Exhibit 8

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

AMENDED EXPERT REPORT OF [redacted]

October 13, 2021

Securities and Exchange Commission v. Ripple Labs, Inc. et al.
Index No. 1:20-CV-10832-AT

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I. INTRODUCTION

A. Assignment

1. I have been engaged by the Securities and Exchange Commission ("SEC") to provide expert testimony in the matter of *Securities and Exchange Commission v. Ripple Labs, Inc., et al.* pending in the United States District Court for the Southern District of New York. The SEC has retained me to independently analyze and comment on two areas. First, the SEC asked me to opine on whether Ripple Labs Inc. ("Ripple"), Chris Larsen ("Larsen"), and Brad Garlinghouse ("Gsarlinghouse") took steps to influence XRP prices. Second, I have also been retained to opine on the incentives that might have been present for Ripple to attempt to influence the price of XRP.[1]

2. My opinions are based upon my professional knowledge and experience, my review of documents and information relevant to this matter, and the analyses described in this report. My analyses in this report rely partly on data, documents, and statements produced to the SEC by Ripple. I am not currently opining on the validity of the data, documents, and statements made by Ripple or produced to the SEC by Ripple in this matter.

B. Qualifications

3. [redacted] I have also served on the faculty at [redacted] I received a B.A. in Economics from [redacted], a M.S. in Finance from [redacted], and my Ph.D. in Finance from [redacted]

[1] I have also been retained to potentially provide additional analysis or opinion, if necessary, in response to additional information which may be presented in Defendants' expert reports.

[redacted]. I have been teaching investments to undergraduate and Ph.D. students over the last twenty-four years. I have also taught international finance to undergraduate and MBA students at [redacted] I am a past President and Vice-President of the [redacted], former director of the [redacted] and current President and former Vice-President of the [redacted]

4. My research focuses on forensic finance, with specific interest in [redacted] market manipulation, structured finance, credit ratings, initial public offerings (IPOs) and international finance. I have published 30 papers, mostly in the [redacted] and have been cited [redacted] times according to Google Scholar. In the [redacted], my academic research on [redacted] titled "[redacted], was published in [redacted] and has been extensively featured in over [redacted] outlets around the world including Bloomberg, The New York Times, The Wall Street Journal, and The Financial Times. I have also co-authored a significant number of published journal papers related to [redacted]. In particular, my academic research on [redacted] was similarly featured on many of the top media outlets and published in the [redacted], and my paper analyzing [redacted], was published in the [redacted]

5. I am the President and owner of [redacted], I have advised and consulted for the U.S. Department of Justice, the Securities and

Exchange Commission, the Commodity Futures Trading Commission, state-level enforcement and regulatory entities, and private parties.

6. My curriculum vitae, attached as Appendix A to this report, provides more details about my educational and professional background and experience, as well as a list of my publications in the last ten years. A list of cases for which I have provided testimony or submitted court-filed expert reports in the past four years is attached as Appendix B. I have been compensated at a rate of $700 per hour for my personal time and I have been assisted by employees of Integra FEC [redacted]. My compensation is not contingent upon the findings of this report or outcome in this or any other matter. The use of "I" in this report includes all analyses of data performed by the staff of Integra FEC under my direction and oversight. My opinions are based on my own understanding of the analysis and results presented in this report.

C. Documents Considered

7. Documents, data, and other information that I have relied upon as the basis for my opinions are cited in this Report and listed in Appendix C. These include, but are not limited to, XRP sales reports from market makers retained by Ripple, Ripple internal communications, deposition transcripts and related exhibits reflecting communications of Ripple employees, XRP digital wallet addresses identified to be associated with Ripple, Larsen, and Garlinghouse, and Ripple financial statements. Other sources relied upon include publicly available XRP Ledger transactions and historical digital asset prices from CoinMarketCap and CryptoTick.

8. It is possible that I may review additional new information that may become later available, as well as the reports and depositions of other experts. I reserve the right to supplement my report and analyses based on any additional evidence, including any evidence brought to my attention by the defense, other experts, or obtained through discovery.

II. SUMMARY OF OPINIONS

9. Based on i) the analysis of Ripple's internal and external communications, documents and data provided by the SEC, ii) analysis of publicly available XRP Ledger transactions and historical price data, and iii) my academic research and knowledge of this field, I conclude that Ripple and its executives at specific times took steps to influence the price of XRP and their sales of XRP functioned similarly to that of a public equity offering for Ripple.[2] The facts I have reviewed reflect the following, among others:

a. At specific times, Ripple and its executives directed GSR, a digital asset trading and market making firm,[3] to buy XRP in a manner consistent with i) pushing prices upward, or ii) providing a price floor to stabilize and keep prices from falling. In analyzed episodes of Ripple-directed trading, GSR traded exactly as directed and XRP prices generally moved upward or stopped declining.

b. Through market making firms, Ripple sold XRP to purchasers in a manner designed to minimize downward pressure on the price of XRP. Ripple employed trading strategies to protect the price of XRP.

c. Ripple also placed lock-up restrictions on certain sales of XRP, sold in over-the-counter sales agreements to individual or institutional investors, that would mitigate selling pressure. These functioned similarly to lock-up restrictions in a traditional company's Initial Public Offering and allowed Ripple to protect the price of XRP from falling.

[2] Throughout this report, I frequently use the present tense as a stylistic preference, however, unless otherwise indicated, my report covers the period from when Ripple began selling XRP in 2013 to the filing of the complaint in this action, December 22, 2020. Additionally, analysis is performed only when data are available for specific date ranges within this period.

[3] https://www.gsr.io/our-team.

d. Ripple and its executives are incentivized to influence XRP prices in order to maximize the proceeds raised from XRP sales. In addition to Ripple's sales of XRP, Larsen and Garlinghouse collectively transferred 4.4 billion units of XRP (valued at $1.3 billion at the time of transfer) from their XRP digital wallet addresses. A large portion of these transfers were made to GSR, a market maker who also sold XRP programmatically on Ripple's behalf, to strategically sell their XRP holdings slowly over time.

e. From 2017 to 2020, Ripple relied on XRP sales to supplement a very significant funding gap of over $800 million that venture capital fundraising and other revenue items could not cover.

f. Ripple used XRP in a similar manner as companies use stock. Ripple employees receiving XRP were incentivized to work together to increase the price of XRP similar to the incentives of employees at public companies who work to increase company share value. XRP was also used to fund Ripple operations and to enrich Ripple's founders, directors, and early investors.

III. BACKGROUND ON RIPPLE AND XRP

10. According to Ripple, beginning in 2011, Jed McCaleb, David Schwartz, and Arthur Britto evidently began development of XRP and the XRP Ledger as an alternative to Bitcoin and the Bitcoin blockchain.[4] The ledger launched publicly in late 2012, and soon after Chris Larsen joined Ripple (then referred to as "OpenCoin") as co-founder and CEO. The native digital asset on the ledger, XRP, was created with a total fixed allocation of 100 billion XRP, of which 20

[4] https://xrpl.org/history.html.

billion XRP were given to the founders and the remaining 80 billion XRP were transferred to Ripple.[5]

11. XRP is a digital asset whose transactions are tracked and recorded on a publicly distributed database known as the XRP Ledger. The XRP Ledger is also referred to as a blockchain. Transactions are recorded and grouped together into "blocks" that are cryptographically-validated and chronologically connected, forming a chain of blocks (i.e., a blockchain). Transactions on the XRP Ledger, like other blockchains, are recorded, maintained, and verified autonomously across a peer-to-peer network of servers and validators, where each computer retains an identical copy of the transactions database and updates database records by consensus agreement. On other blockchains such as Bitcoin and Ethereum, this network of computers is incentivized to verify and record transactions because of transactional fees paid by users to those who verify and record transactions via "mining" processes. These fees are paid in Bitcoin (BTC) and Ether (ETH) on the Bitcoin and Ethereum blockchains, respectively. In contrast, computers operating the XRP Ledger do not receive fees and there is no "mining" on the XRP Ledger.

12. Ripple sold XRP to the public beginning in 2013 and to at least December 22, 2020.[6] Ripple sells its XRP to the secondary markets via digital asset platforms and through bulk over-the-counter ("OTC") sales to institutional and individual purchasers.[7] Beginning in December 2017, Ripple placed 55 billion XRP into 55 escrow accounts controlled by Ripple, which were scheduled to be released at a rate of one billion XRP per month. Ripple continues to

[5] https://xrpl.org/xrp-overview.html.
[6] Q4 2020 XRP Markets Report, https://ripple.com/insights/q4-2020-xrp-markets-report.
[7] Q1 2017 XRP Markets Report, https://ripple.com/insights/q1-2017-xrp-markets-report,
Q2 2017 XRP Markets Report, https://ripple.com/insights/q2-2017-xrp-markets-report/,
Q3 2017 XRP Markets Report, https://ripple.com/insights/q3-2017-xrp-markets-report,
Q4 2017 XRP Markets Report, https://ripple.com/insights/q4-2017-xrp-markets-report.

monetize XRP sales by releasing XRP from its escrow accounts, then deciding how much of the one billion XRP per month should be released into the market and how much should be re-escrowed. As of December 22, 2020, there is a circulating supply of 45.4 billion XRP that can be bought, sold, or transferred in the open markets and the price of XRP is $0.47 for a total (circulating and non-circulating supply) market cap of XRP of $47.1 billion.[8]

13. Individuals or entities can interface with the XRP Ledger through computer applications and websites that enable them to send and receive XRP from a given XRP Ledger address (subsequently referred to as "XRP address"). XRP is controlled and spent using private keys, public keys, and public addresses. Private keys are randomly generated alphanumeric strings, public keys are alphanumeric strings mathematically derived from private keys, and public addresses are alphanumeric strings derived from public keys. In order to transfer XRP, the sender must know the private key that corresponds to the public address which stores the digital assets. Therefore, in a given transaction of XRP, one can infer that the sending party controls—i.e., has the private keys to—the XRP address that sent the funds, but the sending party may or may not have control of the receiving XRP address.

14. XRP can be exchanged for other digital assets and fiat currencies either on-ledger or off-ledger mainly via digital asset platforms. On-ledger trades are recorded on the XRP Ledger and historical trade prices, amounts, and timing can be retrieved and analyzed. Trades can be attributed to unique blockchain digital wallet addresses, similar to bank account numbers. The identities of traders behind these transactions are generally anonymized on the Ledger but can sometimes be unmasked through various means including self-disclosure, forensic analytics, or proprietary Know-Your-Customer data from digital asset platforms. Beginning in 2017, XRP

[8] Wayback Machine Internet Archive of XRP on CoinMarketCap as of December 22, 2020. Accessed on October 4, https://web.archive.org/web/20201222190557/https://coinmarketcap.com/currencies/xrp/

became more commonly listed on centralized digital asset platforms where customers can convert XRP to another digital asset like Bitcoin or to fiat currencies like U.S. dollars. Centralized digital asset platforms are online marketplaces controlled and maintained by a company or organization on one or multiple centralized computer servers. Trades on centralized digital asset platforms are aggregated and reconciled by private computer servers and therefore, individual trades can only be analyzed if one has access to data provided by such platforms.

IV. RIPPLE COORDINATED WITH GSR TO BUY XRP IN A MANNER CONSISTENT WITH POSITIVELY INFLUENCING XRP PRICES

15. I first evaluate whether Ripple and its executives expended efforts consistent with attempting to influence the price of XRP. Ripple and its executives played a central role in creating and overseeing a liquid market for secondary transactions.[9] Ripple has stated in its submissions in this litigation that Ripple and its executives "do not control the price of XRP" and that the price of XRP is "not based on the efforts of Ripple."[10] Yet, Ripple and its executives explicitly directed at least one of their market makers, GSR, to purchase or refrain from selling XRP at specific times with a stated intent of influencing the price of XRP. GSR traded in a manner consistent with the directions from Ripple executives to increase or stabilize the price of XRP as described in these emails and shown below.

16. Since the XRP Ledger is a publicly available database and at least some of the addresses from which GSR sold Ripple's XRP are known through discovery, one can examine GSR's trading activities directly on the XRP Ledger. Using XRP addresses associated with GSR,

[9] 2017-05-25 GSR Programmatic Market Activity Agreement (Bates GSR00017429), 2018-03-02 GSR amended programmatic market maker agreement (Bates GSR00018580), 2019-09-05 GSR Xrapid master agreement (Bates GSR00000988).
[10] Joint Submission by the Parties to Hon. Analisa Torres, February 15, 2021, Dkt. No. 45.

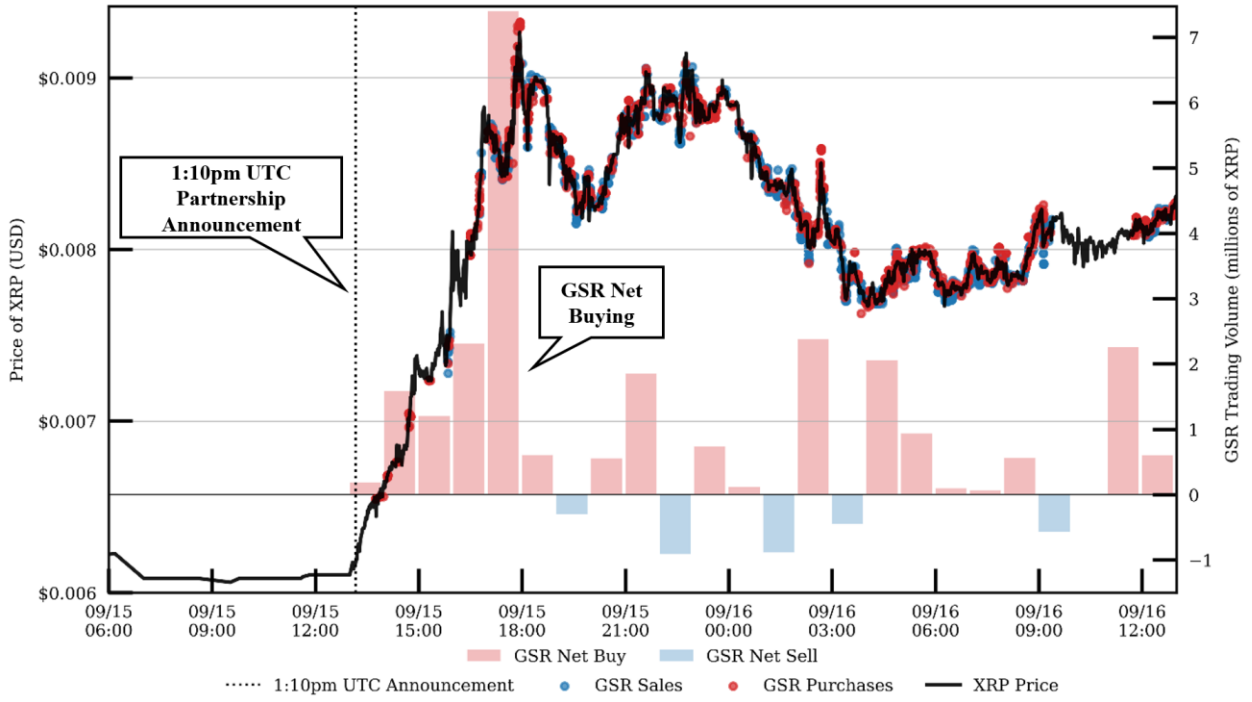
I am able to observe GSR's trades on behalf of Ripple. Technical details of the identification of GSR ledger trades can be found in Appendix D.

17. Based on emails from as early as 2016, Ripple executives worked directly with GSR to devise trading strategies to positively influence XRP prices. In some instances, these were timed to maximize the price of XRP around large news announcements. For example, on September 14, 2016, [redacted], received directions from Patrick Griffin (EVP of Business Development) and [redacted] (VP of Finance) to time Ripple's orders of XRP ahead of Ripple's announcements of new bank partnerships and Series B funding on the following day. Additional bank partners and funding would be highly positive news for XRP. GSR was then instructed by Griffin to "make purchases up to $300k" and asked to consider "plac[ing] offers on the ask side of the order book to tighten the spreads and attract more buying volume from the market."[11] Griffin's direction to "make purchases" and "[place] offers…to tighten the spreads and attract more buying volume" suggests that Griffin wanted GSR to purchase XRP and induce other buyers to do the same. If traders see a highly active buying market, they may also purchase XRP because they see potential upward price momentum. Purchasing around a key announcement and pushing the price upward in the process might further create the perception for other market participants that the news being released is extremely important. GSR was directed to trade for "24 hours starting at 6am PST" or 1pm UTC on September 15, 2016. On the following day, news of Ripple's new partnerships and Series B funding was released at 1:10pm UTC by Ripple.[12,13]

[11] Email from Patrick Griffin, September 14, 2016 (Bates GSR00020001).
[12] https://ripple.com/ripple_press/ripple-adds-several-new-banks-global-network. This partnership announcement does not involve any bank using XRP or the XRP Ledger, but Ripple nevertheless touted the announcement as proof of Ripple's successful efforts to expand its network of banking partners that would adopt its technology for cross-border payments.
[13] https://ripple.com/ripple_press/ripple-raises-55-million-series-b-funding.

18. Figure 1 examines GSR trading around this time to see if it traded as directed. The red bars denote hours of net buying by GSR on behalf of Ripple, while blue bars represent net selling. Net buying is calculated as total purchases minus total sales of XRP and net buying will be positive if there are more purchases than sales by GSR. Net selling is total sales minus total purchases of XRP. The red dots represent individual buy trades and the blue dots sell trades. As one can see from Figure 1, the price of XRP was flat in the six hours before GSR trading and GSR had no purchase or sale activity in the six-hour period prior to 1pm UTC. Beginning at 1pm UTC time, GSR begins net buying. This net buying directly corresponds to the time that GSR was directed to trade by Ripple. GSR is then a large net buyer of XRP for the next five hours. During these five hours, XRP jumps from $.0061 to a high of $0.0093, for a gain of $0.0032. This is a 53 percent price increase in five hours. By analyzing transactions publicly available on the XRP Ledger, I can confirm that GSR did in fact follow Ripple's directive to purchase XRP and that the activity appears successful as the price increased dramatically.

Figure 1 – GSR Trading on XRP Ledger on September 15th, 2016.
This figure plots XRP transactions conducted by GSR in a 30-hour window on September 15 and 16 around Ripple's announcement on September 15, 2016. Transactions are sourced from the XRP Ledger. XRP Price, denoted by the black line, was calculated using the volume weighted average price at 1-minute intervals across all trades on the XRP Ledger involving the XRP-USD trading pair. GSR net buys and net sales are reported as bars in hourly increments. Individual GSR buy and sell prices are plotted using red and blue circles. The dashed vertical line represents the time of the news announcement. Data are displayed in UTC time zone.



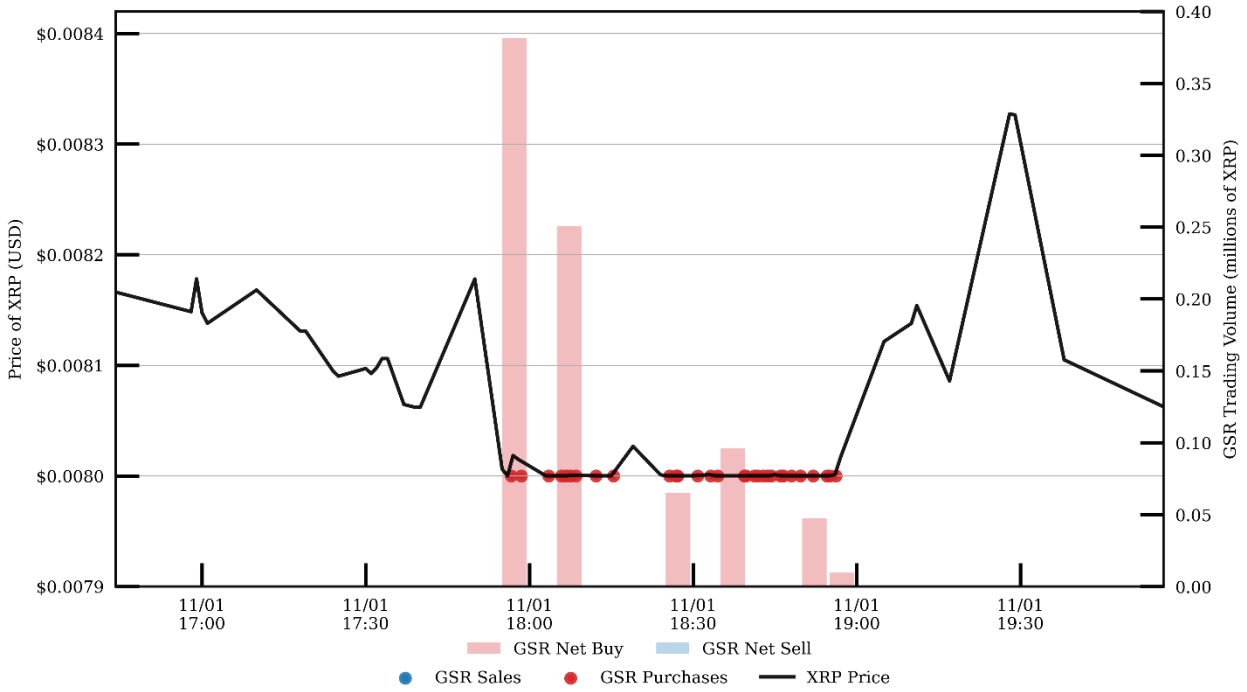
19. In addition to this example of maximizing the price of XRP during a major announcement, from at least April 2016 to June 2017 certain Ripple executives also expended efforts that appear aimed at protecting the price of XRP at certain price floors. A price floor can be implemented to prevent large downward price movements that might lead to large losses for XRP holders, including Ripple, the largest XRP holder since XRP's inception. Declining prices are more likely to cause investors to sell their holdings, further exacerbating losses and making XRP appear as an unattractive investment to other buyers. In addition to having an economic incentive to make efforts to increase the price of XRP, Ripple had an economic incentive to attempt to stabilize or reverse any declining price trends in order to encourage investors to continue to hold

or buy more XRP. Protecting a price floor for XRP would permit Ripple to maximize revenue from its own XRP sales, all else being equal.

20. On November 1, 2016, Patrick Griffin instructed GSR to "aim to protect a $0.008 floor."[14] By analyzing GSR transactions on the XRP Ledger, the trading and price behavior of XRP is plotted in Figure 2. Around 5pm UTC, XRP prices declined near $0.008 USD. I make three observations. First, GSR made many purchases directly at $0.008 USD, consistent with implementation of a price floor just as directed by Ripple. Second, the trading seems to have succeeded in protecting XRP from dipping below $0.008 USD as the price did not go below this level. Third, the prices reverted higher in the subsequent hour.

[14] Email from Patrick Griffin, November 1, 2016 (Bates GSR00005000).

Figure 2 – GSR Floor Setting on XRP Ledger on November 1, 2016.
This figure plots XRP transactions conducted by GSR on November 1, 2016. Transactions are sourced from the XRP Ledger. The XRP Price, denoted by the black line, was calculated using volume weighted average price at 1-minute intervals across all trades on the XRP Ledger involving the XRP-USD trading pair. GSR net purchases and net sales are reported as bars in 5-minute increments. Individual GSR buy and sell prices are plotted using red and blue circles. Data are displayed in UTC time zone.



21. GSR also executed uneconomic trades whose purpose appears to be to push the price of XRP upward. Traditional market makers add liquidity to markets by reducing the spread between buyers and sellers. They make a profit by purchasing at a low bid price and selling at a slightly higher price. In contrast, GSR would place bid prices at levels artificially higher than other traders. The economic incentive to make bids for XRP in the market at prices above the prevailing bids would be to attempt to push the price of XRP higher. For a market maker without an existing position, overpaying by purchasing at higher prices rather than lower prices would generally be an uneconomic trade. But since Ripple held large quantities of XRP, the small additional cost of pushing the price higher would be more than offset by the gains from the large XRP positions which would then be valued at a higher price.

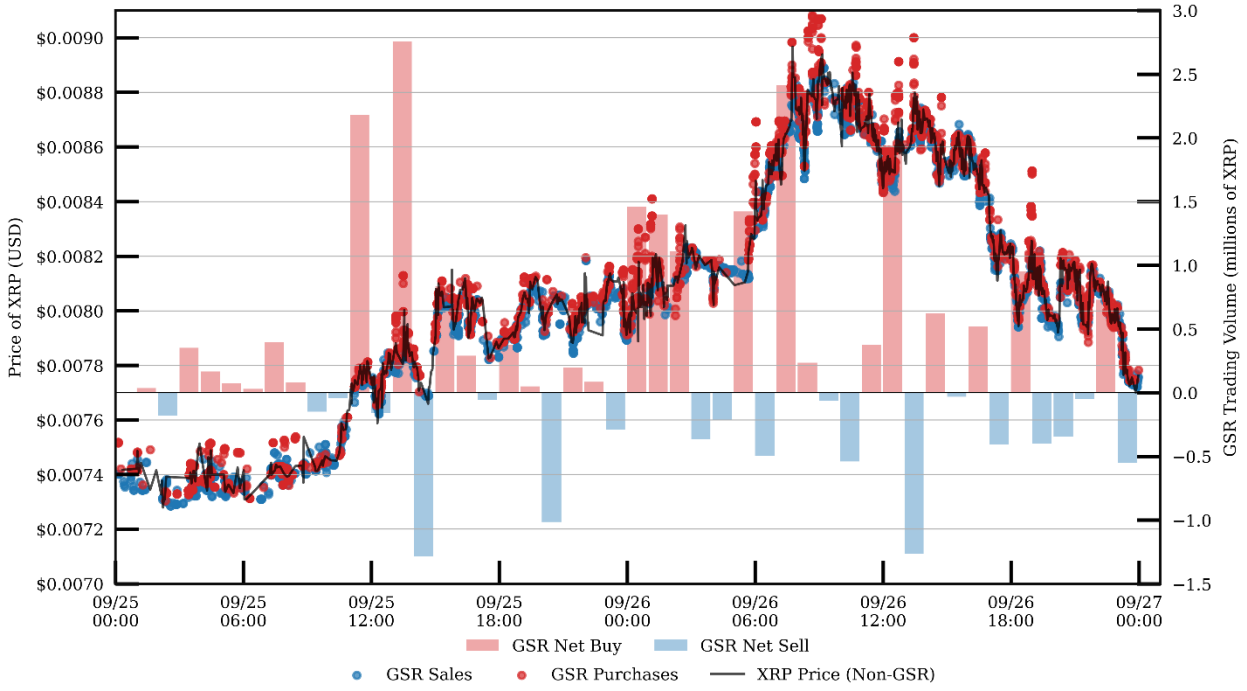
22. For example, on September 23, 2016, Ripple announced the creation of the Ripple Global Payments Steering Group.[15] The Steering Group was purported to be a consortium of global banks that would help oversee the creation of Ripple transaction rules and promote Ripple's as of then undeveloped payment network. On September 23, 2016, with the approval of Garlinghouse, [redacted] directed GSR "to keep the buying light post announcement and then do the bigger slug starting Sunday night [September 25, 2016]," to coincide with Monday morning in Asia.[16] On the XRP Ledger, we can see, as shown in Figure 3, that GSR made many purchases significantly above market prices.

23. As shown in in Figure 3, Panel A, GSR's large purchases are consistent with placing a "bigger slug" starting on Sunday, September 25, 2016. GSR made several large purchases of XRP that both preceded and accompanied a dramatic rise in the price of XRP of over 15 percent within 24 hours. Moreover, as shown in Figure 3, Panel B, many of GSR's purchases (red dots) were consistently above average market prices (black line), and GSR on average purchased XRP at a 1.5 percent premium compared to the last trade price. These uneconomic trades, i.e., buying XRP above market prices, coincide with XRP's increase in value on September 25 and the early morning of September 26.

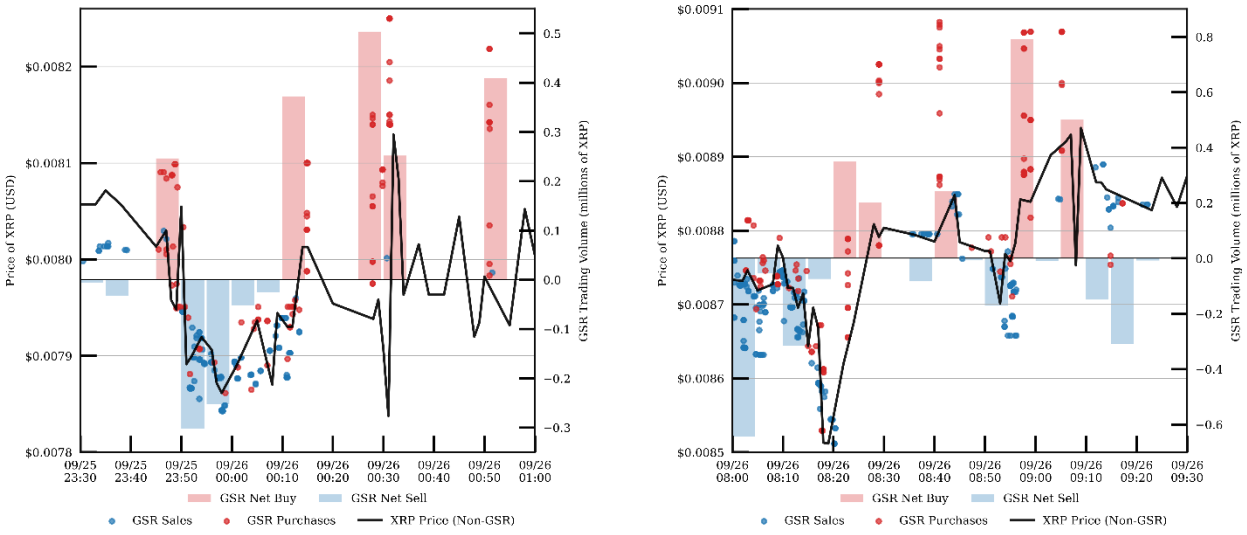
[15] https://ripple.com/insights/announcing-ripples-global-payments-steering-group.
[16] GSR00006693.

Figure 3 – GSR Transactions Overpayment on September 25 and 26, 2016.
This figure plots XRP transactions conducted by GSR on September 25 and 26, 2016. Transactions are sourced from the XRP Ledger. The XRP Price was calculated using the volume-weighted average price at 1-minute intervals across all trades on the XRP Ledger involving the XRP-USD trading pair. GSR net purchases and net sales are reported as bars in hourly increments. Individual GSR buys and sell prices are plotted using red and blue circles. Data are displayed in UTC time zone.

Panel A. GSR Trading on September 25 and 26, 2016

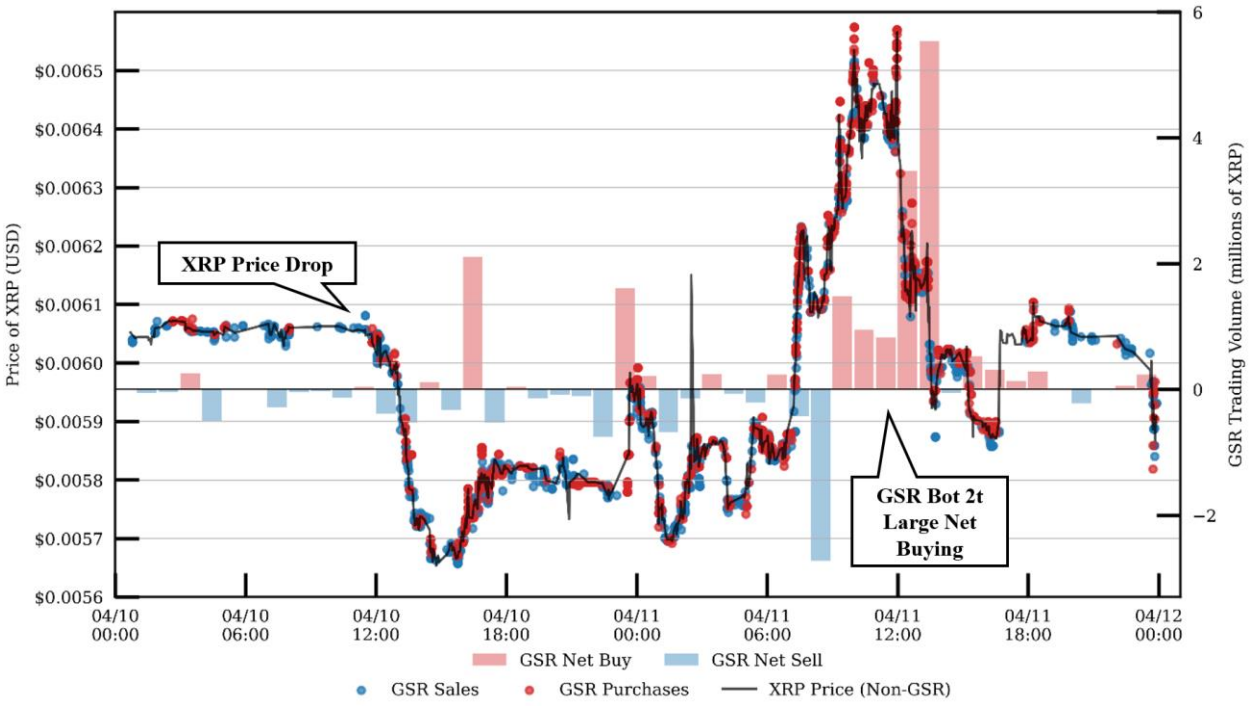


Panel B. GSR Transaction Overpayment



24. In at least one instance, instructions for GSR to buy XRP on behalf of Ripple that appear aimed at price support came directly from Ripple's top executives, Larsen and Garlinghouse. For example, on April 10, 2016 Garlinghouse wrote to Larsen, "Given the sell off this weekend – I think we should halt the sales entirely tomorrow and Tuesday – instead purchase $20k each day."[17] After Larsen replied, 'Let's try it,"[18] Ripple executives passed on the directives to GSR to buy XRP, who confirmed with an email the next day that it had followed Ripple's instructions and "reversed bot 2.t to net-buy 5% of previous 24 hour trading volume."[19] As seen in Figure 4, at the direction of Ripple, GSR reversed its programmatic sales after the price of XRP continues to decline. Instead of net selling, XRP began net buying around 9:00am UTC.

Figure 4 – GSR Transactions on April 10 and 11, 2016.
This figure plots XRP transactions conducted by GSR on April 10 and 11, 2016. Transactions are sourced from the XRP Ledger. The XRP Price was calculated using volume weighted average price at 1-minute intervals across all trades on the XRP Ledger involving the XRP-USD trading pair. GSR net purchases and net sales are reported as bars in hourly increments. Individual GSR buys and sell prices are plotted using red and blue circles. Data are displayed in UTC time zone.



[17] Email from Brad Garlinghouse, April 10, 2016 (Bates RPLI_SEC 0307781).
[18] Email from Chris Larsen, April 10, 2016 (Bates RPLI_SEC 0307781).
[19] Email from [redacted], April 11, 2016 (Bates GSR00011984).

25. The instances examined above provide specific examples of how Ripple and certain of its executives directed GSR to trade XRP on behalf of Ripple in a way consistent with an attempt to increase or stabilize the price of XRP. Indeed, as discussed above, contemporaneous statements from Ripple employees support the conclusion that Ripple took these steps to increase or stabilize the price of XRP. GSR did in fact trade just as directed. GSR executed trades with the stated motive of preventing the price of XRP from going down and moving the price of XRP upward when it was directed to by Ripple and its executives. GSR also seems to have been at least partially successful in its targeted efforts in these directed cases as the price of XRP generally increased or stabilized in the short term at the prices GSR set.

V. LARSEN COORDINATED WITH GSR TO BUY XRP WITH HIS PERSONAL FUNDS IN A MANNER CONSISTENT WITH POSITIVELY INFLUENCING XRP PRICES

26. In addition to instances where Ripple directed GSR to trade XRP in a manner consistent with positively influencing XRP prices, there are also instances where Larsen himself directed GSR to trade his personal holdings in a similar manner. For example, on February 18, 2017, Larsen emailed GSR, requesting "on my bot4, could you start buying as long as we're below 0.006 usd.bitstamp."[20] As covered in the next Section VII.A, GSR provided programmatic sales for Larsen's personal XRP holdings and "4t" was the name of one the trading algorithms, referred to by GSR as "bots," that conducted trades on behalf of Larsen.[21] Like Ripple, Larsen is a large holder of XRP and stands to financially benefit from higher XRP prices through his personal sales of XRP.

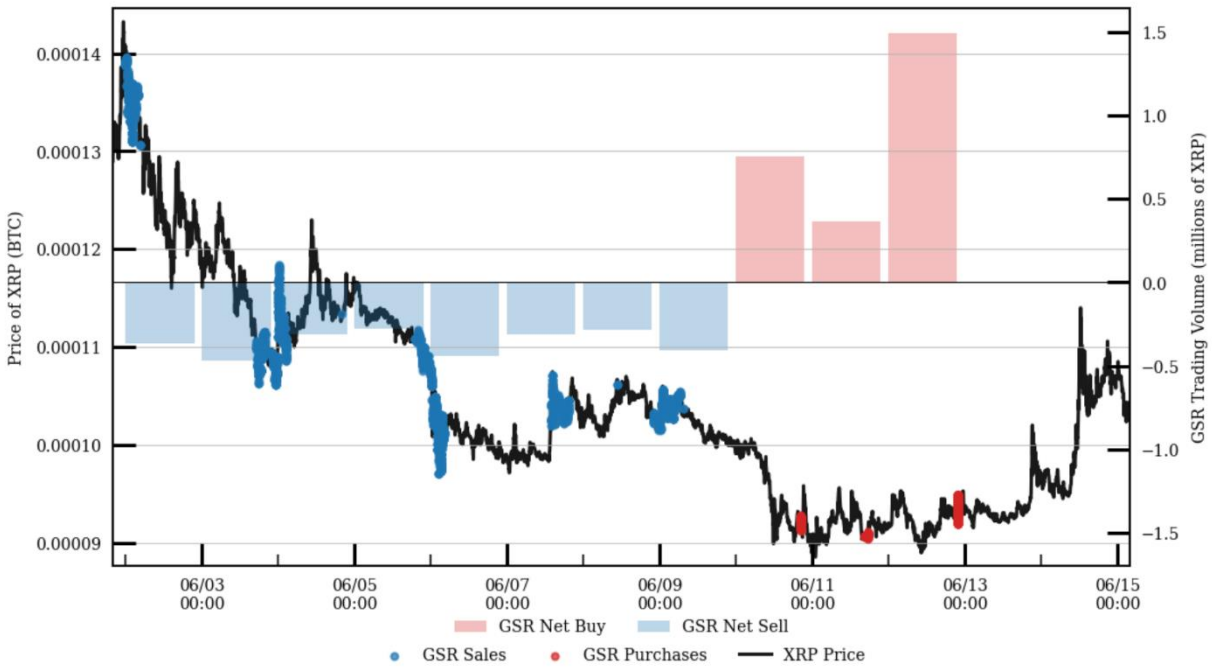
[20] Exhibit CG-34 (Bates GSR0000104).
[21] GSR00000467A.

27. Later in 2017, Larsen again used his personal holdings to buy XRP in a manner consistent with an effort to mitigate XRP price declines. On or around June 9, 2017, prices of XRP had declined by nearly 29% since the beginning of the month as shown on Figure 5. On June 11, 2017, Garlinghouse contacted Larsen, noting there had been "decent stability in the price over the past 36 hours."[22] Larsen responded that he personally bought a "total [of] $800k [of XRP] by end [of] weekend" through GSR. In response, Garlinghouse speculated that Larsen's purchases might be the reason for the recent XRP price stability.[23]

28. Figure 5 plots Larsen's trading activity through GSR on the digital asset platform Poloniex in the XRP/BTC currency pair. In the eight days prior to June 10, Larsen was a large daily seller averaging 357,901 XRP in sales per day. Starting on June 11 and in the subsequent 72 hours, Larsen purchased a net total of 2,623,363 in XRP, or an average of 874,454 XRP per day and nearly 2.5 times more than his daily average of XRP volume in early June. Normally a seller of XRP, Larsen's purchases are consistent with selection of an opportune time to purchase XRP to provide support similar to implementing a price floor to keep the price of XRP from further declining. As can be seen in Figure 5, his buying beginning on June 10 coincided with the price of XRP stabilizing around 0.00009 XRP/BTC, and later reversing its earlier decline.

[22] 2017.06.11 CL BG chat (Bates GARL_Civil_000877-78)
[23] *ibid.*

Figure 5 – Larsen Selling and Buying Activity in June 2017.
This figure plots XRP transactions conducted by GSR on behalf of Larsen from June 3 to 14, 2017. Transactions are sourced from the digital asset platform Poloniex.[24] The XRP Price, denoted by the black line, was calculated using the XRP-BTC price at 1-minute intervals on Poloniex.[25] Net purchases and net sales are reported as bars in daily increments. Individual GSR buy and sell prices on behalf of Larsen are plotted using red and blue circles. Data are displayed in UTC time zone.



VI. RIPPLE DIRECTED GSR TO SELL XRP IN A MANNER CONSISTENT WITH SEEKING TO MINIMIZE DOWNWARD PRESSURE ON XRP PRICES

29. Ripple had an economic incentive to maximize proceeds gained from XRP sales by selling large amounts of XRP while also increasing and maintaining high XRP prices. There is evidence that Ripple executives closely monitored XRP price movements and directed GSR to halt any sales activity that would further exacerbate sell-offs. This section finds that GSR's selling behavior is consistent with the directives from Ripple, and that from January 2015 to at least September 2019,[26] GSR appears to carefully time when XRP would be sold so as to minimize the

[24] Filename: polo_gsr_trades.csv (Bates CIRCLE_00001699).
[25] Historical XRP/BTC trade data at the 1-second interval on Poloniex was sourced from CryptoTick.com.
[26] Detailed daily programmatic sales data for GSR is only available from January 2015 to September 2019.

negative selling impact on the price of XRP. An analysis of GSR's XRP selling activity, together with the selling activity of [redacted] Ripple's other large programmatic XRP sales partner,[27] finds that they sold more XRP following price increases.

30. As per [redacted], a member of Ripple's XRP Markets team which coordinated XRP sales, "Overall, our sales through GSR are done with sophisticated algorithms that 'drip' into the market, so the price impact should be marginal."[28] Specifically, Ripple set "target sell rates"[29] for XRP, which established a maximum amount of XRP it could sell as a percentage of the daily volume of XRP traded. Also, during times when the price of XRP experienced "downward pressure," Ripple executives including Bret Allenbach (then-CFO) and Garlinghouse discussed lowering the target sell rates, e.g., from 3.5% to 1.5%,[30] or even halting XRP sales in order to positively "impact the price."[31]

31. In April 2016, executives from GSR discussed trading strategies with Ripple noting that GSR "[has] analyzed the order books since Jan 1, 2015 in order to determine which days of the week there is more liquidity. We analyze the bid side of the order book in order to determine which days there is most demand for XRP" and that "this more dynamic strategy ***may help maintain XRP prices higher*** than the current strategy [emphasis added]."[32] It was economically rational for Ripple to pursue these trading strategies because they could help maximize the amount of money Ripple could raise through its sales of XRP, as long as Ripple did not sell so much XRP

[27] Ripple also employed the services of [redacted] but it sold less than 2% of Ripple's total XRP sales between November 2014 to September 2019. Source: XRP Programmatic Sales Reporting FY14 to Date v2 (Bates RPLI_SEC 74559).
[28] Email from [redacted] on April 10, 2016 (Bates RPLI_SEC 0205600).
[29] *ibid*.
[30] Email from Bret Allenbach (CFO) on April 10, 2016 (Bates RPLI_SEC 0205602).
[31] Email from Brad Garlinghouse on April 10, 2016 (Bates RPLI_SEC 0205601).
[32] Email from [redacted], April 28, 2016 (Bates GSR00012857).

at one given time as to lower its price, since GSR "[has] observed that higher XRP prices result in more money-in and eventually higher volume" and help "distribute more XRP without adversely affecting the price of XRP."[33]

32. Ripple turned to its programmatic selling partners to implement its XRP selling strategy. Ripple enlisted GSR to provide programmatic sales on behalf of Ripple from November 2014 to January 2017 and from June 2017 to at least September 2019.[34] [redacted] provided programmatic sales on behalf of Ripple from September 2017 to at least September 2019.[35] GSR develops high frequency trading algorithms, or "bots", that programmatically place sales and purchases for XRP. GSR employed a trading bot called bot 2, known at various times as bot 2s, 2t, and 2h, to submit orders programmatically on various trading platforms at the direction of Ripple.[36] For example, between December 2014 to January 2015, comments found in a historical daily sales report (also known as "liquidity extraction report") of bot 2t seem to show GSR and Ripple coordinating XRP sales in a manner consistent with stopping or reducing sales to mitigate impact when XRP prices are declining.[37] Figure 6 shows an episode from December 31, 2014 to January 8, 2015 where the price of XRP was declining and includes captions from notes contained in GSR's liquidity extraction report. As seen in the chart, GSR often purposefully stopped selling XRP in an apparent effort to minimize the negative impact on the price of XRP, followed by instructions from Ripple to resume selling at different target sell rates when the prices stabilized.[38]

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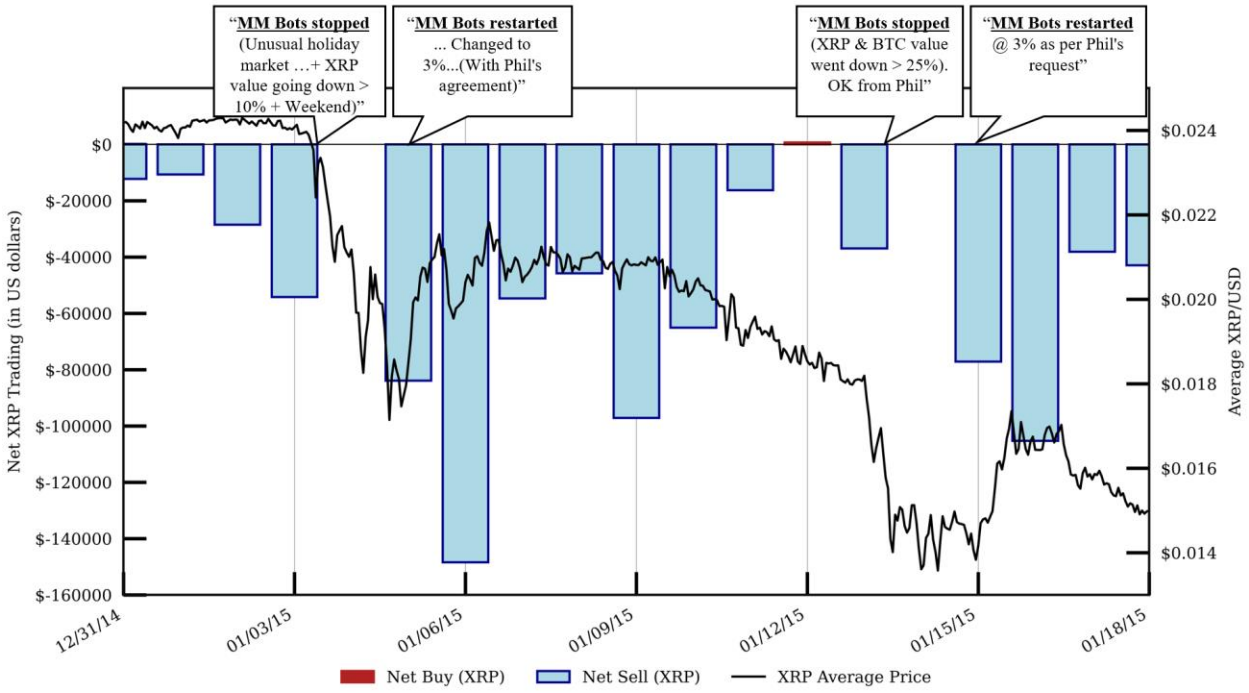
[33] *ibid.*
[34] XRP Programmatic Sales Reporting FY14 to Date v2 (Bates RPLI_SEC 74559).
[35] *ibid*.
[36] Bot 2s was active from November 2014 to July 2015. Bot 2t was active from July 2015 to January 2016. Bot 2h was active from June 2016 to at least September 2019. Detailed daily purchases and sales of these bots are sourced from Excel Export - 2014-2016 - 2t - Liquidity extraction report (Bates RPLI_SEC 0679467-467), Excel_Export_2017_OLD_2h_Liquidity_extraction_report (Bates GSR00000101), Excel_Export_2018_2h_Ripple_Liquidity_Extraction_Report (Bates GSR00000102), and Excel_Export_2019_2h_Ripple_Liquidity_Extraction_Report (Bates GSR00000103).
[37] Excel Export - 2014-2016 - 2t - Liquidity extraction report (Bates RPLI_SEC 0679467-467)
[38] Comments are only reported by dates without timestamps in the liquidity extraction reports.

Figure 6 – Net XRP Sales vs. Price of XRP.
This figure plots the net XRP sold by GSR as reported in GSR sales reports (blue bars) and the XRP/USD price (black dashed line). All data are sourced from GSR's Excel Export - 2014-2016 - 2t - Liquidity extraction report (Bates RPLI_SEC 0679467-467). The captions show notes from the "Comments" column on a given day in GSR's liquidity extraction report. The XRP Price, denoted by the black line, was calculated using volume weighted average price at 1-hour intervals across all trades on the XRP ledger involving the XRP-USD trading pair. Vertical gray line signifies 12pm UTC time for each day. As seen in the chart, GSR paused XRP sales when the notes indicate that XRP declined significantly (e.g., ">10%" or ">25"), and subsequently resumed sales upon either receiving specific sales targets or approval from Ripple.[39]



33. To better understand whether the behavior observed in the example shown in Figure 6 is persistent across a wider time period, I next examine whether Ripple's market makers GSR and [redacted] tend to sell less when prices fall and sell more when prices are stabilized or rising. This selling pattern can be observed by analyzing the daily net buy-sell imbalance of XRP by GSR and [redacted] on behalf of Ripple. Imbalance is defined as the total number of XRP purchased minus total number of XRP sold in a day normalized by the average circulating supply

[39] Based on an email exchange from December 2014 to January 2015 between GSR and Ripple that discusses XRP sales, it is inferred that the person referenced in GSR's liquidity extraction report as "Phil", who is giving instructions/approval to start/stop XRP buys/sales, is [redacted] who at the time was the head of Ripple's XRP Markets Team. Sources: email exchange between [redacted] [Ripple], [redacted] [Ripple], [redacted] [GSR] and [redacted] [GSR] (GSR00007297) and Deposition of Patrick Griffin on June 29, 2021, at 75-76.

of XRP over the previous 30 days.[40] Imbalance regressions are often used in the finance literature to understand how different groups of traders react to past prices [(Chordia, Roll, Subrahmanyam (2002), Chordia and Subrahmanyam (2004); [redacted] (2003), (2007)].

34. A regression analysis of GSR's and [redacted] trading activity shows that when the prior day returns of XRP increase, the amount of XRP that GSR and [redacted] sell also increases (Table 1).[41] The previous day return coefficient, β_1, is highly statistically significant and negative—consistent with net selling following a day of positive returns. Lagged 5-day returns and imbalances are added as controls. Based on this analysis of GSR's and [redacted] net trading of XRP,[42] I conclude that these sellers, on behalf of Ripple, sold more XRP when the price of XRP was increasing and relatively less when the price was decreasing on the previous day. By selling more XRP the day after XRP prices rise, GSR and [redacted], on behalf of Ripple, were able to use rising XRP returns and increased demand to mitigate any potential negative effect of its XRP sales and thus keep XRP prices high.

[40] Daily circulating supply is sourced from https://coinmarketcap.com/currencies/xrp.
[41] This regression follows the same buy-sell imbalance regression methodology as [redacted] (2003).
[42] GSR trading activity is sourced from Excel Export - 2014-2016 - 2t - Liquidity extraction report (Bates RPLI_SEC 0679467-467), Excel_Export_2017_OLD_2h_Liquidity_extraction_report (Bates GSR00000101), Excel_Export_2018_2h_Ripple_Liquidity_Extraction_Report (Bates GSR00000102), and Excel_Export_2019_2h_Ripple_Liquidity_Extraction_Report (Bates GSR00000103). [redacted] trading activity is sourced from 3.d – Ripple XRP Sales – All Trades (SEC-[redacted]-E-0047622).

Table 1 – Regression Results of Programmatic Sellers' Trading Activity and XRP Returns.
A regression was estimated using XRP returns and net buy-sell imbalance calculated for each date between January 1, 2015 and September 12, 2019. *Imbalance* is defined as the number of XRP purchased minus number of XRP sold per day by GSR and [redacted] on behalf of Ripple, normalized by dividing by the average daily circulating supply of XRP over the previous 30 calendar days. Dates where all named parties reported no activity were excluded from analysis. This regression was performed using heteroscedasticity-consistent standard errors (HC3). The coefficient β_1 is signed negative, indicating that as prior day returns increase, the named parties sell more XRP tokens (or buy fewer). For ease of interpretation of coefficient, results are scaled by 100,000. Z-statistics for the regression coefficients are presented in parenthesis. *p < 0.05, **p < 0.01, ***p < 0.001.

$$Imbalance_t = \alpha + \sum_{i=1}^{5} \beta_i * Return_{t-i} + \sum_{i=1}^{5} \lambda_i * Imbalance_{t-i} + \varepsilon_{t,R}$$

		XRP Return					Buy-Sell Imbalance					
Dep. Var.	α	β_1	β_2	β_3	β_4	β_5	λ_1	λ_2	λ_3	λ_4	λ_5	Adj. R^2
GSR and [redacted] Trading on Behalf of Ripple												
$Imbalance_t$	-2.26 (-6.06) ***	-14.96 (-2.98) **	-6.89 (-1.64)	0.02 (0.01)	-2.59 (-0.73)	0.64 (0.02)	0.45 (6.56) ***	0.06 (1.07)	0.03 (0.58)	0.04 (0.80)	0.09 (2.39) *	0.285

35. The findings from this regression analysis are also consistent with communications between Ripple and GSR where Ripple expressed a desire to sell XRP when the price of XRP increased. In an earlier mentioned email from [redacted] (VP of Finance) to GSR where she anticipates the rise in the price of XRP based on a Ripple news announcement, she writes, "We want to keep the bots off for now but expect to make a news announcement on Thursday. If the news has positive impact and price rises, we would like to start selling into that. However, if price is not rising we will want to hold off."[43] This again indicates that Ripple systematically directed sales of XRP in a manner that was consistent with seeking to minimize the negative impact of sales on XRP prices.

[43] Email from [redacted], June 1, 2016 (Bates GSR00004438).

VII. LARSEN AND GARLINGHOUSE EMPLOYED GSR TO SELL THEIR XRP IN A MANNER THAT MINIMIZED THE NEGATIVE PRICE IMPACT OF THEIR XRP SALES, AND BLOCKCHAIN ANALYSIS CONFIRMS THAT THEY TRANSFERRED LARGE AMOUNTS OF PERSONAL XRP HOLDINGS TO GSR

A. Larsen and Garlinghouse Agreements with GSR

36. Both Larsen and Garlinghouse entered into "Liquidity Extraction Activity" agreements[44] with GSR and retained GSR to sell XRP. These agreements have a "Market Maintenance" clause that stipulates how GSR is required to sell XRP "in a controlled manner taking care not to de-stabilize the global Tokens [XRP] market."[45] The earliest agreement between Larsen and GSR also adds specific language related to de-stabilization, which is that XRP sales should not "cause a [redacted] percent decline in the weighted average interday price of XRP."[46] That agreement also limited daily sales to "[redacted] percent of total network XRP trading volume in the twenty-four (24) hour period immediately preceding any sale of [Larsen's] XRP."[47] These contract provisions suggest that Larsen and Garlinghouse employed the services of GSR to minimize the negative impact their XRP sales could have on XRP prices.

