (notwithstanding anything to the contrary in Section 2.1(d)) and to refile such Short-Form Registration upon its expiration, and to cooperate in any shelf take-down by amending or supplementing the prospectus statement related to such Short-Form Registration as may reasonably be requested by the Holders' Representative or as otherwise required, until the Holders no longer hold Registrable Securities.

Section 2.2 Piggyback Registrations.

(a) If, at any time following the last day of the Holding Period, the Company (other than pursuant to Section 2.1) proposes or is required to file a registration statement under the Securities Act with respect to an offering of Common Stock or other equity securities, whether or not for sale for its own account (other than a registration statement (i) on Form S-4, Form S-8 or any successor forms thereto, (ii) filed solely in connection with any employee benefit or dividend reinvestment plan, or (iii) pursuant to a Demand Registration in accordance with Section 2.1 hereof), in a manner that would permit registration of Registrable Securities for sale to the public under the Securities Act, then the Company shall give prompt written notice of such proposed filing at least 20 days before the anticipated filing date (the "**Piggyback Notice**") to the Holders. The Piggyback Notice shall offer the Holders the opportunity to include in such registration statement the number of Registrable Securities as they may request (a "**Piggyback Registration**"). Subject to Section 2.2(b) hereof, the Company shall use its reasonable best efforts to include in each such Piggyback Registration all Registrable Securities with respect to which the Company has received from any Holder written requests for inclusion therein within 15 days following receipt of any Piggyback Notice by such Holder, which request shall specify the maximum number of Registrable Securities intended to be disposed of by such Holder and the intended method of distribution thereof. The Holders shall be permitted to withdraw all or part of the Registrable Securities from a Piggyback Registration at any time at least 2 Business Days prior to the effective date of the Registration Statement relating to such Piggyback Registration. The Company shall be required to maintain the effectiveness of the Registration Statement for a Piggyback Registration for a period of 180 days after the effective date thereof or such shorter period in which all Registrable Securities included in such Registration Statement have actually been sold. There is no limitation on the number of Piggyback Registrations pursuant to this Section 2.2 which the Company is obligated to effect. No Piggyback Registration shall count towards registrations required under Section 2.1.

(b) If any of the securities to be registered pursuant to the registration giving rise to the Holders' rights under this Section 2.2 are to be sold in an underwritten offering, the Holders shall be permitted to include all Registrable Securities requested to be included in such registration in such offering on the same terms and conditions as any Other Securities included therein; provided, however, that if such offering involves a firm commitment underwritten offering and the managing underwriter(s) of such underwritten offering advise the Company in writing that it is their good faith opinion that the total amount of Registrable Securities requested to be so included, together with all Other Securities that the Company and any other Persons having rights to participate in such registration intend to include in such offering, exceeds the total number or dollar amount of such securities that can be sold without having an adverse effect on the price, timing or distribution of the Registrable Securities to be so included together with all Other Securities, then there shall be included in such firm commitment underwritten offering the number or dollar amount of Registrable Securities and such Other Securities that in the opinion of such managing underwriter(s) can be sold without so adversely affecting such offering, and such number of Registrable Securities and Other Securities shall be allocated for inclusion as follows:

(i) (A) first, all Other Securities being sold by the Company or by any Person (other than a Holder) exercising a contractual right to demand registration or to participate in such demand registration on a primary basis (*i.e.* not on a piggyback basis) and (B) all holders of Other Securities requesting to be included in such registration pursuant to piggyback registration rights contained in the Registration Rights Agreement dated March 25, 2008 between the Company and the several investors listed on Schedule I thereto (which are affiliates of Thomas H. Lee Advisors, LLC and The Goldman Sachs Group, Inc.) (as amended by Amendment No. 1 thereto dated May 18, 2011); and

(ii) second, among all Holders of Registrable Securities and any other holders of Other Securities requesting to be included in such registration, pro rata (if applicable), based on the number of Registrable Securities Beneficially Owned by each such Holder and the number of Other Securities Beneficially Owned by each such holder of Other Securities.

Section 2.3 Lock-Up Agreements.

(a) Each Holder agrees, in connection with any underwritten offering made pursuant to a Registration Statement filed pursuant to this Article II in which such Holder has elected to include Registrable Securities, if requested (pursuant to a written notice) by the managing underwriter(s) not to effect any public sale or distribution of any common equity securities of the Company (or securities convertible into or exchangeable or exercisable for such common equity securities) (except as part of such underwritten offering) during the period commencing not earlier than 7 days prior to and continuing for not more than 90 days (or such shorter period as the managing underwriter(s) may permit) after the effective date of the related Registration Statement (or a Prospectus supplement if the offering is made pursuant to a "shelf" registration) pursuant to which such underwritten offering shall be made; provided, that such Holders shall only be so bound so long as and to the extent that each other stockholder having registration rights with respect to the securities of the Company is similarly bound, and provided further that a request under this Section 2.3(a) shall not be effective more than once in any twelve-month period.

(b) With respect to each underwritten offering of Registrable Securities covered by a registration pursuant to Section 2.1, the Company agrees not to effect any public sale or distribution, or to file any registration statement (other than (x) any such registration statement required under Section 2.1 or (y) a registration statement (i) on Form S-4, Form S-8 or any successor forms thereto or (ii) filed solely in connection with any employee benefit or dividend reinvestment plan) covering any of its equity securities, or any securities convertible into or exchangeable or exercisable for such securities, during the period commencing not earlier than 7 days prior to and continuing for not more than 90 days (or such shorter period as the managing underwriter(s) may permit) after the effective date of the related registration statement (or a Prospectus supplement if the offering is made pursuant to a "shelf" registration) pursuant to which such underwritten offering of Registrable Securities shall be made, in each case, as may be requested by the managing underwriter for such offering; provided, that a request under this Section 2.3(b) shall not be effective more than once in any twelve-month period.

Section 2.4 Registration Procedures. If and whenever the Company is required to use its reasonable best efforts to effect the registration of any Registrable Securities under the Securities Act as provided in Article II, the Company shall effect such registration to permit the sale of such Registrable Securities in accordance with the intended method or methods of disposition thereof, and pursuant thereto the Company shall cooperate in the sale of the securities and shall, as expeditiously as possible:

(a) Prepare and file with the SEC a Registration Statement or Registration Statements on such form which shall be available for the sale of the Registrable Securities by the Holders or the Company in accordance with the intended method or methods of distribution thereof, and use its reasonable best efforts to cause such Registration Statement to become effective and to remain effective as provided herein; provided, however, that before filing a Registration Statement or Prospectus or any amendments or supplements thereto (including documents that would be incorporated or deemed to be incorporated therein by reference), the Company shall furnish or otherwise make available to the Selling Holders, their counsel and the managing underwriter(s), if any, copies of all such documents proposed to be filed (including all exhibits thereto), which documents will be subject to the reasonable review and comment of such counsel, and such other documents reasonably requested by such counsel, including any comment letter from the SEC, and, if requested by such counsel, provide such counsel reasonable opportunity to participate in the preparation of such Registration Statement and each Prospectus included therein and such other opportunities to conduct a reasonable investigation within the meaning of the Securities Act, including reasonable access to the Company's books and records, officers, accountants and other advisors. The Company shall not file any such Registration Statement or Prospectus or any amendments or supplements thereto (including such documents that, upon filing, would be incorporated or deemed to be incorporated by reference therein) with respect to any registration pursuant to Section 2.1 or 2.2 to which the Holders' Representative, its counsel, or the managing underwriter(s), if any, shall reasonably object, in writing, on a timely basis, unless, in the opinion of the Company, such filing is necessary to comply with applicable Law.

(b) Prepare and file with the SEC such amendments and post-effective amendments to each Registration Statement as may be necessary to keep such Registration Statement continuously effective during the period provided herein and comply in all material respects with the provisions of the Securities Act with respect to the disposition of all securities covered by such Registration Statement, and cause the related Prospectus to be supplemented by any Prospectus supplement or Issuer Free Writing Prospectus as may be necessary to comply with the provisions of the Securities Act with respect to the disposition of the securities covered by such Registration Statement, and as so supplemented to be filed pursuant to Rule 424 (or any similar provisions then in force) under the Securities Act.

(c) Notify each Selling Holder and the managing underwriter(s), if any, promptly, and (if requested by any such Person) confirm such notice in writing, (i) when a Prospectus or any Prospectus supplement, Issuer Free Writing Prospectus or post-effective amendment has been filed, and, with respect to a Registration Statement or any post-effective amendment, when the same has become effective, (ii) of any request by the SEC or any other Governmental Entity for amendments or supplements to a Registration Statement or related Prospectus or Issuer Free Writing Prospectus or for additional information, (iii) of the issuance by the SEC of any stop order suspending the effectiveness of a Registration Statement or the initiation of any proceedings for that purpose, (iv) if at any time the representations and warranties of the Company contained in any agreement (including any underwriting agreement contemplated by Section 2.4(o) below) cease to be true and correct, (v) of the receipt by the Company of any notification with respect to the suspension of the qualification or exemption from qualification of any of the Registrable Securities for sale in any jurisdiction, or the initiation or threatening of any proceeding for such purpose, and (vi) of the existence of any fact of which the Company becomes aware that makes any statement made in such Registration Statement or related Prospectus or any document incorporated or deemed to be incorporated therein by reference or any Issuer Free Writing Prospectus related thereto untrue in any material respect or that requires the making of any changes in such Registration Statement, Prospectus, documents or Issuer Free Writing Prospectus so that, in the case of the Registration Statement, it will not contain any untrue statement of a material fact or omit to state any material fact required to be stated therein or necessary to make the statements therein, not misleading, and that in the case of any Prospectus or Issuer Free Writing Prospectus, it will not contain any untrue statement of a material fact or omit to state any material fact necessary in order to make the statements therein, in light of the circumstances under which they were made, not misleading.

(d) Use its reasonable best efforts to obtain the withdrawal of any order suspending the effectiveness of a Registration Statement, or the lifting of any suspension of the qualification (or exemption from qualification) of any of the Registrable Securities for sale in any jurisdiction at the reasonably earliest practical date.

(e) If requested by the managing underwriter(s), if any, or the Holders of a majority of the Registrable Securities being sold in connection with an underwritten offering, promptly include in a Prospectus supplement, post-effective amendment or Issuer Free Writing Prospectus such information as the managing underwriter(s), if any, or such Holders may reasonably request in order to permit the intended method of distribution of such securities and make all required filings of such Prospectus supplement, such post-effective amendment or Issuer Free Writing Prospectus as soon as practicable after the Company has received such request.

(f) Furnish or make available to each Selling Holder, and each managing underwriter, if any, without charge, such number of conformed copies of the Registration Statement and each post-effective amendment thereto, including financial statements (but excluding schedules, all documents incorporated or deemed to be incorporated therein by reference, and all exhibits, unless requested in writing by such Holder, counsel or managing underwriter(s)), and such other documents, as such Holders or such managing underwriter(s) may reasonably request, and upon request a copy of any and all transmittal letters or other correspondence to or received from, the SEC or any other Governmental Entity relating to such offering.

(g) Deliver to each Selling Holder, and the managing underwriter(s), if any, without charge, as many copies of the Prospectus or Prospectuses (including each form of Prospectus and any Issuer Free Writing Prospectus related to any such Prospectuses) and each amendment or supplement thereto as such Persons may reasonably request in connection with the distribution of the Registrable Securities; and the Company, subject to the last paragraph of this Section 2.4, hereby consents to the use of such Prospectus and each amendment or supplement thereto by each of the Selling Holders and the managing underwriter(s), if any, in connection with the offering and sale of the Registrable Securities covered by such Prospectus and any such amendment or supplement thereto.

(h) Prior to any public offering of Registrable Securities, use its reasonable best efforts to register or qualify or cooperate with the Selling Holders, the managing underwriter(s), if any, and their respective counsel in connection with the registration or qualification (or exemption from such registration or qualification) of such Registrable Securities for offer and sale under the securities or "Blue Sky" laws of such jurisdictions within the United States as any seller or managing underwriter(s) reasonably requests in writing and to keep each such registration or qualification (or exemption therefrom) effective during the period such Registration Statement is required to be kept effective and to take any other action that may be necessary or advisable to enable such Selling Holders to consummate the disposition of such Registrable Securities in such jurisdiction; provided, however, that the Company will not be required to (i) qualify generally to do business in any jurisdiction where it is not then so qualified or (ii) take any action that would subject it to general service of process in any such jurisdiction where it is not then so subject.

(i) Cooperate with the Selling Holders and the managing underwriter(s), if any, to facilitate the timely preparation and delivery of certificates (not bearing any legends) representing Registrable Securities to be sold after receiving written representations from each Selling Holder that the Registrable Securities represented by the certificates so delivered by such Selling Holder will be transferred in accordance with the Registration Statement, and enable such Registrable Securities to be in such denominations and registered in such names as the managing underwriter(s), if any, or the Selling Holders may request at least 2 Business Days prior to any sale of Registrable Securities.

(j) Use its reasonable best efforts to cause the Registrable Securities covered by the Registration Statement to be registered with or approved by such other Governmental Entities within the United States, except as may be required solely as a consequence of the nature of such Selling Holder's business, in which case the Company will cooperate in all reasonable respects with the filing of such Registration Statement and the granting of such approvals as may be necessary to enable the seller or sellers thereof or the managing underwriter(s), if any, to consummate the disposition of such Registrable Securities.

(k) Upon the occurrence of any event contemplated by Section 2.4(c)(ii), (c)(iii), (c)(iv), (c)(v) or (c)(vi) above, prepare a supplement or post-effective amendment to the Registration Statement or a supplement to the related Prospectus or any document incorporated or deemed to be incorporated therein by reference or an Issuer Free Writing Prospectus related thereto, or file any other required document so that, as thereafter delivered to the Selling Holders, such Prospectus will not contain an untrue statement of a material fact or omit to state a material fact required to be stated therein or necessary to make the statements therein, in light of the circumstances under which they were made, not misleading.

(l) Prior to the effective date of the Registration Statement relating to the Registrable Securities, provide a CUSIP number for the Registrable Securities.

(m) Provide and cause to be maintained a transfer agent and registrar for all Registrable Securities covered by such Registration Statement from and after a date not later than the effective date of such Registration Statement.

(n) Use its reasonable best efforts to cause all shares of Registrable Securities covered by such Registration Statement to be authorized to be listed on each national securities exchange, if any, on which similar securities issued by the Company are then listed.

(o) Enter into such agreements (including an underwriting agreement in form, scope and substance as is customary in underwritten offerings) and take all such other actions reasonably requested by the Holders of a majority of the Registrable Securities being sold in connection therewith or by the managing underwriter(s), if any, to expedite or facilitate the disposition of such Registrable Securities, and in connection therewith, whether or not an underwriting agreement is entered into and whether or not the registration is an underwritten registration, (i) make such representations and warranties to the Selling Holders and the managing underwriter(s), if any, with respect to the business of the Company and its subsidiaries, and the Registration Statement, Prospectus and documents, if any, incorporated or deemed to be incorporated by reference therein, in each case, in form, substance and scope as are customarily made by issuers in underwritten offerings, and, if true, confirm the same if and when requested, (ii) use its reasonable best efforts to furnish to the Selling Holders of such Registrable Securities opinions of counsel to the Company and updates thereof (which counsel and opinions (in form, scope and substance) shall be reasonably satisfactory to the managing underwriter(s), if any, and counsels to the Selling Holders of the Registrable Securities), addressed to each Selling Holder of Registrable Securities and each of the managing underwriter(s), if any, covering the matters customarily covered in opinions requested in underwritten offerings and such other matters as may be reasonably requested by such counsel and managing underwriter(s), (iii) use its reasonable best efforts to obtain “cold comfort” letters and updates thereof from the independent certified public accountants of the Company (and, if necessary, any other independent certified public accountants of any Subsidiary of the Company or of any business acquired by the Company for which financial statements and financial data are, or are required to be, included in the Registration Statement) who have certified the financial statements included

in such Registration Statement, addressed to each Selling Holder of Registrable Securities (unless such accountants shall be prohibited from so addressing such letters by applicable standards of the accounting profession) and each of the managing underwriter(s), if any, such letters to be in customary form and covering matters of the type customarily covered in "cold comfort" letters in connection with underwritten offerings, (iv) if an underwriting agreement is entered into, the same shall contain indemnification provisions and procedures substantially to the effect set forth in Section 2.7 hereof with respect to all parties to be indemnified pursuant to said Section except as otherwise agreed by the Holders of a majority of the Registrable Securities being sold in connection therewith and the managing underwriter(s) and (v) deliver such documents and certificates as may be reasonably requested by the Holders of a majority of the Registrable Securities being sold in connection therewith, their counsel and the managing underwriter(s), if any, to evidence the continued validity of the representations and warranties made pursuant to clause (i) above and to evidence compliance with any customary conditions contained in the underwriting agreement or other agreement entered into by the Company. The above shall be done at each closing under such underwriting or similar agreement, or as and to the extent required thereunder.

(p) Upon execution of a customary confidentiality agreement, make available for inspection by a representative of the Selling Holders, the managing underwriter(s), if any, and any attorneys or accountants retained by such Selling Holders or managing underwriter(s), at the offices where normally kept, during reasonable business hours, financial and other records, pertinent corporate documents and properties of the Company and its Subsidiaries, and cause the officers, directors and employees of the Company and its Subsidiaries to supply all information in each case reasonably requested by any such representative, managing underwriter(s), attorney or accountant in connection with such Registration Statement.

(q) Cause its officers to use their reasonable best efforts to support the marketing of the Registrable Securities covered by the Registration Statement (including, without limitation, by participation in "road shows") taking into account the Company's business needs; provided, that, neither the Company nor its officers, employees or representatives shall be required to participate in any road show in connection with an offering of Registrable Securities for anticipated aggregate gross proceeds of less than $5 million.

(r) Otherwise use its reasonable best efforts to comply with all applicable rules and regulations of the SEC and any applicable national securities exchange, and make available to its security holders, as soon as reasonably practicable (but not more than 18 months) after the effective date of the Registration Statement, an earnings statement which shall satisfy the provisions of Section 11(a) of the Securities Act.

(s) Take all reasonable action to ensure that any Issuer Free Writing Prospectus utilized in connection with any registration covered by Section 2.1 or 2.2 complies in all material respects with the Securities Act, is filed in accordance with the Securities Act to the extent required thereby, is retained in accordance with the Securities Act to the extent required thereby and, when taken together with the related Prospectus, Prospectus supplement and related documents, will not contain any untrue statement of a material fact or omit to state a material fact necessary to make the statements therein, in light of the circumstances under which they were made, not misleading.

(t) Use its reasonable best efforts to take all other steps necessary to effect the registration of Registrable Securities contemplated hereby.

To the extent the Company is a well-known seasoned issuer (as defined in Rule 405 under the Securities Act) (a "**WKSI**") at the time any Demand Registration request is submitted to the Company, and such Demand Registration request requests that the Company file an automatic shelf registration statement (as defined in Rule 405 under the Securities Act) (an "**automatic shelf registration statement**") on Form S-3, the Company shall file an automatic shelf registration statement which covers those Registrable Securities which are requested to be registered. The Company shall use its reasonable best efforts to remain a WKSI (and not become an ineligible issuer (as defined in Rule 405 under the Securities Act)) during the period during which such automatic shelf registration statement is required to remain effective. If the Company does not pay the filing fee covering the Registrable Securities at the time the automatic shelf registration statement is filed, the Company agrees to pay such fee at such time or times as the Registrable Securities are to be sold. Subject to Section 2.5, if the automatic shelf registration statement has been outstanding for at least three years, at the end of the third year the Company shall, upon written request by the Holders' Representative, refile a new automatic shelf registration statement covering the Registrable Securities, if there are any remaining Registrable Securities covered thereunder. If at any time when the Company is required to re-evaluate its WKSI status the Company determines that it is not a WKSI, the Company shall use its reasonable best efforts to refile the shelf registration statement on Form S-3 and, if such form is not available, Form S-1 and keep such registration statement effective during the period during which such registration statement is required to be kept effective.

If the Company files any shelf registration statement for the benefit of the holders of any of its securities other than the Holders, the Company agrees that it shall use its reasonable best efforts to include in such registration statement such disclosures as may be required by Rule 430B under the Securities Act (referring to the unnamed selling security holders in a generic manner by identifying the initial offering of the securities to the Holders) in order to ensure that the Holders may be added to such shelf registration statement at a later time through the filing of a Prospectus supplement rather than a post-effective amendment.

The Company may require each Selling Holder to furnish to the Company in writing such information required in connection with such registration regarding such Selling Holder and the distribution of such Registrable Securities as the Company may, from time to time, reasonably request in writing and the Company may exclude from such registration the Registrable Securities of any Selling Holder who unreasonably fails to furnish such information within a reasonable time after receiving such request.

Each Selling Holder agrees that, upon receipt of any notice from the Company of the happening of any event of the kind described in Section 2.4(c)(ii), (c)(iii), or (c)(vi) hereof, such Holder will forthwith discontinue disposition of such Registrable Securities covered by such Registration Statement or Prospectus until such Holder's receipt of the copies of the supplemented or amended Prospectus contemplated by Section 2.4(k) hereof, or until it is advised in writing by the Company that the use of the applicable Prospectus may be resumed, and has received copies of any additional or supplemental filings that are incorporated or deemed to be incorporated by reference in such Prospectus; provided, however, that the Company shall extend the time periods under Section 2.1 and Section 2.2 with respect to the length of time that the effectiveness of a Registration Statement must be maintained by the amount of time the Holder is required to discontinue disposition of such securities.

Section 2.5 Rule 144. Notwithstanding anything in this Agreement to the contrary, the Company shall not be required to file or refile any registration statement pursuant to the provisions of Section 2.1(i), or refile any automatic shelf registration statement pursuant to Section 2.4(t), if the Company and the Holders' Representative shall receive a written opinion from counsel reasonably satisfactory to the Company and the Holders' Representative that the Holders can sell their Registrable Securities freely under Rule 144 without (x) any limitations on the amount of Registrable Securities which may be sold by the Holders or (y) any other requirement imposed by Rule 144 (including, without limitation, the requirement relating to the availability of current public information with respect to the Company).

Section 2.6 Certain Additional Agreements. If any Registration Statement or comparable statement under state "blue sky" laws refers to any Holder by name or otherwise as the Holder of any securities of the Company, then such Holder shall have the right to require (a) the insertion therein of language, in form and substance satisfactory to such Holder and the Company, to the effect that the holding by such Holder of such securities is not to be construed as a recommendation by such Holder of the investment quality of the Company's securities covered thereby and that such holding does not imply that such Holder will assist in meeting any future financial requirements of the Company, or (b) in the event that such reference to such Holder by name or otherwise is not in the judgment of the Company, as advised by counsel, required by the Securities Act or any similar federal statute or any state "blue sky" or securities law then in force, the deletion of the reference to such Holder; provided, however, that if any Registration Statement refers to any Holder by name or otherwise as the holder of any securities of the Company and if in such Holder's sole and exclusive judgment, such Holder is or might be deemed to be an underwriter or a controlling Person of the Company, then such Holder shall have the right to require (i) the insertion therein of language, in form and substance reasonably satisfactory to such Holder and the Company and presented to the Company in writing, to the effect that the holding by such Holder of such securities is not to be construed as a recommendation by such Holder of the investment quality of the Company's securities covered thereby and that such holding does not imply that such Holder will assist in meeting any future financial requirements of the Company, or (ii) in the event that such reference to such Holder by name or otherwise is not required by the Securities Act or any similar federal statute or any state "blue sky" or securities law then in force, the deletion of the reference to such Holder; provided that with respect to this clause (ii), if reasonably requested by the Company, such Holder shall furnish to the Company an opinion of counsel to such effect, which opinion and counsel shall be reasonably satisfactory to the Company.

Section 2.7 Indemnification.

