UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

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

DECLARATION OF KYLIE CHISEUL KIM
IN SUPPORT OF DEFENDANTS' MOTION TO EXCLUDE
THE TESTIMONY OF [redacted] PH.D.

I, Kylie Chiseul Kim, hereby declare under penalty of perjury pursuant to 28 U.S.C. § 1746 as follows:

1. I am an associate at the law firm of Kellogg, Hansen, Todd, Figel & Frederick, P.L.L.C., and counsel to Defendant Ripple Labs Inc. I submit this declaration in support of Defendants' Motion to Exclude the Testimony of [redacted] Ph.D.

2. Attached as **Exhibit A** to this declaration is a redacted copy of the Amended Expert Report of [redacted] Ph.D., dated October 6, 2021.

3. Attached as **Exhibit B** to this declaration is a true and correct copy of the transcript of [redacted] February 18, 2022 deposition, filed under seal pending review for redactions.

4. Attached as **Exhibit C** to this declaration is a redacted copy of the Expert Rebuttal Report of Daniel R. Fischel, dated November 12, 2021.

5. Attached as **Exhibit D** to this declaration is a true and correct copy of the transcript of [redacted] May 10, 2022 supplemental deposition, filed under seal pending review for redactions.

6. Attached as **Exhibit E** to this declaration is a redacted copy of the Supplemental Expert Report of [redacted] Ph.D., dated February 28, 2022.

7. Attached as **Exhibit F** to this declaration is a redacted copy of the Supplemental Expert Report of M. Laurentius Marais, Ph.D., dated May 13, 2022.

8. Attached as **Exhibit G** to this declaration is a true and correct copy of Exhibit 16 to the May 10, 2022 Supplemental Deposition of [redacted] Ph.D., filed under seal pending review for redactions.

I hereby declare under the penalty of perjury that, to the best of my knowledge, information, and belief, the foregoing is true and correct.

Dated: July 12, 2022
Washington, D.C.

By: 

Kylie Chiseul Kim

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Exhibit A

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE COMMISSION, **Plaintiff** **v** RIPPLE LABS, INC., BRADLEY GARLINGHOUSE, AND CHRISTIAN A. LARSEN, **Defendants**	**20 Civ. 10832**

AMENDED EXPERT REPORT OF
[redacted] **Ph.D.**

[redacted]

OCTOBER 6, 2021

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I. Qualifications

1. My name is [redacted] and I am a [redacted]

2. I have testified as an expert witness for the Securities and Exchange Commission on event studies and market efficiency. I have worked for defendants, plaintiffs, and governmental agencies in matters involving fraud, conspiracies and manipulations, and multisided platforms. I have worked both in assessing liability issues as well as in estimating damages.

3. I received my [redacted], where I specialized in statistics and econometrics, finance, monetary economics, and numerical methods. I was awarded a [redacted] by the Economics Department. I also received my [redacted] and my [redacted], where I graduated summa cum laude.

4. I began working as an economic consultant in October of 2018. Prior to that, I was employed for fifteen years at [redacted] where I was the [redacted], a team of nearly 100 professionals with responsibility for developing credit models and analytical methodologies for all asset classes across all lines of business. I frequently met with U.S., European, and Asian regulators and policy makers to discuss credit risk, credit ratings performance, risk modeling, and regulatory, antitrust and other policy matters.

5. Before leading the [redacted], I was the [redacted] at [redacted] with responsibilities including Default Research, Model Development and Verification, and Technology.

6. As an economist at [redacted] I specialized in credit research and modelling. While there I developed numerous econometric models of corporate and consumer credit as well as credit rating transitions. I routinely assessed the impact of new information on the credit worthiness of corporates, financial institutions, sovereign entities and structured vehicles.

7. I have developed patented models of default and credit rating transitions and trademarked models of regional real estate prices. I have developed models of residential mortgage default, prepayment and loss which have been used to assess the credit risk of hundreds of billions of dollars in securitizations. I have also developed several models of corporate and consumer credit, financial risk contagion, real estate market performance measures, and pharmaceutical drug development, among others. In addition, I conducted event studies to assess the impact of credit actions and announcements on corporate and sovereign costs of capital.

8. I have authored and co-authored articles in peer reviewed journals, trade publications, and [redacted] Special Comments on subjects such as credit rating performance, corporate and sovereign defaults, collusion, manipulation, and screening. I have also contributed a chapter for a book on emerging markets and sovereign risk which was based, in part, on an event study analysis.

9. My curriculum vitae is included as Appendix A. [redacted] an hourly rate of $600 for my time in this matter. Staff at The Brattle Group have assisted me by performing work at my direction. My opinions are my own, and neither mine nor The Brattle Group's compensation are dependent on my opinions or the outcome of this matter.

II. Assignment

10. I have been retained by the Securities and Exchange Commission ("SEC") to provide expert opinions in the matter captioned above. Specifically, I was asked to perform an empirical analysis of XRP's price movements and assess whether actions by Ripple Labs, Inc. impact XRP prices. In conjunction with this assignment, I have been asked to assess the extent to which XRP price movements are driven by price movement in Bitcoin and other digital tokens. I have also been asked to be prepared to respond as needed on an expert issue or provide a rebuttal report on any subject on which I am qualified to opine.

11. My opinions are based on my knowledge and expertise gained during my professional career and my academic training and research. In forming my opinions in this matter, I have considered certain documents provided to me. A list of the documents I have relied upon is attached as Appendix B. In addition, I have prepared work papers that are available upon request. The opinions stated in this report are based on the evidence that has been provided to me to date. I am not opining on the accuracy of how Ripple describes its products or certain events in news or other public announcements. My work in this matter is ongoing, and I reserve the right to modify or supplement my conclusions as additional information is made available to me, or as I perform further analysis.

III. Summary of Opinions

12. Based on my analysis and review of documents produced in this matter, I have reached the following opinions:

    a. **XRP prices react to certain news and public statements about Ripple's actions.** Using a well-accepted event study methodology, I find statistically significant evidence that XRP prices react to news about Ripple's actions. This is particularly true for news of important milestones in the history of Ripple Labs and for announcements more directly related to XRP. The results hold for nearly all statistical models I examine at scientifically accepted levels of statistical significance. In no case do I

find a significant correlation of news and XRP returns in the days before the news, again confirming that XRP prices are reacting to news about Ripple's actions. Taken together, this evidence indicates that XRP prices react to the news of actions by Ripple Labs.

In Figure 1, I present a summary table that illustrates my findings. Across 20 different regression model specifications, which in varying degrees account for the price movements of digital tokens like Bitcoin ("BTC"), Ether ("ETH"), and other variables, I indicate the cases in which the relationship between news and XRP prices is statistically significant.[1]

FIGURE 1: XRP PRICES REACT TO DIFFERENT TYPES OF RIPPLE NEWS

Model Number	Milestones	Trading Platform Listings	Customers & Product Developments	Ripple Commercialization Initiatives	Select Categories
1	✓	✓	✓	✓	✓
2	✓	✓	✓		✓
3	✓	✓	✓	✓	✓
4	✓	✓	✓		✓
5	✓	✓	✓	✓	✓
6	✓	✓	✓		✓
7	✓	✓	✓	✓	✓
8	✓	✓	✓		✓
9	✓	✓	✓	✓	✓
10	✓	✓	✓		✓
11	✓	✓	✓	✓	✓
12	✓	✓	✓	✓	✓
13	✓	✓	✓	✓	✓
14	✓	✓	✓	✓	✓
15	✓	✓	✓	✓	✓
16	✓	✓	✓		✓
17	✓	✓	✓	✓	✓
18	✓	✓	✓		✓
19	✓	✓	✓	✓	✓
20	✓	✓	✓	✓	✓

Notes:

✓ Indicates significance at the 5% level.

Indicates not significant at the 5% level.

Select Categories is defined as the combination of Corporate Milestones, Trading Platform listings, Customer & Product Announcements, Ripple Commercialization Initiatives, and Acquisitions & Investments.

[1] Throughout this report, unless otherwise noted I shall use the phrase "statistically significant" to refer to model outcomes for which the probability of occurring under the null hypothesis is 5% or less. This "5% significance level" is a common standard for academic research.

b. **The relationship between XRP returns and the returns of other digital tokens changes over time.** In studying the degree to which XRP returns correlate with those of BTC and ETH, I find evidence that those relationships change over time. Correlations with other digital tokens are sometimes zero or even negative. Such correlation does not preclude that XRP prices could react to news and public statements about certain Ripple actions.

IV. Overview of Ripple Labs and XRP

A. Company Overview

13. Ripple Labs, Inc. ("Ripple") is a for-profit technology company based in San Francisco, CA. According to its website, Ripple has 500 employees and nine offices around the globe.[2] Ripple's senior leadership and executives include Chris Larsen, who is the Executive Chairman of Ripple's board of directors and former Chief Executive Officer ("CEO"), Brad Garlinghouse, who currently serves as CEO, and David Schwartz, who serves as Chief Technology Officer ("CTO").[3]

14. Throughout its history, Ripple has highlighted certain news or initiatives of the company. Such announcements relate to Ripple raising funds from venture capital investors in 2015, 2016 and 2019, its joint venture with SBI Holdings, and its receipt of a Bitlicense from the State of New York, Department of Financial Services.[4] Another event in the company's history that Ripple chose to highlight is its decision

[2] "Our Story," Ripple.com, ("500 Employees, 9 Global Offices, 3X YoY Customer Growth"), accessed September 28, 2021, https://ripple.com/company.

[3] "Leadership," Ripple.com, accessed September 28, 2021, https://ripple.com/company/leadership/; *see also,* "Board of Directors," Ripple.com, accessed September 28, 2021, https://ripple.com/company/board-of-directors/.

[4] *See*, e.g., "Ripple Labs Closes $28 Million Series A Funding Round," Ripple, May 19, 2015, accessed September 10, 2021, https://ripple.com/ripple_press/ripple-labs-closes-28-million-series-a-funding-round/; "Ripple Raises $55 Million in Series B Funding," Ripple, September 15, 2016, accessed September 10, 2021, https://ripple.com/ripple_press/ripple-raises-55-million-series-b-funding/;, and "Ripple Caps Record Year With $200 Million Series C Funding," Ripple, December 20, 2019, accessed September 10, 2021, https://ripple.com/insights/ripple-caps-record-year-with-200-million-series-c-funding/. "Ripple Strikes Multi-National Deal with SBI Holdings to Meet Growing Demand for Ripple Solutions Across Asia," Ripple Press, January 28, 2016, accessed September 10, 2021, https://ripple.com/ripple_press/ripple-strikes-multi-national-deal-with-sbi-holdings-to-meet-growing-demand-for-ripple-solutions-across-asia/. *See*, "Ripple Receives New York's First BitLicense for an Institutional Use Case of Digital Assets," Ripple Insights, June 13, 2016, accessed September 10, 2021, https://ripple.com/insights/ripple-receives-new-yorks-first-bitlicense-institutional-use-case-digital-assets/.

to put 55 billion XRP tokens into escrow, which according to Ripple would ensure supply predictability for XRP "investors."[5]

15. According to its website and other promotional materials distributed by the company, Ripple operates a network called RippleNet, which the company advertises as a real-time settlement system that aims to enable nearly instantaneous monetary transactions globally.[6]

16. Prior to branding RippleNet in 2019, Ripple separately marketed its commercial products under the names xRapid, xVia, and xCurrent. xRapid became commercially available in October 2018[7] and was eventually re-branded as On-Demand Liquidity ("ODL").[8] xRapid or ODL allow users to transfer one currency to another with XRP facilitating the transfer.[9] According to Ripple's public announcements, the primary selling point of this process is that it would provide faster and less expensive settlements compared to traditional cross-currency payment processing.[10]

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[5] This action was announced in May 2017 and completed in December 2017. *See,* "Ripple to Place 55 Billion XRP in Escrow to Ensure Certainty of Total XRP Supply," Brad Garlinghouse, *Ripple Insights,* May 16, 2017, accessed September 10, 2021, https://ripple.com/insights/ripple-to-place-55-billion-xrp-in-escrow-to-ensure-certainty-into-total-xrp-supply/. ("By securing the lion's share of our XRP, investors can now mathematically verify the maximum supply of XRP that can enter the market."); *see also,* "Ripple Escrows 55 Billion XRP for Supply Predictability," Ripple Insights, December 7, 2017, accessed September 10, 2021, https://ripple.com/insights/ripple-escrows-55-billion-xrp-for-supply-predictability/.

[6] RippleNet Brochure, Ripple.com, accessed September 28, 2021, https://ripple.com/files/ripplenet_brochure.pdf ("The needs of individuals and businesses sending cross-border payments have dramatically evolved. These customers are now demanding real-time, low-cost and fully trackable payments on a global scale. Yet, today's global payments infrastructure yields an experience that is slow, costly and opaque. Ripple solves these pain points through RippleNet, a network of banks, payment providers and others. Employing Ripple's solutions and a standardized ruleset allows for those connected on RippleNet to efficiently send and receive payments around the world.").

[7] "Ripple Highlights Record Year, xRapid Now Commercially Available," Ripple Press, October 1, 2018, accessed August 22, 2021, https://ripple.com/ripple_press/ripple-highlights-record-year-xrapid-now-commercially-available/.

[8] "Ripple's blockchain cross-border payments network grows to 300," Ledger Insights, November 7, 2019, https://www.ledgerinsights.com/ripple-blockchain-300-customers/, accessed October 1, 2021. ("Until recently, Ripple had two main products called xCurrent and xRapid on RippleNet. The former is a messaging system for payments which competes with SWIFT. The latter uses Ripple's digital currency XRP for fund transfers. However, the two were merged into the RippleNet brand, with xRapid rebranded as On-Demand Liquidity (ODL) which leverages XRP.").

[9] "Free Working Capital with On-Demand Liquidity", Ripple.com, accessed October 1, 2021, https://ripple.com/ripplenet/on-demand-liquidity/. ("Through the On-Demand Liquidity (ODL) service, RippleNet leverages the digital asset XRP as a bridge between two currencies, allowing you to eliminate pre-funding of destination accounts, reduce operational costs and unlock capital.").

[10] *See*, e.g., "goLance Leverages On-Demand Liquidity to Deliver Faster, Cheaper Payments to Their Global Marketplace of Freelancers," Ripple Insights, January 29, 2020, accessed October 1, 2021, https://ripple.com/insights/golance-leverages-on-demand-liquidity-to-deliver-faster-cheaper-payments-to-their-global-marketplace-of-freelancers/. ("RippleNet's On-Demand Liquidity gives us the ability to make hyper-efficient, low-cost payments that make our customers happy and drive growth for our business.").

17. xVia is described as a software tool that provides a single API to standardize connections between different payment networks.[11] xVia signed its first five customers in April of 2018, before later being integrated into RippleNet.[12] xCurrent, which became available in the first quarter of 2018,[13] is the software that eventually became the underlying platform of RippleNet. xCurrent "enables banks to message and settle their transactions… with RippleNet members."[14] The three products were integrated into RippleNet in October of 2019.[15]

18. In addition to its direct commercial efforts, Ripple has engaged in and publicized various other initiatives over time. Some of these initiatives are directed to commercialize its product suite and technology and perhaps ultimately to create use-cases for XRP. As an example, the Xpring program was a venture capital initiative announced in May 2018.[16] The goal of Xpring was to "invest in, incubate, acquire and provide grants to companies and projects run by proven entrepreneurs" who intended to "use XRP and the XRP Ledger…to solve their customer's problems in a transformative way."[17] Company documents indicate that by 2019, Ripple had invested $500M in over 20 companies through Xpring.[18] In 2020, Xpring was re-branded as RippleX.[19]

19. Ripple also engaged in and publicized initiatives directed to more general blockchain research or other company interests. An example of the latter type of initiative is the University Blockchain Research Initiative ("UBRI"). As described by Ripple, UBRI is a partnership program between Ripple and various

[11] *See* Birla Deposition Exhibit 32, WSJ D.Live Briefing Materials, October 30, 2018 [RPLI_SEC 0081034 at RPLI_SEC –81039]; *see also, "*xVia: A brief product overview for payment originators," October 2017, accessed August 26, 2021, https://ripple.com/files/xvia_brochure.pdf, at p. 8.

[12] *See* Asheesh Birla, "xVia Opens New Doors in Emerging Markets," Ripple Insights, April 26, 2018, accessed August 26, 2021, https://ripple.com/insights/xvia-opens-new-doors-in-emerging-markets/.

[13] *See* David Z. Morris, "Ripple-Powered Mobile Payments to Debut at Santander," Fortune, February 3, 2018, accessed August 26, 2021, https://fortune.com/2018/02/03/ripple-mobile-payments-santander/ ("The xCurrent-based service, referred to simply as "Pay" in a recent Santander earnings presentation, is projected to go live in the U.K., Spain, Brazil, and Poland in the first quarter of this year.").

[14] "xCurrent: A brief technical overview for financial institutions on RippleNet," October 2017, accessed August 20, 2021, https://ripple.com/files/xcurrent_brochure.pdf, p. 4.

[15] Sead Fadilpasic, "This is Why Ripple Removed xRapid, xVia, and xCurrent from their Site," Cryptonews, October 9, 2019, accessed August 26, 2021, https://cryptonews.com/news/this-is-why-ripple-removed-xrapid-xvia-and-xcurrent-from-the-4817.htm.

[16] "Welcome to Xpring," Ripple Insights, May 14, 2018, accessed August 20, 2021, https://ripple.com/insights/welcome-to-xpring/.

[17] "Welcome to Xpring," Ripple Insights, May 14, 2018, accessed August 20, 2021, https://ripple.com/insights/welcome-to-xpring/.

[18] *See* Madigan Deposition pp. 198:23 – 205:5; *see also*, Madigan Deposition Exhibit 15, Email from Breanne Madigan to D. Samarasinghe, July 15, 2019, [RPLI_SEC0200768] and Madigan Deposition Exhibit 56, Q2 2019 XRP Markets Report, July 24, 2019.

[19] Madigan Deposition, p. 60:5-13 ("Q… Is – is Xpring something that still exists or that no longer exists? A. So after Ron will and Ethan left around the same time, both the former Xpring team and the markets team were moved under Monica Long in a newly formed group called RippleX.").

universities to "support academic research, technical development and innovation in blockchain, cryptocurrency and, [sic] digital payments."[20] According to its webpage, Ripple has committed $50 million to its UBRI initiative.[21]

20. To date, Ripple's primary source of funding has been sales of XRP tokens, according to company financial statements. As shown in Figure 2, almost all of Ripple's revenue for the years 2013 to 2020 derived from XRP sales. According to figures disseminated by Ripple, it sold approximately $1.4 billion worth of XRP between Q1 2017 and Q4 2020 to a mix of institutional investors and retail investors via digital asset trading platforms and over-the-counter ("OTC") sales.[22] In addition to funding through XRP sales, Ripple also raised approximately $300 million in funding from angel investors and venture capital firms in Series A, Series B, and Series C rounds.[23]

FIGURE 2: RIPPLE LABS REVENUE BY SOURCE, 2013-2020 ($ IN MILLIONS)

	2013	2014	2015	2016	2017	2018	2019	2020
XRP Token Revenue	$4.4	$13.4	$12.2	$15.6	$186.1	$552.1	$710.8	$457.8
Software Revenue	-	-	-	0.1	1.0	2.3	5.1	0.6
Services Revenue	-	0.1	0.5	1.7	3.9	3.1	2.9	0.6
Total Revenue	$4.4	$13.5	$12.7	$17.5	$190.9	$557.6	$718.8	$459.0
XRP Token Revenue (% of Total)	100.0%	99.5%	96.0%	89.6%	97.5%	99.0%	98.9%	99.7%

Note: For the years 2019 and 2020, Ripple Labs lists revenues from "XRP transactions" and "Non-monetary XRP transactions" separately. This table includes the sum of both as "XRP Token Revenue."

Source: Ripple Labs Financial Statements, 2013-2020 (RPLI_SEC 0090938; RPLI_SEC 0426161; NY-9875_T_00017816; RPLI_SEC 0267872; RPLI_SEC 0920429).

[20] "What is University Blockchain Research Initiative (UBRI)?" accessed August 24, 2021, https://ubri.ripple.com/faq/.

[21] "What is University Blockchain Research Initiative (UBRI)?" accessed August 24, 2021, https://ubri.ripple.com/faq/.

[22] "XRP Markets Reports," Ripple, 1Q2017 – 2Q2020, https://ripple.com/insights. *See also,* Figure 6.

[23] "Ripple Labs Closes $28 Million Series A Funding Round," Ripple, May 19, 2015, accessed September 10, 2021, https://ripple.com/ripple_press/ripple-labs-closes-28-million-series-a-funding-round/; "Ripple Raises $55 Million in Series B Funding," Ripple, September 15, 2016, accessed September 10, 2021, available at https://ripple.com/ripple_press/ripple-raises-55-million-series-b-funding/; "Ripple Caps Record Year With $200 Million Series C Funding," Ripple, December 20, 2019, accessed September 10, 2021, available at https://ripple.com/insights/ripple-caps-record-year-with-200-million-series-c-funding/.