B. Blockchain Tracing of Funds Leaving Larsen's Addresses

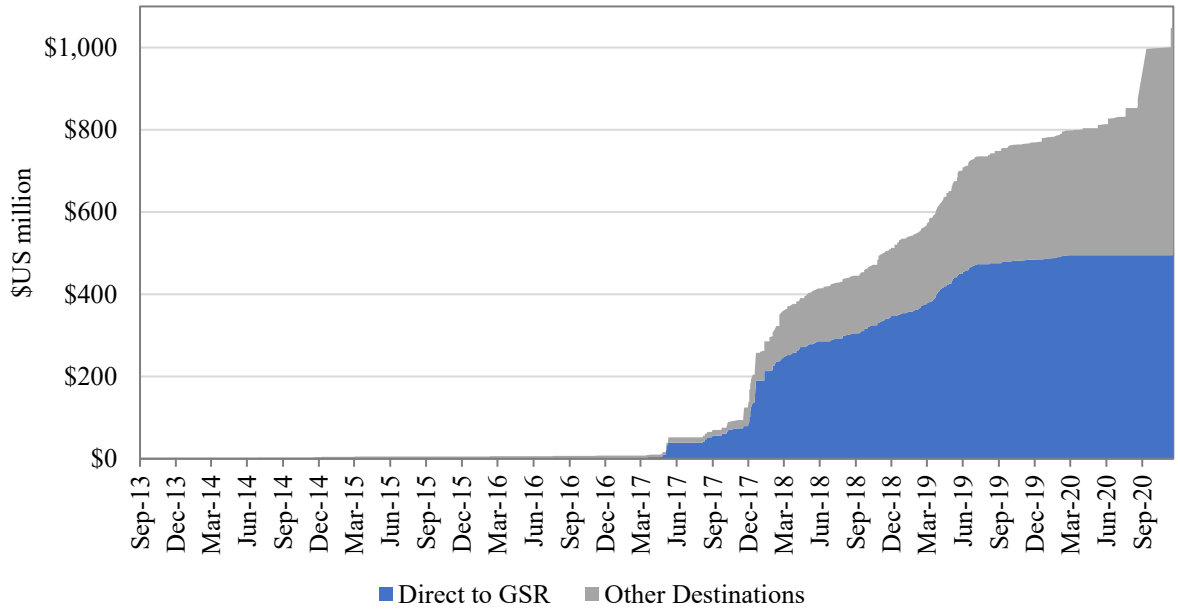
37. Based on analysis of the XRP blockchain, I conclude that Larsen made significant use of GSR's liquidity extraction services described in the previous Section VII.A to sell his XRP. Larsen directly transferred 1.5 billion XRP ($495 million) to GSR out of a total of 4.0 billion XRP

[44] 2015 GSR Larsen agreement (Bates LARSEN-SEC-LIT-00004869-70); GSR Loan and Purchase Agreement_Chris Larsen Trust (final) (Bates GSR00008433-442); and 2017 GSR Garlinghouse Liquidity Extraction agreement (Bates GSR00000673-80).
[45] *ibid*.
[46] 2015 GSR Larsen agreement (Bates LARSEN-SEC-LIT-00004869-70).
[47] *ibid*.

($1.1 billion) transferred out of his identified addresses.[48] This can be seen in Figure 7 which shows the cumulative amount of XRP transferred out of Larsen's identified addresses over time, including direct transfers to GSR. Other destinations receiving direct transfers of XRP from Larsen's identified addresses include digital asset platforms, other entities such as Coil (a startup where Larsen is a board member), or unidentified addresses. Unidentified addresses could be "over-the-counter" (OTC) trading counterparties or friends of Larsen to whom he sold XRP, as mentioned in his deposition.[49] Additional detail regarding where XRP flowed from Larsen's identified accounts as well as the methodology for the blockchain tracing can be found in Appendix D and Appendix E.

[48] The US dollar equivalent shown is the value of the XRP on the date it first left one of Larsen's identified addresses. The XRP-USD exchange rate is obtained from CoinMarketCap. Larsen's identified addresses comprise of a list of addresses produced to the SEC by Larsen (Bates LARSEN_NAT 00000102).
[49] Chris Larsen deposition at 80-83. September 14, 2021.

Figure 7 – Cumulative Value of Direct Transfers Out of Larsen's Identified XRP Addresses
This figure plots the cumulative value, in US dollars, of the XRP that was transferred out of Larsen's identified addresses. The amount that was directly transferred to GSR is shaded in blue. The US dollar value is based on the XRP-USD exchange rate, obtained from CoinMarketCap, on the day that the XRP was transferred out of Larsen's identified addresses. Note: Larsen began transferring XRP out of his identified addresses beginning September 2013, but the amounts cannot be seen on the chart because of the scale.



38. The previous analysis is conservative because it looks only at direct transactions from Larsen to GSR. Larsen could have moved funds between blockchain addresses over multiple transfers, or 'hops'. When analyzing blockchain transactions over multiple hops, the certainty that the initial owner of funds still controls them decreases as the number of hops increases. Additional XRP moved from Larsen's identified addresses to GSR addresses over multiple hops. If one traces these out as far as seven hops, the total amount that Larsen transferred to GSR could be as high as 1.9 billion XRP ($599 million). As shown in Table 2, Larsen sent at least 1.50 billion XRP to GSR via one hop, but he could have sent up to 1.90 billion XRP to GSR over up to four hops, or 1.93 billion if tracing up to seven hops. It is worth noting that Larsen could have sold or gifted

XRP to entities or individuals who subsequently transferred the XRP to GSR; this could be a reason why XRP reached GSR from Larsen's identified wallets over a series of up to seven hops.

Table 2 – Cumulative Value of XRP Sent from Larsen to GSR Over up to Seven Hops
This table shows the cumulative amount of XRP sent to GSR from Larsen's identified addresses, given the number of transfers, as well as the USD equivalent on the date XRP left the identified addresses. For example, 1,496 million XRP was directly sent to GSR over 1 hop and 1,926 million was traced to GSR over up to seven hops. There is a small amount of XRP traced to GSR over 8 hops that is not shown because of rounding; blockchain analysis did not identify additional XRP sent to GSR beyond 8 hops.

Number of Hops	Cumulative XRP Transferred to GSR (million)	USD Equivalent (million)
1	1,496	495
Up to 2	1,519	499
Up to 3	1,860	568
Up to 4	1,901	590
Up to 5	1,906	592
Up to 6	1,916	596
Up to 7	1,926	599

Values rounded to the nearest 1 million XRP and 1 million USD.

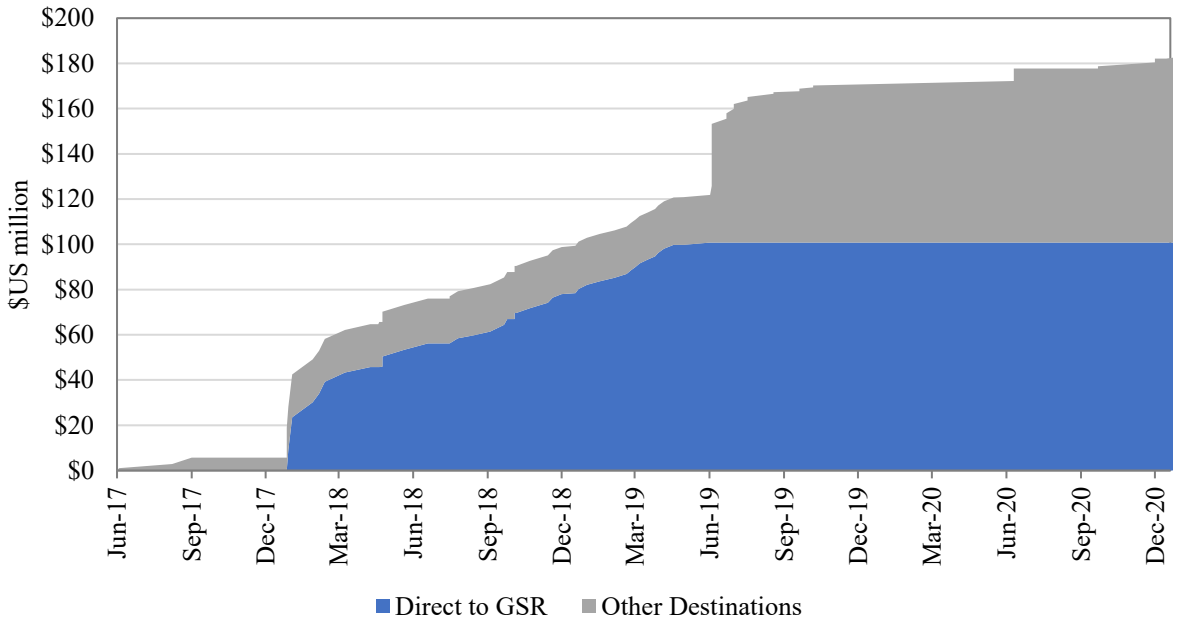
C. Blockchain Tracing of Funds Leaving Garlinghouse's Addresses

39. Similar to the Larsen analysis above, I also conclude that Garlinghouse made significant use of GSR's liquidity extraction services to sell his XRP. Garlinghouse directly transferred 167 million XRP ($104 million) to GSR out of a total of 377 million XRP ($186 million) transferred out of his identified addresses.[50] This can be seen in Figure 8 which shows the cumulative amount of XRP transferred out of Garlinghouse's identified addresses over time, including direct transfers to GSR. Other destinations receiving direct transfers of XRP from Garlinghouse identified addresses include digital asset platforms, Ripple, or unidentified addresses. Additional detail regarding where XRP flowed from Garlinghouse's identified accounts

[50] The US dollar equivalent shown is the value of the XRP on the date it first left one of Larsen's identified addresses. The XRP-USD exchange rate is obtained from CoinMarketCap. Garlinghouse's identified addresses comprise of a list of XRP addresses produced to the SEC by Garlinghouse [Garlinghouse Subpoena Response Spreadsheet, "Request 4" Tab (Bates GARL00000001-1) and Garlinghouse XRP Award Addresses (Bates GARL00000002-9)].

as well as the methodology for the blockchain tracing can be found in Appendix D and Appendix E.

Figure 8 – Cumulative Value of Direct Transfers Out of Garlinghouse's Identified XRP Addresses
This figure plots the cumulative value, in US dollars, of the XRP that was transferred out of Garlinghouse's identified addresses. The amount that was directly transferred to GSR is shaded in blue. The US dollar value is based on the XRP-USD exchange rate, obtained from CoinMarketCap, on the day that the XRP was transferred out of Garlinghouse's identified addresses.



40. The total amount that Garlinghouse transferred to GSR could be as high as 277 billion XRP ($139 million)[51] because additional XRP moved from Garlinghouse's identified addresses to GSR addresses through up to two hops, as shown in Table 3. Unlike with Larsen's accounts, blockchain analysis does not identify XRP going to GSR beyond two hops.

[51] The US dollar equivalent shown is the value of the XRP on the date it first left one of Larsen's identified addresses. The XRP-USD exchange rate is obtained from CoinMarketCap.

Table 3 – Cumulative Value of XRP Sent from Garlinghouse to GSR Over up to Two Hops
This table shows the cumulative amount of XRP sent to GSR from Garlinghouse's identified addresses, given the number of hops, as well as the USD equivalent on the date XRP left the identified addresses. The blockchain analysis did not identify additional XRP sent to GSR beyond two hops.

Number of Hops	Cumulative XRP Transferred to GSR (million)	USD Equivalent (million)
1	167	104
Up to 2	277	139

Values rounded to the nearest 1 million XRP and 1 million USD.

VIII. RIPPLE ENTERED INTO PARTNERSHIP AND OTC AGREEMENTS WHICH INCLUDED TERMS THAT WOULD MINIMIZE DOWNWARD PRESSURE ON XRP PRICES

41. Lock-up provisions are common on Initial Public Offerings (IPOs) of shares, typically last 180 days, and are a means to prohibit or slow insiders, venture capital, and other pre-IPO shareholders from selling shares [Field and Hanka (2001)]. The motivation behind these restrictions is to limit the supply of saleable shares or sellers and thus reduce the downward pressure on shares prices. Similar to these IPO practices, Ripple implemented lock-up periods and selling restrictions on the resale of XRP. By restricting the amount these purchasers and partners could resell on the open market for XRP, Ripple limited the supply of XRP tokens, thereby minimizing downward pressure on the price of XRP as I describe in more detail below.

42. Ripple made use of lock-up periods and selling restrictions in its institutional sales. For example, in October 2014 when [redacted]"[52] purchased [redacted] worth of XRP, it was subject to a lock-up period of [redacted][53] When Ripple sold [redacted] worth of XRP in June 2016 to [redacted]"[54] Ripple required a [redacted] lock-up period and a subsequent [redacted]

[52] https://www.linkedin.com/company/[redacted]about.
[53] XRP II Master Agreement – [redacted] 11.29.2014 (Bates RPLI_SEC 0259585-593).
[54] https://fortune.com/[redacted].

period where XRP sales were limited to [redacted] of the average daily volume.[55] Subsequent XRP bulk purchase agreements, for example in 2018 to [redacted] an investment management firm, also included a "Lockup Period" and a "Daily Sale Limitation."[56]

43. When distributing XRP as compensation or incentives to service providers and partners, Ripple also made use of lock-up and selling restrictions. In its 2017 agreement with [redacted] which also helped Ripple sell XRP on the open markets, XRP payments from Ripple to [redacted] were subject to a lock-up period of [redacted] and sales after this lock-up period were limited "to no more than [redacted] of daily XRP notional value trading volume on all venues where XRP is listed."[57] In 2019, Ripple entered into an agreement with [redacted] to develop a digital asset wallet and provided an "XRP Incentive" of [redacted].[58] In that agreement, [redacted] subsequent selling of this XRP incentive could not exceed [redacted] of the three-day average total trade volume of XRP.[59] Overall, these lock-up provisions and sales restrictions are consistent with Ripple taking steps to protect the price of XRP.

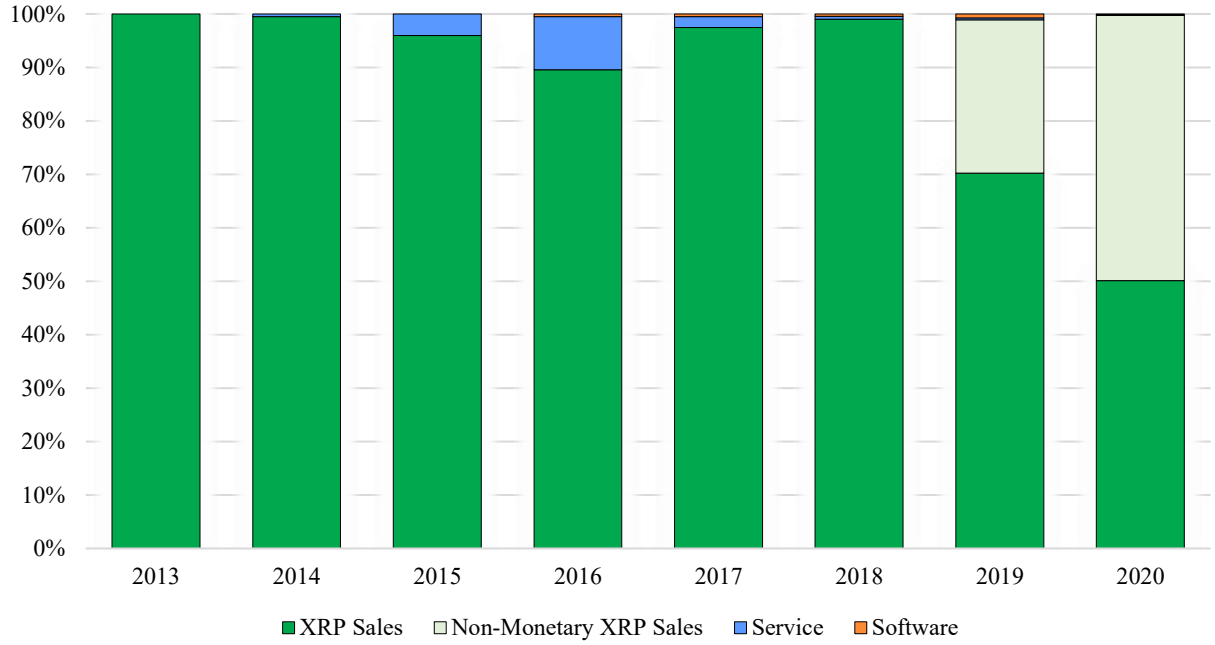
IX. RIPPLE HAD STRONG INCENTIVES TO MAXIMIZE XRP PRICES

A. Funding Operational Costs

44. Revenue from XRP sales comprise Ripple's key source of revenue. As seen in Figure 9, from 2013 to 2020, in each year revenue from XRP sales accounted for over 90% of Ripple's total revenue, and in some years was greater than 99% of total revenue.

[55] 2016-06-09 [redacted] summary of XRP purchase, (Bates RPLI_SEC 0000626-631) and 2016-06-23 [redacted] summary of XRP purchase, (Bates RPLI_SEC 0000636-641).
[56] 2018-02-22 [redacted] Purchase agreement, (Bates RPLI_SEC 0233130-148).
[57] 2017-02-14 [redacted] MM and programmatic market activity agreement, (Bates RPLI_SEC 0899145-151).
[58] 2019-05-24 [redacted] Incentive agreement, (Bates RPLI_SEC 0298094-102).
[59] *ibid*.

Figure 9 – Ripple Revenue Stream Proportions, 2013-2020.
This figure displays Ripple's revenue streams as a proportion of total revenue from 2013 to 2020. The bars for each year aggregate the XRP sales, XRP non-monetary transactions,[60] service and software revenue to show the total revenue. Data are sourced from the income statements from Ripple audited annual financial statements.[61]



45. Without revenue from XRP sales, Ripple would have faced enormous operating deficits. This is shown in Figure 10, which plots Ripple's operating expenses (orange line) against Ripple's revenue excluding revenue from XRP (blue line). Without revenue from XRP sales, Ripple would have operated with significant annual operating deficits (signified by the gap

[60] Ripple's auditors define non-monetary XRP transactions as follows: "Non-monetary XRP transactions revenue consists of transactions where the Company delivers XRP to customers for consideration other than cash or other monetary consideration and is recognized upon delivery of XRP. Revenue for non-monetary XRP transactions is determined based on the value of consideration expected to be received from the customer. This is typically the value of the XRP delivered to the customer." Consolidated Financial Statements-as of December 31, 2019 (Bates RPLI_SEC 0301113-1160).
[61] Ripple Financial Statements 2013 and 2014 - with notes (Bates RPLI_SEC 0090938-962),
Ripple - 2015 FS (Bates RPLI_SEC 0426161-187)
Ripple Financial Statements 2016 and 2017 OCR (Bates NY-9875_T_00017816-854)
Ripple Financial Statements 2017 and 2018 OCR (Bates RPLI_SEC 0267872-911)
Consolidated Financial Statements-as of December 31, 2019 (Bates RPLI_SEC 0301113-1160)
2020 and 2019 Audited Financial Statements OCR (Bates RPLI_SEC 0920429-475)

between orange and blue lines) ranging from [redacted] to [redacted] per year from 2017 to 2020.

Figure 10 – Ripple Total Non-XRP Revenue vs. Total Operating Expenses, 2013-2020.
This figure plots Ripple's total operating expenses (orange line) against total Ripple revenue excluding revenue from XRP sales (blue line). Without revenue from selling XRP, Ripple would have operated with large annual operating deficits ranging from $[redacted] to [redacted] from 2017 to 2020, which can be seen as the gap between the orange and blue lines. Data comes from the income statements from Ripple audited annual financial statements.

46. From 2013 to 2020, Ripple has also received multiple rounds of outside capital funding, totaling $284 million, net of issuance fees.[62] While this funding has helped to cover Ripple's operational deficits to a certain extent, as seen in Figure 11, starting in 2017 Ripple has been dependent on XRP sales to fund its operations. Had Ripple not sold XRP to fund its operations, it would have had an annual funding gap of [redacted] in 2017 which would have grown to nearly [redacted] by the end of 2020, as denoted by the red line in Figure 11. Without additional funding Ripple could not have stayed in operation, given its cost structure, without its sales of XRP. Indeed, an early Ripple pitch deck stated that part of Ripple's business model

[62] Value calculated from "Cash flows from financing activities" in the cash flow statements from Ripple audited annual financial statements.

included keeping a significant portion of XRP and "occasionally" selling XRP "to fund itself."[63] However, since 2017 Ripple has been dependent on selling XRP to fund its operations.

B. Funding for Shares Repurchases

47. Sales of XRP have not only provided critical funding for Ripple's operations but have also enabled Ripple to undertake private share repurchases that have rewarded existing shareholders, who are likely mostly comprised of early investors, founders, and employees of

[63] Ripple Financial Services, July 2013 (Bates RPLI_SEC 0088287).

Ripple.[64] Ripple has repurchased a total of [redacted] in shares previously issued to its early investors and founders (Figure 12). Without XRP sales, Ripple would have had a significant cash deficit (denoted by the red line in Figure 11 above) and would not have had the cash to pay for shares repurchases. However, with XRP sales, Ripple has been able to fund shares repurchases that have rewarded early investors, founders or employees handsomely, as Ripple's private valuation apparently skyrocketed from $100 million in 2015 to $10 billion in 2020—a hundred-fold increase.[65]

[64] It is possible that early investors, founders or employees may have sold their shares in private markets to other entities or individuals.

[65] Ripple was valued at $100 million after its funding round in 2015 (https://www.wsj.com/articles/BL-DGB-40105), and later valued at $10 billion after its funding round in 2020 (https://www.cnbc.com/2019/12/20/ripple-creator-of-xrp-crypotocurrency-is-now-valued-at-10-billion.html). This valuation does not include the holdings of XRP held in escrow or circulating supply of XRP in market held by public hands.

[66] Ripple Financial Statements 2013 and 2014 - with notes (Bates RPLI_SEC 0090938-962),
Ripple - 2015 FS (Bates RPLI_SEC 0426161-187)
Ripple Financial Statements 2016 and 2017 OCR (Bates NY-9875_T_00017816-854)
Ripple Financial Statements 2017 and 2018 OCR (Bates RPLI_SEC 0267872-911)
Consolidated Financial Statements-as of December 31, 2019 (Bates RPLI_SEC 0301113-1160)
2020 and 2019 Audited Financial Statements OCR (Bates RPLI_SEC 0920429-475)

C. Funding from Outside Investors vs. Through XRP Sales

48. As established in the previous section, Ripple needed to sell XRP because outside sources of funding, which include venture and institutional investors, and sales of non-XRP related software and services[67] did not provide enough capital to fund its annual operational costs. Internally at Ripple, there was discussion that not being completely dependent on outside institutional investors was beneficial. According to David Schwartz (CTO), Ripple's revenue stream from XRP sales provided an important source of funding that would enable Ripple to be less dependent on outside funding. Specifically, he argues, "XRP price matters because it's a current and future revenue stream, securing our business and maintaining a level of independence of the company from outside funding. The value of the company's XRP holdings is significant and we have an obligation to be sensible stewards."[68]

49. When companies raise funds by issuing equity to outside investors, their management loses a portion of control over the company since their share of equity is diluted with each round of new investments. This is the case when Ripple received venture capital funding from its outside investors.[69] However, the sales of XRP are not subject to a reduction of shareholder voting rights for executives because holders of XRP do not have any voting rights. This provided a further incentive to raise more funds through selling XRP and taking actions to increase its price. In other words, by selling XRP instead of equity, Ripple could enjoy the benefits of capital raising through sale of XRP, without the costs typically associated with such sales. Those costs typically

[67] https://www.crunchbase.com/organization/ripple-labs/company_financials.
[68] David Schwartz Deposition Exhibit 84 (RPLI_SEC 0576405). In his deposition (pp 407-408), Schwartz states that his document, "Why Should We Care About XRP Right Now?" was imported into the referenced document under discussion. The quotation comes from the top of the "Why Should We Care About XRP Right Now?" section.
[69] For example, Ripple's Series A funding round provided voting rights to investors and entitled them to appoint a director to Ripple's Board of Directors, as seen in Ripple Labs, Inc. Consolidated Financial Statements As of December 31, 2014 At 16 (Bates RPLI_SEC 0090955).

include giving up control of its operations and the costs and scrutiny of complying with regular investor disclosures of financial records.

50. Because sales of XRP helped to fund its operations with less strings attached relative to raising equity, Ripple had the incentive to increase both its sales of XRP and the price of XRP.

D. Executive Compensation

51. Another incentive for Ripple and its executives to actively manage and increase the price of XRP is that Ripple executives and employees owned XRP and received compensation and bonuses in XRP. As detailed in Section VII, both Larsen and Garlinghouse received and subsequently transferred large amounts of XRP, valued at $1.1 billion and $186 million respectively. The average CEO of the top 350 publicly traded company makes approximately $9.5 million per year through shares and shares options awards.[70] In contrast, Larsen and Garlinghouse on average transferred $120 million per year out of their addresses,[71] more than 12 times the average annual executive shares and shares option awards at the top 350 publicly traded companies. Yet, Ripple's non-XRP revenue, as shown in Figure 10, is trivial compared to the annual revenue of these companies.

52. Other Ripple executives also received compensation in XRP. For example, a Ripple General Manager was entitled to and received annual bonuses from Ripple of one million XRP.[72] This suggests that the team of Ripple managers and executives who received XRP, including

[70] https://www.epi.org/publication/ceo-compensation-2018.
[71] Average is based on every full year that Larsen and Garlinghouse transferred funds out of their identified addresses, i.e., 2014-2020 for Larsen and 2018-2020 for Garlinghouse.
[72] Asheesh Birla deposition at 55. June 23, 2021.

Larsen and Garlinghouse, were incentivized to manage and increase the price of XRP and minimize downward pressure on the price of XRP.

E. XRP vs. Stock Similarities

53. Based on my expertise in investments, IPOs,[73] and financial markets, I find that Ripple used XRP in a similar manner as companies use stock. Although Ripple had publicly stated plans to develop uses for XRP beyond the ways that a company uses stock (e.g., to potentially one day serve as a bridge currency for banking transactions), Ripple ultimately primarily used XRP to fund operations and enrich its executives. Companies sell shares either through initial public offerings ("IPOs") or seasoned equity offerings ("SEOs") to fund operations and new investments [Ritter and Welch (2002) and DeAnglo, DeAngelo, and Stulz (2010)]. IPOs typically have lock-up provisions on these shares to limit supply and selling pressure. As previously described, Ripple took actions to lock-up XRP tokens to limit supply and selling pressure.

54. Companies also use equity or options on equity as a means to deliver substantial compensation to company executives and top managers [Murphy (2013)]. Ripple used and managed XRP in an almost identical capacity to pay Ripple executives and founders, as well as other key employees who sold significant amounts of XRP over time. Ripple employees who held XRP were incentivized to work together to increase the price of XRP and minimize downward pressure on the price of XRP in the same way that managers and executives holding company shares work to increase the share value of their company. Companies also use funding from IPOs and SEOs to fund new operations, and Ripple similarly funded the vast majority of its operations through XRP sales. Overall, in the way that XRP funded operations and incentivized executives

[73] See [redacted] (2007) for IPOs. Expertise in areas of investments and financial markets are outlined in many papers and teaching expertise in Appendix A.

and managers through XRP sales, Ripple used XRP in an extremely similar capacity as firms use publicly traded equity.

55. However, Ripple enjoyed the benefits of capital raising through sale of XRP, without the costs typically associated with such sales. XRP did not grant holders any formal voting rights in the governance of Ripple. Thus, Ripple executives did not have to give up any control of company operations as they normally would when selling dilutive shares with voting rights. Additionally, by not issuing publicly traded stock Ripple was not obligated to provide regular investor disclosures of financial records and corporate activities that companies typically make.

56. Another more peculiar Ripple practice not typically present with registered companies is Ripple's close relationship with market makers, wherein Ripple directed them to trade not only in such a way as to sell XRP to raise revenue, but also to buy XRP both to provide a price floor and to push the price upward. Companies may enter repurchase agreements to purchase shares in aftermarket trading, but not in a manner where they actively seek to set price floors at certain prices or push prices upward during news announcements. In other words, publicly traded companies are not allowed to use trading strategies to influence their stock price, but Ripple employed multiple market makers to manage the trading aspects in XRP. The increasing and high price of XRP over the period enabled Ripple executives to profit greatly.

Executed October 13, 2021

[redacted], Ph.D.

X. APPENDIX A: CURRICULUM VITAE

ACADEMIC APPOINTMENTS

Sept 2009 – Aug 2012

Jan 2004

Jan 2005 – May 2005

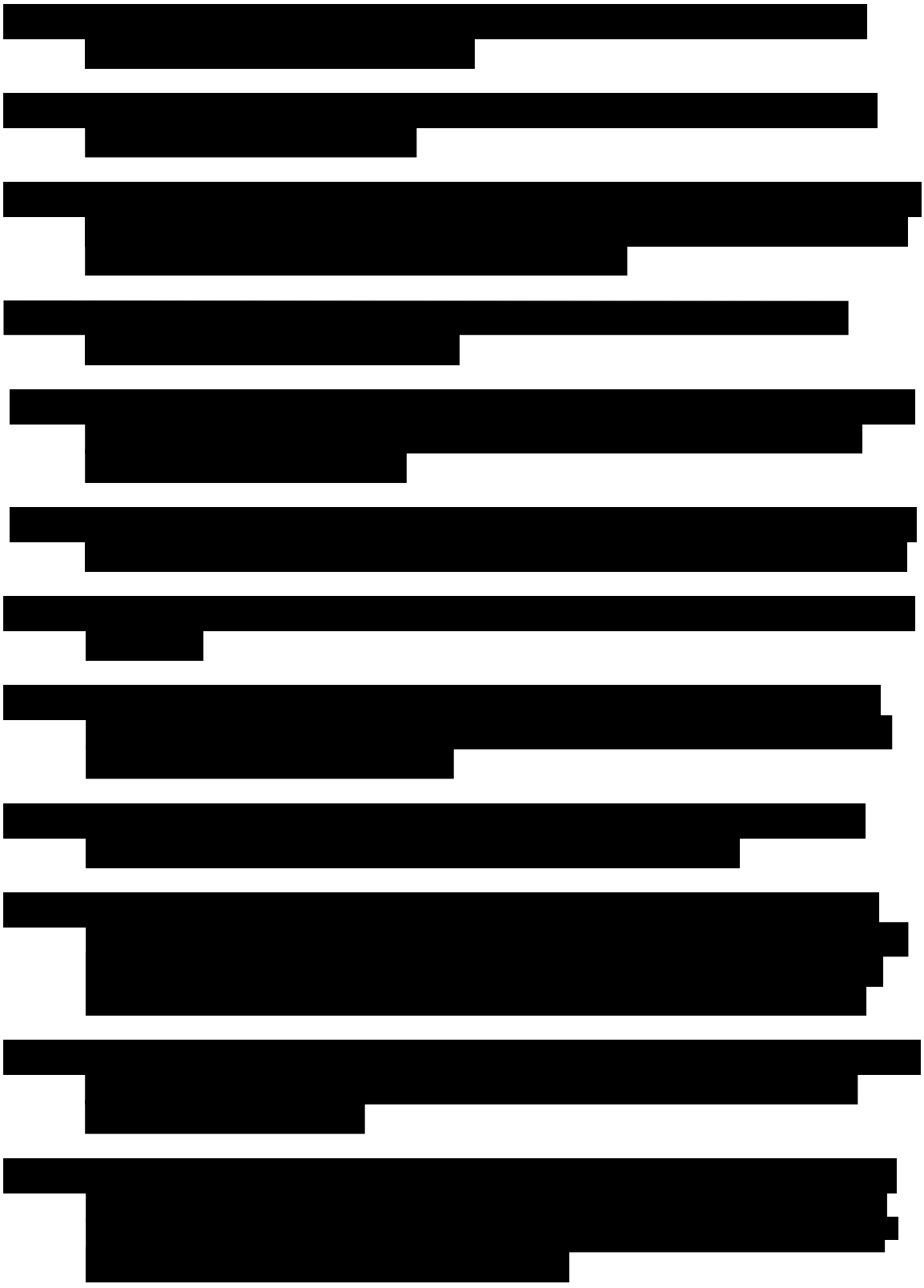
Jan 2003 – Dec 2003

Aug 1997 – May 2003

RESEARCH INTERESTS

Cryptocurrencies, Market Manipulation, Conflicts of Interest, CDOs, MBS, Credit Ratings, International Finance, Insider Trading, Institutional and Individual Investors, Real Estate, Rational and Behavioral Pricing, Hedge Funds

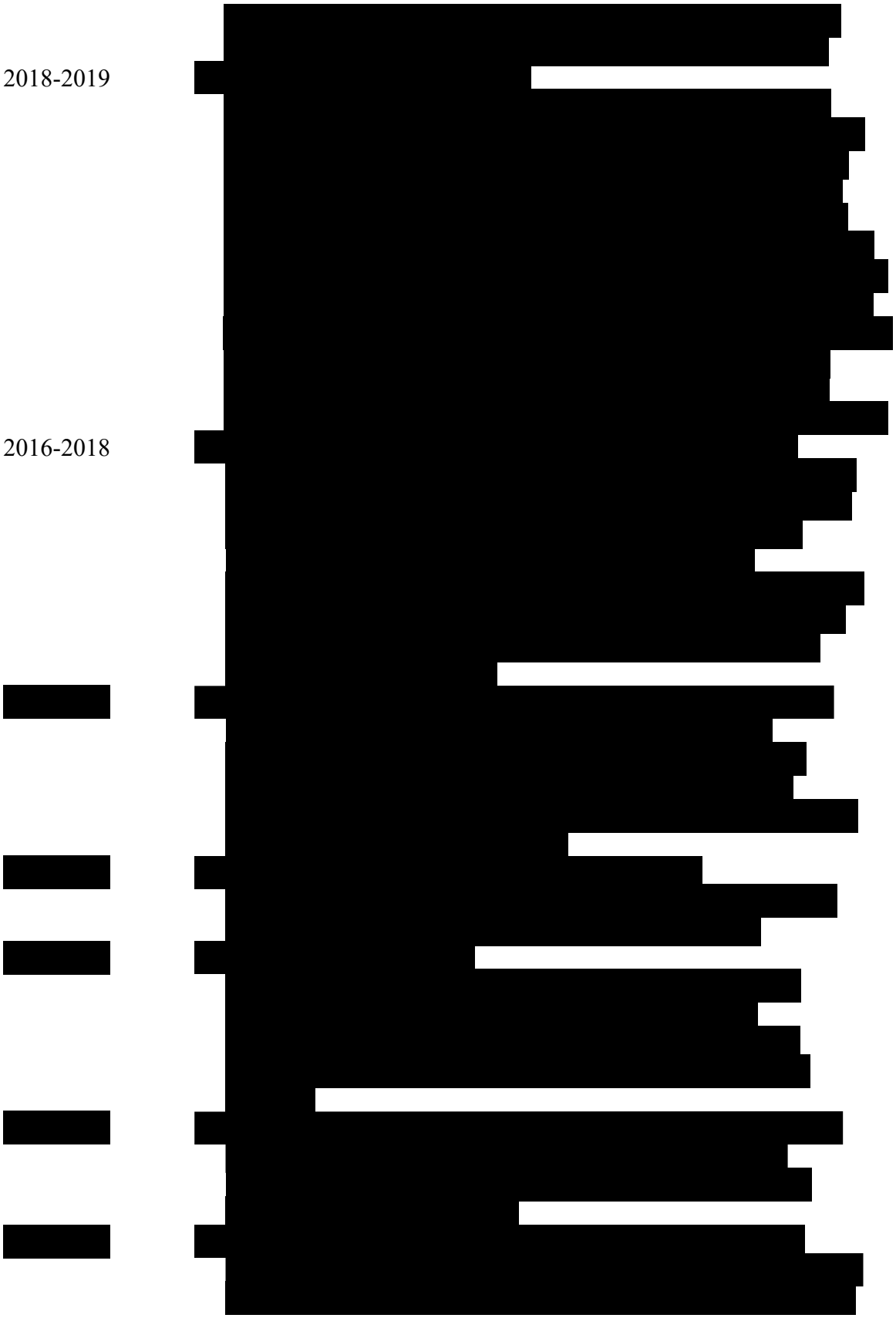
PUBLISHED OR FORTHCOMING ARTICLES

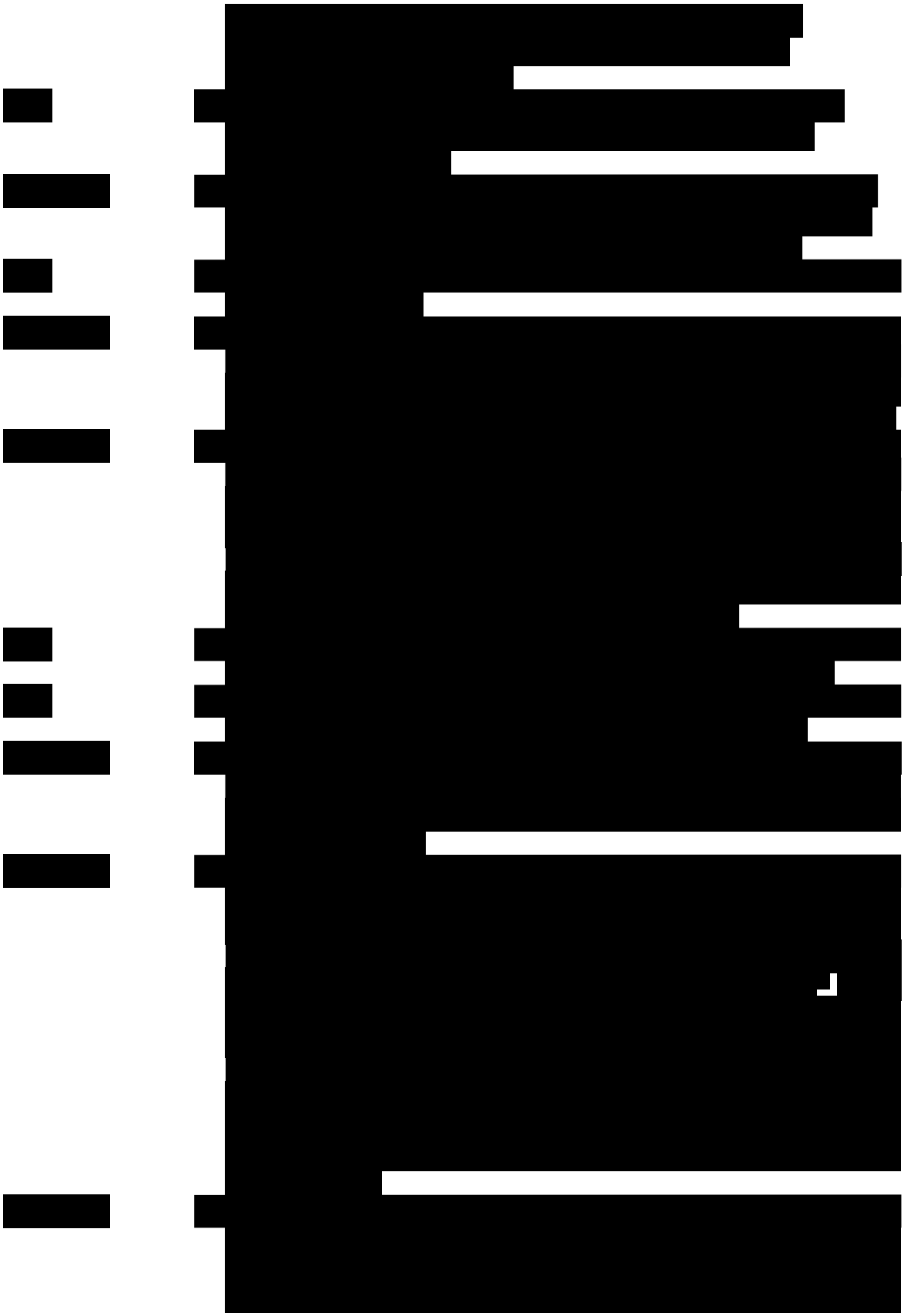


[redacted]

2018-2019

2016-2018





XI. APPENDIX B: RECENT TESTIMONY AND COURT-FILED EXPERT REPORTS

Testimony in the last four years and court-filed expert reports

Case Name: [redacted]

Case No.: [redacted] (United States District Court, Eastern District of Arkansas, Central Division)

Date: [redacted]

Case Name: [redacted]

Case No.: [redacted] (United States District Court, Western District of Louisiana, Shreveport Division)

Date: [redacted]

XII. APPENDIX C: LIST OF DOCUMENTS RELIED UPON

2015 GSR Larsen agreement, LARSEN-SEC-LIT-00004869-70.

2016-06-09 [redacted] summary of XRP purchase, RPLI_SEC 0000626-631.

2016-06-23 [redacted] summary of XRP purchase, RPLI_SEC 0000636-641.

2017 GSR Garlinghouse Liquidity Extraction agreement, GSR00000673-80.

2017-02-14 [redacted] MM and programmatic market activity agreement, RPLI_SEC 0899145-151.

2017-05-25 GSR Programmatic Market Activity Agreement, GSR00017429.

2017.06.11 CL BG chat, GARL_Civil_000877-78.

2018-02-22 [redacted] Purchase agreement, RPLI_SEC 0233130-148.

2018-03-02 GSR amended programmatic market maker agreement, GSR00018580.

2019-05-24 [redacted] Incentive agreement, RPLI_SEC 0298094-102.

2019-09-05 GSR Xrapid master agreement, GSR0000098.

2020 and 2019 Audited Financial Statements OCR, RPLI_SEC 0920429-475.

XRP Ledger Foundation. (Accessed on September 29, 2021). https://xrpl.org/accounts.html#creating-accounts.

Announcing Ripple's Global Payments Steering Group. (2016, September 23). Ripple Insights. https://ripple.com/insights/announcing-ripples-global-payments-steering-group.

Asheesh Birla deposition at 55, June 23, 2021.

Browne, Ryan. Ripple, which uses cryptocurrency for cross-border payments, is now valued at $10 billion. (Accessed October 4, 2021). CNBC. https://www.cnbc.com/2019/12/20/ripple-creator-of-xrp-crypotocurrency-is-now-valued-at-10- billion.html

Built for Bitcoin. (Accessed on September 29, 2021). NYDIG. https://nydig.com.

Casey, Michael J. and Chernova, Yuliya. Digital-Payments Company Ripple Labs Is Finalizing a $30 Million Funding Round. (Accessed October 4, 2021). The Wall Street Journal. https://www.wsj.com/articles/BL-DGB-40105.

Chordia, T., Roll, R., and Subrahmanyam, A. (2002). Order imbalance, liquidity, and market returns. Journal of Financial Economics, 2002, vol. 65, issue 1, 111-130.

Chordia, Tarun and Subrahmanyam, Avanidhar (2004). Order Imbalance and individual stock returns: Theory and evidence. Journal of Financial Economics, 2004, vol. 72, issue 3, 485-518.

Coil. Ripple's Xpring Makes 1 Billion XRP Grant to Drive XRP Adoption and Advance Coil's Monetized Platform for Creators. (Accessed on October 2, 2021). PR Newswire. https://www.prnewswire.com/news-releases/ripples-xpring-makes-1-billion-xrp-grant-to-drive- xrp-adoption-and-advance-coils-monetized-platform-for-creators-300902194.html

Consolidated Financial Statements-as of December 31, 2019, RPLI_SEC 0301113-1160.

[redacted]

David Schwartz Deposition Exhibit 84, RPLI_SEC 0576405.

DeAngelo, H., DeAngelo, L., and Stulz, R. (2010). Seasoned equity offerings, market timing, and the corporate lifecycle. Journal of Financial Economics, 2010, vol. 95, issue 3, 275-295.

Deposition of Patrick Griffin at 75-76, June 29, 2021.

Email from Brad Garlinghouse, April 10, 2016, RPLI_SEC 0205601.

Email from Brad Garlinghouse, April 10, 2016, RPLI_SEC 0307781.

Email from Bret Allenbach, April 10, 2016, RPLI_SEC 0205602.

Email from [redacted], June 1, 2016, GSR00004438.

Email from Chris Larsen, April 10, 2016, RPLI_SEC 0307781.

Email from [redacted], April 11, 2016, GSR00011984.

Email from [redacted] April 28, 2016, GSR00012857.

Email from Patrick Griffin, September 14, 2016, GSR00020001.

Email from Patrick Griffin, November 1, 2016, GSR00005000.

Email from [redacted] April 10, 2016, RPLI_SEC 0205600.

Excel Export - 2014-2016 - 2t - Liquidity extraction report, RPLI_SEC 0679467-467.

Excel_Export_2017_OLD_2h_Liquidity_extraction_report, GSR00000101.

Excel_Export_2018_2h_Ripple_Liquidity_Extraction_Report, GSR00000102

Excel_Export_2019_2h_Ripple_Liquidity_Extraction_Report, GSR00000103

Exhibit CG-34, GSR0000104.

Field, Laura Casares and Hanka, Gordon (2001). The expiration of IPO share lockups. The Journal of Finance 56, no. 2, 471-500.

Garlinghouse Subpoena Response Spreadsheet, "Request 4" Tab, GARL00000001-1.

Garlinghouse XRP Award Addresses, GARL00000002-9.

Get Account Activations. (Accessed on September 29, 2021). XRPSCAN API. https://api.xrpscan.com/api/v1/account/{address}/activations.

Get Account Exchanges. (Accessed on September 29, 2021). Ripple Data API v2. https://data.ripple.com/v2/accounts/{address}/exchanges.

Get Exchanges. (Accessed on September 29, 2021). Ripple Data API v2. https://data.ripple.com/v2/exchanges/{base_currency}+{base_issuer}/{counter_currency }+{counter_issuer}.

Get Transaction. (Accessed on September 29, 2021). Ripple Data API v2. https://data.ripple.com/v2/transactions/{transaction_hash}.

[redacted]

GSR00000348.

GSR00000467A.

GSR00006693.

GSR00007297.

GSR Loan and Purchase Agreement_Chris Larsen Trust, GSR00008433-442.

History. (Accessed on September 29, 2021). XRP Ledger Foundation. https://xrpl.org/history.html.

Joint Submission by the Parties to Hon. Analisa Torres. February 15, 2021, Dkt. No. 45.

Larsen, Chris [@chrislarsensf]. (2020, September 22). *As some of you may have noticed, I moved an $XRP wallet to NYDIG. I've known the founders for a while, and am impressed by their security and top notch institutional standards -- this is truly custody 2.0. Check them out at nydig.com* [Tweet]. Twitter. https://twitter.com/chrislarsensf/status/1308459310574264325.

List of Chris Larsen Addresses, LARSEN_NAT 00000102.

Mishel, Lawrence and Wolfe, Julia. CEO compensation has grown 940% since 1978. (2019, August 14). Economic Policy Institute. https://www.epi.org/publication/ceo-compensation-2018.

Murphy, Kevin J. Executive compensation: Where we are, and how we got there. In Handbook of the Economics of Finance, vol. 2, pp. 211-356. Elsevier, 2013.

Our Team. (Accessed on September 29, 2021). GSR. https://www.gsr.io/our-team.

Polo_gsr_trades, [redacted]00001699.

Q4 2020 XRP Markets Report, https://ripple.com/insights/q4-2020-xrp-markets-report.

Q1 2017 XRP Markets Report, https://ripple.com/insights/q1-2017-xrp-markets-report.

Q2 2017 XRP Markets Report, https://ripple.com/insights/q2-2017-xrp-markets-report.

Q3 2017 XRP Markets Report, https://ripple.com/insights/q3-2017-xrp-markets-report.

Q4 2017 XRP Markets Report, https://ripple.com/insights/q4-2017-xrp-markets-report.

Ritter, Jay R. and Welch, Ivo (2002). A Review of IPO Activity, Pricing and Allocations. Yale ICF Working Paper No. 02-01 (February 2002). Available at SSRN: http://dx.doi.org/10.2139/ssrn.296393.

Ripple Adds Several New Banks to Global Network. (2016, September 15). Ripple Press. https://ripple.com/ripple_press/ripple-adds-several-new-banks-global-network.

Ripple Financial Services, July 2013, RPLI_SEC 0088287.

Ripple – Funding, Financials, Valuation & Investors. (Accessed on September 29, 2021). Crunchbase. https://www.crunchbase.com/organization/ripple-labs/company_financials.

Ripple Labs, Inc. Consolidated Financial Statements As of December 31, 2014 At 16, RPLI_SEC 0090955.

Ripple Raises $55 Million in Series B Funding. (2016, September 15). Ripple Press. https://ripple.com/ripple_press/ripple-raises-55-million-series-b-funding.

Roberts, Jeff John. Genesis expands crypto footprint with custody acquisition. (2020, May 21). Fortune. https://fortune.com/2020/05/21/genesis-cryptocurrency-vo1t-bitcoin.

Ripple - 2015 FS, RPLI_SEC 0426161-187.

Ripple Financial Statements 2013 and 2014 - with notes, RPLI_SEC 0090938-962.

Ripple Financial Statements 2016 and 2017 OCR, NY-9875_T_00017816-854.

Ripple Financial Statements 2017 and 2018 OCR, RPLI_SEC 0267872-911.

Wind, Wietse. WietseWind/fetch-xrpl-transactions. (Accessed on September 29, 2021). GitHub repository. https://github.com/WietseWind/fetch-xrpl-transactions.

XRP. (Accessed on September 29, 2021). XRP Ledger Foundation. https://xrpl.org/xrp-overview.html.

XRP Explorer. (Accessed on September 29, 2021). Bithomp. https://bithomp.com/explorer/rDCgaaSBAWYfsxUYhCk1n26Na7x8PQGmkq.

XRP Explorer. (Accessed on September 29, 2021). Bithomp. https://bithomp.com/explorer/rGFuMiw48HdbnrUbkRYuitXTmfrDBNTCnX.

XRP II Master Agreement – [redacted] 11.29.2014, RPLI_SEC 0259585-593.

XRP price today, XRP to USD live, marketcap and chart. (Accessed on October 4, 2021). CoinMarketCap. https://coinmarketcap.com/currencies/xrp.

XRP Programmatic Sales Reporting FY14 to Date v2, RPLI_SEC 74559.

Any other documents or materials identified in my report, including data obtained from CoinMarketCap and CryptoTick.

XIII. APPENDIX D: IDENTIFICATION OF GSR ADDRESSES

Summary of Sources

57. The data are sourced from the 2014-2016 GSR liquidity extraction report[74] ("extraction report"), detailing GSR's activities with respect to Client "Ripple Labs" and Bot "2t", as well as publicly available blockchain data.[75]

Context: The Liquidity Extraction Report

58. The "Daily Summary" tab of the extraction report describes daily trading activities of GSR on behalf of Ripple via Bot 2t. The "Comments" column (column S) reports, among other events, payouts to Ripple and commission fees received by GSR. Many cells in the "Comments" column contain transaction hashes on the XRP Ledger, which is inferred to correspond with the aforementioned payouts and commission fees based on other context given in the "Comments" cells and the balance changes of USD and EUR documented in columns Q and R. It is also inferred that "TPWR" as used in the "Comments" column refers to an address (or set of addresses) controlled by Ripple that receives the aforementioned payouts, and "GSR" as used in the "Comments" column refers to an address (or set of addresses) controlled by GSR that receives the aforementioned commission fees.

59. In the "Details" tab of the extraction report, sums of XRP amounts are given daily and correspond with the amount of "Total XRP" owned by GSR for the corresponding date in the

[74] Excel Export - 2014-2016 - 2t - Liquidity extraction report (Bates RPLI_SEC 0679467-467).
[75] This report used XRP blockchain data from two sources: i) an application programming interface (API) provided by Ripple (Ripple Data API v2), available at https://data.ripple.com/v2/transactions/{transaction_hash}, https://data.ripple.com/v2/exchanges/{base_currency}+{base_issuer}/{counter_currency}+{counter_issuer} and https://data.ripple.com/v2/accounts/{address}/exchanges; and ii) the full history of the XRP Ledger for use in Google's BigQuery data warehouse, available at https://github.com/WietseWind/fetch-xrpl-transactions. The latter source is provided by Wietse Wind, founder of XRPL Labs (https://wietse.com/bio).

"Daily Summary" tab;[76] it is inferred that addresses listed in column A of the "Details" tab are GSR-controlled. In particular, it is inferred that [redacted] is a GSR-controlled address.

60. Descendants of a certain address 'N' are defined to be any address 'M' such that 'N' activated 'M', where activation is meant in the conventional sense that 'M' first received XRP from 'N'.[78] A genealogy of address 'N' is the recursively-generated tree with root 'N' and branches given by the descendants of 'N', the descendants of the descendants of 'N', and so on. A depth-first search is performed using XRPScan's API[79] to construct the genealogy of [redacted] This genealogy tree has depth four, i.e., there are at most four edges between the root and any leaf.

Identification of GSR Addresses Used in Figures 1-4

61. The term "GSR" as used in Figures 1-4 refers to a set of addresses whose identification is explained in this section. Every string in the "Comments" column in the "Daily Summary" tab of the extraction report with more than 60 characters was extracted and, after removing punctuation and whitespace characters, verified to be a valid transaction hash on the XRP Ledger, with one exception.[80] For each such transaction hash, the date of the transaction was retrieved as well as the associated sending address from the aforementioned BigQuery tables. The resulting set of sending addresses ("candidate wallets") was analyzed to determine the number of transactions, out of those listed in the "Comments" column, each candidate wallet initiated, as well as the dates of the first and last instances of such transactions. The results can be seen in Table 4.

[76] For example, the amount in cell F43, "Details" tab, corresponding to December 1, 2014, matches the amount in cell G3, "Daily Summary" tab, also corresponding to December 1, 2014.
[77] [redacted] is an abbreviation for XRP address [redacted].
[78] https://xrpl.org/accounts.html#creating-accounts.
[79] https://api.xrpscan.com/api/v1/account/{address}/activations.
[80] The exception occurs in cell S705, "Daily Summary" tab, with the string "https://blockchain.info/tx/e5b6ba00fe8c1754bd0e36eecbad5456473eaf61965737d8c0c7b16a55cef2dc", corresponding to a transaction made by GSR on the Bitcoin blockchain regarding a purchase of BTC.

Table 4 – Activity of Candidate Wallets.
This table provides the summary of the activity of the candidate wallets as discussed in Appendix D. The 195 transaction hashes identified in the "Comments" column of the extraction report were attributed to the candidate wallet that initiated the transaction, and the set of such transactions for each candidate wallet is described.

Address	Number of Transactions	Date of First Transaction	Date of Last Transaction
[redacted]	2	November 1, 2016	December 2, 2016
[redacted]	6	February 15, 2016	November 1, 2016
[redacted]	3	March 11, 2015	March 11, 2015
[redacted]	1	March 20, 2015	March 20, 2015
[redacted]	14	September 10, 2015	November 5, 2015
[redacted]	20	January 14, 2015	August 21, 2015
[redacted]	1	March 17, 2015	March 17, 2015
[redacted]	117	August 21, 2015	January 21, 2017
[redacted]	1	March 29, 2016	March 29, 2016
[redacted]	1	August 18, 2016	August 18, 2016
[redacted]	1	September 28, 2016	September 28, 2016
[redacted]	23	February 24, 2015	March 19, 2015
[redacted]	5	March 11, 2015	March 11, 2015

62. The only candidate wallets that made transactions in 2016 are [redacted] and [redacted] The former two, [redacted] and [redacted] are owned by Poloniex and Bitstamp respectively,[94] and their presence in the candidate wallet set is a result of GSR buying or selling XRP through the respective off-chain digital asset platform.[95] The fourth address, [redacted] is used by GSR to collect commission fees and corresponds with "GSR" as used in the "Comments" column

[redacted].