(a) Indemnification by the Company. The Company shall indemnify and hold harmless, to the fullest extent permitted by Law, each Selling Holder whose Registrable Securities are covered by a Registration Statement or Prospectus, the officers, directors, partners (limited and general), members, managers, shareholders, accountants, attorneys, agents and employees of each of them, each Person who controls (within the meaning of Section 15 of the

Securities Act or Section 20 of the Exchange Act) each such Selling Holder and the officers, directors, partners (limited and general), members, managers, shareholders, accountants, attorneys, agents and employees of each such controlling Person, each underwriter (including any Holder that is deemed to be an underwriter pursuant to any SEC comments or policies), if any, and each Person who controls (within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act) such underwriter (collectively, "**Holder Indemnitees**"), from and against any and all losses, claims, damages, liabilities, expenses (including, without limitation, costs of preparation and reasonable attorneys' fees and any other reasonable fees or expenses incurred by such party in connection with any investigation or Action), judgments, fines, penalties, charges and amounts paid in settlement (collectively, "**Losses**"), as incurred, arising out of or based upon (i) any untrue statement (or alleged untrue statement) of a material fact contained in any applicable Registration Statement or any other offering circular, amendment of or supplement to any of the foregoing or other document incident to any such registration, qualification, or compliance, or the omission (or alleged omission) to state therein a material fact required to be stated therein or necessary to make the statements therein not misleading, (ii) any untrue statement (or alleged untrue statement) of a material fact contained in any preliminary or final Prospectus, any document incorporated by reference therein or any Issuer Free Writing Prospectus, or the omission or alleged omission to state therein a material fact required to be stated therein or necessary in order to make the statements therein, in the light of the circumstances under which they were made, not misleading, and (iii) any violation by the Company of any Law applicable in connection with any such registration, qualification, or compliance; provided, that the Company will not be liable to a Selling Holder or underwriter, as the case may be, in any such case to the extent that any such Loss arises out of or is based on any untrue statement or omission by such Selling Holder or underwriter, as the case may be, but only to the extent, that such untrue statement (or alleged untrue statement) or omission (or alleged omission) is made in such Registration Statement (or in any preliminary or final Prospectus contained therein, any document incorporated by reference therein or Issuer Free Writing Prospectus related thereto), offering circular, amendment of or supplement to any of the foregoing or other document in reliance upon and in conformity with written information furnished to the Company by such Selling Holder or underwriter specifically for inclusion in such document; and provided, further, that the Company will not be liable to any Person who participates as an underwriter in any underwritten offering or sale of Registrable Securities, or to any Person who is a Selling Holder in any non-underwritten offering or sale of Registrable Securities, or any other Person, if any, who controls such underwriter or Selling Holder within the meaning of the Securities Act, under the indemnity agreement in this Section 2.7 with respect to any preliminary Prospectus or the final Prospectus (including any amended or supplemented preliminary or final Prospectus), as the case may be, to the extent that any such loss, claim, damage or liability of such underwriter, Selling Holder or controlling Person results from the fact that such underwriter or Selling Holder sold Registrable Securities to a Person to whom there was not sent or given, at or prior to the written confirmation of such sale, a copy of the final Prospectus as then amended or supplemented, whichever is most recent, if the Company has previously furnished copies thereof to such underwriter or Selling Holder and such final Prospectus, as then amended or supplemented, has corrected any such misstatement or omission. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of any Holder Indemnitee or any other Holder and shall survive the transfer of such securities. The foregoing indemnity agreement is in addition to any liability that the Company may otherwise have to each Holder Indemnitee.

(b) Indemnification by Selling Holders. In connection with any Registration Statement in which a Selling Holder is participating by registering Registrable Securities, such Selling Holder agrees, severally and not jointly with any other Person, to indemnify and hold harmless, to the fullest extent permitted by Law, the Company, the officers and directors of the Company, and each Person who controls (within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act) the Company, and each underwriter, if any, and each Person who controls (within the meaning of Section 15 of the Securities Act or Section 20 of the Exchange Act) such underwriter (collectively, "**Company Indemnitees**"), from and against all Losses, as incurred, arising out of or based on any untrue statement (or alleged untrue statement) of a material fact contained in any such Registration Statement (or in any preliminary or final Prospectus contained therein, any document incorporated by reference therein or Issuer Free Writing Prospectus related thereto) or any other offering circular or any amendment of or supplement to any of the foregoing or any other document incident to such registration, or any omission (or alleged omission) to state therein a material fact required to be stated therein or necessary to make the statements therein (in the case of a final or preliminary Prospectus, in light of the circumstances under which they were made) not misleading, in each case solely to the extent that such untrue statement (or alleged untrue statement) or omission (or alleged omission) is made in such Registration Statement (or in any preliminary or final Prospectus contained therein, any document incorporated by reference therein or Issuer Free Writing Prospectus related thereto), offering circular, or any amendment of or supplement to any of the foregoing or other document in reliance upon and in conformity with written information furnished to the Company by such Selling Holder expressly for inclusion in such document. Such indemnity shall remain in full force and effect regardless of any investigation made by or on behalf of the Company or any of its directors, officers or controlling Persons. The Company may require as a condition to its including Registrable Securities in any Registration Statement filed hereunder that the holder thereof acknowledge its agreement to be bound by the provisions of this Agreement (including Section 2.7) applicable to it.

(c) Conduct of Indemnification Proceedings. If any Person shall be entitled to indemnity hereunder (an "**indemnified party**"), such indemnified party shall give prompt notice to the party from which such indemnity is sought (the "**indemnifying party**") of any claim or of the commencement of any Action with respect to which such indemnified party seeks indemnification or contribution pursuant hereto; provided, however, that the delay or failure to so notify the indemnifying party shall not relieve the indemnifying party from any obligation or liability except to the extent that the indemnifying party has been actually prejudiced by such delay or failure. The indemnifying party shall have the right, exercisable by giving written notice to an indemnified party promptly after the receipt of written notice from such indemnified party of such claim or Action, to assume, at the indemnifying party's expense, the defense of any such Action, with counsel reasonably satisfactory to such indemnified party; provided, however, that an indemnified party shall have the right to employ separate counsel in any such Action and to participate in the defense thereof, but the fees and expenses of such counsel shall be at the expense of such indemnified party unless: (i) the indemnifying party agrees to pay such fees and expenses; (ii) the indemnifying party fails promptly to assume, or in the event of a conflict of interest cannot assume, the defense of such Action or fails to employ counsel reasonably

satisfactory to such indemnified party, in which case the indemnified party shall also have the right to employ counsel and to assume the defense of such Action; or (iii) in the indemnified party's reasonable judgment a conflict of interest between such indemnified and indemnifying parties may exist in respect of such Action; provided, further, however, that the indemnifying party shall not, in connection with any one such Action or separate but substantially similar or related Actions in the same jurisdiction, arising out of the same general allegations or circumstances, be liable for the fees and expenses of more than one firm of attorneys (together with appropriate local counsel) at any time for all of the indemnified parties, or for fees and expenses that are not reasonable. Whether or not such defense is assumed by the indemnifying party, such indemnified party will not be subject to any liability for any settlement made without its consent (but such consent will not be unreasonably withheld or delayed). The indemnifying party shall not (without the written consent of the indemnified party) consent to entry of any judgment or enter into any settlement that does not include as an unconditional term thereof the giving by all claimants or plaintiffs to such indemnified party of a release, in form and substance reasonably satisfactory to the indemnified party, from all liability in respect of such claim or litigation.

(d) Contribution.

(i) If the indemnification provided for in this Section 2.7 is unavailable to an indemnified party in respect of any Losses (other than in accordance with its terms), then each applicable indemnifying party, in lieu of indemnifying such indemnified party, shall contribute to the amount paid or payable by such indemnified party as a result of such Losses, in such proportion as is appropriate to reflect the relative fault of the indemnifying party, on the one hand, and such indemnified party, on the other hand, in connection with the actions, statements or omissions that resulted in such Losses as well as any other relevant equitable considerations. The relative fault of such indemnifying party, on the one hand, and indemnified party, on the other hand, shall be determined by reference to, among other things, whether any action in question, including any untrue or alleged untrue statement of a material fact or omission or alleged omission to state a material fact, has been taken by, or relates to information supplied by, such indemnifying party or indemnified party, and the parties' relative intent, knowledge, access to information and opportunity to correct or prevent any such action, statement or omission.

(ii) The parties hereto agree that it would not be just and equitable if contribution pursuant to this Section 2.7(d) were determined by pro rata allocation or by any other method of allocation that does not take account of the equitable considerations referred to in the immediately preceding paragraph.

(iii) No Person guilty of fraudulent misrepresentation (within the meaning of Section 11(f) of the Securities Act) shall be entitled to contribution from any Person who was not guilty of such fraudulent misrepresentation.

(iv) The obligation of any Selling Holder obliged to make contribution pursuant to this Section 2.7(d) shall be several and not joint.

(e) Additional Provisions.

(i) Notwithstanding anything to the contrary contained in this Agreement, an indemnifying party that is a Holder shall not be required to indemnify or contribute any amount in excess of the amount by which the net proceeds from the sale of the Registrable Securities sold by such Holder in the applicable offering exceeds the amount of any damages that such Holder has otherwise been required to pay pursuant to Section 2.7(b).

(ii) The indemnification provided for under this Agreement shall remain in full force and effect regardless of any investigation made by or on behalf of the indemnified party or any officer, director, manager, partner or controlling Person of such indemnified party and shall survive the Transfer of securities.

(iii) The indemnification and contribution required by this Section 2.7 shall be made by periodic payments of the amount thereof during the course of the investigation or defense, as and when bills are received or Loss is incurred.

(iv) To the extent that any of the Selling Holders is, or would be expected to be, deemed to be an underwriter of Registrable Securities pursuant to any SEC comments or policies or any court of law or otherwise, the Company agrees that (i) the indemnification and contribution provisions contained in this Section 2.7 shall be applicable to the benefit of the Selling Holders in their role as deemed underwriter in addition to their capacity as a Selling Holder (so long as the amount for which any other Selling Holder is or becomes responsible does not exceed the amount for which such Selling Holder would be responsible if the Selling Holder were not deemed to be an underwriter of Registrable Securities) and (ii) the Selling Holders and their representatives shall be entitled to conduct the due diligence which they would normally conduct in connection with an offering of securities registered under the Securities Act, including receipt of customary opinions and comfort letters.

Section 2.8 Rule 144; Rule 144A. The Company covenants that it will use reasonable best efforts to timely file the reports required to be filed by it under the Securities Act and the Exchange Act and the rules and regulations adopted by the SEC thereunder (or, if the Company is not required to file such reports, it will, upon the request of any Holder, make publicly available other information so long as necessary to permit sales pursuant to Rule 144 or Rule 144A under the Securities Act or any similar rules or regulations hereafter adopted by the SEC), and it will take such further action as any Holder may reasonably request, all to the extent required from time to time to enable such Holder to sell Registrable Securities without registration under the Securities Act within the limitation of the exemptions provided by (i) Rule 144 or Rule 144A or Regulation S under the Securities Act, as such rules may be amended from time to time, or (ii) any similar rule or regulation hereafter adopted by the SEC. Upon the request of any Holder, the Company will deliver to such Holder a written statement as to whether it has complied with such requirements and, if not, the specifics thereof.

Section 2.9 Underwritten Registrations.

(a) If any offering of Registrable Securities pursuant to any Demand Registration or shelf registration is an underwritten offering, the Company shall have the right to select the investment banker or investment bankers and managers to administer the offering, subject to approval by the Holders' Representative, not to be unreasonably withheld or delayed. The Company shall have the right to select the investment banker or investment bankers and managers to administer any incidental or Piggyback Registration.

(b) No Person may participate in any underwritten registration hereunder unless such Person (i) agrees to sell the Registrable Securities or Other Securities it desires to have covered by the registration on the basis provided in any underwriting arrangements in customary form (including pursuant to the terms of any over-allotment or "green shoe" option requested by the managing underwriter, provided that no such person will be required to sell more than the number of Registrable Securities that such Person has requested the Company to include in any registration), and (ii) completes and executes all questionnaires, powers of attorney, indemnities, underwriting agreements and other documents required under the terms of such underwriting arrangements, provided that such Person (other than the Company) shall not be required to make any representations or warranties other than those related to title and ownership of shares and as to the accuracy and completeness of statements made in a Registration Statement, Prospectus, offering circular, or other document in reliance upon and in conformity with written information furnished to the Company or the managing underwriter(s) by such Person and provided further, that such Person's (other than the Company's) liability in respect of such representations and warranties shall not exceed such Person's net proceeds from the offering.

Section 2.10 Registration Expenses. The Company shall pay all reasonable documented expenses incident to the Company's performance of or compliance with its obligations under this Article II, including, without limitation, (i) all registration and filing fees (including, without limitation, fees and expenses (A) with respect to filings required to be made with the SEC, all applicable securities exchanges and/or the National Association of Securities Dealers, Inc. and (B) of compliance with securities or Blue Sky laws including any fees and disbursements of counsel for the underwriter(s) in connection with Blue Sky qualifications of the Registrable Securities pursuant to Section 2.4(h)), (ii) printing expenses (including expenses of printing certificates for Registrable Securities in a form eligible for deposit with The Depository Trust Company and of printing Prospectuses if the printing of Prospectuses is requested by the managing underwriter(s), if any, or by the Holders of a majority of the Registrable Securities included in any Registration Statement), (iii) messenger, telephone and delivery expenses of the Company, (iv) fees and disbursements of counsel for the Company, (v) expenses of the Company incurred in connection with any road show, and (vi) fees and disbursements of all independent certified public accountants (including, without limitation, the expenses of any "cold comfort" letters required by this Agreement) and any other Persons, including special experts retained by the Company. For the avoidance of doubt, the Company shall pay the fees and disbursements of one firm of counsel for the Holders in connection with each registration under Article II, but the Company shall not pay any underwriting discounts attributable to sales by Holders of Registrable Securities. In addition, the Company shall bear all of its internal expenses (including all salaries and expenses of its officers and employees performing legal or accounting duties), the expense of any annual audit, the fees and expenses incurred in connection with the listing of the securities to be registered on any securities exchange on which similar securities issued by the Company are then listed and rating agency fees and the fees and expenses of any Person, including special experts, retained by the Company.

ARTICLE III

Miscellaneous

Section 3.1 Other Activities; Nature of Holder Obligations.

(a) Notwithstanding anything in this Agreement, none of the provisions of this Agreement shall in any way limit an Investor or any of its Affiliates from engaging in any brokerage, investment advisory, financial advisory, anti-raid advisory, principaling, merger advisory, financing, asset management, trading, market making, arbitrage, investment activity and other similar activities conducted in the ordinary course of their business. Notwithstanding anything herein to the contrary, the restrictions contained in this Agreement shall not apply to Common Stock or any other equity securities of the Company, or any securities convertible into or exchangeable or exercisable for such securities, acquired by an Investor or any of its Affiliates following the effective date of the first Registration Statement of the Company covering Common Stock (or other equity securities of the Company, or any securities convertible into or exchangeable or exercisable for such securities) to be sold on behalf of the Company in an underwritten public offering.

(b) Nature of Holders' Obligations. The obligations of each Holder under this Agreement are several and not joint with the obligations of any other Holder, and no Holder shall be responsible in any way for the performance of the obligations of any other Holder under this Agreement. Nothing contained herein, and no action taken by any Holder pursuant hereto or in connection herewith, shall be deemed to constitute the Holders as a partnership, a joint venture or any other kind of entity, or create a presumption that the Holders are in any way acting in concert or as a group with respect to such obligations or any of the transactions contemplated by this Agreement.

Section 3.2 Adjustments Affecting Registrable Securities. The Company shall not take any action, or permit any change to occur, with respect to its securities which would adversely affect the ability of any Holder of Registrable Securities to include such Registrable Securities in a registration undertaken pursuant to this Agreement.

Section 3.3 Other Registration Rights Agreements. Until after the second Demand Registration, the Company shall not enter into any agreement with respect to any equity securities that grants or provides holders of such securities with registration rights that have terms more favorable than the registration rights granted to Holders of the Registrable Securities in this Agreement unless similar rights are granted to Holders of Registrable Securities. Each party acknowledges that the Company is in the process of negotiating a registration rights agreement with the lenders under the Company's second lien credit facility and that if such registration rights agreement is executed on substantially similar terms to this Agreement, the granting of registration rights thereunder shall not be in conflict with the terms of this Section 3.3.

Section 3.4 Conflicting Agreements. Each party represents and warrants that it has not granted and is not a party to any proxy, voting trust or other agreement that is inconsistent with or conflicts with any provision of this Agreement.

Section 3.5 Termination. This Agreement shall terminate upon the earlier of such time as there are no Registrable Securities and the tenth anniversary of the date hereof, except for the provisions of Sections 2.7, 2.8, 2.10 and this Article III, which shall survive such termination.

Section 3.6 Amendment and Waiver. Except as otherwise provided herein, no modification, amendment or waiver of any provision of this Agreement shall be effective against the Company or any Holder unless such modification, amendment or waiver is approved in writing by the Company and the Holders' Representative; provided that the written consent of the Company and Investor shall be sufficient in order to effect a modification, amendment or waiver of any provision of this Agreement which (i) affects only the rights of the Company or Investor or (ii) does not adversely affect the rights of any party hereto other than Investor. Any party hereto may waive any right of such party hereunder by an instrument in writing signed by such party and delivered to the other parties. The failure of any party to enforce any of the provisions of this Agreement shall in no way be construed as a waiver of such provisions and shall not affect the right of such party thereafter to enforce each and every provision of this Agreement in accordance with its terms.

Section 3.7 Severability. If any provision of this Agreement shall be declared by any court of competent jurisdiction to be illegal, void or unenforceable, all other provisions of this Agreement shall not be affected and shall remain in full force and effect.

Section 3.8 Entire Agreement. Except as otherwise expressly set forth herein, this Agreement, the SPA and the Warrant Agreement, together with the several agreements and other documents and instruments referred to herein or therein or annexed hereto or thereto, embody the complete agreement and understanding among the parties hereto with respect to the subject matter hereof and supersede and preempt any prior understandings, agreements or representations by or among the parties, written or oral, that may have related to the subject matter hereof in any way.

Section 3.9 Successors and Assigns. Neither this Agreement nor any right or obligation hereunder is assignable in whole or in part by any party without the prior written consent of the other party hereto, provided that an Investor may transfer its rights and obligations hereunder (in whole or in part) to any Transferee (and any Transferee may transfer such rights and obligations to any subsequent Transferee) without the prior written consent of the Company. Any such assignment shall be effective upon receipt by the Company of (x) written notice from the transferring Holder stating the name and address of any Transferee and identifying the number of shares of Registrable Securities with respect to which the rights under this Agreement are being transferred and the nature of the rights so transferred and (y) a written agreement in substantially the form attached as Exhibit A hereto from such Transferee to be bound by the applicable terms of this Agreement. Any such transfer shall be without prejudice to Section 3.3. Any action taken by the Holders' Representative shall not become void or ineffective as a result of a subsequent change in the identity of the Holders' Representative.

Section 3.10 Counterparts; Execution by Facsimile Signature. This Agreement may be executed in any number of counterparts, each of which shall be an original, but all of which together shall constitute one instrument. This Agreement may be executed by facsimile signature(s).

Section 3.11 Remedies.

(a) Each party hereto acknowledges that monetary damages would not be an adequate remedy in the event that any of the covenants or agreements in this Agreement is not performed in accordance with its terms, and it is therefore agreed that, in addition to and without limiting any other remedy or right it may have, the non-breaching party will have the right to an injunction, temporary restraining order or other equitable relief in any court of competent jurisdiction enjoining any such breach or threatened breach and enforcing specifically the terms and provisions hereof. Each party hereto agrees not to oppose the granting of such relief in the event a court determines that such a breach has occurred, and to waive any requirement for the securing or posting of any bond in connection with such remedy.

(b) All rights, powers and remedies provided under this Agreement or otherwise available in respect hereof at law or in equity shall be cumulative and not alternative, and the exercise or beginning of the exercise of any thereof by any party shall not preclude the simultaneous or later exercise of any other such right, power or remedy by such party.

Section 3.12 Notices. All notices required or permitted hereunder shall be in writing and shall be deemed effectively given (i) upon personal delivery to the party to be notified, (ii) when sent by confirmed facsimile if sent during normal business hours of the recipient, if not, then on the next Business Day or (iii) one Business Day after deposit with a nationally recognized overnight courier, specifying next day delivery, with written verification of receipt. All communications shall be sent to the addresses set forth below or such other address or facsimile number as a party may from time to time specify by notice to the other parties hereto:

If to the Company:

MoneyGram International, Inc.
2828 N. Harwood St., 15th Floor
Dallas, Texas 75201
Attention: Aaron Henry; Robert Villaseñor
Electronic mail: ahenry@moneygram.com; rvillasenor@moneygram.com

with a copy (which shall not constitute notice) to:

Vinson & Elkins LLP
2001 Ross Ave.
Suite 3900
Dallas, TX 75201
Attention: Alan Bogdanow; Chris Rowley
Phone: (214) 220-7857; (214) 220-7972
Electronic mail: abogdanow@velaw.com; crowley@velaw.com

If to Investor, to:

Ripple Labs Inc.
315 Montgomery St. Floor 2
San Francisco, CA 94104
Attn: General Counsel
Email: stu@ripple.com

with copies (which shall not constitute notice) to:

Skadden, Arps, Slate, Meagher & Flom LLP
525 University Avenue
Palo Alto, California 94301
Attention: Amr Razzak
Email: amr.razzak@skadden.com

and

Gunderson Dettmer Stough Villeneuve Franklin & Hachigian, LLP
One Bush Plaza
Suite 1200
San Francisco, CA 94104
Attention: Brooks Stough
Email: bstough@gunder.com

Section 3.13 Governing Law; Consent to Jurisdiction. (a) This Agreement shall be governed in all respects by the laws of the State of New York.

(a) Each of the parties hereto (a) consents to submit itself to the personal jurisdiction of any Federal or state court located in the Borough of Manhattan in the City of New York, New York in the event any dispute arises out of this Agreement, (b) agrees that it will not attempt to deny or defeat such personal jurisdiction by motion or other request for leave from any such court and (c) agrees that it will not bring any Action relating to this Agreement in any court other than a Federal or state court located in the Borough of Manhattan in the City of New York, New York.

(b) Each of the parties hereto hereby irrevocably and unconditionally waives trial by jury in any legal Action or proceeding in relation to this Agreement and for any counterclaim therein.

IN WITNESS WHEREOF, the parties hereto have executed this Registration Rights Agreement as of the date first written above.

MONEYGRAM INTERNATIONAL, INC.

By: /s/ Lawrence Angelilli
Name: Lawrence Angelilli
Title: Chief Financial Officer

RIPPLE LABS INC.

By: /s/ Brad Garlinghouse
Name: Brad Garlinghouse
Title: Chief Executive Officer

EXHIBIT A

MoneyGram International, Inc.
2828 N. Harwood St., 15th Floor
Dallas, Texas 75201
Attention: General Counsel

Ladies and Gentlemen:

Reference is made to the Registration Rights Agreement, dated as of June 17, 2019 (the "**Agreement**"), by and among MoneyGram International, Inc., a Delaware corporation (the "**Company**"), and Ripple Labs Inc. Capitalized terms used and not otherwise defined herein are used herein as defined in the Agreement. The undersigned ("**Transferee**") hereby: (i) acknowledges receipt of a copy of the Agreement; (ii) notifies the Company that, on *[Date],* Transferee acquired from *[insert name of assigning Holder]* (pursuant to a private transfer that was exempt from the registration requirements under the Securities Act) *[describe the Registrable Securities that were transferred]* (the "**Transferred Securities**") and an assignment of such transferor's rights under the Agreement with respect to the Transferred Securities, and the Transferee has assumed from such transferor the liability of the transferor in respect of any and all obligations under the Agreement related to the Transferred Securities; and (iii) agrees to be bound by all terms of the Agreement with respect to the Transferred Securities applicable to a Holder of such Transferred Securities as if the Transferee was an original signatory to the Agreement. Notices to the Transferee for purposes of the Agreement may be addressed to: [.], [•], Attn: [0], Fax: [0]. This document shall be governed by, and construed in accordance with, the laws of the State of New York, applicable to contracts executed in and to be performed entirely within that State.

[Transferee]

[By:] _____
Name:
[Title:]

cc: [Transferor]

Exhibit C

Form of Additional Closing Officer's Certificate

[See attached.]

MONEYGRAM INTERNATIONAL, INC.

ADDITIONAL CLOSING OFFICER'S CERTIFICATE

[•], 20[•]

Reference is made to that certain Securities Purchase Agreement (the "***Agreement***"), dated as of June 17, 2019, by and between MoneyGram International, Inc., a Delaware corporation (the "***Company***"), and Ripple Labs Inc., a Delaware corporation ("***Purchaser***"). Defined terms used but not otherwise defined herein shall have the meanings assigned to such terms in the Agreement.

The undersigned, being the [•][1] of the Company, pursuant to Section 7.1(c) of the Agreement, hereby certifies to Purchaser on and as of the date hereof, in his capacity as an executive officer of the Company, and not individually, as follows:

1. The Additional Closing Company Representations are true and correct as of the date hereof, with the same effect as though such Additional Closing Company Representations had been made on and as of the date hereof (other than any Additional Closing Company Representation that is made by its terms as of a specified date, which are true and correct as of such specified date);

2. The Company has performed, satisfied and complied in all material respects with the covenants, agreements and conditions required by the Agreement, and each Transaction Agreement to which the Company is or will be a party, to be performed, satisfied or complied with by the Company at or prior to the date hereof;

3. No Material Adverse Effect has occurred since the date of the Agreement; and

4. (A) No Termination Event has occurred since the date of the Agreement and is continuing and (B) no event has occurred since the date of the Agreement and is continuing which, but for the lapse of time or the giving of notice, or both, would constitute an Event of Default under the Company's senior secured first lien term facility (or any successor debt facility) or senior secured second lien term facility (or any successor debt facility).

[*Remainder of Page Intentionally Left Blank*]

---

1 Note to Draft: To be an executive officer of the Company.

IN WITNESS WHEREOF, the undersigned has executed this certificate as of the date first written above.

MONEYGRAM INTERNATIONAL, INC.

By: _____
Name:
Title:

Signature Page to Additional Closing Officer's Certificate

Exhibit D

Form of Purchaser Observer/Director NDA

[See attached.]

FORM OF

CONFIDENTIALITY AGREEMENT[1]

THIS CONFIDENTIALITY AGREEMENT (the "**Agreement**") is effective as of [•], 20[•], by and among MoneyGram International, Inc., a Delaware corporation (the "**Company**"), [ ] ("**Observer**"), and Ripple Labs Inc., a Delaware corporation ("**Purchaser**"), and together with the Company and Observer, the "**Parties**" and each a "**Party**"). Capitalized terms used but not defined herein have the meanings assigned to such terms in that certain Securities Purchase Agreement (the "**SPA**"), dated June 17, 2019, between the Company and Purchaser.