B. XRP Trades on Digital Asset Trading Platforms

21. Digital asset trading platforms are marketplaces where those who wish to buy and sell digital tokens such as XRP can connect. Trading is conducted 24 hours a day, seven days a week on digital asset trading platforms, so there is no "opening" and "closing" of daily trading like in traditional financial exchanges.[24] Some of the largest and best-known U.S. trading platforms include Coinbase, Kraken, and Gemini, though there are hundreds of trading platforms globally.

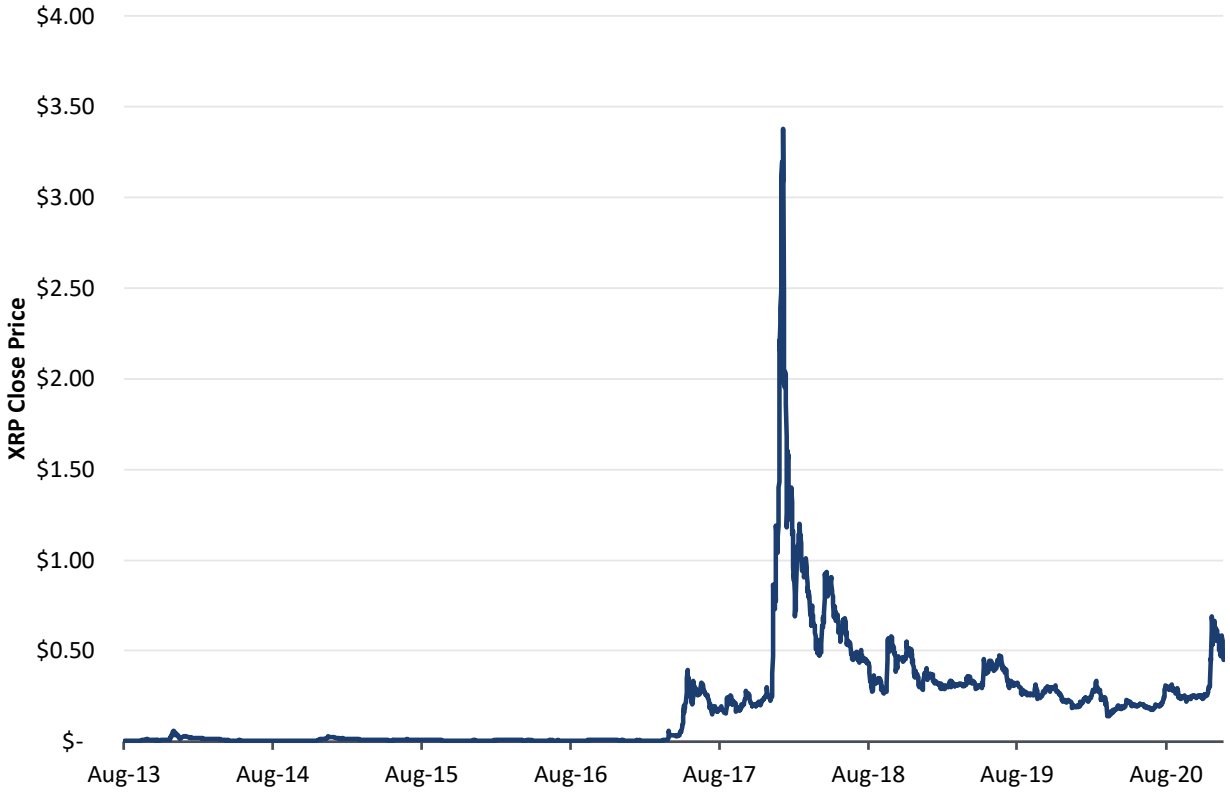
22. As with other digital tokens, XRP trades are in the form of asset pairs in which one specified token is exchanged for another specified token or for a fiat currency. For example, XRP-BTC represents the XRP to Bitcoin ("BTC") pair (i.e., XRP prices denominated in BTC) and XRP-USD represents the XRP to U.S. Dollar pair (i.e., XRP prices denominated in USD).

23. As shown in Figure 3 and Figure 4, XRP prices fluctuated substantially over time. For the first several years, it traded at or below one cent per XRP token for the most part. From mid-2017 to December 2020, XRP prices have ranged from approximately $0.25 per token to a high of about $3.40.[25]

[24] Ash Bennington, "Crypto Assets Trade 24/7 – And that Changes More than Uptime," Coindesk.com, July 24, 2017, accessed September 28, 2021, https://www.coindesk.com/markets/2017/07/24/crypto-assets-trade-247-and-that-changes-more-than-uptime/ ("Let's start with one of the most obvious aspects of cryptocurrency: Markets trade 24 hours a day, seven days a week – and that feature, as I'll explain, changes a lot more than market uptime…For one, the 24-hour market structure requires investors to think about the daily price changes in their positions through a different conceptual lens than their stock portfolios. In the U.S., stocks listed on The New York Stock Exchange or the NASDAQ Stock Market trade, during regular market hours, between 9:30 a.m. and 4 p.m. EST.").

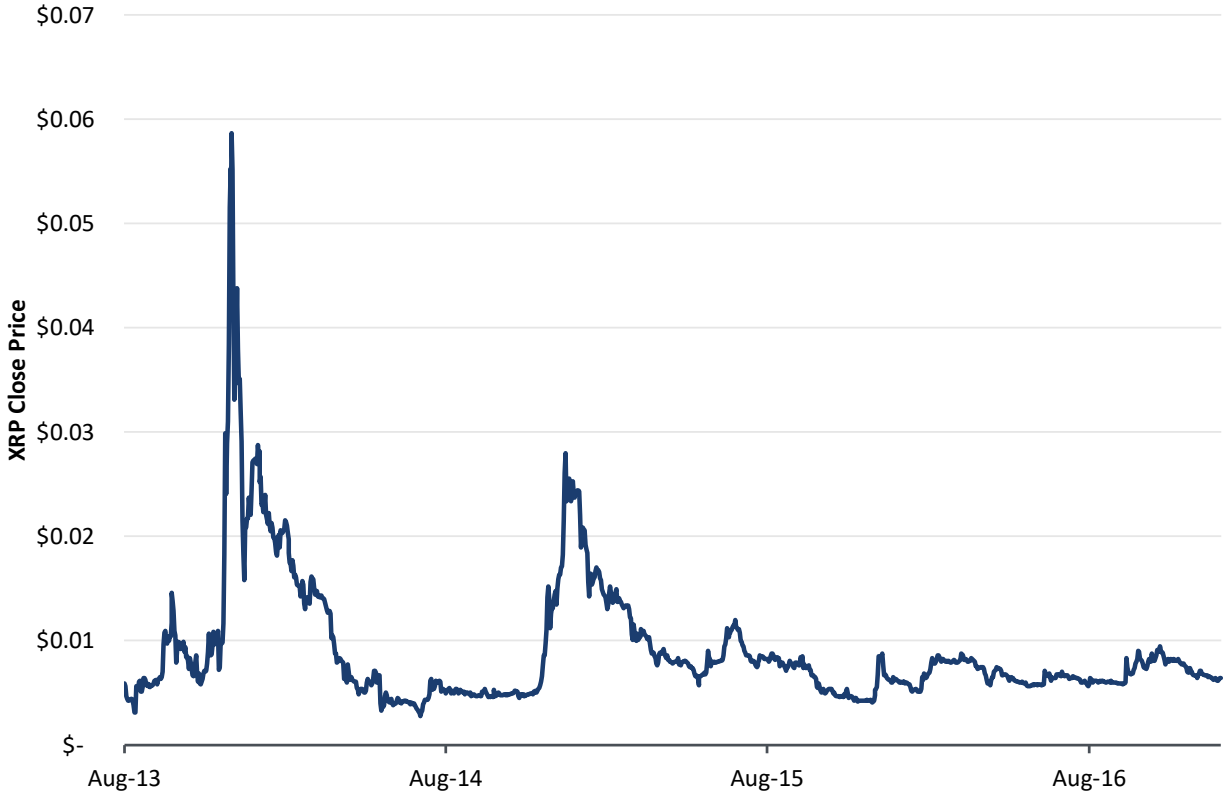
[25] The pricing data in Figure 3 is taken from CoinMarketCap.com, which provides a volume-weighted price across a number of digital asset trading platforms. The website hosts historical daily price data for XRP, including "open" and "close" prices based on the earliest and latest trade data in the UTC time zone, as well as a high price and a low price for the day.

FIGURE 3: XRP CLOSE PRICE, AUGUST 2013 – DECEMBER 22, 2020



Source: CoinMarketCap.

FIGURE 4: XRP CLOSE PRICE, AUGUST 2013 – DECEMBER 31, 2016



Source: CoinMarketCap.

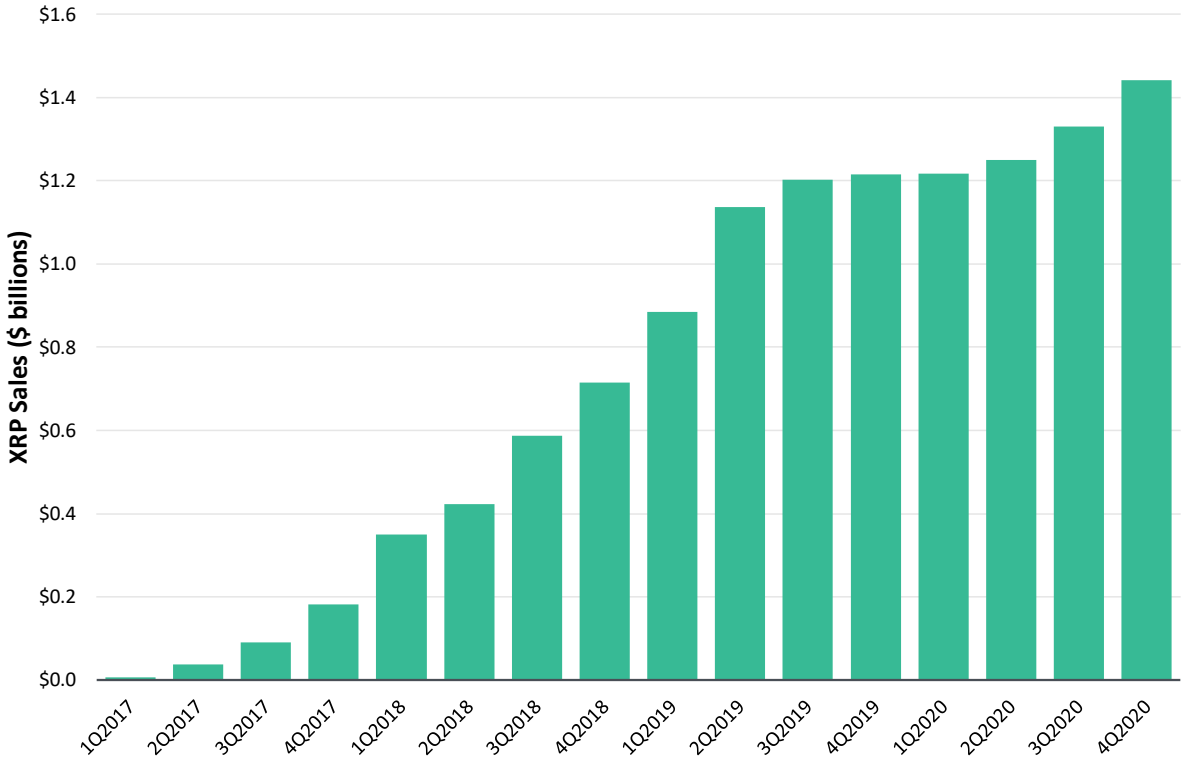
C. Ripple Sold XRP through Various Channels to Fund Operations

24. Ripple has sold more than $1.4 billion dollars worth of XRP tokens through various channels. As Mr. Garlinghouse explained in a February 2020 *Financial Times* article, Ripple was dependent on XRP sales for its operating cash needs, saying that "We would not be profitable or cash flow positive [without selling XRP], I think I've said that."[26]

[26] Izabella Kaminska and Cat Rutter-Pooley, "The art of redefining success, MoneyGram and Ripple edition," Financial Times, February 28, 2020. ("When pressed on Ripple's own profitability, Mr. Garlinghouse noted that Ripple, the company, was cash flow positive. How much of that cash flow was coming from service provision as opposed to sales of pre-existing XRP stock was less clear. Asked if XRP was keeping everything cash flow positive at Ripple Labs, Mr. Garlinghouse answered: 'Well XRP is one source. I don't know how to answer that because if you took away our software revenues, that would make us less profitable. If you took away all our XRP, that makes us less profitable. So I don't think about it as one thing.' He clarified later: 'We would not be profitable or cash flow positive [without selling XRP], I think I've said that. We have now.'").

25. As show in Figure 5, Ripple reported that it raised approximately $1.4 billion from sales of XRP through the fourth quarter of 2020.

FIGURE 5: CUMULATIVE QUARTERLY SALES OF XRP BY RIPPLE



Sources: Ripple sales from Quarterly XRP Markets Reports, 1Q2017 - 4Q2020.

26. Ripple classified its sales of XRP into two categories: programmatic sales and OTC sales.

    a. The programmatic sales were sales of XRP on digital asset trading platforms, managed by third-party market making firms, with two major ones being GSR and Cryptosystems.[27]

[27] Madigan Deposition, p. 51:4-23 ("Q.... When you arrived at Ripple, when you arrived at Ripple, to the extent you knew about programmatic sales, who was buying XRP from Ripple in programmatic sales? A. Sure. So the one point of clarification I wanted to make is that Ripple does not have a trading desk and so Ripple relies on third parties for its programmatic sales; namely, market makers. And, in particular, my recollection is that GSR and Cryptosystems were both managing those sales of XRP. Q. GSR and Cryptosystems were serving as intermediaries between Ripple and the market, is that correct? A. I think that's a fair term, although I don't know what -- yeah, what you'd call them, but they managed the sales of the XRP because Ripple couldn't sell directly.").

b. The OTC sales were negotiated block sales of XRP to large purchasers.[28] The OTC buyers included wealthy individuals, hedge funds, other investment firms, and financial institutions that had contracted with Ripple to transact in XRP using ODL.[29]

27. As show in Figure 6, Ripple reported $745 million of XRP sales in the form of programmatic sales on digital asset trading platforms followed and another $698 million in OTC sales from the first quarter of 2017 through the end of 2020.

[28] Griffin Deposition, pp. 149:6 – 150:18 ("Q. Mr. Griffin, in connection with your employment at Ripple, does the term "OTC sales" mean anything to you? A. Yes. Q. What does it mean? A. An OTC sale is over-the-counter sale. Q. Sale of what? A. XRP. Q. And why -- what's the reference to over the counter?... A. I think the -- the idea of an O – what we -- I would have thought about an OTC as a sale to a large purchaser of XRP. Q. And were you -- what was -- what, if any, was your involvement with OTC sales of XRP while you were employed at Ripple? A. I managed the team that was charged with that responsibility. … Q. And was one of their responsibilities to negotiate the potential purchases of XRP?... A. Yes.").

[29] Griffin Deposition, pp. 163:2 – 164:3. ("Q. …You know, what are the categories of persons that bought XRP from Ripple as OTC purchasers while you were at Ripple?... A. What -- there were individuals and investment firms. So, like, financial institutions. Brokers. I recall vaguely there was also mar -- possibly market makers. I can't remember exactly the composition of who was buying it, but that sounds -- sounds right. Q. To the extent there were individuals, were -- you know, were these wealthy individuals or sort of -- what -- can you give me a little more about the types of individuals?... A. For the most part, that sounds right, that they were wealthy individuals if they were individuals. Q. And does investment firms include, like, hedge funds and things of that nature? A. Right.").

FIGURE 6: RIPPLE QUARTERLY XRP SALES BY CHANNEL
($ MILLIONS)

	Programmatic Sales	OTC Sales	All Sales
	[1]	[2]	[3] = [1] + [2]
1Q2017	-	$6.70	$6.70
2Q2017	$10.30	$21.00	$31.30
3Q2017	$32.60	$19.60	$52.20
4Q2017	$71.50	$20.10	$91.60
1Q2018	$151.10	$16.60	$167.70
2Q2018	$56.66	$16.87	$73.53
3Q2018	$65.27	$98.06	$163.33
4Q2018	$88.88	$40.15	$129.03
1Q2019	$107.49	$61.93	$169.42
2Q2019	$144.64	$106.87	$251.51
3Q2019	$16.12	$50.12	$66.24
4Q2019	-	$13.08	$13.08
1Q2020	-	$1.75	$1.75
2Q2020	-	$32.55	$32.55
3Q2020	-	$81.39	$81.39
4Q2020	-	$111.12	$111.12
Total	**$744.56**	**$697.89**	**$1,442.45**

Sources: XRP Markets Reports, 1Q2017 - 4Q2020.

V. Analytical Methodology

28. In this section, I describe the methodology I use to test whether XRP returns are associated with news about Ripple. My analysis builds upon a well-accepted econometric framework referred to as an event study. An event study is commonly used to measure the impact of new public information on market

prices.[30] Event studies have been widely used in the academic literature for over 40 years,[31] and have also been commonly accepted in the context of securities financial litigation.[32]

29. Event studies on the price of a security generally proceed with the understanding that the price is expected to be affected by important, unanticipated news about the company. For example, if an event study shows that the stock price for Company X does not change following a particular earnings announcement from Company X, this would generally be taken as evidence that the earnings announcement was not "important" (or that it was not "news"). It is generally *not* taken as evidence that the stock price of Company X is independent of the earnings of Company X.

30. In the matter at hand, I understand that the XRP token is not a claim on the assets or earnings of Ripple Labs and that Ripple Labs maintains that market participants do not view Ripple Labs' efforts as relevant to the XRP market price. I have been asked by the SEC's litigation counsel to test whether news about Ripple Labs and its actions is associated with statistically significant XRP price changes. This association can be tested based on the idea of independence – that is, by evaluating the likelihood that news about Ripple Labs would occur at the same time as a significant XRP price change.[33]

31. Even if XRP prices are independent of Ripple Labs, there will likely be, by sheer coincidence, examples of "news" happening at the same time as "significant price changes." Similarly, even if Ripple Labs does affect XRP prices, there will likely be examples of "news" without "significant price changes," and vice versa. To analyze the independence between XRP prices and news about Ripple Labs, I therefore examine the question: Do the instances of "news" coincide with "significant price changes" more frequently than random chance could explain?

32. As a second analysis, I consider the news jointly and test whether, as a group, XRP price increases on news days are significantly large. This analysis, known as the generalized rank test, is also used in the

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[30] A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39 at p. 13.

[31] John J. Binder, "The Event Study Methodology Since 1969," *Review of Quantitative Finance and Accounting* Vol. 11, 1998, pp. 111-137 at p. 111.

[32] *See*, Frank Torchio, "Proper Event Study Analysis in Securities Litigation," *The Journal of Corporation Law,* Vol. 35, 2009, pp. 159-168, at p. 159 ("For over two decades, event studies have been prominently used as a valuation technique in various litigation matters including securities litigation.").

[33] Two events are independent if the occurrence of one event does not affect the occurrence of the other. *See*, e.g., Morris H. DeGroot and Mark J. Schervish, "Probability and Statistics", 4th Edition, p. 66 ("The conditional probability of the event A given that the event B has occurred is the revised probability of A after we learn that B has occurred. It might be the case, however, that no revision is necessary to the probability of A even after we learn that B occurs. … In this case, we say that A and B are independent events.").

academic literature on how digital token prices (including XRP) respond to news events.[34] It tests whether the price returns associated with a collection of events is statistically significant.[35]

33. In this section, I describe my methodology for testing the above question. I begin with a brief primer on event studies in the context of digital tokens, describe the regression models I consider, describe my approach to assembling news, and then explain how I use these elements to statistically evaluate the relationship between Ripple Labs and XRP prices.

A. Event Studies in the Context of Digital Tokens

34. Event studies have been used for decades in academic research to examine market price reactions to the publication of new information.[36] An event study is conducted by first specifying a model of *expected* price movements and then testing the extent to which *actual* price movements differ from those expectations. The econometric question an event study answers is whether the differences between actual and expected price movements are sufficiently large that, from a statistical standpoint, such differences are unlikely to be explained by random chance. "Sufficiently large" differences between the actual price movement and the expected price movement are those which are "statistically significant." I provide a detailed discussion of the event study methodology in Appendix D.

35. Securities markets in which prices adjust to new information "quickly" are called informationally efficient.[37] Academic researchers have found that the digital token markets, including the XRP market, are generally less informationally efficient than the stock market, though there is evidence that efficiency is increasing over time.[38] My own analysis—discussed in detail in Appendix F—is consistent

[34] Mohammad Hashemi Joo, Yuka Nishikawa, and Krishnan Dandapani, "Announcement effects in the cryptocurrency market," *Applied Economics* Vol. 52, No. 44, 2020, pp. 4794-4808 at p. 4800.

[35] This generalized rank testing procedure is developed by James W. Kolari and Seppo Pynnonen. *See*, James W. Kolari and Seppo Pynnonen, "Nonparametric Rank Tests for Event Studies," *Journal of Empirical Finance* Vol. 18, 2011, pp. 953-971.