[94] Identities sourced from https://bithomp.com/explorer/rDCgaaSBAWYfsxUYhCk1n26Na7x8PQGmkq and https://bithomp.com/explorer/rGFuMiw48HdbnrUbkRYuitXTmfrDBNTCnX.
[95] For example, line 3, cell S705, "Daily Summary" tab.

of the "Daily Summary" tab of the extraction report. The fifth address, [redacted] is unidentified, but it can reasonably be excluded from consideration since it was responsible for only one transaction mentioned in the "Comments" column; moreover, this single transaction corresponds to an "order from Patrick to sell… XRP for… [redacted]"[96] The sixth address, [redacted] is the recipient of "TPWR" payouts throughout the extraction report; the single transaction appearing in the "Comments" column for which [redacted] is responsible corresponds to an event where GSR "received 50k from TPWR for buying,"[97] which explains its presence in the candidate wallet set. The final candidate wallet of the six that made at least one transaction in 2016, [redacted] was responsible for by far the greatest number of transactions, as seen in Table 4. It is possible to conclude that [redacted] is GSR-controlled and is responsible for the aforementioned payout and commission fee transactions. Moreover, it can be inferred that, as far as the extraction report indicates, [redacted] is the only GSR-controlled wallet with payout responsibilities in 2016.

63. A table of transactions was constructed in which either the sending address or the receiving address is a candidate wallet; the subset of this table of successful transactions[98] was retrieved in which either the sending address or the receiving address is [redacted] All such transactions in which the *receiving* address is [redacted] are of the Payment type, none of which are transfers of XRP.[99] Of the 109 addresses that make Payments to [redacted] at least once in 2016, all but four are members of the [redacted] genealogy, so it is inferred that these 105 addresses are GSR-controlled. The remaining four addresses that are not members of the genealogy are [redacted],

[96] Cell S630, "Daily Summary" tab.
[97] Cell S671, "Daily Summary" tab.
[98] Encoded as "tesSUCCESS" on the XRP Ledger.
[99] This, among other factors, suggests that other addresses are exchanging XRP for non-XRP assets (e.g., USD) on the XRP Ledger on behalf of [redacted] which in turn uses the non-XRP assets for payouts and commission fees.

[redacted] and [redacted] These were previously identified as Poloniex, Bitstamp, "TPWR," and "GSR" (the recipient of commission fees), respectively.

64. The 105 addresses that make at least one Payment to [redacted] in 2016 and which are not Poloniex, Bitstamp, "TPWR," or "GSR," as discussed above, constitute the set of addresses termed "GSR" in Figures 1-4.

XIV. APPENDIX E: METHODOLOGY FOR BLOCKCHAIN ANALYSIS AND FLOW OF XRP FROM LARSEN AND GARLINGHOUSE ADDRESSES

A. Methodology for Blockchain Tracing

65. The blockchain tracing analysis starts with i) lists produced to the SEC that identify XRP addresses that are under Larsen's or Garlinghouse's control[100] and ii) publicly available XRP blockchain data which includes the full history of every transaction.[101] From the lists produced to the SEC, there are 28 Larsen-identified addresses and 19 Garlinghouse-identified addresses. Then, the "first-in, first-out" (FIFO) forensic accounting methodology is applied to trace the flow of XRP out of those Larsen-identified and Garlinghouse-identified addresses. The XRP from these addresses is traced until one of the following scenarios: i) XRP reaches a "GSR-associated" address,[102] ii) XRP reaches an "identified address" such as a digital asset exchange or other known entities on the XRP blockchain,[103] iii) XRP reaches a non-identified address with over 1,000 transactions (labeled as "high-activity address"),[104] iv) XRP is returned to one of the Larsen-

[100] List of Chris Larsen Addresses (Bates LARSEN_NAT 00000102); Garlinghouse Subpoena Response Spreadsheet, "Request 4" Tab (Bates GARL00000001-1); Garlinghouse XRP Award Addresses (Bates GARL00000002-9).

[101] This report used XRP blockchain data from two sources: i) an application programming interface (API) provided by Ripple (Ripple Data API v2), available at https://data.ripple.com/v2/transactions/{transaction_hash} and ii) the full history of the XRP Ledger for use in Google's BigQuery data warehouse, available at https://github.com/WietseWind/fetch-xrpl-transactions. The latter source is provided by Wietse Wind, founder of XRPL Labs (https://wietse.com/bio).

[102] "GSR-associated" addresses were identified from liquidity extraction reports produced to the SEC (Bates RPLI_SEC 0679467-467, GSR00000102, GSR00000103, GSR00000441, GSR00000442, GSR00000444, GSR00000446, GSR00000447, GSR00000448, GSR00000449, GSR00000452, GSR00000453, GSR00000454, GSR00000455, GSR00000460, GSR00000461, GSR00000462, GSR00000463, GSR00000464, GSR00000465, GSR00000466, GSR00000467). More details can be found in Appendix D.

[103] The identities of certain addresses on the XRP blockchain can be derived from publicly available sources online. These include data from XRP blockchain explorers (blockchain explorers enable users to view blockchain data from a web interface), e.g., bithomp.com which lists the identity behind certain XRP addresses, and from social media sites such as twitter.com.

[104] Addresses that have had over 1,000 transactions and were labelled "high-activity" because it is possible that they are digital asset platforms that have not been identified.

identified or Garlinghouse-identified addresses, v) less than 5 XRP is flowing out of an address,[105] or vi) XRP is transferred over 13 hops.[106]

66. For the purposes of this report, funds are only traced if they involve "Payment" and "AccountDelete" transactions of XRP. Payment transactions entail direct transfers of a certain asset from an address to another address. AccountDelete transactions entail a deletion of an address (its transaction history remains in the ledger history) and a transfer of all assets in that address to another address. There exist Payment transactions of other assets, such as USD, which are excluded from this analysis. Other types of transactions excluded for the purpose of this tracing analysis are other XRP balance-affecting changes on the ledger, such as: i) "offers" – buy/sell offers exchanging XRP for another asset at a given exchange rate, ii) "checks" – IOUs that can be cashed by the receiving party up to an expiration time and iii) "payment channels" – safeboxes where XRP is stored and can be retrieved by the receiving party. To exclude the above balance-affecting transactions means that this report assumed such transactions or changes did not actually occur.

B. Flow of XRP from Larsen and Garlinghouse Addresses

67. This section provides a summary of the flow of XRP out of Larsen's and Garlinghouse's identified addresses based on i) direct transfers (1 hop only) and ii) tracing XRP over multiple hops.

[105] Tracing was not done for transactions less than 5 XRP because: i) tracing minute amounts is computationally intensive and does not impact the results significantly, so a lower bound is necessary, and ii) 5 XRP has typically been the largest fee that has been charged in the course of a transaction.

[106] Due to the exponential growth in the number of addresses and transactions to trace for each additional hop, the analysis stopped at 13 hops for the Larsen-identified addresses. Less than 20,000 XRP was traced that went beyond 13 hops before reaching one of the criteria above, representing less than 0.001% of the XRP flowing out of Larsen-identified addresses. XRP flowing out of Garlinghouse-identified addresses was not transferred over two hops before it hit one of the other criteria above.

68. As noted in the tracing methodology described above, the XRP flowing from the identified addresses could have been transferred to other XRP addresses up to 13 times before reaching an identified destination, such as a digital asset platform. Hence, it is possible that the ownership of the XRP changed hands between when it left one of the identified addresses and when it reached a digital asset exchange, e.g., through an over-the-counter (OTC) sale, as an exchange for a good or service, as an investment or as a donation. Indeed, this happened with some of Larsen's XRP since, as alluded to the main report, he sold XRP in OTC sales and to friends who themselves could have subsequently sold their XRP on digital asset platforms. In general, fewer transfers of a digital asset provides more confidence that the digital asset is still in the possession of the original holder. As such this Appendix provides an accounting of funds both i) directly transferred over 1 hop from the identified addresses and ii) transferred over multiple hops.

69. In general, the point of the tracing is not to pinpoint where all the funds went and exactly when they were transferred to other parties. Nevertheless, it is possible to infer that significant amounts of XRP originating from Larsen's and Garlinghouse's identified addresses were transferred and traced to GSR as well as digital asset platforms where they could have been sold. Whether or not the traced XRP was actually sold at digital asset platforms would require having detailed account data from all digital asset platforms where XRP was traced to have reached, which was not available at the time of this report's writing.

Direct Transfers of XRP

Figure 13 – Visualization of Direct transfers from the Larsen-Identified Addresses.
This figure illustrates the flow of funds from Larsen's identified XRP addresses, from left to right. The thickness of each category denotes the relative size, in XRP, of funds traced. The largest recipient of funds was GSR. "Other Addresses" are addresses that were not identified.

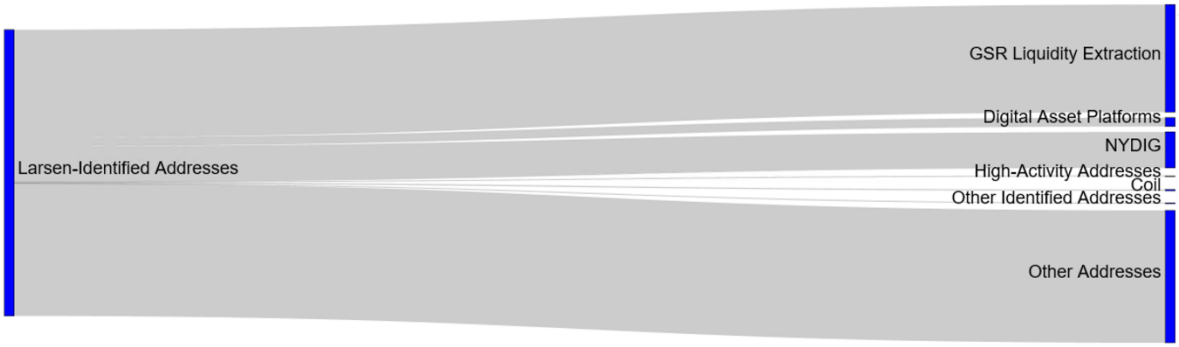


Table 5 – Direct Transfer Amounts from the Larsen-Identified Addresses.
This table provides the summary of blockchain analysis of the flow of funds out of Larsen's identified addresses via 1 hop only. The US dollar (USD) equivalent value shown is the value of the XRP at the time that it left one of the Larsen-identified addresses. Analysis is as of December 22, 2020.

Address Type	XRP Transferred (million)	USD Equivalent (million)
GSR Liquidity Extraction	1,496	495
NYDIG[107]	500	117
Bitstamp (Digital Asset Platform)	87	51
Coinbase (Digital Asset Platform)	27	7
Coil (Micropayments Start-up Funded by Ripple)[108]	17	5
Kraken (Digital Asset Platform)	9	3
Other Identified Addresses (Internet Archive & XRP Tip Bot)	0.3	0.1
Other Addresses (not Identified)	1,840	394
Total	**3,976**	**1,072**

Values rounded to the nearest 1 million XRP and 1 million USD, except for "Other Identified Addresses" which is rounded to the nearest hundred thousand.

[107] NYDIG is a technology and financial services firm providing digital asset services to institutions and private clients (https://nydig.com/); Larsen publicly disclosed that he moved XRP to NYDIG in September 2020 (https://twitter.com/chrislarsensf/status/1308459310574264325).
[108] https://www.prnewswire.com/news-releases/ripples-xpring-makes-1-billion-xrp-grant-to-drive-xrp-adoption-and-advance-coils-monetized-platform-for-creators-300902194.html.

Figure 14 – Visualization of Direct transfers from the Garlinghouse-Identified Addresses.
This figure illustrates the flow of XRP from Garlinghouse's identified XRP addresses. The largest flows were to GSR. Analysis is as of December 22, 2020.

Table 6 – Direct Transfer Amounts from the Garlinghouse-Identified Addresses.
This table provides the summary of blockchain analysis of the flow of funds out of Garlinghouse's identified addresses via 1 hop only. The US dollar (USD) equivalent value shown is the value of the XRP on the date that it left one of the Garlinghouse-identified addresses. Analysis is as of December 22, 2020.

Address Type	XRP Transferred (million)	USD Equivalent (million)
GSR Liquidity Extraction	167	104
Ripple	62	25
Bitstamp (Digital Asset Platform)	36	21
Bitfinex (Digital Asset Platform)	2	1
Coinbase (Digital Asset Platform)	0.3	0.1
Kraken (Digital Asset Platform)	0.2	0.1
Other Addresses (not Identified)	110	35
Total	**377**	**186**

Values rounded to the nearest 1 million XRP and 1 million USD, except for Coinbase and Kraken which are rounded to the nearest hundred thousand.

Tracing of XRP over Multiple Hops

Figure 15 – Visualization of Flow of Funds from the Larsen-Identified Addresses.
This figure illustrates the flow of funds from Larsen's identified XRP addresses, from left to right. The thickness of each category denotes the relative size, in XRP, of funds traced. The largest recipient of funds was GSR, followed by digital asset platforms.

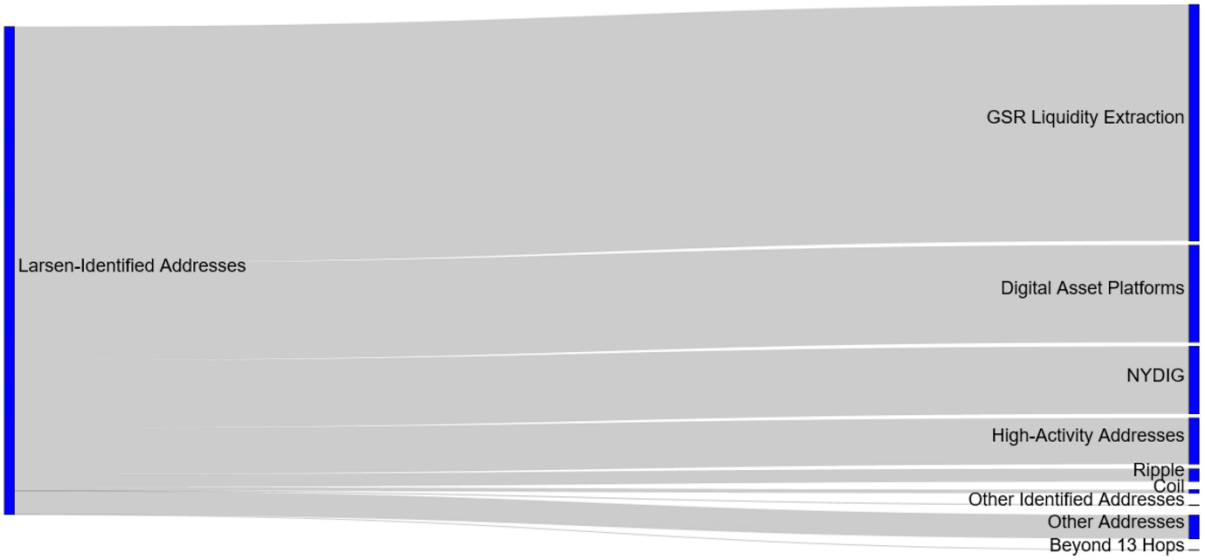


Table 7 – Value of XRP Traced from the Larsen-Identified Addresses.
This table provides the summary of blockchain analysis of the flow of funds out of Larsen's identified addresses. The US dollar (USD) equivalent value shown is the value of the XRP on the date that it left one of the Larsen-identified addresses. Analysis is as of December 22, 2020.

Address Type	XRP Traced (million)	USD Equivalent (million)	Weighted Average Number of Hops
GSR Liquidity Extraction	1,926	599	1.5
Digital Asset Platforms	794	244	2.8
NYDIG[109]	550	131	1.1
High-Activity (Addresses with > 1,000 Transactions)	377	54	3.2
Ripple	106	27	2.0
Coil (Micropayments Start-up Funded by Ripple)[110]	30	5	1.9
Other Identified Addresses (e.g., Internet Archive)	1.0	0.1	4.8
Other Addresses (not Identified)[111]	193	13	2.6
Total	**3,976**	**1,072**	**1.9**

Values rounded to the nearest 1 million XRP and 1 million USD, except for "Other Identified Addresses" which is rounded to the nearest hundred thousand.

Figure 16 – Visualization of Flow of Funds from the Garlinghouse-Identified Addresses.
This figure illustrates the flow of XRP from Garlinghouse's identified XRP addresses. The largest flows were to GSR. Analysis is as of December 22, 2020.

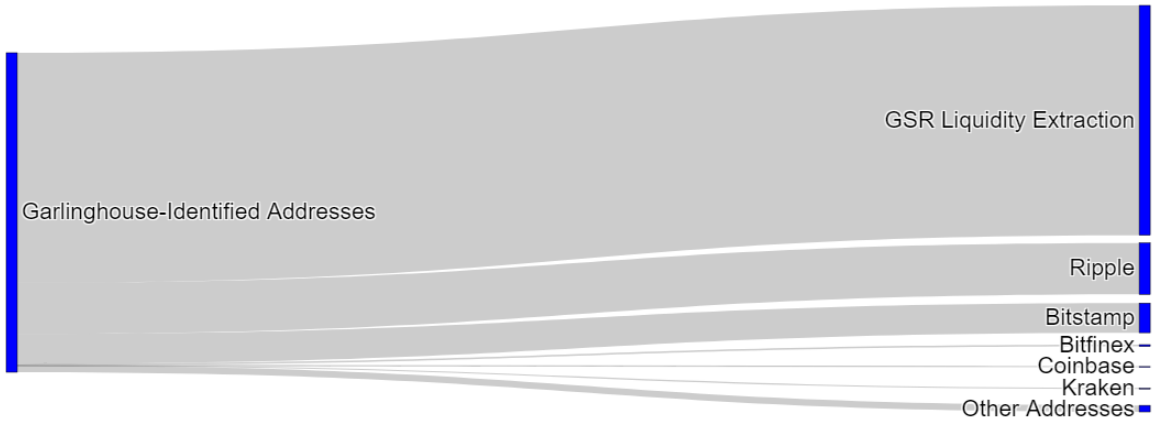


Table 8 – Value of XRP Traced from the Garlinghouse-Identified Addresses.
This table provides the summary of blockchain analysis of the flow of funds out of Garlinghouse's identified addresses. The US dollar (USD) equivalent value shown is the value of the XRP on the date that it left one of the Garlinghouse-identified addresses. Analysis is as of December 22, 2020.

Address Type	XRP Traced (million)	USD Equivalent (million)	Weighted Average Number of Hops
GSR Liquidity Extraction	277	139	1.4
Ripple	62	25	1.0
Bitstamp (Digital Asset Platform)	36	21	1.0
Bitfinex (Digital Asset Platform)	2	1	1.0
Coinbase (Digital Asset Platform)	0.3	0.1	1.0
Kraken (Digital Asset Platform)	0.2	0.1	1.0
Other Addresses (not Identified)	0.0001	0.0001	1.0
Total	**377**	**186**	**1.2**

Values rounded to the nearest 1 million XRP and 1 million USD, except for Coinbase and Kraken which are rounded to the nearest hundred thousand and "Other Addresses" which is rounded to the nearest hundred.

[109] NYDIG is a technology and financial services firm providing digital asset services to institutions and private clients (https://nydig.com/); Larsen publicly disclosed that he moved XRP to NYDIG in September 2020 (https://twitter.com/chrislarsensf/status/1308459310574264325).
[110] https://www.prnewswire.com/news-releases/ripples-xpring-makes-1-billion-xrp-grant-to-drive-xrp-adoption-and-advance-coils-monetized-platform-for-creators-300902194.html.
[111] The XRP that was traced beyond 13 hops is included in "Other Addresses (not identified)".

Exhibit 9

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

REBUTTAL REPORT OF [redacted]

November 12, 2021

Securities and Exchange Commission v. Ripple Labs, Inc. et al.
Index No. 1:20-CV-10832-AT

TABLE OF CONTENTS

I. INTRODUCTION

A. QUALIFICATIONS

1. I am a Professor of Finance and the [redacted] at the [redacted]. I have also served on the faculty at [redacted], and [redacted]. I received a B.A. in Economics from [redacted], a M.S. in Finance from [redacted], and my Ph.D. in Finance from [redacted]. I have been teaching investments to undergraduate and Ph.D. students over the last twenty-four years. I have also taught international finance to undergraduate and MBA students at [redacted], and the [redacted]. I am a past President and Vice-President of the [redacted], former director of the [redacted], and current President and former Vice-President of the [redacted].

2. My research focuses on forensic finance, with specific interest in [redacted]. I have published 30 papers, mostly in the [redacted] and have been cited over [redacted] times according to Google Scholar. In the [redacted], my [redacted] on [redacted], was published in [redacted] and has been extensively featured in over [redacted] media outlets around the world including Bloomberg, The New York Times, The Wall Street Journal, and The Financial Times. I have published eleven papers related to international finance, mostly in top finance journals that deal with various aspects of international financial markets including currencies. I have also taught International Finance to undergraduate and MBA students for over

10 years, during which I lecture on the many aspects of currencies as they are a central component to studying international finance.

3. [redacted] I have advised and consulted for the U.S. Department of Justice, the Securities and Exchange Commission, the Commodity Futures Trading Commission, state-level enforcement and regulatory entities, and private parties.

4. My curriculum vitae, attached as Appendix A to this report, provides more details about my educational and professional background and experience, as well as a list of my publications in the last ten years. A list of cases for which I have provided testimony or submitted court-filed expert reports in the past four years is attached as Appendix B. I have been compensated at a rate of $700 per hour for my personal time and I have been assisted by employees of Integra FEC [redacted]. My compensation is not contingent upon the findings of this report or outcome in this or any other matter. The use of "I" in this report includes all analyses of data performed by the staff of Integra FEC under my direction and oversight. My opinions are based on my own understanding of the analysis and results presented in this report.

B. BACKGROUND

5. I have been engaged by the Securities and Exchange Commission ("SEC") to provide expert testimony in the matter of *Securities and Exchange Commission v. Ripple Labs, Inc., et al.* pending in the United States District Court for the Southern District of New York. On October 4, 2021, I submitted a report to this court titled "Expert Report of [redacted]" (the "Original Report"), which detailed my analysis demonstrating that Ripple Labs Inc. ("Ripple"), Christian Larsen ("Larsen"), and Bradley Garlinghouse ("Garlinghouse") (i) took specific steps to

influence XRP prices, (ii) were incentivized to attempt to influence XRP price to maximize proceeds raised from sales of XRP, and (iii) relied on XRP sales to supplement operational expenses in a manner similar to how companies use equity.

6. I have now been asked by the SEC to examine and opine on certain opinions in the Expert Report of Prof. Carol Osler ("Osler Report") and the Expert Report of Allen Ferrell, Ph.D. ("Ferrell Report"). The specific opinions on which I have been asked by the SEC to opine on are detailed under "Assignment" of each section. I have not been asked to review any other topics in the Osler Report or the Ferrell Report, nor to respond to the opinions expressed in reports of Defendants' other expert witnesses.[1]

C. DOCUMENTS CONSIDERED

7. The documents, data, and other information that I have relied upon as the basis for my opinions are cited in this Report and listed in Appendix C. These include, but are not limited to, Ripple internal communications, Ripple's quarterly XRP Market Reports, Appendix C from the Expert Report of Peter Adriaens, and academic literature on currency and asset pricing.

8. It is possible that I may review additional new information that may become available later, as well as the reports and depositions of other experts. I reserve the right to supplement my report and analyses based on any additional evidence, including any evidence brought to my attention by the defense, other experts, or obtained through discovery.

[1] While I have not been asked to comment on any opinions from the Expert Report of Peter Adriaens ("Adriaens Report"), this rebuttal report references the "Use Cases" listed in Appendix C of the Adriaens Report as provided by defense counsel.

II. REBUTTAL OF DEFENDANTS' EXPERTS' OPINIONS ON CURRENCY

A. ASSIGNMENT

9. The SEC has asked me to examine opinions in the Osler Report and Ferrell Report pertaining to whether XRP functions as a currency. Specifically, I have been asked to comment on the Osler Report's assertion that "XRP fits the economic definition of a 'currency'"[2] and the Ferrell Report's assertion that "XRP has the same function as money."[3]

B. SUMMARY OF OPINIONS

10. Based upon (i) my understanding of the academic literature on currency (ii) my analysis of the nature of XRP usage and (iii) my academic research and expertise in economics and international finance, I conclude that XRP does not fulfill the economic definition of a currency because it does not commonly perform *any* of the three primary functions of a currency according to economists: a medium of exchange, unit of account, and store of value.[4,5] The facts I have reviewed reflect the following, among others:

a. Professor Mankiw's *Principles of Economics* specifies that a currency, or money, is "the set of assets in the economy that people ***regularly use*** to buy goods and services (emphasis added)" and "that are ***regularly accepted*** by sellers in exchange for goods and services (emphasis added)."[6] Other leading textbook definitions also concur that

[2] Expert Report of Carol Osler at 3.
[3] Expert Report of Allen Ferrell, Ph.D. at 71.
[4] The main definition for a currency in this report is the same source cited in both the Osler Report and the Ferrell Report: Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.
[5] Throughout this report, I frequently use the present tense as a stylistic preference; however, unless otherwise indicated, my report covers the period from when Ripple began selling XRP in 2013 to the filing of the complaint in this action, December 22, 2020.
[6] Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.

a currency, or money, "is anything that is ***generally accepted*** in payment for goods or services or in the repayment of debts (emphasis added)"[7] and is "***generally accepted*** means of payment (emphasis added)."[8] A currency has three primary functions in the economy: commonly accepted medium of exchange, unit of account, and store of value.

b. XRP is not a commonly accepted medium of exchange for the purchase of goods or services nor in processing payments for goods. None of the largest retailers in the U.S. nor the major payment processors accept XRP as a medium of exchange.

c. XRP does not function as a unit of account because XRP is not generally used to quote the prices and values of goods and services, nor is it used in financial reporting. Even Ripple's own quarterly XRP Market Reports, which publicly disclosed the amount of XRP that Ripple sold each quarter, quoted Ripple's sales in U.S. Dollars, not XRP.

d. XRP is not a reliable or stable store of value. XRP is not suited for such purposes because its price is at least 11 times more volatile than any of the top ten most traded fiat currencies in the world.

e. The Osler Report makes the erroneous conclusion that "XRP fits the economic definition of a 'currency'" by pointing to hypothetical or rare use cases while ignoring that currencies must be *regularly* and *generally* used to buy goods and services. The Osler Report identifies rare use cases where XRP "can be" used to pay

[7] Mishkin, Frederic S. and Serletis, Apostolos. The Economics of Money, Banking and Financial Markets (4th Canadian ed.). Toronto: Pearson Addison Wesley, 2011 at 43.
[8] Krugman, Paul; Obstfeld, Maurice; Melitz, Marc, International Economics: Theory & Policy, 9th edition, 2012 at 355-356.

for goods and services.[9] Yet, that something "can be" used as a medium of exchange does not satisfy the economic definition to qualify as a currency. The same authoritative source used by the Osler Report to define a currency, Professor Mankiw's *Principles of Economics*, specifies that a currency must be "regularly use[d]" and "regularly accepted."[10] XRP is neither regularly used nor regularly accepted.

f. Professor Osler also asserts that currencies can be highly volatile and points to the Venezuelan Bolivar. However, currencies like the Bolivar that are poor stores of value can continue to exist as currency because the Venezuelan government requires and designates the Bolivar as legal tender. In contrast, XRP is not designated legal tender nor government-backed like traditional fiat currencies and thus is not required to be accepted as a medium of exchange. Professor Osler also fails to acknowledge that Venezuelans commonly transact goods in other more stable foreign currencies such as the U.S. Dollar even within Venezuela and, in 2020, even Venezuela legalized U.S. Dollar based transactions.[11] Moreover, XRP is even more volatile than the Venezuelan Bolivar, further demonstrating its weakness as a potential currency.

g. The Ferrell Report similarly asserts that XRP "can be" a medium of exchange, "can be" a unit of account, and "can be" a store of value. However, many non-currency assets in the world such as Apple stock or pieces of silver can be exchanged, can be used to express prices, and can be a store of value, but hypotheticals do not make

[9] Expert Report of Carol Osler at 5.
[10] Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.
[11] Saving, Thomas. Can Cryptocurrencies Successfully Compete in the Money Market?, PERC Policy Study 2102.

them currencies. Even items such as airline miles that can function in a limited capacity to pay for flights are not currencies because they are not *generally accepted* as payment for other goods and services. The reality is that XRP units are not regularly used today because XRP does not perform any of the three traditional functions of currency, and speculating on what "can be" is irrelevant to whether XRP *is actually currently* a commonly accepted medium of exchange, unit of account, and store of value.

C. WHAT IS CURRENCY?

11. The traditional definition used by economists, as according to Professor Mankiw's Principles of Economics, to define currency, or money, is "the set of assets in the economy that people ***regularly use*** to buy goods and services from each other (emphasis added)" and "that are ***regularly accepted*** by sellers in exchange for goods and services (emphasis added)."[12] And Professor Mankiw furthers describes a currency as serving three primary functions: a commonly accepted medium of exchange, a unit of account, and a store of value.[13] These same functions, from Professor Mankiw's Principles of Economics, are also cited in the Osler Report. The Ferrell Report cites a similar definition from Professor Mankiw's Macroeconomics textbook.[14] This definition of money is consistent across other leading economics textbooks, including by Professors Krugman et al. who define money as a "***generally accepted*** means of payment (emphasis added)"[15] and by Professors Mishkin and Serletis who state that money is "anything

[12] Mankiw, N., Principles of Economics, 8th edition, 2016 at 604.
[13] Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.
[14] Expert Report of Allen Ferrell, Ph.D. at 7.
[15] Krugman, Paul; Obstfeld, Maurice; Melitz, Marc, International Economics: Theory & Policy, 9th edition, 2012 at 355.

that is ***generally accepted*** in payment for goods or services or in the repayment of debts (emphasis added)."[16]

12. Interestingly, Professors Osler and Ferrell fail to discuss this particularly important requirement of *regular* or *general* use for an asset to be a "currency" as defined by economists, including Professor Mankiw whom they cite. Additionally, it is important to note that the definition and understanding of a currency by Professor Mankiw dictates that all three functions "***together*** distinguish money from other assets in the economy (emphasis added)".[17,18]

13. Currency functions as a medium of exchange by enabling the exchange of goods and services for consideration between buyers and sellers.[19] One can use U.S. Dollars to purchase common goods like a coffee or services like a haircut. However, if one were to own a share of Apple or GameStop, one would not be able to easily purchase these same goods and services without first exchanging Apple or GameStop stock for U.S. Dollars, or another currency if one were in another country, because stores would *generally* not accept stock as a form of payment. Thus, included in Professor Mankiw's specification of currency as a medium of exchange is that it is "commonly accepted" since buyers and sellers need to be confident that a given currency can be used to make purchases at other venues.[20] As such, even though it might be technically feasible to use Apple stock as a medium of exchange, e.g., to make an in-kind donation to a nonprofit, Apple stock is not currency because it is not commonly accepted by other vendors in the economy.

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[16] Mishkin, Frederic S. and Serletis, Apostolos. The Economics of Money, Banking and Financial Markets (4th Canadian ed.). Toronto: Pearson Addison Wesley, 2011 at 43.
[17] Mankiw, N., Principles of Economics, 8th edition, 2016 at 605.
[18] Professors Krugman et al. also states that money serves as a medium of exchange, unit of account, and store of value but that "the most important function of money is to serve as the medium of exchange" and the "second important role is as a unit of account." In discussing the third role as store of value, Krugman notes that "this attribute is essential for any medium of exchange." Krugman, Paul; Obstfeld, Maurice; Melitz, Marc, International Economics: Theory & Policy, 9th edition, 2012 at 355.
[19] ibid.
[20] ibid.

In addition, Mankiw specifies that in order for an asset to be used as a medium of exchange, it needs to be transferred from a buyer to a seller: "A medium of exchange is an item that buyers give to sellers when they purchase goods and services… [T]his transfer of money [or currency] from buyer to seller allows the transaction to take place."[21]

14. Currency also functions as a unit of account to measure the value of goods and services as well as the financial performance of companies or the wealth of a household.[22] As a practical matter, a currency's usefulness as a commonly accepted medium of exchange automatically makes it a *regularly* used unit of account since buyers and sellers must be able to quickly and easily quote the value for goods and services one could purchase with such currency. A unit of account needs to be *regularly* used in order to fulfill the function of a currency. For example, while it is possible to measure the value of a cup of coffee as 0.03 shares of Apple, a plane ticket as 2 shares of Apple, or a house as 2,000 shares of Apple, it is unhelpful to do so because Apple shares are not *regularly* used as a unit of account. On the other hand, a $4.50 cup of coffee, a $300 plane ticket and a $300,000 house can be easily valued because U.S. Dollars, as currency, are a common unit of account.

15. Finally, currency functions as a store of value that can be held for use at a later time.[23] A stable currency like the U.S. Dollar allows for predictable purchasing power that typically does not drastically change over short periods of time. With the example of Apple or GameStop stock that we have used, a vendor might not want to accept GameStop shares for payment because its value could radically change with company news. For example, if a coffee shop has received payment in shares of GameStop and the price of GameStop suddenly declines,

[21] ibid.
[22] ibid.
[23] ibid.

the coffee shop might not have enough funds to pay its employees. Thus, the coffee shop would not use GameStop shares as a store of value because of the associated price volatility. Rather, the coffee shop accepts U.S. Dollars because it can store U.S. Dollars from coffee purchases and use them in the future to pay its employees and suppliers without having to worry about significant short-term price declines.

16. Fiat currency derives value from the backing by the issuer of the fiat note. Fiat currencies are typically backed by the full faith and credit of the government that issues them. Traditional fiat currencies like the U.S. Dollar are typically classified as legal tender and are required by *law* to be accepted as a medium of exchange to settle public or private debt in its country of issuance. At times, certain fiat currencies have historically been incredibly volatile and became a poor store of value or unit account. In these cases of extreme currency volatility such as recently happened in Venezuela, citizens resort to using stable foreign currencies such as the U.S. dollar. The local currency might continue to serve as an official medium of exchange and be used in the country only because it is decreed by the government.

17. Certain digital assets are sometimes called "virtual currencies" or "cryptocurrencies" but whether an asset actually functions as a currency is determined by the test set forth above. With respect to XRP, Ripple's own CEO, Brad Garlinghouse, has publicly denied that XRP is a currency or functions as a currency because it is not *regularly* used as a medium of exchange. At a Yahoo Finance summit on digital assets on February 7, 2018,[24] Garlinghouse stated: "I'm even careful, and I would even encourage journalists of the world to be careful, that I don't call this cryptocurrency. ***It's not currency***. I can't go to Starbucks or Amazon and use [it]. And you know somebody inevitably [will say], 'I have one example where I bought something

[24] Yahoo Finance All Markets Summit: Crypto, February 7, 2018. https://www.yahoo.com/news/yahoo-finance-markets-summit-crypto-february-7-2018-223531903.html.

with a Bitcoin.' Then, I usually say, 'Well, did you do a second transaction?' Like, it's not actually a currency. These are digital assets (emphasis added)."[25]

18. Additionally, economists have performed assessments using the same currency framework as Professor Mankiw and found that Bitcoin functions more like a speculative investment than a currency or commonly accepted medium of exchange due to its highly volatile nature.[26,27] Bitcoin is the largest and most widely traded digital asset with a current total value of $1.21 trillion.[28] At a relatively much smaller total value of $55.8 billion—or 4.6 percent of outstanding Bitcoin[29]—it would be farfetched to argue that XRP currently functions as a regularly used medium of exchange when Bitcoin does not function in that way yet, despite wider market recognition and adoption. Furthermore, XRP price is on average twice as volatile as Bitcoin and would serve as an even more unstable store of value.[30] I conclude in the following sections that XRP does not function as a currency because it does not perform the three primary functions of a currency.

D. XRP IS NOT A MEDIUM OF EXCHANGE AS DEFINED FOR CURRENCIES

19. As explained in the previous Section II.C, an asset functions as a medium of exchange if it is commonly accepted by sellers in exchange for goods and services. XRP is not commonly accepted as a medium of exchange. Even if it is possible for a vendor to receive XRP

[25] YouTube. (2019). BRAD GARLINGHOUSE RIPPLE CEO YAHOO FINANCE INTERVIEW 30 MINUTES, starting at 15:09. Accessed at: https://youtu.be/pzbJ6e8sdpg?t=909.
[26] Baur, Dirk and Dimpfl, Thomas. (2021). The volatility of Bitcoin and its role as a medium of exchange and a store of value. Empirical Economics, vol. 61, issue 5, pp. 2663-2683.
[27] Baur, D., Hong, K., and Lee, A. (2017). Bitcoin: Medium of Exchange or Speculative Assets?. Journal of International Financial Markets, Institutions and Money 54.
[28] CoinMarketCap. Bitcoin Price Data. https://coinmarketcap.com/currencies/bitcoin/. Accessed on November 12, 2021.
[29] CoinMarketCap. XRP Price Data. https://coinmarketcap.com/currencies/xrp/. Accessed on November 12, 2021.
[30] Leirvik, Thomas. (2021). Cryptocurrency returns and the volatility of liquidity. Finance Research Letters, at Table 1.

as payment for a good or service, a vendor cannot in turn easily use that XRP to buy the typical set of goods and services required to operate her business because XRP is not commonly accepted by most vendors today. To analyze the extent to which XRP is commonly accepted as a medium of exchange, this report reviewed the largest 100 retailers in the U.S., as ranked by 2020 retail sales volume, and documented whether any of these retailers' online platforms accept XRP as a medium of exchange.[31] This list of retailers includes stores that sell a wide range of everyday goods such as Amazon, Walmart, Best Buy and Home Depot. These 100 retailers represent 60 percent of total U.S retail sales in 2020,[32] and their full list is included in Appendix D. By visiting the online platform of each top 100 retailer and reviewing the payment options accepted to complete a purchase at each retailer, it appears that none of the top 100 retailers directly accept XRP as a form of payment for goods and services.[33]

20. Another demonstration that XRP is not commonly accepted as a medium of exchange is that it is not accepted by major credit card processors. Visa, Mastercard, UnionPay, American Express, JCB, and Discover collectively processed 99% of the total worldwide credit card purchase transactions in 2017.[34] These credit card processors enable the transmittance and settlement of payment from a buyer to a seller of goods and services. However, as of December

[31] National Retail Federation. Top 100 Retailers 2021 List. https://nrf.com/resources/top-retailers/top-100-retailers/top-100-retailers-2021-list; Although the acceptance of XRP as payment was analysed for retailers at the time of writing of this rebuttal report, there is no reason to believe that circumstances were different between 2013 to 2020 and nothing in Osler's or Ferrell's report suggests otherwise.

[32] National Retail Federation. State of Retail. https://nrf.com/topics/economy/state-retail; The 60 percent figure is calculated by totalling U.S. sales of the 100 retailers ($2.43 trillion) in Appendix D and dividing by all 2020 U.S. retail sales ($4.07 trillion), found in the NRF's State of Retail annual sales growth chart: https://infogram.com/1pl9yq9p7rvglmfqpv1ryxgljmsz575wwm1.

[33] Certain payment processors such as BitPay allow the purchase of store gift cards that can later be used at certain retailers in the top 100 list. However, this is not considered a medium of exchange and is further discussed in Section III.GI.A.v.

[34] Statista. Distribution of credit card issuers worldwide in 2017, by purchase transactions. https://www.statista.com/statistics/278970/share-of-purchase-transactions-on-global-credit-cards/.

22, 2020, none of these credit card processors accepted XRP as a sending or settlement currency.[35] Thus, XRP is not commonly accepted as a medium of exchange nor regularly used as a means of payment.

E. XRP IS NOT A STORE OF VALUE AS DEFINED FOR CURRENCIES

21. As discussed in Section II.C, an asset cannot be subject to high volatility and still function as a store of value as defined for currencies. For a currency like the U.S. dollar to function as a store of value, its users must be able to have the reasonable belief that a payment received in such a currency will not gain or lose significant purchasing power over a short period of time.[36] An asset used as a store of value that has large price swings could result in economic instability or large loss of wealth for the holder of that asset. Thus, sellers of goods and services are unlikely to accept a currency for payment if its value were known to spike or evaporate immediately.[37] Volatile currencies like the Venezuelan Bolivar have lost significant value in recent years.[38] While the Bolivar continues to be accepted as a currency in Venezuela as required by law, price volatility has led Venezuelans to adopt more stable currencies like the Euro and U.S. Dollar to purchase basic goods and services.[39] In fact, Venezuela legalized U.S. Dollar-based transactions in 2020.[40]

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[35] As of November 4, 2021, none of the payment processors' websites return a search result that mentions the use of XRP on their processing platforms as a medium of exchange between buyers and vendors:
https://www.google.com/search?q=site%3Avisa.com+xrp,
https://www.google.com/search?q=site%3Amastercard.com+xrp,
https://www.google.com/search?q=site%3Aamericanexpress.com+xrp,
https://www.google.com/search?q=site%3Adiscover.com+xrp,
https://www.google.com/search?q=site%3Aunionpayintl.com+xrp,
https://www.google.com/search?q=site%3Ajcb.com+xrp.

[36] Saving, Thomas. Can Cryptocurrencies Successfully Compete in the Money Market?, PERC Policy Study 2102.

[37] Krugman, Paul; Obstfeld, Maurice; Melitz, Marc, International Economics: Theory & Policy, 9th edition, 2012 at 356.

[38] Xe. Venezuelan Bolívar to US Dollar Exchange Rate Chart.
https://www.xe.com/currencycharts/?from=VEF&to=USD&view=10Y.

[39] Reuters. In Venezuela's major cities, over 50% of goods are sold in hard currency.
https://www.reuters.com/article/us-venezuela-economy/in-venezuelas-major-cities-over-50-of-goods-are-sold-in-hard-currency-idUSKCN20K38Q.

[40] Saving, Thomas. Can Cryptocurrencies Successfully Compete in the Money Market?, PERC Policy Study 2102.

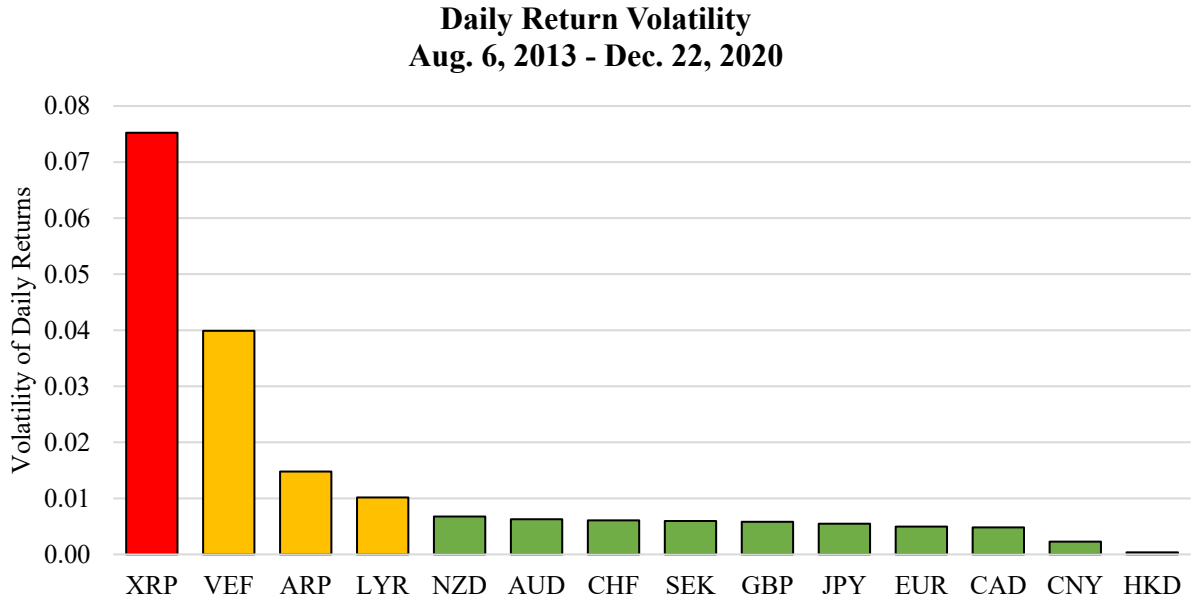
Hence, high price volatility makes it impractical for a currency to be accepted as a medium of exchange and held as a store of value.

22. To evaluate the extent, if any, to which XRP reasonably functions as a store of value relative to major currencies, this report calculates the daily standard deviation of price returns to quantify the daily volatility of XRP returns compared to the top 10 most traded currencies after the U.S. Dollar, according to the Bank of International Settlements.[41] Comparison of exchange rates are expressed relative to the U.S. Dollar and thus it is not included in the analysis as a separate currency. In addition, historically volatile currencies including the Venezuelan Bolivar, the Argentinean Peso, and the Turkish Lyra are included as comparison.[42] As shown in Figure 1, between August 6, 2013 and December 22, 2020, XRP has had a daily standard deviation, or volatility, of 7.5 percent. This means that on average, XRP moved 7.5 percent upward or downward per day during the observed time period. Compared to the top 10 currencies (as shown in green bars in Figure 1), XRP is at least 11 to 33 times as volatile. XRP has nearly twice the daily volatility expected from even the volatile Venezuelan Bolivar. The Venezuelan Bolivar is able to continue as a currency because the government can require the currency to be official legal tender, but there is no government that currently requires for XRP to be used as legal tender.

[41] BIS. Foreign exchange turnover in April 2019. https://www.bis.org/statistics/rpfx19_fx.pdf.
[42] These examples had high periods of instability during the time period examined for XRP and were identified as unstable currencies in the following article: https://news.bitcoin.com/a-short-history-of-major-fiat-currency-collapses-and-what-triggered-them/.

Figure 1. Volatility of XRP vs. Fiat Currencies

This graph plots the daily volatility of XRP returns and major fiat currencies. Green bars represent the top 10 most traded currencies, including the New Zealand Dollar (NZD), Australian Dollar (AUD), Swiss Franc (CHF), Swedish Krona (SEK), Pound Sterling (GBP), Japanese Yen (JPY), Euro (EUR), Canadian Dollar (CAD), Chinese Yuan (CNY), and Hong Kong Dollar (HKD). Yellow bars represent examples of volatile fiat currencies including the Venezuelan Bolivar (VEF), Argentinean Peso (ARP), and Turkish Lira (LYR).



23. Additionally, it is important to note that being a good store of value is a necessary but insufficient condition to be a currency. Apple stock is far less volatile than GameStop and also much less volatile than the Venezuelan Bolivar, but that does not make Apple stock a currency without also being a regularly used medium of exchange and unit of account. Professor Mankiw highlights that there are other stores of value, including "***nonmonetary*** assets such as stocks and bonds (emphasis added)."[43] Nevertheless, the high volatility of XRP makes it an extremely poor store of value today and hence not currently a good candidate as a currency.

F. XRP IS NOT A UNIT OF ACCOUNT AS DEFINED FOR CURRENCIES

24. As described in Section II.C, an asset must be *regularly* used as a unit of account in order to function as currency that provides a useful measure of value. For example, when one

[43] Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.

visits a restaurant, the prices are quoted in U.S. Dollars, e.g., $3 for a cup of coffee and $9 for a sandwich, as opposed to other assets, e.g., 0.014 shares of GameStop for a cup of coffee or 0.041 shares of GameStop for a sandwich. It is obviously feasible to quote prices at the restaurant using shares of GameStop as a unit of account but not at all practical because shares of GameStop are not *regularly* used as a unit of account. Similarly, XRP is not *regularly* used as a unit of account and thus does not function as a currency.

25. Ripple itself does not use XRP as a unit of account. Beginning in Q4 2016, Ripple began to publish quarterly reports that publicly detailed its sales of XRP and the monetary value gained from these sales. As shown in the example in Figure 2, Ripple's sales of XRP were quoted using U.S. Dollars as the unit of account. This form of accounting is unsurprising and in line with generally accepted accounting principles in which U.S. Dollars are much more commonly used as a unit of account. It would not be easy to interpret the monetary gain from Ripple's XRP sales if they were denominated in XRP, both because XRP is not commonly used as a unit of account (it would be difficult for a reader to understand the size of the gain that accrued to Ripple as a result of XRP sales) and also because of the price volatility of XRP (the size of the gain might be substantially different if measured on the date of publication versus the date of sale). However, were XRP a regularly used unit of account, Ripple might have reported its sales in XRP units. Instead, every quarterly report published by Ripple from Q4 2016 to December 22, 2020 did not report Ripple's XRP sales in XRP units, but rather in U.S. Dollars.[44]

[44] Ripple Insights. Quarterly XRP. Market Reports, 2017-2020. https://ripple.com/insights/Q4-2016-xrp-markets-report, https://ripple.com/insights/Q1-2017-xrp-markets-report, https://ripple.com/insights/Q2-2017-xrp-markets-report, https://ripple.com/insights/Q3-2017-xrp-markets-report, https://ripple.com/insights/Q4-2017-xrp-markets-report, https://ripple.com/insights/Q1-2018-xrp-markets-report, https://ripple.com/insights/Q2-2018-xrp-markets-report, https://ripple.com/insights/Q3-2018-xrp-markets-report, https://ripple.com/insights/Q4-2018-xrp-markets-report, https://ripple.com/insights/Q1-2019-xrp-markets-report, https://ripple.com/insights/Q2-2019-xrp-markets-report, https://ripple.com/insights/Q3-2019-xrp-markets-report, https://ripple.com/insights/Q4-2019-xrp-markets-report, https://ripple.com/insights/Q1-2020-xrp-markets-report, https://ripple.com/insights/Q2-2020-xrp-markets-

Figure 2. XRP Sales Summary From Q3 2020 XRP Market Report
The table below reports the total XRP sales for Q2 2020 and Q3 2020 as shown in Ripple's quarterly Q3 2020 Market Report.

Sales Summary *(dollars in millions)*	Q2 2020	Q3 2020
Total ODL-related sales*	32.55	81.39
Total purchases	0	45.55
Sales *(net of purchases)*	32.55	35.84

Global XRP volume	Q2 2020	Q3 2020
ADV XRP *(dollars in millions)*	196.28	403.58
Total XRP volume *(dollars in billions)***	17.86	37.13
Net sales as % of total volume	0.18%	0.10%

26. XRP is not regularly used as a unit of account even among the businesses identified by defense counsel that purport to adopt XRP as a payment "use case." Appendix C of the Adriaens Report provides a list of 660 purported "use cases for XRP or the XRP Ledger" which he identifies as being provided by defense counsel.[45] Of the 660 purported "use cases", analysis is performed for all examples that pertain to e-commerce sites involving goods and services and can be accessed as of the date of this report. A list of these 163 examples can be found in Appendix E. Only one of these e-commerce sites, Travala, offers the ability to view prices in XRP units by manually toggling away from the defaulted U.S. Dollar-denominated prices. For example, PrestigeTime, an online e-commerce store listed in Appendix C of the Adriaens Report, specializes in the sale of luxury watches. Watches listed on this e-commerce storefront are quoted exclusively in U.S. dollars. Presumably, this set of businesses identified by Defendants as purportedly employing XRP

report, https://ripple.com/insights/Q3-2020-xrp-markets-report, https://ripple.com/insights/Q4-2020-xrp-markets-report.
[45] Expert Report of Peter Adriaens at 64.

"use cases" might be more receptive to using XRP as a unit of account, but U.S. dollars are overwhelmingly used as the unit of account. This is unsurprising, as use of XRP as a unit of account appears to be exceedingly rare. The Osler Report, for example, fails to cite a single example.

G. THE OSLER REPORT MISCHARACTERIZES XRP AS A CURRENCY

27. The Osler Report asserts that "XRP fits the economic definition of a 'currency' because it has the functions and attributes commonly assigned to currencies by experts." Yet, the Osler Report cites limited (and in some cases zero) examples of how XRP fulfills each of the three functions of a currency. The Osler Report also confuses certain *potential* usage of XRP with how it is *actually* used as a digital asset. Moreover, certain attributes as claimed to be shared by XRP are simply not unique or sufficient to deem an asset to be a currency. I describe in the following sections how the Osler Report fails to establish that XRP fits the economic definition of a currency.

i. The Osler Report Fails to Establish that XRP is Regularly Used as a Medium of Exchange

28. As discussed in Section II.C, economic experts assert that a currency must be "commonly accepted" and "regularly use[d]" as a medium of exchange.[46] The Osler Report speaks to how XRP purportedly can function as a medium of exchange and a means of payment:

> *Means of payment: Every transaction on the XRP Ledger, including transactions through Ripple's ODL[47] product, described in Section IV, costs a fraction of an XRP. That is, XRP is used to pay for the service of liquidity. In addition to that payment for use of the XRP Ledger itself, XRP can be used to pay for physical goods through online platforms including Bitcoin Superstore and Shopify and travel through Travala.[48]*
>
> *Medium of exchange: One function of XRP is to serve as a medium of exchange between two other currencies and currently serves that function for the client firms using Ripple's ODL.[49]*

[46] Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.
[47] ODL is an abbreviation for Ripple's On-Demand Liquidity Product.
[48] Expert Report of Carol Osler at 5.
[49] ibid.

29. The Osler Report errs in at least five ways when characterizing XRP as a "medium of exchange." First, "means of payment" is not part of the standard economic definition for a currency—"medium of exchange" is—and this distinction is important.[50] Professor Osler contradicts herself on whether a "means of payment" is a separate function by asserting "four major functions"[51] while acknowledging that "[v]irtually any standard economics textbook will list the same three functions of money."[52] A "medium of exchange" refers to ***what*** can be exchanged for goods and services while a "means of payment" refers to ***how*** such payment can be delivered. Thus, U.S. Dollars and Euro are currencies (in relevant part because they are mediums of exchange), while checks and money orders are not (because they are only means of payments and not mediums of exchange). Similarly, as discussed in Section II.G.v., even if a purchase of a good or service is paid with XRP, if the seller receives the payment in fiat currency then XRP is not a medium of exchange and therefore is not a currency. For example, one can use airline miles to purchase various goods such as magazine subscriptions or Amazon gift cards. However, even though airline miles are used as a "means of payment," they are not a "medium of exchange" because the seller of those goods receives fiat dollars and not airline miles. As such, even if XRP can be used to pay for goods and services to vendors who use Shopify, Professor Osler did not show that that those vendors actually receive payment in XRP; Shopify enables XRP payments via processors such as BitPay which commonly settle digital asset payments in fiat currency, as discussed in more details in the later Section II.G.v. In the Shopify example, Professor Osler has not analyzed, let alone shown, that XRP is truly used as a medium of exchange between buyers and sellers.

[50] Yang, Bill. (2007). What is (Not) Money? Medium of Exchange ≠ Means of Payment. The American Economist, vol. 51, issue 2, pp. 101-104.
[51] Expert Report of Carol Olser at 9.
[52] Expert Report of Carol Olser at 5.

30. Second, the fee or "fraction of an XRP" used to "pay for the service of liquidity" for transfers on the XRP Ledger does not fit the definition of a medium of exchange. According to the standard understanding of this phrase, a buyer gives money in exchange for goods and services from the seller and in exchange for providing goods and services, the seller receives the money as consideration. While a sender of XRP does pay a transaction fee in XRP on the ledger, the XRP paid as transaction cost is permanently destroyed on the network.[53] The XRP fee is not paid as consideration to anyone in exchange for the service provided.