WHEREAS, on June 17, 2019, the Company and Purchaser entered into the SPA;

WHEREAS, pursuant to the SPA, and subject to certain conditions and exclusions as set forth therein, Purchaser is entitled to appoint an individual to attend and observe meetings of the Company Board and any Applicable Board Committee in a non-voting capacity (such person, the "**Purchaser Observer**");

WHEREAS, Purchaser has appointed Observer as the Purchaser Observer;

WHEREAS, during the course of Observer's appointment as the Purchaser Observer, Observer will have access to Confidential Information (as defined below) of the Company not readily available to the public; and

WHEREAS, in connection with such appointment and pursuant to the SPA, Observer has agreed to execute this Agreement as reasonably requested by the Company Board.

NOW THEREFORE, in consideration of the premises and the covenants contained herein, the Company, Observer and Purchaser do hereby covenant and agree as follows:

1. **Confidentiality**. Except as otherwise provided in Section 2, Observer agrees that it will keep confidential and will not disclose, divulge or use for any purpose (other than (i) for the benefit of the Company or (ii) Observer's use (but not disclosure) of Confidential Information for Observer to monitor, review and analyze Purchaser's current and future investment in the Company, the Company's implementation and use of Purchaser's xRapid platform or the strategic relationship between Purchaser and the Company, it being understood that any disclosure of Confidential Information by Observer is subject to the terms of this Agreement, including this Section 1 and Section 2) any Confidential Information obtained from the Company (including, without limitation, any Confidential Information received from the Company's Affiliates, employees, directors or advisors) unless such Confidential Information (a) is known or becomes publicly available (other than as a result of a breach of this Agreement, the SPA or that certain Mutual Confidentiality Agreement, dated May 12, 2017, by and between Ripple Services, Inc. and MoneyGram Payment Systems, Inc. (the "**Ripple NDA**")), (b) is or has been independently developed or conceived by Purchaser or its Affiliates or Observer without

[1] Note to Draft: Confidentiality Agreement with any Ripple director to be in substantially the same form as this Confidentiality Agreement with contextually appropriate changes.

use of the Company's Confidential Information, or (c) is or has been made known or disclosed to Observer by another Person without a breach of any obligation of confidentiality or duty such Person has to the Company. As used herein, "**Confidential Information**" shall mean any and all information or data (including non-privileged information) concerning the Company or its Affiliates, whether in verbal, visual, written, electronic or other form, which is disclosed, directly or indirectly, to Observer by the Company or any director, officer, employee, agent or other Representative of the Company (including all notices, minutes, consents and other materials that are non-public information), including analyses, compilations, copies, notes or summaries prepared or created by Observer, Purchaser or any of its Affiliates, or any of their Representatives to the extent that they contain, are based on or otherwise reflect such information or data.

2. **Covenants of Purchaser and Observer**.

(a) Observer shall, solely for the purpose of allowing Purchaser to monitor, review and analyze Purchaser's current and future investment in the Company, the Company's implementation and use of Purchaser's xRapid platform or the strategic relationship between Purchaser and the Company, have the right to disclose Confidential Information that is not Privileged Confidential Information (as defined below) to Purchaser, its controlled Affiliates or to any of its or their Representatives who (i) have a need to know such information and (ii) are informed of its confidential nature. "**Privileged Confidential Information**" shall mean Confidential Information (or any portion of any Confidential Information) disclosed to, or obtained by, Observer (1) to the extent marked, designated or labeled as protected by the attorney-client privilege, attorney work-product doctrine or similar protections or privileges and which is, or which would reasonably be expected to be, in fact subject to the attorney-client privilege, attorney-work product doctrine or similar protections (collectively, "**Privilege Protections**") or (2) with respect to which the Company, Company Board or any Representative of the Company has informed Observer, either orally or in writing, that it is subject to Privilege Protections. For the avoidance of doubt, Observer shall not disclose Privileged Confidential Information to any Person (other than other members of the Company Board and its counsel), including Purchaser or its controlled Affiliates or any of its or their Representatives.

(b) Observer and Purchaser shall, and Purchaser shall cause Observer to, (i) retain all Confidential Information in strict confidence and in accordance with the terms hereof; (ii) not release or disclose Confidential Information in any manner to any other Person (other than disclosures permitted pursuant to Section 2(a)); *provided*, *however*, that the foregoing shall not apply to the extent Purchaser, its Affiliates, any of its or their Representatives or Observer is compelled to disclose Confidential Information by judicial or administrative process or by requirements of law or regulation; *provided*, *further*, *however*, that, to the extent legally permissible, prior written notice of such disclosure shall be given to the Company so that the Company may take action, at its expense, to prevent such disclosure and any such disclosure is limited only to that portion of the Confidential Information which such Person is compelled to disclose.

(c) Observer and Purchaser, on behalf of itself and Observer, acknowledge that the Confidential Information is proprietary to the Company and may include trade secrets or other business information the disclosure of which could harm the Company. None of Purchaser, any of its Affiliates, their Representatives or Observer shall, by virtue of the Company's disclosure of, or such Person's use of any Confidential Information, acquire any rights with respect thereto, all of which rights (including intellectual property rights) shall remain exclusively with the Company. Purchaser shall be responsible for any breach of this Section 2 by Observer, any of its Affiliates, or its or their Representatives.

(d) Observer and Purchaser, on behalf of itself and Observer, agree that, upon the request of the Company following the termination of Purchaser's right to designate a Purchaser Observer and Purchaser Director under the SPA, it will (and will cause Observer, its Affiliates and its and their Representatives to) promptly (i) destroy all physical materials containing or consisting of Confidential Information and all hard copies thereof in their respective possession or control; and (ii) destroy all electronically stored Confidential Information in their possession or control; *provided, however*, that each of Purchaser, its Affiliates, and its and their Representatives may retain any electronic or written copies of Confidential Information as may be (1) stored on its electronic records or storage system resulting from automated back-up systems; (2) required by law, other regulatory requirements, or internal document retention policies; or (3) contained in presentations or minutes of board meetings of Purchaser or its Affiliates; *provided, further, however*, that any such retained Confidential Information shall remain subject to this Section 2.

3. **Securities Law Matters**. Purchaser and Observer acknowledge and will advise their respective Affiliates and Representatives that United States securities laws prohibit any Person who has received from an issuer any material, non-public information from purchasing or selling securities of such issuer or from communicating such information to any other Person under circumstances in which it is reasonably foreseeable that such Person is likely to purchase or sell such securities.

4. **Termination**. This Agreement and all rights and obligations hereunder shall terminate at the time Observer resigns, is removed or replaced; *provided*, *that* the non-use and non-disclosure obligations contained herein shall survive for one year following the date on which Purchaser no longer has the right to designate a Purchaser Observer or Purchaser Director pursuant to the SPA; *provided*, *further*, such termination shall not relieve a Party from its responsibilities in respect of any breach of this Agreement prior to such termination.

5. **Severability**. Any provision of this Agreement which is prohibited or unenforceable in any jurisdiction shall, as to such jurisdiction, be ineffective to the extent of such prohibition or unenforceability without invalidating the remaining provisions hereof, and any such prohibition or unenforceability in any jurisdiction shall not invalidate or render unenforceable such provision in any other jurisdiction.

6. **Governing Law; Specific Performance**. This Agreement shall be governed by, and construed in accordance with, the laws of the State of Delaware (without giving effect to choice of law or conflict of laws principles thereof that would cause the application of the Laws of any jurisdiction other than the State of Delaware). Each Party acknowledges that its breach of this Agreement may cause irreparable damage to the other Party and hereby agrees that the other Party may seek injunctive relief under this Agreement for such breach or threatened breach as well as such further relief as may be granted by a court of competent jurisdiction. Such relief shall be available without the obligation to prove any damages underlying such breach, and each Party further agrees to waive any requirement for the securing or posting of any bond in connection with any such remedy.

7. **Notices**. All notices and other communications hereunder shall be in writing and shall be deemed given (i) upon receipt if sent by facsimile or email (provided confirmation of transmission is mechanically or electronically generated and kept on file by the sending party); (ii) on the first Business Day following the date of dispatch if delivered by a recognized next day courier service; or (iii) on the third Business Day following the date of mailing if delivered by registered or certified mail, return receipt requested, postage prepaid. All notices hereunder shall be delivered to the address set forth on the signature page of the applicable Party to this Agreement or pursuant to such other instructions as may be designated in writing by the Party to receive such notice.

8. **Successors and Assigns**. No Party to this Agreement may assign its rights or obligations under this Agreement without the written consent of the other Parties. This Agreement shall be binding upon and inure to the benefit of the Company, Observer and Purchaser and their respective successors and permitted assigns.

9. **Amendment and Waiver**. This Agreement and any terms hereof may not be amended, supplemented or modified except pursuant to a writing signed by the Company, Observer and Purchaser. Any waiver or any breach of any of the terms or conditions of this Agreement shall not operate as a waiver of any other breach of such terms or conditions or of any other term or condition, nor shall any failure to insist upon strict performance or to enforce any provision hereof on any one occasion operate as a waiver of such provision or of any other provision hereof or a waiver of the right to insist upon strict performance or to enforce such provision or any other provision on any subsequent occasion. Any waiver must be in writing signed by the Person exercising such waiver.

10. **No Other Amendment or Modification**. Nothing in this Agreement amends, modifies or waives any Party's rights or obligations under the SPA or Ripple NDA and such agreements shall remain in full force and effect.

11. **Counterparts**. This Agreement may be executed in two or more identical counterparts, all of which shall be considered an original and one and the same agreement and shall become effective when counterparts have been signed by each Party and delivered to the other Parties, it being understood that all Parties need not sign the same counterpart. In the event that any signature is delivered by facsimile transmission or by an e-mail which contains a portable document format (.pdf) file of an executed signature page, such signature page shall create a valid and binding obligation of the Party executing (or on whose behalf such signature is executed) with the same force and effect as if such signature page were an original thereof.

[Signature Page Follows]

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement effective as of the day and year first above written.

COMPANY:

MONEYGRAM INTERNATIONAL, INC.

By: _____
Name: _____
Title: _____

Address: 2828 N. Harwood Street, 15th Floor
Dallas, Texas 75201
Attention: F. Aaron Henry; Robert L. Villaseñor
Email: ahenry@moneygram.com; rvillasenor@moneygram.com

SIGNATURE PAGE – CONFIDENTIALITY AGREEMENT

OBSERVER**:**

_____

[OBSERVER]

Address: _____

_____

_____

SIGNATURE PAGE – CONFIDENTIALITY AGREEMENT

PURCHASER**:**

RIPPLE LABS INC.

By: _____
Name: _____
Title: _____

Address: 315 Montgomery St. Floor 2
San Francisco, California 94104
Attention: General Counsel
Email: stu@ripple.com

SIGNATURE PAGE – CONFIDENTIALITY AGREEMENT

Exhibit N

Exhibit 99.1

MoneyGram Announces Strategic Partnership with Ripple

Includes $30 million equity investment in MoneyGram and commercial partnership leveraging blockchain-based technology

Provides Update on Refinancing

DALLAS – June 17, 2019 – MoneyGram International, Inc. (NASDAQ: MGI), one of the world's largest money transfer companies, announced today that it has entered into a strategic agreement with Ripple, a provider of leading enterprise blockchain solutions for global payments. This agreement will enable MoneyGram to utilize Ripple's xRapid product (XRP) in foreign exchange settlement as part of the MoneyGram's cross-border payment process. The partnership supports the companies' shared goal of improving the settlement of cross-border payments by increasing efficiency and reducing cost through integration of the XRP platform.

Through this partnership, which will have an initial term of two years, Ripple will become MoneyGram's key partner for cross-border settlement using digital assets. As part of this partnership, Ripple has made an initial investment of $30 million in MoneyGram equity, made up of common stock and a warrant to purchase common stock. Ripple purchased the newly-issued common stock (including the shares underlying the warrant) from MoneyGram at $4.10 per share, which represents a significant premium to MoneyGram's current market price. In addition, at MoneyGram's election, Ripple may fund additional purchases of common stock or warrants up to $20 million at a minimum price of $4.10 per share.

"I'm extremely excited about Ripple's investment in MoneyGram and the related strategic partnership," said Alex Holmes, MoneyGram Chairman and CEO. "As the payments industry evolves, we are focused on continuing to improve our platform and utilizing the best technology as part of our overall settlement process," said Mr. Holmes. "Through our partnership with Ripple, we will also have the opportunity to further enhance our operations and streamline our global liquidity management. Since our initial partnership announced in January 2018, we have gotten to know Ripple and are looking forward to further leveraging the strengths of both of our businesses."

Today, MoneyGram relies on traditional foreign exchange markets to meet its settlement obligations, which require advance purchases of most currencies. Through this strategic partnership, MoneyGram will be able to settle key currencies and match the timing of funding with its settlement requirements, reducing operating costs, working capital needs and improving earnings and free cash flow.

"This strategic partnership will enable MoneyGram to greatly improve its operations and enable millions of people around the world to benefit from its improved efficiency. This is a huge milestone in helping to transform cross-border payments and I look forward to a long-term, very strategic partnership between our companies," said Brad Garlinghouse, CEO of Ripple.

"We are very pleased with the terms of the Ripple investment which supports the Company with permanent capital and additional liquidity," said Larry Angelilli, Chief Financial Officer of MoneyGram. "This partnership also provides MoneyGram with the opportunity to improve operating efficiencies and increase earnings and free cash flow."

Separately, MoneyGram is providing the update that it continues to make progress toward closing the refinancing of its existing first lien term and revolving facilities and expects to announce the closing of that transaction next week.

About MoneyGram

MoneyGram is a global leader in omnichannel money transfer and payment services that enables friends and family to safely, affordably, and conveniently send money for life's daily needs in over 200 countries and territories.

The innovative MoneyGram platform leverages its leading digital and physical network, global financial settlement engine, cloud-based infrastructure with integrated APIs, and its unparalleled compliance program that leads the industry in protecting consumers.

For more information, please visit MoneyGram.com

Forward-Looking Statements

This communication contains forward-looking statements which are protected as forward-looking statements under the Private Securities Litigation Reform Act of 1995 that are not limited to historical facts, but reflect the Company's current beliefs, expectations or intentions regarding future events. Words such as "may," "will," "could," "should," "expect," "plan," "project," "intend," "anticipate," "believe," "estimate," "predict," "potential," "pursuant," "target," "continue," and similar expressions are intended to identify such forward-looking statements. The statements in this communication that are not historical statements are forward-looking statements within the meaning of the federal securities laws. Specific forward-looking statements include, among others, statements regarding the company's projected results of operations, specific factors expected to impact the company's results of operations, and the expected restructuring and reorganization program results. Forward-looking statements are subject to numerous risks and uncertainties, many of which are beyond the Company's control, which could cause actual results to differ materially from the results expressed or implied by the statements. These risks and uncertainties include, but are not limited to: our ability to consummate future common stock and warrant Issuances under the agreement with Ripple, our ability to close the Company's contemplated second lien term facility or complete the refinancing of its first lien term loan and revolving credit facilities; our ability to compete effectively; our ability to maintain key agent or biller relationships, or a reduction in business or transaction volume from these relationships, including our largest agent, Walmart, whether through the introduction by Walmart of additional competing "white label" branded money transfer products or otherwise; our ability to manage fraud risks from consumers or agents; the ability of us and our agents to comply with U.S. and international laws and regulations; litigation or investigations involving us or our agents; uncertainties relating to compliance with the agreements entered into with the U.S. federal government and the effect of the Agreements on our reputation and business; regulations addressing consumer privacy, data use and security; our ability to successfully develop and timely introduce new and enhanced products and services and our investments in new products, services or infrastructure changes; our ability to manage risks associated with our international sales and operations; our offering of money transfer services through agents in regions that are politically volatile; changes in tax laws or an unfavorable outcome with respect to the audit of our tax returns or tax positions, or a failure by us to establish adequate reserves for tax

events; our substantial debt service obligations, significant debt covenant requirements and credit ratings; major bank failure or sustained financial market illiquidity, or illiquidity at our clearing, cash management and custodial financial institutions; the ability of us and our agents to maintain adequate banking relationships; a security or privacy breach in systems, networks or databases on which we rely; disruptions to our computer network systems and data centers; weakness in economic conditions, in both the U.S. and global markets; a significant change, material slow down or complete disruption of international migration patterns; the financial health of certain European countries or the secession of a country from the European Union; our ability to manage credit risks from our agents and official check financial institution customers; our ability to adequately protect our brand and intellectual property rights and to avoid infringing on the rights of others; our ability to attract and retain key employees; our ability to manage risks related to the operation of retail locations and the acquisition or start-up of businesses; any restructuring actions and cost reduction initiatives that we undertake may not deliver the expected results and these actions may adversely affect our business; our ability to maintain effective internal controls; our capital structure and the special voting rights provided to designees of Thomas H. Lee Partners, L.P. on our Board of Directors; and uncertainties described in the "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" sections of the Company's public reports filed with the Securities and Exchange Commission (the "SEC"), including the Company's annual report on Form 10-K for the year ended December 31, 2018 and the Company's quarterly report on Form 10-Q for the quarterly period ended March 31, 2019.

Additional information concerning factors that could cause actual results to differ materially from those in the forward-looking statements is contained from time to time in the Company's SEC filings. The Company's SEC filings may be obtained by contacting the Company, through the Company's web site at ir.moneygram.com or through the SEC's Electronic Data Gathering and Analysis Retrieval System (EDGAR) at http://www.sec.gov. The Company undertakes no obligation to publicly update or revise any forward-looking statement.

Contact:

Investor Relations:
214-979-1400
ir@moneygram.com

Media:
Wendi Schlarb
media@moneygram.com
214-999-7687

Exhibit O

UNITED STATES
SECURITIES AND EXCHANGE COMMISSION
Washington, D.C. 20549

FORM 8-K

CURRENT REPORT
Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

Date of Report (Date of earliest event reported): February 24, 2020

MoneyGram International, Inc.

(Exact name of registrant as specified in its charter)

Delaware	**1-31950**	**16-1690064**
(State or other jurisdiction of incorporation)	(Commission File Number)	(I.R.S. Employer Identification Number)
2828 N. Harwood Street, 15th Floor Dallas, Texas		**75201**
(Address of principal executive offices)		(Zip code)

Registrant's telephone number, including area code: **(214) 999-7552**

Not applicable

(Former name or former address, if changed since last report)

Check the appropriate box below if the Form 8-K filing is intended to simultaneously satisfy the filing obligation of the registrant under any of the following provisions:

[ ] Written communications pursuant to Rule 425 under the Securities Act (17 CFR 230.425)

[ ] Soliciting material pursuant to Rule 14a-12 under the Exchange Act (17 CFR 240.14a-12)

[ ] Pre-commencement communications pursuant to Rule 14d-2(b) under the Exchange Act (17 CFR 240.14d-2(b))

[ ] Pre-commencement communications pursuant to Rule 13e-4(c) under the Exchange Act (17 CFR 240.13e-4(c))

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	**Trading Symbol(s)**	**Name of each exchange on which registered**
Common stock, $0.01 par value	**MGI**	**The NASDAQ Stock Market LLC**

Indicate by check mark whether the registrant is an emerging growth company as defined in Rule 405 of the Securities Act of 1933 (§230.405 of this chapter) or Rule 12b-2 of the Securities Exchange Act of 1934 (§240.12b-2 of this chapter).

Emerging growth company ☐

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐

Item 2.02 Results of Operations and Financial Condition.

On February 24, 2020, MoneyGram International, Inc. (the "Company") issued a press release reporting financial results for its fourth quarter and full year ended December 31, 2019. A copy of the press release is furnished herewith as Exhibit 99.1.

Item 9.01 Financial Statements and Exhibits.

(d) Exhibits

Exhibit No.	Description of Exhibit
99.1	Press release dated February 24, 2020.

SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned hereunto duly authorized.

MONEYGRAM INTERNATIONAL, INC.

By: /s/ Lawrence Angelilli
Name: Lawrence Angelilli
Title: Chief Financial Officer

Date: February 24, 2020

EXHIBIT INDEX

Exhibit No.	Description of Exhibit
99.1	Press release dated February 24, 2020.

MoneyGram International Reports Fourth Quarter and Full Year 2019 Financial Results

DALLAS (February 24, 2020) -- MoneyGram International, Inc. (NASDAQ: MGI) today reported financial results for its fourth quarter and full year ending December 31, 2019.

Fourth Quarter Business Update

- MoneyGram's business transformation continued to accelerate, demonstrated by the success of MoneyGram's direct-to-consumer digital business in addition to continued better-than-expected expense reductions as a result of modernizing and digitizing global operations.
- MoneyGram Online achieved 39% year-over-year transaction growth in the fourth quarter, led by strong international performance, with transaction and revenue growth of 113% and 53%, respectively.
- International markets, which represent 62% of total money transfer revenue, strengthened both sequentially and year-over-year, posting 7% transaction growth and 3% revenue growth from the same quarter in 2018.
- MoneyGram continued to launch innovative solutions to improve the customer experience and to lead the evolution of digital P2P payments. Exciting recent launches include the innovative FastSend™ service enabling customers to send money directly to a phone number. Additionally, MoneyGram continued to expand its strategic partnership with Ripple as the first money transfer company to scale the use of blockchain capabilities.

Commenting on the progress made in 2019, Alex Holmes, Chairman and CEO noted, "This was a pivotal year for us as we continued to execute our digital transformation and deliver a differentiated experience to our customers. Throughout the year we launched innovative product solutions, invested in new technology, renewed key partner relationships, led the industry in consumer protection and re-established our competitive position in the market. The combination of our efforts is resonating with consumers around the world. Our direct-to-consumer digital business achieved strong growth rates and international markets continued to outperform, which enabled us to return to transaction growth in the month of December. Importantly, we also delivered record online digital transaction growth during the 2019 holiday season and reported Adjusted EBITDA for the fourth quarter that exceeded our expectations."

Fourth Quarter 2019 Financial Results

- Revenue was $323.7 million, a decline of 6% from the fourth quarter 2018. Revenue excludes $8.9

million of benefit from Ripple, which will be accounted for as a contra expense rather than revenue based on a recent consultation with the Securities and Exchange Commission.

- At the time the Company issued fourth quarter guidance, it assumed Ripple market development fees would be accounted for as revenue, consistent with the third quarter treatment. As a result of the change, the Ripple financial benefit of $8.9 million in the fourth quarter and $2.4 million in the third quarter is now accounted for as offset to operating expenses, in Transaction and Operations Support and is no longer included in revenue.

  - Global Funds Transfer segment revenue was $299.7 million, down 6% from the fourth quarter of the prior year. Within the segment, money transfer revenue was $285.9 million, a decline of 6%, and bill payment revenue was $13.8 million.
  - Investment revenue was $12.4 million, a decline of $1.6 million from the fourth quarter in 2018.
- Total operating expenses were $311.0 million, an improvement of $21.1 million over the fourth quarter of 2018. This is an improvement of 6% from 2018's fourth quarter.
- Net loss was $11.9 million compared with $12.5 million for the fourth quarter of 2018.
- Adjusted EBITDA was $57.6 million compared with $60.0 million in the previous year's fourth quarter. Adjusted EBITDA margin improved to 17.8% from 17.4% in the fourth quarter of 2018.
- Diluted loss per share was $0.16 and adjusted diluted income per share was $0.01.
- Adjusted Free Cash Flow was $19.8 million.

Full Year 2019 Financial Results

- Total revenue of $1,285.1 million declined 11% on a reported basis and 10% on a constant currency basis compared to 2018. Revenue excludes $11.3 million of Ripple benefit, which is now recorded as a contra expense.
  - Global Funds Transfer segment revenue was $1,183.3 million. The segment revenue is comprised of money transfer revenue of $1,123.9 million and bill pay revenue of $59.4 million.
- Total operating expenses were $1,233.1 million for the full year, which includes $11.3 million benefit from Ripple.
- Net loss was $60.3 million compared with $24.0 million in 2018. The year-over-year change was primarily due to a $31.3 million non-cash pension settlement charge related to the sale of the pension liabilities, a $2.4 million of debt extinguishment costs, as well as a $30.0 million merger termination payment received in 2018.
- Adjusted EBITDA was $213.7 million, a 13% decrease on a reported basis and an 11% decrease on a constant currency basis compared to 2018. The decrease is primarily related to the decrease in revenue.
- For the year, diluted loss per share was $0.85 and adjusted diluted income per share was $0.03.
- Adjusted Free Cash Flow was $62.4 million. The $38.6 million decrease from 2018 is composed of lower Adjusted EBITDA and higher cash payments for interest.

Balance Sheet Highlights and Capital Structure Highlights

Cash and cash equivalents on hand at December 31, 2019 totaled $146.8 million compared to $145.5 million at the end of 2018. Fourth quarter and full year interest expense was $24.3 million and $77.0 million, respectively. Capital expenditures in 2019 were $54.5 million.

First Quarter 2020 Outlook

For the first quarter 2020, the Company anticipates total revenue of approximately $300 million, and Adjusted EBITDA of approximately $50 million, both on a constant currency basis.

"We have invested proactively during the past several years to re-position MoneyGram as a modern, mobile, API-driven organization that is leading the evolution of digital P2P payments. While we begin

2020 with challenges in our US-outbound and US domestic walk-in businesses, we have a significant pipeline of agent renewals and new signings along with innovative digital products and growth opportunities that have the potential to offset these challenges and improve our financial performance," said Holmes. "We will continue to focus on growing our customer base, while implementing market-specific strategies that set us uniquely apart from the competition. We are excited about the underlying strength in our business and the momentum created by the transformation of our business."