[36] A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature,* Vol. 35, 1997, pp. 13–39. *See also*, Abigail McWilliams and Donald Siegel, "Event studies in management research: Theoretical and empirical issues," *Academy of Management Journal*, Vol. 40, No. 3, 1997, pp. 626-657.

[37] Eugene F. Fama, "Efficient Capital Markets: A Review of Theory and Empirical Work," *The Journal of Finance* Vol. 25 (2), 1970, pp. 383-417.

[38] *See*, e.g, Andrew Urquhart, "The Inefficiency of Bitcoin," *Economics Letters* Vol. 148, 2016, p. 5 ("…we do show that Bitcoin may becoming more efficient with some of the tests for market efficiency suggesting that Bitcoin returns are random in the second subsample. … Since it is a relatively new investment asset and still in its infancy, it is similar to an emerging market and therefore the inefficiency finding is not surprising. Consistent with this argument is that Bitcoin will become more efficient over time as more investors analyse and trade Bitcoin."); Aurelio F. Bariviera, "The Inefficiency of Bitcoin Revisited: A Dynamic Approach," *Economics Letters* Vol. 161, 2017, Abstract ("…daily returns exhibit persistent behavior in the first half of the period under study, whereas its behavior is more informational efficient since 2014."); Aviral Kumar Tiwari, R.K. Jana, Debojyoti Das, and David Roubaud, "Informational Efficiency of Bitcoin—An Extension," *Economics Letters* Vol. 163,

with the academic literature in that, by one common measure of efficiency (serial correlation), the XRP market is not fully efficient during the period of interest.[39]

36. Academic researchers have applied the event study methodology to digital token markets.[40] For example, Joo, Nishikawa, and Dandapani (2020) used an event study to evaluate the price reaction of BTC, ETH, and XRP to major news events and found all three digital tokens have statistically significant abnormal returns in connection with the identified news events.[41]

37. When conducting event studies on digital token prices, academic researchers typically investigate price reactions over multi-day windows.[42] This accounts for the possibility that digital token prices may not react to relevant information as "quickly" as would be observed in some other markets.

38. In my analysis below, I adapt several aspects of the Joo, Nishikawa, and Dandapani (2020) and Gerritsen, Lugtigheid, and Walther (2021) methodologies to the matter at hand. Where they allow up to seven days for prices to react to news, I conservatively limit my analysis to a three day window – meaning, I associate price reactions to a news event on date *t* only if I find evidence of statistically significant price

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2018, Abstract ("We report that the market is informational efficient as consistent to recent findings of Urquhart (2016), Nadarajah and Chu (2017) and Bariviera (2017)."); and pp. 6-7 ("We observe that the market is largely efficient with some exception to the period of April-August, 2013 and August-November, 2016."); and Ahmet Sensoy, "The Inefficiency of Bitcoin Revisited: A High-Frequency Analysis with Alternative Currencies," *Finance Research Letters* Vol. 28, 2019, Abstract ("We find that BTCUSD and BTCEUR markets have become more informationally efficient at the intraday level since the beginning of 2016, and BTCUSD market is slightly more efficient than BTCEUR market in the sample period.").

39 "Serial correlation" refers to the correlation of a data series with its own history, meaning that the data at time *t* is correlated with the data at time *t – s* for some lag *s*. Because it is the correlation of a data series with its own history, "serial correlation" is also referred to as "autocorrelation."

40 As an early example, see Wenjun Feng, Yiming Wang, and Zhengjun Zhang, "Informed Trading in the Bitcoin Market," *Finance Research Letters* Vol. 26, 2018, pp. 63-70, which finds evidence of informed trading in the Bitcoin market. *See also,* Dirk F. Gerritsen, Rick A.C. Lugtigheid, and Thomas Walther, "Can Bitcoin Investors Profit from Predictions by Crypto Experts?" *Finance Research Letters,* 2021 which analyzes how Bitcoin prices react to analyst commentary.

41 Mohammad Hashemi Joo, Yuka Nishikawa, and Krishnan Dandapani, "Announcement effects in the cryptocurrency market," *Applied Economics* Vol. 52, No. 44, 2020, Abstract ("Abnormal returns as well as cumulative abnormal returns (CARs) around major news announcements, both positive and negative, are investigated for three primary cryptocurrencies: Bitcoin, Ethereum, and Ripple. High abnormal returns are observed on the event day (Day 0), and CARs typically diverge during event windows of (−3, 6) and (0, 6), indicating that the information is not fully reflected in prices immediately after the news events. The CARs that linger for six days after an event suggest that the information flow in the cryptocurrency market is visibly slow. The magnitudes of CARs are larger for negative events than for positive events, implying that the market reaction to negative events is stronger than to positive announcements. The findings of this study may have crucial implications for investors, arbitragers and practitioners as we document evidence of potential trading opportunities for investors who initiate a trading position even after announcements.").

42 For example, the Joo, Nishikawa, and Dandapan (2020) paper investigates price reactions from 3 days before to 6 days after an event. The Gerritsen, Lugtigheid, and Walther (2021) paper investigates price reactions from 4 days before to 4 days after an event. *See also*, Mark Schaub, "On the OCC Announcement Allowing US Banks to Use Stablecoins and the Immediate Impact on Cryptocurrency Valuations," *The Economics and Finance Letters* Vol. 8, 2021, Abstract ("… Bitcoin and Etherium increased over 20% in value within 5 days of the announcement…") and p. 156 ("Returns are reported beginning 10 days before the OCC announcement until 10 days after for a window of (-10, +10).").

movements in the first three days.[43] Also, I limit my analysis to price reactions beginning on the day of the announcement and do not consider that prices may have begun reacting (perhaps based on leaks or rumors) in the days preceding the announcement. To the extent there was any leak of information, my approach is conservative.

B. Modeling XRP Returns

39. In my event study analysis, I consider several regression models of XRP price movements. The first model I consider has no control variables and is known as the Constant Mean Return Model.[44] This model has been used in other digital token event studies.[45] I then add in sequence the returns of Bitcoin (BTC), Ether (ETH), and Lumens (XLM).[46] Finally, I replace the individual return series with an equal-weighted index of these three returns as well as the returns on Binance Coin (BNB) and Ada (ADA).[47]

[43] By adopting this standard, I am not taking the position that price reactions in the XRP token market are necessarily complete in three days. To the extent that prices continue to react for several days after a news event, my approach is conservative in that I will not include such reactions when determining the significance of an event. My results are robust to considering shorter and longer event windows. *See* Appendix E for results over a one day event window and a seven day event windows.

[44] *See*, e.g., Stephen J. Brown and Jerold B. Warner, "Using Daily Stock Returns: The Case of Event Studies," *Journal of Financial Economics* Vol. 14, 1985, pp. 3-31 (discussing estimating excess returns by subtracting mean return from actual returns at pp. 6-7).

[45] *See*, e.g., Mohammad Hashemi Joo, Yuka Nishikawa and Krishnan Dandapani, "Announcement Effects in the Cryptocurrency Market," *Applied Economics* Vol. 52, No. 44, 2020, pp. 4794-4808, at p. 4795 ("…we apply the mean-adjusted returns model. In this model, the mean return of the previous trading days is employed as the baseline-expected return, and abnormal returns are calculated as the difference between the actual daily return and the expected return."). *See also*, Dirk F. Gerritsen, Rick A.C. Lugtigheid, and Thomas Walther, "Can Bitcoin Investors Profit from Predictions by Crypto Experts?" *Finance Research Letters,* 2021.

[46] Stellar, founded in 2014 by Jed McCaleb, one of the co-founders of Ripple, shares similarities with Ripple in their blockchain technologies. The native token of the Stellar blockchain is called Lumens (XLM). *See*, e.g., Mary Ann Callahan, "Ripple vs. Stellar: Will There Be Only One Winner?" FX Empire, Yahoo News, August 29, 2018, accessed September 29, 2021, https://www.yahoo.com/news/ripple-vs-stellar-only-one-083151892.html ("Cryptocurrency enthusiasts frequently compare Stellar and Ripple due to the similarities in their blockchains. … One of the co-founders of Ripple, Jed McCaleb, created Stellar in 2014. As with Ripple and XRP, Stellar refers to the technology, while XLM or Lumens refers to the cryptocurrency. Stellar is like Ripple in that it also allows for quick and affordable sending and receiving of funds. It also has similar coding to Ripple, which should be unsurprising considering their shared founder."). My pricing data for Bitcoin begins on April 28, 2013, for Lumens on August 5, 2014, and for Ether on August 7, 2015. As a result, the models which control for these tokens explicitly are not available in the very early periods of news.

[47] I construct the "equal-weighted index" using data as they become available. In the very early period, the index only comprises Bitcoin for example. My pricing data for Binance Coin and Ada begin relatively late, on July 25, 2017 and October 1, 2017, respectively, hence I do not consider models which explicitly control for those tokens.

40. For each of the five regression models above, I further control for the growth in XRP accounts.[48] This factor has been suggested in recent academic literature to be related to prices of digital tokens.[49] This gives me a total of ten sets of control variables.

41. As I discuss in more detail in Appendix F, over much of the time period in question, the XRP return on date *t* is correlated with the return on date *t* – 1, sometimes positively, sometimes negatively. This is known as "first order autocorrelation." For each of the ten specifications, I therefore also estimate models that control for first order autocorrelation in XRP's residual returns.[50]

42. My analysis thus consists of 20 different models for XRP returns, which I summarize in Figure 7. I estimate all models using data from the prior 180 trading days (roughly six months) up to four days prior to the date of interest.[51, 52]

43. The Constant Mean Return Model evaluates the XRP return in the context of its own recent history; essentially, the model flags a return as "significant" because it is significantly different from the returns of the previous 180 days.[53] By controlling for the returns of other digital tokens, as many of the other

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[48] XRP Scan reports counts of unique account addresses on the XRP Ledger created each day. These addresses are base58-formatted identifiers derived from the associated public key. My data on account creation begins on January 2, 2013 when 3 new accounts are reported. I do not have data on the number of accounts that may have existed before that day and assume it was 0. *See* "Integration Guide: Account," XRPScan, accessed October 2, 2021, https://docs.xrpscan.com/integration-guide.html.

[49] Yukun Liu and Aleh Tsyvinski, "Risks and Returns of Cryptocurrency," *The Review of Financial Studies* Vol. 34, 2021, pp. 2699-2700 ("We use four measures to proxy for the network effect: the number of wallet users, the number of active addresses, the number of transaction count, and the number of payment count. … these results suggest that the network factors that measure the network effect of user adoptions are important drivers of cryptocurrency prices.").

[50] To correct for this autocorrelation, I follow standard practice and regress XRP returns on date *t* on the control variables measured at *t* and one lag of XRP returns and the control variables. Gerritsen, Lugtigheid, and Walther (2021) also consider a correction for first order autocorrelation to the Constant Mean Return Model.

[51] A well-accepted method for performing the event study is to estimate a regression model over some period of time (an "estimation window") to quantify the typical relationship between the price movements of the relevant instrument and explanatory factors (often market-wide movements). *See*, for example, A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39 at p. 15 ("For example, in an event study using daily data and the market model, the market model parameters could be estimated over the 120 days prior to the event."). A 120 business day window corresponds to roughly six months of calendar time, or 180 days.

[52] In my analysis, the estimation window (i.e., the 180-day window used to estimate the regression) will change with different dates of interest. This is typically referred to as a "rolling estimation window" (since the estimation window is "rolled forward" for each subsequent date of interest). By using a rolling estimation window, I allow for the relationship between the XRP prices and the explanatory factors, as well as the volatility of the random factor, ε_t, to change over time. Use of a rolling model to account for changing volatility and evolving relationships among factors is often applied and is accepted in peer-reviewed literature. *See* Phillip A. Braun, Daniel B. Nelson, & Alain M. Sunier, "Good News, Bad News, Volatility, and Betas," *The Journal of Finance* Vol. 50 (5), 1995, pp. 1575-1603 at pp. 1575, 1597. Rolling estimation windows have been applied in the context of digital token event studies as well. *See* for example, Joo, Nishikawa, and Dandapani (2020) which uses a 365 day window. Gerritsen, Lugtigheid, and Walther (2021) uses a 49 day window.

[53] Consider the following hypothetical. Suppose that on some date *t*, it is announced that XRP has been listed on a new trading platform and XRP prices fall 5%. The Constant Mean Return Model will evaluate a return of -5% against the returns

models used in this analysis do, I consider the excess return of XRP prices beyond what can be explained by factors impacting the digital token market more broadly.[54, 55]

FIGURE 7: MODEL SPECIFICATIONS

Model Number	Constant	Independent Variables: Account Growth	BTC	ETH	XLM	E-Index	Lagged XRP	Lagged Independent Variables
1	✓							
2	✓	✓						
3	✓		✓					
4	✓	✓	✓					
5	✓		✓	✓				
6	✓	✓	✓	✓				
7	✓		✓	✓	✓			
8	✓	✓	✓	✓	✓			
9	✓					✓		
10	✓	✓				✓		
11	✓						✓	
12	✓	✓					✓	✓
13	✓		✓				✓	✓
14	✓	✓	✓				✓	✓
15	✓		✓	✓			✓	✓
16	✓	✓	✓	✓			✓	✓
17	✓		✓	✓	✓		✓	✓
18	✓	✓	✓	✓	✓		✓	✓
19	✓					✓	✓	✓
20	✓	✓				✓	✓	✓

NOTES:

Check mark indicates the variable is included in the model. E-Index refers to an equal-weighted index across the returns of ADA, BNB, BTC, ETH, and XLM subject to data availability.

of the previous 180 days. Suppose it finds such a return to be "statistically significantly negative." Evaluating the news of the platform listing using this model, I would conclude that there was a significantly negative return at the same time.

[54] Now suppose that on that same day it was announced that there had been a major hack to another trading platform, and this news adversely impacted digital tokens more broadly. Suppose BTC and ETH, in particular, drop 10% on date *t*. In a regression model which controls for those returns, the fact that XRP drops only 5% might indicate that its abnormal return – the difference between its actual and expected return – is actually significantly *positive*: its price dropped 5%, but it would be expected (say) to drop 10%, hence its abnormal return was actually +5%. Now evaluating the news of the platform listing using this other model, I would conclude that there was a significantly positive return at the same time.

[55] Ignoring stable coins, Bitcoin, Ether, Binance Coin, and Ada are currently the four largest digital tokens by market capitalization. For example, see "Today's Cryptocurrency Prices by Market Cap," CoinMarketCap, accessed October 4, 2021, https://coinmarketcap.com. Lumens is described as having a similar use case as XRP.

C. Identifying Pertinent News to Test

44. While there is generally a presumption that stock prices respond to new and relevant news about the company, one would not expect to see significant price changes accompanying every company announcement. For example, earnings announcements that are in line with investor expectations would not be expected to result in a significant price reaction.[56] An event study analysis can be used in these cases to determine if an earnings announcement (or other strategic announcements by a company about products or clients) was important news by investigating whether or not it is associated with a statistically significant price reaction.

45. A company can also disclose news other than earnings announcements. For example, many companies announce executive staff appointments, such as the appointment of a new CEO. Many companies engage in charitable activities, which they announce. In these cases, the price reaction following the event can be examined to determine if the announcement was "important." If there is a statistically significant price reaction, and if certain conditions can be established,[57] then one might conclude that the market reacted significantly to the announcement. In these cases, it is often not necessary to determine *a priori* if the stock price is expected to react to the news. There is a general presumption that it would if the news were relevant and important. Significant price reactions may be taken as evidence that the news in question was important. However, a lack of significant price reaction to a specific news event is typically not generalized as evidence that the stock price does not react to all other news of the same general type or of news about the efforts, announcements, successes, or failures of the issuer of the stock.

46. In this case, the question of whether XRP prices respond to news about Ripple Labs and its business activities needs to be examined. The question therefore is not whether a particular Ripple action or event is associated with a particular XRP price response (as is the case in many event study disputes), but instead, whether Ripple actions or events are collectively associated with significant XRP price reactions. In other words, I do not presume that XRP prices might react to anything Ripple does; instead, I am investigating whether such a relationship exists.

[56] In line with this, the earnings announcement literature has studied the impact of forecast error on stock prices. Forecast error is typically measured based on the difference between actual earnings and expected earnings. See, e.g., Bradford Cornell and Wayne R. Landsman, "Security Price Response to Quarterly Earnings Announcements and Analysts' Forecast Revisions," *The Accounting Review* Vol. 64 (4), 1989, pp. 680-692, at p. 681 ("The purpose of this paper is to investigate the extent to which revisions of more distant earnings forecasts, as well as the current forecast error, affect stock prices.") and p. 687 ("the forecast error … is given by $(EPS_{it} - E(EPS_{it}|\theta_0))/P_{it}$, where EPS_{it} is the realized quarterly earnings per share, $E(EPS_{it}|\theta_0)$ is the mean pre-announcement IBES consensus forecast of EPS_{it}, …").

[57] Such conditions may include: (i) if there is no other confounding news that day which might explain such movement, (ii) if there is no evidence that the announcement had been leaked or anticipated by the market, and (iii) if there is a plausible explanation as to why the market might react to this announcement.

47. My statistical analysis begins with the hypothesis that there is no link – that the XRP market is independent of news about Ripple Labs.[58] I will then investigate the extent to which the available data are consistent with that hypothesis, or if the hypothesis of independence should be rejected.

48. I first identify the types of news that are relevant for the purpose of testing this relationship. I summarize the news identification process below:

    a. I start with the news which Ripple Labs has identified to be important by virtue of (i) having issued a press release about the event, or (ii) having written about it on its Insights/News page, or (iii) having linked to a third-party news outlet in its curated Newsroom page. By limiting myself to this set of news, I am not taking the position that other events are necessarily "unimportant." I simply assume that based on its understanding of its business and industry, Ripple had some basis to highlight certain events and not others.

    b. I then classify these news announcements into the following categories:

        - **Acquisition & Investment**: announcement of an acquisition or investment made by Ripple Labs, including through its development arm Xpring
        - **Case Study**: discussion of a customer experience or use case of XRP or other Ripple Labs products
        - **Charity**: announcement of a charitable endeavor or donation by Ripple
        - **Corporate Activity & Announcement**: miscellaneous corporate announcement or activity not related to Ripple's products or new customers
        - **Customer & Product:** announcement related to new customer relationship (e.g., financial institutions or money centers often described as "partnering" with Ripple Labs) or products, including enhancements to the XRP ledger protocol
        - **Litigation:** news of litigation or regulatory enforcement involving Ripple Labs
        - **Market Commentary & Company Overview:** general commentary of the digital token market or Ripple Labs
        - **Markets Report:** a quarterly markets report published by Ripple
        - **Milestone:** key event in the history of Ripple Labs not related to products or customers

[58] Throughout this report, the phrase "XRP market" should be understood to mean specifically XRP *prices*, as distinct from other market considerations such as volume or liquidity.

- **Miscellaneous:** other announcement not otherwise categorized
- **Other Initiative:** initiative not primarily described as being related to the commercialization or promotion of Ripple's products or technology in the XRP ecosystem; includes cases of Ripple Labs joining existing interest groups
- **Office and Staff Announcement:** announcement of executive staff changes or the opening of a new office
- **Ripple Commercialization Initiative:** initiative launched by Ripple Labs primarily described as being related to the commercialization or promotion of Ripple's products or technology in the XRP ecosystem
- **Trading Platform:** announcement that XRP is available for trading on a new digital asset trading platform

I acknowledge that such categorizations rely on judgment. However, I show in VI.F.3that my results are robust to alternative categorization choices.

c. Finally, I identify any announcements within a category that should be excluded from the analysis. There are two reasons to exclude an announcement. First, the announcement may substantially repeat a previous announcement; I term such announcements "stale." Second, the nature of the announcement may not have a particular directional implication for XRP prices, even assuming the hypothesis of independence is false. I describe such announcements as "direction uncertain."

   I acknowledge again that these considerations require judgment. I show in Appendix E that my results are robust to these exclusions.

49. My initial set of sources consists of 72 Press Releases, 298 Insight Articles, and 323 Newsroom Articles for a total of 693 sources published prior to December 22, 2020.[59] I exclude ten of these sources from my analysis: eight are excluded because the articles are no longer available, one is excluded because it is not available in English, and one is excluded because I could not determine its exact publication date (a review of its content indicates that it would not prove relevant anyway). These exclusions are listed in Figure 8.[60] My final set of sources thus consists of 683 documents which I group into 514 events.[61] These are listed in Appendix C.

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[59] On December 22, 2020 the SEC announced its action against Ripple Labs, which may have had direct effects on XRP prices, over and above any effect it may have on those tokens through an effect on Ripple. I therefore limit my analysis to events reported before December 22, 2020.

[60] In a handful of additional cases the link from the Ripple Newsroom no longer works, however an internet search revealed articles of the same title from the same source. I have included those in my analysis.

[61] Some events are covered by multiple documents, hence there are fewer events than documents.