31. Third, Professor Osler states "XRP can be used to pay for physical goods through online platforms including Bitcoin Superstore." However, XRP cannot currently be used at all on Bitcoin SuperStore since this platform no longer has an operating domain as of the date of this report.[54]

32. Fourth, as further discussed in Section II.I, XRP is not a medium of exchange as used in Ripple's ODL platform. Although Professor Osler makes extensive comparisons of XRP to "cowrie shells," cowrie shells are not a common currency today even though they could possibly be traded in remote regions or among vacationers at the beach. The sender of fiat in the cross-border transaction pays MoneyGram a transaction fee to facilitate the transfer. This fee is paid in the sender's local currency. Thus, the medium of exchange that the sender uses to pay to facilitate a transfer to a cross-border recipient is in fiat currency and not in XRP. Additionally, ODL depends on a liquid market for XRP in which Ripple expends significant efforts to incentivize and subsidize, as discussed in more details in the later Section 0 on XRP liquidity.

33. Fifth, the Osler Report did not analyze or demonstrate whether XRP actually is a commonly accepted and regularly used medium of exchange, which is an essential requirement

[53] XRP Ledger. Transaction Cost. https://xrpl.org/transaction-cost.html#beneficiaries-of-the-transaction-cost.
[54] The URL for Bitcoin SuperStore, https://www.bitcoinsuperstore.us/, was not accessible on November 12, 2021.

for economists to classify an asset as a currency as described in Section II.C. While it may be possible for XRP to be accepted as means of payment by lesser-known sites like Travala, this is far from the threshold required for a currency to be "commonly accepted" and "regularly use[d]"[55] as specified in Professor Mankiw's *Principles of Economics*, which Professor Osler cites. As discussed in Section II.D, XRP cannot be used as a medium of exchange at the largest retailers that are much more representative of the type of transactions in the everyday economy. Professor Osler simply ignores the important distinction that XRP is neither commonly accepted nor regularly used.

ii. The Osler Report Fails to Demonstrate that XRP is Used as a Unit of Account

34. Professor Osler asserts, with no justification or examples, that XRP is used as a unit of account:

> *Unit of account: XRP is used to value other things available to exchange.*[56]

35. XRP is very rarely used as a unit of account. Even on online platforms that purportedly accept XRP as payment, almost all prices are quoted in more widely used fiat units such as the U.S. Dollar. XRP is not used to measure economic value or wealth, even by Ripple itself, as shown in Section II.F.

iii. The Osler Report Fails to Establish that XRP is a Stable Store of Value

36. Lastly, Professor Osler asserts that despite its volatile nature, XRP could still be considered a store of value. She cites the volatile nature of fiat legal tender as a comparison:

> *A wide range of prices between a currency, on the one hand, and goods and services, on the other, is also irrelevant to the nature of that currency. At the time of writing there is substantial uncertainty about US inflation, or equivalently there is concern about the US dollar's future value in terms of goods and services. No one questions, however, whether*

[55] Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.
[56] Expert Report of Carol Osler at 5.

> *the US dollar is a currency. Likewise, the rate at which Venezuelan bolivar loses value in terms of goods and services has been extremely difficult to predict in recent years. In 2018, for example, that currency lost 88% of its value in February, 1% in September, and 85% in December. This has no influence on whether the bolivar is a currency.*[57]

37. Professor Osler fails to acknowledge that while the Venezuelan Bolivar is indeed highly volatile, its continued status as a currency is due to its designation as legal tender in Venezuela. As legal tender, the citizens and businesses of Venezuela are required by law to accept the Bolivar to satisfy debts and financial obligations. Nevertheless, even as legal tender, the highly volatile nature of the Bolivar gave way to a black market where more goods and services are bought using more stable foreign currencies than the local currency,[58] as discussed in Section II.E. Unlike the Bolivar, XRP is neither legal tender nor state-sponsored. Since XRP is not legal tender, there is no legal requirement for sellers of goods and services to regularly accept XRP as payment. Coupled with its highly volatile price as shown in Figure 1, XRP is an unreliable store of value and unsuitable to be used as a currency particularly in circumstances where there is no law mandating that it be accepted as a medium of exchange.

iv. Other Attributes Cited by the Osler Report are not Unique to Currencies

38. In addition to the three primary functions of a currency, Professor Osler also asserts that XRP, like cowrie shells, possesses all seven valuable attributes of a currency as defined by the Federal Reserve and economists:[59]

> *Durability:* ***Units of XRP*** *do not rot, hold no appeal to animals, and do not tarnish. Portability:* ***Units of XRP*** *are effectively portable insofar as they can be accessed anywhere one finds an internet connection. Divisibility:* ***Units of XRP*** *are divisible because, like Bitcoin, they can be traded in decimal fractions. Uniformity: Unlike a shell, a bead, or a silver coin that must be stamped by a craftsperson and will naturally vary slightly,* ***units of XRP*** *are identical by construction. Each XRP comprises precisely 1*

[57] Expert Report of Carol Osler at 6.
[58] Reuters. In Venezuela's major cities, over 50% of goods are sold in hard currency. https://www.reuters.com/article/us-venezuela-economy/in-venezuelas-major-cities-over-50-of-goods-are-sold-in-hard-currency-idUSKCN20K38Q.
[59] Expert Report of Carol Osler at 6.

> *million drops, the smallest sub-unit. Acceptability:* ***XRP*** *can be traded on myriad exchanges around the world. Low storage costs:* ***XRP*** *is stored in "wallets," which effectively "cost" 10 XRP (to satisfy a reserve requirement) for on-Ledger electronic repositories and can be stored in hardware wallets that cost roughly the same range as a medium-quality physical wallet: $50 to $200.24 Wallet security is high because transaction ledgers are maintained on many independent servers around the world and updated frequently. This means that the underlying record of XRP ownership is robust to physical or electronic disasters. Limited supply: The long-term supply of* ***XRP*** *is limited to the 100 billion already inexistence. No additional units of XRP can be created without changing the XRP Ledger itself (emphasis added).*[60]

39. However, these attributes are not unique or sufficient to define a currency from a standard economic perspective. These attributes are shared by many other assets such as stocks and bonds in the same manner as the Osler Report describes. For example, Apple shares are divisible since brokerage houses offer customers the ability to buy and sell fractional shares of stock.[61] Apple shares are also uniform as each common share represents the same ownership interest in the company and are interchangeable when buying or selling on an exchange. In fact, as an illustrative point, if "shares of Apple" were to be substituted with minimal stylistic changes into the same paragraph laid out by Professor Osler to describe "units of XRP", all of these attributes would ring true for Apple shares.

> *Durability:* ***Shares of Apple*** *do not rot, hold no appeal to animals, and do not tarnish. Portability:* ***Shares of Apple*** *are effectively portable insofar as they can be accessed anywhere one finds an internet connection. Divisibility:* ***Shares of Apple*** *are divisible because they can be traded in fractional shares. Uniformity: Unlike a shell, a bead, or a silver coin that must be stamped by a craftsperson and will naturally vary slightly,* ***shares of Apple*** *are identical by construction. Acceptability:* ***Shares of Apple*** *can be traded on myriad exchanges around the world. Low storage costs:* ***Shares of Apple*** *can be held in online brokerages with zero or minimal maintenance cost. Limited supply: The supply of* ***Apple shares*** *is limited.*

40. Thus, shares of Apple, GameStop, or any other publicly traded stock for that matter can fulfill the attribute requirements in *exactly* the same way that Professor Osler demonstrates for

[60] Expert Report of Carol Osler at 8.
[61] Charles Schwab. Fractional Shares. https://www.schwab.com/fractional-shares-stock-slices.

XRP. However, shares of stocks are certainly not currencies but rather securities. This highlights the fallacy in Professor Osler's argument. Whether or not an asset meets Professor Osler's arbitrary attributes, these attributes are not sufficient to classify them as a currency from a standard economic perspective. Instead, a currency must be a regularly and widely accepted a) medium of exchange, b) unit of account, and c) store of value. XRP again fails to meet any of these conditions as shown above.

v. XRP is not a Medium of Exchange, Even if Certain Payments Can be Made Using XRP via Payment Processors

41. Digital asset payment processors, such as BitPay, enable customers to purchase goods and services using digital assets at various vendors. For example, as mentioned in the Osler Report, a clothing vender can use Shopify's e-Commerce solution and integrate with BitPay in order to enable customers to pay for its clothing using digital assets such as XRP. In a similar manner to how one can redeem airline miles for flights, the existence of such payment processing solutions allows XRP to be used as a means of payment but it does not make XRP function as a medium of exchange. In order for XRP to be a medium of exchange, the buyer needs to spend XRP *and* the seller needs to receive payment in XRP. [62] If the seller receives payment in a fiat currency such as U.S. Dollars, XRP is not actually exchanged in the sale.

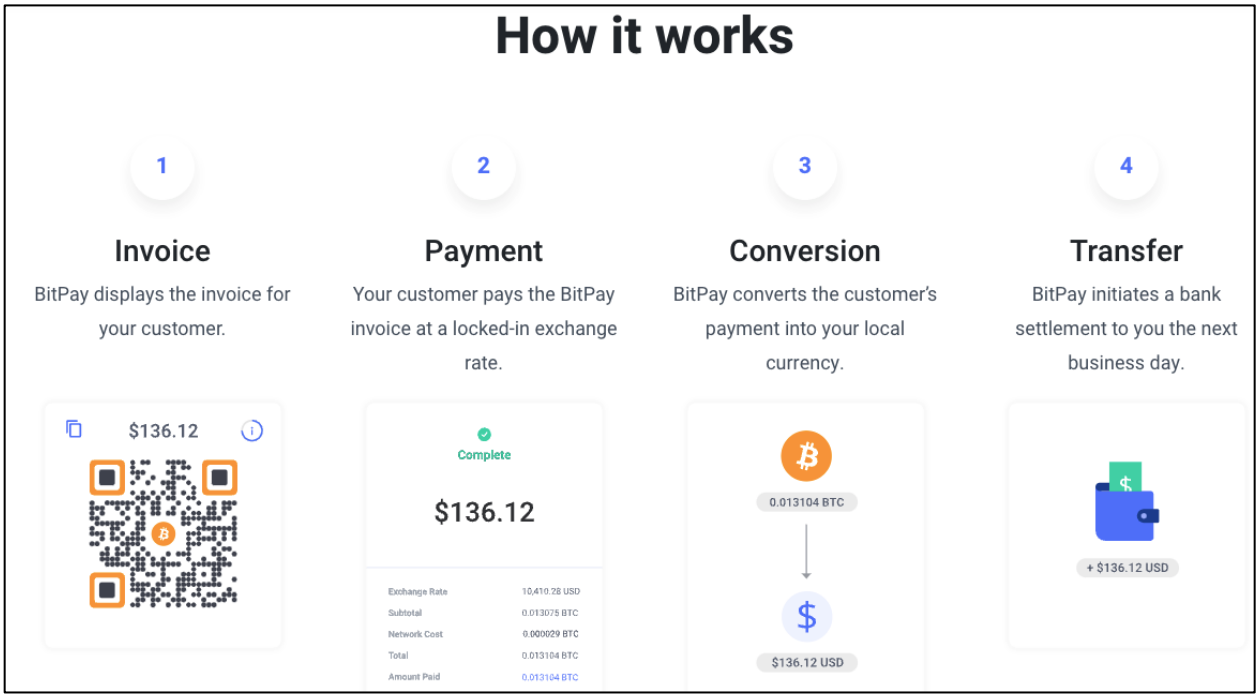
42. At digital payment processors such as BitPay, vendors who receive digital assets as payment are advised to settle in fiat local currency rather than XRP as shown in Figure 3. This makes sense because: (i) XRP is not commonly accepted as a medium of exchange and thus cannot be used by vendors to subsequently buy other goods and services, and (ii) XRP has significant

[62] Mankiw, N., Principles of Economics, 8th edition, 2016 at 604-605.

price volatility which makes it undesirable for vendors to use XRP as a store of value to make future purchases.

43. BitPay, in recognition of the undesirability for vendors to settle payments in digital assets, promotes the ability for sellers to "Receive funds directly to your bank account with ***zero price or volatility risk*** (emphasis added)."[63] As shown in Figure 3, BitPay's promoted payment process involves customers paying in a digital asset at a "locked-in exchange rate" (step "2") followed by vendors receiving funds in their local fiat currency (step "3"). The graphic in Figure 3 indicates that the normal process for vendors using BitPay is to convert digital assets used for payment into fiat currency. Under such a scenario, the digital asset does not function as a medium of exchange since the seller does not actually receive the paid digital asset, e.g., XRP, in exchange for the good or service sold.

Figure 3. Payment Process Promoted by BitPay[64]



[63] BitPay. Business. https://bitpay.com/business/.
[64] BitPay. Online Payments. https://bitpay.com/online-payments/.

H. THE FERRELL REPORT MISCHARACTERIZES XRP AS HAVING THE SAME FUNCTIONS AS MONEY

44. Similar to the Osler Report, the Ferrell Report argues that "XRP has the same function as money albeit as a virtual currency." [65] However, the Ferrell Report similarly fails to demonstrate that XRP exhibits the functions necessary to be classified as a currency. Notably, on several occasions, the Ferrell Report provides examples where XRP "can be" used as one of the functions of a currency. However, "can be" is not the threshold for classification as a currency. Rather, in order for an asset to be classified as a currency, it needs to be ***commonly accepted*** and ***regularly used*** as a means of exchange and a unit of account respectively, in addition to having low volatility as a store of value as discussed in Section II.C.

i. The Ferrell Report Does Not Show that XRP is Commonly Used as a Medium of Exchange

45. The Ferrell Report provides one use case where XRP "can be" used as a medium of exchange:

> *XRP can be used as a medium of exchange in peer-to-peer exchange, for example, between wallets on the blockchain, and can also be exchanged for fiat currency (USD, Euro, Japanese Yen, etc.) or other cryptocurrencies at the cryptocurrency exchanges.*[66]

46. While XRP "can be" used as a medium of exchange in a "peer-to-peer exchange", the Ferrell Report does not provide any proof that this type of exchange actually happens nor any characterization of the nature of this "peer-to-peer exchange". For example, this peer-to-peer exchange could involve an over-the-counter trade of XRP as an investment. Furthermore, even if the Ferrell Report envisions such a "peer-to-peer exchange" to involve use of XRP to pay for a good or service, the mere fact that XRP "can be" used in such a transaction is insufficient to

[65] Expert Report of Allen Ferrell, Ph.D. at 71.
[66] Expert Report of Allen Ferrell, Ph.D. at 73.

establish XRP as a currency. Currencies need to be regularly used and commonly accepted as a medium for exchange by both buyers and sellers in a market economy, as discussed in Section II.C.

ii. The Ferrell Report Does Not Show that XRP is Commonly Used as a Unit of Account

47. The Ferrell Report cites specific examples of how XRP can be used as a unit of account:

> *XRP can be used as a common base to express the price of a unit of XRP on the XRP Ledger but also to express prices at cryptocurrency exchanges.*[67]

48. While the Ferrell Report posits that XRP "can be" used as a common base to express prices, it makes no attempt at analyzing whether XRP *is regularly* used to do so as discussed in Section II.C. Indeed, XRP units are almost never used to quote prices of goods and services. Digital asset prices on the largest digital asset platforms like Binance, Coinbase, and FTX are not regularly expressed in XRP units but rather in fiat currencies such as the U.S. dollar, Euro, or digital stablecoins.[68] While certainly anything potentially can be used as a common base to express prices, the reality is that XRP units are not used regularly to do so.

iii. The Ferrell Report Does Not Show that XRP is Used as a Store of Value

49. The Ferrell Report claims that former SEC Chair Jay Clayton explained how digital assets can be a store of value:

> *In a 2017 speech, then-Chairman of the SEC Jay Clayton explained that cryptocurrencies also serve as a store of value.*[69]

[67] Expert Report of Allen Ferrell, Ph.D. at 72.
[68] FTX US. Markets. https://ftx.us/markets; Coinbase. All Asset Prices. https://www.coinbase.com/price; Binance. Home Page. https://www.binance.com/en.
[69] ibid.

50. However, in the subsequent quotation provided in the Ferrell Report, Jay Clayton does not mention that digital assets function as a store of value:

> *Cryptocurrencies: Speaking broadly, cryptocurrencies purport to be items of inherent value (similar, for instance, to cash or gold) that are designed to enable purchases, sales, and other financial transactions.*[70]

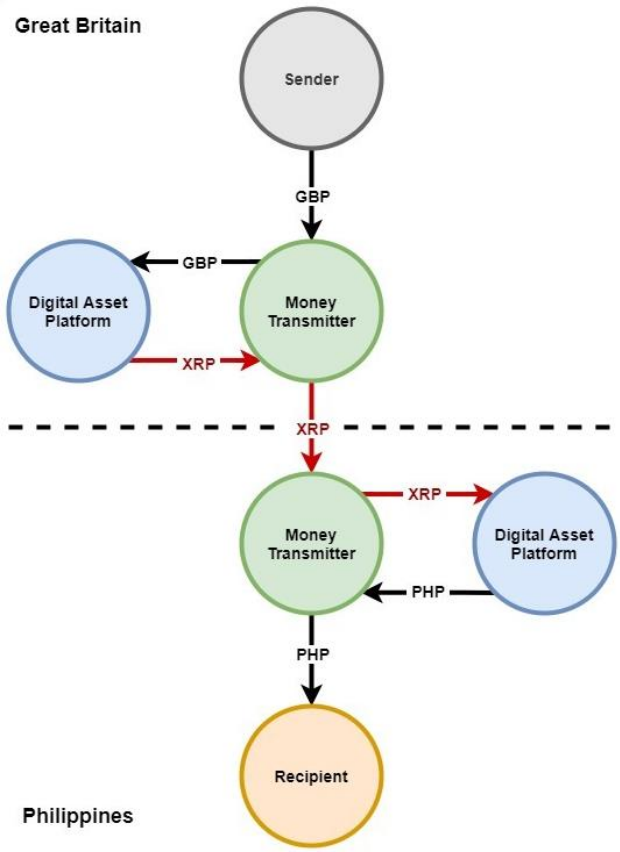
51. Instead, Clayton only mentions that digital assets "***purport*** to be items of inherent value (emphasis added)." As discussed in Section II.C, shares of Apple have inherent value derived from ownership of expected company cashflows, but are not classified as a currency because they are not commonly used as a medium of exchange or unit of account and are a relatively less stable store of value compared to currencies like the U.S. Dollar. Similarly, XRP purports to have value, but cannot be classified as a currency because it is not a widely accepted medium of exchange or unit of account, and XRP's price volatility precludes it from being a stable store of value.

I. XRP IS NOT USED AS A MEDIUM OF EXCHANGE FOR RIPPLE'S ON-DEMAND LIQUIDITY PRODUCT

52. Both the Osler and Ferrell Report characterizes XRP as a medium of exchange because XRP is used in Ripple's ODL. ODL uses XRP as a bridge asset to make cross-border payments using the XRP blockchain. Figure 4 provides an illustration of an example cross-border payment using ODL.

[70] ibid.

Figure 4. Illustration of a Transaction on Ripple's On-Demand-Liquidity Platform.



53. The transaction starts in Great Britain where a sender wishes to send a remittance payment to the Philippines. To do so, she uses the services of Azimo, one of the money transmitters that uses Ripple's ODL platform to facilitate cross-border payments. The following steps are taken to send British Pounds (GBP) to the Philippines where it will be received as Philippine Pesos (PHP): (i) the sender sends GBP to the Azimo, (ii) Azimo takes the GBP and trades it for XRP at a European digital asset platform, (iii) Azimo sends the XRP from its account at the European digital asset platform to its account at a Filipino digital asset platform, (iv) at the Filipino digital asset platform, Azimo converts the XRP into PHP, and (v) Azimo pays PHP to the intended recipient.

54. None of the steps in the ODL transaction process described above involve the use of XRP as a medium of exchange. Steps (i) and (v) involve fiat currency. Steps (ii) and (iv) involve a trade between fiat currencies (GBP and PHP) and a digital asset (XRP), but XRP is not actually used as a medium of exchange; it is simply received by Azimo in exchange for GBP and there is no exchange for the purchase of goods or services. In Step (iii) using the XRP ledger, XRP is sent from Azimo's account at the European digital asset platform to its account at the Filipino digital asset platform, and again there is no exchange between a buyer or a seller since there is no change in ownership of the XRP. In addition, the fee paid by the sender to the money transmitter also does not use XRP as a medium of exchange. Money transmittal fees are typically paid in the sending currency, e.g., GBP, but could be deducted from the final payment, e.g., PHP, and certainly would not be paid in XRP. In these transactions, neither the sender nor the receiver ever interface with XRP and thus do not use XRP as a medium of exchange to pay for such a service fee.

III. REBUTTAL OF PROFESSOR FERRELL'S OPINIONS ON RIPPLE'S IMPACT ON XRP PRICE AND LIQUIDITY

A. ASSIGNMENT

55. The SEC has asked me to examine opinions in the Ferrell Report pertaining to the Ferrell Report's dual assertions that (i) "none of [XRP's] returns is owing to the efforts of Ripple"[71] because "Ripple's XRP Distributions Did Not Increase XRP Price Return"[72] and (ii) "Ripple's efforts over time were concerned with improving market liquidity."[73]

B. SUMMARY OF OPINIONS

56. Based upon (i) my understanding of the academic literature on liquidity and asset prices, (ii) the Ferrell Report's regression analyses, and (iii) my academic research and expertise in finance, I conclude that the Ferrell Report's conclusion that "none of [XRP's] returns is owing to the efforts of Ripple" is inconsistent with the Ferrell Report's detailing of the steps taken by Ripple to make a liquid market for XRP. The facts I have reviewed reflect the following, among others:

a. A large body of academic literature finds that increasing liquidity is generally associated with increasing asset price. All else equal, an asset is more valuable when it is more liquid. Stated another way, an investor will pay a higher price for an asset to the extent that the opportunity to sell the asset becomes easier and less costly. In fact, Professor Ferrell, in an earlier expert report for an unrelated matter, conceded that "a more liquid asset will be more valuable than a less liquid asset."[74]

[71] Expert Report of Allen Ferrell, Ph.D. at 55.
[72] Expert Report of Allen Ferrell, Ph.D. at 51.
[73] Expert Report of Allen Ferrell, Ph.D. at 58.
[74] Report of Allen Ferrell in *James A. Bacon et al. v. Stiefel Laboratories, Inc., (No. 09-21 871-KING).*

b. Professor Ferrell asserts that "none of [XRP's] returns is owing to the efforts of Ripple." Yet, the Ferrell Report also carefully details the extensive efforts undertaken by Ripple to make a liquid market for XRP. As the academic literature discussed above makes clear, Ripple's efforts to increase the liquidity of XRP are consistent with increasing XRP price. Indeed, in both public and private communications to their potential investors, Ripple and its employees indicate that they are aware of the positive relationship between liquidity and XRP value. Ripple's efforts increased liquidity, as Professor Ferrell acknowledged; and increasing liquidity is generally associated with higher prices. Professor Ferrell's conclusion that "none of [XRP's] returns is owing to the efforts of Ripple" is directly contradictory to: a) his extensive acknowledgment of Ripple's efforts to increase liquidity, and b) his acknowledgement that "a more liquid asset will be more valuable than a less liquid asset."[75]

c. The empirical regression models that Professor Ferrell estimated to support his assertions that XRP distributions had no impact on XRP prices are both severely flawed conceptually and improperly implemented. Professor Ferrell is purportedly "[f]ollowing the [redacted] framework,"[76] and "implement[s] the [redacted] specification"[77] but errs in implementation. No reliable inferences can be drawn from his analysis.

[75] Report of Allen Ferrell in *James A. Bacon et al. v. Stiefel Laboratories, Inc., (No. 09-21 871-KING).*
[76] Expert Report of Allen Ferrell, Ph.D. at 54 and 55.
[77] ibid.

C. RIPPLE'S EFFORTS TO INCREASE XRP LIQUIDITY ARE CONSISTENT WITH INCREASING XRP PRICE

57. The Ferrell Report asserts that "the SEC fails to consider possible alternative explanations for the economic reality that Ripple's efforts do not impact XRP prices" and that "XRP's long-run price returns are owing to non-XRP cryptocurrency market factors; none of those returns is owing to the efforts of Ripple."[78] Yet immediately following, Professor Ferrell devoted nearly ten full pages of his report to explain the extensive efforts that Ripple undertook to "facilitate the growth of XRP market liquidity."[79] These efforts include contracting with market intermediaries and listing XRP on various digital asset platforms. According to Professor Ferrell, increasing liquidity for XRP through the help of market intermediaries and cross-listings on digital asset platforms would lead to lower transaction costs and make XRP more widely available as a global settlement solution.[80]

58. However, he fails to also acknowledge that the academic literature, internal Ripple communications, and his own prior report in a separate matter clearly support a connection between increasing liquidity and higher XRP prices. Thus, efforts by Ripple to make a liquid market for XRP, as spelled out in the Ferrell Report, are consistent with Ripple exerting effort to increase XRP prices. Notwithstanding the well-established relationship between liquidity and price (as further explained below), Professor Ferrell does not explain or attempt to account for the tension between his opinion that Ripple's extensive actions had no impact on XRP's price and his detailed recitation of Ripple's efforts to increase XRP's liquidity—efforts that he previously acknowledged have a positive impact on asset price, all else equal.

[78] Expert Report of Allen Ferrell, Ph.D. at 55.
[79] Expert Report of Allen Ferrell, Ph.D. at 57-67.
[80] ibid.

59. The Ferrell Report clearly outlined the intent and mechanisms that Ripple implemented to increase market liquidity for XRP. Economists typically define liquidity as the "ease with which an asset can be converted into the economy's medium of exchange."[81] Stocks and bonds generally can be sold quickly with low transaction costs and therefore are relatively liquid assets. In contrast, selling a house or art collectible generally requires more effort and thus these assets are considered less liquid.[82] The Ferrell Report details Ripple's effort to increase XRP liquidity through two different mechanisms: the first is to pay for the services of wholesale purchasers and market makers to facilitate XRP transactions on over-the-counter ("OTC") and centralized digital asset platforms and the second is to have XRP listed on digital asset platforms and fund volume incentives for increased platform trading.

60. In the first instance, Ripple expended effort to engage with intermediaries to make XRP trading less costly and more widely available to new purchasers.[83] Peer-to-peer trading between wallets on the XRP Ledger is akin to an OTC market. In the absence of a centralized matching system, a buyer must search for a seller, incurring large search costs. To facilitate greater ease of transaction and increase liquidity of XRP, Ripple entered into agreements with wholesale purchasers such as [redacted], and [redacted] to serve as intermediaries for XRP trading.[84] According to the Ferrell Report, in exchange for a discounted wholesale rate, these firms hold XRP inventory and act as intermediaries to facilitate the trading of XRP through OTC trading desks.[85] Ripple also contracted with market makers that purport to increase liquidity of XRP on digital asset platforms and the XRP Ledger by filling these platforms'

[81] Mankiw, N., Principles of Economics, 8th edition, 2016 at 605.
[82] ibid.
[83] Expert Report of Allen Ferrell, Ph.D. at 57-59.
[84] Expert Report of Allen Ferrell, Ph.D. at 61.
[85] [redacted] and XRP II, *Letter Agreement*, September 18, 2017. (RPLI_SEC 0000861); *Amendment to Letter Agreement*, December 27, 2017. (RPLI_SEC_0000488); [redacted] and XRP II, *Master XRP Purchase Agreement*, August 3, 2017. (RPLI_SEC_0000792).

order books with bids and offers.[86] By paying for the services of these intermediaries, Ripple sought to reduce transaction costs for potential buyers and sellers and make XRP more accessible to new potential buyers.

61. In the second instance, Ripple made efforts to get XRP listed on various new digital asset platforms and enlisted the platforms' efforts to increase XRP trading volume and liquidity. According to the Ferrell Report, Ripple made efforts to have XRP listed on at least seven major digital asset platforms in 2017.[87] New listings on digital asset platforms help make XRP more accessible for purchase to new buyers across different trading venues and countries. Professor Ferrell further asserts "in an effort to facilitate market liquidity at these cryptocurrency exchanges, Ripple funded volume incentive and trading fee rebate programs at the cryptocurrency exchanges."[88] Another way to summarize these statements is that Ripple's effort to develop a liquid XRP market by entering into contracts to list XRP on new digital asset platforms is consistent with incentivizing increased trading volume and lowering transaction costs. The impact of this effort is to increase demand—and therefore price—for XRP across a larger investor base.

62. Before discussing the extensive academic evidence on the relationship between liquidity and asset prices, I briefly discuss the basic economic intuition and principles behind market liquidity and its positive price effects. If one could choose to hold either a liquid or illiquid asset, most people will prefer the more liquid asset because it can be more easily converted to cash upon short notice and therefore is more valuable than an asset which cannot be monetized as easily. For two assets that are otherwise identical, a buyer will pay more for the liquid asset. Stated another

[86] [redacted] Market Making Agreement, March 31, 2014. (RPLI_SEC 0947000); [redacted] Market Making Agreement, February 7, 2014. (RPLI_SEC 0507336); [redacted] and Ripple Payments, Master XRapid Market Maker Agreement, July 29, 2019. (RPLI_SEC 0899563).
[87] Expert Report of Allen Ferrell, Ph.D. at 63.
[88] ibid.

way, if one can increase an asset's liquidity by making it easier and less costly to buy or sell the asset, it will make the asset more valuable all else being equal. This is the reason why privately held firms whose shares cannot be easily traded are typically valued at a discount relative to firms whose shares can be bought or sold with minimal transaction costs. Increasing liquidity is one of the reasons why firms seek to be publicly listed on stock exchanges and why even after an initial listing, firms often seek additional international listings. This is also a reason why digital assets are often listed on multiple digital asset platforms, as discussed further below.

63. Extensive academic research has shown that increasing asset liquidity tends to lead to higher trading volume, lower transactions costs, and ultimately higher asset prices in traditional financial markets [Amihud and Mendelson (1986), Kadlec and McConnell (1994), Foerster and Karolyi (1999), Miller (1999), Roosenboom and Dijk (2009)]. Foerster and Karolyi (1999) found that cross-listing of securities on new stock exchanges lead to higher asset prices due to exposure to a larger investor base. The positive effect that increasing liquidity has on prices also holds true for digital asset markets. Momtaz (2019) analyzes the performance of digital assets after their initial exchange listings and identifies an average abnormal return of 15% on the first day. Benedetti (2019) analyzes secondary market listings for 3,625 digital assets on 108 marketplaces and observed raw positive cumulative returns of 49% and market-adjusted returns of 16% for a 2-week window around the first cross-listing event. Ante (2019) analyzes 327 secondary platform listings for 180 digital assets and similarly found significant abnormal return of 5.7% on the day of the listing event and 9.2% in the three-day window around the listing date. Listing digital assets on new platforms, and therefore creating new investor bases and increasing liquidity, has an even greater positive effect on prices than in traditional stock markets.

64. Thus, the efforts of Ripple to develop a liquid market for XRP is consistent with efforts to increase XRP value. Ripple's contracts with intermediaries and listings across digital asset platforms are consistent with removing barriers to investment, exposing XRP to new buyers from new markets who can now purchase the asset and help increase XRP visibility. Similar to the investor recognition hypothesis [Merton (1987)], Ripple expands XRP investor base and increases XRP's value by increasing the degree of investor recognition of the project. By introducing new investors to purchase XRP, existing investors can realize profits by selling their holdings to new buyers.

D. RIPPLE AND ITS EXPERT HAVE COMMUNICATED THIS POSITIVE RELATIONSHIP BETWEEN LIQUIDITY AND PRICE

65. In direct contrast to the Ferrell Report's assertion that "Ripple's XRP Distributions Did Not Increase XRP Price Return," Ripple communicated to potential investors that Ripple's XRP distribution strategies would drive demand and have a positive effect on XRP prices. For example, in an email on July 22, 2014 to a potential investor, Phil Rapoport (Ripple's Director of Markets and Trading) references Ripple's distribution strategy published publicly on Ripple's website that states "Our goal in distributing XRP is to incentivize actions that build trust, utility, and ***liquidity*** *in* the network…If we distribute XRP with these goals in mind, over time we expect to see ***an increase in demand for XRP that more than offsets the additional supply*** we inject into the market (emphasis added)."[89] The distribution strategy outline continues to state that Ripple expects these distributions strategies "to result in a stable or ***strengthening XRP exchange rate against other currencies*** (emphasis added)." The efforts to increase liquidity that the Ferrell Report extensively detailed (and were explained in the previous section) were dependent on

[89] Re: XRP Bulk Purchase. ([redacted]_Ripple_0002422).

Ripple's XRP distributions to market makers, exchanges, and key participants. As also explained in the previous section, efforts to increase liquidity are associated with an increase in price. Therefore, it should be understood that Ripple's distribution efforts at least in part would be associated with increasing XRP price, or as Ripple puts it "strengthening XRP exchange rate." Indeed, Ripple and its executives communicated this very fact to the public.

66. Public and private communications from Ripple and its executives also highlight this common positive relation between liquidity and prices and that Ripple must exert effort to make XRP markets more liquid. For example, in an internal company email on February 19, 2016, Bob Way (Ripple's Integration Architect) references a study he conducted to analyze XRP's potential to become a bridge asset, and the study acknowledges "XRP's value is tied directly to its liquidity…***XRP becomes more valuable as its liquidity increases*** (i.e. instantaneous demand) (emphasis added)."[90] Mr. Way's study further acknowledges that "increases in volume directly support increases in XRP prices." In addition, this relationship between liquidity and price is also acknowledged by David Schwartz, Ripple's Chief Technology Officer, who publicly states on Twitter, "Liquidity tends to correlate with price…"[91] Additionally, in internal documents discussing the valuation of Ripple, Ripple makes clear that its institutional investors place an illiquidity discount on the company's valuation due to the illiquid nature of its XRP holdings, stating "No matter how it's packaged, an illiquid asset will face a steep discount."[92] To this end, Ripple is incentivized to increase the liquidity of XRP as it directly benefits its own XRP holdings by increasing XRP prices and making XRP easier for Ripple to monetize by selling XRP to new buyers.

[90] XRP Bridge Currency Papers. (RPLI_SEC 0364717).
[91] Twitter. David Schwartz. 2018. https://twitter.com/joelkatz/status/966021274018357253.
[92] Proposal to Consider XRP Escrow Schedule. (RPLI_SEC 0754085).

67. Moreover, Ripple's expert has demonstrated in his own written opinion that liquidity is a key determinant of asset value. An expert report authored by Professor Ferrell for a different matter acknowledges that:

> *In analyzing these investment decisions, it is important to recognize that the private value to a participant of illiquid undiversified holdings of Company stock will generally be lower than the fair market value of that Company stock. This follows from basic economic principles. In particular, the value of any financial asset to an individual depends on the risk, expected returns, and liquidity of that asset. All else equal, an asset with higher expected returns will be more valuable than an asset with lower expected returns. Similarly, an asset with lower risk will be more valuable than an asset with higher risk, all else equal. And,* ***a more liquid asset will be more valuable than a less liquid asset, all else equal*** (emphasis added).[93]

68. Additionally, Professor Ferrell asserts that "the number of exchanges that list XRP continued to grow even after Ripple stopped their distributions to cryptocurrency exchanges around April 2018" and that "trading and market liquidity at the vast majority of exchanges has ***developed organically*** (emphasis added)."[94] This is contrary to Ripple's own statements as detailed by Mr. Way's report and moreover, whether or not Ripple actually stopped expending efforts to list XRP on more platforms after April 2018 is tangential. The key point is Ripple's early efforts to actively manage the liquidity of XRP helped set in motion—in Professor Ferrell's own words—"a virtuous feedback whereby 'liquidity demand begets liquidity supply'" and helped attract more market participants to transact in XRP.

69. Consistent with a large body of academic literature on liquidity and asset prices, Ripple's effort to increase liquidity in the manners detailed by the Ferrell Report would have had the precise effect of increasing XRP transaction volume and demand and therefore, increasing XRP price. Similarly, public and private communications and Professors Ferrell's previous writing

[93] Report of Allen Ferrell in *James A. Bacon et al. v. Stiefel Laboratories, Inc., (No. 09-21 871-KING).*
[94] Expert Report of Allen Ferrell, Ph.D. at 65.

indicate that Ripple and its expert agree with the notion that the effort of Ripple to increase liquidity is directly consistent with increasing XRP's price.

E. PROFESSOR FERRELL'S REGRESSION ANALYSIS ON XRP DISTRIBUTIONS AND PRICES IS FLAWED BOTH EMPIRICALLY AND CONCEPTUALLY

70. To empirically demonstrate that "Ripple's efforts do not impact XRP prices", Professor Ferrell erroneously attempts to test whether Ripple's efforts—as measured by XRP distributions—had a statistically significant impact on XRP prices. The Ferrell regression analyzes the rate of XRP distributions against XRP price returns while controlling for market factors and other controls purportedly from my academic paper [redacted].[95] Professor Ferrell finds no significant statistical relation and thus from this result concludes that XRP long-run price returns cannot be attributed to the efforts of Ripple.[96] However, Professor Ferrell fails to reconcile the contradictory nature of his conclusion with Ripple's own public and private comments on the relationship between XRP distributions and price as discussed in Section II.D, and indeed no conclusions can be inferred from his analysis because it is flawed for at least five reasons as detailed below.

i. Regression Uses Nonstandard 28-day Event Window

71. The Ferrell Report uses a nonstandard fixed 28-day event window that potentially obscures the timing between trading behavior and price movement. Professor Ferrell examined Ripple's aggregate distributions using a 28-day window instead of the more standard daily or intraday window when dealing with flows. Professor Ferrell states that he is "[F]ollowing the

[95] The author of this expert report is the same [redacted] who [redacted] that the Ferrell Report relied upon.
[96] Expert Report of Allen Ferrell, Ph.D. at 51-55.

[redacted] framework", but my academic paper uses intraday data in the empirical analyses. The literature seeking to examine the relationship between asset returns and trading activity typically uses daily or intraday data [(Chordia, Roll, Subrahmanyam (2002), Chordia and Subrahmanyam (2004); [redacted]] as longer windows will obscure the important timing between returns and trading behavior [Sias, Starks, and Titman (2006)]. Indeed, the major point of a paper by Sias, Starks, and Titman (2006) is that longer windows make it impossible to discern whether the examined trading activity and relationship with a stock price occurs before the price, with the price, or after the price movement.

72. Professor Ferrell cites Fama and French (2015) and Liu and Tsyvinski (2021) who use monthly returns (though they do not deal with flows/distributions like the literature above) but these papers do not use his ad hoc 28-day window approach. Notably, Professor Ferrell cannot cite **any** peer-reviewed academic papers that have implemented his ad-hoc use of an exact 28-day window.

ii. XRP Distributions are Denominated in U.S. Dollars Rather Than XRP Units

73. The Ferrell Report denominates distributions in U.S. Dollars rather than XRP units. [redacted]. Since XRP value has significantly increased during the 2013-2020 period that Professor Ferrell's analysis encompasses,[97] denominating XRP distributions in U.S. Dollars assigns heavier weight on distributions in later years when XRP price was relatively much higher and less weight on the earlier years. Conceptually, XRP distributions would likely be more influential relative to price in the earlier time periods when the market for XRP was much smaller and more illiquid. Thus, constructing the series in dollars biases the test against finding a relationship.

[97] CoinMarketCap. XRP Prices. https://coinmarketcap.com/currencies/xrp/.

iii. Regression Analysis Fails to Account for Ripple's Active Management of XRP Distributions

74. An insignificant relationship between XRP returns and XRP distributions, particularly over as long a window as 28 days, might indicate that Ripple was effective in managing XRP distributions, as explained below and in my October 4, 2021 Original Report.[98] The regression fails to account for Ripple's own actions to time XRP distributions in relation to past prices, which could deliver the exact type of insignificant result that Professor Ferrell purports to find. This type of regression cannot be used to conclude that distributions do not impact returns, because the distributions are not random but timed inversely with past returns.

75. XRP distributions introduce new XRP supply to the market and, all else being equal, would exert downward pressure on XRP price. However, as shown in my Original Report,[99] internal communications indicate that Ripple and its executives recognized this potential relationship and actively directed market makers to time programmatic sales in relation to how XRP price moves. For example, around an upcoming news announcement, [redacted] (VP of Finance) stated to [redacted], "We want to keep the bots off for now but expect to make a news announcement on Thursday. If the news has positive impact and price rises, we would like to start selling into that. However, if price is not rising we will want to hold off."[100] In another example, between December 2014 and January 2015, comments found in a [redacted] historical daily sales report indicate [redacted] and Ripple coordinated XRP sales in a manner consistent with stopping or reducing sales to mitigate impact when XRP prices were declining.[101]

[98] Expert Report of [redacted] at 21-26.
[99] ibid.
[100] Email from [redacted]. June 1, 2016. ([redacted]00004438).
[101] Excel Export - 2014-2016 - 2t - Liquidity extraction report. (RPLI_SEC 0679467-467).

76. As explained in my Original Report, Ripple also directed purchases of XRP which the Ferrell regression fails to measure. This is an additional reason why the approach of using XRP distributions is incomplete and incorrect.

77. My Original Report also conducted a formal regression analysis that found from January 2015 to at least September 2019 certain market makers including [redacted] and [redacted] [redacted]—consistent with directives from Ripple—tended to sell less when prices were falling and to sell more when prices were stabilized or rising.[102] Ripple is incentivized to closely monitor XRP prices in order to maintain high or stable XRP prices and avoid large sell-offs that would devalue their own XRP holdings. Thus, conceptually, given that XRP sales were related to past prices and this relationship is not accounted for in the regressions, it is not clear what one could learn from the Ferrell Report's analysis even if were performed in a meaningful manner.

iv. Timing of XRP Transfers May Not Be Consistent with Sales of XRP

78. The Ferrell Report defines the timing of an XRP distribution as occurring on the date when XRP is first transferred out from the Ripple Escrow and other Ripple accounts.[103] This is another point where Professor Ferrell fails to properly apply the methodology of [redacted] which he purportedly "implement[s]."[104] The date of the XRP distribution as defined by Ferrell does not necessarily serve as a proxy for the exact timing of when XRP is sold to the public on digital asset platforms, which is the timing used by [redacted]. This distinction is important because the Ferrell regressions calculate XRP returns using digital asset

[102] Expert Report of [redacted] at 24-26.
[103] "The date of each distribution in the data is calculated as follows. For transfers involving Ripple's Main Balance [consisting of Ripple Escrow and other Ripple accounts], the date on which the transfer occurred is used. For transfers and adjustments (further discussed below) missing an exact date, the first date of the month on which the distributions occurred is used. For transfers involving a Reserved or Custody account, the date on which the transfer first occurred is used." Expert Report of Allen Ferrell, Ph.D. at C-7.
[104] Expert Report of Allen Ferrell, PhD. At 54.

platform prices sourced from CryptoCompare.[105] For example, according to Professor Ferrell, an XRP distribution could be a transfer from the Escrow to a Custody account used to administratively hold funds on behalf of another entity.[106] If a Custody account is not associated with a digital asset platform (and Professor Ferrell provides no evidence of such), it would be implausible to expect an XRP distribution to have any impact on XRP prices on digital asset platform since these distributions have yet to be sold to the general public.

v. The Ferrell Regression Analysis Does Not Account for the Long-run Effect that XRP Distributions Have on Increased Liquidity, Recognition, and Demand

79. The Ferrell regression analysis is not designed to properly assess the long-run effect of XRP distributions on demand and therefore, prices. The effect of increasing liquidity on investor demand, which would impact prices, need not happen instantaneously or in the short-term as acknowledged by Ripple. Indeed, as Professor Ferrell noted in his report, "[i]t takes time to develop a liquid market on a particular platform or for a particular asset."[107] For example, distributing XRP units by selling into the market might have an immediate short-term negative effect on prices due to the increased supply, but in the long-run might increase demand for the asset—and therefore its price—by growing the investor base and recognition and making XRP more familiar to investors. There is a large body of literature demonstrating that investors purchase stocks with which they are more familiar [Huberman (2001) and Grinblatt and Keloharju (2001)], buy and sell stocks they already own [Frazzini and Lamont (2008)], and buy relatively more stocks with increased recognition and visibility [Gervais, Kaniel, and Mingelgrin (2001) and Grullon, Kanatas, and Weston (2004)]. Thus, distributing XRP into the hands of more holders should have a positive

[105] Expert Report of Allen Ferrell, Ph.D. at C-1.
[106] Expert Report of Allen Ferrell, Ph.D. at C-6.
[107] Expert Report of Allen Ferrell, Ph.D. at 65.

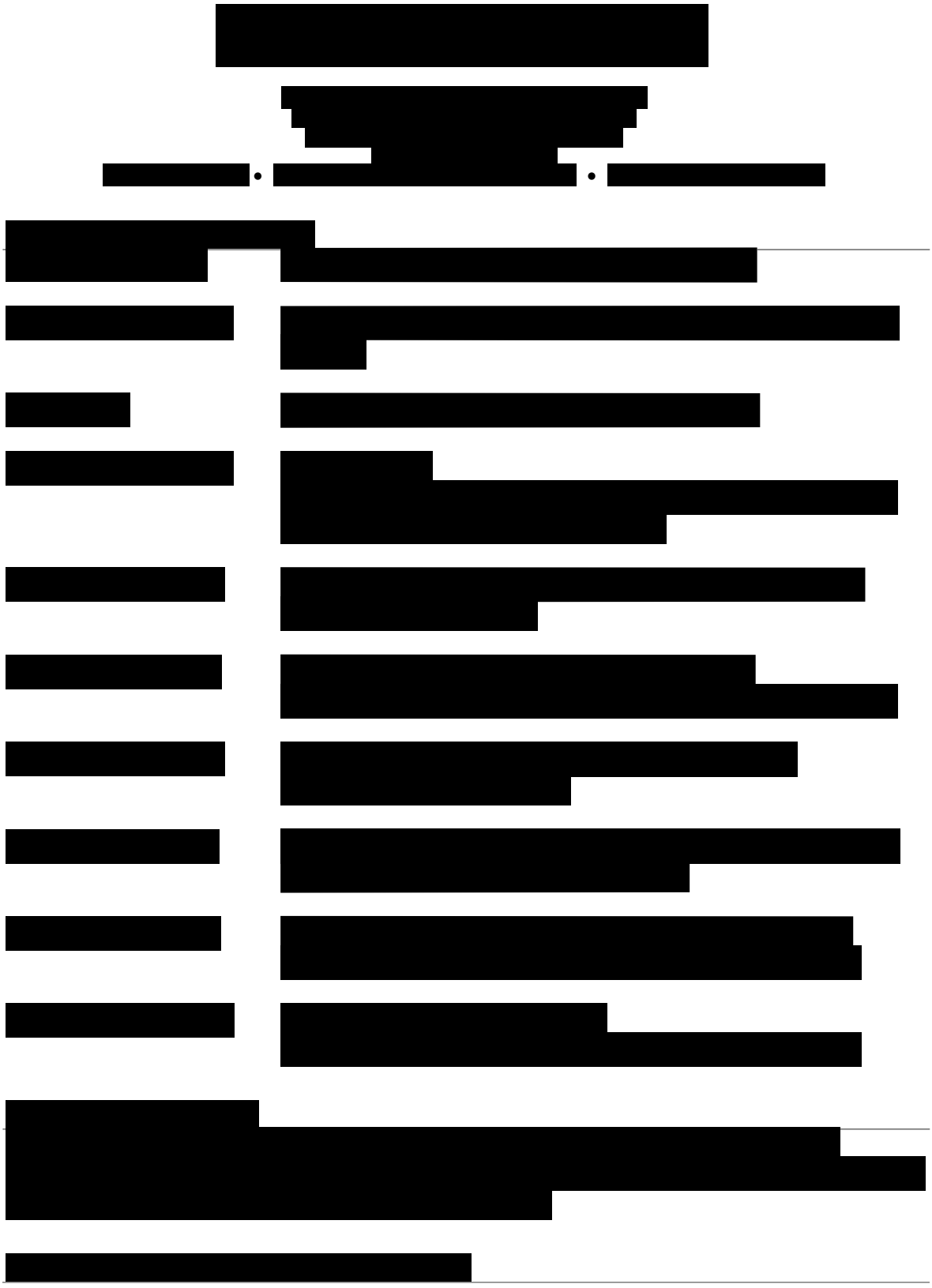
long-run effect on liquidity and prices as Ripple itself stated and planned: "***over time*** we expect to see ***an increase in demand for XRP*** *that more than offsets the additional supply* we inject into the market (emphasis added)."[108] In other words, Ripple executives recognized that selling shares might depress shares in the short-term—an impact that they tried to minimize, as discussed earlier— but that such efforts would be beneficial to the price of XRP "over time." According to Ripple, the intended effect of XRP distributions is to "incentivize actions that ***build***…liquidity in the network" which should lead to "an increase in demand for XRP" and "***strengthening XRP exchange rate***."[109] Yet, unlike the statements from Ripple, Professor Ferrell's regression analysis is not focused on the long-term effects of Ripples XRP distributions but is rather focused only on the contemporaneous impact.

[108] Re: XRP Bulk Purchase. ([redacted]_Ripple_0002422).
[109] ibid.

Executed November 12, 2021

[redacted], Ph.D.

IV. APPENDIX A: CURRICULUM VITAE



[redacted]

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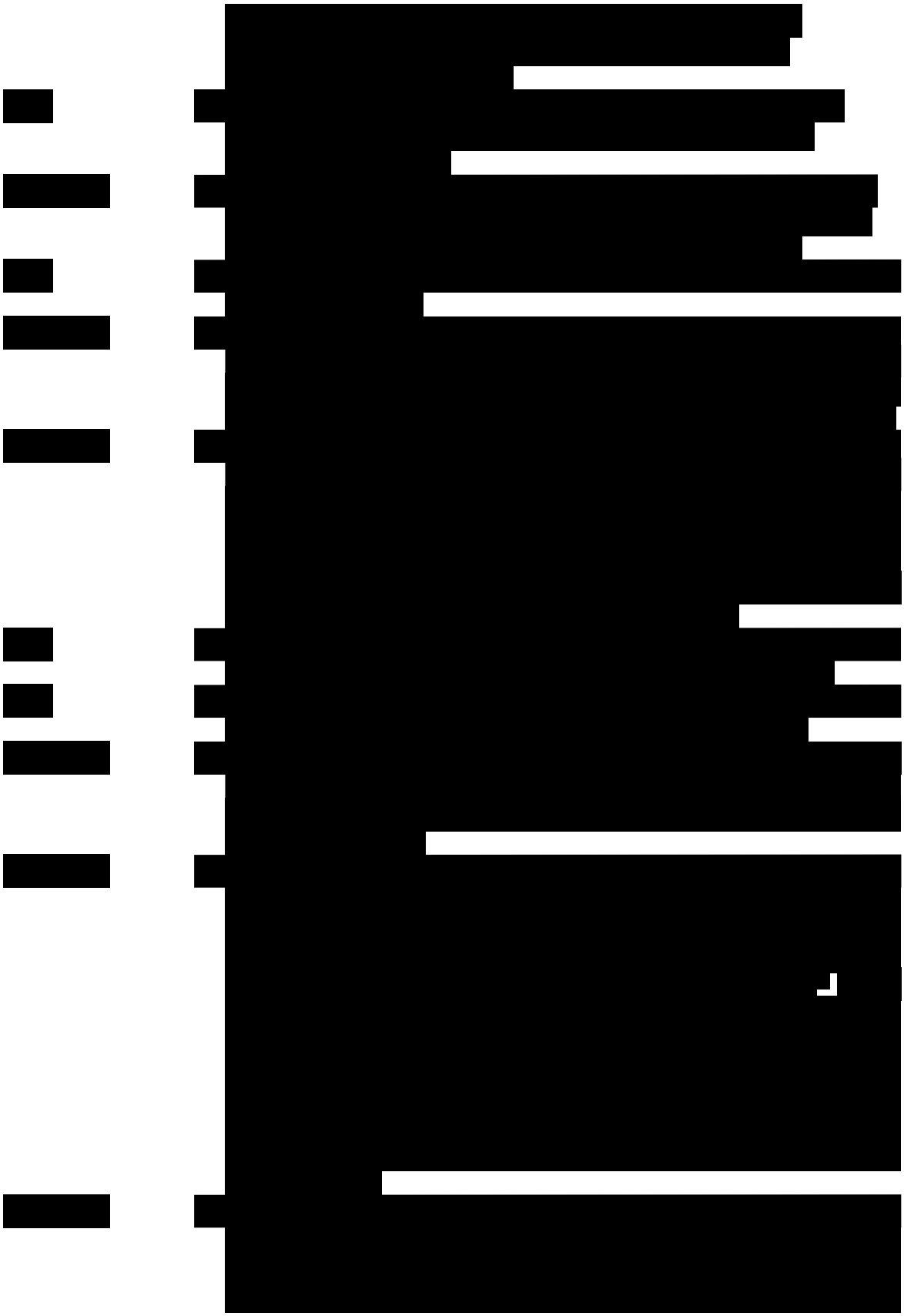


V. APPENDIX B: RECENT TESTIMONY AND COURT-FILED EXPERT REPORTS

Testimony in the last four years and court-filed expert reports

Case Name: [redacted]

Case No.: [redacted]

Date: [redacted] (Report), [redacted] (Deposition), [redacted] (Report)

Case Name: [redacted]

Case No.: [redacted]

Date: [redacted] (Report)

VI. APPENDIX C: LIST OF DOCUMENTS RELIED UPON

Accept Bitcoin & Crypto Payments Anywhere with Zero Risk. (Accessed November 9, 2021). BitPay. https://bitpay.com/business/.

Accept Bitcoin & Crypto Payments on Your Website. (Accessed November 9, 2021). BitPay.https://bitpay.com/online-payments/.

Akhtar, Tanzeel. A Short History of Major Fiat Currency Collapses and What Triggered Them. (2019, February 1). Bitcoin.com. https://news.bitcoin.com/a-short-history-of-major-fiat-currency-collapses-and-what-triggered-them/.

Amendment to Letter Agreement, December 27, 2017. RPLI_SEC_0000488.

Amihud, Yakov and Mendelson, Haim. (1986). Asset pricing and the bid-ask spread. Journal of Financial Economics, vol. 17, issue 2, pp. 223-249.

Ante, Lennart. (2019). Market Reaction to Exchange Listings of Cryptocurrencies. Blockchain Research Lab Working Paper Series, no. 3, 2019.

Baur, Dirk and Dimpfl, Thomas. (2021). The volatility of Bitcoin and its role as a medium of exchange and a store of value. Empirical Economics, vol. 61, issue 5, pp. 2663-2683.

Baur, D., Hong, K., and Lee, A. (2017). Bitcoin: Medium of Exchange or Speculative Assets?. Journal of International Financial Markets, Institutions and Money 54.

Bitcoin price today, BTC to USD live, marketcap and chart. (Accessed November 12, 2021). CoinMarketCap. https://coinmarketcap.com/currencies/bitcoin/.

Benedetti, Hugo. (2019). 3 Essays in Empirical Finance. Boston College.

Best, Raynor. Distribution of credit card issuers worldwide in 2017, by purchase transactions. (Accessed on November 9, 2021). Statista. https://www.statista.com/statistics/278970/share-of-purchase-transactions-on-global-credit-cards/.

Buy/Sell Bitcoin, Ether and Altcoins | Cryptocurrency Exchange. (Accessed November 9, 2021). Binance. https://www.binance.com/en.

Cryptocurrency Prices, Charts, Daily Trends, Market Cap. (Accessed November 9, 2021). https://www.coinbase.com/price.

[redacted] and Ripple Payments, Master XRapid Market Maker Agreement, July 29, 2019. RPLI_SEC 0899563.

Dijk, Mathijs and Roosenboom, Peter. (2009). The market reaction to cross-listings: Does the destination market matter?. Journal of Banking & Finance, vol. 33, issue 10, 1898-1908.

Email from [redacted]. June 1, 2016. [redacted]00004438.

Excel Export - 2014-2016 - 2t - Liquidity extraction report. RPLI_SEC 0679467-467.

Expert Report of Allen Ferrell, Ph.D. October 4, 2021.

Expert Report of Carol Osler. October 4, 2021.