Forward-Looking Statements

This communication contains forward-looking statements which are protected as forward-looking statements under the Private Securities Litigation Reform Act of 1995 that are not limited to historical facts, but reflect MoneyGram's current beliefs, expectations or intentions regarding future events. Words such as "may," "will," "could," "should," "expect," "plan," "project," "intend," "anticipate," "believe," "estimate," "predict," "potential," "pursuant," "target," "continue," and similar expressions are intended to identify such forward-looking statements. The statements in this communication that are not historical statements are forward-looking statements within the meaning of the federal securities laws. Specific forward-looking statements include, among others, statements regarding the company's projected results of operations, specific factors expected to impact the company's results of operations, and the expected restructuring and reorganization program results. Forward-looking statements are subject to numerous risks and uncertainties, many of which are beyond MoneyGram's control, which could cause actual results to differ materially from the results expressed or implied by the statements. These risks and uncertainties include, but are not limited to: our ability to compete effectively; our ability to maintain key agent or biller relationships, or a reduction in business or transaction volume from these relationships, including our largest agent, Walmart, whether through the introduction by Walmart of additional competing "white label" branded money transfer products or otherwise; our ability to manage fraud risks from consumers or agents; the ability of us and our agents to comply with U.S. and international laws and regulations; litigation or investigations involving us or our agents; uncertainties relating to compliance with the DPA entered into with the U.S. federal government and the effect of the DPA on our reputation and business; regulations addressing consumer privacy, data use and security; our ability to successfully develop and timely introduce new and enhanced products and services and our investments in new products, services or infrastructure changes; our ability to manage risks associated with our international sales and operations; our offering of money transfer services through agents in regions that are politically volatile; changes in tax laws or an unfavorable outcome with respect to the audit of our tax returns or tax positions, or a failure by us to establish adequate reserves for tax events; our substantial debt service obligations, significant debt covenant requirements and credit ratings; major bank failure or sustained financial market illiquidity, or illiquidity at our clearing, cash management and custodial financial institutions; the ability of us and our agents to maintain adequate banking relationships; a security or privacy breach in systems, networks or databases on which we rely; disruptions to our computer network systems and data centers; weakness in economic conditions, in both the U.S. and global markets; a significant change, material slow down or complete disruption of international migration patterns; the financial health of certain European countries or the secession of a country from the European Union; our ability to manage credit risks from our agents and official check financial institution customers; our ability to adequately protect our brand and intellectual property rights and to avoid infringing on the rights of others; our ability to attract and retain key employees; our ability to manage risks related to the operation of retail locations and the acquisition or start-up of businesses; any restructuring actions and cost reduction initiatives that we undertake may not deliver the expected results and these actions may adversely affect our business; our ability to maintain effective internal controls; our capital structure; and uncertainties described in the "Risk Factors" and "Management's Discussion and Analysis of Financial Condition and Results of Operations" sections of MoneyGram's public reports filed with the Securities and Exchange Commission (the "SEC"), including MoneyGram's annual report on Form 10-K for the year ended December 31, 2018 and MoneyGram's quarterly reports on Form 10-Q.

Additional information concerning factors that could cause actual results to differ materially from those in the forward-looking statements is contained from time to time in MoneyGram's SEC filings. MoneyGram's SEC filings may be obtained by contacting MoneyGram, through MoneyGram's web site at ir.moneygram.com or through the SEC's Electronic Data Gathering and Analysis Retrieval System ("EDGAR") at http://www.sec.gov. MoneyGram undertakes no obligation to publicly update or revise any forward-looking statement.

###

Non-GAAP Measures

In addition to results presented in accordance with accounting principles generally accepted in the United States ("GAAP"), this news release and related tables include certain non-GAAP financial measures, including a presentation of EBITDA (earnings before interest, taxes, depreciation and amortization, including agent signing bonus amortization), Adjusted EBITDA (EBITDA adjusted for certain significant items), Adjusted EBITDA margin, Adjusted Free Cash Flow (Adjusted EBITDA less cash interest, cash taxes and cash payments for capital expenditures and agent signing bonuses), constant currency measures (which assume that amounts denominated in non-U.S. dollars are translated to the U.S. dollar at rates consistent with those in the prior year), adjusted diluted earnings per share and adjusted net income. In addition, we present adjusted operating income and adjusted operating margin for our two reporting segments. The following tables include a full reconciliation of non-GAAP financial measures to the related GAAP financial measures. The equivalent GAAP financial measures for projected results are not provided, and projected results do not reflect the potential impact of certain non-GAAP adjustments, which include (but in future periods, may not be limited to) stock-based, contingent and incentive compensation costs, compliance enhancement program costs, direct monitor costs, legal and contingent matter costs, restructuring and reorganization costs, currency changes and the tax effect of such items. We cannot reliably predict or estimate if and when these types of costs, adjustments or changes may occur or their impact to our financial statements. Accordingly, a reconciliation of the non-GAAP financial measures to the equivalent GAAP financial measures for projected results is not available.

We believe that these non-GAAP financial measures provide useful information to investors because they are an indicator of the strength and performance of ongoing business operations. These calculations are commonly used as a basis for investors, analysts and other interested parties to evaluate and compare the operating performance and value of companies within our industry. Finally, EBITDA, Adjusted EBITDA, Adjusted EBITDA margin, Adjusted Free Cash Flow, constant currency, adjusted diluted earnings per share and adjusted net income figures are financial and performance measures used by management in reviewing results of operations, forecasting, allocating resources or establishing employee incentive programs. Although MoneyGram believes the above non-GAAP financial measures enhance investors' understanding of its business and performance, these non-GAAP financial measures should not be considered in isolation or as substitutes for the accompanying GAAP financial measures.

Description of Tables

Table One	-	Condensed Consolidated Statements of Operations
Table Two	-	Segment Results
Table Three	-	Segment Reconciliations
Table Four	-	Reconciliation of Certain Non-GAAP Measures to Relevant GAAP Measures - EBITDA, Adjusted EBITDA, Adjusted EBITDA Margin and Adjusted Free Cash Flow
Table Five	-	Reconciliation of Certain Non-GAAP Measures to Relevant GAAP Measures - Adjusted Net Income and Adjusted Diluted EPS
Table Six	-	Condensed Consolidated Balance Sheets
Table Seven	-	Condensed Consolidated Statements of Cash Flows

Conference Call

MoneyGram International will host a conference call on February 25, at 9:00 a.m. ET, to discuss its results. Alex Holmes, Chairman and CEO, and Larry Angelilli, CFO, will host the call.

Participant Dial-In Numbers:	
U.S.:	1-888-220-8474
International:	1-646-828-8193
Webcast:	http://public.viavid.com/index.php?id=138132
Replay:	1-844-512-2921 or 1-412-317-6671
Replay ID:	7513339
Replay is available through March 3, 2020, 11:59pm ET	

About MoneyGram International

MoneyGram is a global leader in cross-border P2P payments and money transfers. Its consumer-centric capabilities enable the quick and affordable transfer of money to family and friends in more than 200 countries and territories, with over 65 countries now digitally enabled. The innovative MoneyGram platform leverages its leading distribution network, global financial settlement engine, cloud-based infrastructure with integrated APIs, and its unparalleled compliance program to enable seamless and secure transfers around the world. For more information, please visit moneygram.com

CONTACT

Investor Relations:
214-979-1400
ir@moneygram.com

Media Relations:
Noelle Whittington
214-979-1402
media@moneygram.com

TABLE ONE
MONEYGRAM INTERNATIONAL, INC.
CONDENSED CONSOLIDATED STATEMENTS OF OPERATIONS
(Unaudited)

(Amounts in millions, except percentages and per share data)	Three Months Ended December 31, 2019	Three Months Ended December 31, 2018	2019 vs 2018	Twelve Months Ended December 31, 2019	Twelve Months Ended December 31, 2018	2019 vs 2018
REVENUE						
Fee and other revenue	$ 311.3	$ 331.8	$ (20.5)	$ 1,230.4	$ 1,398.1	$ (167.7)
Investment revenue	12.4	14.0	(1.6)	54.7	49.5	5.2
Total revenue	323.7	345.8	(22.1)	1,285.1	1,447.6	(162.5)
Total revenue change, as reported	(6)%	(15)%		(11)%	(10)%	
Total revenue change, constant currency	(6)%	(14)%		(10)%	(11)%	
OPERATING EXPENSES						
Total commissions and direct transaction expenses	167.7	176.6	(8.9)	662.2	732.2	(70.0)
Compensation and benefits	65.0	58.7	6.3	228.4	259.8	(31.4)
Transaction and operations support [1]	45.4	63.6	(18.2)	207.8	298.8	(91.0)
Occupancy, equipment and supplies	14.5	14.6	(0.1)	60.9	62.0	(1.1)
Depreciation and amortization	18.4	18.6	(0.2)	73.8	76.3	(2.5)
Total operating expenses	311.0	332.1	(21.1)	1,233.1	1,429.1	(196.0)
OPERATING INCOME	12.7	13.7	(1.0)	52.0	18.5	33.5
Other expenses						
Interest expense	24.3	13.8	10.5	77.0	53.6	23.4
Other non-operating expense (income) [2]	1.2	1.4	(0.2)	39.3	(24.2)	63.5
Total other expenses	25.5	15.2	10.3	116.3	29.4	86.9
Loss before income taxes	(12.8)	(1.5)	(11.3)	(64.3)	(10.9)	(53.4)
Income tax (benefit) expense	(0.9)	11.0	(11.9)	(4.0)	13.1	(17.1)
NET LOSS	$ (11.9)	$ (12.5)	$ 0.6	$ (60.3)	$ (24.0)	$ (36.3)
Basic and diluted loss per common share	$ (0.16)	$ (0.19)	$ 0.03	$ (0.85)	$ (0.37)	$ (0.48)
Basic and diluted weighted-average outstanding common shares and equivalents used in computing loss per share	76.7	64.5	12.2	71.1	64.3	6.8

(1) Twelve months ended December 31, 2018 includes an accrual of $40.0 million related to the resolution of the DPA matter.
(2) Twelve months ended December 31, 2019 includes a non-cash pension settlement charge of $31.3 million and debt extinguishment costs of $2.4 million.

TABLE TWO
MONEYGRAM INTERNATIONAL, INC.
SEGMENT RESULTS
(Unaudited)

Global Funds Transfer

(Amounts in millions, except percentages)	Three Months Ended December 31, 2019	Three Months Ended December 31, 2018	2019 vs 2018	Twelve Months Ended December 31, 2019	Twelve Months Ended December 31, 2018	2019 vs 2018
Money transfer revenue	$ 285.9	$ 302.9	$ (17.0)	$ 1,123.9	$ 1,273.4	$ (149.5)
Bill payment revenue	13.8	16.8	(3.0)	59.4	74.5	(15.1)
Total revenue	$ 299.7	$ 319.7	$ (20.0)	$ 1,183.3	$ 1,347.9	$ (164.6)
Commissions and direct transaction expenses	$ 162.9	$ 170.1	$ (7.2)	$ 637.9	$ 711.6	$ (73.7)
Operating income (loss)	$ 5.5	$ 6.7	$ (1.2)	$ 22.0	$ (5.9)	$ 27.9
Operating margin	1.8 %	2.1 %		1.9 %	(0.4)%	
Money transfer revenue change, as reported	(6)%	(17)%		(12)%	(10)%	
Money transfer revenue change, constant currency	(5)%	(16)%		(10)%	(12)%	

Financial Paper Products

(Amounts in millions, except percentages)	Three Months Ended December 31, 2019	Three Months Ended December 31, 2018	2019 vs 2018	Twelve Months Ended December 31, 2019	Twelve Months Ended December 31, 2018	2019 vs 2018
Money order revenue	$ 12.4	$ 13.7	$ (1.3)	$ 53.0	$ 55.3	$ (2.3)
Official check revenue	11.6	12.4	(0.8)	48.8	44.4	4.4
Total revenue	$ 24.0	$ 26.1	$ (2.1)	$ 101.8	$ 99.7	$ 2.1
Total commissions expense	$ 4.8	$ 6.5	$ (1.7)	$ 24.3	$ 20.6	$ 3.7
Operating income	$ 8.0	$ 8.3	$ (0.3)	$ 33.8	$ 30.6	$ 3.2
Operating margin	33.3 %	31.8 %		33.2 %	30.7 %	

TABLE THREE
MONEYGRAM INTERNATIONAL, INC.
SEGMENT RECONCILIATIONS
(Unaudited)

Global Funds Transfer

(Amounts in millions, except percentages)	Three Months Ended December 31, 2019	Three Months Ended December 31, 2018	2019 vs 2018	Twelve Months Ended December 31, 2019	Twelve Months Ended December 31, 2018	2019 vs 2018
Revenue (as reported)	$ 299.7	$ 319.7	$ (20.0)	$ 1,183.3	$ 1,347.9	$ (164.6)
Adjusted operating income	$ 20.4	$ 22.6	$ (2.2)	$ 64.4	$ 90.9	$ (26.5)
Legal and contingent matters	(2.4)	(2.2)	(0.2)	(2.4)	(44.3)	41.9
Restructuring and reorganization costs	(7.1)	(6.2)	(0.9)	(11.3)	(19.9)	8.6
Compliance enhancement program	(2.3)	(1.4)	(0.9)	(7.7)	(10.1)	2.4
Direct monitor costs	(1.5)	(3.9)	2.4	(13.9)	(11.3)	(2.6)
Stock-based compensation expense	(1.6)	(2.2)	0.6	(7.1)	(11.2)	4.1
Total adjustments	(14.9)	(15.9)	1.0	(42.4)	(96.8)	54.4
Operating income (loss) (as reported)	$ 5.5	$ 6.7	$ (1.2)	$ 22.0	$ (5.9)	$ 27.9
Adjusted operating margin	6.8 %	7.1 %		5.4 %	6.7 %	
Total adjustments	(5.0)%	(5.0)%		(3.6)%	(7.2)%	
Operating margin (as reported)	1.8 %	2.1 %		1.9 %	(0.4)%	

Financial Paper Products

(Amounts in millions, except percentages)	Three Months Ended December 31, 2019	Three Months Ended December 31, 2018	2019 vs 2018	Twelve Months Ended December 31, 2019	Twelve Months Ended December 31, 2018	2019 vs 2018
Revenue (as reported)	$ 24.0	$ 26.1	$ (2.1)	$ 101.8	$ 99.7	$ 2.1
Adjusted operating income	$ 8.4	$ 9.1	$ (0.7)	$ 35.8	$ 34.6	$ 1.2
Compliance enhancement program	(0.2)	(0.6)	0.4	(1.2)	(2.8)	1.6
Stock-based compensation expense	(0.2)	(0.2)	—	(0.8)	(1.2)	0.4
Total adjustments	(0.4)	(0.8)	0.4	(2.0)	(4.0)	2.0
Operating income (as reported)	$ 8.0	$ 8.3	$ (0.3)	$ 33.8	$ 30.6	$ 3.2
Adjusted operating margin	35.0 %	34.9 %		35.2 %	34.7 %	
Total adjustments	(1.7)%	(3.1)%		(2.0)%	(4.0)%	
Operating margin (as reported)	33.3 %	31.8 %		33.2 %	30.7 %	

TABLE FOUR
MONEYGRAM INTERNATIONAL, INC.
RECONCILIATION OF CERTAIN NON-GAAP MEASURES TO RELEVANT GAAP MEASURES
EBITDA, ADJUSTED EBITDA, ADJUSTED EBITDA MARGIN AND ADJUSTED FREE CASH FLOW
(Unaudited)

(Amounts in millions, except percentages)	Three Months Ended December 31, 2019	Three Months Ended December 31, 2018	2019 vs 2018	Twelve Months Ended December 31, 2019	Twelve Months Ended December 31, 2018	2019 vs 2018
Loss before income taxes	$ (12.8)	$ (1.5)	$ (11.3)	$ (64.3)	$ (10.9)	$ (53.4)
Interest expense	24.3	13.8	10.5	77.0	53.6	23.4
Depreciation and amortization	18.4	18.6	(0.2)	73.8	76.3	(2.5)
Signing bonus amortization	11.8	11.9	(0.1)	46.4	53.9	(7.5)
EBITDA	41.7	42.8	(1.1)	132.9	172.9	(40.0)
Significant items impacting EBITDA:						
Restructuring and reorganization costs	7.1	6.4	0.7	11.2	20.1	(8.9)
Legal and contingent matters [1]	2.6	2.3	0.3	4.5	45.0	(40.5)
Compliance enhancement program	2.5	2.0	0.5	8.9	12.9	(4.0)
Stock-based, contingent and incentive compensation	1.8	2.4	(0.6)	7.9	12.4	(4.5)
Direct monitor costs	1.5	3.9	(2.4)	13.9	11.3	2.6
Severance and related costs	0.4	0.2	0.2	0.7	0.6	0.1
Non-cash pension settlement charge [2]	—	—	—	31.3	—	31.3
Debt extinguishment costs [3]	—	—	—	2.4	—	2.4
Income related to the terminated merger with Ant Financial [4]	—	—	—	—	(29.3)	29.3
Adjusted EBITDA	$ 57.6	$ 60.0	$ (2.4)	$ 213.7	$ 245.9	$ (32.2)
Adjusted EBITDA margin [5]	17.8 %	17.4%	0.4%	16.6 %	17.0%	(0.4)%
Adjusted EBITDA change, as reported	(4)%			(13)%		
Adjusted EBITDA change, constant currency adjusted	(3)%			(11)%		
Adjusted EBITDA	$ 57.6	$ 60.0	$ (2.4)	$ 213.7	$ 245.9	$ (32.2)
Cash payments for interest	(18.1)	(13.3)	(4.8)	(63.3)	(50.7)	(12.6)
Cash payments for taxes, net of refunds	(2.8)	(0.9)	(1.9)	(4.4)	(4.8)	0.4
Cash payments for capital expenditures	(12.0)	(13.3)	1.3	(54.5)	(57.8)	3.3
Cash payments for agent signing bonuses	(4.9)	(11.4)	6.5	(29.1)	(31.6)	2.5
Adjusted Free Cash Flow	$ 19.8	$ 21.1	$ (1.3)	$ 62.4	$ 101.0	$ (38.6)

(1) Twelve months ended December 31, 2018 includes an accrual of $40.0 million related to the resolution of the DPA matter.

(2) Twelve months ended December 31, 2019 includes a non-cash charge from the sale of pension liability.

(3) Twelve months ended December 31, 2019 includes debt extinguishment costs related to the amended and new debt agreements.

(4) Income includes the $30.0 million merger termination fee and costs include, but are not limited to, legal, bank and consultant fees.

(5) Adjusted EBITDA margin is calculated as Adjusted EBITDA divided by total revenue.

TABLE FIVE
MONEYGRAM INTERNATIONAL, INC.
RECONCILIATION OF CERTAIN NON-GAAP MEASURES TO RELEVANT GAAP MEASURES
ADJUSTED NET INCOME AND ADJUSTED DILUTED EPS
(Unaudited)

	Three Months Ended December 31,		Twelve Months Ended December 31,	
(Amounts in millions, except per share data)	**2019**	**2018**	**2019**	**2018**
Net loss	$ (11.9)	$ (12.5)	$ (60.3)	$ (24.0)
Total adjustments [1]	15.9	17.2	80.8	73.0
Tax impacts of adjustments [2]	(3.6)	(4.1)	(18.5)	(8.5)
Adjusted net income	$ 0.4	$ 0.6	$ 2.0	$ 40.5
Diluted loss per common share	$ (0.16)	$ (0.19)	$ (0.85)	$ (0.37)
Diluted adjustments per common share	0.17	0.20	0.88	1.00
Diluted adjusted income per common share	$ 0.01	$ 0.01	$ 0.03	$ 0.63
Diluted weighted-average outstanding common shares and equivalents	76.7	64.5	71.1	64.3

(1) See summary of adjustments in Table Four - EBITDA, Adjusted EBITDA, Adjusted EBITDA Margin and Adjusted Free Cash Flow.
(2) Tax rates used to calculate the tax expense impact are based on the nature and jurisdiction of each adjustment.

TABLE SIX
MONEYGRAM INTERNATIONAL, INC.
CONDENSED CONSOLIDATED BALANCE SHEETS
(Unaudited)

(Amounts in millions, except share data)	December 31, 2019	December 31, 2018
ASSETS		
Cash and cash equivalents	$ 146.8	$ 145.5
Settlement assets	3,237.0	3,373.8
Property and equipment, net	176.1	193.9
Goodwill	442.2	442.2
Other assets [1]	182.9	140.7
Total assets	$ 4,185.0	$ 4,296.1
LIABILITIES		
Payment service obligations	$ 3,237.0	$ 3,373.8
Debt, net [2]	850.3	901.0
Pension and other postretirement benefits	77.5	76.6
Accounts payable and other liabilities [1]	260.6	213.5
Total liabilities	4,425.4	4,564.9
STOCKHOLDERS' DEFICIT		
Participating convertible preferred stock - series D, $0.01 par value, 200,000 shares authorized, 71,282 issued at December 31, 2019 and December 31, 2018	183.9	183.9
Common stock, $0.01 par value, 162,500,000 shares authorized, 65,061,090 and 58,823,567 shares issued at December 31, 2019 and December 31, 2018, respectively	0.7	0.6
Additional paid-in capital	1,116.9	1,046.8
Retained loss	(1,460.1)	(1,403.6)
Accumulated other comprehensive loss	(63.5)	(67.5)
Treasury stock: 2,329,906 and 3,207,118 shares at December 31, 2019 and December 31, 2018, respectively	(18.3)	(29.0)
Total stockholders' deficit	(240.4)	(268.8)
Total liabilities and stockholders' deficit	$ 4,185.0	$ 4,296.1

(1) 2019 financial information reflects the adoption of ASC 842 - Leases. Other Assets includes $50.0 million of right-of-use assets related to the Company's operating leases and Accounts payable and other liabilities includes $54.2 million of lease liabilities.

(2) On June 26, 2019, MoneyGram entered into an amended first lien credit agreement and a new second lien credit agreement, each with Bank of America, N.A. acting as administrative agent. These agreements extended and/or repaid in full all outstanding indebtedness under the Company's existing credit facility.

TABLE SEVEN
MONEYGRAM INTERNATIONAL, INC.
CONDENSED CONSOLIDATED STATEMENTS OF CASH FLOWS
(Unaudited)

	Twelve Months Ended December 31,	
(Amounts in millions)	**2019**	**2018**
CASH FLOWS FROM OPERATING ACTIVITIES		
Net loss	$ (60.3)	$ (24.0)
Adjustments to reconcile net loss to net cash provided by operating activities	123.3	53.3
Net cash provided by operating activities	63.0	29.3
CASH FLOWS FROM INVESTING ACTIVITIES		
Purchases of property and equipment	(54.5)	(57.8)
Net cash used in investing activities	(54.5)	(57.8)
CASH FLOWS FROM FINANCING ACTIVITIES		
Transaction costs for issuance and amendment of debt	(24.3)	—
Principal payments on debt	(31.6)	(9.8)
Net proceeds from issuing equity instruments	49.5	—
Payments to tax authorities for stock-based compensation	(0.8)	(6.2)
Net cash used in financing activities	(7.2)	(16.0)
NET CHANGE IN CASH AND CASH EQUIVALENTS	1.3	(44.5)
CASH AND CASH EQUIVALENTS—Beginning of period	145.5	190.0
CASH AND CASH EQUIVALENTS—End of period	$ 146.8	$ 145.5

Exhibit P

Fwd: SEC Response to my Questions if XRP is a security or not Part 3

Frank [redacted]
Thu 4/1/2021 6:52 AM
To: **All-Deaton <All-Deaton@deatonlawfirm.com>**

Von meinem iPhone gesendet

Anfang der weitergeleiteten Nachricht:

Von: Frank [redacted]
Datum: 23. Februar 2021 um 21:54:01 MEZ
An: [redacted]
Betreff: SEC Response to my Questions if XRP is a security or not Part 3

----- Weitergeleitete Nachricht -----
Von: Help" <help@sec.gov> <help@sec.gov>
An: [redacted]
Gesendet: Dienstag, 20. Oktober 2020, 23:15:51 MESZ
Betreff: SEC Response HO::~01024304~::HO

Dear Mr. [redacted]

Thank you for recent email to the U.S. Securities and Exchange Commission (SEC).

We appreciate the opportunity to review your additional concerns about Ripple (XRP) cryptocurrency. As we explained previously, the SEC has not issued a determination on whether the cryptocurrency XRP is a security. Also, this office cannot comment on whether the SEC will make a determination as to whether XRP is a security, or otherwise provide a timeframe for which any determination might be made.

Thank you for contacting the SEC.

Sincerely,

Amy Rosenthal
Investor Assistance Specialist
Office of Investor Education and Advocacy
U.S. Securities and Exchange Commission
(800) 732-0330
www.sec.gov
www.investor.gov
www.twitter.com/SEC_Investor_Ed

ref:_00D30JxQy._500t0YzCv4AAF:ref

Re: SEC Response HO::~00758969~::HO

[redacted]>

Wed 3/31/2021 11:07 PM

To: **All-Deaton <All-Deaton@deatonlawfirm.com>**

[redacted],22:57 ,2019 [redacted] "Help" <help@sec.gov> <help@sec.gov>:

Dear Investor:

Thank you for contacting the U.S. Securities and Exchange Commission (SEC).