FIGURE 8: ARTICLES CLASSIFIED AS NOT AVAILABLE

Date	Headline	Source	Reason for Exclusion
8/23/2020	Ripple, A Blockchain-Powered Cross-Border Payments, Addresses an Increasing Need for Immigrant Remittances in the Japanese Market	Ripple Newsroom	Document not in English
n.a.	Ripple and XRP Are More Stable Than You Think	Ripple Newsroom	Document Unavailable
10/14/2016	Bloomberg Markets: Next President Must Have Fintech Plan	Ripple Newsroom	Document Unavailable
6/23/2016	Bloomberg Advantage: Larsen on the Internet of Value	Ripple Newsroom	Document Unavailable
4/28/2015	Building the Value Web with Open Standards	Ripple Newsroom	Document Unavailable
n.a.	Top Five Trends for Payments in 2015	Ripple Newsroom	Document Unavailable
n.a.	Why Do Banks Prefer Ripple Over Bitcoin?	Ripple Newsroom	Document Unavailable
n.a.	Cross-Border Payments Due For Disruption	Ripple Newsroom	Date Indeterminable**
n.a.	Bitcoin Makes Gains With Merchants	Ripple Newsroom	Document Unavailable
9/27/2018	Ripple for Good Supports Education and Financial Inclusion with $100 Million Commitment	Ripple Insights	Document Unavailable

Notes:

** This article is available as part of a report dated spring 2015. I am not able to determine an exact publishing date, so I exclude the article from my analysis, despite its still being available.

50. Below I test the correlation between XRP returns and news announcements in those categories related more directly to XRP, such as Customer & Product. If the null hypothesis of independence is false, then I should find a statistically significant correlation; if it is true, then I should not. For certain other categories, such as general market commentary (often written by third parties and which does not break new information), it seems self-evident that there should be no meaningful connection with the XRP market in any case, hence testing such categories is not informative.

51. It is important to consider the qualitative direction of the news I am evaluating. As a self-selected (by Ripple) set of news, it is strongly biased in favor of "good" news or at worst "neutral" news. Ripple may announce when customers are added to its network, but it may choose not to announce if a customer leaves its network. If the XRP market reacts to this "good" news, then it presumably means that XRP prices increase, they do not decrease. I will thus be testing whether "good news" is correlated with significant *positive* XRP returns, not negative returns.[62]

[62] There is always the subtle possibility that news which appears superficially "good" is nevertheless disappointing to the market. If a company announces an increase in earnings of $0.02 per share when the market had expected $0.05, it is possible that such an announcement might lead to a decrease in the stock price. Likewise, it might be that when Ripple announces a partnership with 7 banks, the market had expected 20. My analysis conservatively assumes that what is superficially "good news" should be met with positive XRP returns. I do not consider a negative return (even if it is significant) to be evidence in support of the proposition that the XRP market reacts to Ripple. I will test for correlation with negative returns as a robustness check.

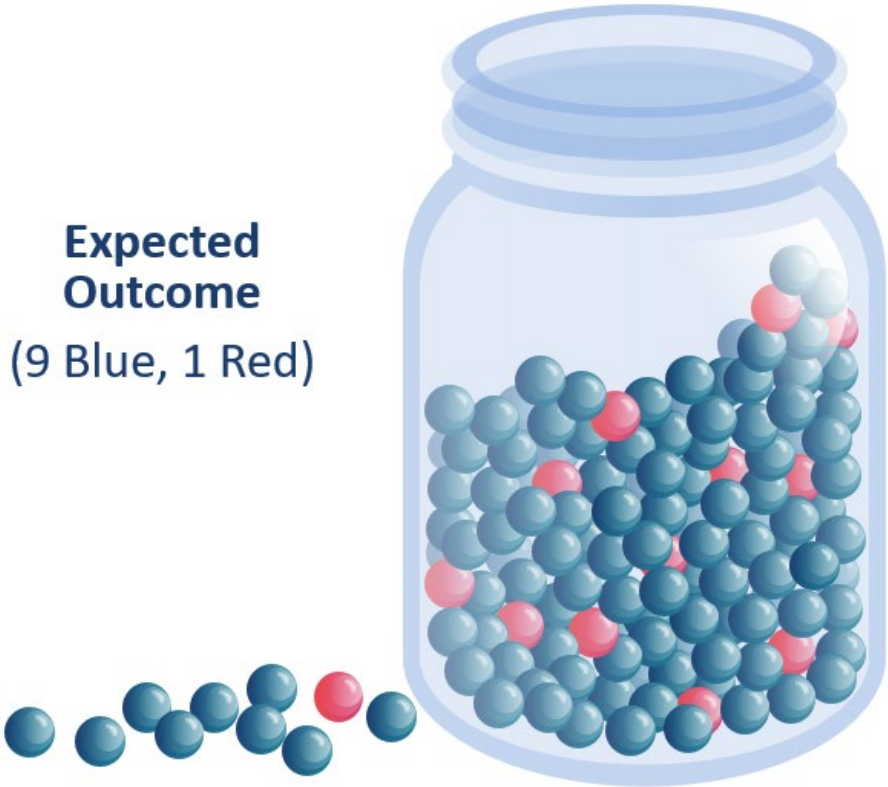
D. Testing for XRP Price Reactions to Ripple News

52. As I explained above, my analysis examines whether instances of Ripple news coincide with significant XRP price changes more frequently than random chance could explain. Consider the following "jar of marbles" example as an illustration of the framework for my statistical analysis:

    a. Imagine a jar with one thousand marbles. Nine hundred are blue, and they are mixed with one hundred red marbles. From this jar of marbles, if one were to draw a marble at random, the likelihood of drawing a red marble is 10% since 10% of all the marbles are red.

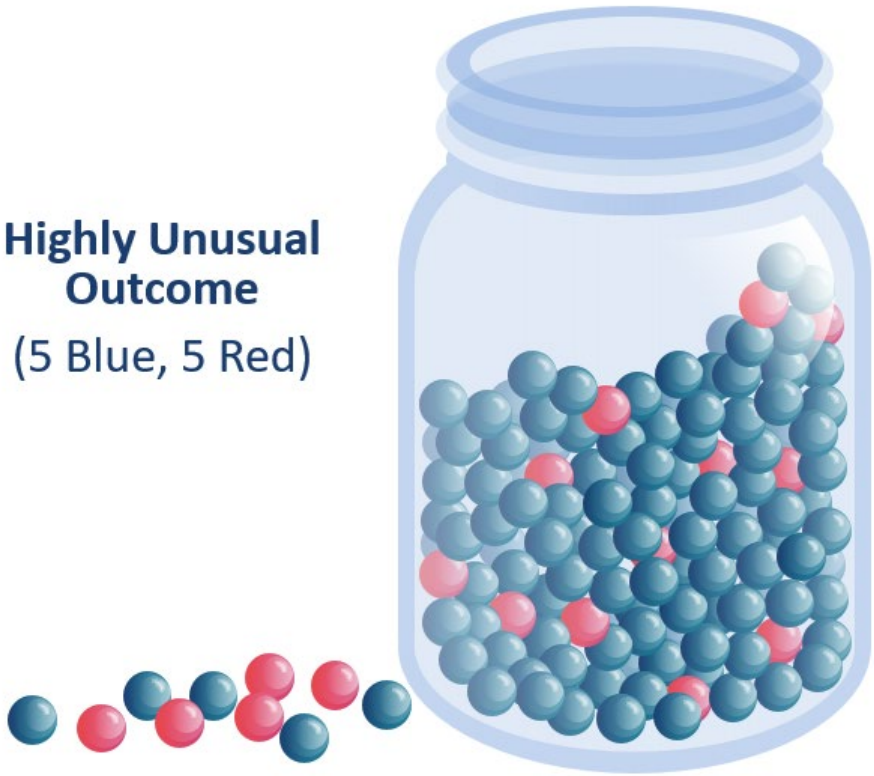
    b. Now imagine 10 marbles are drawn *at random*. Since 10% of all the marbles are red, we would expect to find 1 red marble in this group of 10 (as 10% of 10), as shown in Figure 9. However, as with most experiments that involve randomness, it is possible that we may have two or three. We could likely find no red marbles. It's even theoretically possible to draw 10 red marbles, though that is less likely than winning the lottery.

FIGURE 9: IN A RANDOM DRAW OF 10 MARBLES, ONE IS EXPECTED TO BE RED



c. The likelihood of all outcomes, from having 0 red marbles to having 10, is well understood by statisticians, if the draws are *random*.[63] Across the range of possible outcomes, some are more likely than others. For example, suppose we find 5 of the 10 marbles are red, not 1 as expected, as shown in Figure 10. While having 5 instead of 1 may not seem like a significant outcome, in fact it is. The probability of drawing 5 or more red marbles at random is about 0.15%. That is less likely than two people sharing the same birthday. Against the common academic standard of 5% significance, we would say that this outcome is statistical evidence that the draws were not, in fact, random.

FIGURE 10: DRAWING 5 RED MARBLES IS STATISTICALLY SIGNIFICANT EVIDENCE THAT THE DRAW WAS NOT RANDOM



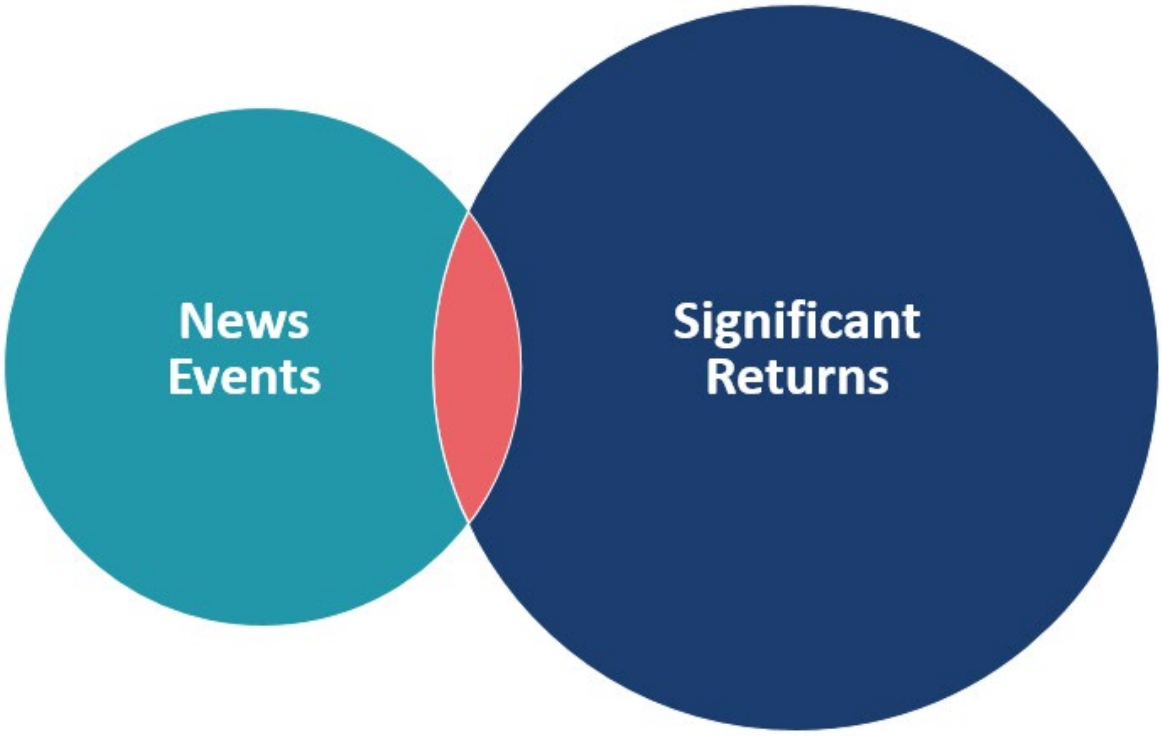
53. In the matter at hand, we do not have marbles which might be red, we have days which might have a significant (positive) XRP return. And rather than draw those days at random, I draw them based on whether there is Ripple Labs news as identified from my news identification process discussed above.

[63] Without replacement, each draw of marbles from the jar changes, however slightly, the probability that the next draw will be red. This complexity separates the binomial distribution (which assumes draws with replacement) from the hypergeometric distribution (which assumes draws without replacement).

54. Between May 5, 2014 (the first instance of news in my set) and December 20, 2020 (the last instance of news in my set before the SEC announced its action against Ripple Labs) there are 2,422 trading days (for illustrative purposes, imagine it is an even 2,500 days). For each of those days, I estimate the regression models that I described above based on the previous 180 trading days.[64] Each model generates an estimated abnormal return on each day, and a measure of the statistical likelihood of that abnormal return. I thus obtain from each model a set of days which have statistically significant positive XRP returns. We can think of this as the "set of red marbles" created by each model.

55. Suppose that a given model classifies 225, or 9%, of those 2,500 returns as significantly positive. Suppose that during the same period, 100 days have pertinent Ripple Labs news. If XRP returns are independent of Ripple Labs news, then we would expect 9 of those 100 "news days" to also have "significant returns" since 9% of all days have significant returns. In other words, if there is no relationship between "news" and "returns," random chance still suggests that there will be some small overlap between those sets, and statistics tells us what that overlap should be. This random overlap is shown in Figure 11.

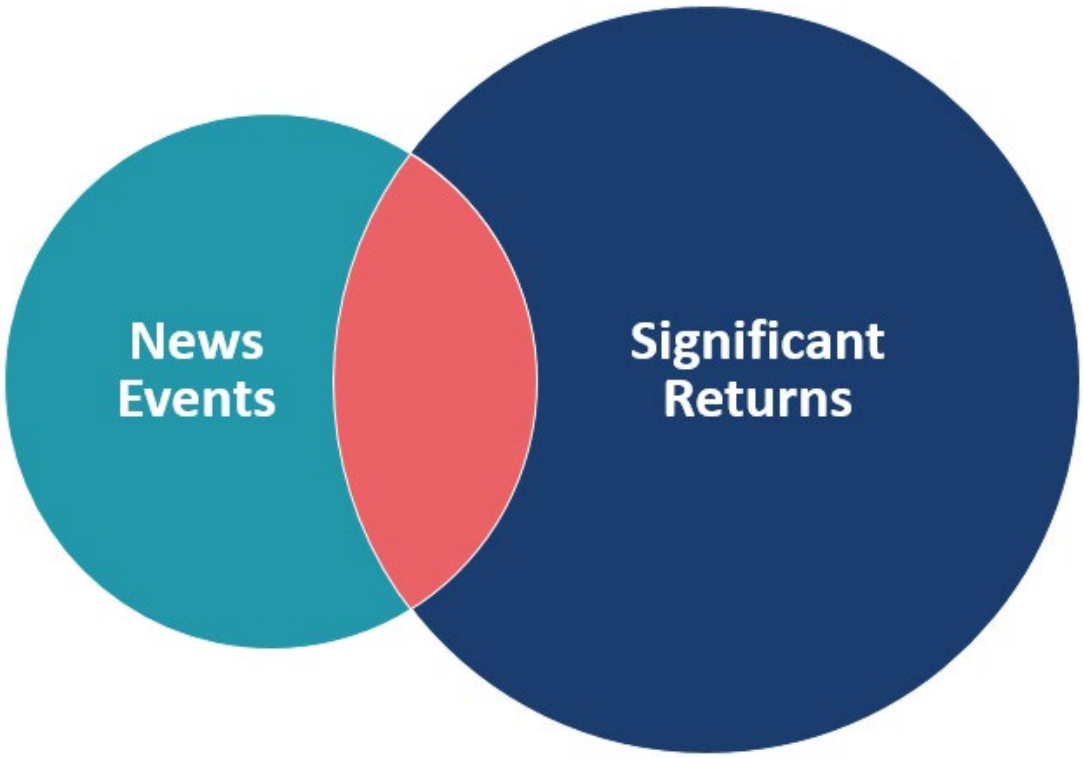
FIGURE 11: THE DEGREE OF OVERLAP IS SMALL IF NEWS EVENTS AND MARKET RETURNS ARE UNRELATED



[64] Note that not every statistical model I consider can be estimated over this entire period. Models which use the returns on certain other digital tokens as controls, for example, cannot be estimate before price data for those tokens become available.

56. But suppose that rather than 9, I find 25 significant returns among the 100 news days. How likely is such an outcome if the XRP market is independent of Ripple Labs? This is exactly analogous to the jar of marbles example: from a jar with 2,500 marbles, with just 225 of them being red, if 100 marbles are drawn at random, how likely is it that 25 or more would be red? If it is unlikely – if, say, the probability of that outcome is less than 5% - then this would be evidence that the draw was *not* random. In the case of XRP returns and Ripple Labs news, this would be evidence that there is a statistically significant relationship or correlation between Ripple Labs news and XRP returns. Figure 12 illustrates such a statistically significant overlap.

FIGURE 12: A LARGE OVERLAP IS STATISTICALLY SIGNIFICANT EVIDENCE THAT NEWS AND RETURNS ARE RELATED



57. To have 25 or more red marbles *from a random draw* is highly unlikely: the probability is just 0.0001%, or about one in 1,000,000, far beyond the common academic standard of 5% significance. To put that in perspective, the probability that two people selected at random share the same birthday is about 2,500 times greater. Such a result is statistical evidence that the draw was not random and is evidence of a statistically significant correlation between Ripple news and XRP returns. This result is effectively what I find below.

58. In summary, my analysis first selects different categories of news event, determines how many of those correspond to significantly positive XRP returns according to different regression models I consider, and then calculates how likely that outcome is. If the likelihood is less than 5%, I will conclude that there is a statistically significant (positive) correlation between the news events in question and XRP returns.

E. Summary of the Empirical Methodology

59. I implement the statistical framework described above with the following steps.

60. First, I specify the regression model of XRP returns. As explained in Section V.B above, I consider 20 different models estimated using 180 day "estimation windows." As shown in Appendix E, my conclusions are robust to longer and shorter estimation windows.

61. Second, I specify the "event window," i.e., the window over which to measure the changes in XRP prices following a news event. As discussed above, I consider event windows over multiple days: date *t* (i.e., a one-day event window coinciding with the day of the news event), dates *t* and *t* + 1 (i.e., a two-day event window), and dates *t*, *t* + 1, and *t* + 2 (i.e., a three-day event window). As shown in Appendix E, my conclusions are robust to longer and shorter event windows.

62. Third, I estimate the (cumulative) abnormal returns for each trading day over the corresponding event window and determine which are significant. I determine the significance of abnormal returns using two approaches:

    a. **Parametric Approach:** assesses the abnormal return against the significant thresholds from the t-distribution (approximately 1.64 for a one-sided test and 1.96 for a two-sided test).[65] This approach is common practice in academic studies.[66]

    b. **Nonparametric Approach:** assesses the abnormal return against the distribution of standardized abnormal returns observed over the 180 days used to estimate the regression model.

63. For both the parametric and nonparametric approaches, I evaluate abnormal returns at the 5%, significance level. For a given significance level, I classify date *t* as "significantly positive" if any of its

[65] The "one-sided" test classifies a return as significant if there is only a 5% probability of drawing a greater (more positive) return. The "two-sided" test classifies a return as significant if there is only a 5% probability of drawing a more extreme (whether positive or negative) return. When using the "two-sided" standard, I continue to restrict myself only to positive returns, unless otherwise noted.

[66] Under general conditions this approach is appropriate. However, those general conditions may not apply in this case. In particular, XRP returns may not be normally distributed. To account for this possibility, the nonparametric method compares the standardized abnormal return from the event window with the distribution of standardized abnormal returns from the estimation data.

cumulative returns over a one-, two-, or three-day event window is significantly positive and none of its returns over those windows is significantly negative.

64. Finally, I examine the interaction between the set of news days I have identified and the set of days with significant positive XRP returns. If there is a relationship between Ripple's actions and XRP returns, then I would expect that (presumptively positive) news would be significantly associated with positive returns. I would not expect that such news would be significantly associated with negative returns, and I consider this robustness check below.

VI. XRP Prices React to News about Ripple's Actions

65. In this section, I describe the results of my analysis. I find that across major milestones in the history of Ripple Labs and across those categories of news more directly related to XRP's proposed use cases, there is statistically significant evidence that the price of XRP reacts to news of Ripple's actions. This holds for nearly all statistical models at any reasonable significance level.

66. In no case do I find a significant correlation between news about Ripple Labs and XRP's negative returns. In no case do I find a significant correlation between news about Ripple Labs and XRP's returns in the days before the news. Furthermore, I find that my results are robust to possible errors in the classification of news events.

67. Taken together, my results indicate that the price of XRP reacts to the news about actions of Ripple Labs. I therefore reject the hypothesis that XRP prices are independent of Ripple Labs.

A. XRP Prices Reacted to Key Milestones in Ripple's History

68. Figure 13 lists eight key corporate milestones in the history of Ripple Labs.[67] These milestones include Ripple's funding rounds, its joint venture with SBI Holdings, the licensing by New York State, and its

[67] I identify nine milestone events in my data, listed in Appendix C. On 5/16/2017, Ripple announces its plan to escrow 55 billion XRP tokens. A Newsroom article from 5/26/2017 again reports Ripple's plan to escrow 55 billion XRP tokens. I exclude the 5/26/2017 event from my analysis as stale. *See* Brad Garlinghouse, "Ripple to Place 55 Billion XRP in Escrow to Ensure Certainty of Total XRP Supply," ripple.com insights, May 16, 2017, accessed 10/4/2021, https://ripple.com/insights/ripple-to-place-55-billion-xrp-in-escrow-to-ensure-certainty-into-total-xrp-supply/ and Ari Levy, "Bitcoin rival Ripple is suddenly sitting on billions of dollars worth of cryptocurrency," CNBC, May 26, 2017, accessed 10/4/2021, https://www.cnbc.com/2017/05/26/bitcoin-rival-ripple-is-sitting-on-many-billions-of-dollars-of-xrp.html.

decision to escrow 55 billion XRP tokens. If the XRP market is independent of Ripple Labs, then there is no reason that XRP prices should react to any of these events.