Expert Report of Peter Adriaens. October 4, 2021.

Foerster, Stephen and Karolyi, G. Andrew. (1999). The Effects of Market Segmentation and Investor Recognition on Asset Prices: Evidence from Foreign Stocks Listing in the United States. Journal of Finance, vol. 54, issue 3, pp. 981-1013.

Fractional Shares. (Accessed on November 9, 2021). Charles Schwab. https://www.schwab.com/fractional-shares-stock-slices.

FTX US – Markets. (Accessed on November 9, 2021). FTX US. https://ftx.us/markets.

[redacted] and XRP II, *Master XRP Purchase Agreement*, August 3, 2017. RPLI_SEC_0000792.

[redacted]

[redacted] Market Making Agreement, March 31, 2014. RPLI_SEC 0947000.

In Venezuela's major cities, over 50% of goods are sold in hard currency. (2020, February 26). Reuters. https://www.reuters.com/article/us-venezuela-economy/in-venezuelas-major-cities-over-50-of-goods-are-sold-in-hard-currency-idUSKCN20K38Q.

Kadlec, Gregory and McConnell, John. (1994). The Effect of Market Segmentation and Illiquidity on Asset Prices: Evidence from Exchange Listings. The Journal of Finance, vol. 49, issue 2, pp. 611-636.

Kiyotaki, Nobuhiro and Wright, Randall. (1989). On Money as a Medium of Exchange. Journal of Political Economy, vol. 97, no. 4, pp. 927-954.

Kiyotaki, Nobuhiro and Wright, Randall. (1991). A contribution to the pure theory of money. Journal of Economic Theory, vol. 53, issue 2, pp. 215-235.

Kiyotaki, Nobuhiro and Wright, Randall. (1993). A Search-Theoretic Approach to Monetary Economics. The American Economic Review, vol. 83, no. 1, pp. 63-77.

Krugman, P., Melitz, M., Obstfeld, M. International Economics: Theory & Policy (9th ed.), pp. 355-356. Boston: Pearson Addison-Wesley, 2009.

Leirvik, Thomas. (2021). Cryptocurrency returns and the volatility of liquidity. Finance Research Letters, 102301.

Mankiw, N. Gregory. Principles of Economics (8th ed.), pp. 604-605. CENGAGE Learning Custom Publishing, 2016.

Merton, Robert. (1987). A Simple Model of Capital Market Equilibrium with Incomplete Information. Journal of Finance, vol. 42, pp. 483-510.

Miller, Darius. (1999). The market reaction to international cross-listings: evidence from Depositary Receipts. Journal of Financial Economics, vol. 51, issue 1, pp. 103-123.

Mishkin, Frederic S. and Serletis, Apostolos. The Economics of Money, Banking and Financial Markets (4th Canadian ed.). Toronto: Pearson Addison Wesley, 2011.

Momtaz, Paul. (2019). The Pricing and Performance of Cryptocurrency. European Journal of Finance, forthcoming.

Proposal to Consider XRP Escrow Schedule. RLPI_SEC 0754085.

Q4 2020 XRP Markets Report. (2021, February 5). Ripple Insights. https://ripple.com/insights/q4-2020-xrp-markets-report/.

Re: XRP Bulk Purchase. [redacted]_Ripple_0002422.

Report of Allen Ferrell in James A. Bacon et al. v. Stiefel Laboratories, Inc., (No. 09-21 871-KING).

Saving, Thomas. (2021). Can Cryptocurrencies Successfully Compete in the Money Market?. PERC Policy Study 2102.

Schwartz, David [@JoelKatz]. (2018, February 20). *Liquidity tends to correlate with price and the more liquid XRP is, the more efficient the corridors we can target. A higher price/liquidity also means we can target higher value payments. 1/2* [Tweet]. Twitter. https://twitter.com/joelkatz/status/966021274018357253.

State of Retail. (Accessed on November 9, 2021). National Retail Federation. https://nrf.com/topics/economy/state-retail.

[redacted] and XRP II, Letter Agreement, September 18, 2017. RPLI_SEC 0000861.

Top 100 Retailers 2021 List. (Accessed on November 9, 2021). National Retail Federation. https://nrf.com/resources/top-retailers/top-100-retailers/top-100-retailers-2021-list.

[redacted] Market Making Agreement, February 7, 2014. RPLI_SEC 0507336.

Transaction Cost. (Accessed on November 9, 2021). XRP Ledger. https://xrpl.org/transaction-cost.html#beneficiaries-of-the-transaction-cost.

Triennial Central Bank Survey: Foreign exchange turnover in April 2019. (2019, September 16). Bank for International Settlements. https://www.bis.org/statistics/rpfx19_fx.pdf.

Venezuelan Bolivar to US Dollar Exchange Rate Chart (Accessed November 9, 2021). Xe. https://www.xe.com/currencycharts/?from=VEF&to=USD&view=10Y.

XRP Bridge Currency Papers. RPLI_SEC 0364717.

XRP price today, XRP to USD live, marketcap and chart. (Accessed on November 12, 2021). CoinMarketCap. https://coinmarketcap.com/currencies/xrp/.

Yahoo Finance All Markets Summit: Crypto, February 7, 2018. (2018, February 7). Yahoo Finance. https://www.yahoo.com/news/yahoo-finance-markets-summit-crypto-february-7-2018-223531903.html.

Yang, Bill. (2007). What is (Not) Money? Medium of Exchange ≠ Means of Payment. The American Economist, vol. 51, issue 2, pp. 101-104.

YouTube. (2019). BRAD GARLINGHOUSE RIPPLE CEO YAHOO FINANCE INTERVIEW 30 MINUTES, starting at 15:09. Accessed at: https://youtu.be/pzbJ6e8sdpg?t=909.

Any other documents, materials, or web tools identified in my report, including data obtained from CoinMarketCap, Google, Ripple Insights, XRP Markets, and Wayback Machine.

VII. APPENDIX D: TOP 100 RETAILERS

The table below lists the top 100 retail companies ranked by 2020 US sales, as estimated by Kantar Group for the National Retail Federation.[110] It excludes restaurants, and the listed dollar amounts are each company's worldwide retail-exclusive sales.

Rank	Company	2020 Retail Sales (billions)	Rank	Company	2021 Retail Sales (billions)
1	**Walmart**	$430.82	51	**WinCo Foods**	$8.74
2	**Amazon.com**	$187.27	52	**Good Neighbor Pharmacy**	$8.45
3	**The Kroger Co.**	$131.57	53	**Southeastern Grocers (BI-LO)**	$8.23
4	**The Home Depot**	$121.26	54	**Army & Air Force Exchange**	$7.90
5	**Costco Wholesale**	$121.22	55	**J.C. Penney Company**	$7.48
6	**Walgreens Boots Alliance**	$104.70	56	**Save-A-Lot**	$7.25
7	**Target**	$92.40	57	**Bass Pro**	$6.80
8	**CVS Health Corporation**	$89.53	58	**Staples**	$6.63
9	**Lowe's Companies**	$82.88	59	**Williams-Sonoma**	$6.61
10	**Albertsons Companies**	$69.73	60	**Sprouts Farmers Market**	$6.45
11	**Apple Stores / iTunes**	$55.06	61	**Speedway**	$6.38

[110] National Retail Federation. Top 100 Retailers 2021 List. https://nrf.com/resources/top-retailers/top-100-retailers/top-100-retailers-2021-list.

12	**Royal Ahold Delhaize USA**	$51.17	62	**AVB Brandsource**	$6.28
13	**Publix Super Markets**	$44.84	63	**Big Lots**	$6.20
14	**Best Buy**	$43.24	64	**Ulta Salon, Cosmetics & Fragrance**	$6.15
15	**Aldi**	$34.54	65	**Foot Locker**	$6.03
16	**Dollar General**	$33.74	66	**Ikea North American Services**	$5.91
17	**H.E. Butt Grocery**	$29.01	67	**Office Depot**	$5.78
18	**TJX Companies**	$25.17	68	**Academy Sports**	$5.69
19	**Dollar Tree**	$25.08	69	**Burlington**	$5.63
20	**Ace Hardware**	$22.69	70	**Camping World**	$5.45
21	**Meijer**	$19.59	71	**Discount Tire**	$5.15
22	**Wakefern / ShopRite**	$18.27	72	**Sephora (LVMH)**	$5.01
23	**7-Eleven**	$18.25	73	**Piggly Wiggly**	$4.85
24	**Macy's**	$17.15	74	**Hobby Lobby Stores**	$4.79
25	**AT&T Wireless**	$17.02	75	**Petco**	$4.78

26	**Rite Aid**	$16.37	76	**Michaels Stores**	$4.76
27	**Verizon Wireless**	$15.49	77	**Stater Bros Holdings**	$4.68
28	**BJ's Wholesale Club**	$15.43	78	**Signet Jewelers**	$4.65
29	**Kohl's**	$15.33	79	**Exxon Mobile Corporation**	$4.63
30	**PetSmart**	$13.18	80	**Defense Commissary Agency**	$4.60
31	**Menards**	$12.80	81	**My Demoulas**	$4.55
32	**Ross Stores**	$12.51	82	**Advance Auto**	$4.35
33	**Dell Technologies**	$12.31	83	**Dillard's**	$4.16
34	**Hy Vee**	$11.97	84	**Smart & Final**	$4.12
35	**Wayfair**	$11.61	85	**Weis Markets**	$4.11
36	**O'Reilly Auto Parts**	$11.60	86	**Ingles**	$4.02
37	**Gap**	$11.51	87	**Golub**	$3.91
38	**Qurate Retail**	$11.21	88	**Shell Oil Company**	$3.88
39	**Health Made Systems**	$10.94	89	**Save Mart**	$3.86

40	**Wegmans Food Market**	$10.84	90	**Total Wine & More**	$3.82
41	**L Brands**	$10.80	91	**Caseys General Store**	$3.72
42	**AutoZone**	$10.70	92	**Guitar Center**	$3.43
43	**True Value Co.**	$10.60	93	**GameStop**	$3.40
44	**Tractor Supply Co.**	$10.57	94	**American Eagle**	$3.33
45	**Giant Eagle**	$9.97	95	**UNFI**	$3.17
46	**Alimentation Couche-Tard**	$9.95	96	**Grocery Outlet**	$3.13
47	**Dick's Sporting Goods**	$9.57	97	**Belk**	$3.13
48	**Sherwin-Williams**	$9.40	98	**Lululemon**	$3.04
49	**Nordstrom**	$9.35	99	**Sears Holdings**	$3.03
50	**Bed Bath & Beyond**	$8.91	100	**AMPM**	$3.00

VIII. APPENDIX E: ANALYZED PURPORTED "USE CASES" FROM APPENDIX C OF ADRIAENS REPORT

The table below presents a filtered list of purported "use cases" as identified in Appendix C of the Adriaens Report. A qualitative filter was applied to remove any "use cases" that pertain to digital asset platform trading, payment services, lending and investments, wallet applications, casino/gambling, and those that could not be accessed online or appear to no longer be an operating domain as of the date of this report. All details listed below including Entity Name, Category, and Website are copied as is from Appendix C of Adriaens Report.

List of XRP "Use Cases"		
Entity Name	**Category**	**Website**
2sync	Hosting Provider	https://www.2sync.co/
AGRsicurezza	Consultancy	https://www.agrsicurezza.it/
AirVPN	VPN Hosting	https://airvpn.org/
Alphacat	Robo-advisor Marketplace	https://alphacat.io/
Alquicoche	Rental car booking site	https://www.alquicoche.es/
Alternative Airlines	Air travel booking site	https://www.alternativeairlines.com/
AMLBot	AML support	https://amlbot.com/#~np1
Antalya Homes	Real Estate	https://www.antalyahomes.com/
As You Wish Bodywork LTD	Massage	https://www.massagebook.com/Denver~Massage~AsYouWishBodywork?utm_source=cryptwerk
AsiaMTM Group	Manufacturing, Trading, Marketing	https://asiamtm.com/
Autohaus-seidl.at	Physical car dealer	https://www.autohaus-seidl.at/
BCHLX	Blockchain applications	https://bchlx.com/
Beachhead	Game	https://beachhead.com/
Beliani	Furniture	https://www.beliani.co.uk/
Beschriftungsprofi	Marketing services (lettering, etc.)	https://www.beschriftungsprofi.at/
Bidali	Purchase/Gift Card	https://www.bidali.com/
Bitcoin.travel	Travel booking site	https://bitcoin.travel/
Bitgild	Precious metals Marketplace	https://www.bitgild.com/
BitStickers	Marketplace	https://bitstickers.net/
Blockdaemon	Networking	https://blockdaemon.com/
Bluzelle	Technology	https://bluzelle.com/
Boatsters Black	Yachts for Charter	https://boatstersblack.com/
BookcoinShop	Marketplace	https://bookcoinshop.com/
Booking.com	Hotel booking site	https://www.booking.com/
BookMauritiusHotels	Hotel Booking	https://www.bookmauritiushotels.com/
Bravsy	Travel agency	https://bravsy.com/
Bronn Travel	Travel Agency	https://bronntravel.com.ua/
Bullion79	Precious metals Marketplace	https://bullion79.com/
BuyWithCoins	Marketplace	https://www.buywithcoins.online/

List of XRP "Use Cases"		
Celtic Gold	Precious metals Marketplace	https://www.celticgold.eu/en/
Chainalysis	Blockchain Analysis	https://www.chainalysis.com/
Club Turismo	Travel agency	https://www.clubeturismo.com.br/
Coin Monster Store	Purchase/Fashion Apparel	https://coinmonster.store/
Creative Click	Video/animation Productions	https://www.creativeclick.co/
Crypto Coffee	Marketplace	https://crypto-coffee.com/
Crypto Cove	Purchase/Fashion Apparel	https://cryptocove.io/
Crypto Emporium	Purchase/Fashion Apparel, Cars, Electronics	https://cryptoemporium.eu
Crypto Posters	Poster store	https://www.cryptocurrencyposters.com/
Crypto Shopper	Purchase/Fashion Apparel	https://cryptoshopper.store/
Crypto Voucher	Buy vouchers	https://cryptovoucher.io/
Crypto Whale Clothing	Marketplace	https://cryptowhaleclothing.com/
Cryptoholic Shop	Purchase/Fashion Apparel	https://www.cryptoholicshop.com
Cryptojaunt	Travel Booking Platform	https://www.cryptojaunt.com/
Cryptopet	Marketplace	http://cryptopet.com/
Cryptosa	Advisory Firm	https://cryptosa.org/
Delphin hotel	Hotel	https://delphinhotel.com/
DEV	Online community	https://dev.to/
Diaz Plasencia y Asociados	Legal services	http://diazplasencia.com/
Digitec	Marketplace	https://www.digitec.ch/
Do You Space	Architecture firm	http://www.doyouspace.net/about-3/
Dokter Online	Online pharmacy	https://www.dokteronline.com/en/
Dynasty Goddess Hair	Hair extension shop	https://www.dynastygoddess.com/
Eat Me Clothing	Purchase/Fashion Apparel	https://eatmeclothing.com/
Ecstatic	Purchase/Fashion Apparel	https://ecstaticstore.com/
Ecwid	E-commerce hosting	https://www.ecwid.com/
eGifter	Purchase/Gift Card	https://www.egifter.com/buy-gift-cards-with-xrp
EnterBillions	Spam Blocker	https://enterbillions.co/
Evident Proof	Data Verification/Proof Service	https://evident-proof.com/
Expedia	Travel booking site	www.expedia.com
Extrutherm	Construction services	http://www.extrutherm.at/2018/
FAMprint	Printing	https://www.fam-print.ch/
Fetch Portraits	Photographer	https://www.fetchportraits.com/
FinFreeOTC	P2P Cryptocurrency Marketplace	https://finfreeotc.com/
Frank and Beans	Purchase/Fashion Apparel	https://www.frankandbeans.com.au/
Galaxus	Marketplace	https://www.galaxus.ch/
Game Servers Today	Game server hosting	https://gameservers.today/
Gas Aces	Gas and heat repairs	https://www.gasaces.com/

List of XRP "Use Cases"		
GBI	Bullion store	https://www.bullioninternational.com/
Giacobbe & Co.	Jewelery	https://giacobbeandco.com/
Glace Bay Luxury Shuttle	Rental car company	https://hankcooper.com/shuttle
GoLance (ODL)	Online Workforce Platform	https://golance.com/
Greitai	Travel booking site	https://www.greitai.lt/
Grupo Terramovil del Mediterraneo SL	Car dealer	https://criptocoches.com/
Harmonie im Garten	Garden goods	https://www.harmonie-im-garten.at/
Hauer 1a	Contractor	https://www.hauer1a.at/
Haus Irene	Accomodations	https://www.ferienwohnungen-irene.de/
Henley Audtio	A/V services for events	https://henleyaudio.com/
Hide.me	VPN	https://hide.me/en/
Hostería Encantó del Lolog	Accomodations	https://encantodellolog.com/
Hostiso	Hosting Provider	https://hostiso.com/
Hostsailer	Technology	https://hostsailor.com/how-to-pay-with-cryptocurrencies/
Hostwinds	Web Hosting Provider	https://www.hostwinds.com/
Hotel Ploberger	Accomodations	https://www.hotel-ploberger.at/de/
Hotel Vienna	Accomodations	https://www.hotelvienna.at/
Indybudmarv2	3D printing and design	https://www.budmarv2.com/
itlawyers.gr LLC	Legal services	https://www.itlawyers.gr/
KAZARTT	Purchase/Fashion Apparel	https://www.kazartt.com/
Keyless Technologies	Authentication software	https://keyless.io/
Keys4coins	Marketplace	https://www.keys4coins.com/
KinkyBoots & Bits	Purchase/Fashion Apparel	https://www.kinkyboots.com.au/
Kristina Rybaltchenko	Purchase/Fashion Apparel	https://rybaltchenko.com/
Kryptohotel Vienna	Accomodations	https://www.kryptohotel.at/
Kun Koro	Counseling	https://kunkoro.kiwi/indexeng.html#
Laferla	Insurance company	https://www.laferla.com.mt/
Lord	Purchase/Fashion Apparel	https://www.lord.gr/en/
Mader Reisen	Travel agency	https://www.maderreisen.at/Home/
Marketing Empire	Digital Marketing Agency	https://marketingempire.co.uk/
Mental Market	Marketplace	http://mentalmarketing.com/
Mileata	Watch manufacturer	https://mileata.com/
Mopesa Car Rental	Rental car service	https://www.facebook.com/mopesacarrentalkoronadal/
NordVPN	Technology	https://nordvpn.com/
OffshoreDedicated	Hosting Provider	https://offshorededicated.net/
Omgserv	Minecraft Server	https://www.omgserv.com/en/

List of XRP "Use Cases"		
Omni Projects	Software	omnigroup.com
Opu Labs	Healthcare e-commerce	https://www.opulabs.com/
PexPeppers	Marketplace	https://pexpeppers.com/
PPC Protect	Fraud Prevention	https://ppcprotect.com/
PrestigeTime	Online luxury watch store	https://www.prestigetime.com/
Print Ted	Purchase/Fashion Apparel	https://print-ted.com/
Propy	Marketplace	https://propy.com/browse/
Qeeq	Rental car service	https://www.qeeq.com/
Quantoz (Nexus)	Transaction processing	https://quantoz.com/solutions/cryptocurrency-services/
R3	Software	https://www.r3.com/
Refundo	Tax refund	https://refundo.com/
Rights	Digital Market	https://rights-dapp.io/
Search Candy	Digital Marketing	https://www.searchcandy.uk/
Selly	E-Commerce	https://selly.io/
Sesocio	Investment platform	https://sesocio.com.ar/
Shopify	Marketplace	https://www.shopify.com/
Snel.com	Technology	https://www.snel.com/
Sologenic	Tokenization	https://www.sologenic.com/
Soulful Essence	Marketplace	https://soulfulessence.com/
SSL Dragon	SSL Certificate Marketplace	https://www.ssldragon.com/
Standing Ovation	Event Service Provider	https://standingovation.ch/en/
Starting Point Mental Health	Therapy	https://www.therapydelandfl.com/
Stats Autos Spa	Auto detailing	https://stats-auto-spa.com/
Staxe	Tokenization	https://staxe.io/
STYRA Technologies	Interledger gateway provider	https://www.styra.com/
SubscribeStar	Crowdfunding	https://www.subscribestar.com/
Suisse Gold	Precious metals Marketplace	https://www.suissegold.eu/en/
Swiss Crypto Vault	Crypto storage	https://swisscryptovault.ch/
Talizi Hair Transplantation Clinic	Hair transplants	https://tsilosani.com/en/
TapJets	Travel	https://www.tapjets.com/
Tegiwa	Imports	https://www.tegiwaimports.com/
ti&m	IT service provider	https://www.ti8m.com/
TMD STUDIO LTD.	Architecture	https://www.tmd.studio/
Toca Coffee	Marketplace	https://www.tocacoffee.com/
TorGuard	Technology	https://torguard.net
Trachtenhans	Purchase/Fashion Apparel	https://www.trachtenhans.com/
Transfer4cheap	Travel	https://www.transfer4cheap.com/en
Travala	Purchase/Travel	https://www.travala.com/payment/xrp

List of XRP "Use Cases"		
Travolier Hoteliermart	Loyalty program	https://travolier.com/
Tron Network Store	Merchandise store	https://tronnetwork.store/
TruViewz	Photographer	https://truviewz.com/
Ultimez	Web Design	https://ultimez.com/
Unicef	Charity	https://www.unicef.fr/
Upvotes Club	Marketplace	https://upvotes.club/
Varle.lt	Online marketplace	https://www.varle.lt/
VeePN	VPN	https://veepn.com/
ViaBTC	Cryptocurrency mining service	https://www.viabtc.com/
Victory Rentals	Outdoor equipment rental	https://www.victory-rentals.com/
Villa Eros Apartments	Accomodations	https://villa-eros.weebly.com/
Volkskraftwerk	Energy technology	https://www.volkskraftwerk.com/
Vontobel Investment Banking	Wealth management, active asset management and investment solutions	https://www.vontobel.com/en-int/
W.Hamond	Jewelry Store	https://whamond.com/
WeMakePrice	Mall	https://front.wemakeprice.com/main
Winipple	Purchase/Fashion Apparel	https://winipple.com/shop/
WooCommerce	E-commerce hosting	https://woocommerce.com/
Wrecky Car Wreckers	Towing service	https://www.wrecky.com.au/
XcelTrip	Travel booking site	https://www.xceltrip.com/
xCryptoCrash	Gambling site	https://xcryptocrash.com/
Yacht Break	Yacht Charter	https://theyachtbreak.com/
Zwei Fach Vertriebs GmbH	Interior decorating	https://www.zwei-fach.at/

Exhibit 10

UNITED STATES DISTRICT COURT

SOUTHERN DISTRICT OF NEW YORK

EXPERT REPORT OF [redacted]

OCTOBER 4, 2021

U.S. Securities and Exchange Commission v. Ripple Labs, Inc., Bradley Garlinghouse, and Christian A. Larson

TABLE OF CONTENTS

1. Introduction

1.1 Assignment

1. I have been engaged by the U.S. Securities and Exchange Commission ("SEC") to provide expert testimony in the matter of *U.S. Securities and Exchange Commission v. Ripple Labs, Inc., et al.*, pending in the United States District Court for the Southern District of New York.

2. The SEC retained me to independently analyze and render opinions on the perspective of a reasonable purchaser of XRP on Ripple's statements, actions, and product offerings.[1] The purchasers I am considering in this matter primarily include individuals, institutional investors, and financial services companies. The purchases of XRP were made through trades on the XRP Ledger, on digital asset trading platforms, and in private over-the-counter (OTC) transactions throughout the period that Ripple offered XRP for sale from 2013 to the filing of the SEC's Complaint on December 22, 2020 ("Issuance Period"). My report is limited to the Issuance Period.

1.2 Qualifications

3. [redacted] assisting various government agencies with investigating possible securities violations and financial fraud in the digital assets space. This experience includes analyzing fraudulent blockchain investment schemes, tracking money laundering on the blockchain, and discovering and proving manipulative trading activity related to digital assets. [redacted]

[1] I also was retained to provide analysis and/or a rebuttal to Defendants' expert reports, if and as needed.

[redacted] I have provided expert consulting in blockchain, digital assets, and forensic data analytics for private companies, federal agencies, and foreign securities regulators. My work providing expert consulting related to digital assets has ranged from examining documents and representations related to initial coin offerings to providing detailed analysis of blockchain data, including flows of funds on the blockchain, smart contract activity, on-blockchain trading data, and decentralized finance platforms. I have also developed and managed the development of scripts and algorithms to process and analyze large collections of blockchain data.

4. In addition, I am the Founder and Managing Director of an investment partnership, [redacted]. [redacted] began operating in [redacted] and legally formed in [redacted] was originally primarily focused on making investments in the digital asset space, and since its founding I have profitably allocated capital to many digital asset investments. In addition to analyzing hundreds of companies, projects, coins, and tokens in the digital asset space, I have developed and executed successful cryptocurrency arbitrage strategies. These activities have given me an intimate familiarity with many different participants in the digital asset space including retail users and traders, institutional investors, cryptocurrency miners, software developers, entrepreneurs, and venture capital investors. I have practical firsthand experience with using blockchains as well as the trading platforms, software platforms, and institutional products built on top of them. In addition to my experience in digital asset investments, I have [redacted] of experience evaluating and investing in companies, public equities, commodities, real estate, bonds, currencies, and derivatives of those asset classes. I

have managed automated quantitative strategies as well as discretionary investment strategies across many different asset classes, with emphasis on equities and equity options. As part of this work, I routinely analyze the investment thesis – that is, the relative risks and rewards of an investment and the circumstances in which the investment makes the most sense – for hundreds of investments, including digital assets. I received a [redacted], and an [redacted].

5. Appendix A to this report contains my curriculum vitae with more details about my professional background. [redacted]. I have been assisted by additional staff members of Integra to analyze data and documents related to this matter. My conclusions are my own and are based on my independent analysis and review of their work. Integra is compensated by the SEC at a rate of $520 per hour (Engagement Director), $330 per hour (Data Scientist), and $235 per hour (Data Analyst) for their work.

1.3 Documents Considered

6. Appendix B to this report contains a complete list of documents and data sources I relied upon to complete the analysis in this report. Included in that list are public statements and press releases from Ripple and company insiders and transaction data related to what Ripple advertises as its core software product—a product for financial institutions Ripple at some point called On-Demand Liquidity ("ODL"). I also reviewed and considered other documents and data sources, including trading data, blockchain data, technical documentation, and social media posts from websites like Twitter, Reddit, Quora, Bitcoin Talk, and XRP Chat.

2. Summary of Findings

7. Based on my review and analysis of Ripple's public statements made throughout the Issuance Period, documents, and design decisions made by Ripple and/or its founders, and on my professional experience in the digital asset space, I find the following:

8. The design of XRP as a fixed-supply coin[2], as well as statements made by Ripple, were consistent with promoting an investment use case for XRP. Based on my experience in the digital asset space, I conclude that a reasonable purchaser would have had an expectation of future profit derived from the efforts of Ripple. Specifically, purchasers would have expected or hoped to profit by later re-selling their XRP at a higher price on a secondary market after XRP substantially increased in value. Due to basic supply and demand dynamics, any asset that has a variable price but fixed quantity tends to increase in value with increased demand for that asset. Therefore the design of the XRP blockchain using a fixed-supply coin for its native asset created a direct financial link between the price of XRP and the success of Ripple's efforts to develop and market software products that could gain users and attract high transaction volumes in XRP. Ripple also promoted a variety of its achievements, initiatives, and strategy that created a well-understood bullish thesis for the price of XRP and encouraged speculative investment flows into the digital asset. This promotional activity included advertising new partnerships with financial institutions, highlighting the experience and expertise of Ripple's team members, making public statements about why XRP was poised to increase in price, publishing positive commentary about the future growth trajectory of Ripple's products, and describing the plans for developing

[2] Consistent with the standard usage in the crypto space, in this report 'coin' denotes the native or fundamental digital asset of a blockchain, e.g. XRP is a coin and the native asset for the XRP Ledger, and 'token' refers to a digital asset that is represented on a blockchain but that is not the native asset of that blockchain, e.g. COMP is a token on the Ethereum blockchain. In my report, my use of the terms 'coin' and 'token' is not intended to supply an opinion that the digital asset has the characteristics of a currency or any other particular classification of asset.

the XRP ecosystem[3]. Although Ripple's development of the blockchain and broader XRP ecosystem, along with its promotion of the bull case for buying XRP, would not guarantee a profit, it would create the hope that a purchaser could passively earn profits by owning XRP while Ripple took steps to increase the value of the coin. In my experience as an investor and close observer of the digital asset space, the statements, actions, background, and competence of the founders and companies that create and support a blockchain project are extremely important to the decision-making process of purchasers of digital assets.

9. Based on Ripple's public statements, the design of XRP as a fixed-supply variable-price coin, and the creation of the XRP escrow accounts, I also conclude that there are certain elements in Ripple's and its founders' design of XRP, the XRP Ledger, and a variety of software products that appealed more to a purchaser of XRP interested in making a profit than to financial institutions seeking to embrace Ripple's stated vision of utilizing XRP as a bridge asset for cross-border asset transfers. Financial institutions desiring a solution for international wire transfers and other cross-border payment mechanisms would be better served by a variable-supply, fixed price solution, such as offered by fiat currency. Using XRP to complete cross-border payments requires two exchange transactions (from the source currency to XRP and from XRP to the destination currency) and involves paying the fees and trading losses (i.e. "slippage"[4]) associated with both of those transactions. If both trades are not conducted simultaneously or if an institution needs to carry an inventory of XRP, this approach also

[3] In this report "ecosystem" refers broadly and collectively to all the software, people, and organizations who are involved with a blockchain project, such as retail investors, institutional investors, miners, software developers, software products, companies, merchants, trading platforms and market makers.

[4] "Slippage" is a trading term referring to trading losses incurred from executing trades against a bid-ask spread; it is the difference between the displayed market price of a trade and the actual price upon which the trade was executed. Slippage is generally higher i) in less liquid markets and ii) when larger trades are executed.

involves tying up capital in a volatile asset with an uncertain future price that has nothing to do with the source or destination currencies intended to be transmitted abroad.

3. Background

3.1 Digital Assets

10. Digital assets, such as XRP, are assets wherein transactions or account balances involving those assets are recorded and maintained on digital ledgers using blockchain technology. Cryptographically-signed transactions denominated in these digital assets are validated and grouped together into "blocks," or in the case of XRP these blocks are called "ledgers." A "blockchain," also called the "XRP Ledger" in the case of the digital ledger on which XRP balances and transactions are maintained and recorded, comprises a chronological collection of successive blocks that have been accepted by a software-defined consensus mechanism. This blockchain data is typically stored for the collective use of anyone who wishes to interact with the data or transaction history associated with a given digital asset. The primary digital asset that is recorded on a given blockchain is referred to as that blockchain's "native asset." For example, Bitcoin ("BTC") is the native asset of the Bitcoin blockchain and XRP is the native asset of the XRP Ledger.

11. Each blockchain has different fundamental characteristics related to the extent to which it is: 1) decentralized, i.e. controlled, operated, and governed by a distributed collection of independent people and organizations; 2) permissioned, i.e. restricted or freely accessible for use by any person or organization; 3) secure, i.e. resistant to fraudulent or invalid transactions. The transaction speed and capacity of the blockchain, among other properties, also differ from one blockchain to another as a result of making tradeoffs in this design space.

12. Blockchains may provide computational features beyond just the record-keeping function of maintaining a digital asset ledger. For example, the Ethereum blockchain includes "smart contracts" which are software-defined applications with code stored directly on the blockchain. Smart contracts contain instructions for a wide range of tasks, including automating financial transactions between parties, storing data on the blockchain, and defining new digital tokens which are themselves digital assets. The XRP blockchain includes additional functionality for "IOUs", which are liabilities issued by private third-party entities (referred to by Ripple as "gateways") and denominated in a wide range of underlying fiat currencies or digital assets.

3.2 Trading Platforms

13. Digital assets are often traded in public marketplaces, also called "exchanges" or "trading platforms." Some popular examples of digital asset trading platforms are Coinbase, FTX, and Bitstamp. On these platforms, digital assets may be traded for fiat currencies (i.e. government-issued currencies such as the U.S. Dollar or the British Pound) or other digital assets. "Centralized exchanges" carry out this trading task on a private server, without recording trades directly on the blockchain. "Decentralized exchanges," on the other hand, record all trades directly on the blockchain, making every trade publicly viewable. In the case of the XRP blockchain, both types of trading platforms, along with alternate trading venues such as futures and derivatives markets, are components of the overall ecosystem.

4. Ripple Platform Overview

4.1 History of Ripple, XRP, and Product Offerings

14. The predecessor to Ripple was founded in 2012 as a technology company in the blockchain space. Also in 2012, the XRP blockchain was released to the public and went live for

the first time with a maximum supply of 100 billion XRP created.[5] Of this 100 billion XRP, 80 billion XRP was distributed to Ripple and 20 billion XRP was distributed to several key individuals.[6]

15. In the early years, Ripple released products geared towards prospective individual users and traders. In 2013, Ripple released an iPhone app called the Ripple Client which enabled individuals to send and receive XRP as well as other assets such as BTC and USD.[7] After several upgrades, Ripple Client was rebranded in 2014 as Ripple Trade, with Ripple recognizing that "Trading has rapidly become the number one use case of Ripple."[8] This trading predominantly involved buying and selling XRP, as can be seen in Figure 1 which shows that the top three markets on the XRP Ledger circa February 2014 were the XRP/USD, XRP/CNY and XRP/BTC trading pairs. The screenshot shown in Figure 1 is from the RippleCharts product that Ripple "revamped" in February 2014, which at the time provided detailed trading data including real-time XRP prices and a real-time feed of trades executed. When the revamp was announced, Ripple also noted that it sought to design its products around the trading use case for XRP, noting, "To revamp RippleCharts from the inside out, we solicited feedback from Ripple's lively **trading** community. [emphasis added]"[9]

[5] Ripple. Q3 2019 XRP Markets Report (2019). https://ripple.com/insights/q3-2019-markets-report/.
[6] Ripple. Answer of Defendant Ripple Labs, Inc. to Plaintiff's First Amended Complaint (2021). Page 16, paragraph 46.
[7] Ripple. Inside the Code of Ripple Client: the Newest Mobile Payment App for iOS (2013). https://ripple.com/insights/inside-the-code-of-ripple-client-the-newest-mobile-payment-app-for-ios/.
[8] Ripple. Introducing the New Ripple Trade Client (2014). https://ripple.com/insights/introducing-the-new-ripple-trade-client/.
[9] Ripple. RippleCharts Revamp (2014). https://ripple.com/insights/ripplecharts-revamp/.

Figure 1. "Top Markets" from RippleCharts circa February 2014[10]

16. Starting in 2015 and over the following six years Ripple rolled out a series of software products aimed at facilitating the transfer of funds for institutional financial organizations. In October 2015 Ripple introduced the Interledger Protocol, a product that aimed to facilitate "efficient payments across payment networks" among banks and other financial institutions.[11] Next, the RippleNet Committee was announced, laying the foundation for various products geared towards global payments problems.[12] In 2017 xCurrent was launched as the common messaging technology for RippleNet and utilized the Interledger Protocol[13]. xVia was launched the same year to provide an API[14] for payment originators to interface with RippleNet banking partners. In October 2018 xRapid was launched. Later re-named to On Demand

[10] *ibid*.
[11] Ripple. Implementing the Interledger Protocol in Ripple (2015). https://ripple.com/insights/implementing-the-interledger-protocol/.
[12] Ripple. RippleNet. https://ripple.com/ripplenet/. See also Ripple's "Our Story" page at https://ripple.com/company/ and additional background about the RippleNet Committee at https://ripple.com/ripplenet-committee/.
[13] Ripple. xCurrent (2017). https://ripple.com/files/xcurrent_brochure.pdf.
[14] API stands for "application programming interface" which is a set of standards or protocol that enables computers or software systems to communicate with each other through a shared interface.

Liquidity (ODL), the xRapid product was designed to facilitate cross-border transactions between financial institutions by using XRP as a bridge currency.[15]

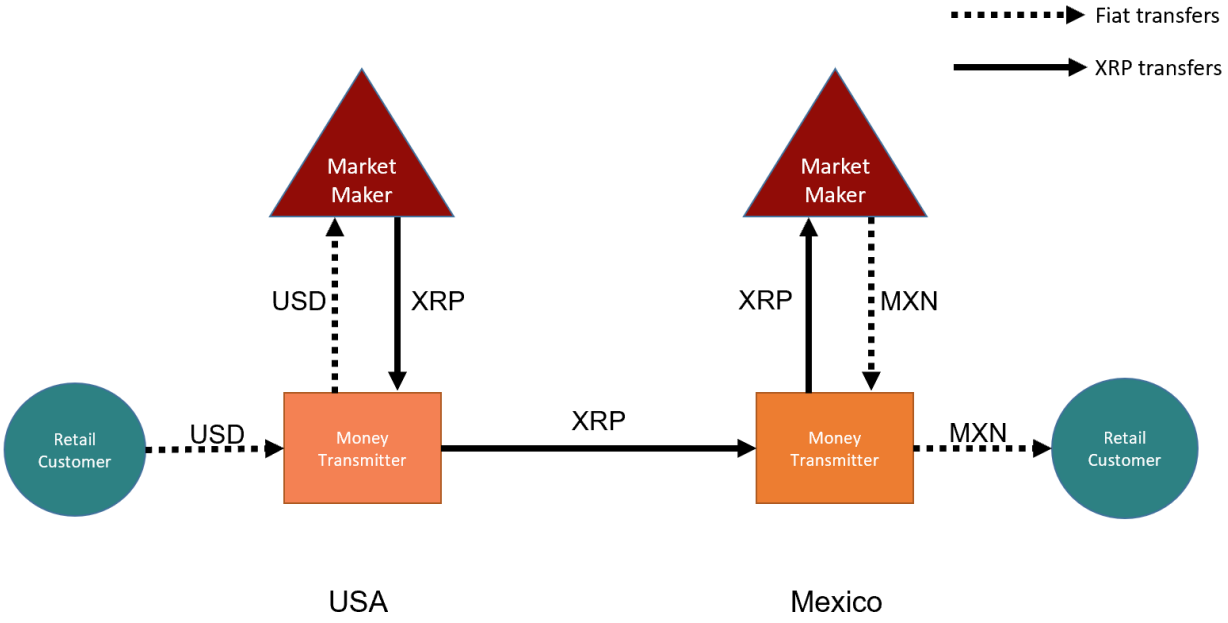
4.2 Overview of ODL Usage

17. ODL, originally called xRapid, has been a cornerstone of an effort by Ripple to create a commercially successful product that utilized XRP as a required asset.[16] ODL was intended to facilitate cross-border transactions between money transmitters' domestic and foreign accounts by coordinating a three-step process: 1) trading XRP in exchange for the source fiat currency (i.e., buying XRP and selling the source currency), 2) transferring XRP from the source country to the destination country on the XRP Ledger, and 3) trading XRP in exchange for the destination currency (i.e., selling XRP and buying the destination currency).

18. The overall effect of these steps is to exchange the source currency for the destination currency and to send money from the source country to the destination country. Figure 2 illustrates the flow of assets involved with an ODL transaction. In this example a money transmitter uses ODL to complete a remittance payment from the United States to Mexico on behalf of retail customers. The money transmitter trades on a trading platform with a market maker in each country.

[15] Ripple. Ripple Highlights Record Year, xRapid Now Commercially Available (2018). https://ripple.com/insights/ripple-highlights-record-year-xrapid-now-commercially-available/.
[16] Ripple. On Demand Liquidity (2021). https://ripple.com/ripplenet/on-demand-liquidity/.

Figure 2. Example of ODL Transaction for Remittance Payment Between USA and Mexico.



19. Ripple promoted the growth of ODL users and transaction volumes. Figure 3 shows an excerpt from a 2019 announcement, where Ripple highlights growing usage trends for ODL.[17]

Figure 3. Excerpt from November 6, 2019 Announcement on the Ripple Website.

> In less than a year since the commercialization of ODL, we have seen tremendous growth and customer interest with two dozen customers signed on to use the product. Some of the notable customers committed to using ODL include MoneyGram, goLance, Viamericas, FlashFX and Interbank Peru. There have been more than 7x the number of transactions using ODL from the end of Q1 to the end of October.

20. The transaction volumes processed through ODL rose very quickly throughout the second half of 2019 and the first half of 2020, and nearly all this growth was due to a single customer, MoneyGram. Ripple took an ownership stake in MoneyGram in 2019, and the two companies put an agreement in place for MoneyGram to use ODL for some of its cross-border

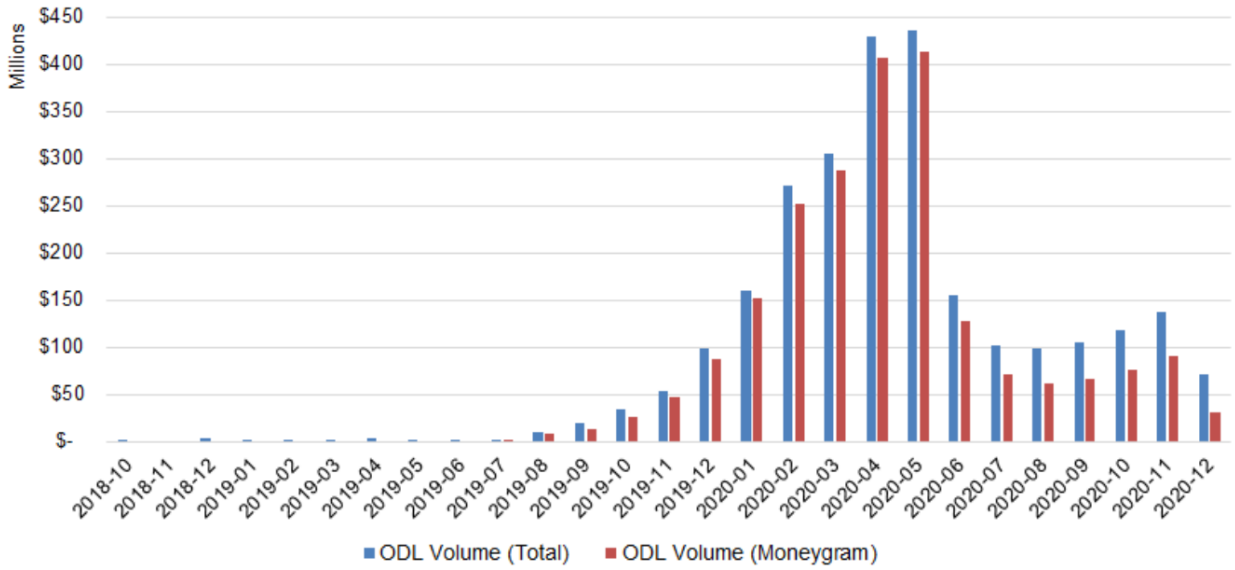
[17] Ripple. RippleNet Growth: Announcing More Than 300 Customers (2019). https://ripple.com/insights/ripplenet-growth-announcing-more-than-300-customers/.

transactions. Ripple subsidized MoneyGram's ODL transaction activity with payments in XRP that began at 2.5% of MoneyGram's ODL transaction volumes, with different subsidy levels at different volume tiers. This initial percentage depended on achieving certain volume targets, and the total subsidy agreement had a maximum payout of $110 million.[18] Since every ODL transaction required MoneyGram to potentially lose money to fees and slippage by completing two exchanges on two different trading platforms, Ripple provided additional subsidies to MoneyGram. As such, MoneyGram reports that it received $61.5 million in "market development fees" from Ripple in 2019 and 2020.[19]

21. The total monthly ODL transaction volumes starting at the commencement of the ODL product launch[20] are shown in Figure 4, along with the ODL transaction volumes made by MoneyGram. This chart shows that MoneyGram was responsible for nearly all ODL activity. Starting in June 2020 MoneyGram significantly reduced its ODL transactions, and overall ODL volumes fell sharply as a result.

[18] Ripple. Metric - Work Order (Execution Version).pdf (2019). Page 5.
[19] MoneyGram. MoneyGram International Reports Fourth Quarter and Full-Year 2020 Financial Results (2021). https://ir.moneygram.com/news-releases/news-release-details/moneygram-international-reports-fourth-quarter-and-full-year-5.
[20] ODL was launched in October 2018 during Ripple's 2018 Swell Conference (See: https://ripple.com/insights/the-ripple-drop-on-the-ground-at-swell-2019/).

Figure 4. Monthly ODL Volumes of All Transactions and MoneyGram Transactions



22. By subsidizing MoneyGram to induce ODL activity, Ripple successfully created a pattern of quickly accelerating product growth throughout the period from June 2019 to June 2020. The rapid growth of ODL was an important aspect of Ripple's bull case ("bull case" refers to an optimistic thesis for why an asset will appreciate in price) for purchasing XRP. In the Q4 2019 Market Report, Ripple highlighted this product growth by saying: "In 2019, dollar value transacted through ODL increased more than a hundred times between Q1 and Q4, and specifically from Q3 to Q4 by 550% … showcasing high customer demand for leveraging digital assets, specifically XRP, in cross-border transactions."[21]

5. Features of XRP Coin Economics and Suitability as a Bridge Asset

5.1 XRP's Fixed-Supply Cap Allows Purchasers to Profit from Ripple's Success

23. All else equal, for any digital asset with a fixed-supply cap, increased demand for the coin increases the price of the coin. This is a basic economic result of supply and demand.

[21] Ripple. Q4 2019 XRP Markets Report (2020). https://ripple.com/insights/q4-2019-xrp-markets-report/.

XRP was deliberately created with a maximum fixed-supply cap of 100 billion coins along with a variable price dictated by market forces. The total supply of coins essentially never changes,[22] while the price has historically fluctuated significantly over time. The anticipated use of Ripple's ODL product by financial institutions would tend to increase the demand for and price of XRP, all else being equal. Other drivers of increased appetite for holding XRP include speculative or investment-driven demand for the coin, as well as individuals or businesses choosing to hold an inventory of XRP to make transfers directly in XRP. Due to the fixed-supply cap, all these sources of increased demand to hold XRP would tend to push up the price of XRP.

24. The fixed-supply, variable price coin model takes on further importance because of Ripple's efforts to promote the growth of the XRP ecosystem and to develop financial products that use XRP to conduct transactions. Based on my experience investing in digital assets, a reasonable purchaser of XRP would understand that if Ripple's ambitious cross-border payment business were successful, the ensuing demand for XRP would tremendously increase the price of XRP.

25. Ripple directly and publicly made the case for this relationship between increased demand for XRP and the future price of XRP. In an interview with Bloomberg Technology, for example, Garlinghouse ties Ripple's efforts to provide payments solutions with increased demand and higher prices, all enabled by XRP's fixed-supply model:

> *When Ripple uses XRP we're solving a payments problem. I believe that the more utility you draw, the more demand you're going to drive. And for most of these digital assets you have fixed supply. If you have fixed supply and increasing demand it's going to drive price up.*[23]

[22] Technically, a trace amount of XRP is destroyed as a fee in each transaction, which means that the total supply of XRP is currently decreasing at a very slow and negligible rate.
[23] YouTube. Ripple CEO Garlinghouse Sees Real Value in Bitcoin at 2:06. https://www.youtube.com/watch?v=akLQEacOT3w&t=126s. (2017).

In another statement to CNBC, Garlinghouse confirms Ripple's commitment to increasing the demand for XRP, stating, "We're driving velocity and demand of XRP."[24]

26. Potential purchasers of XRP would have understood the simple economics behind the message being promoted by Ripple on this subject: XRP, as designed, provided a mechanism for passive XRP owners to benefit financially from Ripple's success as a provider of financial service products built on the XRP Ledger,[25] as a developer of the XRP ecosystem, and as a driver of demand for XRP.

5.2 Alternative to Fixed-Supply Cap Model

27. The fixed-supply model used by XRP is the opposite of the fixed-price model of a fiat currency, such as U.S. Dollars, or a "stablecoin," which is a digital asset designed to maintain a pegged value against such a fiat currency. A stablecoin issuer takes active managerial steps to ensure that the available token supply grows or shrinks to match the demand and keeps the price stable over time. There are several significant advantages to using a fiat currency or a stablecoin for cross-border currency transfers.

28. First, the variable price of XRP means that two cross-asset trades are always required to conduct a single cross-border payment: one from the source currency to XRP, and one from XRP to the destination currency. Both of these exchange transactions incur possible fees and slippage, including from price spreads between what buyers and sellers are willing to bid and offer. However, when using a traditional cross-border payment system there is a single foreign exchange transaction, for example from U.S. Dollars to Mexican Pesos. This currency

[24] CNBC. Ripple is sitting on close to $80 billion and could cash out hundreds of millions per month — but it isn't (2016). https://www.cnbc.com/2018/01/16/why-ripple-is-not-cashing-out-its-xrp-holdings.html.
[25] Although some Ripple products did not use XRP, this report focuses on what Ripple communicated publicly, including its assertions that usage of its products by financial institutions would ultimately lead to greater demand for XRP. This is further discussed in Section 7.

exchange can be accomplished with a single trade on the interbank market for extremely low fees and slippage due to the deep liquidity in those markets.[26] Even a stablecoin solution only requires one trade between assets that fluctuate against one another such as a U.S. Dollar stablecoin and a Euro stablecoin. And, moving between U.S. Dollars and a U.S. Dollar stablecoin can be accomplished with no fees.[27] Ripple's CTO David Schwartz discussed this shortcoming of using XRP for cross-border payments in a post on XRP Chat on November 11, 2016: "So the last piece [referring to 'obstacles to using XRP for cross-border payments'] will be bringing the spreads down. To go from X [to] Y directly, you pay one spread. To go X [to] XRP [to] Y you pay two spreads."[28]

29. Second, anyone buying XRP to facilitate cross-border payments would have to bear the substantial price volatility of XRP.[29] These volatility-related costs could be large compared to the margins earned in the course of fulfilling remittance or cross-border payment transactions. In fact, banking regulators have determined that the volatility of non-stablecoin digital assets like XRP warrant the maximum possible risk weighting for the purpose of calculating capital requirements.[30] This outright gamble on the XRP price is not a desirable activity for traditional financial institutions or market makers with conservative balance sheets (meaning that those institutions prefer to avoid holding risky assets).

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[26] From January 3, 2007 to January 3, 2008, the daily realized bid-ask spread for USD to MXN was 0.0174%, and the daily realized bid-ask spread for USD to EUR was 0.0045%. *See* Journal of Banking and Finance. Order flow, bid-ask spread and trading density in foreign exchange markets at 600 (2012). https://www.sciencedirect.com/science/article/pii/S0378426611002603.

[27] Circle. Circle USDC Fee Schedule (2018). https://support.usdc.circle.com/hc/en-us/articles/360015471331.

[28] XRP Chat. Fortune's Poll about XRP, BTC & ETH at 2 (2016). https://www.xrpchat.com/topic/2409-fortunes-poll-about-xrp-btc-eth/page/2/.

[29] From January 1, 2018 to October 15, 2020, the average annualized volatility for XRP based on 1-month volatility was high at 65.1%. *See* Journal of Empirical Finance. Volatility Cascade in Cryptocurrency Trading at 252 (2021). https://www.sciencedirect.com/science/article/pii/S092753982100030X.

[30] The Basel Committee on Banking Regulation has recommended a 1,250% risk weighting for non-stablecoin digital assets such as XRP, meaning banks must retain additional capital to cover the full value of their XRP holdings. *See* Basel Committee on Banking Regulation. Prudential Treatment of Cryptoasset Exposures (2021).

5.3 Perspective of a Reasonable Purchaser with Respect to XRP's Fixed-Supply Model

31. The correlation between the success of the platform and price of the coin is fantastic for investment-oriented purchasers of XRP, but not for the purchasers who are exclusively interested in the utility use of the cross-border payment product. From the perspective of a reasonable investment-oriented purchasers, the fixed-supply and variable-price model provides a direct link between 1) the success of Ripple's efforts to build the XRP ecosystem and stimulate demand for XRP and 2) the financial performance of the purchaser's investment in XRP. From the perspective of a utility-oriented purchaser, as discussed above, the fixed-supply and variable price model of XRP presents significant disadvantages. Exchanging directly between two fiat currencies would alleviate all of these issues, and these shortcomings help to explain why ODL has been heavily subsidized by Ripple.

6. XRP Sale and Escrow Mechanics

6.1 Process to Sell on Open Markets Through Programmatic Sales

32. Ripple has engaged in sales of XRP into the open market to provide funding for the company. In a 2019 interview with the Financial Times, Garlinghouse acknowledged "[w]e would not be profitable or cash flow positive [without selling XRP]."[31] Ripple regularly reported the amount of its XRP sales in its quarterly market reports starting in 2017. These ongoing sales of XRP in part provided the necessary capital to build Ripple's products, grow the ecosystem and sign new partners, as described in more detail in Section 7.6.

[31] Financial Times. The art of redefining success, MoneyGram and Ripple edition (Updated) (2020). https://www.ft.com/content/3f2fb6bc-e17a-4179-a0a4-152a3e0db1d6.

33. Many of Ripple's XRP sales were "programmatic sales" executed by market makers that had partnered with Ripple, meaning that a third party was responsible for selling the XRP into the open market on behalf of Ripple using proprietary trading algorithms. For example, in its Q3 2017 market report Ripple announced that "the company sold $71.5 million worth of XRP programmatically as a small percentage of overall exchange volume."[32] The highest reported quarterly XRP programmatic sales totaled $251.51 million in Q2 2019[33], while the lowest reported figure was $1.75 million in Q1 2020.[34]

34. Selling large amounts of XRP – and increasing the supply of XRP to the market – has the potential to exert downward pressure on the price of XRP, and Ripple made sure to publicly mention that it conducted its programmatic sales in such a way as to minimize this effect. Ripple described the nature of its programmatic sales of XRP in the Q2 2019 XRP Markets Report:

> *"Ripple's programmatic XRP sales have been done with the goal of minimizing market impact. The company did this through limiting XRP programmatic sales to what it considers a small percentage of traded volume, which was executed across multiple exchanges."*[35]

35. As can been seen in the above excerpt, Ripple's programmatic sales of XRP were made to the public "across multiple exchanges." This means that Ripple did not limit its sales of XRP to the financial institutions that could be reasonably expected to use the ODL platform—to the contrary, based on the pseudonymous nature of the trading venues where XRP was sold to the public, Ripple likely did not know who its counterparties were in those XRP sales.

[32] Ripple. Q4 2017 XRP Markets Report (2018). https://ripple.com/insights/q4-2017-xrp-markets-report/.
[33] Ripple. Q2 2019 XRP Markets Report (2019). https://ripple.com/insights/q2-2019-xrp-markets-report/.
[34] Ripple. Q1 2020 XRP Markets Report (2020). https://ripple.com/xrp/q1-2020-xrp-markets-report/.
[35] Ripple. Q3 2019 XRP Markets Report (2019). https://ripple.com/insights/q3-2019-markets-report/.

6.2 Over-the-Counter Sales

36. In addition to the programmatic sales into the open market, Ripple reported direct over-the-counter (OTC) sales of XRP to outside organizations. The Q1 2017 XRP Markets Report describes the nature of these sales: "In Q1 market participants purchased $6.7MM directly from XRP II, LLC, Ripple's registered and licensed money service business (MSB). These buyers tend to be institutional in nature and their purchases include restrictions that help mitigate the risk of market instability due to large subsequent sales."[36]

37. There are two important things to note about these institutional purchases. First, at times they include sales restrictions that help mitigate the risk of downward price pressure due to large subsequent sales into the open market. Second, these purchases are significant because they signaled institutional interest in the XRP ecosystem which would be indicative of XRP's broader capital market potential. These points would appeal to an individual purchaser with a long-term investment mindset, and were repeatedly communicated by Ripple in the XRP Markets Reports.