The SEC has not issued a determination on whether the cryptocurrency XRP is a security. Whether a cryptocurrency is considered a security will depend on the characteristics and use of the cryptocurrency. For additional information, see Chairman Clayton's statement regarding cryptocurrencies and initial coin offerings at https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11.

Sincerely,

Trevor Perkins
Attorney
Office of Investor Education and Advocacy
U.S. Securities and Exchange Commission
(800) 732-0330
http://www.sec.gov
www.investor.gov
www.twitter.com/SEC_Investor_Ed

File Attachment:
Correspondent Name: Mr. [redacted]
Create Date: 2018-12-27 06:15:42
Origin: Web
File #: HO::~00758969~::HO
Description:
Xrp clarity please Xrp is security or not?
ref:_00D30JxQy._500t0EH1xSAAT:ref

Fwd: SEC Response HO::~01036605~::HO

Arunsankar [redacted]>
Wed 3/31/2021 6:38 PM
To: **All-Deaton <All-Deaton@deatonlawfirm.com>**

---------- Forwarded message ---------
From: **"Help" <help@sec.gov>** <help@sec.gov>
Date: Thu, Nov 5, 2020 at 9:20 AM
Subject: SEC Response HO::~01036605~::HO
To: [redacted]

Dear Mr.[redacted]:

Thank you for contacting the U.S. Securities and Exchange Commission (SEC).

Thank you for writing regarding your concerns about Ripple. Our office processes many comments from individual investors and others. We keep records of the correspondence we receive in a searchable database that SEC staff may make use of in inspections, examinations, and investigations. In addition, some of the correspondence we receive is referred to other SEC offices and divisions for their review. If they have any questions or wish to respond directly to your comments, they will contact you.

As you may know, whether a cryptocurrency is considered a security will depend on the characteristics and use of the cryptocurrency. For more information on the SEC's regulation of cryptocurrencies, please visit Chairman Jay Clayton's Statement on Cryptocurrencies and Initial Coin Offerings (ICOs) at https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11. You may also wish to review the SEC's Spotlight pages on ICOs and digital assets at https://www.sec.gov/ICO and https://www.investor.gov/additional-resources/specialized-resources/spotlight-initial-coin-offerings-digital-assets.

Sincerely,

Lisa Skrzycki
Attorney
Office of Investor Education and Advocacy
U.S. Securities and Exchange Commission
(800) 732-0330
www.sec.gov
www.investor.gov
www.twitter.com/SEC_Investor_Ed

File Attachment:
Correspondent Name: Mr. Arunsankar [redacted]
Create Date: 2020-10-25 07:27:53
Origin: Web
File #: HO::~01036605~::HO
Description:
Ripple is hinting about moving out of US because of the lack of regulatory clarity. is XRP a security or not?. If its deemed as a security, what happens if Ripple move their operation outside of US?
ref:_00D30JxQy._500t0ayLv9AAE:ref

From: [redacted]
Subject: Re: SEC Response HO::~01045772~::HO
Date: March 31, 2021 at 5:21 PM
To: Help help@sec.gov

> On Jan 6, 2021, at 11:42 AM, Help <help@sec.gov> <help@sec.gov> wrote:
>
> Dear Dr[redacted]
>
> Thank you for contacting the U.S. Securities and Exchange Commission (SEC).
>
> As we had responded to you in our response to your March 24, 2019 correspondence, the SEC's Office of Investor Education and Advocacy (OIEA) was not able to inform you that XRP was a security because the SEC did not issue a determination that the cryptocurrency XRP was a security at that time. As also noted, whether a cryptocurrency is considered a security will depend on the characteristics and use of the cryptocurrency. Finally, we also directed your attention to Chairman Jay Clayton's statement regarding cryptocurrencies and initial coin offerings at https://www.sec.gov/news/public-statement/statement-clayton-2017-12-11.
>
> Sincerely,
>
> Kathleen Kim
> Special Counsel
> Office of Investor Education and Advocacy
> U.S. Securities and Exchange Commission
> (800) 732-0330
> http://www.sec.gov
> www.investor.gov
> www.twitter.com/SEC_Investor_Ed
>
> ref:_00D30JxQy._500t0djoN4AAI:ref

> On Jan 6, 2021, at 10:22 AM, [redacted] wrote:
>
> Dear Ms Kim,
>
> Thank you for your information regarding the OIG. I will contact them regarding the effectiveness of the Office of Investor Education and Advocacy.
>
> Unfortunately you must have over looked my first question:
>
> Why didn't your office tell me XRP was a security in its reply to my March 24, 2019 correspondence?
>
> Regards,
>
> Dr. Robert[redacted]

> > On Jan 6, 2021, at 5:29 AM, Help <help@sec.gov> <help@sec.gov> wrote:
> >
> > Dear D[redacted]
> >
> > Thank you for contacting the U.S. Securities and Exchange Commission (SEC) with your concerns regarding the SEC's case against Ripple Labs, Inc.
> >
> > If you would like to contact the Office of Inspector General (OIG), we recommend doing so by contacting them directly as noted on their webpage, available at https://www.sec.gov/oig. As noted on that page, OIG is an independent office within the SEC that conducts, supervises, and coordinates audits and investigations of the programs and operations of the SEC. The mission of the OIG is to prevent and detect fraud, waste, and abuse and to promote integrity, economy, efficiency, and effectiveness in the Commission's programs and operations.
> >
> > Please be advised the SECs Office of Investor Education and Advocacy processes many comments from individual investors and others. We keep records of the correspondence we receive in a searchable database that SEC staff may make use of in

> others. We keep records of the correspondence we receive in a searchable database that SEC staff may make use of in inspections, examinations, and investigations. In addition, some of the correspondence we receive is referred to other SEC offices and divisions for their review. If they have any questions or wish to respond directly to your comments, they will contact you.
>
> Thank you for communicating your views.
>
> Sincerely,
>
> Kathleen Kim
> Special Counsel
> Office of Investor Education and Advocacy
> U.S. Securities and Exchange Commission
> (800) 732-0330
> http://www.sec.gov
> www.investor.gov
> www.twitter.com/SEC_Investor_Ed

> File Attachment:
> Correspondent Name: Dr. Robert[redacted]
> Create Date: 2020-12-24 18:51:20
> Origin: Web
> File #: HO::~01045772~::HO
> Description:
> Recently the SEC filed suit against Ripple claiming that the cryptocurrency XRP is a security. I wrote this very office a year ago requesting clarification about the status of XRP prior to making investments. I want to know why your office didn't tell me XRP was a security if the SEC's case were so cut and dry? If your purpose is to protect investors, you failed. Even when I came to you. Furthermore, why in the world did the SEC offer a 5 year relief to crypto exchanges the day AFTER filing suit against Ripple and not before? Surely the SEC had some idea of the impact this would have. What steps do I need to take to file a formal complaint against this department in particular? and the SEC in general? Is there an IG or equivalent for the SEC? Regards, Robert Harpool
> ref:_00D30JxQy._500t0djoN4AAI:ref

Exhibit Q

Policy

Gensler Says Most Crypto Trading Platforms Need to Register With SEC

The SEC chairman said that securities have likely been traded on the platforms.

By Nelson Wang

Sep 13, 2021 at 2:42 p.m. EDT

Updated Sep 13, 2021 at 5:50 p.m. EDT

DeFi and crypto lending may pose issues for investors, SEC Chair Gary Gensler said.

CORRECTION (Sept. 13, 19:54 UTC): A previous version of this story incorrectly stated that Gensler's testimony was given on Monday. It is to be given on Tuesday.

U.S. Securities and Exchange Commission Chairman Gary Gensler will emphasize that almost all crypto trading platforms need to register with the SEC in testimony he plans to give before the Senate Committee on Banking, Housing and Urban Affairs on Tuesday. A copy of his prepared remarks was released on Monday.

Gensler wrote that while not every crypto token qualified as a security, the fact that platforms have allowed the trading of so many tokens means it is highly likely that at least some securities are being offered on the platforms.

"Make no mistake: To the extent that there are securities on these trading platforms, under our laws they have to register with the commission unless they qualify for an exemption," Gensler wrote.

Gensler wrote that as a result, he has suggested that crypto platforms and projects talk to the SEC.

With his latest remarks, Gensler has added to his position that many areas of the crypto industry need more regulation by the SEC.

Gensler added that regarding investor protection, the SEC is working with its sister agency, the Commodity Futures Trading Commission (CFTC), with which it has relevant and sometimes overlapping jurisdictions in the crypto markets.

"Currently, we just don't have enough investor protection in crypto finance, issuance, trading or lending," Gensler wrote. "Frankly, at this time, it's more like the Wild West or the old world of 'buyer beware' that existed before the securities laws were enacted."

UPDATE (Sept. 13, 18:50 UTC): Added an additional quote in the sixth bullet point.

Read more about

SEC | Gary Gensler | Trading Platform

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Nelson Wang

Nelson Wang is CoinDesk's news editor for the East Coast. He holds BTC and ETH above CoinDesk's disclosure threshold of $1,000.

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Weekend Story: Hodlonaut Wins Norwegian Lawsuit Against Self-Proclaimed 'Satoshi' Craig Wright

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English

Exhibit R

Markets

Crypto

SEC's Gensler Steps Up Push to Get Crypto Exchanges to Register With Regulator

Photographer: Al Drago/Bloomberg

By Lydia Beyoud
July 28, 2022, 1:36 PM EDT

From **Crypto**

US Securities and Exchange Commission Chair Gary Gensler is stepping up his push to get crypto trading platforms to register with the Wall Street regulator.

Gensler said in a video released on Thursday that he's asked the agency's staff to work with digital-asset exchanges so that they are "regulated much like securities exchanges." Officials at the markets watchdog are also developing ways to get certain coins to be registered as securities, he said.

"Look, there's no reason to treat the crypto market differently just because a different technology is used," he said.

Agency staff are also considering whether to address potential conflicts of interest when crypto platforms also serve as market-makers, he said. Gensler has previously raised concerns that some platforms are shirking rules and may be betting against their own customers.

Bloomberg News reported earlier this week that SEC has been investigating Coinbase Global Inc., the US's biggest crypto exchange, for potentially listing unregistered securities.

Exhibit S

2 minute readSeptember 8, 20226:47 PM EDTLast Updated 2 months ago

Crypto intermediaries should register with U.S. SEC, agency chair says

By Michelle Price

[1/2] The seal of the U.S. Securities and Exchange Commission (SEC) is seen at their headquarters in Washington, D.C., U.S., May 12, 2021. REUTERS/Andrew Kelly

WASHINGTON, Sept 8 (Reuters) - Companies that help facilitate transactions in the cryptocurrency market should register with the U.S. Securities and Exchange Commission (SEC) just like other market intermediaries, the agency's chair said on Thursday.

Gary Gensler said intermediaries in the crypto market provide a range of functions regulated by the SEC, including operating as an exchange, broker dealer, clearing agent and custodian, and should be registered accordingly.

"If you fall into any of these buckets, come in, talk to us, and register," Gensler told an audience of attorneys in Washington, D.C., reiterating that the vast majority of crypto tokens qualify as securities and are captured by relevant laws.

"The commingling of the various functions within crypto intermediaries creates inherent conflicts of interest and risks for investors," he added.

While Gensler has previously said crypto lenders fall under the SEC's purview, his comments provide more detail on other crypto market actors the SEC believes fall within its jurisdiction.

Latest Updates

- Musk fired Twitter executives in attempt to avoid payouts, layoffs planned, reports say
- Dogecoin surges on Elon Musk's Twitter deal
- Renault-backed Beyonca EV venture touts health monitoring, targets Audi in China
- Elon Musk manages free speech versus 'hellscape' at Twitter
- Self-driving cars face uncertain path to U.S. deployment

The comments will likely spook crypto market participants who had hoped to avoid the costly requirements typically associated with SEC registration, including disclosures, risk management controls and capital and liquidity minimums, although it remains to be seen if such firms will voluntarily comply.

Gensler said he has asked SEC staff to work with crypto intermediaries to ensure they register each of their functions, which could involve splitting them out into separate legal entities to mitigate conflicts of interest.

He added, however, that the SEC may need to be flexible in applying existing disclosure requirements, noting tailored product disclosures exist elsewhere under the SEC's regime.

Reporting by Michelle Price; Additional reporting by Hannah Lang; Editing by Josie Kao

Exhibit T

The XRP TipBot is a multi-platform application that monitors social media posts on Twitter, Reddit, or Discord, and allows one person to send another person XRP. It started as a hobby project by enthusiastic developer and XRP community member Wietse Wind, who is based in The Netherlands. The XRP TipBot is an easy way to send XRP while also raising awareness and bringing more people to the XRP community. The XRP TipBot has also been used for good, helping many charities.

Regulatory changes

With cryptocurrency custody regulation coming to The Netherlands, there are not enough resources nor time for Wietse's hobby project to comply with these changes.

As Wietse explains in a blog post, the bill was passed on April 21st, providing a six month grace period, starting January 10th, 2020. However, registration is mandatory by May 18th, three days from today, while there is great uncertainly on the costs required.

As Wietse continues, "A deadline I cannot possibly meet. Costs I cannot possibly predict. Implementing KYC and AML myself. While plans still exist to do all of this in a more generic way I decided I can't get my ducks in a row within a few weeks (now days), and I don't want to charge absurd fees for using the TipBot. That wouldn't make any sense, and take all the fun out of it."

Taking the entire XRP TipBot on ledger through XUMM was not a viable option. The 20 XRP account reserve means that new users would not be able to onboard unless someone tipped them 20 XRP at once, while the whole onboarding experience would be too complicated. Two of the main reasons behind the TipBot's success was its simplicity and the minimal cost of using it.

Will the TipBot have a similar fate to XRParrot and XRPtext

In the past few months, due to these regulatory changes in The Netherlands, Wietse has had to terminate two other XRP related projects. XRParrot, a platform that enabled users to convert fiat into XRP at low cost and without the need for an exchange and XRPtext, an app that allowed users to send XRP using text messages. Would the XRP TipBot suffer the same fate?

Uphold to the rescue

Uphold is a digital wallet and trading platform operating since 2015. After thoroughly discussing all aspects of a possible partnership, the XRP TipBot will now live on:

> “So I called them. A week ago. What would/could XRP TipBot ❤️ Uphold look like? Would we be able to partner up in a matter of days? We had calls at odd hours (early mornings & late nights (time zones)). The Uphold team went all out to help me. To allow the XRP TipBot to survive. And they did!”

The XRP TipBot will live on, but now all XRP TipBot users will have to link an Uphold account to be able to hold & receive XRP. XRP Tipbot users that already have an Uphold account will be able to easily link their account to the TipBot a few days from now. Users without an Uphold account will have to register at Uphold first. Of course, users will be able to skip this and simply withdraw their TipBot balance to a destination account of their choice.

New capabilities available

As soon as XRP TipBot users link their accounts with an Uphold account, they will have the following capabilities:

- Fiat on-ramp
- Fiat off-ramp
- Crypto currency exchange (from / to the TipBot linked account)
- Optional: linked TipBot balance for multiple social media accounts, eg. Twitter (Private) + Twitter (corporate) + Reddit + Discord sharing balance. Or separate balances per account. Mix and match!

The XRP TipBot did not only overcome this hurdle but made the best out of a difficult situation to continue with more capabilities. Wietse will provide more information on the migration as soon as the last lines of code are done. Wietse promises that not a single drop of XRP will be lost, and the migration process to Uphold will be as simple as possible.

Exhibit U

BITCOIN • APRIL 19, 2021, 12:49PM EDT

Time Magazine now accepts bitcoin and other cryptocurrencies for digital subscriptions

by Yogita Khatri

Drop of Light/ Shutterstock

The 98-year old publication Time Magazine now accepts bitcoin and other cryptocurrencies for digital subscription payments.

Announcing the news on Monday, Time said it has partnered with Crypto.com for the feature, which is currently only available in the U.S. and Canada. Global access is expected to be rolled out "in the next several months."

Time will accept all cryptocurrencies currently supported by Crypto.com Pay, a Crypto.com spokesperson told The Block. These include bitcoin, ether, dogecoin, XRP and litecoin, as well as DeFi tokens Uniswap, Aave, Balancer, and Compound.

Subscribers who pay with Crypto.com's native token CRO will get rewards of up to 10%, said Time.

Time will keep accepted cryptocurrencies from subscribers. "Cryptocurrency payments for digital

The publication is also partnering with crypto asset manager Grayscale on a new video series on the crypto space. Time will receive payment in the form of bitcoin and then hold the funds on its balance sheet, [according to Grayscale CEO Michael Sonnenshein].

ABOUT AUTHOR

Yogita is a senior reporter at The Block and covers all things crypto. Before joining The Block, Yogita worked for CoinDesk and The Economic Times. She can be reached at ykhatri@theblock.co. Follow her on Twitter @Yogita_Khatri5.

MORE BY YOGITA KHATRI

Exhibit V

BTC $20,664 ETH $1,591 LTC $56 BCH $117 DOGE $0.1161 DASH $42 XRP $0.46 XMR $147 USDT $1.0000 ETC $24.7

XRP directory

1500+ companies, stores , services accepting XRP as a payment. Find where to spend your XRP

PRICE
$0.4610
-3.02%

MERCHANTS
1658 +9
October 2022

RATING
19.24%
7 rank

Merchants Discounts Analytics Map Market

- Shops, markets 688
- Internet services 507
- Offline Services 119
- Tourism, Traveling, Renting 46
- Crypto services 739
- Business services 214
- Web marketing / development 113
- Gambling 89
- Gaming 31

Top companies accepting XRP

Hostry
Domains Email + 3 more
4.9 — 10 reviews

The history of Hostry started in 2006 with a simple question: How can we make deploying and managing infrastructure less painful? We found out that it was possible if we find new ways to automate...

PLAYFINA
Casino Dice
4.7 — 2 reviews

Being an affiliate, you're most probably spending a lot of time making an input to your business to ensure the maximum profit from your traffic, to find secure partners, opportunities for...

Alfa-coin
Fast Exchanges Trading
3.8 — 1 review

Our advantages Maximum ease of exchange and the ability to choose your exchange strategy will allow you to make a profitable exchange. Using our fast processing and clever interface, you will...

ServerWhere.com
Cloud Hosting
3.8 — 1 review

ServerWhere.com (SW) is a cryptocurrencies based business platform for provisioning of Cloud infrastructure & Dedicated server hosting. We deliver services in 44 data centers and 34 countries...

ALT 5 SIGMA
Payment gateways Trading
3.8

ALT 5 Pay overcomes digital asset volatility for merchants by incorporating payments directly into exchange platform networks for instant liquidity, best rates and the lowest fees in the market....

cryptostorm.is VPN

Security VPN

3.4
6 reviews

The VPN provider for the truly paranoid. Our anonymous token authentication system keeps us from knowing who you are, and our encryption algorithms rival most "military-grade" standards. Flexible...

Alfacash Store

Fast Exchanges

4.0
14 reviews

Alfacash Store is a non-custodial cryptocurrency exchange especially focused on the Eurozone. Properly regulated and registered in Estonia since 2019, this brand is part of the much older Alfacash...

Rock'n'Block

Different Blockchain + 4 more

4.8
3 reviews

Official Enterprise Ethereum Alliance member Since 2017, we have been engaged in custom development and implementation of software based on blockchain technologies for businesses and startups....

Payment gateways accepting XRP

CoinPayments

NOWPayments

CoinGate

Salamantex

Binance Pay

CryptocurrencyCheckout

Show more →

Save 5% With Cryptocurrency

N/A

Socratic Solutions Kratom

Automatically save 5% off all orders paid for with cryptocurrency and get free shipping. Applies to everything including sale items. No code needed.

10% Sitewide

36N4XQ5

Socratic Solutions Kratom

Save 10% on entire inventory, no minimums, and get free shipping. No exclusions.

AstroPay Prepaid Card special offers

giftcardsus

Giftcardsify

AstroPay Prepaid Card special offers

Buy Paypal Gift Cards Online with Bitcoin Or Crypt

giftcardsus

Giftcardsify

Buy Paypal Gift Cards Online with Bitcoin Or Crypto

FIFA 23 Coins 15% discount code for new customers

FIFA23Launch

WhatsGaming

The launch of the new season of FIFA comes with lots of hot events and discounts, especially for the eager customers of WhatsGaming. FIFA 23 Coins 15% discount code is one-time use for new customers. Unprecedented! You can't find a bigger discount for FUT 23 Coins anywhere. Claim your discount at Wh

Giftcardsify discounts and special offers

giftcardsus

Giftcardsify

Giftcardsify discounts and special offers for Paysafecard

VPN 50% Off First Month

VPN50OFF

COIN.HOST Privacy-infused crypto hosting

Get 50% off your first month payment for a premium VPN service with a dedicated Swiss IP and server.

Cryptwerk 10% discount

PAYCRYPTO22

La Escribana

Get 10% discount when you book directly with the owners.
For available dates see https://la-escribana.com/en/booking
Valid for bookings made before September 2023.

Browse all discounts for XRP

New companies accepting XRP

skinorac 1.2

Pharmacy

skinorac- 10% discount for crypto payments

Seenfinity 3.9

Marketing, Ads, PR | SMM

Seenfinity Marketing always looking to infinity

Helendor 3.9

Fast Exchanges | Trading

Instant exchange in automatic mode, within 1-2 minutes, No AML / KYC required for the exchange, Full anonymity, no verification is required for the exchange.

Crypto.am 1.7

Fast Exchanges | Offline exchanges

Secure and fast cryptocurrency exchange services.

VCCPRO 3.4

Accounts | GiftCards

We offer Virtual Visa card / MasterCard , 100% Legal & Safe

Socratic Solutions Kratom 3.8

Health | Pharmacy

Trusted retailer of fresh, lab tested, small batch kratom since 2018

Latest reviews

Bull Miners

★★★★★ Ben Walton

Yesterday, at 09:54 pm

Recommended. Best mining device retailer in the market

Apple Bitcoin Store

★★★★★ Roy Astley

Yesterday, at 09:46 pm

Just a great service..Bought an iPhone 14 with Dogecoin last week.got it today

Giftcardsify

★★★★★ Sally J Spencer

Yesterday, at 05:42 pm

The first order I actually completed all parts of the confirmation process and had my gift card within 30 minutes Thank u

Seenfinity

★★★★★ Pixel Fantasy CEO

Yesterday, at 03:27 pm

Time Square Billboard sucess, Excellent work

Socratic Solutions Kratom

★★★★★ Jake L

Oct 27, 2022, at 10:03 pm

Excellent company for fresh kratom!

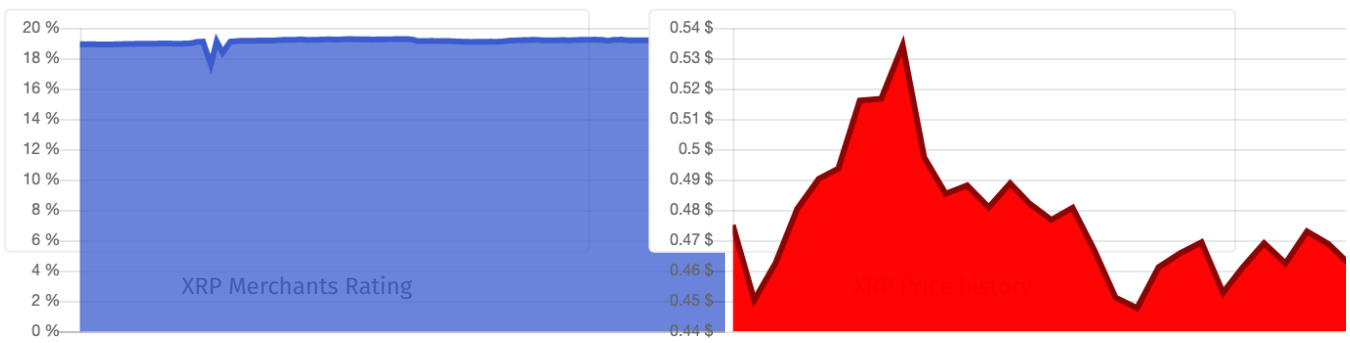
HostZealot

★★★★★ DiGiTaL

Oct 24, 2022, at 08:32 am

A good provider. Support is available 24 hours a day by phone or through the contact form on the website. I also like the fact that the servers are not just anywhere, but in a large data center.... Read more

XRP Coinmap



The biggest online directory with fresh special offers and products from merchants where you can pay with XRP. Find where to spend your crypto.

At the moment your can find 1000+ companies, shops, stores, merchants and services accepting XRP as a payment.

Use Cryptwerk to live on cryptocurrencies and pay less.

Cryptwerk provide several services for holders who want to spend XRP

1658

Merchants database

324

Collection of discounts and special offers

6121

Marketplace with products and services from stores accepting XRP

World map with merchants

Updated: October 2022

Cryptwerk is online directory with companies, websites, shops, services where you can pay with Bitcoin and other popular cryptocurrencies.

Bitcoin, Litecoin, Ethereum, Dash, Monero, Bitcoin Cash, Zcash, Dogecoin, Ripple and other altcoins accepted here.

Cryptwerk is useful for people who wants to spend cryptocurrency directly, without exchanges or banking cards. Registration is free.

Exhibit W

Published in GlobaliD

GlobaliD Follow
Aug 3, 2021 · 6 min read · Listen

Introducing the XRP Mastercard® Debit Card

We're thrilled to announce the launch of the XRP Mastercard® Debit Card!