FIGURE 13: KEY MILESTONE EVENTS

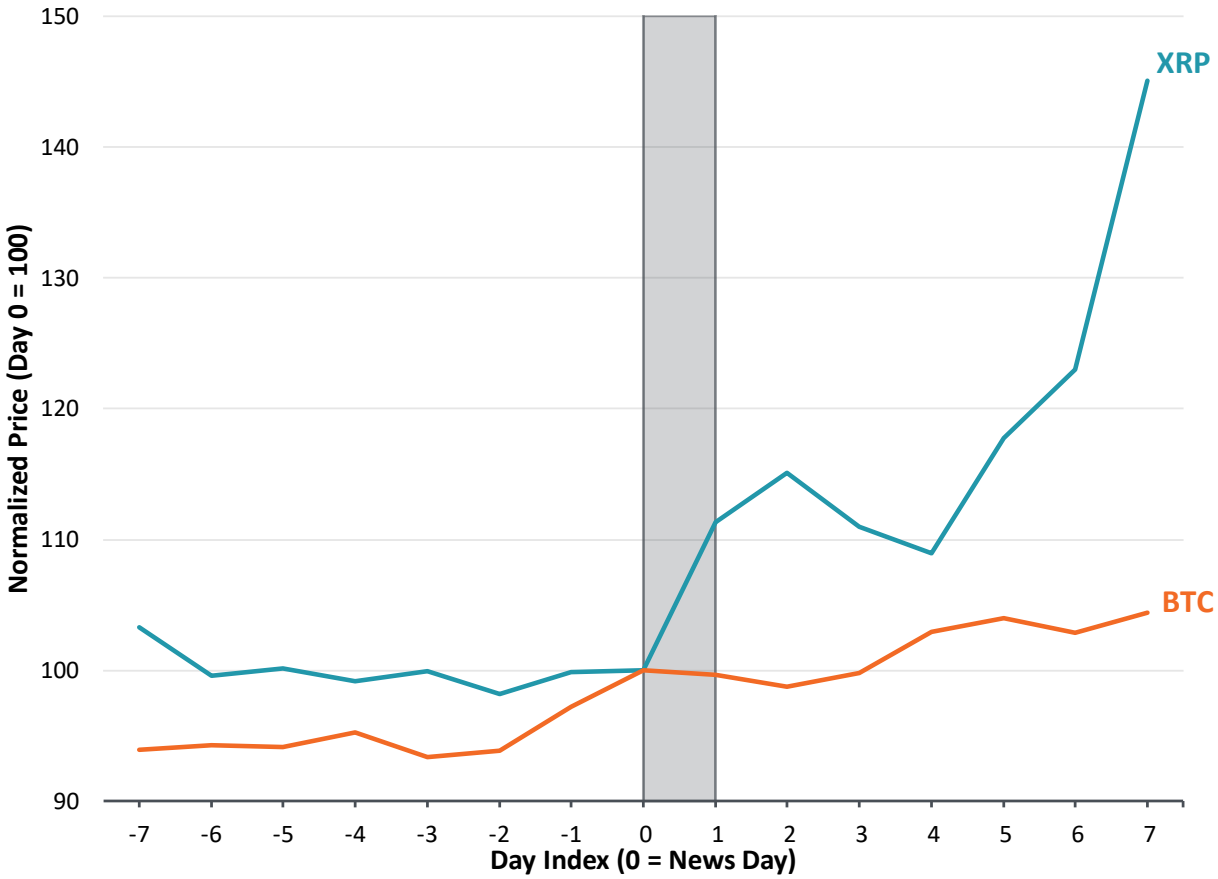
			Representative Document	
Event Date	Event	Stale?	ID	Headline
5/18/2015	Series A Funding		7585	Ripple Labs Closes $28 Million Series A Funding Round
10/6/2015	Santander Investment		7580	Ripple Adds Santander InnoVentures Fund as Series A Investor
1/29/2016	SBI Holdings Deal		7578	Ripple Strikes Multi-National Deal with SBI Holdings to Meet Growing Demand for Ripple Solutions Across Asia
6/13/2016	New York BitLicense		8527	Ripple Receives New York's First BitLicense for an Institutional Use Case of Digital Assets
9/15/2016	Series B Funding		7573	Ripple Raises $55 Million in Series B Funding
5/16/2017	Escrow Announcement		8463	Ripple to Place 55 Billion XRP in Escrow to Ensure Certainty of Total XRP Supply
5/26/2017	Escrow Announcement	✓	7793	Bitcoin rival Ripple is suddenly sitting on billions of dollars worth of cryptocurrency
12/8/2017	Escrow Action		8432	Ripple Escrows 55 Billion XRP for Supply Predictability
12/20/2019	Series C Funding		8329	Ripple Caps Record Year With $200 Million Series C Funding

69. Figure 14 plots the average XRP price path for the week leading up to and the week following these milestones and compares it with the average BTC price path.[68] The average XRP price path was essentially flat for the week leading up to a milestone event, then jumps 11% on the milestone date, holds fairly steady for a couple of days, and then appears to increase even further. By contrast, the prices of Bitcoin (commonly known to be the largest digital token by market cap)[69] are comparatively flat around these milestone events, which indicates that the movements in XRP prices are not attributable to movements in the broader digital token market.

[68] For each milestone, I collect prices for the seven days leading up to and following the milestone date. I then normalize the price to 100 at the beginning of the news day (equivalently, the end of the day before the news day). The chart plots the simple average across these normalized price series.

[69] *See* "Today's Cryptocurrency Prices by Market Cap," CoinMarketCap, accessed October 1, 2021, https://coinmarketcap.com/.

FIGURE 14: AVERAGE NORMALIZED PRICE BEFORE AND AFTER RIPPLE MILESTONES EVENTS



Note: Day labels indicate the beginning of the specified day. News Day is shaded in gray. News is released at some point between Day 0 and 1.

70. The first event, Series A funding, is dated May 18, 2015 and the last event, Series C funding, is dated December 20, 2019. This spans 1,678 trading days. I consider 20 different statistical models of XRP returns, each of which generate somewhat different estimates of the abnormal XRP return on each of those days. I then evaluate those abnormal returns at the one-sided 5% significance level determined both parametrically and nonparametrically. The result is 40 potentially different sets of "significant positive XRP return days."[70] As an example, applying the Constant Mean Return Model (Model 1) and the one-sided 5% significance level determined parametrically yields 146 days as "significantly positive."

[70] This follows as 40 = 20 models x 2 methods of determining critical values.

71. Each model measured under each method thus generates a probability of finding a significantly positive XRP day at random. For the Constant Mean Return Model we have been considering, this is 8.7% (146/1,678).

72. If I draw eight days at random from the 1,678 days which span May 18, 2015 through December 20, 2019 where the chance that any one is significant is just 8.7%, the most likely outcome is that I would not draw a single significantly positive day; for the Constant Mean Return Model, the probability of drawing 0 significantly positive days is 48.2%, or 1 in 2.1.

73. However, I do not draw the eight days at random. Rather, I draw the eight days corresponding to the eight milestone events described above. And in that set of eight days, I find six days with significantly positive returns. Where my "success rate" if I were picking these days at random should be 8.7%, my actual success rate is 75% (6/8). The odds of drawing six or more by random chance are about 1 in 100,000, or 0.0010%. The usual scientific standard would consider any outcome with a likelihood of less than 5%, or 1 in 20, as "statistically significant." While it is not impossible to draw 6 by random luck, the more likely explanation is that there is a relationship between this news about Ripple and XRP prices.

74. Figure 15 presents the results of my event study and statistical analysis. A check mark indicates that I find statistically significant evidence of a correlation between XRP price increases and Ripple milestone events. In other words, I can reject the hypothesis that XRP prices are independent of these eight Milestone events.

75. Put another way, the results in Figure 15 mean that statistically I can reject the hypothesis that it is simply coincidence that XRP prices significantly increase at the same time that these events are publicized; there is almost certainly a common factor between them. From an economic perspective, one explanation of course is that news of the event causes the XRP price response.[71]

76. Observing a relationship between XRP prices and Ripple milestone events has important economic implications for the matter at hand. If the XRP market looks to Ripple Labs to create value, then it becomes understandable why certain corporate developments would impact XRP prices. However, if the XRP market does not look to Ripple Labs to create value, then it is difficult to understand why XRP prices would react to these events.

[71] Another explanation would be the reverse – that somehow the news of these events is released in response to XRP price increases but otherwise would not have been released on these days, or that the "price causes the news." A third explanation would be that there is some other factor – an "X factor" – which is driving both these events and the XRP market. These events, of course, are disparate in their nature, including venture funding rounds involving multiple investors, joint ventures in Asia, and licensing decisions made by the state of New York. Many of them also represent the culmination of long processes.

FIGURE 15: XRP PRICES REACT TO RIPPLE MILESTONE EVENTS

Model Number	Parametric	Nonparametric
1	✓	✓
2	✓	✓
3	✓	✓
4	✓	✓
5	✓	✓
6	✓	✓
7	✓	✓
8	✓	✓
9	✓	✓
10	✓	✓
11	✓	✓
12	✓	✓
13	✓	✓
14	✓	✓
15	✓	✓
16	✓	✓
17	✓	✓
18	✓	✓
19	✓	✓
20	✓	✓

Notes:

✓	Indicates significance at the 5% level.
	Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

B. XRP Prices Reacted to Digital Asset Trading Platform Listings

77. I have identified eleven announcements related to new listings of XRP on trading platforms.[72] I examine if there is a significant correlation between these announcements and XRP prices.

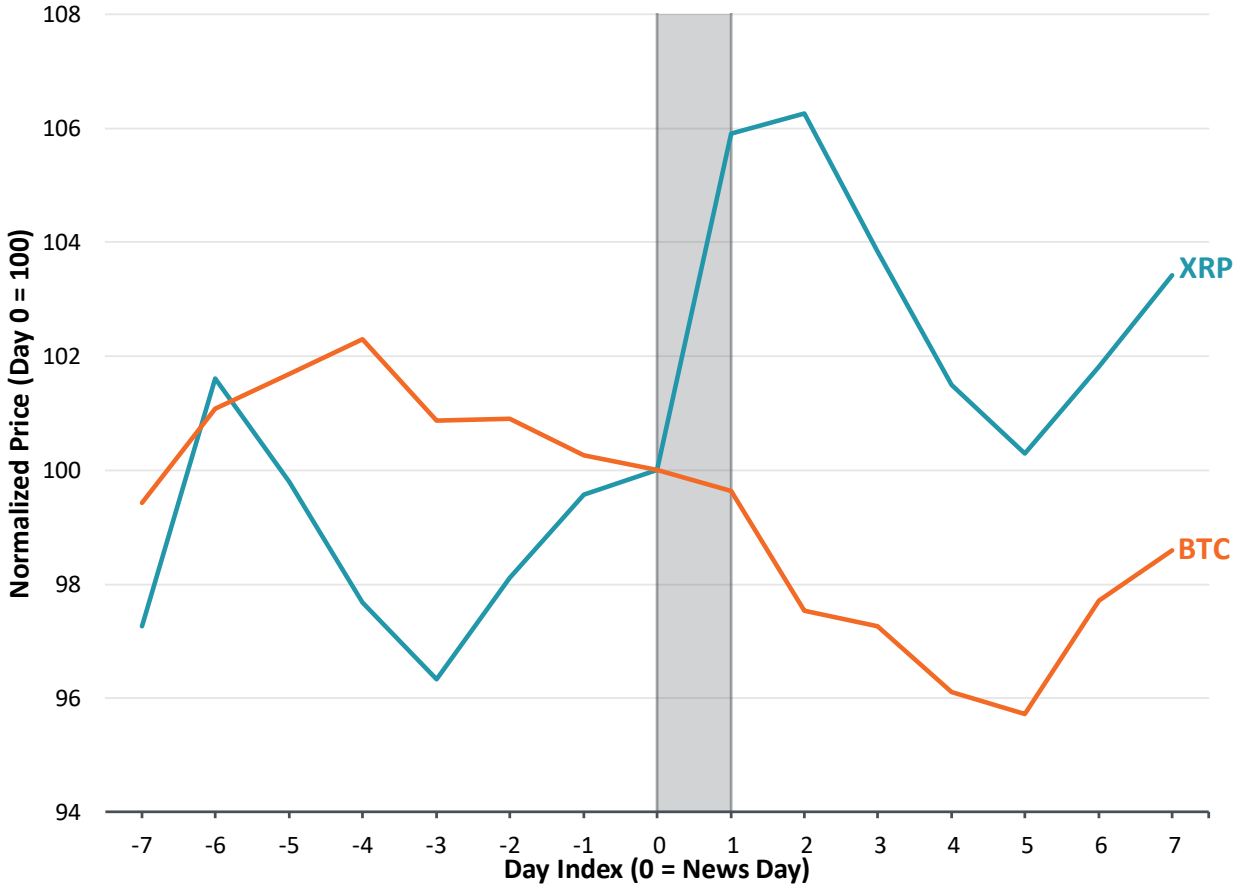
FIGURE 16: KEY TRADING PLATFORM LISTING EVENTS

			Representative Document	
Event Date	Event	Ripple Action?	ID	Headline
2/29/2016	Partnership with Crypto Facilities	✓	8539	Ripple Partners with Crypto Facilities for XRP Derivatives
10/9/2016	Derivatives Listing on Crypto Facilities	✓	8501	Ripple Announces XRP Futures Trading on Crypto Facilities
10/27/2016	Listing on Coincheck		8496	Coincheck Lists XRP on Its Digital Asset Exchange
1/10/2017	Listing on Bitstamp with 0% Fees	✓	8483	Bitstamp Now Trading XRP with 0% Fees
5/18/2017	Listing on Six New Exchanges	✓	7567	XRP Liquidity to Increase With Listings on Six New Exchanges
8/31/2017	Partnership with Bitcoin IRA, Kingdom Trust		8452	It's Never Been Easier to Access and Store XRP
12/21/2017	Listing on CEX.IO, GMOCoin, Huobi.pro		8426	XRP Now Available on 50 Exchanges Worldwide
1/30/2018	Listing on SBI Virtual Currencies		8419	SBI Virtual Currencies to Exclusively List XRP at Launch
3/28/2018	Listing on Uphold		8410	XRP Ecosystem Grows with New Listing on Uphold
8/16/2018	Listing on Bittrex, Bitso, and Coins.ph	✓	7550	xRapid Brings on Three New Exchange Partners
2/12/2020	Partnership with BRD Wallet	✓	8323	BRD Supports XRP and Launches Enterprise Expansion

78. Figure 17 plots the average XRP price path for the week leading up to and the week following these eleven announcements and compares it with the average BTC price path. The XRP price on average jumps 6% on these dates, though the bump appears to be temporary. By contrast, Bitcoin prices are trending down on average and show no particular reaction to these XRP listings.

[72] On January 10, 2017, an Insight article announces that XRP is newly listed on Bitstamp. An announcement dated February 16, 2017 extends that by announcing that a particular trading pair (XRP/BTC) is newly available on that trading platform. I regard this second announcement as qualitatively different from announcing a listing on a new trading platform, hence I do not include it in my analysis.

FIGURE 17: AVERAGE NORMALIZED PRICE BEFORE AND AFTER TRADING PLATFORM LISTINGS



Note: Day labels indicate the beginning of the specified day. News Day is shaded in gray. News is released at some point between Day 0 and 1.

79. The first trading platform announcement is dated February 29, 2016, and the last February 12, 2020, spanning 1,445 days. Using again the example of the Constant Mean Return Model, this model identifies 123 days as being significantly positive (when assessed parametrically) over this period of time. Drawing eleven days at random, the most likely single outcome is to find just one significantly positive day—the probability of this outcome is 39%. But among the eleven trading platform listing days, I find five significantly positive market days.[73] The probability of drawing five or more is just 0.13%, or about 1 in 800.

[73] By "market day," I mean a day with a statistically significant positive abnormal return.

80. Figure 18 presents the result of my event study and statistical analysis. A check mark indicates that I find a statistical evidence of a correlation between XRP prices and announcements of listings on new trading platforms. In other words, I can reject the hypothesis that XRP prices are independent of news of trading platform listings.

FIGURE 18: XRP PRICES REACT TO LISTINGS ON NEW TRADING PLATFORMS

Model Number	Parametric	Nonparametric
1	✓	✓
2	✓	✓
3	✓	✓
4	✓	✓
5	✓	✓
6	✓	✓
7	✓	✓
8	✓	✓
9	✓	✓
10	✓	✓
11	✓	✓
12	✓	✓
13	✓	✓
14	✓	✓
15	✓	✓
16	✓	✓
17	✓	✓
18	✓	✓
19	✓	✓
20	✓	✓

Notes:

✓	Indicates significance at the 5% level.
	Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

81. Ripple Labs may not have been an active participant in every trading platform listing. But according to Ripple's announcements, it appears to have been involved in at least some, and this is a type of action

which is significantly correlated with XRP prices. For example, in an Insight Article from October 10, 2016, Ripple writes:

> "In February, Ripple formalized its partnership with Crypto Facilities, a London-based financial services firm that provides FCA-regulated risk management and trading solutions for digital assets. Today, Ripple is excited to announce that Crypto Facilities will be the first derivatives exchange to list regulated XRP futures contracts. To further establish digital assets as a new asset class, Crypto Facilities is also partnering with CME Group, which has invested in Ripple through its venture arm."[74]

82. In my review of these eleven announcements, I believe that six indicate involvement by Ripple.[75] Figure 19 reports the likelihood of the outcomes from this subset of trading platform listings. The subset of trading platform listings which indicate action by Ripple is significantly correlated with XRP prices. Once again, I can reject the hypothesis that XRP prices are independent of trading platform listings.

[74] "Ripple Announces XRP Futures Trading on Crypto Facilities," Ripple.com Insights, October 10, 2016, accessed September 29, 2021, https://ripple.com/insights/ripple-announces-xrp-futures-trading-crypto-facilities/.

[75] I am not taking the position that Ripple was not involved in the other trading platform listings. I am simply identifying those six events for which my reading of the announcements suggests that Ripple likely was involved.

FIGURE 19: XRP PRICES REACT TO NEW TRADING PLATFORM LISTINGS INVOLVING RIPPLE LABS

Model Number	Parametric	Nonparametric
1	✓	✓
2	✓	✓
3	✓	✓
4	✓	✓
5	✓	✓
6	✓	✓
7	✓	✓
8	✓	✓
9	✓	✓
10	✓	✓
11	✓	✓
12	✓	✓
13	✓	✓
14	✓	✓
15	✓	✓
16	✓	✓
17	✓	✓
18	✓	✓
19	✓	✓
20	✓	✓

Notes:

✓ Indicates significance at the 5% level.

Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

C. XRP Prices Reacted to Customer and Product Announcements

83. I have identified 85 announcements related to customer and product developments. It is not always clear if Ripple is an active participant or not. For example, Ripple's first press release, dated May 5,

2014, is headlined "Ripple Labs Announces Fidor Bank AG as First Bank to Use the Ripple Protocol."[76] The body of the announcement says that "Fidor Bank AG [is] the first bank to integrate Ripple," and it goes on to define Ripple as "an open, decentralized payments protocol that enables anything of value to be traded through a global value web." Reading this press release, one could interpret this as an example of a bank choosing to adopt an open source technology such that, in principle, Ripple Labs is in no way involved. In fact, the first several announcements by Ripple – AstroPay, GBI, CBW Bank, and Cross River Bank – read largely the same way.

84. However, following the announcements that CBW Bank and Cross River Bank were integrating the "Ripple protocol" – again defined as the decentralized ledger technology – Chris Larsen, then CEO of Ripple Labs, is quoted in a Newsroom Article saying, "It's a big milestone…We've been working on our enterprise banking strategy for well over a year. It takes awhile for banks to get going."[77] This would suggest that it was, at least in part, due to the efforts of Ripple Labs that some of these first institutions adopted the decentralized protocol.

85. One economic consideration is that not all product developments might be expected to lead directly to increased utilization of XRP. For example, some announce new validators on the XRP ledger; this is different from a new bank joining RippleNet. Also, two events appear to repeat old information and hence are effectively stale.[78] In all, from these 85 events, I exclude 8 as not relevant. These are listed in Figure 20. I note that my conclusions are qualitatively unchanged if these events are included; please see Appendix E.

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[76] "Ripple Labs Announces Fidor Bank AG as First Bank to Use the Ripple Protocol," ripple.com press center, May 5, 2014, accessed September 29, 2021, https://ripple.com/ripple_press/ripple-labs-announces-fidor-bank-ag-as-first-bank-to-use-the-ripple-protocol/.