6.3 Compensating Partners in XRP

38. Creating new partnerships with financial institutions was a key aspect of the bull case for XRP. Ripple's compensation to attract and maintain some of those partnerships was publicly known to be made in XRP.[37] Ripple's distributions of XRP to business partners were another mechanism (in addition to Ripple's sales of XRP described in the XRP Market Reports) by which Ripple effectively sold XRP into the broader XRP ecosystem.

[36] Ripple. Q1 2017 XRP Markets Report (2017). https://ripple.com/insights/q1-2017-xrp-markets-report/.
[37] Ripple. Ripple Rolls Out $300M RippleNet Accelerator Program to Grow Volume and XRP Utility (2017). https://ripple.com/insights/ripple-rolls-300m-ripplenet-accelerator-program-grow-volume-xrp-utility/.

39. MoneyGram regularly updated its investors in public filings to the U.S. Securities and Exchange Commission about the compensation it received from Ripple, and that the compensation was in the form of XRP payments. In a February 28, 2020, 10-K filing, MoneyGram said "In June 2019, we entered into a commercial agreement with Ripple to utilize Ripple's ODL platform (formerly known as xRapid), as well as XRP, to facilitate cross-border non-U.S. Dollar exchange settlements. The company is compensated by Ripple in XRP for developing and bringing liquidity to foreign exchange markets."[38] Another public filing issued by MoneyGram four days earlier specified that the value of this compensation in U.S. Dollars was $8.9 million during the fourth quarter of 2019.[39] MoneyGram also stated in an interview to TheBlock, a news site covering digital assets, that the XRP earned as compensation from Ripple was sold as soon as it was received.[40] Since Ripple gave XRP to MoneyGram, and MoneyGram sold that XRP to the open market via digital asset trading platforms, the overall effect of these XRP payments was to sell additional XRP into the open market in exchange for cash.

40. In addition to partnerships forged with financial institutions, some Ripple partnerships with other, non-financial, organizations were also completed by transferring XRP. Coil, a web platform allowing content creators to be compensated for their content through micropayments, received a grant of 1 billion XRP from Ripple that was worth approximately

[38] MoneyGram. Form 10-K 2019 Annual Report at 44 (2020). https://ir.moneygram.com/financials-and-filings/annual-reports.
[39] MoneyGram. Form 8-K Current Report Issued February 24, 2020 (2020). https://ir.moneygram.com/financials-and-filings/annual-reports.
[40] The Block. 'We sell XRP as soon as we receive it,' says MoneyGram on Ripple incentive payments (2020). https://www.theblockcrypto.com/daily/58860/we-sell-xrp-as-soon-as-we-receive-it-says-moneygram-on-ripple-incentive-payments.

$265 million at the time the grant was announced.[41] Coil's press release stated that the XRP would be "deployed towards driving adoption of XRP and the InterLedger Protocol."[42]

6.4 Escrow

41. In December 2017 Ripple created 55 escrow accounts, simply called "escrows" on the XRP blockchain. As described on the XRP Ledger Blog, each escrow held 1 billion XRP owned by Ripple, and exactly one escrow would release its stored XRP every month for the following 55 months.[43] This action effectively locked away 55% of the total supply of XRP and reduced the circulating float (meaning the amount of coins immediately available to be sold) of XRP.

42. Over the following years, Ripple continued to place a substantial amount of the coins back into new escrows as soon as they were released each month, and these actions were announced by Ripple and visible to the public. As of December 22, 2020, Ripple had replaced 29.2 billion XRP that were already released back into escrows again. In addition to the 19 billion XRP still remaining from the original creation of the escrows in 2017, this resulted in a total of 48.2 billion XRP locked in escrows on December 22, 2020.[44]

43. Although Ripple continued to sell XRP into the open market on a regular basis, this significant restriction of the XRP supply would have greatly encouraged potential investment-oriented purchasers of XRP to earn a speculative investment profit with their

[41] Coindesk. Ripple to Give Away 1 Billion XRP in Massive Bid to Fund Online Content (2019). https://www.coindesk.com/ripple-is-giving-away-1-billion-xrp-in-massive-bid-to-fund-online-content.
[42] PR Newswire. Ripple's XPring Makes 1 Billion XRP Grant to Drive XRP Adoption and Advance Coil's Monetized Platform for Creators (2019). https://www.prnewswire.com/news-releases/ripples-xpring-makes-1-billion-xrp-grant-to-drive-xrp-adoption-and-advance-coils-monetized-platform-for-creators-300902194.html.
[43] XRP Ledger Blog. An Explanation of Ripple's XRP Escrow (2017). https://ripple.com/insights/explanation-ripples-xrp-escrow/.
[44] XRParcade. Ripple Escrow: Unraveling the Mystery (2020). https://www.xrparcade.com/2020/03/02/ripple-escrow-unraveling-the-mystery/.

purchase. Indeed, when the escrow was announced, Ripple CEO Brad Garlinghouse wrote about how this would benefit "investors":

> *Today we are permanently removing that uncertainty by committing to place 55 billion XRP into a cryptographically-secured escrow account by the end of 2017. By securing the lion's share of our XRP, investors can now mathematically verify the maximum supply of XRP that can enter the market.*[45]

The reduced float would tend to increase the price of XRP, directly by reducing selling pressure and indirectly by assuring the public that there was an upper limit to how much XRP would be sold by Ripple on the open market through trading platforms in any given month going forward. Ripple's ongoing replacement of released XRP into new escrows reinforced the positive effect of this reduction in circulating supply by showing a commitment to keeping those coins away from trading platforms for even longer.

6.5 XRP Buyback Purchases Made by Ripple

44. At times Ripple communicated to the public that it would purchase XRP with open market transactions, an action that would effectively support the price of XRP. The fundraising activities described in Section 6.1 and Section 6.2 involved repeated sales of XRP, so it is noteworthy that Ripple also signaled to the market at times that it would do the opposite by purchasing XRP.

45. In the Q2 2020 XRP Markets Report Ripple announced buybacks with the following statement: "A healthy, orderly XRP market is required to minimize cost and risk for customers, and Ripple plays a responsible role in the liquidity process…Ripple has been a buyer in the secondary market and may continue to undertake purchases in the future at market prices."[46]

[45] Ripple. Ripple to Place 55 Billion XRP in Escrow to Ensure Certainty of Total XRP Supply (2017). https://ripple.com/insights/ripple-to-place-55-billion-xrp-in-escrow-to-ensure-certainty-into-total-xrp-supply/.
[46] Ripple. Q2 2020 XRP Markets Report (2020). https://ripple.com/insights/q2-2020-xrp-markets-report/.

46. The next quarterly report also included a description of Ripple's ongoing plans to purchase XRP. The section of the report called 'XRP Purchases' stated: "As indicated in the Q2 2020 XRP Markets Report, Ripple is purchasing – and may continue to purchase – XRP to support healthy markets."[47]

47. Ripple's buyback activity would increase demand for and therefore tend to increase the price of XRP and to instill confidence in other purchasers that Ripple will continue to support the price of the coin going forward, thereby helping to sustain an orderly secondary market for XRP. Although the buyback activity would not have mattered to purely utility-oriented purchasers of XRP, buybacks are very important signals for investment-oriented purchasers. Open market purchases, and the public communications about those purchases, alter the potential risk and reward of an investment in XRP by increasing buying pressure on the coin and by reducing the probability and severity of a possible crash in the price of XRP. Like the escrow accounts described in Section 6.3, the buyback activities executed by Ripple would also have the effect of reducing the effective float of the coin.

6.6 Perspective of a Reasonable Purchaser with Regards to Ripple's XRP Sales and Escrow

48. The manner and mechanism of Ripple's ongoing sales, distribution, escrow, and buybacks of XRP would have been extremely important to a potential investment-oriented purchaser of XRP for the following reasons: 1) the programmatic sales comprised an ongoing fundraising process that provided necessary capital for Ripple to develop the XRP ecosystem, as described further in Section 7.6 of this report; 2) the direct sales to business partners as well as XRP payments to companies like MoneyGram brought new financial institutions into the XRP

[47] Ripple. Q3 2020 XRP Markets Report (2020). https://ripple.com/insights/q3-2020-xrp-markets-report/.

ecosystem; 3) the lock-up provisions as well as the ongoing public escrow activities, both publicized by Ripple, amounted to public commitments to reduce the float of XRP and reduce the risk of significant selling pressure via XRP being dumped on markets; and 4) buybacks of XRP, first announced in 2020, by Ripple placed direct upward pressure on the price of XRP and reduced the float of XRP. All of these factors supported the bull case, and price, of XRP.

49. On the other hand, a reasonable purchaser of XRP that is exclusively considering the utility use of the coin would be less concerned with some of these heavily promoted sales and distribution mechanisms. For example, buybacks of XRP or an escrow mechanism to restrict the supply of XRP by more than half of the total supply do not benefit a purely utility-oriented purchaser. The announced resale lock-ups in general are similarly neutral for this category of purchaser, and would actually be a negative factor for the particular institutional holders of XRP who are subject to the lock-ups and face constraints on their ability to sell XRP. The one aspect of Ripple's distribution of XRP that unequivocally benefits a purchaser of XRP for cross-border payments was the existence of direct XRP subsidy payments to such purchasers, e.g., MoneyGram, to incentivize their use of XRP and Ripple products.

7. Ripple Communications and Promotional Statements

7.1 Promotional Factors Considered by an Investment-Oriented Purchaser

50. Based on my experience as an investor in digital assets as well as my close observation of the digital asset space, I believe that a reasonable investment-oriented purchaser of XRP would consider at least the following factors when purchasing XRP: 1) an explanation of the investment bull case for the digital asset, i.e. an explanation of the company's own view about why its digital asset will increase in value over time; 2) announcements of any important strategic partnerships; 3) descriptions of the qualifications of the team members who will

develop and manage the project; 4) the target addressable market for the platform or product; 5) plans for the use of funds being raised; and 6) plans to provide a liquid trading market for the digital asset. Ripple communicated about each of these topics extensively in public venues, which in my opinion had the effect of generating significant investor interest in purchasing XRP.[48]

51. This section considers, from the perspective of a reasonable investment-oriented purchaser of XRP, public statements made by Ripple. Ripple made public statements across various platforms, ranging from its own website, social media platforms, finance and digital asset news sites, and investor forums. Ripple's election to communicate with the public on this last venue – investor-oriented forums – suggests that Ripple targeted its communications to potential purchasers who were considering purchasing XRP as an investment. Such forums include:

- The 2018 Yahoo Finance All Markets Summit: Crypto, promoted as an event to "examine the growing market and investor interest in cryptocurrencies…[and] discuss crypto investing with CEOs, engineers, policy makers and legal experts."[49] For this event, Ripple CEO Brad Garlinghouse was a highly anticipated speaker on the topic: "Beyond Bitcoin: Ripple and $XRP."[50]
- The 2017 CoinDesk Consensus: Invest conference, billed as "the world's first digital asset investor outlook event…[which] offers attendees the chance to get connected with

[48] Although these topics are of particular interest to purchasers of digital assets, this list is not exhaustive. Due to the presence of other factors in purchasing decisions, addressing these points does not guarantee an increase in price. Supply and demand, and therefore the prices, of speculative assets are driven by many complicated factors beyond the scope of this report.
[49] Yahoo Finance All Markets Summit: Crypto, February 7, 2018. https://www.yahoo.com/news/yahoo-finance-markets-summit-crypto-february-7-2018-223531903.html.
[50] *ibid*. Also, when Garlinghouse was introduced by the Yahoo Finance interviewer, "Brad here today is the CEO of Ripple. This is a company that has surely been at lot in the news recently. I have to say just anecdotally that as we've gone through this day and seen a lot of great speakers, a lot of terrific panelists, everyone keeps stopping me and asking, when's Garlinghouse, when's Garlinghouse?"

how to invest, store, trade and judge value in this new asset class."[51] Ripple's Head of XRP Markets, Miguel Vias, spoke at this event and when asked what advice he had for investors looking to "incorporate some crypto into their portfolio," he encouraged the audience to consider digital assets where "the use case makes sense" and follows that by explaining the case for Ripple and XRP: "One of the reasons I joined Ripple is the XRP use case made a ton of sense to me…So for me it was simple – utility will drive value eventually to this because there's a company behind it that's pushing a particular use case and it makes sense."[52]

- The 2020 Barron's Cryptocurrency Investors' Forum, which featured "essential conversations around the state and future of digital currency, and how to approach investing in this asset class."[53] At this forum, Ripple VP of Global Institutional Markets Breanne Madigan spoke on the panel, "Weighting Crypto in a Portfolio," and, similarly to Vias, suggested that investors seeking to enter to digital asset markets consider XRP.[54]
- Online forums specifically discussing the investment use case for XRP. Ripple CTO David Schwartz participated in several of these forums, including the "[XRP] Ripple Speculation Thread" on BitcoinTalk.com,[55] the "XRP Trading and Speculation" discussion forum on XRPChat.com,[56] and multiple Q&A posts on Quora.com where he directly answered questions regarding the investment case for XRP.[57] For example, on

[51] Consensus: Invest, November 28, 2017. https://events.bizzabo.com/consensusinvest.
[52] YouTube. Trade Desk: Advancing the Asset. https://youtu.be/jdFuiRVNUoM?t=2120 (2017).
[53] The Cryptocurrency Investor Forum, December 3, 2020. https://barronscustomevents.com/grayscale.
[54] Video interview of Breanne Madigan with Barron's and Grayscale Investments' "The Cryptocurrency Investor Forum" on December 3, 2020. *See* https://barronscustomevents.com/grayscale from 1:46:09 to 1:47:52.
[55] Examples include: https://bitcointalk.org/index.php?topic=1381669.msg18859629#msg18859629 and https://bitcointalk.org/index.php?topic=1381669.msg19787105#msg19787105.
[56] An example is provide in the subsequent Section.
[57] Examples include: https://www.quora.com/If-banks-use-Ripple-for-payments-but-don-t-need-to-buy-XRP-then-who-will-buy-XRP-and-why-will-its-price-increase-Does-it-make-any-sense-to-invest-in-XRP,

> Quora a potential investor in XRP asks, "If banks use Ripple for payments but don't need to buy XRP, then who will buy XRP and why will its price increase? Does it make any sense to invest in XRP?" Schwartz answers by describing how Ripple's strategy of building a payment system for financial institutions will increase the demand for XRP, which as described in Section 5.1 would increase the price of XRP. He writes, "If we're successful with this strategy, and XRP is used as a settlement currency for some fraction of RippleNet payments, that could set up sources of demand for XRP...That's just one way adoption of XRP as a settlement asset could cause significant increases in demand for holding XRP."[58]

52. Ripple's Insights blog, of which many posts are discussed in this section, was also directed, in part, towards purchasers considering XRP as an investment. In fact, on multiple occasions Ripple specifically refers to potential purchasers of XRP as an "investor" or "investors".[59] For example, in a post from October 2017 titled, "10 Things You Need to Know About XRP", Ripple lists reasons why XRP should be attractive relative to other digital assets such as "XRP is the most scalable digital asset", "XRP is the best digital asset for payments" and "XRP scales faster than Bitcoin."[60] Ripple ends the list with "10. It's easy to buy" and then

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https://www.quora.com/Are-those-who-invested-in-XRP-in-possible-danger-of-losing-their-investments-as-Ripple-does-not-extend-exclusivity-to-XRP-on-its-network and https://www.quora.com/If-a-large-amount-of-banks-were-to-adopt-xrapid-and-started-using-xrp-how-would-that-impact-the-tokens-value.

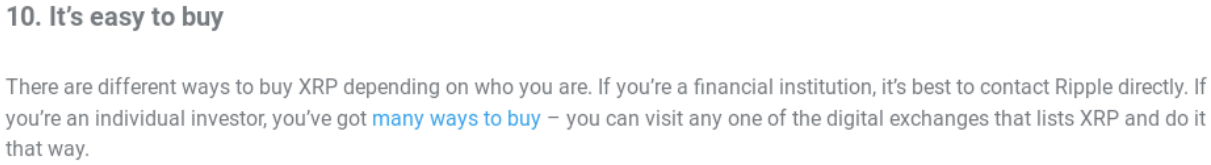
[58] Quora Post: If banks use Ripple for payments but don't need to buy XRP, then who will buy XRP and why will its price increase? Does it make any sense to invest in XRP?" https://www.quora.com/If-banks-use-Ripple-for-payments-but-don-t-need-to-buy-XRP-then-who-will-buy-XRP-and-why-will-its-price-increase-Does-it-make-any-sense-to-invest-in-XRP.

[59] In addition to the following example, see also https://ripple.com/insights/ripple-to-place-55-billion-xrp-in-escrow-to-ensure-certainty-into-total-xrp-supply/ (announcement of 55 billion XRP escrow by Garlinghouse) and https://ripple.com/insights/bitstamp-now-trading-xrp/ (quotation from Miguel Vias, Head of XRP Markets at Ripple), both referenced in my report.

[60] Ripple. 10 Things You Need to Know about XRP (2017). https://ripple.com/insights/10-things-need-know-xrp/.

specifically addresses "individual investor[s]", as seen in Figure 5,[61] providing a link that directed to a Ripple webpage[62] with a guide on where to purchase XRP.

Figure 5. Screenshot from Ripple's Insights Blog Post, "10 Things You Need to Know About XRP"



7.2 Ripple Communications on the Investment Use Case

53. Ripple executives made statements linking the company's efforts to increases in the price of XRP. As such, Ripple's public statements reflected its view that XRP would make a good investment if Ripple succeeded in its vision to use XRP to disrupt the global payments system. Such communications would have appealed to potential purchasers who were interested in XRP as an investment.

54. Ripple executives made public statements on the XRP Chat online platform. XRP Chat is a social media website and one of the leading forums for discussion about XRP and Ripple. The most popular forum, by number of posts, on XRP Chat is the "XRP Trading and Price Speculation" forum which currently has over 200,000 posts discussing issues related to the trading and investment case for XRP, as noted in its sub-header: "Speculation about trading and price of XRP. Technical trading tips, fundamental analysis."[63]

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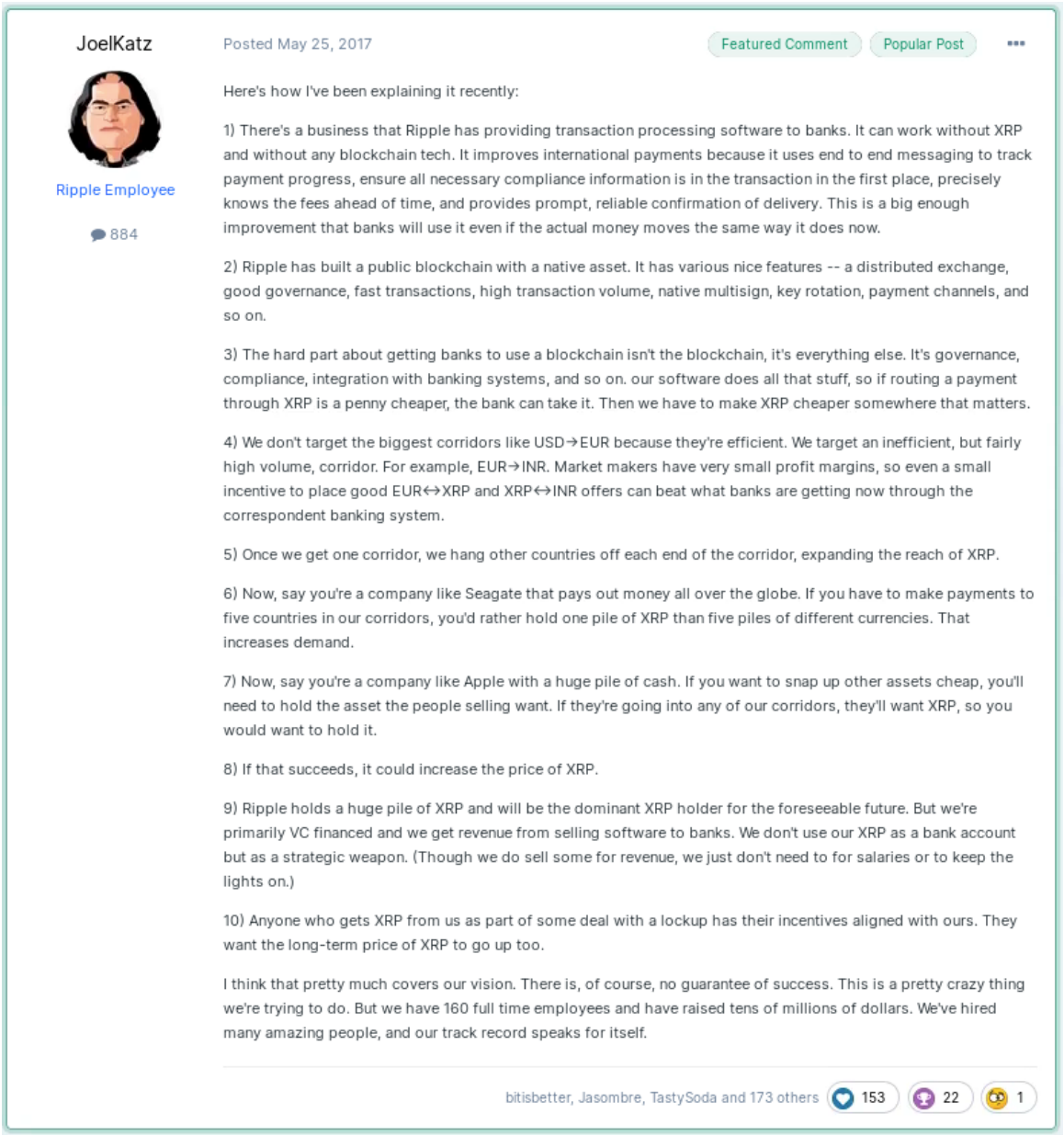
[61] *ibid*.
[62] Ripple. XRP Buying Guide (2017). Archived version available at: https://web.archive.org/web/20171211225351/https://ripple.com/xrp/buy-xrp/.
[63] *See* https://www.xrpchat.com/ and https://www.xrpchat.com/forum/17-xrp-trading-and-price-speculation/, accessed on August 18, 2021. The sub-header of the forum, "Speculation about trading and price of XRP. Technical trading tips, fundamental analysis," points to the trading and investment use case of XRP. "Fundamental analysis" is the analysis of a company's inherent business and financial model as pertains to its value and growth potential; in the context of this forum on XRP Chat and as seen in the proceeding example, this includes discussions about Ripple's business model and its effect on the price of XRP.

55. On this forum, user "Vertigo2131" initiated a post titled, "Valuation Models - XRP The Digital Currency Vs. Ripple the Company" and asks how Ripple's success might impact the valuation of XRP.[64] In response, David Schwartz, Ripple's CTO representing himself as a "Ripple employee" and writing under his publicly known pseudonym "Joel Katz",[65] provides a detailed, step-by-step response (Figure 6) explaining how the success of Ripple's business model would translate into higher demand for XRP and thus higher XRP prices for those holding XRP as a speculative asset.

[64] XRP Chat. Valuation Models – XRP The Digital Currency Vs. Ripple the Company (2017). https://www.xrpchat.com/topic/5280-valuation-models-xrp-the-digital-currency-vs-ripple-the-company/.
[65] Schwartz's Twitter profile (@JoelKatz) around the time of his engagement with this post contained the following information: "David Schwartz @JoelKatz Improving global settlement with blockchain tech. Chief Cryptographer at Ripple; one of the original architects of the XRP network." *See.* https://web.archive.org/web/20170616010746if_/https://twitter.com/JoelKatz.

Figure 6. David Schwartz's Response to Question Regarding the Impact of Ripple on XRP's Valuation.



JoelKatz

Ripple Employee

884

Posted May 25, 2017

Featured Comment | Popular Post

Here's how I've been explaining it recently:

1) There's a business that Ripple has providing transaction processing software to banks. It can work without XRP and without any blockchain tech. It improves international payments because it uses end to end messaging to track payment progress, ensure all necessary compliance information is in the transaction in the first place, precisely knows the fees ahead of time, and provides prompt, reliable confirmation of delivery. This is a big enough improvement that banks will use it even if the actual money moves the same way it does now.

2) Ripple has built a public blockchain with a native asset. It has various nice features -- a distributed exchange, good governance, fast transactions, high transaction volume, native multisign, key rotation, payment channels, and so on.

3) The hard part about getting banks to use a blockchain isn't the blockchain, it's everything else. It's governance, compliance, integration with banking systems, and so on. our software does all that stuff, so if routing a payment through XRP is a penny cheaper, the bank can take it. Then we have to make XRP cheaper somewhere that matters.

4) We don't target the biggest corridors like USD→EUR because they're efficient. We target an inefficient, but fairly high volume, corridor. For example, EUR→INR. Market makers have very small profit margins, so even a small incentive to place good EUR↔XRP and XRP↔INR offers can beat what banks are getting now through the correspondent banking system.

5) Once we get one corridor, we hang other countries off each end of the corridor, expanding the reach of XRP.

6) Now, say you're a company like Seagate that pays out money all over the globe. If you have to make payments to five countries in our corridors, you'd rather hold one pile of XRP than five piles of different currencies. That increases demand.

7) Now, say you're a company like Apple with a huge pile of cash. If you want to snap up other assets cheap, you'll need to hold the asset the people selling want. If they're going into any of our corridors, they'll want XRP, so you would want to hold it.

8) If that succeeds, it could increase the price of XRP.

9) Ripple holds a huge pile of XRP and will be the dominant XRP holder for the foreseeable future. But we're primarily VC financed and we get revenue from selling software to banks. We don't use our XRP as a bank account but as a strategic weapon. (Though we do sell some for revenue, we just don't need to for salaries or to keep the lights on.)

10) Anyone who gets XRP from us as part of some deal with a lockup has their incentives aligned with ours. They want the long-term price of XRP to go up too.

I think that pretty much covers our vision. There is, of course, no guarantee of success. This is a pretty crazy thing we're trying to do. But we have 160 full time employees and have raised tens of millions of dollars. We've hired many amazing people, and our track record speaks for itself.

bitisbetter, Jasombre, TastySoda and 173 others 153 22 1

56. In public statements, Garlinghouse has also made the case that Ripple's successful efforts could translate into higher XRP prices. For example, when the price of XRP increased dramatically in March and early April 2017, Garlinghouse attributed XRP's large price increase to Ripple's efforts. In a public statement on Coindesk, one of the leading digital asset news sites,

Garlinghouse commented, "We have had a significant rally in XRP prices, but it is reflective of a lot of work we have done to make Ripple a very compelling solution."[66] Later in the same article he even more strongly linked Ripple's actions to XRP's success: "One of the big differences between XRP and many other digital currencies is that we are solving a real-world problems for banks and providing ROI. This has been giving us credibility in the broader cryptocurrency space. [emphasis added]"[67]

57. Garlinghouse at times emphasized that Ripple's success would be measured by the long-term rise in price of XRP rather than simply short-term price swings. On multiple occasions, he conveyed this point using similar language as he used in an interview at the 2018 Yahoo Finance summit for digital asset investors:

> *"I'll tell you the exact same thing I tell people inside the company: The price of XRP over three hours, over three days, over three weeks, or even three months, that is not success. That's not how I measure success. I think about success over the next three to five years."*[68]

58. Garlinghouse similarly connects the success of Ripple's efforts to the price of XRP in a press conference where he is asked whether, given that it is possible that banks can implement RippleNet without having to use XRP, "the expansion or growth of RippleNet is not correlated to the value or the price of XRP?"[69] In response, Garlinghouse answers, "I actually think they're very correlated," and explains how partnering with such banks provides the

[66] Coindesk. Use or Speculation: What's Driving Ripple's Price to All-Time Highs? (2017). https://www.coindesk.com/use-or-speculation-whats-driving-ripples-price-to-all-time-highs.
[67] *ibid*.
[68] Yahoo Finance. Ripple CEO Brad Garlinghouse: 'There's a lot of FUD about XRP' (2018). https://www.yahoo.com/news/ripple-ceo-brad-garlinghouse-theres-lot-fud-xrp-181425025.html.
[69] YouTube. Ripple CEO Brad Garlinghouse Korea Reporter Meeting. https://youtu.be/JOAuXEYu9Pg?t=1837 (2018).

opportunity for Ripple to cross-sell its XRP payments solution, xRapid, thereby necessitating the use of XRP at those banks.[70]

59. Ripple's quarterly XRP Markets Reports also linked the success of its banking partnerships with the increase in the price of XRP. The reports, many written by Miguel Vias, Head of XRP Markets, also more broadly linked Ripple's efforts to the price of XRP. For example, in the wake of XRP's large price increase in Q2 2017, the XRP Markets Report listed four Ripple initiatives that "clearly contributed to XRP's incredible second quarter" and were "instrumental in helping to drive XRP interest," including partnerships with financial institutions and the escrows previously described in Section 6.4.[71] Vias again highlighted Ripple's instrumental role in causing the price of XRP to increase when he was quoted in an article by CoinTelegraph, a digital asset news site, about the surge in XRP prices at the end of Q2 2017:

> *"While the recent surge in XRP is certainly influenced by Bitcoin's scalability issues, much of the recent momentum is due to the announcement that MUFG [the world's third largest bank according to Ripple][72] joined Ripple's steering group, GPSG. Unlike other digital assets, XRP has a clear use case and people are beginning to recognize that."*[73]

60. Finally, in an interview with a finance and technology news site in 2014, Larsen also publicly communicated that Ripple "created a lot of value in XRP."[74] While describing how Ripple would develop the XRP ecosystem, Larsen connected Ripple's efforts to the increased value of XRP, stating, "All we're concerned about is trust, utility and liquidity, grow the network, that will actually be the best thing for the value of XRP."[75] Later in the interview, when

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[70] *ibid*.
[71] Ripple. Q2 2017 XRP Markets Report (2017). https://ripple.com/insights/q2-2017-xrp-markets-report/.
[72] Ripple. MUFG Joins Ripple's Global Payments Steering Group (2017). https://ripple.com/insights/mufg-joins-ripples-global-payments-steering-group.
[73] CoinTelegraph. Ripple Price Surge Continues, Altcoin Takes Advantage Of Bitcoin Scaling Troubles (2017). https://cointelegraph.com/news/ripple-price-surge-continues-altcoin-takes-advantage-of-bitcoin-scaling-troubles.
[74] YouTube. Chris Larsen discusses Ripple. https://youtu.be/_SpdX36p6ao?t=827 (2014).
[75] YouTube. Chris Larsen discusses Ripple. https://youtu.be/_SpdX36p6ao&t=1376s (2014).

asked, why people should trust Ripple if it "controls the disbursement of the Ripple [referring to XRP] and could potentially modify the money supply [of XRP]", Larsen emphasized that Ripple is focused on increasing the value of XRP:

> *"For those that are skeptical I would just say it's a different approach. Give us time, hopefully we'll earn their trust over time that we're doing this in a way that adds the most value to the protocol. At the end of the day that's all that matters and you know we're constantly learning we're constantly trying to maximize how we do that but we think it actually could be a real strength in making sure that things are being done to just add as much you know kind of partnerships and value as we possibly can to the protocol."*[76]

7.3 Ripple Communications on Partnership Milestones

61. One of the key aspects for evaluating whether a company or project has a viable business model is whether it has "traction", i.e., to what extent is there is "product/market-fit" where actual customers have signed up to use the company's product or service such as to demonstrate that it solves a real problem.[77] In the case of Ripple, whose stated core business model is to provide "financial institutions" with "the most advanced blockchain technology for global payments,"[78] showing traction meant needing to demonstrate that financial institutions were signing up to partner with Ripple for its payment solutions.[79] As such, Ripple made it a point to publicly announce and feature its partnerships with financial institutions, as well as connect those partnerships with the success of its business model. Ripple also publicly connected the success of its partnerships with the increased demand for and value of XRP, even though

[76] YouTube. Chris Larsen discusses Ripple. https://youtu.be/_SpdX36p6ao?t=1493 (2014).
[77] See, for example, the discussion on the importance of "traction" and "product/market fit" to investors by Steve Blank, a leading expert on technology startups and an adjunct professor at Stanford: https://steveblank.com/raising-money/.
[78] Ripple. https://ripple.com (2021). Accessed on August 18, 2021.
[79] Although some of these partnerships involved Ripple products that did not use XRP, this report focuses on what Ripple communicated publicly, including its assertions that usage of its products by financial institutions would ultimately lead to greater demand for XRP. This is further discussed in the remainder of this section.

some of these partnerships at the time did not involve the use of XRP. This section focuses primarily on Ripple's announcements regarding these financial institution partnerships.

62. In Ripple's 2014 Year in Review, Ripple listed one of its key achievements as having "refined market fit and gained traction."[80] In the section of the report describing this traction, Ripple highlighted its partnerships with Fidor Bank, its first banking partner, and with Cross River and CBW Bank, the first U.S. Banks to partner with Ripple.[81] Ripple publicly touted its subsequent partnerships with financial institutions through press releases and posts on its Insights blog. Ripple's notable milestones, e.g., reaching 100 financial institution partners, were also prominently announced.[82]

63. Ripple's quarterly XRP Markets Reports frequently highlighted new banking partnerships and at times also touted their positive impact on the price of XRP. For example, the Q1 2017 XRP Markets Report provided reasons for the large increase in the price of XRP at the end of March 2017 and noted as a "particularly important" development that Ripple signed partnerships with "MUFG, the world's third largest bank, 47 banks in Japan and [expanded] into the Middle East and India through NBAD [National Bank of Abu Dhabi] and Axis Bank."[83] The report clearly connected Ripple's growing bank partnerships to increased demand for XRP, which would increase XRP's value:

> *Markets are clearly connecting the dots that banks which join the Ripple network today are prospective users of XRP liquidity in the future. Growing bank membership of the Ripple network creates opportunities for Ripple to deepen*

[80] Ripple. Ripple Labs 2014: A Year in Review (2014). https://ripple.com/insights/views/ripple-labs-2014-a-year-in-review/.
[81] *ibid*.
[82] Ripple. RippleNet Grows to More Than 100 Financial Institutions (2017). https://ripple.com/insights/ripplenet-grows-to-over-100-financial-institutions/.
[83] Ripple. Q1 2017 XRP Markets Report (2017). https://ripple.com/insights/q1-2017-xrp-markets-report/.

> *those customer relationships and cross-sell liquidity solutions built on XRP, all of which should be beneficial to the asset.*[84]

64. Then, against the backdrop of another large increase in the price of XRP in Q4 2017, that quarter's XRP Markets Report again connected the XRP price increase with new banking partnerships and also directly mentioned that these partnerships were important "milestones" for potential purchasers of XRP:

> *In late Q4, XRP markets began to connect the dots once again. Of particular importance were the American Express/Santander partnership announcement, the activation of escrow and the connection of Korean banks to the Japan Bank Consortium… each one of these client milestones increases the probability that institutions will eventually use XRP and xRapid to take advantage of more efficient liquidity, just like Cuallix does today. As digital asset markets grow and evolve, newer market participants will continue to look to milestones such as these to gauge XRP's potential.*[85]

65. Another type of partnership that would have appealed to a purchaser interested in the investment use case for XRP was solidified by an agreement between Ripple and a provider of retirement investment accounts. Ripple announced that purchasers could buy XRP through Bitcoin IRA's retirement accounts.[86] Bitcoin IRA is a trading platform that enables users to purchase digital assets using a tax-advantaged retirement account. The only possible use case for a purchaser buying XRP on Bitcoin IRA would be for the purpose of making an investment (not to make cross-border payments). And, when joint statements from Ripple and Bitcoin IRA were released on the date of the announcement, Ripple underscored how its partnerships with financial institutions would increase the ownership of XRP and make XRP compelling to "forward thinking" individuals looking to purchase XRP using a retirement account:

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[84] *ibid*.
[85] Ripple. Q4 2017 XRP Markets Report (2018). https://ripple.com/insights/q4-2017-xrp-markets-report/.
[86] Ripple. It's Never Been Easier to Access and Store XRP (2017). https://ripple.com/insights/its-never-been-easier-to-access-and-store-xrp/.

> *As institutional adoption of Ripple's enterprise blockchain solution has grown, people increasingly understand the future opportunity for banks, payment providers and other institutions to use XRP as an on- demand liquidity solution for cross-border payments. Bitcoin IRA, Kingdom Trust and BitGo offer a forward-thinking way for individuals in the U.S. to access and store XRP.*[87]

7.4 Ripple Communications on Qualifications of Team Members

66. The quality of a project's team is of paramount importance to a reasonable purchaser in the digital asset space, who wants to know whether the team associated with the coin is able to deliver with respect to the vision outlined by the team behind the coin or project. Ripple publicly announced new team members' roles and highlighted how they would help develop the XRP ecosystem and increase demand for XRP.

67. Shortly after Ripple hired Phil Rapoport, Director of Markets and Trading, it published a post interviewing him and connecting his role with attracting traders to the XRP ecosystem. After discussing Rapoport's background from Columbia University and Goldman Sachs, the interview shifts to Rapoport's role which would involve "thinking a lot about market structure and macroeconomic questions that might arise in the future, and making sure that the Ripple ecosystem feels welcoming for traders and finance professionals."[88] When asked, "Why should traders get involved in Ripple now?" Rapoport replies that "the investment [in XRP] has barely even started. This is going to be a tremendous opportunity from many angles and a theme you'll want to be close to."[89]

68. Similarly, when Miguel Vias, the head of Ripple's XRP markets team was hired, Ripple published a post on its blog, stating, "In his new role, Vias will utilize his considerable

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[87] *ibid.*
[88] Ripple. Interview with Phil Rapoport, Director of Markets and Trading at Ripple Labs (2013). https://ripple.com/insights/interview-with-phil-rapoport-director-of-markets-and-trading-2/.
[89] *ibid*.

expertise building liquidity for new financial products by working with market makers, traders, investors and exchanges to strengthen the XRP markets and set the stage for large-scale institutional adoption."[90] Ripple highlighted Vias' background as a former executive of CME Group, a large derivatives exchange, and connected how his background would help drive greater adoption and demand for XRP, with Vias stating, "My experience in OTC markets and at an exchange will aid in charting a path toward wholesale XRP adoption."[91]

69. When Ripple added Zoe Cruz to its board of directors it also connected her industry background, including as an executive from Morgan Stanley and founder of an investment management firm, with growing the usage of and demand for XRP. [92] On Ripple's Insights blog, Garlinghouse is quoted as saying, "With her 35 years of experience in finance and foreign exchange, Zoe will offer us a unique perspective and invaluable guidance on how to accelerate RippleNet growth and XRP usage across the network globally."[93]

70. Ripple also touted the technical credentials of its team and how its engineers were building a superior blockchain that is faster and more scalable than others. When a group including several engineers was hired in 2014, Ripple highlighted its "world class team of cryptographers, security experts, distributed network developers, Silicon Valley, and Wall Street veterans."[94] That year, Ripple also announced the hiring of a "C++ Guru" who would work on "rippled", the codebase of the XRP Ledger protocol software.[95] In later blog posts, Ripple

[90] Ripple. CME Group Executive Miguel Vias Joins Ripple (2016). https://ripple.com/insights/cme-group-executive-miguel-vias-joins-ripple/.
[91] *ibid*.
[92] Ripple. Zoe Cruz Joins Ripple's Board of Directors (2017). https://ripple.com/insights/zoe-cruz-joins-ripples-board-directors/.
[93] *ibid*.
[94] Ripple. Welcome Abiy, Peter, Mark, Yong-Soo, and Tom to Ripple Labs (2014). https://ripple.com/insights/welcome-abiy-peter-mark-tushar-yong-soo-and-tom-to-ripple-labs/.
[95] Ripple. Ripple Labs Welcomes C++ Guru Howard Hinnant (2014). https://ripple.com/insights/ripple-labs-welcomes-c-guru-howard-hinnant/.

highlighted its team's "engineering practices" and "continued efforts to scale the performance of the XRP Ledger", including efforts that enabled Ripple to regard itself as "The Most (Demonstrably) Scalable Blockchain."[96] Moreover, Ripple claimed that XRP was "The Best Digital Asset for Payments" because "When you line up the top digital assets for these attributes [speed, cost, and scalability], it's clear that XRP is the winner."[97]

71. The impressive credentials and capabilities of new additions to Ripple's management team, along with public statements by Ripple executives about the how the new team members would likely advance the adoption of Ripple products, XRP, and the XRP Ledger, would have provided a basis for confidence to a potential purchaser of XRP that Ripple could execute its strategy and ultimately grow the demand for XRP.

7.5 Ripple Communications on Platform Growth Projections

72. The size of a company's target addressable market is an important consideration for investors evaluating the growth potential and value of early-stage companies such as Ripple. Investors want to know whether a given company solves a big enough problem that is related to a large market of potential customers. When discussing both Ripple's potential growth and XRP's potential value, Ripple executives often touted how Ripple was solving a problem in the multi-trillion-dollar payments industry and thus would create a lot of value for XRP.

73. In an interview as part of "The Cryptocurrency Investor Forum," Breanne Madigan, Ripple's former Head of Global Institutional Markets, described how XRP would benefit from its large addressable market:

[96] Ripple. The Most (Demonstrably) Scalable Blockchain (2017). https://ripple.com/insights/demonstrably-scalable-blockchain/.
[97] Ripple. How XRP Stacks Up Against Other Digital Assets (2017). https://ripple.com/xrp/xrp-stacks-digital-assets/.

> *"So for people who are newer coming in, take a look at a few individual crypto assets. Understand their utility, their core value proposition, what problem are they solving. Look at the total addressable market there. For example, in payments because of trapped capital, there's trillions and trillions of dollars of market opportunity that XRP as a digital asset is solving for. So that's a huge addressable market. So there you would see a driver for value creation.*[98]

74. When asked about the nature of the large increase in the price of XRP in 2017 at the 2018 Yahoo Finance summit, Garlinghouse similarly tied the growth potential of XRP to Ripple's large addressable market:

> *"We're solving a problem measured in the trillions of dollars and if we can, if we can activate that asset, if we can make global commerce more efficient there's an opportunity to drive a lot of velocity, a lot of demand, and a lot of volume across XRP. We are just at the starting line."*[99]

In another interview, Garlinghouse also tied his optimism regarding the long-term price of XRP to Ripple's large addressable market:

> *The price of XRP will take care of itself over a three to five year period.* ***We're building something that I think can transform a multi-trillion-dollar problem around how liquidity is managed.*** *If we are successful in doing that, I am very optimistic about the future. [emphasis added]*[100]

75. Ripple's Insights blog also frequently alluded to Ripple's multi-trillion-dollar addressable market. For example, a 2017 article presenting Ripple's vision described how the "$180 trillion worth of cross-border payments made every year, with a combined cost of more than $1.7 trillion a year" could be addressed through Ripple's vision for the "Internet of value."[101] In another article featuring a report by McKinsey & Company on the global payments

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[98] Video interview of Breanne Madigan with Barron's and Grayscale Investments' "The Cryptocurrency Investor Forum" on December 3, 2020. *See* https://barronscustomevents.com/grayscale starting at 1:47:22.
[99] Video interview of Brad Garlinghouse at the Yahoo Finance All Markets Summit: Crypto at 9:06. February 9, 2018. https://finance.yahoo.com/news/ripple-ceo-brad-garlinghouse-theres-lot-fud-xrp-181425025.html.
[100] YouTube. Ripple CEO Brad Garlinghouse Korea Reporter Meeting. https://youtu.be/JOAuXEYu9Pg?t=1984 (2018).
[101] Ripple. The Internet of Value: What It Means and How It Benefits Everyone (2017). https://ripple.com/insights/the-internet-of-value-what-it-means-and-how-it-benefits-everyone/.

market, Ripple made it a point to emphasize how "**payments offer $135 trillion in flows, bringing in $240 billion** in revenue [emphasis added by Ripple]" and discussed how banks were starting "to accept distributed ledger technology for commercial solutions."[102]

7.6 Ripple Communications on Use of Funds and Development Plans

76. When investment-oriented purchasers evaluate a company or project as a potential investment, they want to understand how the funds collected will be deployed by management to grow the venture. Ripple publicly described how it would use XRP sales, whether directly through programmatic or over-the-counter sales, or indirectly through compensating partners with XRP (see Sections 6.1, 6.2, and 6.3), to develop the XRP ecosystem and ultimately add value to XRP.

77. The Q1 2018 XRP Markets Report describes how Ripple would use funds released from the escrow "in a variety of ways to help invest in the XRP ecosystem."[103] Similar language was used in many subsequent reports, sometimes with more detail on how funds from sales of XRP released from the escrow would be used by Ripple:

- "used in a variety of ways to help support the XRP ecosystem." (Q2 2018, Q3, 2018, Q1 2019)[104]
- "used in a variety of ways to help support the XRP ecosystem, including the RippleNet Accelerator Program and Xpring investments like Securitize." (Q4 2018)[105]

[102] Ripple. McKinsey: Corporates Need Faster Payments, Too (2016). https://ripple.com/insights/mckinsey-corporates-need-faster-payments/.
[103] Ripple. Q1 2018 XRP Markets Report (2018). https://ripple.com/insights/q1-2018-xrp-markets-report/.
[104] Ripple. Q2 2018 XRP Markets Report (2018), Ripple. Q3 2018 XRP Markets Report (2018), Ripple. Q1 2019 XRP Markets Report (2019). https://ripple.com/insights/q2-2018-xrp-markets-report/, https://ripple.com/insights/q3-2018-xrp-markets-report/, https://ripple.com/insights/q1-2019-xrp-markets-report/.
[105] Ripple. Q4 2018 XRP Markets Report (2019). https://ripple.com/insights/q4-2018-xrp-markets-report/.

- "used in a variety of ways to develop use cases for XRP, including Xpring initiatives and RippleNet partnerships (such as MoneyGram)." (Q2 2019)[106]

As seen above, Ripple communicated that it used XRP to fund the development of the "XRP ecosystem." This includes the RippleNet Accelerator Program, which sought to drive adoption among financial institutions by offering volume rebates and marketing incentives.[107] In particular, Ripple spent millions of dollars to incentivize and subsidize MoneyGram to use its ODL product.[108]

78. Another key use of funds from XRP sales is to increase the liquidity of the trading market for XRP. According to Ripple's website, "Since 2012, Ripple has methodically sold XRP and used it to incentivize market maker activity to increase XRP liquidity and strengthen the overall health of XRP markets."[109] More specifically, Ripple has stated that it uses XRP to provide "incentives to market makers who offer tighter spreads for payments."[110] These incentives are critically important because, as described in Section 5.2, tight spreads are a prerequisite for Ripple's ODL solution to be economically viable for cross-border payments by financial institutions.

79. On other forums, Ripple's executives also communicated that the proceeds of Ripple's XRP sales would be used by Ripple to grow the adoption of XRP and develop the XRP ecosystem. On XRP Chat, David Schwartz (CTO) referred to Ripple's "large stash of XRP" as a

[106] Ripple. Q2 2019 XRP Markets Report (2019). https://ripple.com/insights/q2-2019-xrp-markets-report/.
[107] Ripple. Ripple Rolls Out $300M RippleNet Accelerator Program to Grow Volume and XRP Utility (2017). https://ripple.com/insights/ripple-rolls-300m-ripplenet-accelerator-program-grow-volume-xrp-utility/.
[108] *See* Sections 4.2 and 6.3.
[109] Ripple. Market Performance (2021). https://web.archive.org/web/20201206204539/https://ripple.com/xrp/market-performance/.
[110] Ripple. Ripple Escrows 55 Billion XRP for Supply Predictability (2017). https://ripple.com/insights/ripple-escrows-55-billion-xrp-for-supply-predictability/.

"secret weapon" that it could deploy to incentivize financial institutions to use Ripple.[111] In a similar manner, on the "r/Ripple" channel on the Reddit online forum, Schwartz described Ripple's "stash of XRP" as a "strategic weapon" to spur increased liquidity in specific XRP-fiat currency trading pairs (referred to by Schwartz as "payment corridors") to enable financial institutions to use such payment corridors.[112] On the BitcoinTalk forum, Schwartz also communicated that Ripple's stock of XRP "funds the development and ensures there's a healthy company standing behind the network."[113]

80. Larsen also describes, broadly, how Ripple uses proceeds from XRP to build the XRP ecosystem. In his interview with Money & Tech, he stated how Ripple's "job number one"—which involves "aggressively recruiting for cryptographers and developers, … incredibly talented technology folks, business development folks, product folks [for] building stuff that's super valuable"—is to "use the value that we're being able to monetize [from XRP] already to pump that right back into the protocol."[114]

7.7 Ripple Communications Regarding Promoting Healthy Secondary Markets and Liquidity for XRP

81. Ripple actively undertook measures to expand the number of secondary XRP markets and build more liquid trading markets for XRP. Ripple publicly promoted such efforts,

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[111] XRP Chat. XRP Has no Price Limitation-CONFIRMED at 2 (2017). https://www.xrpchat.com/topic/11951-xrp-has-no-price-limitation-confirmed/page/2/?tab=comments#comment-122892.

[112] "The second piece [of Ripple's strategy] is to use some of Ripple's stash of XRP as a strategic weapon to incentivize the creation of pools of liquidity between XRP and currencies that are currently expensive or slow to deliver." *See* Schwartz, David. https://www.reddit.com/r/Ripple/comments/6z6dn8/whats_the_best_eli5_about_ripple/dmunm3l/ (2017).

[113] Schwartz's comments are found in a thread titled, "Ripple or Bitcoin." In response to a question, "Is the only reason for it not working as well with BTC is that Opencoin wouldn't have a stock of XRP to hand out to promote the system? If that's the only case it doesn't sound like a good reason." Schwartz replies, "That's not the only reason, but that's a very good reason by itself. Getting mass adoption is far from a sure thing. Being able to make it free for as many people as possible for as long as possible significantly decreases the chances that all the develop[sic] effort will be for nothing. Not to mention, XRP funds the development and ensures there's a healthy company standing behind the network." https://bitcointalk.org/index.php?topic=176077.msg1848303#msg1848303 (2013).

[114] YouTube. Chris Larsen discusses Ripple at 13:57 to 14:53 (2014). https://youtu.be/_SpdX36p6ao?t=837.

at times even tying such efforts to increases in the price of XRP. According to Ripple, in February 2016 it announced a program that provided incentives and rebates for digital asset exchanges to list XRP.[115] When Ripple publicly announced the listing of XRP on Bitstamp, the first participant in Ripple's digital asset exchange incentive program, it drew attention to how Ripple's efforts to increase liquidity and onboard banks would benefit "investors":

> *XRP is uniquely capable of introducing more liquidity to exchanges to support global payment volume, especially in exotic corridors. Ripple's adoption with banks puts XRP in pole position to become a global settlement asset, which translates to more liquidity for Bitstamp, and more value for institutional and individual* ***investors****.[emphasis added]*[116]

Similarly, the Q2 2017 XRP Markets Report asserts that Ripple's new listings at six digital asset exchanges were among several "instrumental" achievements contributing to "XRP's incredible quarter."[117] When the number of digital asset exchanges reached over 50 by the end of 2017, Ripple took the opportunity to highlight how this contributed to increased trading volumes and how it was "the result of Ripple's continued investment in the XRP ecosystem."[118]

82. Another way that Ripple promoted its role in building liquidity and supporting healthy secondary markets for XRP is by publicly supporting market makers. Market makers serve the role of providing liquidity on an exchange by constantly posting bids and offers to trade an asset, which allows traders to have a ready-made counterparty. In the Q1 2018 XRP Markets Report, Ripple announced that it provided millions of dollars of loans to enable market makers i) to more actively "get involved in XRP markets" and ii) to "tighten spreads" so that the market

[115] Ripple Q4 2016 XRP Markets Report (2017). https://ripple.com/insights/q4-2016-xrp-markets-report/.
[116] Ripple. Bitstamp Now Trading XRP with 0% Fees (2017). https://ripple.com/insights/bitstamp-now-trading-xrp/.
[117] Ripple. Q2 2017 XRP Markets Report (2017). https://ripple.com/insights/q2-2017-xrp-markets-report/.
[118] *Id.* at 35.

would be more efficient for market participants. In particular, Ripple communicated how its on-demand liquidity solution would stand to benefit from the subsequently increased liquidity:

> *For Ripple, this additional liquidity is useful for xRapid as it increases the capacity of order books to support cross-border payments. Also, incremental liquidity in order books will lower volatility over time, further increasing XRP's ability to provide on-demand liquidity for xRapid.*[119]

83. Ripple also played an instrumental role in promoting secondary markets and adding liquidity to XRP trading venues by developing "gateways" for traders to bring assets, e.g., BTC or USD, onto the XRP Ledger to trade with XRP. These gateways were operated by various entities such as Bitstamp, and provided market participants with a venue to create a gateway-backed asset on the XRP Ledger. For example, one could give $100 to Bitstamp and receive $100 on the XRP Ledger which could then be used to trade with XRP and other assets on the XRP Ledger. As these gateways were the only sources to inject liquidity for trades on the XRP Ledger, Ripple stated that it made it a priority to onboard gateways by "providing XRP incentives and extended technical support for gateways."[120]

84. Ripple's actions in promoting healthy secondary markets also bolstered its bull case of facilitating global payments for financial institutions. As described in its Q4 2017 XRP Markets Report, "In order for XRP to be highly efficient as a settlement asset for cross-currency transactions, it will continue to need greater volume and depth of order books [i.e., greater liquidity]. These market attributes increase its ability to support much larger cross-border payments and thus increase its utility broadly."[121] Thus, Ripple's efforts to increase the liquidity

[119] Ripple. Q1 2018 XRP Markets Report (2018). https://ripple.com/insights/q1-2018-xrp-markets-report/.
[120] Ripple. How Ripple Labs supports gateways (2014). https://ripple.com/insights/ripple-labs-helps-gateways/.
[121] Ripple Q4 2017 XRP Markets Report (2018). https://ripple.com/insights/q4-2017-xrp-markets-report/.

of XRP markets served to both attract additional investors as well as develop the XRP ecosystem needed to execute its global payments strategy underlying the bull case for investment in XRP.

7.8 Perspective of a Reasonable Purchaser with Respect to Ripple Communications

85. Investment-oriented purchasers of digital assets often pay close attention to company communications related to the factors described above. Ripple's extensive public comments and reports about these topics likely served to inform and persuade investment-oriented purchasers about the potential reward of purchasing XRP for the purpose of generating a profit. Indeed, the use of terms such as "traction," "market fit," "total addressable market," and even "investors" when describing Ripple's progress and growth potential are words typically understood by market participants to mean that they should view buying XRP as a potentially profitable investment.

86. Purchasers of XRP for cross-border payments would also be interested in some of these topics, but not all. For example, a money transmitter likely cares deeply about specific topics like the liquidity of the digital asset trading platforms it needs to rely on to complete an ODL transaction, but is less interested in Ripple's communications about the bull case for the price of XRP. Ripple's target customers for ODL are private financial institutions, and these organizations are less likely to engage in discussions with Ripple's management team on a website message board like BitcoinTalk.

87. It is my opinion from carefully following the digital asset space that many of Ripple's public communications conveyed to reasonable purchasers of XRP an expectation of future profit derived from the efforts of Ripple.

8. Summary of Findings and Conclusions

88. Based on my professional experience in the blockchain space, in part as an investor and trader in digital assets, as well as my analysis of the public statements, documents, and design decisions of Ripple, I am able to reach the following findings and conclusions:

89. Both the designed economic properties of XRP and the actions and statements of Ripple in promoting the future growth of the usage of XRP support an investment use case. Over the course of the Issuance Period a reasonable purchaser of XRP would have had an expectation of generating profit based on the efforts of Ripple and its management to accomplish the growth strategies that Ripple advertised to the public as being already achieved or planned for the future. The fixed-supply model of XRP (along with the eventual further restriction of float through escrows) created a direct link between the perceived success of Ripple's product offerings and the price of XRP. Given this relationship between Ripple's performance and the price of XRP, a reasonable purchaser would have closely considered many factors that were publicized by Ripple such as disclosed partnerships with financial institutions, the quality of Ripple's management team, the target addressable market for Ripple's products, and the availability of liquidity on trading platforms for XRP. Ripple's management publicly touted the growth potential for the usage and value of XRP, and explained a coherent strategy for how they would attempt to achieve that future success for XRP.