As part of the GlobaliD vision, we believe that everyone has a right to not only an identity but also a wallet tied to that identity. With that wallet, they should be able to hold, trade, and spend money and assets of any kind. In essence, it's about giving everyone a seat at the table.

Mastercard is accepted — all while earning up to 5% cash back in XRP rewards.

The XRP Card is also the first ever community-linked debit card of its kind — it's available exclusively to members of the XRP Army Group on GlobaliD. The longer term vision is to empower any community with the tools to quickly and conveniently issue their own community debit cards to their members, each with their own unique set of traits and rewards programs.

How to get the XRP Mastercard® Debit Card

- Watch the step-by-step instructional video
- Join the XRP Army Group on GlobaliD
- Read the FAQ

(For now, the card is only available to U.S. residents, but we're working hard on international expansion. Residents of Colorado, Hawaii, Louisiana, Nevada, New York, and Virginia are not eligible for the program at this time.)

All of this is made possible by GlobaliD's Sovereignty Stack — composed of self-sovereign identity, messaging and groups, and the wallet — what we see as the core building blocks for the next chapter of the internet. It's one reason why we were able to create the XRP Card in just five months from conception to initial launch.

We also couldn't have done it without our ecosystem of partners — including Uphold, which powers the GlobaliD Wallet, and Apto, whose instant issuance program underpins the XRP Card.

We caught up with two of the team leads on the XRP Card project at GlobaliD — Paul Stavropoulos and Laura Toh — to chat about the launch, the XRP Card program, and the long term vision.

How did the XRP Card get started?

Paul: We believe that identity is a combination of the credentials you have, the people

cards as the first step toward allowing folks to spend and make transactions with the value of any kind that they hold.

We started with the XRP Card because we happen to have a lot of fans that love the value that XRP brings. It was a natural fit to start with the XRP community because they're active and highly engaged, allowing us to push forward not only our vision for allowing you to spend value that's associated with identity but also for empowering communities, which we'll talk about later.

Laura: Greg [Kidd, GlobaliD co-founder and CEO] has always been an advocate for XRP and crypto at large. He has a reputation for not backing away from difficult conversations around its future — for instance, his first podcast on the SEC lawsuit. So it was a natural fit. We were able to get over 25,000 people on the waitlist in the first week with pretty much no marketing — just a tweet.

There's a lot of debit and credit card programs being marketed at the moment that offer crypto rewards. The XRP Card appears unique in that regard since it's tied to a specific community. Can you explain the thinking behind that?

Laura: The vision for GlobaliD is for everyone to have an identity that allows them to trust and be trusted online — similar to real life. For your digital identity to be worthwhile, you need to be able to do something with it. Our theory is that community (and Groups) is the best way of creating incentives for people to kickstart that approach, where the starting point for your identity is to be able to start interacting with other people.

Nobody gets a driver's license for the sake of having a license. You get it because it allows you to do things — whether that's driving a car or getting into a bar. For us, building communities is a way to make these identities valuable today. When you get your XRP Card, you're not just getting a way to pay for things, you're joining a community of like-minded people, who you can trust, interact with, and potentially further down the line, take collective action either socially or financially.

individuals and groups — to allow them to create communities and have the ability to leverage the collective power of those communities. Eventually, GlobaliD users will be able to not only create groups, but also issue their own community-specific cards, allowing them to create their own merchant networks, reward programs, or even group funding mechanisms in order to leverage the group's collective financial power. The next big step is implementing a noncustodial wallet — both for users and communities.

The XRP Card is essentially a reference implementation of that vision — how a decentralized community can organize and use their collective spending power, to earn rewards, and benefit from the way they interact in the real world when they spend money. The XRP Card is a way to build out these communities, and help people bridge that gap to the real world from their online community. It becomes another way to express and establish your identity.

What exactly do you mean by collective action?

Laura: There are two types of collective action that we're exploring: first, a community could leverage its size and spending power to get better deals for its members, and second, they could pool funds in order to get access to goods, services, and investments that would be out of reach individually.

Groups could also grow pooled funds through the card itself — for instance, if they issue a card where a certain portion of the transaction fee goes to the group wallet. It could be a cause-based group aligned with some charity and in that way, the collective spending power of the community to make donations. By spending money with that group card, you'd be passively donating to your favorite charity.

Paul: Imagine if you're a community focused on a particular sports team. The group could pool funds to potentially gain access to athletes and interviews. They could host special events, build out merchant rewards for jerseys or drinks at their favorite bars, or they could even help certain members of the community attend their first game.

framework, particularly around the Sovereign Stack — identity, messaging, wallet. We see those as the core building blocks for Web 3.0, and with some combination of those building blocks, you could, practically speaking, build anything across the spectrum of fintech products and services. We've spent the last few years building that foundation brick by brick so it's incredible to see it all come together.

Laura: That being said, our team has been working incredibly hard to get this to market — so shout out to the engineering team, the product team, the design team, and the customer support team. Also, none of this could have happened without our ecosystem of partners — Apto with their instant issuance powering the card, Uphold powering the wallet. Everyone has been heads down working to make the XRP Card a reality.

But also a special shout out to the community. We wouldn't be here without you — especially the beta testers! Thank you so much for your engagement, your feedback, and most of all, your positive energy and enthusiasm.

We're just all super excited that it's finally in people's hands and wallets!

Follow Paul and Laura on Twitter, and visit Global.iD


You might also be interested in:

- GlobaliD joins the Linux Foundation's Cardea Project
- Partner Spotlight: Apto Payments launches Instant Card Issuance
- GlobaliD is HIPAA compliant
- GlobaliD receives SOC 2 Type II certification
- GlobaliD connects to the Indicio Network
- GlobaliD shares SSI code at the Internet Identity Workshop

Exhibit X

BENJAMIN PIRUS MAR 04, 2020

Uphold's New Debit Card Lets You Pay With Bitcoin, XRP and Gold

Digital payment platform Uphold has announced a debit card that lets users spend converted digital assets, cash and commodities.

12245 344 2:50

Digital payment platform Uphold has announced a new debit card, allowing users to pay with converted crypto, commodities and cash.

Uphold’s new multi-asset debit card allows United States-based participants to spend assets held in their Uphold accounts at any Mastercard compatible location, a representative from Uphold told Cointelegraph in an interview. “Anywhere globally where Mastercard is accepted, they will be able to use this debit card,” she said.

United States-based customers can now join a waitlist to get the card, which touts compatibility for 24 crypto assets, 27 fiat currencies, and four metals including Bitcoin (BTC), Basic Attention Token (BAT), Ripple's XRP, gold, and U.S. dollars.

Uphold is a digital asset platform on which users can buy, sell, spend and hold digital assets, fiat currencies and commodities.

Uphold is the first to combine asset worlds in debit form

Uphold's multi-asset debit card is the first of its kind that allows users to convert different commodities, crypto-assets and fiat currencies to spendable cash at the point of sale.

"If you toggle within the app that the debit card is connected to, you are able to spend, instantly, BAT, gold, palladium, silver USD — anything, anywhere, any time — in real time," an Uphold representative said. "This really gives spendability across any connected asset."

Uphold also touts no foreign exchange fees in the process. "We're really trying to mirror and complement what our wallet already provides users, which is this anytime access to anything within our wallet," she said. "We're not prohibited by borders or foreign exchange fees."

The platform also supports commodities

Although digital asset usage within such a system seems logical, one may wonder how they might go about holding and spending gold, a non-digital and somewhat clunky asset.

"We do have a partner where our users who have gold can actually order physical gold, delivered to their house," the representative explained. She noted that each asset on a user's Uphold account has its own wallet, and users decide which asset they would like to spend on any given purchase.

"It's not as if you have to show up and have the physical bag of gold," she added. "It really just gives the user the freedom to decide what asset they want to spend, versus the limitation that current cards have."

This type of simplicity and low barrier to entry is a significant step forward in making crypto more functional and versatile.

In December 2019, the company also announced work with Salt to provide the public access to crypto-backed loans.

UPDATE March 4, 18:57 UTC: This article has been updated with information Cointelegraph received from Uphold after initial publication. Uphold's card has been announced, but not yet launched. Users can join a waitlist to get the card.

#Bitcoin #Business #Gold #Payments #Finance #Adoption #Mastercard #XRP #Debit Cards #Uphold

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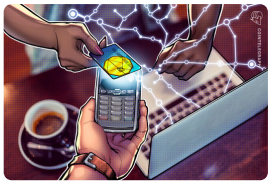

Uphold to launch crypto cards in Europe with new acquisition

Bitcoin volatility still a concern for CEO of BNY Mellon subsidiary

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Exhibit Y

FTX Partners With Visa To Offer XRP And BTC To Millions Of Users

procoinnews.com/ftx-partners-with-visa-to-offer-xrp-and-btc-to-millions-of-users/

October 8, 2022

October 8, 2022 12:36 pm

The credit card firm Visa just announced that they will be partnering with the popular crypto exchange FTX in order to provide debit cards to around 40 nations across three continents.

This is significant because the debit cards that FTX provides is directly linked with the account holder's FTX investing account.

This means that digital assets like XRP and Bitcoin are now available to Visa's large customer base to conduct transactions without having to convert crypto to fiat or actually having to withdraw the crypto from the exchange.

Trending: Ripple Now Holds Less Than Half Of Total XRP Supply

As a result, this is a significant milestone that will boost the adoption of crypto assets like XRP to be used for every day transactions.

The decision to pursue such a partnership indicates that there is still strong demand among investors to spend digital assets despite the crypto bear market.

> 🔥FTX VISA HUGE CRYPTO PARTNERSHIP👀
>
> WATCH ▶️ https://t.co/E5A7VVVtXy#ftx #visa #crypto #cryptocurrency #huobi #binance #cbdc #celsius #bitcoin #ethereum #xrp #cardano #ada pic.twitter.com/uwdrXaCIBX
>
> — Tony Edward (Thinking Crypto Podcast) (@ThinkingCrypto1) October 8, 2022

Crypto-news-flash.com reports:

> VISA's CFO, Vasant Prabhu, said the partnership would enable users to conduct transactions with crypto without needing to convert their cryptos to fiat or withdraw from the crypto exchange platform. Prabhu also said there is still a strong interest in crypto despite the drop in values.
>
> As a company, we have no control over the value of digital currencies or whether it has a long-term positive effect. We want to simplify payment processes for people even when they want to process payments with crypto.
>
> VISA's new partnership with FTX adds to its multiple crypto collaborations. The Credit Card firm has collaborations with Binance and Coinbase, which are FTX's fiercest competitors. Another leader in the credit card space, MasterCard, has also been involved in several crypto partnership deals.
>
> Two notable MasterCard crypto partnerships are with Coinbase and Bakkt. The former is to ease NFT payment transactions, while the latter allows banks and small business owners in the Bakkt network to provide crypto services. Another credit card firm, American Express, said it is developing a way to link its cards and network with stablecoins.

FTX CEO Sam Bankman-Fried commented on the recent development and shared that a lot of the traditional payment companies are not against crypto.

In fact, many are now starting to embrace and incorporate blockchain technology into their existing business which indicates that long term growth will most certainly happen.

This trend will also allow crypto assets to be more than just store of value assets, but will actually provide them with real use cases which will result in further market growth.

With this new partnership between Visa and FTX, all businesses that already accept Visa would be able to accept crypto for payments without having to do any additional work which will likely accelerate adoption given Visa's wide international payments network.

> Big for Bitcoin adoption: FTX partners with VISA to offer #Bitcoin and #Ripple (#XRP) to millions of users in 40 countrieshttps://t.co/jWJm408h90
>
> — Crypto News Flash (@CryptoNewsFlas3) October 8, 2022

CoinTelegraph reports:

> Spending cryptocurrency may become a lot easier. FTX, one of the world's largest crypto exchanges, has partnered with payments giant Visa to roll out debit cards in 40 countries worldwide.
>
> The move would allow FTX users to pay for goods and services using debit cards that boast "zero fees." Plus, card ownership is free, according to the company website.
>
> Sam Bankman-Fried, the most influential person in crypto according to Cointelegraph's Top 100 in 2022, has long touted his desire to unveil an FTX debit card.
>
> His company's decision to partner with legacy payment rails — as opposed to crypto payment rails such as the Lightning Network — aligns with his views that the future of Bitcoin as a payments network is not viable.
>
> The FTX token, the native cryptocurrency of the FTX trading platform, spiked 7% on the news, reaching highs of $25.62. The token's all-time high is some way off, however, at almost $80.

> #crypto #bitcoin #altcoin #NFTs #btc #eth #xrp
> FTT Spiked to 3-Week High as Visa, FTX Revealed Crypto Debit Card
> Source : https://t.co/dAgoZwtcLQ
> Link : https://t.co/14VWfiSXwf
> For latest crypto news press Follow!
>
> — Crypto News (@SirDuCutj) October 7, 2022

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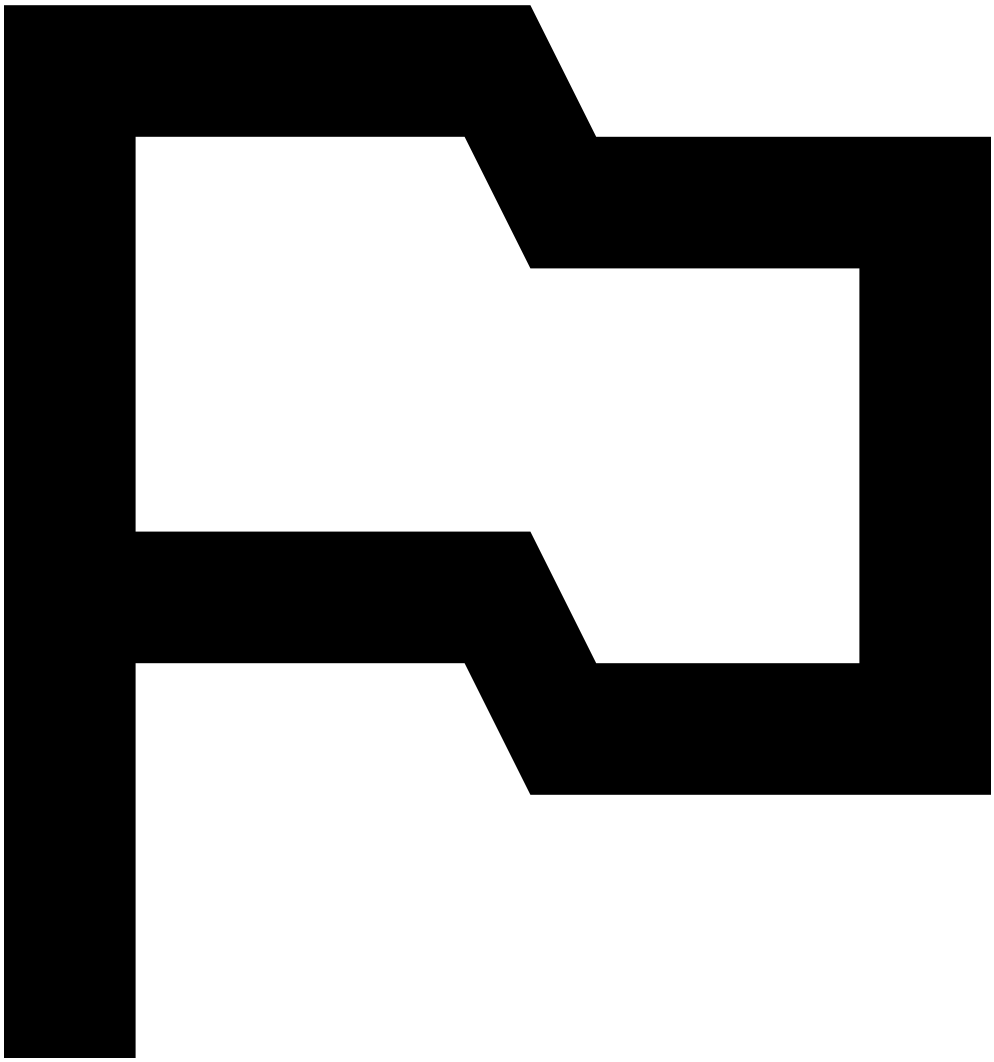
We have no tolerance for comments containing violence, racism, profanity, vulgarity, doxing, or discourteous behavior. If a comment is spam, instead of replying to it please click the



icon below and to the right of that comment. Thank you for partnering with us to maintain fruitful conversation.

Exhibit Z

CRYPTOCURRENCY • NOVEMBER 11, 2020, 6:35AM EST

Andreesen Horowitz-backed Deel launches crypto payroll tool

by Ryan Weeks

Ricardo Santos for The Block

A payroll platform which has drawn in $44 million in venture capital funding during the pandemic has unveiled a new tool to allow remote workers to be paid in cryptocurrency.

Deel, which supports remote workforces with payroll and compliance, says the new tool will enable international workers to be paid in bitcoin, ether, or XRP — with "near-instant" withdrawals.

The San Francisco-based start-up has partnered with Coinbase to deliver the product. Employees will need a Coinbase account to use it.

Deel's chief operating officer Dan Westgarth, who used to run digital bank Revolut's operations in North America, told The Block the aim of the launch is to help workers avoid international transfer fees, as well as helping them to get paid faster.

"A question on a lot of people's tongues is: will it be widely adopted? Will the companies paying these people be willing to opt into it? Well, we built it in a way that the company doesn't choose. The remote worker chooses," he said.

"So I can be working for a very old, boring institution, run by a load of old guys who don't understand crypto and oppose it. They could pay me in U.S. dollars, but given I'm a Deel user and given I get paid through Deel, I could elect to have my paycheck delivered in XRP — instantly."

Founded in 2018, Deel closed a $14 million Series A round led by Silicon Valley heavyweight Andreesen

ABOUT AUTHOR

Ryan is The Block's deals editor. Before joining he worked at Financial News, and has also written for the likes of Wired, Sifted and AltFi.

MORE BY RYAN WEEKS

Exhibit AA

Resources

Search our support resources

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Find experts to boost your SEO, create a custom design or build an app.
(https://partners.bigcommerce.com/directory/)

App Store

Add on powerful enterprise integrations and ecommerce apps
(https://www.bigcommerce.com/apps/)

Connecting with BitPay

What We'll Cover

- Requirements
- Setup
- Common questions

BitPay is one of the world's largest providers of Bitcoin and cryptocurrency payment services. With BitPay, you can accept Bitcoin and other leading cryptocurrencies, gain new customers, reduce payment processing fees, and eliminate chargebacks.

With support for more than 100 cryptocurrency wallets, BitPay protects you against any price volatility, and settles the next business day directly to your bank account or wallet. From setup to settlement, BitPay makes accepting cryptocurrency payments easy and risk-free.

Requirements

- Store must be based in one of BitPay's supported countries and territories (https://support.bitpay.com/hc/en-us/articles/115003026046-Can-I-use-BitPay-to-accept-bitcoin-payments-in-my-country-).
- Business must have a bank account or cryptocurrency wallet for settlement (https://bitpay.com/docs/settlement) in one of the following currencies (note that XRP is supported only outside of the United States):
  - **Direct deposit** — USD, AUD, CAD, GBP, MXN, NZD, EUR, ZAR
  - **Cryptocurrency wallet** — BTC, BCH, APE, DOGE, ETH, LTC, SHIB, WBTC, XRP, BUSD, DAI, GUSD, USDC, USDP, EUROC
- Shoppers must log into or create a BitPay account (https://bitpay.com/authenticate/signup?personal) to check out.

Setup

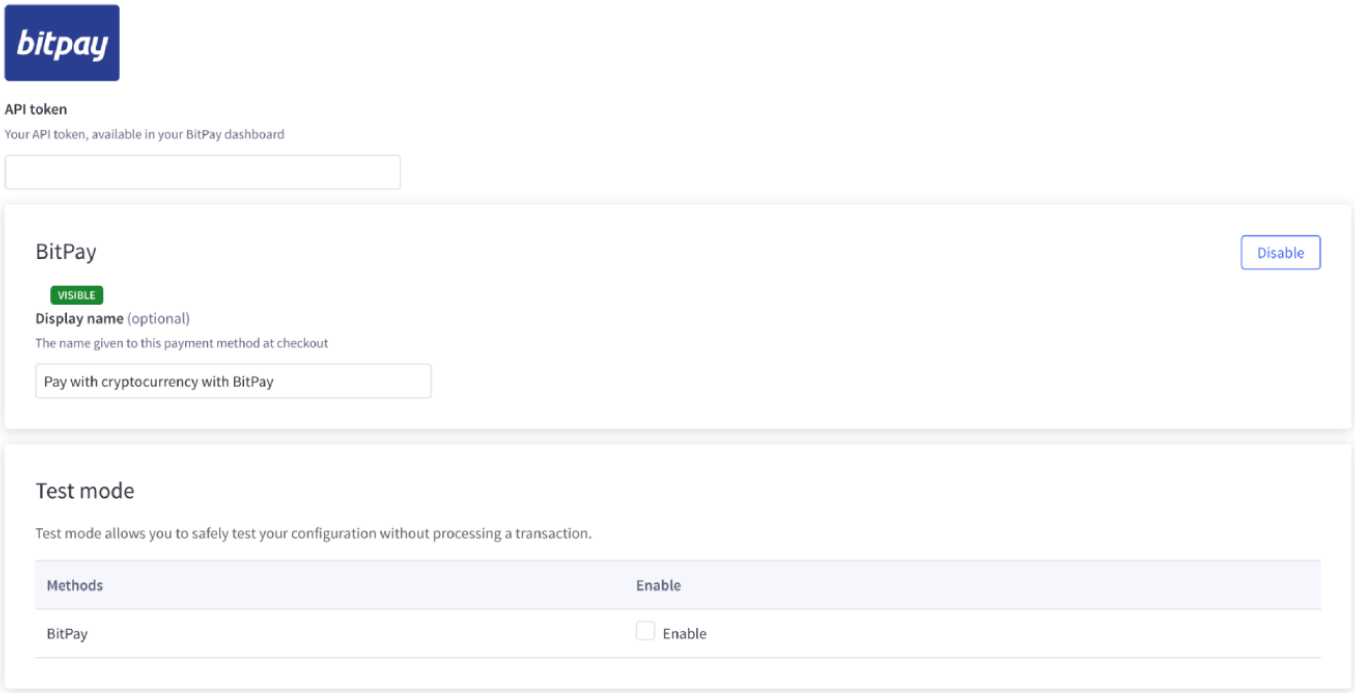
If you do not currently have a BitPay merchant account, you can apply (https://bitpay.com/dashboard/signup) for one.

Once you have an account, log in to your BitPay merchant dashboard and create an API Token (https://bitpay.com/dashboard/merchant/api-tokens). When creating the API token, ensure that the Required Authentication checkbox is not enabled. We recommend using the Token Label field to indicate the token's purpose, such as "BigCommerce", so you can easily identify it in your BitPay account dashboard.

Go to **Store Setup** › **Payments** (http://login.bigcommerce.com/deep-links/settings/payment) in the BigCommerce control panel and select **BitPay** from the list of Online Payment Methods.

You will be taken to the BitPay Settings tab. Enter the API token from your BitPay merchant account into its corresponding field and set your preferences. Click **Save** when done.

- **Display Name** — Control how BitPay appears at checkout. We recommend something like *Pay with cryptocurrency with BitPay*.
- **Test Mode** — Determines whether your store is in Test Mode, which allows you to safely test your payment configuration without processing live transactions. Use the checkbox to toggle this setting for BitPay.



Common Questions

- General
- Pricing and fees
- Account eligibility
- Transactions
- Refunds
- Additional features
- Troubleshooting and payment disputes

GENERAL

Can shoppers check out without having a BitPay account?

No, shoppers need to log into BitPay or create an account (https://bitpay.com/authenticate/signup?personal). This is to ensure that transactions remain secure at all times during checkout.

PRICING AND FEES

What fees are associated with BitPay?

BitPay charges a 1% processing fee on all transactions. See BitPay's documentation on fees (https://support.bitpay.com/hc/en-us/articles/203324073-What-fees-will-I-pay-to-use-BitPay-for-payment-processing-) for more information.

ACCOUNT ELIGIBILITY

What currencies and countries does BitPay support?

- Countries: BitPay supports payment processing and cryptocurrency settlement for merchants in nearly 230 countries and territories (https://support.bitpay.com/hc/en-us/articles/115003026046-Can-I-use-BitPay-to-accept-bitcoin-payments-in-my-country-). For more information about why a country or territory is not on this list, see BitPay's documentation (https://support.bitpay.com/hc/en-us/articles/360000123366-Why-can-t-I-use-BitPay-s-services-in-my-country-) on sanctioned countries and individuals, and prohibited countries and territories.
- Currencies: BitPay supports leading cryptocurrencies, including Bitcoin (BTC), Bitcoin Cash (BCH), Dogecoin (DOGE), Ethereum (ETH), Litecoin (LTC), Shiba Inu (SHIB), Wrapped Bitcoin (WBTC), and USD-pegged stable coins (BUSD, DAI, GUSD, USDC, and USDP). See BitPay's documentation on currencies (https://support.bitpay.com/hc/en-us/articles/203411543-What-currencies-can-I-use-to-pay-a-BitPay-invoice-) for more information.

What items are restricted for merchants to sell?