[77] Biz Carson, "Two US banks are ready to embrace the Ripple protocol, allowing instant global money transfers," Gigaom, September 24, 2014, accessed September 29, 2021, https://gigaom.com/2014/09/24/two-us-banks-are-ready-to-embrace-the-ripple-protocol-allowing-instant-global-money-transfers/.

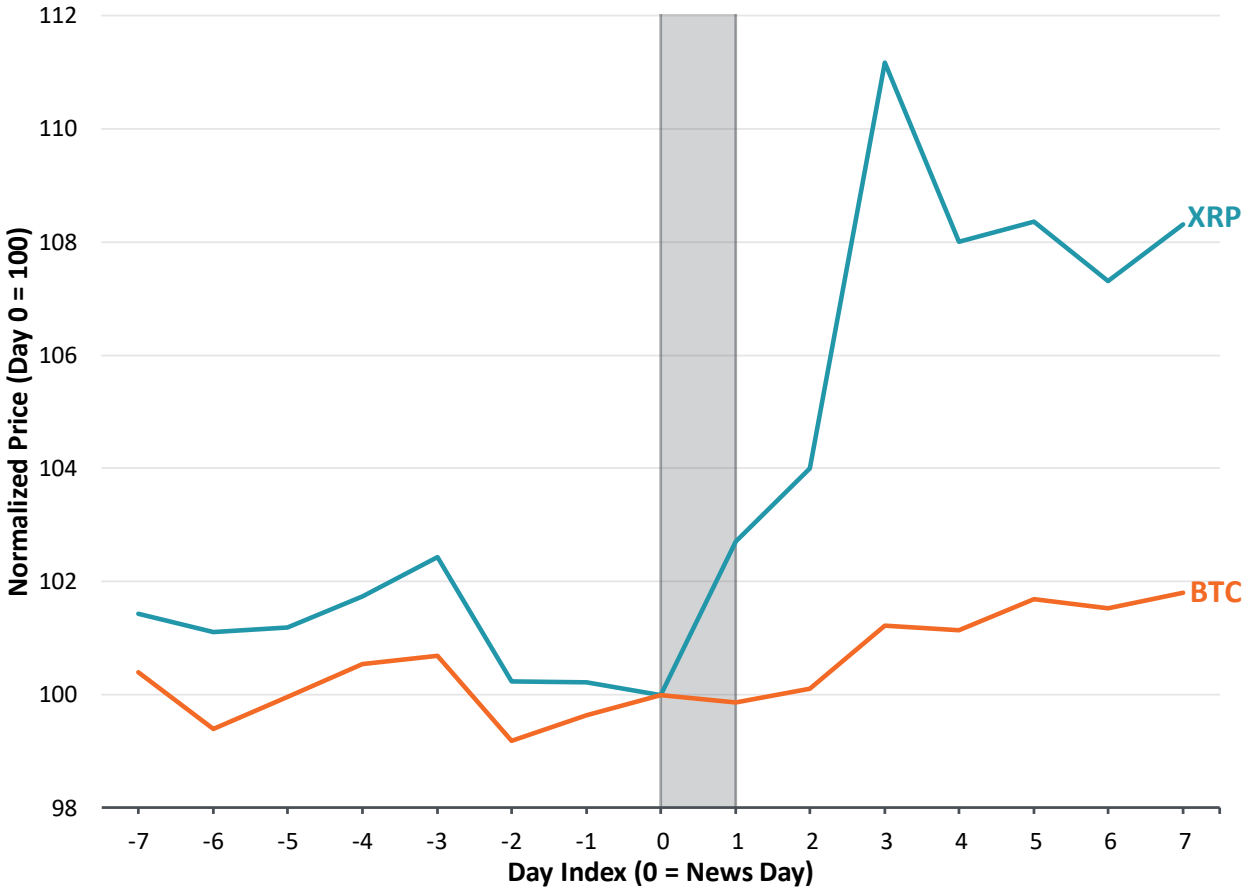
[78] An Insight Article from August 16, 2016 entitled "Multi-Signing in Ripple: A Q&A with David Schwartz" discusses an amendment to the XRP Ledger which had been recently adopted. It is not clear that Ripple Labs sponsored the amendment, but regardless, the amendment itself is not being newly proposed in this article. The second case is a Newsroom Article dated January 29, 2018 entitled "MoneyGram CEO Plans Waves with Ripple" which essentially repeats the news of January 11 from a Press Release headline titled, "Ripple and MoneyGram Partner to Modernize Payments."[78] *See*, "Multi-Signing in Ripple: A Q&A with David Schwartz," ripple.com insights, August 16, 2016, accessed September 29, 2021, https://ripple.com/insights/multi-signing-ripple-qa-david-schwartz/; PYMNTS, "MoneyGram CEO Plans Waves with Ripple," pymnts.com, January 29, 2018, accessed September 29, 2021, https://www.pymnts.com/news/2018/moneygram-ripple-cryptocurrency-blockchain-alex-holmes/; "Ripple and MoneyGram Partner to Modernize Payments," ripple.com press center, January 11, 2018, accessed September 29, 2021, https://ripple.com/ripple_press/ripple-and-moneygram-partner-to-modernize-payments/.

FIGURE 20: EXCLUDED CUSTOMER AND PRODUCT ANNOUNCEMENT EVENTS

		Reason for Exclusion		Representative Document	
Event Date	Event	Stale	Direction Unclear	ID	Headline
1/12/2016	Earthport Launch of Ripple API		✓	8554	Earthport Launches Distributed Ledger Hub
4/12/2016	MIT Runs Ripple Validator		✓	7575	MIT Adopts Ripple Validator to Advance Consensus and Blockchain Research
8/16/2016	Recently Adopted XRP Ledger Amendment	✓		8514	Multi-Signing in Ripple: A Q&A with David Schwartz
11/16/2016	Improvement of RippleCharts		✓	8492	Ripple Announces An Upgrade to RippleCharts
5/11/2017	XRP Ledger Validator Updates		✓	8464	How We Are Further Decentralizing the XRP Ledger to Bolster Robustness for Enterprise Use
7/17/2017	Expansion of XRP Ledger Validator Nodes		✓	8458	XRP Ledger Decentralizes Further With Expansion to 55 Validator Nodes
1/29/2018	Pilot with MoneyGram	✓		7760	MoneyGram CEO Plans Waves With Ripple
2/21/2018	Ripple Releases White Papers		✓	7747	Ripple Papers Pledge New Start for $40 Billion XRP

86. Figure 21 plots the average XRP price path for the week leading up to and week following these 77 announcements and compares it with the average BTC price path. The average XRP price path increases 3% on the announcement date but continues to increase thereafter, ending about 8% higher a week later. By contrast, Bitcoin prices are trending up slowly on average but show no particular reaction to these Ripple announcements.

FIGURE 21: AVERAGE NORMALIZED PRICE BEFORE AND AFTER CUSTOMER AND PRODUCT ANNOUNCEMENTS



Note: Day labels indicate the beginning of the specified day. News Day is shaded in gray. News is released at some point between Day 0 and 1.

87. Figure 22 presents the results of my event study and statistical analysis on customer and product announcements, leading me to reject the hypothesis that XRP prices are independent of these developments.

FIGURE 22: XRP PRICES REACT TO NEW CUSTOMER AND PRODUCT ANNOUNCEMENTS

Model Number	Parametric	Nonparametric
1	✓	✓
2	✓	✓
3	✓	✓
4	✓	✓
5	✓	✓
6	✓	✓
7	✓	✓
8	✓	✓
9	✓	✓
10	✓	✓
11	✓	✓
12	✓	✓
13	✓	✓
14	✓	✓
15	✓	✓
16	✓	✓
17	✓	✓
18	✓	✓
19	✓	✓
20	✓	✓

Notes:

✓	Indicates significance at the 5% level.
	Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

D. XRP Prices Reacted to Ripple's Commercialization Initiatives

88. Ripple Labs has launched a number of initiatives described as commercializing or promoting its technology and payment solutions, including some described as creating use-cases for XRP.[79] These include:

- The Global Payments Steering Group (GPSG), described in a Ripple press release as overseeing "the creation and maintenance of Ripple payment transaction rules, formalized standards for activity using Ripple, and other actions to support the implementation of Ripple payment capabilities."[80]
- The Infrastructure Innovation Initiative, described in a Newsroom article as "a team within [Ripple Labs] that will focus on providing Ripple's DLT [Distributed Ledger Technology] and payments technology to central banks and market infrastructures. The initiative will enable regulators and financial institutions (FIs) to use Ripple's technology to explore blockchain themselves and develop solutions."[81]
- The Line of Credit, described in a Ripple Insight Article as "a new beta service on RippleNet that allows customers using On-Demand Liquidity (ODL) to source capital on-demand to initiate cross-border payments at scale using the digital asset XRP."[82]
- The RippleNet Accelerator Program, described in a Ripple Insight Article as "a unique reward for financial institutions that are the first in their markets to process and promote commercial payments on RippleNet…the RippleNet Accelerator Program is funded by $300 million of XRP from Ripple's XRP holdings."[83]

[79] By classifying these initiatives as "Ripple Commercialization Initiatives," I am not taking the position that the initiatives were ultimately successful in commercializing Ripple's technology or in creating use cases for the XRP token, merely that Ripple's descriptions of these initiatives suggest that that would be a goal or objective of the program.

[80] "Major Banks Launch Global Payments Steering Group," ripple.com press center, September 23, 2016, accessed September 29, 2021, https://ripple.com/ripple_press/major-banks-launch-global-payments-steering-group/.

[81] PYMNTS, "Ripple Ramps Up Focus on Blockchain Infrastructure," pymnts.com, December 21, 2017, accessed September 29, 2021, https://www.pymnts.com/news/b2b-payments/2017/ripple-infrastructure-initiative/.

[82] "Fund Instant Cross-Border Payments With a Line of Credit From RippleNet," ripple.com insights, October 8, 2020, accessed September 29, 2021, https://ripple.com/insights/fund-instant-cross-border-payments-with-a-line-of-credit-from-ripplenet/.

[83] "Ripple Rolls Out $300M RippleNet Accelerator Program to Grow Volume and XRP Utility," ripple.com insights, October 13, 2017, accessed September 29, 2021, https://ripple.com/insights/ripple-rolls-300m-ripplenet-accelerator-program-grow-volume-xrp-utility/.

- Xpring, described in a Ripple Insight Article as "a new initiative by Ripple that will invest in, incubate, acquire and provide grants to companies and projects run by proven entrepreneurs. Every entrepreneur will use the digital asset XRP and the XRP Ledger."[84]

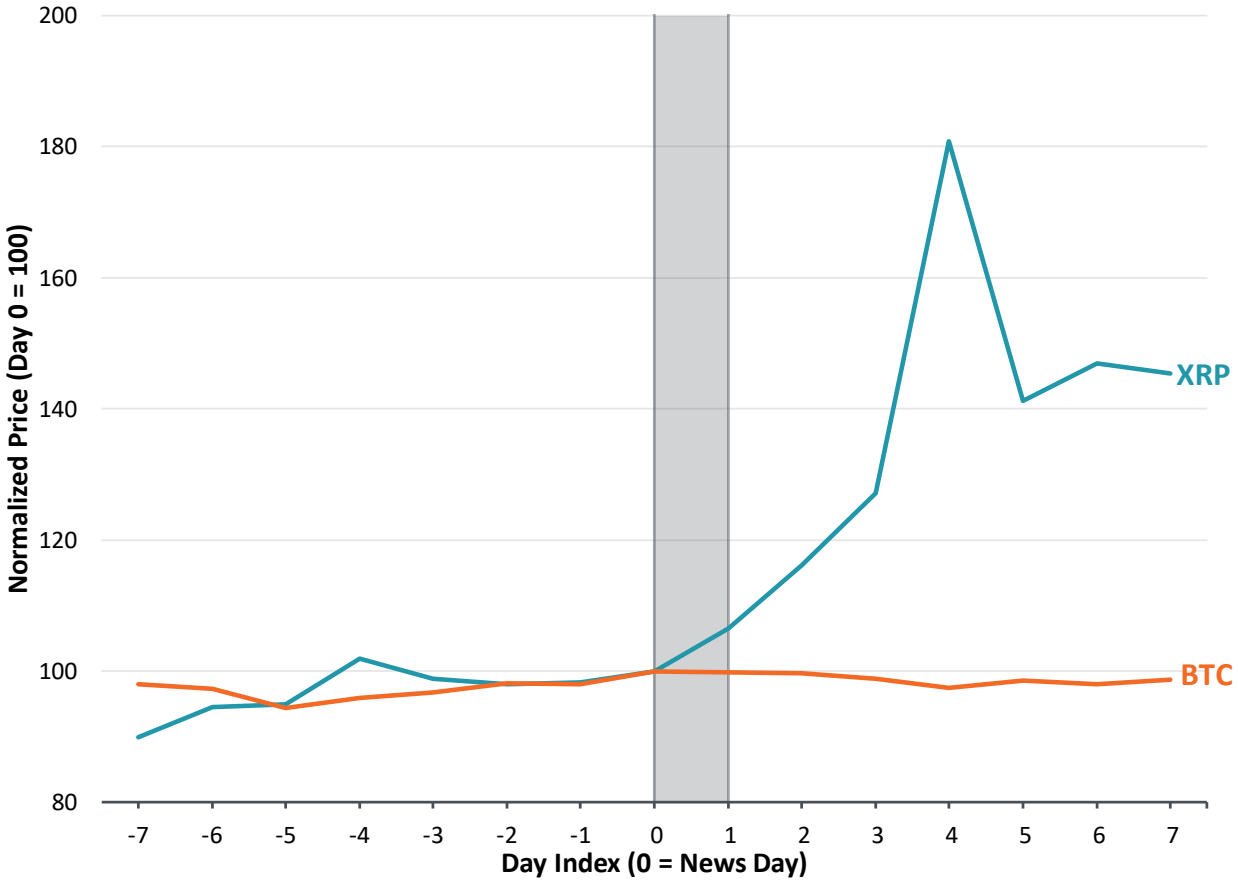
FIGURE 23: KEY RIPPLE COMMERCIALIZATION INITIATIVE EVENTS

		Representative Document	
Event Date	Event	ID	Headline
9/23/2016	Launch GPSG	7571	Major Banks Launch Global Payments Steering Group
3/30/2017	MUFG Joins GPSG	8469	MUFG Joins Ripple's Global Payments Steering Group
10/13/2017	Creation of RippleNet Accelerator Program	8446	Ripple Rolls Out $300M RippleNet Accelerator Program to Grow Volume and XRP Utility
12/19/2017	Establish Infrastructure Innovation Initiative	8428	Exploring Innovation in Payment System Infrastructures
5/14/2018	Announce Xpring	8401	Welcome to Xpring
10/2/2019	Update to Xpring	8340	Announcing the Next Chapter of Xpring, Ripple's Developer Platform
10/8/2020	Launch RippleNet Line of Credit	8298	Fund Instant Cross-Border Payments With a Line of Credit From RippleNet

89. I have identified seven announcements related to these initiatives, either announcing their launch or some expansion to their program; these are listed in Figure 23. Figure 24 plots the average XRP price path for the week leading up to and the week following these announcements and compares it with the average Bitcoin price path. The difference is striking. Average XRP prices increase 7% on the day of the announcement, and one week later are about 50% higher. Bitcoin prices, on the other hand, do not appear to react at all.

[84] "Welcome to Xpring," ripple.com insights, May 14, 2018, accessed September 29, 2021, https://ripple.com/insights/welcome-to-xpring/.

FIGURE 24: AVERAGE NORMALIZED PRICE PATH AROUND RIPPLE'S COMMERCIALIZATION INITIATIVES



Note: Day labels indicate the beginning of the specified day. News Day shaded in gray. News is released at some point between Day 0 and 1.

90. Figure 25 presents the results of my event study and statistical analysis on Ripple Commercialization Initiatives. The statistical evidence here is more mixed than the other news categories I have considered thus far, however, more than half of all models indicate a significantly positive correlation between Ripple Commercialization Initiatives and XRP prices.

FIGURE 25: XRP PRICES REACT TO RIPPLE'S COMMERCIALIZATION INITIATIVES

Model Number	Parametric	Nonparametric
1	✓	✓
2		
3	✓	✓
4		
5	✓	✓
6		
7	✓	✓
8		
9	✓	✓
10		
11	✓	✓
12	✓	✓
13	✓	✓
14	✓	✓
15	✓	✓
16		
17	✓	✓
18		
19	✓	✓
20	✓	✓

Notes:

✓ Indicates significance at the 5% level.

Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

91. By contrast, Ripple Labs has also launched initiatives which do not appear directly related to the commercialization or promotion of its technology, specifically, or to the creation of XRP use cases. These include:

- University Blockchain Research Initiative (UBRI), described in a Ripple press release as "a program comprised of collaborative partnerships with leading universities to support academic research, technical development and innovation in blockchain, cryptocurrency and digital

payments. Through the program, Ripple will donate $50M to universities around the world to help shape the workforce of the future."[85]

- Research Consortium, described in a Newsroom Article which states "SBI Ripple Asia is forming a consortium that will research the use of distributed ledger technology in securities products…the new consortium will see joint efforts from 18 securities firms to research and commercialize applications of emerging technologies, particularly DLT [Distributed Ledger Technology], to improve efficiency for customers, while reducing operational cost."[86]
- Carbon Neutrality, described in a Ripple press release as "several initiatives to lead global finance toward a carbon-neutral future, including the launch of an open-source tool that helps enable any blockchain to decarbonize."[87]
- Ripple Labs periodically announces its participation with existing research initiatives or interest groups. I include such announcements in this analysis.

[85] "Ripple Announces $50M University Blockchain Research Initiative," ripple.com press center, June 4, 2018, accessed September 29, 2021, https://ripple.com/ripple_press/ripple-announces-50m-university-blockchain-research-initiative/.

[86] Wolfie Zhao, "SBI Ripple Asia Forms Consortium to Bring DLT to Securities," CoinDesk, January 30, 2018, accessed September 29, 2021, https://www.coindesk.com/markets/2018/01/30/sbi-ripple-asia-forms-consortium-to-bring-dlt-to-securities/.

[87] "Ripple Leads Sustainability Agenda to Achieve Carbon Neutrality By 2030," ripple.com press center, September 30, 2020, accessed September 29, 2021, https://ripple.com/ripple-press/ripple-leads-sustainability-agenda-to-achieve-carbon-neutrality-by-2030/.