90. Certain aspects of the design characteristics of XRP and the promotional activity of Ripple did not appeal to a pure utility use case. The primary promoted use case, a financial institution using XRP in order to exchange one fiat currency for another and send the funds in a cross-border transaction, was flawed for two important reasons: 1) the financial institution needed to execute two separate exchange transactions on digital trading platforms that, unless

subsidized by Ripple, created a strong headwind to economic viability by incurring two rounds of fees and slippage and 2) parties involved, whether financial institutions or other market participants, had unwanted exposure to the price and volatility of that bridge asset.

9. Right to Supplement

91. The opinions expressed in this report are based on my review and analysis of the documents and data as set forth herein. I reserve the right to supplement my report and analysis based on any new evidence brought to my attention.

[redacted]

KEY QUALIFICATIONS AND EXPERIENCES

- Leads data-driven investigations in cryptocurrency fraud cases involving Ponzi schemes, market manipulation, money laundering, and securities violations
- Provides technical assistance to government regulators, agencies, and private companies related to digital asset technologies and forensic data analytics
- Leads team of data scientists analyzing blockchain data such as on-chain trading, smart contract activity, DeFi platforms, and tracing complex funds transfers
- [redacted]
- [redacted]
- Runs an investment partnership, with first-hand experience investing in digital assets, trading digital assets on cryptocurrency spot and futures markets, executing digital asset arbitrage strategies, and developing quantitative and discretionary investment strategies across a wide range of asset classes

EDUCATION

[redacted]
M.S., Electrical Engineering, May 2010

[redacted]
B.S., Electrical Engineering, May 2006
Honors: magna cum laude

PROFESSIONAL EXPERIENCE

[redacted] *Jan '19 – present*
Director

- Leads data-driven investigations in cryptocurrency fraud cases involving money laundering, market manipulation, theft, and securities violations
- Manages a team that creates custom software and data analysis solutions to trace, cluster, and deanonymize cryptocurrency transactions
- Builds statistical tools to analyze trading data and algorithmically identify manipulative trading activity
- Analyzes activity patterns in smart contracts, ERC-20 tokens, and fund transfers on the Ethereum blockchain to identify fraudulent financial activity

[redacted], [redacted] *Sep '16 – present*

Founder and CEO

- Founded a quantitative investment fund originally focused on cryptocurrency arbitrage as well as derivatives strategies in equity, commodities, and currency markets
- Makes discretionary investments across a broad collection of private and public assets – equities, commodities, bonds, real estate, derivatives, private businesses, and digital assets
- Designed software to automate execution of multiple investment strategies, identify arbitrage opportunities, manage counterparty risk, and securely store cryptocurrency assets
- Created multi-asset algorithmic investment strategies to exploit pricing inefficiencies across time, exchanges, and assets in cryptocurrency markets
- Developed derivatives trading strategies utilizing machine learning and statistical signal processing techniques

[redacted], [redacted] *Jul '15-Aug '16*

Founder and CEO

- Founded a technology company that developed automotive radar for autonomous vehicles
- Designed radar hardware and signal processing algorithms to enable automated detection of objects in a vehicle's environment
- Managed the company's engineering, fundraising, and recruiting efforts

[redacted], [redacted] *Jan '13-Jun '15*

Senior Engineer

- Designed, modeled, tested, and defined requirements for multiple large radar projects
- Engineering and project management focused primarily on hardware, signal processing, and system integration

[redacted], [redacted] *Sep '10- Dec '12*

Associate Technical Staff

- Developed signal processing algorithms for airborne radar systems
- Researched and prototyped novel detection and classification algorithms for high performance radar signal processing projects

Documents Considered to Complete the Expert Report of [redacted]

Document Name	Reference
Basel Committee on Banking Regulation: Prudential Treatment of Cryptoasset Exposures	https://www.bis.org/bcbs/publ/d519.pdf
Bitcoin Forum: [XRP] Ripple Speculation	https://bitcointalk.org/index.php?topic=1381669.msg19787105#msg19787105
Bitcoin Forum: Ripple or Bitcoin	https://bitcointalk.org/index.php?topic=176077.msg1848303#msg1848303
CNBC: Ripple is sitting on close to $80 billion and could cash out hundreds of millions per month – but it isn't	https://www.cnbc.com/2018/01/16/why-ripple-is-not-cashing-out-its-xrp-holdings.html
Coindesk: Ripple to Give Away 1 Billion XRP in Massive Bid to Fund Online Content	https://www.coindesk.com/ripple-is-giving-away-1-billion-xrp-in-massive-bid-to-fund-online-content
CoinDesk: Use or Speculation: What's Driving Ripple's Price to All-Time Highs?	https://www.coindesk.com/use-or-speculation-whats-driving-ripples-price-to-all-time-highs
Consensus: Invest Event	https://events.bizzabo.com/consensusinvest
Financial Times: The art of redefining success, MoneyGram and Ripple edition	https://www.ft.com/content/3f2fb6bc-e17a-4179-a0a4-152a3e0db1d6
Journal of Banking & Finance: Order flow, bid-ask spread and trading density in foreign exchange markets	https://www.sciencedirect.com/science/article/pii/S0378426611002603
Journal of Empirical Finance: Volatility cascades in cryptocurrency trading	https://www.sciencedirect.com/science/article/pii/S092753982100030X
MoneyGram: Form 10-K 2019 Annual Report	https://ir.moneygram.com/financials-and-filings/annual-reports

MoneyGram: Form 8-K Current Report	https://ir.moneygram.com/financials-and-filings/annual-reports
MoneyGram: MoneyGram International Reports Fourth Quarter and Full-Year 2020 Financial Results	https://ir.moneygram.com/news-releases/news-release-details/moneygram-international-reports-fourth-quarter-and-full-year-5
PR Newswire: Ripple's Xpring Makes 1 Billion XRP Grant to Drive XRP Adoption and Advance Coil's Monetized Platform for Creators	https://www.prnewswire.com/news-releases/ripples-xpring-makes-1-billion-xrp-grant-to-drive-xrp-adoption-and-advance-coils-monetized-platform-for-creators-300902194.html
Quora: Are those who invested in XRP in possible danger of losing their investments as Ripple does not extend exclusivity to XRP on its network?	https://www.quora.com/Are-those-who-invested-in-XRP-in-possible-danger-of-losing-their-investments-as-Ripple-does-not-extend-exclusivity-to-XRP-on-its-network
Quora: If a large amount of banks were to adopt xrapid and started using xrp, how would that impact the token's value?	www.quora.com/If-a-large-amount-of-banks-were-to-adopt-xrapid-and-started-using-xrp-how-would-that-impact-the-tokens-value
Quora: If banks use Ripple for payments but don't need to buy XRP, then who will buy XRP and why will its price increase? Does it make any sense to invest in XRP?	https://www.quora.com/If-banks-use-Ripple-for-payments-but-don-t-need-to-buy-XRP-then-who-will-buy-XRP-and-why-will-its-price-increase-Does-it-make-any-sense-to-invest-in-XRP
Reddit: What's the best ELI5 about Ripple?	https://www.reddit.com/r/Ripple/comments/6z6dn8/whats_the_best_eli5_about_ripple/dmunm3l/
Ripple: 10 Things You Need to Know About XRP	https://ripple.com/insights/10-things-need-know-xrp/
Ripple: An Explanation of Ripple's XRP Escrow	https://ripple.com/insights/explanation-ripples-xrp-escrow/
Ripple: Bitstamp Now Trading XRP with 0% Fees	https://ripple.com/insights/bitstamp-now-trading-xrp/

Ripple: CME Group Executive Miguel Vias Joins Ripple	https://ripple.com/insights/cme-group-executive-miguel-vias-joins-ripple/
Ripple: How Ripple Labs supports gateways	https://ripple.com/insights/ripple-labs-helps-gateways/
Ripple: How XRP Stacks Up Against Other Digital Assets	https://ripple.com/xrp/xrp-stacks-digital-assets/
Ripple: Implementing the Interledger Protocol in Ripple	https://ripple.com/insights/implementing-the-interledger-protocol/
Ripple: Inside the Code of Ripple Client: The Newest Mobile Payment App for iOS	https://ripple.com/insights/inside-the-code-of-ripple-client-the-newest-mobile-payment-app-for-ios/
Ripple: Interview with Phil Rapoport, Director of Markets and Trading at Ripple Labs	https://ripple.com/insights/interview-with-phil-rapoport-director-of-markets-and-trading-2/
Ripple: Introducing the New Ripple Trade Client	https://ripple.com/insights/introducing-the-new-ripple-trade-client/
Ripple: It's Never Been Easier to Access and Store XRP	https://ripple.com/insights/its-never-been-easier-to-access-and-store-xrp/
Ripple: It's Never Been Easier to Access and Store XRP	https://ripple.com/insights/its-never-been-easier-to-access-and-store-xrp/
Ripple: McKinsey: Corporates Need Faster Payments, Too	https://ripple.com/insights/mckinsey-corporates-need-faster-payments/
Ripple: Metric - Work Order (Execution Version).pdf	RPLI_SEC 0239684
Ripple: MUFG Joins Ripple's Global Payments Steering Group	https://ripple.com/insights/mufg-joins-ripples-global-payments-steering-group/
Ripple: ODL Analysis.xlsx	RPLI_SEC 0533162
Ripple: odl_txn_data_7_27_20.csv	RPLI_SEC 0301032

Ripple: Q1 2017 XRP Market Reports	https://ripple.com/insights/q1-2017-xrp-markets-report/
Ripple: Q1 2018 XRP Markets Report	https://ripple.com/insights/q1-2018-xrp-markets-report/
Ripple: Q1 2019 XRP Markets Report	https://ripple.com/insights/q1-2019-xrp-markets-report/
Ripple: Q1 2020 XRP Markets Report	https://ripple.com/insights/q1-2020-xrp-markets-report/
Ripple: Q1 2021 XRP Markets Report	https://ripple.com/insights/q1-2021-xrp-markets-report/
Ripple: Q2 2017 XRP Market Reports	https://ripple.com/insights/q2-2017-xrp-markets-report/.
Ripple: Q2 2018 XRP Markets Report	https://ripple.com/insights/q2-2018-xrp-markets-report/
Ripple: Q2 2019 XRP Markets Report	https://ripple.com/insights/q2-2019-xrp-markets-report/
Ripple: Q2 2020 XRP Markets Report	https://ripple.com/insights/q2-2020-xrp-markets-report/
Ripple: Q2 2021 XRP Markets Report	https://ripple.com/insights/q2-2021-xrp-markets-report/
Ripple: Q3 2017 XRP Markets Report	https://ripple.com/insights/q3-2017-xrp-markets-report/
Ripple: Q3 2018 XRP Markets Report	https://ripple.com/insights/q3-2018-xrp-markets-report/
Ripple: Q3 2019 XRP Markets Report	https://ripple.com/insights/q3-2019-markets-report/
Ripple: Q3 2020 XRP Markets Report	https://ripple.com/insights/q2-2020-xrp-markets-report/

Ripple: Q4 2016 XRP Markets Report	https://ripple.com/insights/q4-2016-xrp-markets-report/
Ripple: Q4 2017 XRP Markets Report	https://ripple.com/insights/q4-2017-xrp-markets-report/
Ripple: Q4 2018 XRP Markets Report	https://ripple.com/insights/q4-2018-xrp-markets-report/
Ripple: Q4 2019 XRP Markets Report	https://ripple.com/insights/q4-2019-xrp-markets-report/
Ripple: Q4 2020 XRP Markets Report	https://ripple.com/insights/q4-2020-xrp-markets-report/
Ripple: Ripple Escrows 55 Billion XRP for Supply Predictability	https://ripple.com/insights/ripple-escrows-55-billion-xrp-for-supply-predictability/
Ripple: Ripple Highlights Record Year, xRapid Now Commercially Available	https://ripple.com/insights/ripple-highlights-record-year-xrapid-now-commercially-available/
Ripple: Ripple Home Page	https://ripple.com
Ripple: Ripple Labs 2014: A Year in Review	https://ripple.com/insights/views/ripple-labs-2014-a-year-in-review/
Ripple: Ripple Labs Welcomes C++ Guru Howard Hinnant	https://ripple.com/insights/ripple-labs-welcomes-c-guru-howard-hinnant/
Ripple: Ripple Rolls Out $300M RippleNet Accelerator Program to Grow Volume and XRP Utility	https://ripple.com/insights/ripple-rolls-300m-ripplenet-accelerator-program-grow-volume-xrp-utility/
Ripple: Ripple to Place 55 Billion XRP in Escrow to Ensure Certainty of Total XRP Supply	https://ripple.com/insights/ripple-to-place-55-billion-xrp-in-escrow-to-ensure-certainty-into-total-xrp-supply/
Ripple: RippleCharts Revamp	https://ripple.com/insights/ripplecharts-revamp/
Ripple: RippleNet Grows to More Than 100 Financial Institutions	https://ripple.com/insights/ripplenet-grows-to-over-100-financial-institutions/

Ripple: RippleNet Growth: Announcing More Than 300 Customers	https://ripple.com/insights/ripplenet-growth-announcing-more-than-300-customers/
Ripple: RPLI_SEC 0300926.pdf	RPLI_SEC 0300926
Ripple: The Internet of Value: What It Means and How It Benefits Everyone	https://ripple.com/insights/the-internet-of-value-what-it-means-and-how-it-benefits-everyone/
Ripple: The Most (Demonstrably) Scalable Blockchain	https://ripple.com/insights/demonstrably-scalable-blockchain/
Ripple: The Ripple Drop: On the Ground at Swell 2019	https://ripple.com/insights/the-ripple-drop-on-the-ground-at-swell-2019/
Ripple: Welcome Abiy, Peter, Mark, Yong-Soo, and Tom to Ripple Labs	https://ripple.com/insights/welcome-abiy-peter-mark-tushar-yong-soo-and-tom-to-ripple-labs/
Ripple: Welcome to Xpring	https://ripple.com/insights/welcome-to-xpring/
Ripple: XRP Key Market Performance Metrics	https://ripple.com/xrp/market-performance; accessed at https://web.archive.org/web/20201206204539/https://ripple.com/xrp/market-performance/
Ripple: XRP Trading	https://ripple.com/xrp/buy-xrp/
Ripple: Zoe Cruz Joins Ripple's Board of Directors	https://ripple.com/insights/zoe-cruz-joins-ripples-board-directors/
Ripple. Answer of Defendant Ripple Labs, Inc. to Plaintiff's First Amended Complaint	Court document
RippleNet Home Page	https://ripple.com/ripplenet/
Steve Blank: Raising Money	https://steveblank.com/raising-money/
The Block: 'We Sell XRP as soon as we receive it,' says MoneyGram on Ripple incentive payments	https://www.theblockcrypto.com/daily/58860/we-sell-xrp-as-soon-as-we-receive-it-says-moneygram-on-ripple-incentive-payments

The Cryptocurrency Investor Forum, December 3, 2020	https://barronscustomevents.com/grayscale
Twitter: David Schwartz (@JoelKatz)	https://web.archive.org/web/20170616010746if_/https://twitter.com/JoelKatz
USD Coin: Circle USDC Fee Schedule	https://support.usdc.circle.com/hc/en-us/articles/360015471331
xCurrent: A brief technical overview for financial institutions on RippleNet	https://ripple.com/files/xcurrent_brochure.pdf
XRP Arcade: Ripple escrow: Unraveling the mystery	https://www.xrparcade.com/2020/03/02/ripple-escrow-unraveling-the-mystery/
XRP Chat: Fortune's Poll about XRP, BTC & ETH	https://www.xrpchat.com/topic/2409-fortunes-poll-about-xrp-btc-eth/page/2/
XRP Chat: Valuation Models – XRP The Digital Currency Vs. Ripple the Company	https://www.xrpchat.com/topic/5280-valuation-models-xrp-the-digital-currency-vs-ripple-the-company/
XRP Chat: XRP Has no Price Limitation-CONFIRMED	https://www.xrpchat.com/topic/11951-xrp-has-no-price-limitation-confirmed/page/2/?tab=comments#comment-122892
XRP Chat: XRP Trading and Price Speculation	https://www.xrpchat.com/forum/17-xrp-trading-and-price-speculation/
Yahoo Finance All Markets Summit: Crypto, February 7, 2018	https://www.yahoo.com/news/yahoo-finance-markets-summit-crypto-february-7-2018-223531903.html
Yahoo Finance: Ripple CEO Brad Garlinghouse: 'There's a lot of FUD about XRP'	https://finance.yahoo.com/news/ripple-ceo-brad-garlinghouse-theres-lot-fud-xrp-181425025.html
YouTube: Chris Larsen discusses Ripple	https://youtu.be/_SpdX36p6ao?t=827
YouTube: Ripple CEO Brad Garlinghouse Korea reporter meeting	https://youtu.be/JOAuXEYu9Pg?t=1837

YouTube: Ripple CEO Garlinghouse Sees Real Value in Bitcoin	https://www.youtube.com/watch?v=akLQEacOT3w&t=126s.
YouTube: Trade Desk: Advancing the Asset	https://youtu.be/jdFuiRVNUoM?t=2120

Exhibit 11

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE COMMISSION, Plaintiff, *-against-* **RIPPLE LABS, INC., BRADLEY GARLINGHOUSE, and CHRISTIAN A. LARSEN**, Defendants.	Case No. 20-CV-10832 (AT)

Rebuttal Expert Report of

Allen Ferrell, Ph.D.

November 12, 2021

I. INTRODUCTION

A. QUALIFICATIONS

1. I am an economist and the Greenfield Professor of Securities Law at Harvard Law School. I received a Ph.D. in economics from the Massachusetts Institute of Technology, with fields in econometrics and finance, and a J.D. from Harvard Law School. My Ph.D. dissertation concerned the relationship between stock prices and financial disclosures. After law school, I clerked for Judge Silberman of the United States Court of Appeals for the D.C. Circuit and Justice Kennedy of the Supreme Court of the United States.

2. I am also a faculty associate at the Kennedy School of Government at Harvard, a fellow at Columbia University's Program on the Law and Economics of Capital Markets, a research associate at the European Corporate Governance Institute, and a member of the editorial board of the Journal of Financial Perspectives. I formerly was a member of the Board of Economic Advisors to the Financial Industry Regulatory Authority ("FINRA"), an academic fellow at FINRA, Chairperson of Harvard's Advisory Committee on Shareholder Responsibility (which is responsible for advising the Harvard Corporation on how to vote shares held by its endowment), the ABA Task Force on Corporate Governance, the American Law Institute Project on the Application of U.S. Financial Regulations to Foreign Firms and Cross-Border Transactions, and an executive member of the American Law School section on securities regulation. My current curriculum vitae is listed in Appendix A. I am being compensated for my time on this matter at a rate of $1,250 per hour. My compensation is not contingent on the outcome of this case. No element of my compensation is dependent on the opinions offered in this case.

3. The materials I have considered are listed in Appendix B.

4. This report is subject to change or modification should additional relevant information become available which bears on the analysis, opinions, or conclusions contained herein.

B. OVERVIEW OF DR. [redacted] OPINIONS

5. Ripple Labs Inc. ("Ripple") is a San Francisco-based privately held payments technology company that utilizes distributed ledger technology, including the cryptocurrency XRP, in cross-border payment technology.[1] Plaintiff Securities and Exchange Commission (the "SEC") alleges that defendants[2] engaged in the "unlawful offer and sale of securities in violation of Sections 5(a) and 5(c) of the Securities Act of 1933 ('Securities Act') [15 U.S.C. §§ 77e(a) and 77e(c)]."[3] The SEC presented five expert reports to support its allegations, including the Amended Expert Report of John M. [redacted] served on October 13, 2021.[4]

6. Dr. [redacted] main opinions can be summarized as follows:

a. Dr. [redacted] claims that Ripple and its executives directed market maker, GSR, to purchase XRP "in a manner consistent with i) pushing prices upward, or ii) providing a price floor to stabilize and keep prices from falling."[5] According to Dr. [redacted] Ripple "employed trading strategies to protect the price of XRP"[6]

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[1] Ripple Labs Inc., *Consolidated Financial Statements*, December 31, 2014 through December 31, 2020. As of September 15, 2014, Ripple has been incorporated in the State of Delaware. *See* Ripple Labs, *Good Standing Certificate*, December 1, 2014, at 1.

[2] Defendants are Ripple, Bradley Garlinghouse, and Christian A. Larsen.

[3] First Amended Complaint, *Securities and Exchange Commission v. Ripple Labs, et al.*, No. 1:20-cv-10832 (S.D.N.Y. February 18, 2021), at ¶ 9.

[4] Amended Expert Report of John M. [redacted] October 13, 2021 (hereinafter, "[redacted] Report").

[5] [redacted] Report, at ¶ 9.a.

[6] [redacted] Report, at ¶ 9.b.

by selling XRP to purchasers "in a manner designed to minimize downward pressure on the price of XRP."[7]

b. Dr. [redacted] further claims that lock-up restrictions contained in certain Ripple agreements "functioned similarly to lock-up restrictions in a traditional company's Initial Public Offering, and allowed Ripple to protect the price of XRP from falling."[8] He also contends that Ripple used XRP in a similar manner as companies use stock to incentivize employees and that XRP was used to "fund Ripple operations[[9]] and to enrich Ripple's founders, directors, and early employees."[10]

c. Finally, Dr. [redacted] claims that Ripple and its executives were incentivized to "influence XRP prices in order to maximize the proceeds"[11] and that, in addition to Ripple's sales of XRP, Mr. Larsen and Mr. Garlinghouse transferred large amounts of XRP to GSR.[12]

C. ASSIGNMENT AND CONCLUSIONS

7. I have been asked by counsel for Ripple to assess the claims, summarized above, made in the [redacted] Report. Before doing so, I note that there is nothing in the [redacted] Report that has caused me to change or alter any of the opinions I expressed in my opening report.[13]

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[7] [redacted] Report, at ¶ 9.b.

[8] [redacted] Report, at ¶ 9.c.

[9] Including "a funding gap of over $800 million." *See* [redacted] Report, at ¶ 9.e.

[10] [redacted] Report, at ¶ 9.f.

[11] [redacted] Report, at ¶ 9.d.

[12] [redacted] Report, at ¶ 9.d.

[13] Expert Report of Allen F. Ferrell, October 4, 2021 (hereinafter, "Ferrell Report").

8. Overall, Dr. [redacted] opinions on coordination between GSR and, respectively, Ripple, Christian Larsen, and Bradley Garlinghouse to "buy in a manner consistent with i) pushing prices upward, or ii) providing a price floor to stabilize and keep prices from falling"[14]; his opinions on defendants' alleged efforts in selling XRP (through market making firms) so as not to affect the price of XRP[15]; and his opinions on Ripple using XRP in "a similar manner as companies use stock"[16] — a misleading and disingenuous premise — are not supported by any methodology or analysis that supports an opinion that these actions resulted in any sustained impact on the market price of XRP. In any event, Dr. [redacted] opinions are irrelevant for assessing whether the economic substance of XRP constituted an investment contract.[17]

9. Dr. [redacted] analysis is flawed. Dr. [redacted] focuses on short-term trading patterns that he observes on select dates. As an initial matter, Dr. [redacted] does not (and cannot) explain why a handful of trades on just a few cherry-picked dates would have resulted in any long-term impact on the market price of XRP, much less caused purchasers of XRP to have any reasonable expectation of profits from Ripple's conduct. Further, Dr. [redacted] discussion of the trading patterns lacks rigorous empirical analysis. He merely shows charts (Figures 1 through 6) on a

[14] *See, e.g.*, [redacted] Report, at ¶ 9.a ("At specific times, Ripple and its executives directed GSR, a digital asset trading and market making firm,[footnote omitted] to buy XRP in a manner consistent with i) pushing prices upward, or ii) providing a price floor to stabilize and keep prices from falling.").

[15] *See, e.g.*, [redacted] Report, at ¶ 9.b ("Through market making firms, Ripple sold XRP to purchasers in a manner designed to minimize downward pressure on the price of XRP. Ripple employed trading strategies to protect the price of XRP.").

[16] *See, e.g.*, [redacted] Report, at ¶ 9 ("Ripple and its executives at specific times took steps to influence the price of XRP and their sales of XRP functioned similarly to that of a public equity offering for Ripple."), at ¶ 53 ("Ripple used XRP in a similar manner as companies use stock.").

[17] *See, e.g.*, [redacted] Report, at ¶ 9.f ("Ripple used XRP in a similar manner as companies use stock.").

few select days in a 2,694-day time period[18] when the alleged trading patterns "coincide[d]" with XRP price changes, which he links mostly to communications by Ripple around these dates.[19, 20]

10. Moreover, Dr. [redacted] purported findings of correlations between price changes in XRP and defendants' trade executions do not support an opinion that defendants' trading resulted in any price change. This is probably why Dr. [redacted] repeatedly casts his opinion in terms of his analysis being "consistent" with Ripple "attempting" to influence prices, or his vague observation that defendants' actions "coincided" with XRP price changes. Indeed, he employs no statistical or rigorous analysis that demonstrates any such causation. Even if the trading patterns in question could have had an effect on prices, he does not quantify the amount of such an effect or show that it lasted beyond the time periods he selected. Dr. [redacted] single regression analysis, which he claims is consistent with the communications between Ripple and GSR "where Ripple expressed a desire to sell XRP when the price of XRP increased,"[21] at best demonstrates a correlation between imbalance — that is, total number of XRP purchased minus total number of XRP sold — and lagged XRP price return.[22]

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[18] The number of days in the time period August 6, 2013 to December 20, 2020 is 2,694.

[19] *See, e.g.*, [redacted] Report, at ¶ 18 ("GSR is then a large net buyer of XRP for the next five hours. During these five hours, XRP jumps from $.0061 to a high of $0.0093, for a gain of $0.0032."), at ¶ 23 ("GSR made several large purchases of XRP that both preceded and accompanied a dramatic rise in the price of XRP of over 15 percent within 24 hours."), at ¶ 28 ("As can be seen in Figure 5, [Mr. Larsen's] buying beginning on June 10 coincided with the price of XRP stabilizing around 0.00009 XRP/BTC, and later reversing its earlier decline.").

[20] Examples of Dr. [redacted] vague, unsupported statements include, but are not limited to, his statement that "Ripple and certain of its executives directed GSR to trade XRP on behalf of Ripple in a *way consistent with an attempt* to increase or stabilize the price of XRP," [redacted] Report, at ¶ 25 [emphasis added], and that "GSR also executed uneconomic trades whose purpose *appears to be* to push the price of XRP upward," [redacted] Report, at ¶ 21 [emphases added].

[21] [redacted] Report, at ¶ 35 ("The findings from this regression analysis are also consistent with communications between Ripple and GSR where Ripple expressed a desire to sell XRP when the price of XRP increased.").

[22] [redacted] Report, at ¶ 33 ("To better understand whether the behavior observed in the example shown in Figure 6 is persistent across a wider time period, I next examine whether Ripple's market makers GSR and [redacted] tend to sell less when prices fall and sell more when prices are stabilized or rising. [..] Imbalance is defined as the total number of XRP purchased minus total number of XRP sold in a day normalized by the average circulating supply."). *See also* [redacted] Report, at ¶ 29 (GSR and [redacted] "sold more XRP following

11. Based on my analysis, my review of the materials listed in Appendix B, and my general expertise and experience, I have concluded that:

- None of the alleged short-term trading patterns and XRP price changes Dr. [redacted] observes are lasting. Prices of XRP before and after his selected time periods do not show any long-term, sustained effect as a result of the alleged trading patterns of Ripple, Mr. Larsen, or Mr. Garlinghouse. The blips on the handful of days he selects are just "noise" that drops out when viewed against the long-term price movements of XRP.
- Dr. [redacted] allegations that Ripple and the individual defendants executed sales in a manner designed to minimize negative price impacts on the market price of XRP, and/or to increase its price, are not relevant to determining whether the economic substance of defendants' offers and sales of XRP constitute an investment contract.
    - Foreign exchange or futures traders routinely manage the manner in which sales are executed to minimize adverse price impacts. The fact that market actors attempt to minimize the price impact associated with their sales is hardly surprising or novel, and does not support an opinion that XRP is a security.
    - Ripple has bona fide business reasons to increase the liquidity of XRP for use in settlements.
    - Dr. [redacted] opinion is based on select trading patterns on just a handful of dates across a multi-year period; he does not and cannot offer any explanation as to how trades by Ripple and the individual defendants on these few dates would lead

price increases"), at ¶ 34 ("I conclude that [GSR and [redacted] on behalf of Ripple, sold more XRP when the price of XRP was increasing and relatively less when the price was decreasing on the previous day."), and at ¶ 35 ("The findings from this regression analysis are also consistent with communications between Ripple and GSR where Ripple expressed a desire to sell XRP when the price of XRP increased.").

unrelated purchasers of XRP to believe that they could expect profits on their holdings of XRP from Ripple's efforts.

- As the factor analysis presented in my opening report shows, the long-run prices of XRP were influenced, not by the efforts of Ripple, but by the changes in the value of cryptocurrencies generally; focusing, instead, on a handful of select days does not constitute a reliable scientific methodology.
- Dr. [redacted] contention that Ripple sold XRP to fund operations or repurchase Ripple equity is also irrelevant to whether the economic substance of those sales constitutes an investment contract. Contrary to Dr. [redacted] assertions, sales of XRP are not equivalent to a capital raise through a sale of securities. None of the defendants' sales of XRP gave the owners of XRP any right to future cash flows from Ripple, or to a share in Ripple's profits. As a matter of economic substance, holders of XRP are holders of a virtual currency.
- Using XRP as a component of executive compensation is equally irrelevant to whether the economic substance of XRP constitutes an investment contract. Such compensation does not give the employees any contractual right to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP.

II. DR. [redacted] ANALYSIS OF RIPPLE'S "EFFORTS," DEFINED IN A MANNER IN WHICH RIPPLE, MR. LARSEN, AND MR. GARLINGHOUSE DISTRIBUTED XRP, IS IRRELEVANT FOR ASSESSING WHETHER XRP HAS THE ECONOMIC CHARACTERISTICS OF AN INVESTMENT CONTRACT

A. DR. [redacted] CLAIMS OF RIPPLE'S AND MR. LARSEN'S NET PURCHASES POSITIVELY IMPACTING XRP PRICES ARE UNSUPPORTED

12. Dr. [redacted] claims that at specific times GSR "traded in a manner consistent with the directions from Ripple executives to increase or stabilize the price of XRP"[23] or timed purchases to "maximize the price of XRP around large news announcements."[24] Dr. [redacted] attempts to support his claims regarding Ripple's alleged behavior with "plots of XRP transactions conducted by GSR" on six selected dates in 2016 and eleven dates in 2017.[25] His analysis does not include any consideration of the amount of these sales as compared with the global (or even specific exchange) sales of XRP on that date; nor does he engage in any analysis of the mechanics of price discovery for XRP on those days. Moreover, he fails to analyze XRP price returns on the full sample of days between August 2013 and December 2020, instead restricting his analysis to a limited number of days that he selected. In contrast, the factor analysis I presented in my opening report in Section III.C, analyzed XRP price returns over the entire time period at issue, and did not use trading volume from a single participant such as GSR. Before turning to the details of his examples, I will first make several general observations concerning Dr. [redacted] approach.

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[23] [redacted] Report, at ¶ 15 ("Ripple has stated in its submissions in this litigation that Ripple and its executives 'do not control the price of XRP' and that the price of XRP is 'not based on the efforts of Ripple.' Yet, Ripple and its executives explicitly directed at least one of their market makers, GSR, to purchase or refrain from selling XRP at specific times with a stated intent of influencing the price of XRP. GSR traded in a manner consistent with the directions from Ripple executives to increase or stabilize the price of XRP as described in these emails and shown below.").

[24] [redacted] Report, at ¶ 17 ("Based on emails from as early as 2016, Ripple executives worked directly with GSR to devise trading strategies to positively influence XRP prices. In some instances, these were timed to maximize the price of XRP around large news announcements.").

[25] [redacted] Report, at Figure 1, Figure 2, Figure 3, Figure 4, and Figure 5.

13. Strikingly, Dr. [redacted] employs no statistical or formal analysis to analyze whether Ripple or Mr. Larsen actually influenced XRP prices, despite claiming that he reached an appropriately supported opinion that defendants took steps to influence the price of XRP.[26] His graphical representations on select dates merely show that GSR's purchases and sales of XRP, on behalf of Ripple and Mr. Larsen, happened at the same time as XRP price changes. Dr. [redacted] however, fails to put forth an analysis that actually shows that Ripple's and Mr. Larsen's trades *caused* those price changes. Of course, showing coinciding of events does not show causation. His one regression (which is flawed, as I will show in Section II.C.) itself shows a simple — but irrelevant — correlation, i.e., "sellers, on behalf of Ripple, sold more XRP when XRP was increasing and relatively less when the price was decreasing on the previous day."[27]

14. Furthermore, the relevance of Ripple's temporary trading patterns to assessing whether XRP has the economic substance of an investment contract is neither obvious nor ever explained. For instance, Dr. [redacted] concludes Section IV of his report, which is focused on Ripple's temporary trading patterns on a handful of days, with the statement that it "seems" to Dr. [redacted] that GSR, on behalf of Ripple, was "partially successful" in positively influencing XRP prices in the "short term."[28] The possible relevance of what "seems" to be "short term" price effects to the economic substance of XRP over the August 2013 to December 2020 time

[26] [redacted] Report, at ¶ 1 ("First, the SEC asked me to opine on whether Ripple Labs Inc. ('Ripple'), Chris Larsen ('Larsen'), and Brad Garlinghouse ('Garlinghouse') took steps to influence XRP prices. Second, I have also been retained to opine on the incentives that might have been present for Ripple to attempt to influence the price of XRP.").

[27] [redacted] Report, at ¶ 34 ("A regression analysis of GSR's and [redacted] trading activity shows that when the prior day returns of XRP increase, the amount of XRP that GSR and [redacted] sell also increases (Table 1) . . . . By selling more XRP the day after XRP prices rise, GSR and [redacted] on behalf of Ripple, were able to use rising XRP returns and increased demand to mitigate any potential negative effect of its XRP sales and thus keep XRP prices high.").

[28] [redacted] Report, at ¶ 25 ("GSR also seems to have been at least partially successful in its targeted efforts in these directed cases as the price of XRP generally increased or stabilized in the short term at the prices GSR set.").

period is bereft of explanation. As I demonstrated in my initial report, the long-term price of XRP for the period August 2013 to December 2020 is not related to Ripple's efforts but rather to price movements of non-XRP cryptocurrencies. Accordingly, Dr. [redacted] report provides no support for a conclusion that purchasers of XRP had a reasonable expectation of obtaining profits from the efforts of Ripple.

15. Dr. [redacted] analysis further lacks scientific rigor insofar as he fails to quantify these alleged price effects, or measure their duration. He also fails to consider other factors outside GSR (or Ripple's) control that could affect prices on the limited number of days he discusses. As I will show, the charts he presents are themselves highly incomplete. For instance, he only considers GSR XRP trading on behalf of Ripple on the XRP Ledger, and ignores the significant known amount of off-ledger trading at cryptocurrency exchanges.[29] Without consideration of whether there was a meaningful, sustained impact on the price of XRP beyond the select time periods he considers, Dr. [redacted] analysis is wholly unreliable. I will turn to the specific flaws in each of Dr. [redacted] examples in more detail below.

16. *Example 1*: Dr. [redacted] Figure 1 shows XRP transactions conducted by GSR in a 30-hour window on September 15 and 16, 2016.[30] He claims that GSR did not trade in the six-hour period prior to 1pm UTC on September 15, 2016, but thereafter began net buying at 1pm UTC at a time that he alleges "directly corresponds to the time that GSR was directed to trade by Ripple."[31] There is, however, nothing unique about this pattern in GSR's trading on behalf of

[29] Ferrell Report, Exhibit 14 shows the number of exchanges where XRP trades occurred between August 4, 2013 and December 20, 2020.

[30] [redacted] Report, at Figure 1, ("This figure plots XRP transactions conducted by GSR in the 30-hour window on September 15, and 16 around Ripple's announcements on September 15, 2016. Transactions are sourced from the XRP Ledger."). I use intra-day XRP trading volume at cryptocurrency exchanges from CryptoCompare as the market for XRP trades.

[31] [redacted] Report, at ¶ 18.

Ripple before and after 1pm UTC (which corresponds to 9am ET) on September 15, 2016, because the trading by other market participants at cryptocurrency exchanges follows a similar pattern. Exhibit 1 shows the trading volume of GSR and the volume of XRP trading at all cryptocurrency exchanges (as reported by CryptoCompare) in the six hours before and after 1pm UTC on September 15, 2016, and the trading volumes over the 30-hour window on September 15 and 16, 2016, which Dr. [redacted] discusses. As I show in Exhibit 1, less than 1 percent of the overall market trading during the 30-hour window took place in the six hours before 1pm UTC and approximately 55 percent of market trading took place in the six hours after 1pm UTC.

17. Dr. [redacted] points to a 53-percent increase in XRP's price during six hours on September 15 and 16, 2016 to support his claim that GSR allegedly followed Ripple's directive to purchase XRP "at specific times with a stated intent of influencing the price of XRP."[32] Dr. [redacted] overreaches. Even if Dr. [redacted] analysis shows that GSR's purchases *coincided* with a price increase, he does not perform any empirical assessment showing that GSR's purchases contributed to this price increase. Dr. [redacted] therefore, has no basis to claim that the 53-percent increase in XRP's price during this period was even related to GSR's purchases.

18. Even if one were to assume GSR's net purchases did affect XRP prices, Dr. [redacted] utilizes no methodology to determine the magnitude of the price impact of GSR's trading. Nor did he consider whether trading by other market participants — such as the amounts of purchases and sales by participants other than Ripple (GSR), or exogenous market factors such as price changes in other cryptocurrency prices — could have also contributed to the price increase at this time. I used a square-root price impact model to approximate the potential price

[32] [redacted] Report, at ¶ 15. *See also* [redacted] Report, at ¶ 18 ("This is a 53 percent price increase in five hours. By analyzing transactions publicly available on the XRP Ledger, I can confirm that GSR did in fact follow Ripple's directive to purchase XRP and that the activity appears successful as the price increased dramatically.").

changes that could reasonably be expected given GSR's trading volume.[33] Incorporating intra-day XRP price volatility and overall trading volume of XRP at cryptocurrency exchanges between 1:00 UTC and 18:00 UTC on September 15, 2016, the potential XRP price impact from GSR trading, estimated using the square-root model, is approximately 1.6 percent compared to the 41 percent XRP price return over this period.

19. Furthermore, Dr. [redacted] fails to show that this alleged price increase would last beyond the particular five-hour period between September 15 and 16, 2016. As a matter of economic theory, there is no point in Ripple attempting to impact the XRP price on a limited number of days if the goal is to achieve longer-term price appreciation for its holdings of XRP or the holdings of XRP purchasers in the marketplace. Once again, this highlights the importance of analyzing whether Ripple had the ability to affect XRP prices over the multi-year time period at issue and not just on a select date as Dr. [redacted] claims.

20. *Example 2*: Figure 2 in Dr. [redacted] report shows XRP transactions conducted by GSR on November 1, 2016. He claims that GSR's purchases during a one-hour period around an XRP price of $0.008 are "consistent with implementation of a price floor just as directed by Ripple."[34]

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[33] Academic literature, including Bouchaud et al. (2018) and Donier and Bonart (2015), uses a square-root impact model to quantify the price impact of a particular sized trade. According to this framework, total trading volume and price volatility are important when assessing the price impact of a trade. Dr. [redacted] fails to consider these additional factors in his analysis. *See*, *e.g.,* Bouchaud, J., J. Bonart, J. Donier, and M. Gould, Trades, Quotes and Prices: Financial Markets Under the Microscope, Cambridge University Press, 2018, at 235-237. For a discussion of the square-root impact model more generally *see* Bouchaud, J., J. Bonart, J. Donier, and M. Gould, Trades, Quotes and Prices: Financial Markets Under the Microscope, Cambridge University Press, 2018. *See also* Donier, J., and J. Bonart, "A Million Metaorder Analysis Impact on the Bitcoin," *Market Microstructure and Liquidity* 1(2), 2015 for the application of this framework to Bitcoin.

[34] [redacted] Report, at ¶ 20 ("On November 1, 2016, Patrick [redacted] instructed GSR to 'aim to protect a $0.008 floor.' . . . Second, the trading seems to have succeeded in protecting XRP from dipping below $0.008 USD as the price did not go below this level.").

21. Dr. [redacted] is incorrect in claiming that GSR's trading "seems to have succeeded in protecting XRP from dipping below $0.008 as the price did not go below this level," but "reverted higher in the subsequent hour."[35] Dr. [redacted] ignores that, even though the alleged price floor of $0.008 was supposedly established in October 2016, XRP prices were more often *below* that price floor in November and December 2016, than they were *before* the alleged price floor was established. As I show in Exhibit 2, XRP prices were below $0.008 on approximately 42 percent of the days in October, 60 percent of the days in November, and 100 percent of the days in December 2016.

22. Moreover, Dr. [redacted] once again fails to quantify how much lower XRP's price would have been but for GSR's purchases, but speculates that an XRP price of $0.008 would "permit [them] to maximize revenue from its own XRP sales, all else being equal."[36] Dr. [redacted] argument is flawed. First, even if GSR's purchases prevented XRP prices from dipping below $0.008 during this one hour intra-day, as Dr. [redacted] alleges, it was at best short-lived and could not have affected XRP prices during the multi-year period when Ripple distributed XRP. Further, as my factor model demonstrates, the long-run XRP price return can be explained by exogenous cryptocurrency market factors that are outside Ripple's control.[37]

23. *Example 3*: Dr. [redacted] Figure 3 shows XRP transactions conducted by GSR on September 25 and 26, 2016. He alleges that "GSR made several large purchases of XRP that both preceded and accompanied a dramatic rise in the price of XRP of over 15 percent within 24 hours."[38] Dr. [redacted] graph shows GSR purchases coincided with price increases, but he did not

[35] [redacted] Report, at ¶ 20.

[36] [redacted] Report, at ¶ 19.

[37] Ferrell Report, at ¶¶ 91-99.

[38] [redacted] Report, at ¶ 23.

show, or attempt to show, that GSR's purchases caused this increase. Furthermore, my analysis of XRP price returns on the two days before and after the time period that Dr. [redacted] considers, September 25 to 26, 2016, shows that XRP price return is higher in the days before, and after, the alleged actions by Ripple in coordination with GSR. As I show in Exhibit 3, the XRP price return is 7.6 percent before September 25 and 13.6 percent after September 26, and 8.2 percent from September 25 to 26, 2016. Therefore, even if GSR's purchases coincided with increases in XRP prices, as Dr. [redacted] claims, there are even greater XRP returns after this period that he fails to analyze.

24. Dr. [redacted] claim that GSR "executed uneconomic trades whose purpose appears to be to push the price of XRP upward"[39] on these dates is not based on any economic analysis. He states that "GSR purchased XRP at a 1.5 percent premium compared to the last trade price"[40] but never compares GSR's purchases to an *actual* trade price. Rather, he attempts to show prices of GSR's trades relative to a "volume-weighted average price at 1-minute intervals across all trades on the XRP Ledger involving the XRP-USD trading pair."[41] Here, Dr. [redacted] ignores the possibility that the individual trades that comprise his "volume-weighted average" prices could have been higher or lower than GSR's prices.[42] In other words, his benchmark for GSR's trades, the volume-weighted average price, in fact aggregates a number of trades by averaging various trades rather than comparing GSR's prices to actual trades.

[39] [redacted] Report, at ¶ 21. *See also id.,* at ¶ 23 ("These uneconomic trades, i.e., buying XRP above market prices, coincide with XRP's increase in value on September 25 and the early morning of September 26.").

[40] [redacted] Report, at ¶ 23.

[41] [redacted] Report, at ¶ 21 and Figure 3.Panel B.

[42] Dr. [redacted] fails to provide information on the XRP Ledger prices and volumes he used to create the volume-weighted average prices used in Figure 3 of the [redacted] Report.

25. *Example 4*: Dr. [redacted] Figure 4 shows XRP transactions conducted by GSR on April 10 and 11, 2016. He alleges that GSR's net purchases on April 11, following a decrease in XRP prices on April 10, provide examples "consistent with an attempt to increase or stabilize the price of XRP."[43] Dr. [redacted] claims that "GSR reversed its programmatic sales *after* the *price of XRP continues to decline*."[44] But, in contrast to Dr. [redacted] claim, a more detailed analysis of intra-day prices shows that XRP prices increased approximately two hours *before* GSR became a net buyer, as the hourly XRP returns in Exhibit 4 show. The cumulative return for the five hours before and after the reversal is 6.2 percent when GSR was a net seller and a decline of 3.2 percent when GSR was a net buyer.

26. Even if the price of XRP increased for a few hours intra-day on April 11, the alleged increase in XRP price was short-lived. The daily return on April 11 was 1.9 percent followed by negative returns on April 12 and April 13, 2016.[45] Therefore, XRP return was lower and not higher, in contrast to Dr. [redacted] claim that "GSR executed trades with the stated motive of preventing the price of XRP from going down."[46]

27. *Example 5*: Dr. [redacted] Figure 5 shows XRP versus Bitcoin transactions that Mr. Larsen conducted through GSR from June 3 to 14, 2017 at the cryptocurrency exchange Poloniex. Dr. [redacted] picked twelve days in June 2017, a single cryptocurrency exchange (Poloniex), and a single trading pair (XRP/BTC). This is a highly selective example, from which

[43] [redacted] Report, at ¶ 25 ("The instances examined above provide specific examples of how Ripple and certain of its executives directed GSR to trade XRP on behalf of Ripple in a way consistent with an attempt to increase or stabilize the price of XRP.").

[44] [redacted] Report, at ¶ 24 ("As seen in Figure 4, at the direction of Ripple, GSR reversed its programmatic sales *after* the price of XRP *continues to decline*. Instead of net selling, XRP began net buying around 9:00am UTC.") [emphasis added].

[45] The daily XRP return was negative 2.7 percent on April 12 and negative 3.2 percent on April 13, 2016 using XRP prices from CoinMarketCap.

[46] [redacted] Report, at ¶ 25.

no conclusions can be drawn regarding Mr. Larsen's trading over time or as a whole as a scientific or logical matter. Dr. [redacted] nonetheless alleges that Mr. Larsen's purchases of XRP "are consistent with selection of an opportune time to purchase XRP to provide support similar to implementing a price floor to keep the price of XRP from further declining."[47] Dr. [redacted] opinions are flawed for several reasons.

28. First, even considering only the cherry-picked time, exchange, and trading pair that Dr. [redacted] considered, there is no relation between GSR's transactions on behalf of Mr. Larsen and the daily XRP/BTC price return at Poloniex during this time period. As I show in Exhibit 5, there is no directional relation between the daily XRP price returns and Mr. Larsen's buying and selling activity. For example, daily XRP/BTC price returns decreased by approximately 15 percent on June 2, 2017, a day when GSR sold XRP on behalf of Mr. Larsen, but XRP/BTC price returns also decreased by approximately 11 percent on June 10, 2017, a day when GSR purchased XRP on behalf of Mr. Larsen.

29. Further, on 90 percent of the days between April 15, 2017 and March 18, 2018, when GSR executed trades on behalf of Mr. Larsen, Mr. Larsen's trading volume, measured as total purchases and sales of XRP/BTC, was less than 0.5 percent of total trading volume on Poloniex and less than 0.1 percent of the XRP/BTC trading volume at cryptocurrency exchanges and reported by CryptoCompare.[48] Between June 2 and June 15, 2017, Mr. Larsen's volume was at most 1 percent and often less than 0.5 percent of total Poloniex XRP/BTC volume and at most 0.2 percent of overall cryptocurrency exchange volumes. There were many other market participants trading XRP/BTC during this time at Poloniex and at other cryptocurrency

[47] [redacted] Report, at ¶ 28.

[48] I calculate Mr. Larsen's trading volume as the total purchases and sales.

exchanges. Dr. [redacted] fails to take into account that trading by other market participants could also have contributed to the contemporaneous XRP/BTC prices. The approximate price impact, if any, of GSR's purchases and sales during this period was modest compared to the daily XRP/BTC return at Poloniex as I show in Exhibit 5.

30. Finally, Dr. [redacted] also claims that defendants' actions implemented, or were consistent with implementing, a "price floor."[49] Dr. [redacted] offers no evidence to support his contention that a price floor was in fact being created, or even that defendants' actions caused the alleged price floor. Dr. [redacted] relies on the assumption that the actions of a single market participant were causing the purported changes in the price of XRP. That is a baseless assumption considering how little of the total XRP trading volume defendants accounted for.

31. Taken together, my analysis shows that Dr. [redacted] analysis is unreliable and does not support his claims that GSR trading caused XRP price changes. Moreover, Mr. Larsen's decisions to buy or sell his XRP holdings are distinct from those of Ripple and are irrelevant to assessing the economic substance of an investment contract.

B. DR. [redacted] ALLEGATIONS THAT RIPPLE, IN COORDINATION WITH GSR, TIMED XRP SALES TO "MINIMIZE THE NEGATIVE SELLING IMPACT ON THE PRICE OF XRP" ARE NOT UNIQUE TO INVESTMENT CONTRACTS

32. Dr. [redacted] claims that "from January 2015 to at least September 2019, GSR appears to carefully time when XRP would be sold so as to minimize the negative selling impact on the price of XRP" and also that "Ripple turned to its programmatic selling partners to implement its XRP selling strategy."[50]

[49] [redacted] Report, at ¶ 9.a, ¶ 19 (Ripple), [redacted] Report, at ¶ 28 (Larsen).

[50] [redacted] Report, at ¶ 29 and ¶ 32.

33. Defendants' alleged strategy of minimizing the potential price impact of their sales is irrelevant for assessing whether XRP is an investment contract because there are examples of other large holders of an asset that distribute the asset in a controlled manner so as not to affect prices.

34. For example, the use of algorithms to execute institutional trades in foreign exchange ("FX") or futures markets is designed to minimize the potential impact of sales:

a. "FX algorithmic trading and automated pricing has surged in the last year as traders seek best execution and minimal market impact, according to the head of Bloomberg's FX electronic trading platform."[51]

b. "In institutional FX markets, implementation shortfall algorithms will try to avoid slippage and limit a large orders market impact by creating numerous child orders from the main or parent order. It will then spread those smaller orders across various execution venues and sources of liquidity. Such execution strategies also take account of the cost and or benefits of crossing the bid-offer spread."[52]

c. "Our suite of intelligent algorithms is designed to access liquidity, mitigate market impact and optimize your performance, by reacting rapidly to market dynamics. Our algorithms can also be customized in line with your execution goals. This guide is designed to help you identify the right algorithm for your specific requirements. It covers our global suite and provides an overview of each FX algorithm as well as when and how to use it."[53]

d. Futures trading uses "Execution Algos facilitate the next step in the process, where the trader has already decided what to trade and in what direction, but not necessarily when to trade it. These execution algorithms choose the timing of the predetermined trades. This benefits traders by minimizing trade slippage and market impact."[54]

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[51] Smith, A., "FX Algos and Auto-Pricing on the Rise as Traders Look to Minimize Market Impact, Says Bloomberg FXGO Head," *The Trade News*, June 18, 2021, https://www.thetradenews.com/fx-algos-and-auto-pricing-on-the-rise-as-traders-look-to-minimise-market-impact-says-bloomberg-fxgo-head/.

[52] Sinden, D., "Citi Launches a New Suite of Futures Trading Algos," *Finance Feeds*, January 22, 2021, https://financefeeds.com/citi-launches-new-suite-futures-trading-algos/.

[53] "A Guide to UBS Algorithms, UBS Electronic Execution - FX," *UBS*, August 2019, at 3.

[54] Signorelli, J., "Futures Traders Use Execution Algorithms for Alpha and Timing," *Futures Magazine*, January 6, 2020, http://www.futuresmag.com/2020/01/06/futures-traders-use-execution-algorithms-alpha-and-timing.

e. "Execution algorithms [in futures] are not designed to generate trading decisions—the 'what,' 'why' and 'when'—but rather the 'how' so as to minimize execution risk that could negate any trading alpha identified with the trade idea."[55]

35. The use of block trades is another example where market participants use a particular strategy to minimize the price impact of their trading. As Harris (2003) explains, "[l]arge traders often have a significant impact on prices."[56] Exchanges such as CME or ICE have specific rules for the execution of large trades.[57]

36. There is, therefore, nothing unique about defendants' decision to execute their trades through GSR so as to minimize price impact. Indeed, it would be surprising if a large holder of an asset wishing to sell did not care about minimizing the price impact associated with those sales. Thus, Dr. [redacted] characterization of defendants' strategy of trading in a manner designed to minimize the price impact on XRP leads nowhere as such behavior by market participants is not unique to securities. Indeed, these trading practices often fall under the rubric of "best execution," which includes an attempt to minimize the negative price impact associated with a particularly sized trade.[58]

37. In Figure 6, Dr. [redacted] analyzes 18 days during which GSR and [redacted] had respective

[55] Wood, G. "Transaction Cost Analysis for Futures," *CME Group*, June 2011, at 35, https://www.cmegroup.com/education/files/TCA-4.pdf.

[56] Harris, L., Trading & Exchanges: Market Microstructure for Practitioners, Oxford University Press, 2003, at 322.

[57] *See, e.g.,* "Market Regulation Advisory Notice," *CME*, https://www.cmegroup.com/rulebook/files/cme-group-Rule-526.pdf.

[58] *See, e.g.,* Harris, L., Trading & Exchanges: Market Microstructure for Practitioners, Oxford University Press, 2003. *See also*, Sinden, D., "Citi Launches a New Suite of Futures Trading Algos," *Finance Feeds*, January 22, 2021, https://financefeeds.com/citi-launches-new-suite-futures-trading-algos/. Signorelli, J., "Futures Traders Use Execution Algorithms for Alpha and Timing," *Futures Magazine*, January 6, 2020, http://www.futuresmag.com/2020/01/06/futures-traders-use-execution-algorithms-alpha-and-timing. Wood, G. "Transaction Cost Analysis for Futures," *CME Group*, June 2011, at 35, https://www.cmegroup.com/education/files/TCA-4.pdf.

tenures as programmatic sellers, and claims that they allegedly coordinated with Ripple to execute "XRP sales in a manner consistent with stopping or reducing sales to mitigate impact when XRP prices are declining."[59] Dr. [redacted] analysis is fundamentally flawed for at least three reasons.

38. First, Dr. [redacted] ignores any confounding factors, such as the relation between XRP price returns and returns of cryptocurrencies more generally. As I show in Exhibit 6.A., daily Bitcoin and XRP price returns are correlated over this period (the correlation is 87 percent). Indeed, this is consistent with the factor model I presented in my opening report, which also demonstrates that the long-run XRP price return can be explained by exogenous cryptocurrency market factors that are outside Ripple's control.[60]

39. Second, Dr. [redacted] draws his conclusions based on 18 days but fails to show that the time period he has chosen is in fact representative of the entire period when GSR and [redacted] were active as programmatic sellers. I analyze overall trading from November 2014 to January 2017 and from June 2017 to at least September 2019, the period when Ripple enlisted GSR, and the period when Ripple enlisted [redacted] namely September 2017 to at least September 2019.[61] Notably, this longer time period contains a number of other days with a more than 10-percent decline in XRP price return during each of the respective periods which Dr. [redacted] did not analyze.