In addition to the Prohibited Uses listed in BitPay's Merchant Terms of Use (https://bitpay.com/legal/terms-of-use/), the following categories of businesses, business practices, and items for sale are prohibited from Acceptance Services. Most prohibited business categories are imposed by the requirements of banking providers or regulators. This list is non-exhaustive, and BitPay reserves the right to modify it at any time. It is within BitPay's sole discretion to determine whether an activity falls into a prohibited business category.

If you are uncertain as to whether or not your use of the Acceptance Services involves a prohibited business, contact BitPay (https://bitpay.com/request-help/wizard) about how these requirements may be applicable to you.

Prohibited businesses include the following:

- Drugs and drug paraphernalia, such as narcotics, controlled substances, and any equipment designed for making or using drugs;
- Marijuana/cannabis dispensaries and related products and businesses;
- Weapons, munitions, gunpowder and other explosives, including fireworks;
- Toxic, flammable, and radioactive materials;
- Pseudo-pharmaceuticals;
- Substances designed to mimic illegal drugs;
- Sexually explicit content;
- Sexually-related services;
- Pyramid and investment schemes, multi-level marketing schemes, and other unfair, predatory or deceptive practices;
- Items used for speculation or hedging purposes, such as derivatives;
- Credit and collection services;
- Items that infringe or violate any intellectual property rights such as copyrights, trademarks, trade secrets or patents, including counterfeit or unauthorized goods;
- Products and services with varying legal status from state to state;
- Transactions that disclose the personal information of third parties in violation of applicable law; and
- Transactions related to cloud-mining.

TRANSACTIONS

After I create an account, what is the waiting period before I can process transactions?

Once your application is approved, you have immediate access to your BitPay merchant dashboard. After you add the authorization token to the BitPay Settings tab in the BigCommerce control panel, you can start transacting.

How long until the funds are transferred to my bank?

Settlement payments for BitPay merchants happen automatically, every business day. BitPay collects and deposits all payments processed from the previous business day directly to your bank or cryptocurrency wallet, according to your settlement preferences. For more information, see BitPay's documentation (https://bitpay.com/docs/settlement) on banking and settlements.

Will I or my customers receive an additional email or invoice from BitPay?

No, BitPay does not require or send an additional email or invoice.

REFUNDS

How soon after a transaction can I perform a refund?

A refund can be performed immediately after a transaction has been completed. However, your BitPay ledger must have enough funds to process the refund. If it does not, you will receive an email notifying you that your BitPay account has insufficient funds to process the customer's refund.

Is there an amount of time after which I cannot perform a refund?

A refund can be performed at any time.

Are there any fees for chargebacks/refunds?

One of the greatest benefits to accepting cryptocurrency payments is there are no chargebacks with blockchain payments. BitPay does not charge a refund fee, but there might be a network fee to issue the refund. See BitPay's documentation on the Network Cost fee (https://support.bitpay.com/hc/en-us/articles/115002990803-What-is-the-Network-Cost-fee-on-BitPay-invoices-and-why-is-BitPay-charging-it-) for more information.

ADDITIONAL FEATURES

Are there any fraud filtering options available?

No.

Does BitPay allow authorize-only or recurring/subscription payments?

No.

Does BitPay support multicurrency? (supported by BigCommerce multicurrency)

No.

Does it support cryptocurrency?

Yes, BitPay is one of the largest bitcoin and cryptocurrency payment processors in the world.

Can I use the same account for multiple storefronts?

Yes, provided the additional storefronts are part of the approved business entity.

TROUBLESHOOTING AND PAYMENT DISPUTES

Why did my client receive an error when trying to pay?

The most common payment errors are for insufficient funds and/or the invoice has expired. See BitPay's article on Paying with Bitcoin and Cryptocurrency (https://support.bitpay.com/hc/en-us/categories/115000761843-Paying-with-Bitcoin-and-Cryptocurrency) for more information on paying BitPay invoices and resolving common payment errors.

How are payment disputes handled?

Payment disputes are extremely rare, but if one does arise merchants are encouraged to contact BitPay's support team via the BitPay Help Wizard (https://bitpay.com/request-help/wizard).

How do I contact BitPay's support?

Merchants are encouraged to contact BitPay's support team via the BitPay Help Wizard (https://bitpay.com/request-help/wizard).

GO TO **PAYMENTS** IN MY STORE (HTTP://LOGIN.BIGCOMMERCE.COM/DEEP-LINKS/SETTINGS/PAYMENT)

Additional Resources

- Available Payment Gateways (/s/article/Available-Payment-Gateways)
- Online Payment Methods (/s/article/Online-Payment-Methods)

Was this article helpful?

YES

NO

Exhibit BB

coinbase

Products Prices Company Sign In Get started

Send money internationally for free

- **Fast** - Send money across borders virtually instantly using XRP or USDC [1]
- **Free** - No fees to send or receive XRP or USDC to another Coinbase account [2]
- **Global** - Available to Coinbase users in any supported country, including India, Mexico, and the Philippines [3]

[1] This is not a money remittance; rather, it is a cryptocurrency transaction with conversion into local currency after receipt.

[2] Network fees charged on transfers to non-Coinbase accounts; purchases and sales of XRP are subject to a Coinbase fee.

[3] In countries where Coinbase does not support the local currency, recipients need to transfer their XRP/USDC to an exchange that supports exchanges from XRP/USDC to local currency.

Prices Learn Products Company Earn crypto Get $167+ Sign in Get started

d money
rnationally
free

end money across borders virtually instantly
RP or USDC[1]

No fees to send or receive XRP or USDC to
Coinbase account[2]

- Available to Coinbase users in any supported
, including India, Mexico, and the Philippines[3]

money remittance; rather, it is a cryptocurrency transaction with conversion into
after receipt.
s charged on transfers to non-Coinbase accounts; purchases and sales of XRP are
inbase fee.
where Coinbase does not support the local currency, recipients need to transfer
C to an exchange that supports exchanges from XRP/USDC to local currency.

Fast and free for all Coinbase users

You can now send money to any user with a Coinbase account around the world using XRP or USDC. By using cryptocurrencies that are optimized for cross-border transmission, you can send and receive money virtually instantly by sending those cryptocurrencies and having the recipient convert them into local currency. There's zero fee for sending to other Coinbase users and a nominal on-chain network fee for sending outside of Coinbase.

Bank transfer XRP USDC

Exhibit CC

ANA ALEXANDRE APR 02, 2019

Coinbase Expands Into Cross-Border Payments

Coinbase customers can now transfer funds to any user with a Coinbase account around the world.

12004 291 1:25

American major cryptocurrency exchange Coinbase has expanded into cross-border payments. Coinbase revealed the development in an announcement on March 28.

Coinbase customers can now transfer funds to any user with a Coinbase account around the world using Ripple (XRP ▼ $0.46) and the exchange's stablecoin USDCoin (USDC) with no fee. The development reportedly enables users to send and receive money instantly, as well as convert them into local currency.

March saw several new developments at Coinbase, including a service linking user accounts on its main platform to its Coinbase Wallet app, and a new market structure for the exchange's professional trading platform, Coinbase Pro, which aims to increase liquidity, enhance price discovery and ensure smoother price movements.

Coinbase added support for USDC last October, making it the first stablecoin to trade on the platform. The coin is purportedly 100 percent collateralized with U.S. dollars, and was launched last fall by CENTRE, an affiliate of crypto payments firm Circle.

Earlier this month, India's Federal Bank, a commercial private bank, began using Ripple's network for cross-border remittances. The partnership with Ripple came as part of a wider initiative to apply new technologies to the bank's remittances network. Also on March 28, Federal Bank launched two remittance platforms in the United Arab Emirates for making payments to India.

#Coinbase #Altcoin #Ripple #Transactions #Payments #United States #Cryptocurrency Exchange

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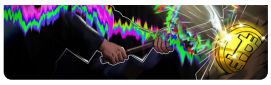

Major Crypto Exchange Coinbase ‘Explores’ Listing XRP, Cardano, EOS, Others

Major US Crypto Exchange Coinbase Adds Cash Withdrawals to PayPal

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Exhibit DD

TECH GUIDE

How to buy XRP, one of the hottest bitcoin competitors

PUBLISHED TUE, JAN 2 2018•4:47 PM EST UPDATED TUE, MAY 22 2018•10:43 AM EDT

Todd Haselton
@ROBOTODD

KEY POINTS

XRP is one of the hottest new cryptocurrencies and it only costs a bit over $2 per coin.

It's a bit harder to buy than bitcoin, however, since it's not available in popular apps such as Coinbase.

We'll walk you through how to buy some, by first buying ethereum and then using that to buy XRP on an exchange called Bitsane.

Update: Bitsane has been experiencing server overload problems. You can also try using Binance.

Ripple coin

Frank and Helena | Cultura | Getty

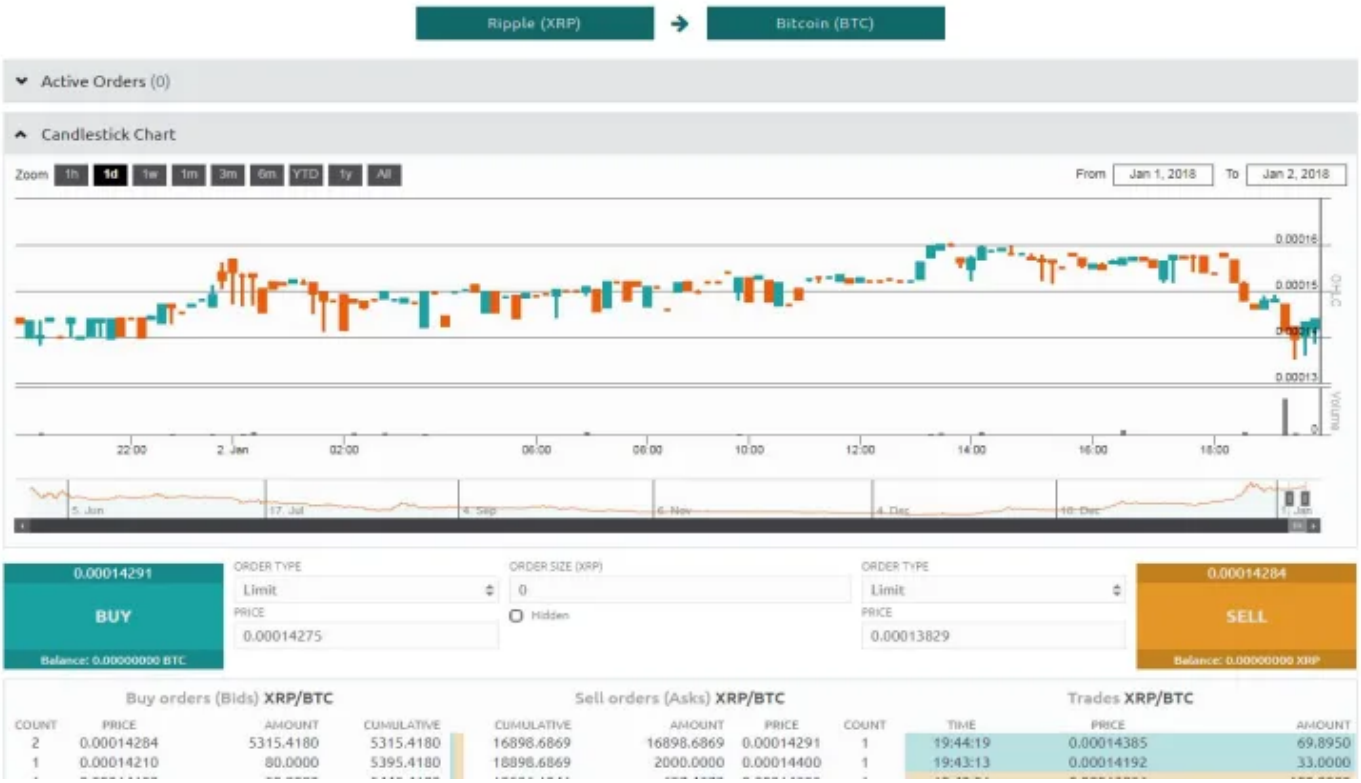
If you thought bitcoin was hot, maybe you should learn about XRP. It's another crytocurrency that's been rocketing in popularity lately. It was created by a company named Ripple.

While it was trading at around $0.20 a few months ago, it's now worth more than $2.25 per coin. XRP is a little different than many other popular cryptocurrencies because it was created by a private, for-profit company that is still the biggest individual owner of the currency.

But XRP isn't as easy to buy as bitcoin or other popular cryptocurrencies, since it isn't available in popular apps such as Coinbase.

That means you need to jump through a few hoops to buy it. I tried several methods and think I've come up with the easiest:

Create an account with a Ripple exchange



Only some of Rpple's recommended exchanges include support for buying XRP with the U.S. dollar, which would be the easiest way. Unfortunately, after trying several and running into technical issues or login problems, I settled on an exchange called Bitsane. (**Update:** Bitsane has been experiencing server overload problems. You can also try using Binance.)

Setting up an account is easy, and the main page has all sorts of information on current exchange prices for trading between various cryptocurrencies. It also lets you send and receive currency from other apps, such as Coinbase, which we'll get to in a moment.

Buy bitcoin or ether

Now you'll need to buy another cryptocurrency: either bitcoin or ether (the cryptocurrency associated with the Ethereum blockchain).

It's annoying that you need to do this extra step, but unfortunately it's the easiest way to move forward.

I used Coinbase to buy ether and bitcoin. It's easy to use and you can buy it using the U.S. dollar, either through a linked bank account or debit card. Follow our guide on how to buy bitcoin and ethereum for this step.

In this case, I'm buying $200 worth of ether.

Move your ether to Bitsane

Next, you're going to move the ether you own in Coinbase over to the Bitsane platform so you can use it to buy XRP. I know it sounds complicated, but it isn't.

- Click “Balances” on the top of the Bitsane page.
- On the “Ethereum” line, select “Deposit.”
- The page will generate a special address. Copy it.
- Open Coinbase on your phone or computer.
- Tap Accounts
- Tap “ETH wallet”
- Tap the “Send” icon on the top right. It looks like a paper airplane.
- Choose how much you want to send. We’ll do $100 worth of ether.
- Enter the address you copied from Bitsane.
- Click Send.
- You’ll pay a small fee -- I paid $0.36 -- and it should arrive in your Bitsane account within 30 minutes.

Buy XRP

using ether

Now that your ether is in your Bitsane account, you can use it to buy XRP

- On the top of the page, select the XRP/ETH exchange. This allows you to buy XRP using ether, and shows you the buy orders (bids), sell orders (asks), and current trades.
- Choose how much you want to buy. Under order type, select “market” and then choose your order size (how many XRP coins you want to buy.)
- Since I have 0.11712345 ether, I can buy 46 XRP coins, which is about $2.20 a pop give or take a few cents.

View your XRP

You can see how much XRP you now own under balances. Here we can see I ended up with about 45.88 full XRP coins.

Now, since I can’t really spend XRP anywhere, I can just sit on it and see what happens. As with most cryptocurrencies, you’re taking a bet here on whether the value is going to increase or decrease. But unlike bitcoin, you can actually buy several of these at once without spending too much money.

VIDEO 00:40

Ripple's XRP just soared more than 30%

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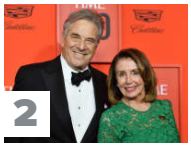

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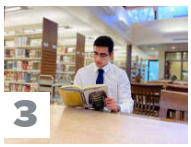

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Exhibit EE

XRP Can Now Be Easily Bought in Europe Straight from Bank Account, Here's How

Wed, 10/12/2022 - 08:51

Gamza Khanzadaev

"XRP for EUR" solution becomes available in XRPL's Xumm wallet

Cover image via www.freepik.com

XRP Ledger's lead developer, Wietse Wind, reports that an on-ramp solution has been added to the Xumm Wallet. With the innovation, users will be able to buy XRP for fiat through Xumm directly from their bank accounts.

At the moment, the new product is only available in the Netherlands, the home country of the Xumm Wallet developers. However, according to Wind, there are plans to expand to Belgium, Germany and the UK. Among other things, an off-ramp solution will be added later to the wallet to allow the process of selling XRP for fiat currencies.

Too exclusive option

Interestingly, in order to use the innovation, Xumm users will have to sign up for two subscriptions: first for the pro version of the wallet, and then separately for €5 per year to connect the ramp functions. On the other hand, there are no further commissions or charges for deposits or withdrawals.

In addition, you must have a Dutch bank account, a residential address in the kingdom and a Dutch passport in order to complete the necessary verifications. On this side, it seems that using Xumm in terms of purchases for fiat is still limited for many.

Related

Here Is Why XRP Doesn't Need Centralized Crypto Exchanges

One may recall the experience of another XRPL project, onXRP, which previously introduced an on-ramp solution with Banxa which, while also having some restrictions for users from certain countries, seems simpler at the moment.

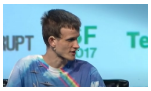
#XRP #XRPL

About the author

Gamza Khanzadaev

Financial analyst, trader and crypto enthusiast.
Gamza graduated with a degree in finance and credit with a specialization in securities and financial derivatives. He then also completed a master's program in banking and asset management.
He wants to have a hand in covering economic and fintech topics, as well as educate more people about cryptocurrencies and blockchain.

10/30/2022 - 16:49



Ethereum’s Vitalik Buterin Says He’s Glad ETFs Are Being Delayed

Alex Dovbnya

10/30/2022 - 15:39

Dogecoin Addresses in Profit Rise to 65% as Price Reaches Five-month High

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DOGE Finally Has Use Case, Says Cardano Founder; Dogecoin Creator Hits Back

DOGE Finally Has Use Case, Says Cardano Founder; Dogecoin Creator Hits Back

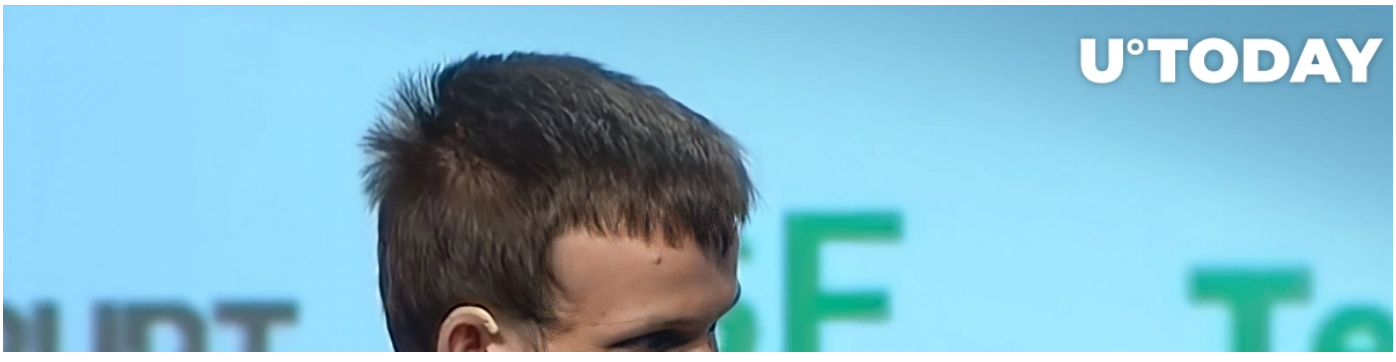
Gamza Khanzadaev

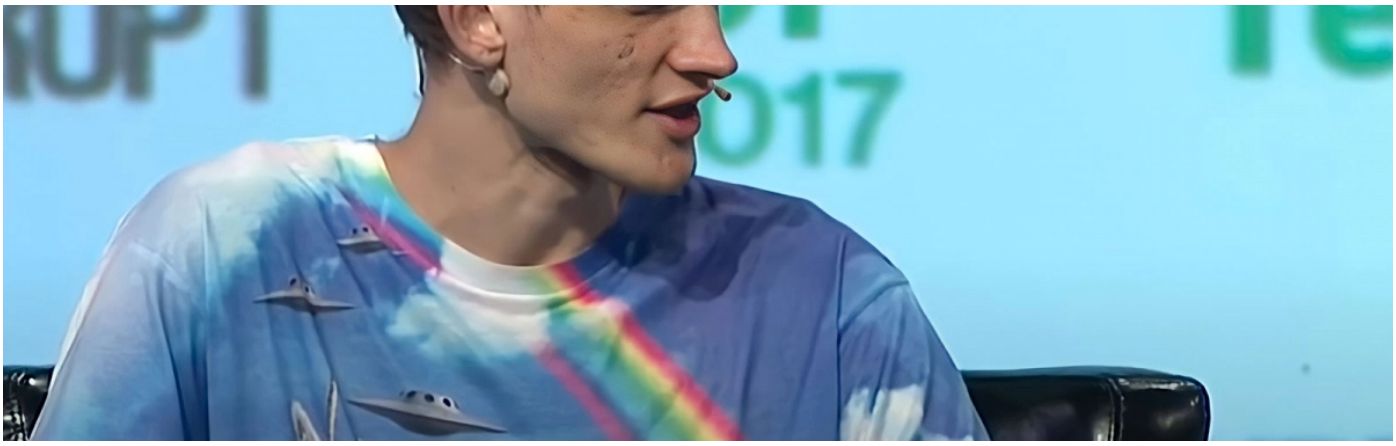
Ethereum’s Vitalik Buterin Says He’s Glad ETFs Are Being Delayed

Sun, 10/30/2022 - 16:49

Alex Dovbnya

Ethereum’s Vitalik Buterin has weighed in on cryptocurrency regulations in a lengthy post on Twitter





Cover image via stock.adobe.com

Ethereum co-founder Vitalik Buterin has weighed in on cryptocurrency regulation in a recent Twitter thread, arguing that the industry shouldn't put too much effort into attracting institutional capital “at full speed.”

Buterin is not overly concerned by the U.S. Securities and Exchange refusal to greenlight a spot-based exchange-traded fund. In fact, he is glad that U.S. regulators have so far blocked all the attempts to launch such a product. Buterin is convinced that the cryptocurrency ecosystem has to become more mature before this becomes a possibility.

Related
Dogecoin Addresses in Profit Rise to 65% as Price Reaches Five-month High

He believes that regulations that prevent cryptocurrencies from reaching the mainstream are now as bad as those regulations that hurt crypto projects internally.

At the same time, he believes that the idea of imposing know-your-customer rules on decentralized finance frontends is not very “pointful” since it would “annoy” users while doing little to deter hackers. Buterin explains that bad actors actually write custom code in order to interact with smart contracts.

Buterin is in favor of moderate DeFi regulations that would include limits on possible leverage, stringent audit requirements as well as other measures.

FTX CEO Sam Bankman-Fried praised Buterin’s suggestions, describing them as “pretty reasonable” in his tweet.

Regulations remain a hot-button issue for the entire cryptocurrency industry, with many executives persistently clamoring for clarity.

#Ethereum News

About the author
Alex Dovbnya

Alex Dovbnya (aka AlexMorris) is a cryptocurrency expert, trader and journalist with extensive experience of covering everything related to the burgeoning industry — from price analysis to Blockchain disruption. Alex authored more than 1,000 stories for U.Today, CryptoComes and other fintech media outlets. He’s particularly interested in regulatory trends around the globe that are shaping the future of digital assets, can be contacted at alex.dovbnya@u.today.

Exhibit FF

XRPL Use Cases

Powering Innovative Technology

Micropayments

Developers are using the XRP Ledger to build innovative products for gaming, content, and web monetization, among other applications where currency is at the center.

Cryptocurrency Wallets

Use the Ledger to build digital wallets to store private and public passwords and interact with various blockchains to send and receive digital assets, including XRP.

Exchanges

Build sophisticated exchanges where users can invest and trade crypto and non-blockchain assets such as stocks, ETFs, and commodities.

Stablecoins

Financial institutions can use Issued Currencies to issue stablecoins on the XRP Ledger. XRPL's integrated decentralized exchange (DEX) allows neutral, counterparty-free digital assets to be seamlessly exchanged to and from "issued assets," including stablecoins.

NFTs

XRPL allows issuance of IOUs which can represent a currency of any value, which can be extended to the issuance of non-fungible tokens (NFTs).

DeFi

Provide access to financial products and services online in a decentralized and borderless manner on XRPL, with decentralized smart contract protocols replacing the traditional role of financial institutions.

CBDCs

The CBDC Private Ledger provides Central Banks a secure, controlled, and flexible solution to issue and manage Central Bank Issued Digital Currencies (CBDCs).

Solving Real Problems Across Industries

Businesses and projects running on the XRP Ledger

There are companies and developer projects around the world that leverage the XRP Ledger to solve interesting problems across a variety of industries and use cases.

Asset Custody

BitGo provides custodial and non-custodial asset holdings for

new and existing financial systems.

Payment Processing

BitPay builds powerful, enterprise-grade tools for accepting and spending cryptocurrencies, including XRP.

Web Monetization

Coil provides web monetization as an alternative to traditional paid advertising. Coil uses the interledger protocol (ILP) to stream micropayments as users consume content. The XRPL's payment channels provide an ideal system for settling these micropayments at high speed and low cost.

Online Gaming

Forte offers an unprecedented set of easy-to-use tools and services for game developers to integrate blockchain technology into their games, to unlock new economic and creative opportunities for gamers across the world.

Wallet and Platforms

GateHub is a platform for the Internet of Value, built on the XRP Ledger protocol. It allows everyone to send, receive, trade and manage any type of assets.

Wallets and Apps

Exodus offers wallets and applications for securing, managing and exchanging crypto.