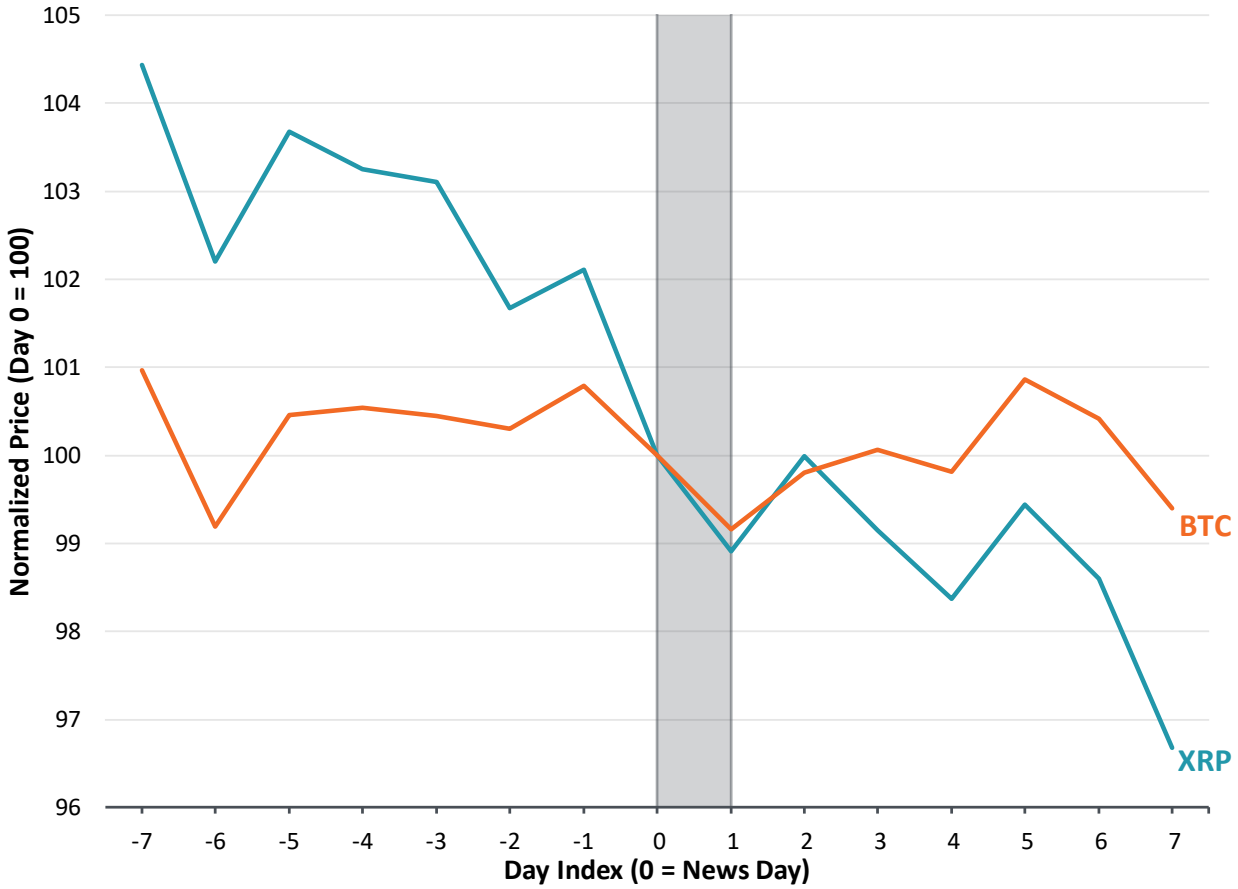
FIGURE 26: KEY OTHER INITIATIVE EVENTS

Event Date	Event	Stale?	Representative Document ID	Representative Document Headline
2/10/2015	Joins Center for Financial Services Innovation		8588	Ripple Labs joins the Center for Financial Services Innovation
2/12/2015	Joins W3C Web Payment Interest Group		7589	Ripple Labs Joins W3C Web Payment Interest Group to Help Set Standards for the Value Web
3/4/2015	Joins International Payments Framework Association		8587	Ripple Labs Joins International Payments Framework Association
6/15/2015	Ryan Zagone Elected to Faster Payments Task Force Steering		8575	Ripple Labs Elected to Fed Steering Committee for Faster Payments
1/30/2018	Creation of SBI Ripple Asia Consortium		7759	SBI Ripple Asia Forms Consortium to Bring DLT to Securities
3/28/2018	Joins Hyperledger Blockchain Consortium		7733	Ripple Joins Hyperledger Blockchain Consortium
6/4/2018	Launch University Blockchain Research Initiative		7552	Ripple Announces $50M University Blockchain Research Initiative
1/23/2019	UBRI Partnership with THUIFR		7679	Ripple Partners With Chinese University for Blockchain Research Program
2/7/2019	Additional UBRI Partnerships		7542	Ripple Announces New University Blockchain Research Initiative Partners, Expands to China and Singapore
7/30/2019	UBRI Expansion to Japan		7538	Ripple Expands University Blockchain Research Initiative Program to Japan, Supports 33 University Partners Across 14 Countries
6/10/2020	Joins ISO 20022 Registration Management Group		8309	ISO 20022: Shaping the Future of Cross-Border Payments
6/18/2020	Joins Open Payments Coalition to launch PayString		8306	Why Ripple Supports PayString
8/26/2020	Additional UBRI Partnerships		8303	UBRI Expands To New Global Markets With More Than 35 University Partners
9/30/2020	Commitment to Carbon-Net Zero by 2030		7529	Ripple Leads Sustainability Agenda to Achieve Carbon Neutrality By 2030
11/2/2020	Commitment to Carbon-Net Zero by 2030	✓	7615	Cryptocurrency's carbon footprint is massive and not sustainable

92. I have identified fourteen relevant announcements related to these initiatives, either announcing their launch or some expansion to their program (see Figure 26).[88] Figure 27 plots the average XRP price path for the week leading up to and following these announcements and compares it with the average BTC

price path. Unlike the direct XRP-related initiatives discussed above, in these cases there appears to be little or no reaction in the XRP markets to these initiatives (if anything, prices are down slightly following these events), and little or no difference between XRP prices and Bitcoin prices in the days immediately surrounding these announcements.

FIGURE 27: AVERAGE NORMALIZED PRICE PATH BEFORE AND AFTER RIPPLE'S OTHER INITIATIVES



Note: Day labels indicate the beginning of the specified day. News Day shaded in gray. News is released at some point between Day 0 and 1.

93. Figure 28 presents the results of my event study and statistical analysis on Ripple's Other Initiatives. Not surprisingly, there is no evidence of any correlation between these initiatives and XRP prices.

[88] I exclude a November 2, 2020 Newsroom Article which repeats the announcement of the sustainability initiative, Ken Weber, "Cryptocurrency's carbon footprint is massive and not sustainable," Forkast, November 2, 2020, accessed September 29, 2021, https://forkast.news/cryptocurrency-big-carbon-footprint-not-sustainable-ripple-ken-weber/.

FIGURE 28: XRP PRICES DO NOT REACT TO RIPPLE'S OTHER INITIATIVES

Model Number	Parametric	Nonparametric
1		
2		
3		
4		
5		
6		
7		
8		
9	**NO SIGNIFICANT RESULTS**	
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Notes:

✓	Indicates significance at the 5% level.
	Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

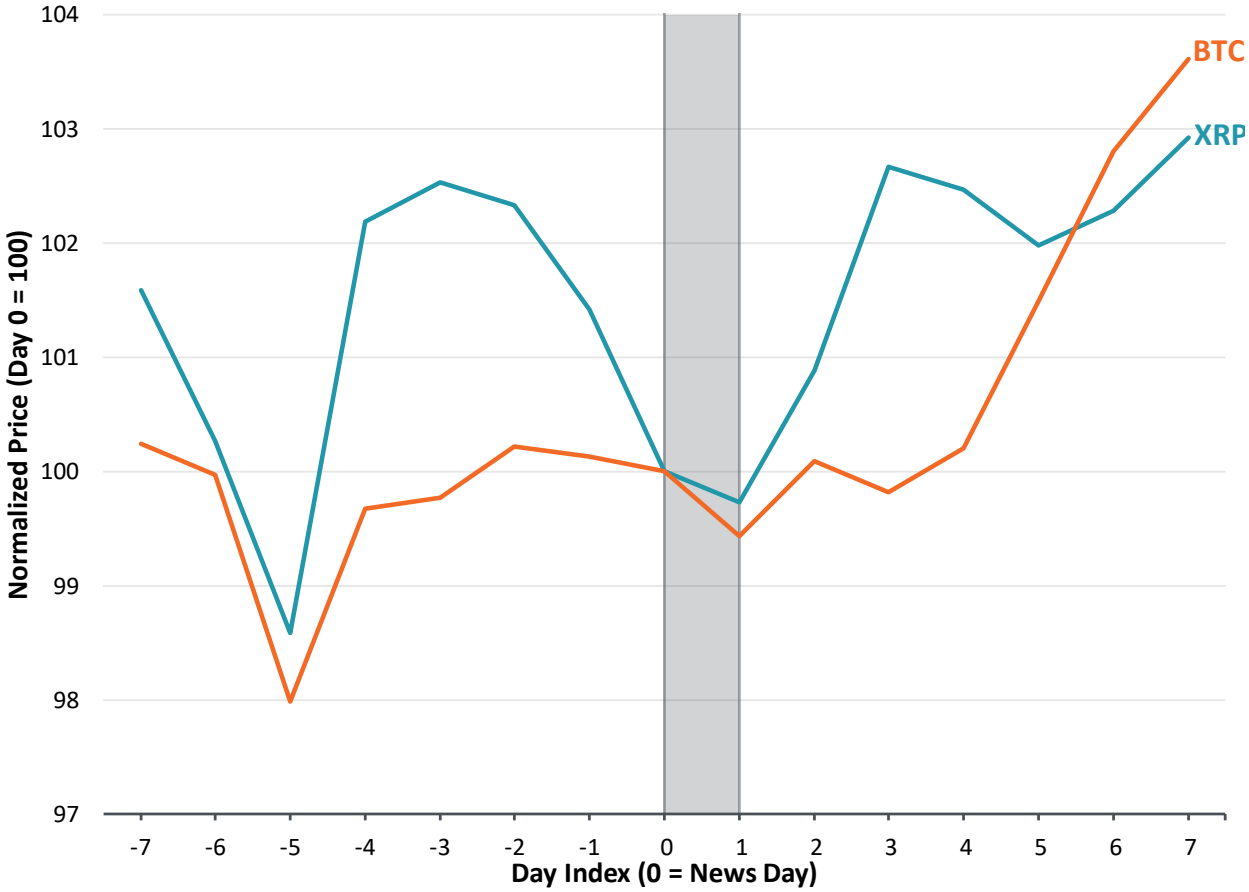
94. The evidence suggests that the XRP market is more responsive to Ripple's Commercialization Initiatives than it is to its other initiatives.

E. XRP Prices Did Not React to Office and Staff Announcements

95. I have identified 28 relevant announcements related to staff or office expansions.[89] Figure 29 plots the average XRP price path for the week leading up to and following these announcements and compares it with the average BTC price path. The series appear very similar, and XRP prices do not appear to react to such announcements.

[89] I exclude a March 17, 2018 Newsroom Article which repeats the March 8 announcement that Cory Johnson was joining Ripple as its chief market strategist. *See* Ari Levy, "Ripple hires Bloomberg TV's Cory Johnson as chief marketing strategist," CNBC, March 8, 2018, accessed September 29, 2021, https://www.cnbc.com/2018/03/08/ripple-hires-bloomberg-tvs-cory-johnson-as-chief-market-strategist.html?__source=twitter%7Cmain; *see also,* Daniel Roberts, "Ripple's new chief market strategist: Crypto regulation will 'separate the wheat from the chaff'," Yahoo! Finance, March 17, 2018, accessed September 29, 2021, https://finance.yahoo.com/news/ripples-new-chief-market-strategist-crypto-regulation-will-separate-wheat-chaff-114110796.html.

FIGURE 29: AVERAGE NORMALIZED PRICE BEFORE AND AFTER OFFICE AND STAFF ANNOUNCEMENTS



Note: Day labels indicate the beginning of the specified day. News Day shaded in gray. News is released at some point between Day 0 and 1.

96. This observation is confirmed statistically. Figure 30 presents the results of my event study and statistical analysis on Office and Staff Announcements. Not a single test indicates a statistically significant correlation between these announcements and XRP prices.[90]

[90] I note that this result does not preclude the possibility that "management quality" is of general interest to investors in Ripple Labs or, possibly, to holders of XRP tokens.

FIGURE 30: XRP PRICES DO NOT REACT TO OFFICE AND STAFF ANNOUNCEMENTS

Model Number	Parametric	Nonparametric
1		
2		
3		
4		
5		
6		
7		
8	**NO SIGNIFICANT RESULTS**	
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Notes:

✓	Indicates significance at the 5% level.
	Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

97. In summary, XRP price increases are significantly correlated with key milestones for Ripple Labs, with news of new trading platform listings, with customer and product announcements, and with major initiatives from Ripple Labs including those designed to generate proposed XRP use cases. They do not appear to react to more mundane office and staff announcements or to Ripple's other initiatives not directly tied to Ripple's Commercialization Initiatives.

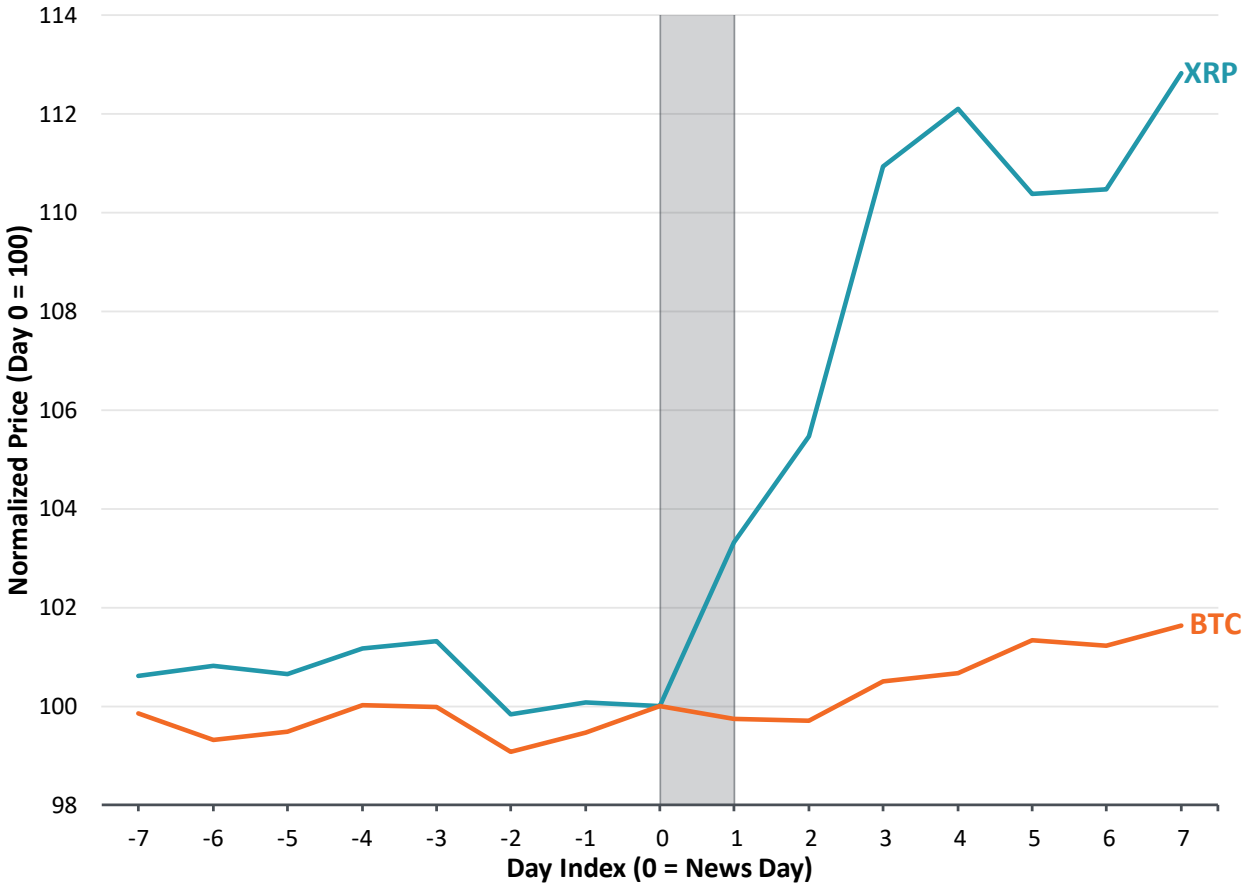
F. Days with Ripple News Are Associated with Significant Abnormal XRP Returns and the Association Is Unlikely to Be Explained by Random Chance

98. As a final analysis I combine all the following categories: Milestones, Trading Platform Listings, Customer & Product, Acquisitions & Investments, and the Ripple Commercialization Initiatives described above in Section VI.D.[91] By combining these events, how I categorize among them becomes irrelevant. It will not matter if a particular event is thought of as a "Milestone" or as a "Customer & Product" announcement. Together these comprise 113 unique, relevant events on 105 unique days.

99. Figure 31 plots the average XRP price path for the week leading up to and the week following these announcements and compares it with the average BTC price path. XRP prices (and Bitcoin prices) appear essentially flat for the week leading up to these events. But while Bitcoin prices remain nearly flat, XRP prices increase sharply, jumping 3% on the day of the announcement and ending about 13% higher one week later.

[91] I had not previously presented the Acquisitions & Investments category. I find 11 Acquisitions & Investments events in my data, listed in Appendix C. I mark one event, the completion of Ripple's investment in MoneyGram on November 25, 2019, as stale, since this investment had been previously announced on June 17, 2019 (*see* Daniel Phillips, "Ripple Completes $50 million investment in MoneyGram," Decrypt, November 25, 2019, accessed 10/3/2021, https://decrypt.co/12038/ripple-completes-50-million-investment-in-moneygram and Paul Vigna, "Ripple to Invest up to $50 Million in MoneyGram," Wall Street Journal, June 17, 2019, accessed 10/3/2021, https://www.wsj.com/articles/ripple-to-invest-up-to-50-million-in-moneygram-11560803556). I do not find a statistically significant relationship with this category in isolation. *See* Appendix E.

FIGURE 31: AVERAGE NORMALIZED PRICE BEFORE AND AFTER MILESTONES, TRADING PLATFORM LISTINGS, CUSTOMER & PRODUCT ANNOUNCEMENTS, ACQUISITIONS & INVESTMENTS, AND RIPPLE COMMERCIALIZATION INITIATIVES



Note: Day labels indicate the beginning of the specified day. News Day shaded in gray. News is released at some point between Day 0 and 1.

100. These 105 event days span 2,369 trading days. Again using the Constant Mean Return Model as an example, it flags 199 days as significantly positive, or 8.4%. Drawing 105 days at random, the single most likely outcome is to draw eight significant market days. Instead, in my sample of 105 event days there are 24 market days. The odds of there being 24 or more market days by random chance are about 1 in 360,000. Recall that the typical standard for scientific research is 1 in 20.

101. Figure 32 presents the results of my event study and statistical analysis on all milestones, trading platform listings, customer & product announcements, acquisitions & investments, and Ripple commercialization initiatives. Every case of every model indicates a statistically significant correlation between these Ripple actions and XRP prices.

FIGURE 32: XRP PRICES REACT TO MILESTONES, TRADING PLATFORM LISTINGS, CUSTOMER & PRODUCT ANNOUNCEMENTS, ACQUISITIONS & INVESTMENTS, AND RIPPLE COMMERCIALIZATION INITIATIVES

Model Number	Parametric	Nonparametric
1	✓	✓
2	✓	✓
3	✓	✓
4	✓	✓
5	✓	✓
6	✓	✓
7	✓	✓
8	✓	✓
9	✓	✓
10	✓	✓
11	✓	✓
12	✓	✓
13	✓	✓
14	✓	✓
15	✓	✓
16	✓	✓
17	✓	✓
18	✓	✓
19	✓	✓
20	✓	✓

Notes:

✓ Indicates significance at the 5% level.

Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

102. The hypothesis that XRP prices are independent of Ripple's news about its business and activities can be rejected at any reasonable significance level. As a further demonstration of this, I apply the generalized rank test also found in Joo, Nishikawa, and Dandapani (2020). This is a test of the joint significance of these 105 event days: is the XRP return of this group events, taken together, statistically significant? Figure 33 indicates the statistical significance of these results. Every model indicates a significant reaction in the XRP market at the 5% level.

FIGURE 33: SIGNIFICANCE OF GENERALIZED RANK TEST APPLIED TO MILESTONES, TRADING PLATFORM LISTINGS, CUSTOMER & PRODUCT ANNOUNCEMENTS, ACQUISITIONS & INVESTMENTS, AND RIPPLE COMMERCIALIZATION INITIATIVES

Model Number	Minimum T-Statistic	Maximum T-Statistic
1	✓	✓
2	✓	✓
3	✓	✓
4	✓	✓
5	✓	✓
6	✓	✓
7	✓	✓
8	✓	✓
9	✓	✓
10	✓	✓
11	✓	✓
12	✓	✓
13	✓	✓
14	✓	✓
15	✓	✓
16	✓	✓
17	✓	✓
18	✓	✓
19	✓	✓
20	✓	✓

Notes:

✓	Indicates significance at the 5% level.
	Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. See Appendix E.

1. There Is No Relationship between Ripple News and Negative XRP Returns

103. As my first robustness check, I investigate whether the Ripple events described above are significantly associated with negative XRP returns. Such an association could be construed as evidence against the proposition in question.

104. Figure 34 reports instances of statistically significant correlations between these news events and XRP price *decreases*. Not a single instance indicates a significant correlation with negative returns.

FIGURE 34: THERE IS NO SIGNIFICANT RELATIONSHIP BETWEEN NEGATIVE XRP RETURNS AND MILESTONES, TRADING PLATFORM LISTINGS, CUSTOMER & PRODUCT ANNOUNCEMENTS, ACQUISITIONS & INVESTMENTS, AND RIPPLE COMMERCIALIZATION INITIATIVES

Model Number	Parametric	Nonparametric
1		
2		
3		
4		
5		
6		
7		
8	**NO SIGNIFICANT RESULTS**	
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

Notes:

✓	Indicates significance at the 5% level.
	Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly negative returns are identified at the 5% one-sided level. See Appendix E.

2. There Is No Relationship between Ripple News and XRP Returns Just before the News Is Released

105. I next investigate whether Ripple news events are announced or released during periods of time when XRP prices are simply increasing for "other reasons." I apply my analytical framework not to the news

day itself, but to three days before the news day. If I continue to find evidence of significant correlation between XRP prices days before the news, this would suggest that something else, something other than the news itself, is driving the price growth. To associate the price increases with the news, and setting aside the possibility of rumors and leakage, I should not find any correlation if I look "too early."

106. Figure 35 reports incidents of statistically significant correlations between these news announcements and XRP prices three days before the news is released. Not a single instance indicates a significant correlation at the 5% significance level.

FIGURE 35: THERE IS NO SIGNIFICANT RELATIONSHIP BETWEEN XRP RETURNS AND MILESTONES, TRADING PLATFORM LISTINGS, CUSTOMER & PRODUCT ANNOUNCEMENTS, ACQUISITIONS & INVESTMENTS, AND RIPPLE COMMERCIALIZATION INITIATIVES 3 DAYS BEFORE EVENT

Model Number	Parametric	Nonparametric
1		
2		
3		
4		
5		
6		
7		
8	**NO SIGNIFICANT**	
9		
10		
11	**RESULTS**	
12		
13		
14		
15		
16		
17		
18		
19		
20		

Notes:

✓	Indicates significance at the 5% level.
	Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

3. Results Are Robust to Misclassifying Events

107. Classifying news is necessarily a subjective exercise. As a final robustness check, I consider the possibility that I may have misclassified events. There are two types of misclassification errors. First, I may have incorrectly included events in my set of "important" events which do not belong – meaning,

some of these 113 events should not have been considered. This first type of error is called "over-classification error." Second, I may have incorrectly excluded events – meaning, some of the 400 or so excluded events should have been included. This second type of error is called "under-classification error." I investigate both types of error below.