40. Third, as I show in Exhibit 6.B, during the period when GSR and [redacted] were enlisted by Ripple there is effectively no difference in the percentage of GSR's average net sales to trading volume on days when the XRP return exceeded a 10-percent decline compared to

[59] [redacted] Report, ¶ 32.

[60] Ferrell Report, at ¶¶ 91-100.

[61] [redacted] Report, at ¶ 32 and Figure 6. I used the data Dr. [redacted] provided in his backup for my analysis.

other days. Therefore, even if GSR halted sales for a short period intra-day, as Dr. [redacted] alleges, the programmatic sales of XRP as a percentage of volume, on average, remain unchanged regardless of XRP prices.

C. DR. [redacted] CLAIMS THAT RIPPLE, IN COORDINATION WITH GSR, INCREASED XRP SALES FOLLOWING PRICE INCREASES ARE FUNDAMENTALLY FLAWED

41. Dr. [redacted] uses a regression analysis to allegedly show that there is a relation between prior XRP returns and GSR and [redacted] purchases and sales: "Ripple's market makers GSR and [redacted] tend to sell less when prices fall and sell more when prices are stabilized or rising" across a "wider time period."[62] Again, even if true, such a claim does not indicate that XRP has the economic substance of an investment contract.

42. In any event, Dr. [redacted] analysis is conceptually flawed. Dr. [redacted] does not establish that GSR sold less on days when prices were falling. In fact, his regression shows a relation between higher sales by GSR *following* a day where prices increase. In general, the price could have increased or decreased the day after prices increased, and Dr. [redacted] does not establish that XRP prices did not decrease the day after an XRP price increase and before GSR and [redacted] could have executed their trades. Moreover, nothing in Dr. [redacted] regression analysis establishes that GSR sales decrease on days when prices increase.[63] Put

[62] [redacted] Report, at ¶ 33 ("To better understand whether the behavior observed in the example shown in Figure 6 is persistent across a wider time period, I next examine whether Ripple's market makers GSR and [redacted] tend to sell less when prices fall and sell more when prices are stabilized or rising. … Imbalance is defined as the total number of XRP purchased minus total number of XRP sold in a day normalized by the average circulating supply."). *See also id.*, at ¶ 29 (GSR and [redacted] "sold more XRP following price increases."), at ¶ 34 ("I conclude that [GSR and [redacted] on behalf of Ripple, sold more XRP when the price of XRP was increasing and relatively less when the price was decreasing on the previous day."), and at ¶ 35 ("The findings from this regression analysis are also consistent with communications between Ripple and GSR where Ripple expressed a desire to sell XRP when the price of XRP increased.").

[63] [redacted] Report, at ¶ 34 ("By selling more XRP the day after XRP prices rise, GSR and [redacted] on behalf of Ripple, were able to *use rising XRP returns* and increased demand to mitigate any potential negative effect of its XRP sales and thus keep XRP prices high.") [emphasis added].

differently, he does not show that there is any relation between GSR imbalances on a particular day and XRP prices on the same day.

43. To analyze the relation between GSR imbalances on a particular day and XRP prices on the same day, I added contemporaneous return as a control variable to Dr. [redacted] regression specification and it shows that there is no statistically significant relation between current XRP price returns and imbalances. As I show in column A.2. of Exhibit 7, the coefficient on the contemporaneous return in not statistically significant.

44. Further, Dr. [redacted] claims that his regression indicates that "Ripple systematically directed sales of XRP in a manner that was consistent with seeking to minimize the negative impact of sales on XRP prices."[64] But Dr. [redacted] does not establish that there is a relation between imbalances and XRP price returns and, even if there were such a relation, he fails to show that it would have any long-term impact on XRP return. To analyze the relation between imbalances and XRP price return, I implement a regression model where XRP price return is the dependent variable, using contemporaneous imbalance, lagged imbalance, and lagged returns as independent variables:

$$XRP_{return_t} = a + \theta * Imbalance_t + \sum_{i-1}^{5} \beta_i * XRP_{return_{t-i}} + \sum_{i-1}^{5} \lambda_i * Imbalance_{t-i} + \varepsilon_t$$

where *a* is a constant term, and Imbalance is the number of XRP units purchased minus the number of XRP units sold per day by GSR and [redacted] on behalf of Ripple normalized by dividing by the daily circulating supply and ε denotes the error term.[65] In my return

[64] [redacted] Report, at ¶ 35.

[65] Note that I use Dr. [redacted] assumptions on number of lags and normalization in my model but do not endorse these assumptions he made. For example, Dr. [redacted] imbalance regression specifications are not robust to alternative specifications he could have chosen. Dr. [redacted] uses *circulating supply* to normalize imbalance whereas Chordia and Subrahmanyam (2004), which Dr. [redacted] cites, use *trading volume* to normalize imbalance. When I implement Dr. [redacted] imbalance regression model using *trading volume* to normalize imbalance, the coefficients on prior return are not statistically significant at the 5% level of significance. *See*

regression, I use the same number of lags on imbalance and return controls and the same normalization as in Dr. [redacted] regression.[66]

45. I implemented my return regressions for the period from January 2015 to September 12, 2019. Exhibit 7, column A.3. (without the contemporaneous imbalance) and in column A.4. (with the contemporaneous imbalance).[67] Using this regression specification, I find that *none* of the coefficients on current imbalances, prior imbalances, or prior returns are statistically significant at the 5-percent level. Dr. [redacted] therefore, has no basis for his claim that "Ripple systematically directed sales of XRP in a manner that was consistent with seeking to minimize the negative impact of sales on XRP prices."[68] In order for this claim to be true, the regression coefficient on the imbalances must be statistically significant, and my return regression specification demonstrates that this is not the case. Dr. [redacted] also has no basis for his claim that "these sellers, on behalf of Ripple, sold more XRP when the price of XRP was increasing and relatively less when the price was decreasing on the previous day," and thus "were able to use rising XRP returns and increased demand to mitigate any potential negative effect of its XRP sales and thus keep XRP prices high."[69] In order for this claim to be true, the

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[redacted] Report, at Table 1 ("Imbalance is defined as the number of XRP purchased minus number of XRP sold per day by GSR and [redacted] on behalf of Ripple, normalized by dividing by the average daily circulating supply of XRP over the previous 30 calendar days.") and Chordia, T., and A. Subrahmanyam, "Order imbalance and individual stock returns: Theory and evidence," *Journal of Financial Economics* 72, 2004, at 494 ("Order imbalance is scaled by the total number of trades or by the total dollar trading volume so as to eliminate the impact of total trading activity.").

[66] [redacted] Report, at ¶ 34 ("Lagged 5-day returns and imbalances are added as controls.").

[67] The time period from January 1, 2015 and September 12, 2019 corresponds to Dr. [redacted] analysis in [redacted] Report, Table 1.

[68] [redacted] Report, at ¶ 35.

[69] [redacted] Report, at ¶ 34 ("I conclude that these sellers, on behalf of Ripple, sold more XRP when the price of XRP was increasing and relatively less when the price was decreasing on the previous day. By selling more XRP the day after XRP prices rise, GSR and [redacted] on behalf of Ripple, were able to use rising XRP returns and increased demand to mitigate any potential negative effect of its XRP sales and thus keep XRP prices high.").

regression coefficient on the prior returns must be statistically significant, and my return regression specification demonstrates that this is not the case

46. Dr. [redacted] regression does not support his claim that GSR and [redacted] on behalf of Ripple, were able to use rising XRP returns and increased demand to mitigate any potential negative effect of its XRP sales and thus keep XRP prices high.[70] There is, accordingly, no economic rationale for Ripple to use temporary imbalances to earn a profit from XRP sales over the long term. The factor model I implemented before also shows that the long-term XRP return is not related to any of Ripple's XRP distributions when controlling for other cryptocurrencies' returns.

III. MR. LARSEN'S AND MR. GARLINGHOUSE'S SALES OF THEIR PERSONAL HOLDINGS OF XRP ARE INDEPENDENT OF RIPPLE AND ARE IRRELEVANT FOR ASSESSING WHETHER XRP IS AN INVESTMENT CONTRACT

47. Dr. [redacted] performed a tracing of funds on the blockchain that he alleges shows that Mr. Larsen and Mr. Garlinghouse "could have sent up to" respectively 1.93 billion XRP and 277 million XRP directly or indirectly to GSR over multiple "hops."[71] Sales of Mr. Larsen and Mr. Garlinghouse's personal holdings of XRP are independent from Ripple and Dr. [redacted] provides no basis for why his analysis of Mr. Larsen's and Mr. Garlinghouse's sales are relevant to the question of whether the economic substance of XRP constitutes an investment contract.

[70] [redacted] Report, at ¶ 34.

[71] [redacted] Report, at ¶ 38 ("As shown in Table 2, Larsen sent at least 1.50 billion XRP to GSR via one hop, but he could have sent up to 1.90 billion XRP to GSR over up to four hops, or 1.93 billion if tracing up to seven hops. It is worth noting that Larsen could have sold or gifted XRP to entities or individuals who subsequently transferred the XRP to GSR; this could be a reason why XRP reached GSR from Larsen's identified wallets over a series of up to seven hops."). *See also* [redacted] Report, at ¶ 39 ("Garlinghouse directly transferred 167 million XRP ($104 million) to GSR out of a total of 377 million XRP ($186 million) transferred out of his identified addresses. This can be seen in Figure 8 which shows the cumulative amount of XRP transferred out of Garlinghouse's identified addresses over time, including direct transfers to GSR. Other destinations receiving direct transfers of XRP from Garlinghouse identified addresses include digital asset platforms, Ripple, or unidentified addresses.") and [redacted] Report Table 2, and Table 3.

48. Dr. [redacted] purports to show cumulative transfers out of wallets owned by Mr. Garlinghouse or Mr. Larsen and claims that they made significant use of GSR's liquidity extraction services. Dr. [redacted] fails to explain the economic relevance of whether Mr. Larsen and Mr. Garlinghouse used GSR to sell XRP to assessing whether the "economic reality" of XRP constitutes an investment contract. Even assuming that Dr. [redacted] analysis of cumulative funds is accurate, his analysis is conceptually flawed for the following reasons:

49. Dr. [redacted] claims that the "contract provisions suggest that Larsen and Garlinghouse employed the services of GSR to minimize the negative impact their XRP sales could have on XRP prices."[72] As I alluded to above, selling an asset to minimize the negative impact is part of the best execution strategy of many sellers and is not unique to sales of securities or (even if true) to sales by Mr. Garlinghouse and Mr. Larsen.

50. Also, Dr. [redacted] claim that these sales were intended to minimize a potential negative impact on XRP prices presumes that Mr. Larsen and Mr. Garlinghouse have some economic control over the cumulative XRP transfers in Dr. [redacted] analysis.[73] But, as I explain below, Mr. Larsen and Mr. Garlinghouse placed no restriction on the amount of XRP or the timing of the intermediary transfers. In fact, Dr. [redacted] recognizes that the control of the original holder decreases after the original transfer.[74]

[72] [redacted] Report, at ¶ 36.

[73] [redacted] Report, at ¶ 38 ("If one traces these out as far as seven hops, the total amount that Larsen transferred to GSR could be as high as 1.9 billion XRP ($599 million)."). Dr. [redacted] discusses tracing of Mr. Larsen's trades up to 7 hops, but his backup includes up to 13 hops. He claims that he excludes "traces beyond 13 hops because they are too small to show up in the charts and tables." *See* Dr. [redacted] backup, (SEC-LIT-EPROD-001851401).

[74] [redacted] Report, at ¶ 38 ("When analyzing blockchain transactions over multiple hops, the certainty that the initial owner of funds still controls them decreases as the number of hops increases.").

51. Exhibit 8 shows an example of an "indirect" XRP transfer from Mr. Larsen's wallet that reached GSR after three hops.[75] The example shows an initial transfer of 20 million XRP from Mr. Larsen to another participant on May 22, 2017. On October 23, 2017 — more five months later — this participant transferred 2,083,333 XRP to yet another anonymous market participant, who then transferred a slightly smaller amount, 2,083,313, to GSR, almost a year later, on March 26, 2018. This "final-hop" reaches GSR after 307 days or almost one year after the original transfers by Mr. Larsen. In contrast, a direct transfer from Mr. Larsen to GSR typically reaches GSR within minutes on the day.

52. Exhibit 8 also shows an example of an "indirect" XRP transfer from Mr. Garlinghouse wallet that reaches GSR after two hops. This example shows an initial transfer of 31.2 million XRP from Mr. Garlinghouse to another, anonymous participant on June 10, 2010. On August 7, 2020, this participant transferred approximately 10 million XRP to GSR. This transfer reaches GSR after approximately 60 days.

53. Dr. [redacted] fails to demonstrate that either Mr. Larsen or Mr. Garlinghouse controlled or benefitted from the sales or transfers of XRP once it left their possession. As Dr. [redacted] acknowledges "the certainty that the initial owner of funds still controls them decreases as the number of hops increases."[76] Moreover, XRP is a fungible virtual currency. Dr. [redacted] did not perform any analysis to show that subsequent transfers of XRP were related to the XRP owned by Mr. Larsen or Mr. Garlinghouse, or that the process of intermediary transfers was controlled by them. For example, other parties could have continued to receive XRP from other sellers, which they could have sent to yet another party or to GSR. Taken together, this means

[75] Dr. [redacted] did not provide any backup on his tracing algorithm, which he claims to be proprietary. I am not providing any opinion on the accuracy of his tracing methodology.

[76] [redacted] Report, at ¶ 38 ("When analyzing blockchain transactions over multiple hops, the certainty that the initial owner of funds still controls them decreases as the number of hops increases.").

that Dr. [redacted] has no basis to conclude that Mr. Larsen and Mr. Garlinghouse could have affected XRP prices through these transfers. Dr. [redacted] tracing analysis is, therefore, irrelevant and speculative. Dr. [redacted] claims about indirect transfers fails to support his claims and lacks quantification of the alleged price impact.

IV. THE USE OF LOCK-UP RESTRICTION IS NOT UNIQUE TO SECURITIES AND CANNOT BE USED TO DISTINGUISH BETWEEN INVESTMENT CONTRACTS AND OTHER TYPES OF ASSETS

54. Dr. [redacted] claims that lock-up restrictions on certain over-the-counter sales of XRP "functioned similarly to lock-up restrictions in a traditional company's Initial Public Offering,"[77] but he fails to explain why the use of a lock-up restriction is relevant for assessing whether the economic substance of XRP constitutes an investment contract.

55. Dr. [redacted] single citation to Field and Hanka (2001) explains that lock-up agreements with pre-Initial Public Offering ("IPO") shareholders serve specific purposes that he fails to discuss: "[t]hey reassure the market that key employees will continue to exert themselves for at least a few months; they provide a credible signal that insiders are not attempting to cash out in advance of imminent bad news; and they may aid the underwriters' price support efforts by temporarily constraining the supply of shares."[78] Therefore, even if IPOs have lock-up provisions, as Dr. [redacted] points out, his analogy is irrelevant here.

56. Ripple did not undertake an IPO. Ripple's use of lock-up periods in its sales to institutional purchasers was not equivalent to sales to "insiders and other pre-IPO

[77] [redacted] Report, at ¶ 9.c. and at ¶¶ 41-43.

[78] Field, L., and G. Hanka, "The Expiration of IPO Share Lockups," *The Journal of Finance* 56 (2), April 2001, 471-500, at 471.

shareholders."[79] Investors in IPOs "wish to maximize share price performance" and "IPOs are ideal opportunities for investors to obtain a sizeable stake in companies."[80] By virtue of owning shares in a company, investors in an IPO are entitled to a share of a company's profits. In contrast, institutional XRP purchasers that agreed to lock-up provisions were not shareholders of Ripple. Moreover, as I discussed before and discuss below, none of Ripple's contracts with institutional XRP purchasers entitled those purchasers to a share of Ripple's profits should Ripple be successful in its ongoing efforts to manage and develop its business operations, nor do the contracts impose any obligation on Ripple to expend ongoing efforts on behalf of those purchasers to increase the price of XRP.[81] This is also true for the institutional purchasers analyzed by Dr. [redacted] Dr. [redacted] cites agreements with various wholesale purchasers and market makers, such as [redacted] or [redacted][82] As I show below, none of these contracts obligate Ripple to generate any returns for these holders of XRP; they do not entitle them to receive future cash flows from Ripple or any other source, and they confer not right to share in Ripple's profits.

57. [redacted] and [redacted] contracts with XRP II, LLC ("XRP II") are purchase and sale agreements for a product and would fall into the "Contracts with Wholesale Purchasers" category of contracts I analyzed in my opening report.[83] [redacted] and [redacted] Master Purchase Agreements with XRP II describe the relationship between the parties as an arms-length transaction: "[n]othing in this Agreement will be construed as creating an employer-

[79] Field, L., and G. Hanka, "The Expiration of IPO Share Lockups," *The Journal of Finance* 56 (2), April 2001, 471-500, at 471.

[80] Geddes, R., IPOs and Equity Offerings, Butterworth-Heinemann – The Securities Institute, 2003, at 3.

[81] Ferrell Report, at ¶ 34 and ¶ 41.

[82] [redacted] Report, at ¶¶ 42-43.

[83] Ferrell Report, at ¶¶ 35-41.

employee or agency relationship, a partnership or a joint venture between the parties."[84] [redacted] agreement further describes the sale/purchase transaction: "[redacted] will purchase and XRP II will sell the Purchased XRP at the Purchase Order Price."[85] [redacted] agreement similarly states that XRP II "will agree to transfer XRP, the digital asset native to the XRP Ledger, to the Purchaser [redacted] against the transfer of funds, typically U.S. dollars, by the Purchaser [redacted] to the Company."[86] Further, upon delivery of XRP to the purchaser, "market risk and benefit [rests] solely with the Purchaser [redacted][87] Similarly, "[i]mmediately upon the Company's delivery of the Purchased XRP to the Purchaser, all title to and risk of loss related to such XRP passes to the Customer [redacted][88] Neither one of these agreements entitle [redacted] nor [redacted] to a share of Ripple's profits.

58. The contract between [redacted] and Ripple is a marketing and incentive contract, similar to the ones I analyzed in my opening report under section "Marketing and Incentive Contracts."[89] [redacted] agreed to develop a mobile and web-based digital asset wallet that is compatible with the Interledger protocol ("ILP") to market and publicize the wallet's use of ILP to [redacted] 1.3 million users, and to actively contribute to the open source codebase of ILP.[90]

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[84] [redacted] and XRP II, LLC, *Master Purchase Agreement*, November 29, 2014 (RPLI_SEC 0259585, at 590); [redacted] and XRP II, LLC, *Master XRP Purchase Agreement*, February 22, 2018 (RPLI_SEC 0233130, at 137).

[85] [redacted] and XRP II, LLC, *Master Purchase Agreement*, November 29, 2014 (RPLI_SEC 0259585, at 586).

[86] [redacted] and XRP II, LLC, *Master XRP Purchase Agreement*, February 22, 2018 (RPLI_SEC 0233130, at 130).

[87] [redacted] and XRP II, LLC, *Master Purchase Agreement*, November 29, 2014 (RPLI_SEC 0259585, at 587).

[88] [redacted] and XRP II, LLC, *Master XRP Purchase Agreement*, February 22, 2018 (RPLI_SEC 0233130, at 132).

[89] Ferrell Report, at ¶¶ 66-70.

[90] [redacted] and Ripple Labs, *XRP Incentive Agreement*, May 24, 2019 (RPLI_SEC 0298094, at 094-095).

Ripple, in turn, agreed to pay [redacted] in XRP.[91] "Immediately upon the Ripple's delivery of the XRP Incentive to [redacted] all title to and risk of loss related to such XRP passes to [redacted][92] [redacted] marketing and incentive contract is a transactional service contract between two parties and does not entitle [redacted] to a share of Ripple's profits.

59. The contract between Ripple and [redacted] Dr. [redacted] cites is a programmatic market maker agreement, which is the same agreement I analyzed in my opening report[93] and found that "unlike the private equity ownership contracts, the contracts with market makers do not give these entities any contractual right to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP. Regardless of whether Ripple's efforts are ultimately successful, the market maker, such as [redacted] … has a contractual right to the specified compensation if the market maker performs its obligations under the agreement."[94]

60. The contract with [redacted] does not "give [redacted] any contractual right to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP. In this sense, it is similar to an entity purchasing diamonds from De

[91] [redacted] and Ripple Labs, *XRP Incentive Agreement*, May 24, 2019 (RPLI_SEC 0298094, at 094).

[92] [redacted] and Ripple Labs, *XRP Incentive Agreement*, May 24, 2019 (RPLI_SEC 0298094, at 095).

[93] [redacted] and Ripple Markets, *Market Maker and Programmatic Market Activity Agreement*, February 14, 2017 (RPLI_SEC 0899145); Ferrell Report, at ¶¶ 46-51.

[94] Ferrell Report, at ¶ 51.

Beers or barrels of oil from Exxon Corporation."[95] Nothing Dr. [redacted] says changes this opinion I expressed in my opening report.

61. Lock-up provisions are also not unique to investment contracts. For example, art dealers use contractual terms that prevent buyers from reselling art for a fixed period of time.[96] This provision does not mean that art is a security or has the economic substance of a security. Certain homeowner associations have various rental restrictions, including "a mandatory waiting period; i.e., someone must own a unit for one year before renting it out."[97] This provision does not mean that the homes are securities or have the economic substance of a security. Some employment contracts contain a non-compete clause, where an employee cannot work for a competitor in the same industry for a certain amount of time.[98] Such provisions do not mean that the employment contracts have the economic substance of a security.

62. Therefore, Ripple's use of lock-up provisions, even if the lock-up was to limit immediate supply in the market, is irrelevant to assess whether XRP is an investment contract because it cannot be used to distinguish between investment and non-investment contracts.

V. DR. [redacted] CLAIMS ABOUT XRP BEING USED IN A SIMILAR MANNER AS COMPANIES USE STOCK IS IRRELEVANT FOR ASSESSING WHETHER XRP HAS THE ECONOMIC SUBSTANCE OF AN INVESTMENT CONTRACT

63. I demonstrated before that the economic substance of the various contracts Ripple entered into for the distribution of XRP are not similar in their economic substance to contracts

[95] Ferrell Report, at ¶ 41.

[96] "Dealers Try to Repel Speculators by Making Buyers Agree Not to Flip Their Art. But Can Those Contracts Actually Be Enforced?" *ArtNet News*, November 18, 2020, https://news.artnet.com/art-world/galleries-legal-resale-clauses-1924336.

[97] "Can an HOA Restrict Rentals? (Spoiler Alert: Yes)" *Million Acres*, December 16, 2019, https://www.millionacres.com/real-estate-investing/rental-properties/can-hoa-restrict-rentals-spoiler-alert-yes/.

[98] *See*, *e.g.*, "How Noncompete Clauses Keep Workers Locked In," *The New York Times*, May 13, 2017.

entered into by Ripple that created various equity and debt obligations. None of Ripple's contracts for the distribution of XRP entitles the holder of XRP to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations and none of these contracts require Ripple to expend ongoing efforts to increase the price of XRP.[99]

64. For example, the executive compensation packages resulted in employees, as part of their compensation for their services, owning an asset (subject to various conditions such as vesting). Unlike the private equity ownership contracts, the compensation contracts do not give the employees any contractual right to a share of Ripple's profits if Ripple is successful in its ongoing efforts to manage and develop its business operations or impose any obligation on Ripple to expend ongoing efforts to increase the price of XRP.[100]

65. The fact that Ripple may have used the proceeds of its sales of XRP to help fund its own operations does not change the economic substance of the transaction or create any obligations on the part of Ripple to share its profits with the purchasers of XRP. Therefore, Dr. [redacted] claims about XRP being used in a similar manner as companies use stock is irrelevant for assessing whether XRP has the economic characteristics of an investment contract.

66. Even though sales of XRP generate revenue for Ripple's business, as Dr. [redacted] suggests, the sale of an asset, even if the seller uses it to fund other activities, does not create a relationship in which the buyer receives a right to future profits from the seller, or in which the seller is obligated to work to generate a future return on that asset. For example, de Beers sales of diamonds or Exxon Corporation sales of barrels of oil generates cash for these entities, but that

[99] Ferrell Report, at Section II.C.

[100] Ferrell Report, at Section II.C.

does not give diamonds or oil the economic substance of securities. XRP does not do that either, and Dr. [redacted] does not attempt to argue otherwise.

I declare under penalty of perjury that the foregoing is true and correct. Executed on November 12, 2021

[Expert name] Frank Allen Ferrell

Exhibit 1
Intra-Day Trading Volume on September 15, 2016

	GSR XRP Ledger		Cryptocurrency Exchanges	
Activity Period (UTC)	**Volume in Time Period**	**Share of Volume (%)**	**Volume in Time Period**	**Share of Volume (%)**
07:00 to 13:00	0	0%	18909793	1%
13:00 to 19:00	21,038,351	30%	1,572,842,549	55%
Total Time Period	69,917,897	100%	2,841,556,077	100%

Sources: [redacted] Backup Materials; SEC-LIT-EPROD-001847955; SEC-LIT-EPROD_001849640; CryptoCompare.

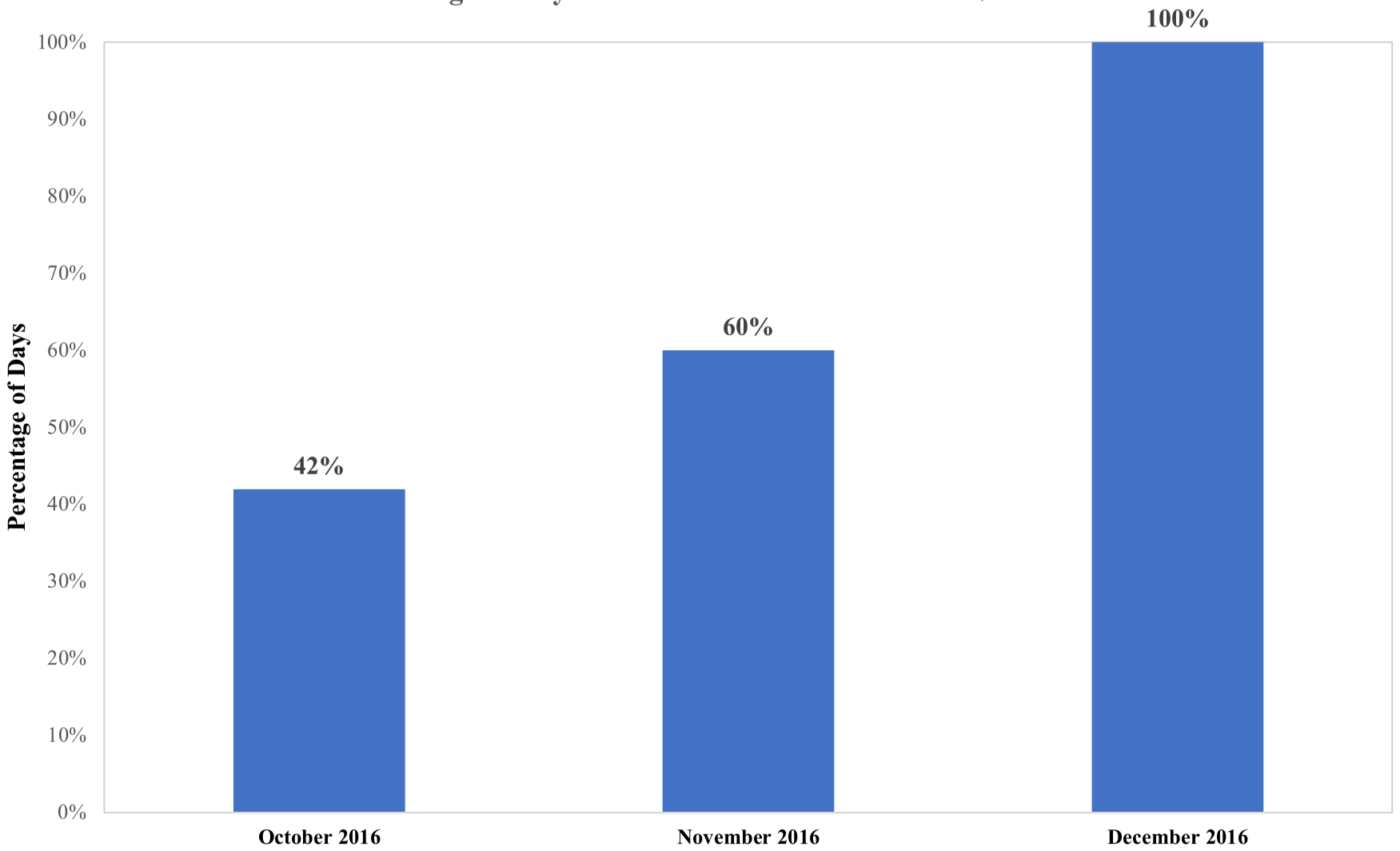
Notes:

[1] Share of volume is the share of the GSR or the exchange volume during the time period divided by the total GSR or the total exchange volume (reported by CryptoCompare) from 06:00 UTC September 15, 2016 to 13:00 UTC September 16, 2016.

[2] GSR volume equals the total purchases plus sales by GSR on the XRP ledger. Exchange volume is the total volume at cryptocurrency exchanges reported by CryptoCompare.

[3] Total Time Period is 06:00 UTC September 15, 2016 to 13:00 UTC September 16, 2016.

Exhibit 2
Percentage of Days With XRP Prices Lower Than $0.008



Source: SEC-LIT-EPROD-001848656.
Note: Percentage of Days is the percentage of days with a daily low price below $0.008.

Exhibit 3
XRP Price Returns
September 23, 2016 - September 28, 2016

Date Range	XRP Price Return
9/23-9/24	7.6%
9/25-9/26	8.2%
9/27-9/28	13.6%

Source: SEC-LIT-EPROD-001848656.
Notes:
[1] All returns are from close-to-close price of XRP.
[2] Close is the XRP price as of midnight UTC.

Exhibit 4
GSR Purchases and Sales and Hourly XRP Returns
April 11, 2016

Hour Before and After GSR "Reversal"	GSR XRP Purchases	GSR XRP Sales	GSR Net Purchases and Sales	XRP Hourly Return	Cumulative Hourly Return
-5	187,318	-254,456	-67,138	-0.2%	-0.2%
-4	749,000	-959,553	-210,552	-0.4%	-0.7%
-3	647,039	-413,843	233,196	-0.1%	-0.7%
-2	1,838,348	-2,265,589	-427,241	4.8%	4.1%
-1	399,628	-3,124,961	-2,725,333	2.0%	**6.2%**
1	1,883,720	-401,119	1,482,601	1.0%	1.0%
2	1,005,048	-57,915	947,134	3.3%	4.4%
3	1,229,106	-400,707	828,399	-1.5%	2.8%
4	3,950,235	-475,237	3,474,999	-2.6%	0.2%
5	5,822,582	-283,410	5,539,172	-3.4%	**-3.2%**

Sources: [redacted] Backup Materials; SEC-LIT-EPROD-001847955; SEC-LIT-EPROD_001849640; CryptoCompare.
Note: The thick blue line corresponds to the 0th hour or 9:00am UTC when GSR allegedly reversed their trading according to Dr. [redacted] *See* [redacted] Report, Figure 4 and ¶ 24 ("Instead of net selling, XRP began net buying around 9:00am UTC.")

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Exhibit 5
GSR's Net XRP Purchases on Behalf of Mr. Larsen at Poloniex

Date Range Shown in Dr. [redacted] Figure 5	GSR Net Purchases of XRP/BTC at Poloniex	Daily XRP/BTC Return	Absolute Value of Net Purchases of GSR as Percentage of Volume	Approximate Price Impact of Mr. Larsen Purchases and Sales
06/02/17	-363,155	-15.33%	0.11%	-0.26%
06/03/17	-465,792	-1.75%	0.21%	-0.49%
06/04/17	-310,157	0.88%	0.17%	-0.29%
06/05/17	-280,636	-7.63%	0.27%	-0.17%
06/06/17	-442,544	-8.15%	0.26%	-0.37%
06/07/17	-311,241	3.20%	0.15%	-0.20%
06/08/17	-281,308	-0.07%	0.21%	-0.18%
06/09/17	-408,377	-1.98%	0.34%	-0.27%
06/10/17	758,667	-10.56%	0.44%	0.38%
06/11/17	366,759	2.41%	0.32%	0.32%
06/12/17	1,497,937	1.29%	0.95%	0.48%
06/13/17	0	4.61%	0.00%	0.00%
06/14/17	0	9.73%	0.00%	0.00%
06/15/17	0	-4.78%	0.00%	0.00%

Sources: CIRCLE_00001699; SEC-LIT-EPROD-001849685 to SEC-LIT-EPROD-001849715; GSR00000101 to GSR00000103; RPLI_SEC 0679467; Poloniex.
Notes:
[1] Daily Return is the return from the closing price on the previous day. Close is the XRP price as of midnight UTC.
[2] Net purchases is GSR's purchases minus sales of XRP/BTC at Poloniex. Volume is XRP/BTC volume at Poloniex.
[3] Price impact uses the formula based on Bouchaud, J., J. Bonart, J. Donier and M. Gould, Trades, Quotes and Prices: Financial Markets Under the Microscope, Cambridge University Press, 2018, at 235-237, and Donier, J., and J. Bonart, "A Million Metaorder Analysis Impact on the Bitcoin," *Market Microstructure and Liquidity* 1(2), 2015.

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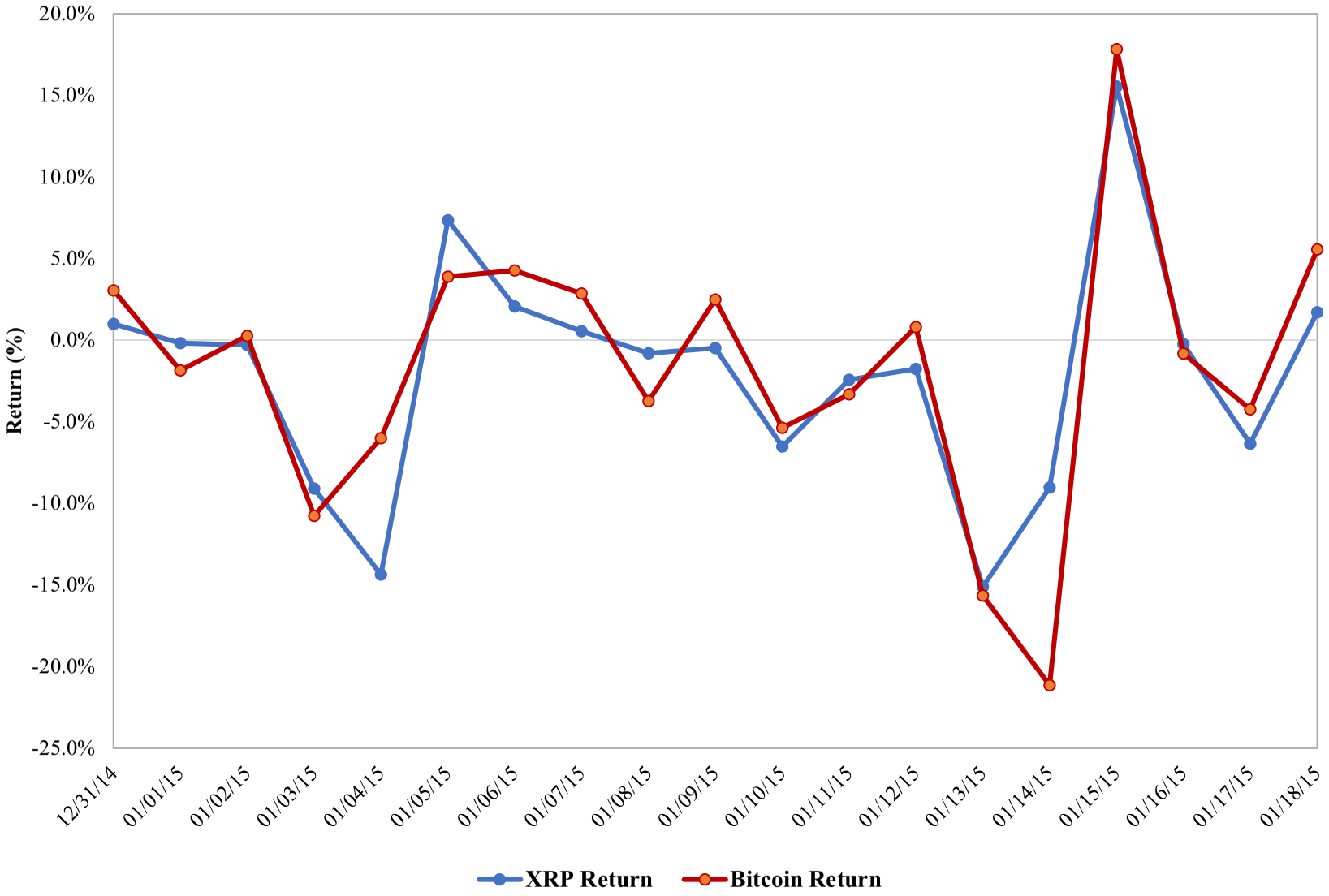
Exhibit 6.A.
Daily XRP Return Versus Daily BTC Return



Source: CoinMarketCap.

Exhibit 6.B.
Comparison of Net GSR Sales on Negative Return Days to Overall

	Day with Negative Return of More than 10%		Overall
Date Range	Number of Days	Ratio of Average Daily Net Sales to Average Daily Volume	Ratio of Average Daily Net Sales to Average Daily Volume
11/1/2014 to 1/31/2017	39	3.30%	3.26%
6/1/2017 to 9/12/2017	7	0.11%	0.14%
9/13/2017 to 9/30/2019	31	0.10%	0.08%

Sources: GSR00000101 to GSR00000103; RPLI_SEC 0679467; CryptoCompare; CoinMarketCap.
Note: The date ranges correspond to Dr. [redacted] date ranges when GSR was active.

Exhibit 7
Regressions of Imbalances and XRP Price Returns

	[A]: Normalized by Circulating Supply				[B]: Normalized by Volume			
	Imbalance		Return		Imbalance		Return	
	[1]	[2]	[3]	[4]	[1]	[2]	[3]	[4]
Constant	-2.26 ***	-2.25 ***	0.00	0.00	-0.00 ***	-0.00 ***	0.00	0.00
	(0.37)	(0.37)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Return (t)		-4.94				0.01		
		(8.43)				(0.01)		
Return (t-1)	-14.96 ***	-14.60 ***	0.07	0.07	-0.01	-0.01	0.07	0.07
	(5.01)	(4.87)	(0.07)	(0.07)	(0.01)	(0.01)	(0.07)	(0.07)
Return (t-2)	-6.89	-6.59	0.06	0.06	-0.01	-0.01	0.06	0.06
	(4.19)	(4.09)	(0.09)	(0.09)	(0.01)	(0.01)	(0.09)	(0.09)
Return (t-3)	-0.02	-0.01	0.00	0.00	0.01	0.01	0.00	0.00
	(3.73)	(3.69)	(0.03)	(0.03)	(0.00)	(0.01)	(0.03)	(0.03)
Return (t-4)	-2.59	-2.59	0.00	0.00	0	0	-0.01	-0.01
	(3.54)	(3.57)	(0.03)	(0.03)	(0.00)	(0.00)	(0.03)	(0.03)
Return (t-5)	0.06	0.27	0.04	0.04	0	0	0.04	0.04
	(3.37)	(3.33)	(0.04)	(0.04)	(0.00)	(0.00)	(0.04)	(0.04)
Imbalance (t)				-25.37				0.07
				(44.60)				(0.06)
Imbalance (t-1)	0.45 ***	0.45 ***	8.25	19.72	0.32 ***	0.31 ***	0.12	0.09
	(0.07)	(0.07)	(20.87)	(26.57)	(0.07)	(0.07)	(0.07)	(0.08)
Imbalance (t-2)	0.06	0.06	16.85	18.33	0.21 ***	0.21 ***	-0.06	-0.08
	(0.05)	(0.05)	(20.30)	(20.48)	(0.06)	(0.06)	(0.06)	(0.06)
Imbalance (t-3)	0.03	0.03	-5.09	-4.38	0.10	0.10	0.010	0.010
	(0.05)	(0.05)	(15.23)	(15.44)	(0.06)	(0.06)	(0.05)	(0.05)
Imbalance (t-4)	0.04	0.04	22.79	23.76	0.16 ***	0.16 ***	0.12 *	0.11 *
	(0.05)	(0.05)	(17.10)	(17.35)	(0.04)	(0.04)	(0.06)	(0.06)
Imbalance (t-5)	0.09 **	0.09 **	4.35	6.51	0.07 *	0.07 *	-0.06	-0.07
	(0.04)	(0.04)	(16.24)	(17.16)	(0.04)	(0.04)	(0.07)	(0.07)
Observations	1424	1424	1424	1424	1424	1424	1424	1424
Adjusted R2	0.29	0.29	0.01	0.01	0.51	0.51	0.01	0.01

Sources: GSR00000101; GSR00000102; GSR00000103; RPLI_SEC 0679467; SEC-[redacted]-E-0047622; SEC-LIT-EPROD-001848656.
Notes:
[1] Standard errors are robust to heteroskedasticity.
[2] * indicates significance at the 10% level, ** at the 5% level, *** at the 1% level.
[3] Following Dr. [redacted] methodology, when I normalize by the circulating supply in columns A.1 - A.4, imbalances are scaled by 100,000 in the imbalance regressions but not in the return regression. *See*, [redacted] Table 1.
[4] When I normalize by the volume, in columns B.1 - B.4, imbalances are scaled by 100,000 in the imbalance regressions and the return regression.
[5] In the volume-normalized columns imbalances are scaled up by 100,000.
[6] Volume is the total amount of currency exchanged as either a buy or sell according to CoinMarketCap.

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Exhibit 8
Examples of Alleged Indirect Transfers of XRP from Mr. Larsen and Mr. Garlinghouse to GSR Traced by Dr. [redacted]

Hop Number	From Address ID	From Address	Timestamp of Transferred Units	Units of XRP Transferred	Destination Address ID	Destination Address	Units of XRP Traced by Dr. [redacted]	Cumulative Number of Days From Larsen or Garlinghouse Wallet Transfer
1	Larsen (Active)	[redacted]	5/22/17 6:30 PM	20,000,000	Another Party	[redacted]	2,083,313	0
2	Another Party	[redacted]	10/23/17 7:01 PM	2,083,333	Another Party	[redacted]	2,083,313	154
3	Another Party	[redacted]	3/26/18 2:45 AM	2,083,313	GSR	[redacted]	2,083,313	307
1	Garlinghouse (XRP Award 3)	[redacted]	6/10/20 6:45 PM	31,249,900	Another Party	[redacted]	9,999,900	0
2	Another Party	[redacted]	8/7/20 5:56 PM	9,999,900	GSR	[redacted]	9,999,900	58

Sources: SEC-LIT-EPROD-001851401; SEC-LIT-EPROD-001851404; SEC-LIT-EPROD-001851408; SEC-LIT-EPROD-001851409.
Note: SEC-LIT-EPROD-001851408 and SEC-LIT-EPROD-001851409 do not include the address IDs for the wallets in between the initial Garlinghouse and Larsen wallets and final destination wallet. When the Address ID has not been provided, "Another Party" is indicated above.

Appendix A

October, 2021

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CURRENT POSITIONS

Greenfield Professor of Securities Law, Harvard Law School

Visiting Professor, Stanford Law School

National Bureau of Economic Research, Research Associate

Member of Editorial Board, Journal of Financial Perspectives

Fellow, Columbia University's Program on the Law and Economics of Capital Markets

Faculty Associate, Kennedy School of Government

Research Associate, European Corporate Governance Institute

EDUCATION

Massachusetts Institute of Technology, Ph.D. in Economics, 2005
Fields in econometrics and finance

Harvard Law School, J.D., 1995, *Magna Cum Laude*

- Recipient of the *Sears Prize* (award given to the two students with the highest grades)
- Editor, *Harvard Law Review*

Brown University, B.A. and M.A., 1992, *Magna Cum Laude*

PREVIOUS POSITIONS

Harvard University Fellow
Harvard Law School, 1997

Law Clerk, Justice Anthony M. Kennedy
Supreme Court of the United States; 1996 Term

Law Clerk, Honorable Laurence H. Silberman
United States Court of Appeals for the District of Columbia; 1995 Term

COURSES TAUGHT

Contracts
Corporate Finance
Law and Finance
Securities Litigation & Regulation

REFEREE FOR FOLLOWING JOURNALS

American Law and Economics Review
Journal of Corporation Finance
Journal of Finance
Journal of Financial Perspectives
Journal of Law and Economics
Journal of Law, Economics and Organization
Journal of Legal Studies
Quarterly Journal of Economics

CONSULTING AREAS

Price Impact and Securities Damages, Valuation, Mergers & Acquisitions

Papers

"Are Star Law Firms Better Law Firms?" with Manconi, Neretina, Powley & Renneboog, Working Paper (2021)

"How Accurate are Matrix Bond Prices?" with Drew Roper & Yibai Shu, Working Paper (2018)

"New Special Study of the Securities Markets: Intermediaries" with John Morley in SECURITIES MARKET ISSUES FOR THE 21ST CENTURY (2018) (editors Fox, Glosten, Greene and Patel)

"Socially Responsible Firms," with Hao Liang and Luc Renneboog, 122 *Journal of Financial Economics* 586-606 (2016) (winner of Moskowitz Prize for outstanding quantitative research)

"Price Impact, Materiality, and *Halliburton II*" with Drew Roper, 93 *Washington University Law Review* 553 (2016)

"Introducing the CFGM Corporate Governance Database: Variable Construction and Comparison" with Cremers, Gompers and Andrew Metrick, Working Paper

"The Benefits and Costs of Indices in Empirical Corporate Governance Research," *in* OXFORD HANDBOOK ON CORPORATE LAW AND GOVERNANCE (2016)

"Thirty Years of Shareholder Rights and Stock Returns," with Martijn Cremers, *revise and resubmit Journal of Financial Economics*

"Thirty Years of Shareholder Rights and Firm Valuation," with Martijn Cremers, 69 *Journal of Finance* 1167 (2014)

"Rethinking *Basic*," with Lucian Bebchuk, 69 *Business Lawyer* 671 (2014)

"Calculating Damages in ERISA Litigation," with Atanu Saha, 1 *Journal of Financial Perspectives* 93 (2013)

"Forward-casting 10b-5 Damages: A Comparison to other Methods", with Atanu Saha, 37 *Journal of Corporation Law* 365 (2011)

"Event Study Analysis: Correctly Measuring the Dollar Impact of an Event" with Atanu Saha, Working Paper (2011)

"Legal and Economic Issues in Litigation arising from the 2007-2008 Credit Crisis," with Jennifer Bethel and Gang Hu, *in* PRUDENT LENDING RESTORED: SECURITIZATION AFTER THE MORTGAGE MELTDOWN (2009)

"Securities Litigation and the Housing Market Downturn," with Atanu Saha, 35 *Journal of Corporation Law* 97 (2009)

"The Supreme Court's 2005-2008 Securities Law Trio: *Dura Pharmaceuticals, Tellabs*, and *Stoneridge*," 9 *Engage* 32 (2009)

"What Matters in Corporate Governance?" with Lucian Bebchuk & Alma Cohen, 22 *Review of Financial Studies* 783 (2009)

"Do Exchanges, CCPs, and CSDs have Market Power?," *in* GOVERNANCE OF FINANCIAL MARKET INFRASTRUCTURE INSTITUTIONS (Ruben Lee) (2009)

"An Asymmetric Payoff-Based Explanation of IPO 'Underpricing'," Working Paper, with Atanu Saha (2008)

"The Law and Finance of Broker-Dealer Mark-Ups," commissioned study for NASD using proprietary database (2008)

"Majority Voting" *in* REPORT OF THE COMMITTEE ON CAPITAL MARKETS REGULATION (2008)

"The Loss Causation Requirement for Rule 10B-5 Causes of Action: The Implications of *Dura Pharmaceuticals v. Broudo*," with Atanu Saha, 63 BUSINESS LAWYER 163 (2007)

"Mandated Disclosure and Stock Returns: Evidence from the Over-the-Counter Market," 36 *Journal of Legal Studies* 1 (June, 2007)

"Policy Issues Raised by Structured Products," with Jennifer Bethel, *in* BROOKINGS –NOMURA PAPERS IN FINANCIAL SERVICES (2007)

"The Case for Mandatory Disclosure in Securities Regulation around the World," 2 *Brooklyn Journal of Business Law* 81 (2007)

"U.S. Securities Regulation in a World of Global Exchanges," with Reena Aggarwal and Jonathan Katz, *in* EXCHANGES: CHALLENGES AND IMPLICATIONS (2007)

"Shareholder Rights" *in* REPORT OF THE COMMITTEE ON CAPITAL MARKETS REGULATION (2007)

"Creditor Rights: A U.S. Perspective," 22 *Angler- und Glaubigerschutz bei Handelsgesellschaften* 49 (2006)

"Measuring the Effects of Mandated Disclosure," 1 *Berkeley Business Law Journal* 369 (2004)

"If We Understand the Mechanisms, Why Don't We Understand the Output?", 37 *Journal of Corporation Law* 503 (2003)

"Why European Takeover Law Matters," *in* REFORMING COMPANY AND TAKEOVER LAW IN EUROPE (2003)

"Does the Evidence Favor State Competition in Corporate Law?", with Alma Cohen & Lucian Bebchuk, 90 *California L. Rev.* 1775 (2002)

"Corporate Charitable Giving," with Victor Brudney, 69 *Univ. Of Chicago Law Review* 1191 (2002)

"A Comment on Electronic versus Floor-Based Securities Trading," *Journal of Institutional and Theoretical Economics* (Spring 2002)

"Much Ado About Order Flow," *Regulation Magazine* (Spring 2002)

"On Takeover Law and Regulatory Competition," with Lucian Bebchuk, 57 *Business Lawyer* 1047 (2002)

"Federal Intervention to Enhance Shareholder Choice," with Lucian Bebchuk, 87 *Virginia Law Review* 993 (2001)

"A New Approach to Regulatory Competition in Takeover Law," with Lucian Bebchuk, 87 *Virginia Law Review* 111 (2001)

"A Proposal for Solving the 'Payment for Order Flow' Problem," 74 *Southern California Law Review* 1027 (2001)

"Federalism and Takeover Law: The Race to Protect Managers from Takeovers," with Lucian Bebchuk, 99 *Columbia L. Rev.* 1168 (1999)

TESTIMONY LAST FOUR YEARS

In re Robinhood Litigation, Case No. 3:20-cv-01626-JD, Expert reports and deposition on September 30, 2021

In re P3 Health Group Holdings, LLC, Case No. 2021-0518-JTL, Expert report and deposition on August 26, 2021

Securitized Asset Funding 2011-2 v. CIBC, Case Index No. 653911/2015, Expert report and deposition on July 30, 2021

Pearlstein et al. v. Blackberry Limited, Case No. 1:13-cv-7060-CM, Expert report and deposition on November 3, 2020

In re Grupo Televisa Securities Litigation, Case No. 1:18-cv-01979-LLS, Expert report and deposition on February 21, 2020

In re Snap Securities Litigation, Case No. 2:17-cv-03679-SVW-AGR, Expert report and deposition on December 16, 2019

People of the State of New York v. Exxon Mobil Corporation, Index No. 452044/2018, Expert report and deposition on July 23, 2019 and trial testimony on November 6, 2019

In re Signet Jewelers Limited Securities Litigation, Case No. 1:16-cv-06728-CM, Expert report and deposition on May 14, 2019

Trustees of DALI et al. v. Barrick Gold Corporation, Case No. CV-14-502316-00CP, Ontario Superior Court of Justice, Expert reports and deposition on April 16, 2019

Ramirez v. Exxon Mobil Corporation et al., Case No. 3:16-cv-031110K, Expert report and deposition on March 22, 2019

CC IMA v. IMA Pizza, JAMS Ref No. 1425026556, Testimony on September 13, 2018

Bradley Cooper v. Thoratec Corporation et al., Case No. 4:14-cv-00360-CW, Expert report and deposition on April 11, 2018

Blattman v. C3, Inc. et al., Case No. 1:15-cv-00530-GMS, Expert report and deposition on December 22, 2017

United States v. Kaleil Tuzman, 15 Criminal Case No. 536 (US Attorney for the Southern District of New York), testimony on December 15 and 18, 2017

Appendix B: Materials Considered

Court Documents

First Amended Complaint, *Securities and Exchange Commission v. Ripple Labs, et al.*, No. 1:20-cv-10832 (S.D.N.Y. February 18, 2021)

Expert Reports

Expert Report of Allen F. Ferrell, October 4, 2021

Amended Expert Report of John M. [redacted] October 13, 2021 and backup

Ripple Company Documents

Ripple Labs, Inc., *Good Standing Certificate*, December 1, 2014

Ripple Labs, Inc., *Consolidated Financial Statements*, December 31, 2014 – December 31, 2020

Academic Literature, Regulatory, and Practitioner Publications

Bouchaud, J., J. Bonart, J. Donier, and M. Gould, Trades, Quotes and Prices: Financial Markets Under the Microscope, Cambridge University Press, 2018

Chordia, T., and A. Subrahmanyam, "Order imbalance and individual stock returns: Theory and evidence," *Journal of Financial Economics* 72 (2004) 485-518

Donier, J., and J. Bonart, "A Million Metaorder Analysis Impact on Bitcoin," *Market Microstructure and Liquidity* 1(2), 2015

Field, L., and G. Hanka, "The Expiration of IPO Share Lockups," *The Journal of Finance* 56(2), April 2001, 471-500

Geddes, R., IPOs and Equity Offerings, Butterworth-Heinemann – The Securities Institute, 2003

Harris, L., Trading & Exchanges: Market Microstructure for Practitioners, Oxford University Press, 2003

News Articles and Press Releases

"A Guide to UBS Algorithms, UBS Electronic Execution - FX," *UBS*, August 2019.

"Can an HOA Restrict Rentals? (Spoiler Alert: Yes)" *Million Acres*, December 16, 2019, https://www.millionacres.com/real-estate-investing/rental-properties/can-hoa-restrict-rentals-spoiler-alert-yes/

"Dealers Try to Repel Speculators by Making Buyers Agree Not to Flip Their Art. But Can Those Contracts Actually Be Enforced?" *ArtNet*, November 18, 2020, https://news.artnet.com/art-world/galleries-legal-resale-clauses-1924336

"How Noncompete Clauses Keep Workers Locked In," *The New York Times*, May 13, 2017

"Market Regulation Advisory Notice," *CME*, https://www.cmegroup.com/rulebook/files/cme-group-Rule-526.pdf.

Signorelli, J., "Futures Traders Use Execution Algorithms for Alpha and Timing," *Futures Magazine*, January 6, 2020, http://www.futuresmag.com/2020/01/06/futures-traders-use-execution-algorithms-alpha-and-timing

Sinden, D., "Citi Launches a New Suite of Futures Trading Algos," *Finance Feeds*, January 22, 2021, https://financefeeds.com/citi-launches-new-suite-futures-trading-algos/

Smith, A., "FX Algos and Auto-Pricing on the Rise as Traders Look to Minimize Market Impact, Says Bloomberg FXGO Head," *The Trade News*, June 18, 2021, https://www.thetradenews.com/fx-algos-and-auto-pricing-on-the-rise-as-traders-look-to-minimise-market-impact-says-bloomberg-fxgo-head/

Wood, G. "Transaction Cost Analysis for Futures," *CME Group*, June 2011, https://www.cmegroup.com/education/files/TCA-4.pdf

Bates-Stamped Documents

RPLI_SEC 0233130

RPLI_SEC 0259585

RPLI_SEC 0298094

RPLI_SEC 0899145

Data Sources

CryptoCompare

Poloniex