On-Demand Liquidity

Ripple powers instant, lower-cost settlement of cross-border payments using XRP to source liquidity on demand. XRP is ideally suited for global payments because it's quicker, less costly, and more scalable than any other digital asset.

Infrastructure

Interledger infrastructures and make non-custodial crypto management easier.

Music

Raised in Space is a music/tech investment group focused on raising the value of music, innovating across the entire value chain of the music industry.

Applications

From cold storage to apps for signing transactions, XRPL Labs is dedicated to building software on the XRP Ledger.

Security

Xrplorer offers services and tools that help prevent and combat fraudulent activity on the XRPL as well as custom APIs and analytics that supplement the XRPL APIs where they are not enough.

Exhibit GG

details about each product.

XRP All Products

Protected High Yield Auto-Invest New

Principal Protected

The same number of tokens deposited to Savings and Staking will be returned to you along with yields paid out in the same type of token. See our Terms & Conditions and FAQs for more details.

Popular Coins Best for Beginners BNB Chain Zone Polka Zone Solana Zone

Coin	Est. APR	Duration
XRP Simple Earn	1.11%	Flexible

Calculate your crypto earnings

I have 1000 XRP

and I am interested in

Flexible | Fixed investment.

Products on offer

Simple Earn
1.11%

Flexible DeFi Staking Advanced
1.39%

Estimated Earnings

+ 33.79511594 XRP

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3. Which cryptocurrencies are supported?

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Exhibit HH

CoinLoan

CoinLoan.io > Crypto Loans > XRP Loans

Get a Loan Backed by Your XRP

Borrow cash from 4.95% annually, without selling your crypto.

Open Account

Loan Amount	1000	EUR
Collateral Amount	10831.65442	XRP
Loan Period	1 12 24 36	6 months
LTV	20% 35% 50% 70%	

Interest Rate	4.95%
LTV	20%
Origination Fee	10 EUR

1,034.75 EUR

CoinLoan

What is Ripple (XRP)?

Ripple is a tech company that provides effective solutions for sending money around the world through its global payment network RippleNet. XRP is RippleNet's native cryptocurrency. It acts as a means of universal liquidity on the network. The platform is open-source, which means that any banking company, payment system and other financial service provider can embed Ripple protocol into their system.

XRP is now the fifth largest cryptocurrency in the world by market capitalization, after Bitcoin, Ethereum, Tether stablecoin, and Polkadot. The cryptocurrency was developed from the ground up, using unique solutions and concepts. It has nothing to do with any existing codebases.

CoinLoan

XRP History

The RippleNet concept was developed in Canada in 2004 by Ryan Fugger. The prototype called RipplePay was a new way of making online payments over the Internet. The system was launched only in 2012 and supported by a powerful development team. Ripple Labs is headquartered in San Francisco with offices in London, Singapore, Sydney, Luxembourg, and Mumbai.

The company now has over 300 partners, including high-profile companies like Mitsubishi UFJ Financial Group, National Australia Bank, Canadian Imperial Bank of Commerce, UniCredit Group, and MoneyGram Inc, one of the world's largest money transfer operators.

CoinLoan

- -

Initially, the company created 100 billion coins. Since then, they have been gradually released into circulation. New emissions are prohibited by the protocol rule.

When carrying out transactions in any other currency, the system provides a commission of 0.00001 XRP. This amount protects the system from cyber attacks, making them too expensive.

Every CoinLoan account owner gets a destination tag that is generated together with a Ripple (XRP) deposit address. This unique code is used to determine what account a deposit should be assigned and credited to.

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Fastest cross-border transfers (3-5 seconds). For comparison: for the Ethereum network, the transaction time is 2 minutes. For Bitcoin it's 1 hour.

Low transaction fee

The transaction fee of 0.00001 XRP is so low that users don't notice it.

High level of protection

XRP network ensures a high level of protection against spam and hacker attacks.

Power economy

XRP isn't mined, which means no additional computing power and electricity costs.

CoinLoan

Three Steps to Give Borrowing a Shot

Start Borrowing

Verify Yourself

We need to get to know you, these are the rules of the financial market. The verification process is automatic and takes a couple of minutes to complete.

Deposit Collateral

You may use crypto, stablecoins or even fiat as a collateral asset. It will be held at our custodian and returned safely to you as soon as you repay your loan.

CoinLoan

and get your money instantly — no credit checks, no paperwork or waiting for the approval.

CoinLoan Stands on Safety

Our imperative is zero-incident safety. We're constantly raising the bar for our security standards so that users can sleep well.

Stay Safe with CoinLoan

- Insured Custodian
- Strict Access Recovery Policy
- Vulnerability Scans
- Two-Factor Authentication
- mer Support

CoinLoan

PCI DSS Compliance Biometric Authentication

Grab the App

4.8(100+) Reviews

Manage all your digital assets in five screens. Stay in touch with your account activity with instant push alerts.

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Blog

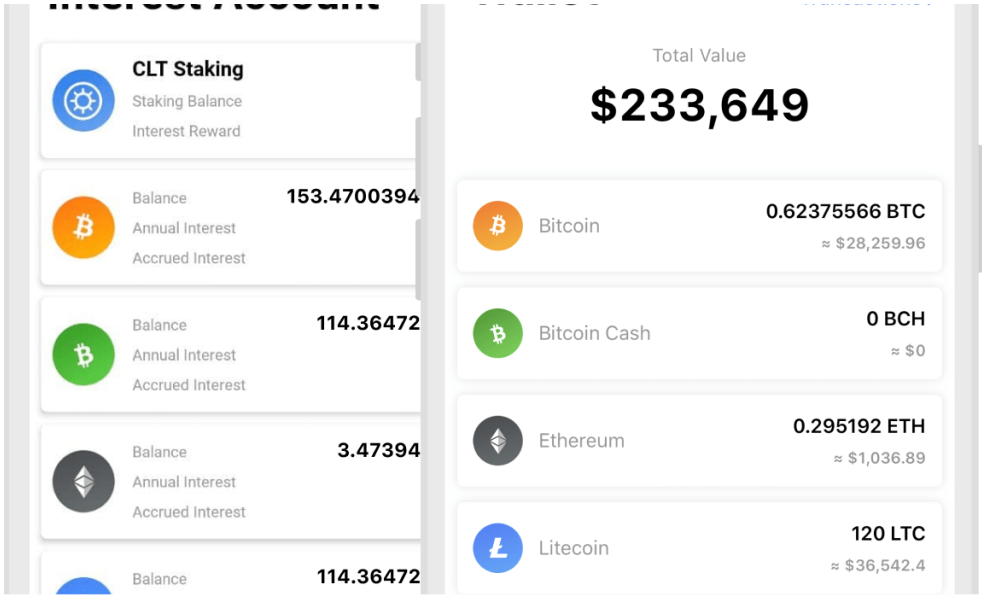

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Exhibit II

2 minute readJuly 14, 20224:58 AM EDTLast Updated 4 months ago

Major crypto lender Celsius files for bankruptcy

By Maria Ponnezhath and Tom Wilson

[1/2] Celsius logo and representation of cryptocurrencies are seen in this illustration taken, July 7, 2022. REUTERS/Dado Ruvic/Illustrations

July 13 (Reuters) - U.S. crypto lender Celsius Network said on Wednesday it had filed for bankruptcy in New York, becoming the latest victim in the cryptocurrency sector of a dramatic plunge in token prices.

New Jersey-based Celsius froze withdrawals last month, citing "extreme" market conditions, cutting off access to savings for individual investors and sending tremors through the crypto market.

In a court filing at the U.S. Bankruptcy Court for Southern District of New York, Celsius estimated its assets and liabilities as between $1 billion to $10 billion, with more than 100,000 creditors. The company has $167 million in cash on hand.

"This is the right decision for our community and company," said Celsius co-founder and Chief Executive Alex Mashinsky.

Crypto lenders such as Celsius boomed during the COVID-19 pandemic, drawing depositors with high interest rates and easy access to loans rarely offered by traditional banks. They lent out tokens to mostly institutional investors, making a profit from the difference.

Latest Updates

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But the lenders' business model came under scrutiny after a sharp sell-off in the crypto market spurred by the collapse of major tokens terraUSD and luna in May.

Another U.S. crypto lender, Voyager Digital Ltd (VOYG.TO), filed for bankruptcy this month after suspending withdrawals and deposits. Singapore's Vauld, a smaller lender, also froze withdrawals this month. read more

Celsius said in a statement it was not requesting authority to allow customer withdrawals, adding it had asked the court to allow it to continue operations such as paying employees.

Celsius's move in June to freeze withdrawals prompted state securities regulators in New Jersey, Texas and Washington to launch investigations into the firms. read more

Reporting by Maria Ponnezhath in Bengaluru; Editing by Sherry Jacob-Phillips and Edmund Blair

Exhibit JJ

Gary Gensler, *Ethics and Governance in the Blockchain Era, Gary Gensler, MIT, April 23, 2018*
https://www.youtube.com/watch?v=Bx4Q19xA7Oc

Exhibit KK

Speech

Remarks Before the Aspen Security Forum

Chair Gary Gensler

Washington D.C.

Aug. 3, 2021

Thank you for that kind introduction. It's good to join the Aspen Security Forum.

As is customary, I'd like to note that my views are my own, and I'm not speaking on behalf of the Commission or the SEC staff.

Some might wonder: What does the SEC have to do with crypto?

Further, why did an organization like the Aspen Security Forum ask me to speak about crypto's intersection with national security?

Let me start at the beginning.

It was Halloween night 2008, in the middle of the financial crisis, when Satoshi Nakamoto published an eight-page paper[1] on a cypherpunk mailing list that'd been run by cryptographers since 1992.[2]

Nakamoto — we still don't know who she, he, or they were — wrote, "I've been working on a new electronic cash system that's fully peer-to-peer, with no trusted third party."[3]

Nakamoto had solved two riddles that had dogged these cryptographers and other technology experts for a couple of decades: first, how to move something of value on the internet without a central intermediary; and relatedly, how to prevent the "double-spending" of that valuable digital token.

Subsequently, his innovation spurred the development of crypto assets and the underlying blockchain technology.

Based upon Nakamoto's innovation, about a dozen years later, the crypto asset class has ballooned. As of Monday, this asset class purportedly is worth about $1.6 trillion, with 77 tokens worth at least $1 billion each and 1,600 with at least a $1 million market capitalization.[4]

Before starting at the SEC, I had the honor of researching, writing, and teaching about the intersection of finance and technology at the Massachusetts Institute of Technology. This included courses on crypto finance, blockchain technology, and money.

In that work, I came to believe that, though there was a lot of hype masquerading as reality in the crypto field, Nakamoto's innovation is real. Further, it has been and could continue to be a catalyst for change in the fields of finance and money.[5]

At its core, Nakamoto was trying to create a private form of money with no central intermediary, such as a central bank or commercial banks.

We already live in an age of digital public monies — the dollar, euro, sterling, yen, yuan. If that wasn't obvious before the pandemic, it has become eminently clear over the last year that we increasingly transact online.

Such public fiat monies fulfill the three functions of money: a store of value, unit of account, and medium of exchange.

No single crypto asset, though, broadly fulfills all the functions of money.

Primarily, crypto assets provide digital, scarce vehicles for speculative investment. Thus, in that sense, one can say they are highly speculative stores of value.

These assets haven't been used much as a unit of account.

We also haven't seen crypto used much as a medium of exchange. To the extent that it is used as such, it's often to skirt our laws with respect to anti-money laundering, sanctions, and tax collection. It also can enable extortion via ransomware, as we recently saw with Colonial Pipeline.

With the advent of the internet age and the movement from physical money to digital money several decades ago, nations around the globe layered various public policy goals over our digital public money system.

As a policy matter, I'm technology-neutral.

As a personal matter, I wouldn't have gone to MIT if I weren't interested in how technology can expand access to finance and contribute to economic growth.

But I am anything but public policy-neutral. As new technologies come along, we need to be sure we're achieving our core public policy goals.

In finance, that's about protecting investors and consumers, guarding against illicit activity, and ensuring financial stability.

So how does the SEC fit into all this?

The SEC has a three-part mission — to protect investors, facilitate capital formation, and maintain fair, orderly, and efficient markets in between them. We focus on financial stability as well. But at our core, we're about investor protection.

If you want to invest in a digital, scarce, speculative store of value, that's fine. Good-faith actors have been speculating on the value of gold and silver for thousands of years.

Right now, we just don't have enough investor protection in crypto. Frankly, at this time, it's more like the Wild West.

This asset class is rife with fraud, scams, and abuse in certain applications. There's a great deal of hype and spin about how crypto assets work. In many cases, investors aren't able to get rigorous, balanced, and complete information.

If we don't address these issues, I worry a lot of people will be hurt.

First, many of these tokens are offered and sold as securities.

There's actually a lot of clarity on that front. In the 1930s, Congress established the definition of a security, which included about 20 items, like stock, bonds, and notes. One of the items is an investment contract.

The following decade, the Supreme Court took up the definition of an investment contract. This case said an investment contract exists when "a person invests his money in a common enterprise and is led to expect profits

solely from the efforts of the promoter or a third party."[6] The Supreme Court has repeatedly reaffirmed this Howey Test.

Further, this is but one of many ways we determine whether tokens must comply with the federal securities laws.

I think former SEC Chairman Jay Clayton said it well when he testified in 2018: "To the extent that digital assets like [initial coin offerings, or ICOs] are securities — and I believe every ICO I have seen is a security — we have jurisdiction, and our federal securities laws apply."[7]

I find myself agreeing with Chairman Clayton. You see, generally, folks buying these tokens are anticipating profits, and there's a small group of entrepreneurs and technologists standing up and nurturing the projects. I believe we have a crypto market now where many tokens may be unregistered securities, without required disclosures or market oversight.

This leaves prices open to manipulation. This leaves investors vulnerable.

Over the years, the SEC has brought dozens of actions in this area,[8] prioritizing token-related cases involving fraud or other significant harm to investors. We haven't yet lost a case.

Moreover, there are initiatives by a number of platforms to offer crypto tokens or other products that are priced off of the value of securities and operate like derivatives.

Make no mistake: It doesn't matter whether it's a stock token, a stable value token backed by securities, or any other virtual product that provides synthetic exposure to underlying securities. These products are subject to the securities laws and must work within our securities regime.

I've urged staff to continue to protect investors in the case of unregistered sales of securities.

Next, I'd like to discuss crypto trading platforms, lending platforms, and other "decentralized finance" (DeFi) platforms.

The world of crypto finance now has platforms where people can trade tokens and other venues where people can lend tokens. I believe these platforms not only can implicate the securities laws; some platforms also can implicate the commodities laws and the banking laws.

A typical trading platform has more than 50 tokens on it. In fact, many have well in excess of 100 tokens. While each token's legal status depends on its own facts and circumstances, the probability is quite remote that, with 50 or 100 tokens, any given platform has zero securities.

Moreover, unlike other trading markets, where investors go through an intermediary like the New York Stock Exchange, people can trade on crypto trading platforms without a broker — 24 hours a day, 7 days a week, from around the globe.

Further, while many overseas platforms state they don't allow U.S. investors, there are allegations that some unregulated foreign exchanges facilitate trading by U.S. traders who are using virtual private networks, or VPNs.[9]

The American public is buying, selling, and lending crypto on these trading, lending, and DeFi platforms, and there are significant gaps in investor protection.

Make no mistake: To the extent that there are securities on these trading platforms, under our laws they have to register with the Commission unless they meet an exemption.

Make no mistake: If a lending platform is offering securities, it also falls into SEC jurisdiction.

Next, I'd like to turn to stable value coins, which are crypto tokens pegged or linked to the value of fiat currencies.

Many of you have heard about Facebook's efforts to stand up a stablecoin called Diem (formerly known as Libra).

Due to the global reach of Facebook's platform, this has gotten a lot of attention from central bankers and regulators. This is not only due to general policies and concerns with crypto, but also due to Diem's potential impact on monetary policy, banking policy, and financial stability.

Maybe less well known to this audience, though, is that we already have an existing stablecoin market worth $113 billion,[10] including four large stablecoins — some of which have been around for seven years.

These stablecoins are embedded in crypto trading and lending platforms.

How do you trade crypto-to-crypto? Usually, somebody uses stablecoins.

In July, nearly three-quarters of trading on all crypto trading platforms occurred between a stablecoin and some other token.[11]

Thus, the use of stablecoins on these platforms may facilitate those seeking to sidestep a host of public policy goals connected to our traditional banking and financial system: anti-money laundering, tax compliance, sanctions, and the like. This affects our national security, too.

Further, these stablecoins also may be securities and investment companies. To the extent they are, we will apply the full investor protections of the Investment Company Act and the other federal securities laws to these products.

I look forward to working with my colleagues on the President's Working Group on Financial Markets on these matters.[12]

Next, I want to turn to investment vehicles providing exposure to crypto assets. Such investment vehicles already exist, with the largest among them having been around for eight years and worth more than $20 billion.[13] Also, there are a number of mutual funds that invest in Bitcoin futures on the Chicago Mercantile Exchange (CME).

I anticipate that there will be filings with regard to exchange-traded funds (ETFs) under the Investment Company Act ('40 Act). When combined with the other federal securities laws, the '40 Act provides significant investor protections.

Given these important protections, I look forward to the staff's review of such filings, particularly if those are limited to these CME-traded Bitcoin futures.

The final policy area has to do with custody of crypto assets. The SEC is seeking comment on crypto custody arrangements by broker-dealers and relating to investment advisers.[14] Custody protections are key to preventing theft of investor assets, and we will be looking to maximize regulatory protections in this area.

Before I conclude, I'd like to note we have taken and will continue to take our authorities as far as they go.

Certain rules related to crypto assets are well-settled. The test to determine whether a crypto asset is a security is clear.

There are some gaps in this space, though: We need additional Congressional authorities to prevent transactions, products, and platforms from falling between regulatory cracks. We also need more resources to protect investors in this growing and volatile sector.

We stand ready to work closely with Congress, the Administration, our fellow regulators, and our partners around the world to close some of these gaps.

In my view, the legislative priority should center on crypto trading, lending, and DeFi platforms. Regulators would benefit from additional plenary authority to write rules for and attach guardrails to crypto trading and lending.

Right now, large parts of the field of crypto are sitting astride of — not operating within — regulatory frameworks that protect investors and consumers, guard against illicit activity, ensure for financial stability, and yes, protect national security.

Standing astride isn't a sustainable place to be. For those who want to encourage innovations in crypto, I'd like to note that financial innovations throughout history don't long thrive outside of our public policy frameworks.

At the heart of finance is trust. And at the heart of trust in markets is investor protection. If this field is going to continue, or reach any of its potential to be a catalyst for change, we better bring it into public policy frameworks.

Thank you. I look forward to your questions.

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[1] *See* Satoshi Nakamoto, "Bitcoin: A Peer-to-Peer Electronic Cash System," *available at* https://bitcoin.org/bitcoin.pdf.

[2] *See* Haseeb Qureshi "The Cypherpunks" (Dec. 29, 2019), *available at* https://nakamoto.com/the-cypherpunks/.

[3] *See* "Bitcoin P2P e-cash paper" (Oct. 31, 2008), *available at* https://satoshi.nakamotoinstitute.org/emails/cryptography/1/.

[4] Numbers as of Aug. 2, 2021. *See* CoinMarketCap, *available at* www.coinmarketcap.com. Crypto asset figures are not audited or reported to regulatory authorities.

[5] *See* Michael Casey, Jonah Crane, Gary Gensler, Simon Johnson, and Neha Narula, "The Impact of Blockchain Technology on Finance: A Catalyst for Change" (2018), *available at* https://www.sipotra.it/wp-content/uploads/2018/07/The-Impact-of-Blockchain-Technology-on-Finance-A-Catalyst-for-Change.pdf.

[6] *See* SEC v. Howey Co., 328 U.S. 293 (1946), "Framework for 'Investment Contract' Analysis of Digital Assets," *available at* https://supreme.justia.com/cases/federal/us/328/293/.

[7] *See* Jay Clayton, Testimony United States Senate Committee on Banking, Housing, And Urban Affairs, "Virtual Currencies: The Oversight Role of the U.S. Securities and Exchange Commission and the U.S. Commodity Futures Trading Commission" (Feb. 6, 2018), *available at* https://www.banking.senate.gov/hearings/virtual-currencies-the-oversight-role-of-the-us-securities-and-exchange-commission-and-the-us-commodity-futures-trading-commission (see approx. 32:00 mark).

[8] *See* Cornerstone Research, "Cornerstone Research Report Shows SEC Establishes Itself as a Key U.S. Cryptocurrency Regulator" (May 11, 2021), *available at* https://www.cornerstone.com/Publications/Press-Releases/Cornerstone-Research-Report-Shows-SEC-Establishes-Itself-as-a-Key-U-S-Cryptocurrency-Regulator.

[9] *See* Alexander Osipovich, "U.S. Crypto Traders Evade Offshore Exchange Bans" (July 30, 2021), *available at* https://www.wsj.com/articles/u-s-crypto-traders-evade-offshore-exchange-bans-11627637401.

[10] Numbers as of Aug. 1. *See* The Block, "Total Stablecoin Supply," *available at* https://www.theblockcrypto.com/data/decentralized-finance/stablecoins.

[11] *See* The Block, "Share of Trade Volume by Pair Denomination," *available at* https://www.theblockcrypto.com/data/crypto-markets/spot.

[12] *See* "Readout of the Meeting of the President's Working Group on Financial Markets to Discuss Stablecoins" (July 19, 2021), *available at* https://home.treasury.gov/news/press-releases/jy0281.

[13] *See* Grayscale® Bitcoin Trust, *available at* https://grayscale.com/products/grayscale-bitcoin-trust/.

[14] *See* Securities and Exchange Commission, "Staff Statement on WY Division of Banking's 'NAL on Custody of Digital Assets and Qualified Custodian Status'" (Nov. 9, 2020), *available at* https://www.sec.gov/news/public-statement/statement-im-finhub-wyoming-nal-custody-digital-assets. *See* Securities and Exchange Commission, "SEC Issues Statement and Requests Comment Regarding the Custody of Digital Asset Securities by Special Purpose Broker-Dealers" (Dec. 23, 2020), *available at* https://www.sec.gov/news/press-release/2020-340.

Exhibit LL

XRP Ledger Services

Support this project: Donate with: xumm

XRPL Transactions | XRPL Tokens | XRPL NFTs | XRPL Tools | XRPL Stats | Website Statistics

General XRPL Statistics

Ledger Index:	75,417,422
Ledger Close Time:	10/30/2022, 12:59:52 PM
Ledger Size:	5,410.21 MB
Total # of Object:	14,773,093
Total XRP:	99,989,147,319 XRP

Accounts

Count:	4,345,437
% of total Objects:	29.41 %
Total size:	753 MB
% of total Ledger size:	13.92 %
Message Key:	171,102
Regular Key:	21,382
Domain:	15,008
Email Hash:	5,325
Ticket:	4,977

Accounts Additional

With 0 Balance:	952
Total XRP in Accounts:	55,683,379,811 XRP
Total Account Reserves:	43,454,370 XRP
Total Owner Reserves:	16,134,872 XRP
Require DestinationTag:	75,736
Disabled Masterkey:	84,712
Default Ripple:	15,542
Global Freeze:	280

Trustlines (RippleState)

Count:	7,722,086
% of total Objects:	52.27 %
Total size:	3,182.4 MB
% of total Ledger size:	58.82 %
Balance greater 0:	4,003,280

Escrows

Count:	8,633
% of total Objects:	0.06 %
Total size:	2 MB
% of total Ledger size:	0.04 %
Total XRP in Escrow:	44,305,767,508 XRP
With Condition:	598
With Cancel Date:	253
With DestinationTag:	95

Offers

Count:	150,292
% of total Objects:	1.02 %
Total size:	54.9 MB
% of total Ledger size:	1.01 %
With Expiration Date:	27,595
Sell Offers:	121,716
Passive Offers:	412
XRP offered on DEX:	17,535,020,593,441 XRP

(NOT ALL OFFERS ARE FUNDED!)

Signer Lists

Count:	72,169
% of total Objects:	0.49 %
Total size:	21.2 MB
% of total Ledger size:	0.39 %
OneOwnerCount Flag:	59,965

Payment Channels

Count:	2,392
% of total Objects:	0.02 %
Total size:	0.8 MB
% of total Ledger size:	0.01 %
OneOwnerCount Flag:	59,965

Tickets

Count:	53,548
% of total Objects:	0.36 %
Total size:	8.7 MB
% of total Ledger size:	0.16 %

Checks

Count:	13
% of total Objects:	0.0001 %
Total size:	0.004 MB
% of total Ledger size:	0.00007 %

SendMax Total in XRP: 1,801,423 XRP

Deposit Preauth

Count:	50
% of total Objects:	0.0003 %
Total size:	0.01 MB
% of total Ledger size:	0.000179 %

Directory Nodes

Count:	2,417,319
% of total Objects:	16.36 %
Total size:	1,368.7 MB
% of total Ledger size:	25.3 %
Owner Directories:	2,306,658
Offer Directories:	110,661

Ledger Hashes Objects

Count:	1,152
% of total Objects:	0.01 %
Total size:	18.5 MB
% of total Ledger size:	0.34 %

Fee Settings Objects

Count:	1
% of total Objects:	0.00001 %
Total size:	70 Bytes
% of total Ledger size:	0.000001 %

Amendment Objects

Count:	1
% of total Objects:	0.00001 %
Total size:	2,930 Bytes
% of total Ledger size:	0.00005 %