108. First I consider whether some of the events I have included in the set of Milestones, Trading Platform Listings, Customer & Product Announcements, Acquisitions & Investments and Ripple Commercialization Initiatives should be excluded. I randomly select 10% of the events and remove them from the analysis. I do this ten times. Figure 36 reports the average results. All cases of all models continue to indicate a significant correlation with XRP prices at any reasonable level of confidence. This indicates that my results are robust up to at least a 10% over-classification error rate.

FIGURE 36: CORRELATION BETWEEN XRP RETURNS AND MILESTONES, TRADING PLATFORM LISTINGS, CUSTOMER & PRODUCT ANNOUNCEMENTS, ACQUISITIONS & INVESTMENTS, AND RIPPLE COMMERCIALIZATION INITIATIVES IS ROBUST TO A RANDOM EXCLUSION OF EVENTS

Model Number	Parametric	Nonparametric
1	✓	✓
2	✓	✓
3	✓	✓
4	✓	✓
5	✓	✓
6	✓	✓
7	✓	✓
8	✓	✓
9	✓	✓
10	✓	✓
11	✓	✓
12	✓	✓
13	✓	✓
14	✓	✓
15	✓	✓
16	✓	✓
17	✓	✓
18	✓	✓
19	✓	✓
20	✓	✓

Notes:

✓ Indicates significance at the 5% level.

Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

109. Next, I consider whether some of the events I have excluded from this set of events should be included. I randomly select 10% of all excluded events and add them to the analysis. I do this ten times. Figure 37 reports the average results. All cases continue to indicate a significant correlation with XRP prices at the 5% level. My results are robust up to at least a 10% under-classification error rate.

FIGURE 37: CORRELATION BETWEEN XRP RETURNS AND MILESTONES, TRADING PLATFORM LISTINGS, CUSTOMER & PRODUCT ANNOUNCEMENTS, ACQUISITIONS & INVESTMENTS, AND RIPPLE COMMERCIALIZATION INITIATIVES IS ROBUST TO A RANDOM INCLUSION OF EVENTS

Model Number	Parametric	Nonparametric
1	✓	✓
2	✓	✓
3	✓	✓
4	✓	✓
5	✓	✓
6	✓	✓
7	✓	✓
8	✓	✓
9	✓	✓
10	✓	✓
11	✓	✓
12	✓	✓
13	✓	✓
14	✓	✓
15	✓	✓
16	✓	✓
17	✓	✓
18	✓	✓
19	✓	✓
20	✓	✓

Notes:

✓	Indicates significance at the 5% level.
	Indicates not significant at the 5% level.

Reports cases which are significant at the 5% level. Significantly positive returns are identified at the 5% one-sided level. See Appendix E.

VII. Correlation of XRP Returns with Other Digital Tokens Changes over Time

110. Event studies applied to traditional equity securities usually include controls for the "broad market" as well as the "industry sector" appropriate to the case at hand.[92] These specifications are supported by a great deal of theoretical research which suggests that there are likely common factors which would be expected to impact equity securities in a broadly similar way, and industry factors which would be expected to impact a subset of equity securities in a broadly similar way. As an example, during the pandemic equities were generally negatively impacted, but "airline" or "hotel" securities as a group might be impacted differently from "pharmaceuticals" as a group.

111. The idea that a particular market price might be affected both by idiosyncratic events as well as broader market drivers is therefore standard in the event study literature. In this section I investigate the relationship between XRP returns and those of other leading digital tokens to determine to what extent there may be common "digital token" factors driving correlated returns.

A. Security Prices Are Often Related to Common Factors

112. Financial economists have proposed a number of methods for modelling prices of securities. One general method is called the factor model,[93] where security prices are modelled to be related to the returns of some factors. Typically, these factors are returns of portfolios of other traded securities.[94] The market model is an example of a one-factor model,[95] which relates securities returns to the return of the broad market portfolio.

113. Because Bitcoin is by far the largest and most well-known digital token—especially in the earlier periods—financial economists have sometimes used Bitcoin as a proxy for the broader digital token

[92] A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39 at p. 18.

[93] A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39 at p. 18.

[94] A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39 at p. 18.

[95] A. Craig MacKinlay, "Event Studies in Economics and Finance," *Journal of Economic Literature* Vol. 35, 1997, pp. 13-39 at p. 18.

market. For example, Liu and Tsyvinski (2021) use Google searches for the word "Bitcoin" to proxy for investor attention of the broader digital token market.[96]

114. Consistent with that, financial economists have found that returns of other digital tokens are correlated with BTC returns.[97] As discussed below, I also find that during the period from 2014 to the end of 2020, XRP returns are correlated with Bitcoin returns, although the magnitude of that correlation fluctuates over time. More importantly, XRP returns can only be partially explained by BTC returns, and sometimes are explained more by ETH returns.

B. XRP Returns Are Only Partially Explained by Bitcoin Returns, and Sometimes Can Be Better Explained by Ether Returns

115. Figure 38 plots the 180-day rolling correlation between XRP returns and BTC returns. Correlation ranges from -1 to 1; a value of "1" means that two series are perfectly correlated while a value of "0" means they are uncorrelated. In this case, a correlation of "1" would mean that XRP returns and BTC returns move in the same direction in a one-to-to manner: when one increased, the other increased, and vice versa. Knowing the return of one token would immediately tell you the return of the other. A correlation of "-1" would mean that when one increased, the other decreased, and vice versa; again, knowing the return of one would tell you the return of the other (it would just be the opposite). If knowing what happened to one token would not tell you anything about what happened to the other, then the correlation would be "0." Intermediate correlations are informative but not decisive: a correlation of, say, 50% means that knowing the return of one token gives you some information about the return of the other, but only limited information.

116. Figure 38 illustrates that, except for some short periods of near-zero or even negative correlation, XRP returns and BTC returns are positively correlated, but only partially, with an average value of 0.42. Importantly, Figure 38 illustrates the historical correlation between XRP and BTC returns fluctuates over time and does not have a clear trend or pattern.

[96] Yukun Liu and Aleh Tsyvinski, "Risks and Returns of Cryptocurrency," *The Review of Financial Studies* Vol. 34, 2021, pp. 2689-2727 at pp. 2707-2708.

[97] *See*, e.g., Albert S. Hu, Christine A. Parlour, and Uday Rajan, "Cryptocurrencies: Stylized Facts on a New Investible Instrument," *Financial Management* Vol. 48, 2019, pp. 1049-1068 at Abstract.

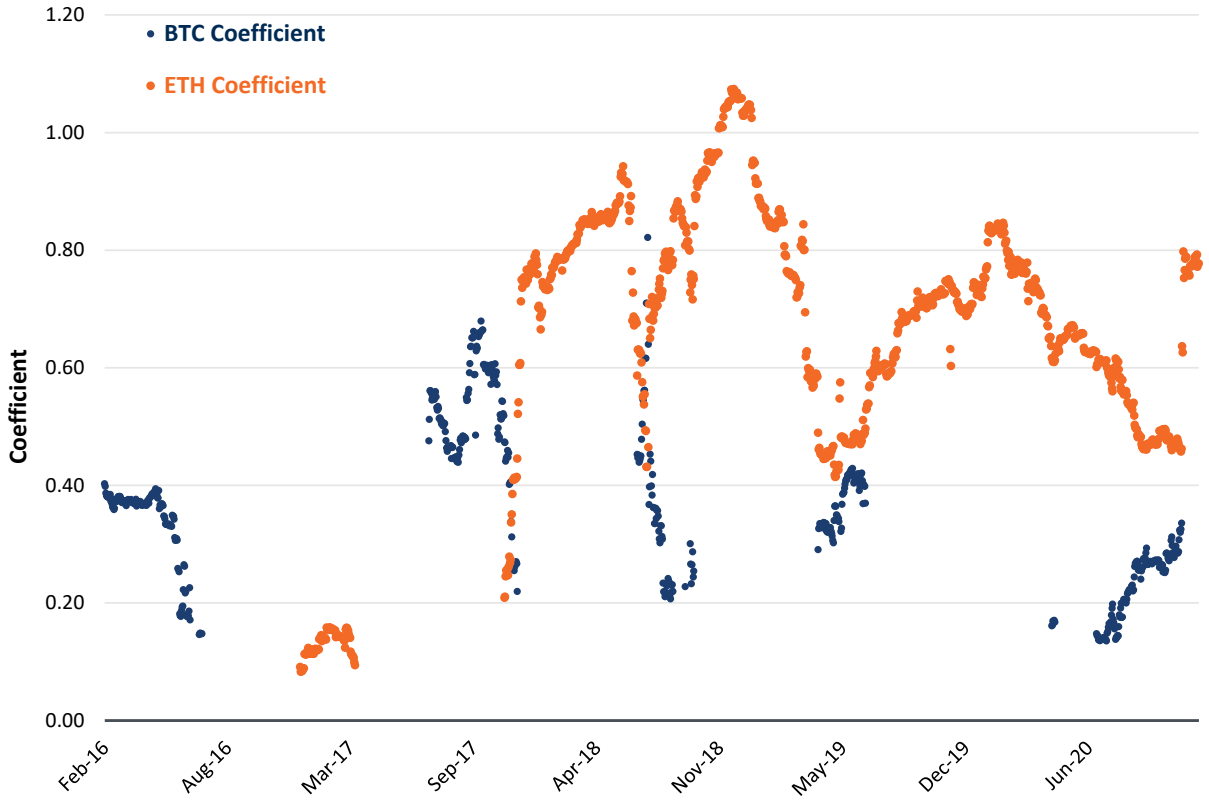
FIGURE 38: 180-DAY ROLLING CORRELATION BETWEEN XRP AND BTC RETURNS

Source: CoinMarketCap.

117. As discussed in Section V.B, I implement 20 regression models for XRP returns, each controlling for different sets of explanatory variables that could explain returns of XRP. Most of the models control for BTC; Model 5, in particular, controls for both BTC returns and ETH returns. Results from this model indicate that XRP returns are often explained more by ETH returns than by BTC returns. In addition, the relationship among returns of XRP, BTC, and ETH fluctuates over time.

118. Figure 39 plots the coefficients on BTC returns (dark blue) and the coefficients on ETH returns (orange) from 180-day rolling regressions. Only coefficients that are significant at least at the 10% level are plotted; gaps in Figure 39 therefore correspond to days when those coefficients do not achieve at least that level of significance. When ETH returns are not statistically related to XRP returns, there is a gap in the orange dots; when BTC returns are not statistically related to XRP returns, there is a gap in the dark blue dots.

FIGURE 39: REGRESSION COEFFICIENTS FROM MODEL 5



Source: CoinMarketCap.

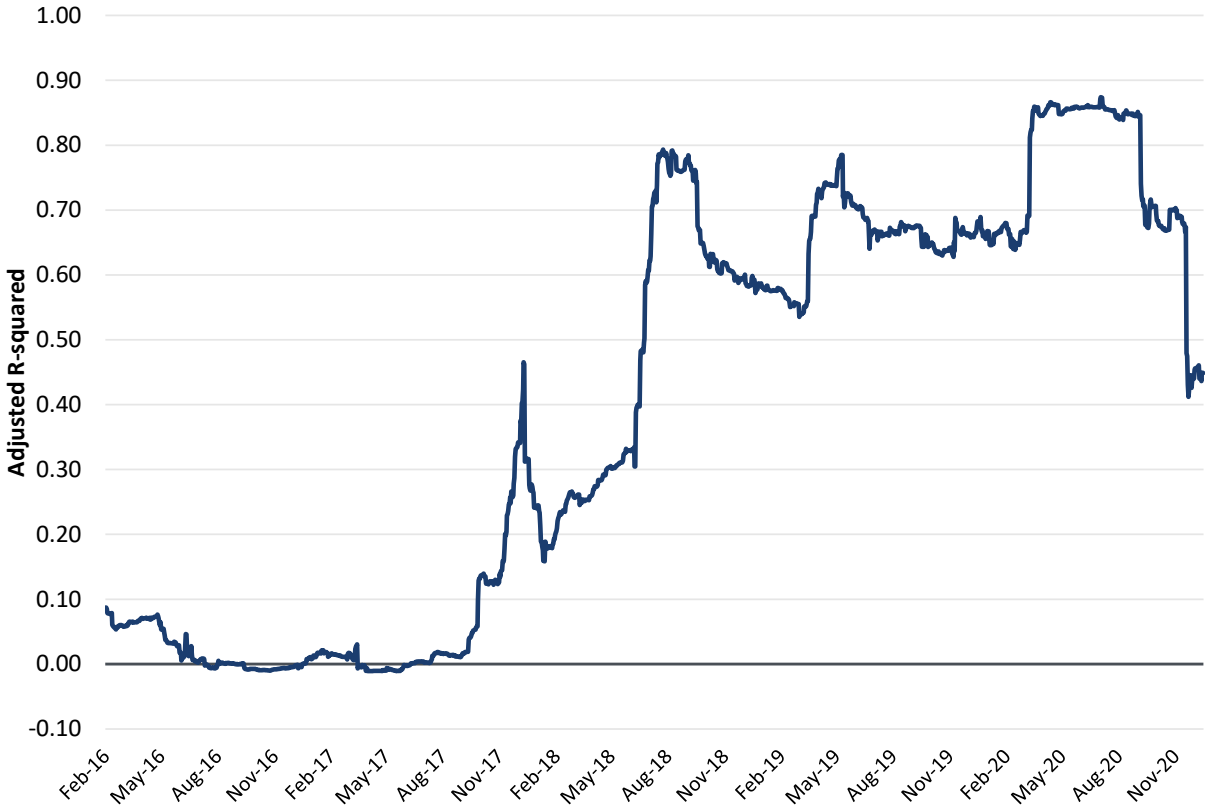
119. As illustrated in Figure 39, for both ETH and BTC there are times when they have no statistically significant relationship with XRP returns (i.e., there are gaps in the chart). More recently, ETH returns have "crowded out" BTC returns: there are more gaps in the dark blue dots than in the orange dots. This means, in more recent periods, ETH returns can explain XRP returns more than BTC returns can.

120. Figure 39 also illustrates that the magnitude of the relationships—measured by the coefficients—between XRP returns and ETH returns and the relationship between XRP returns and BTC returns fluctuate over time. A coefficient of 1 on ETH returns means that a 1% change in ETH's price is expected to be associated with a 1% change in XRP's price. Figure 39 illustrates that the coefficient on ETH returns ranges from about 0.10 to above 1.00, whereas the coefficient on BTC returns ranges from about 0.10 to about 0.70.

121. Consistent with the fluctuating pattern illustrated in Figure 39, when taken together, ETH returns and BTC returns can explain XRP returns in varying degrees over time. The adjusted R-squared of Model 5, plotted in Figure 40, illustrates this point. The R-squared measures how well a given set of control variables can explain the independent variable. An R-squared of 1 means that the control variables, taken together, can explain 100% of the variation in XRP returns. As illustrated in Figure 40, while BTC and ETH returns can explain as much as almost 90% of XRP returns during Q2 and Q3 of 2020, they

provide little explanatory power for XRP returns before late 2017. On average, these two factors explain only about 40% of the variation in XRP returns.[98]

FIGURE 40: ADJUSTED R-SQUARED IN MODEL 5



Source: CoinMarketCap.

[98] 40% calculated as the average of the adjusted R-squared series plotted in Figure 40.

[redacted] Dr. [redacted] worked for 15 years at [redacted], specializing in corporate, financial institution, sovereign and structured finance credit research and analysis. Most recently he was [redacted], a group of nearly 100 professionals with responsibility for developing credit models and methodologies for all asset classes across all lines of business. Dr. [redacted] also worked to create the [redacted], a team dedicated to leveraging machine learning and data mining techniques. Prior to that Dr. [redacted] was the [redacted], including Default Research, Model Development and Verification, and Technology. Dr. [redacted] frequently met with regulators and policy makers to discuss credit risk, credit ratings performance, risk modeling, and anti-trust and other policy questions.

Dr. [redacted] main areas of specialization are econometrics and statistics, finance, institutional and consumer credit, real estate, risk modeling and assessment, and numerical methods. He is the author of copyrighted and patented models. In addition to credit risk, his experience also includes work in asset pricing, real estate, and government. His work has been featured in the media such as the *Wall Street Journal*, *The Financial Times, The Economist, CNNMoney, CNBC, Forbes, Bloomberg, Fox Business, Business Week, Washington Post, Huffington Post,* and *Reuters,* among others.

Since becoming a consultant in 2018, Dr. [redacted] has testified as an expert witness on behalf of the U.S. Securities and Exchange Commission on event studies and market efficiency. He has worked as the case manager for the U.S. Department of Justice on behalf of [redacted] to assist in establishing liability and estimating damages in a case involving fraudulent mortgage servicing practices. Much of his work has been on collusion and manipulation of various markets, including commodities and fixed income securities such as corporate bonds, agency securities, sovereign and supranational bonds, variable rate demand obligations and other debt derivatives.

Dr. [redacted] has also worked on behalf of defendants on issues of class certification in the health insurance market. He has also worked on mergers and acquisitions in the telecommunications industry. Dr. [redacted] has worked extensively on cases involving multi-sided platforms for private plaintiffs, defendants and the U.S. government.

Dr. [redacted] has developed several models of corporate and consumer credit, financial risk contagion, real estate market performance measures, and pharmaceutical drug development, to name a few. He has developed patented models of default and credit rating transitions and trademarked models of regional real estate prices. Dr. [redacted] has developed models of residential mortgage default, prepayment and loss which have been used to assess the credit risk of hundreds of billions of dollars in securitizations. He has contributed to books on emerging markets and sovereign risk.

In pharmaceuticals, he co-developed a model to estimate the likelihood of drugs failing and succeeding each of the clinical stages of the Food and Drug Administration, and their expected durations in each of these phases. This model has become one of the two most used by industry analysts to assist in valuing pharmaceutical and biotechnology pipelines. His research on pharmaceuticals has been discussed in books on how to value pharmaceutical and biotechnology companies, and on publications pertaining to health care, intellectual property and cartels.

Dr. [redacted] has been at the forefront of the empirical detection of some conspiracies and manipulations. In 2008 he flagged the possibility of collusion in LIBOR prior to the launch of large scale investigations. He has also flagged the possibility of manipulation and collusion in gold markets in 2013.

Dr. [redacted] has co-authored several articles and papers on econometric methods and screens for conspiracies, manipulations and fraud. He has published in peer-reviewed journals such as the Journal of Pharmaceutical Finance, Economics and Policy, and the Journal of Banking and Finance. His work has also appeared in trade publications including The Antitrust Source, and The Competition Policy International Antitrust Chronicle.

Dr. [redacted] holds a PhD and a Masters in Economics from [redacted] where he was awarded Distinction in the field of Econometrics. He also holds a Bachelor of Arts in Economics from [redacted] where he graduated summa cum laude.

PROFESSIONAL EXPERIENCE

[redacted] (New York) **2020–Present**

Senior Consultant

- Credit Risk
- Securities fraud and manipulation
- Multi-sided platforms
- Mergers and acquisitions
- Event studies
- Valuation
- Collusion

[redacted] (New York) **2018–2020**

Managing Director. Consulting experience includes:

- Class certification
- Multi-sided platforms
- Mergers and acquisitions
- Event studies
- Securities fraud

- Valuation
- Collusion
- Market Manipulation

[redacted] (New York) 2003–2018

Managing Director of the [redacted], managing a team of about 100 analysts. Research and technical responsibilities included:

- Development of credit rating methodologies and models for all produce lines, including corporate, financial institutions, sovereign, sub-sovereign, municipal and structured finance
- Default and ratings performance research for all product lines, including corporate, financial institutions, sovereign, sub-sovereign, municipal and structured finance
- Model verification and version control
- Regulatory reporting

Managing Director of [redacted], a group of 40 analysts. Research and technical responsibilities included:

- Default and ratings performance research for all product lines, including corporate, financial institutions, sovereign, sub-sovereign, municipal and structured finance
- Rating methodology and credit model development
- Rating methodology and credit model validation
- Model verification and version control
- Regulatory reporting

Research Economist, [redacted], as Vice President and Senior Vice President

- Published research primarily on corporate default and ratings performance
- Represented [redacted] at industry conferences
- Built a patented default and rating transition model
- Built a credit rating predictor model
- Select modeling and methodology development projects include:
- US Residential Mortgages: lead developer of mortgage default and loss severity models using data for nearly 1.4 million private label mortgages. These models represent the core of [redacted] new US residential methodology. The models provide the monthly term structure of default and prepayment risks as well as the first and second moments of the borrower's loss-given-default distribution. Easily permits stressing a portfolio of mortgage exposures based on macroeconomic scenarios.
- Global Bank Stress Testing: lead the effort to develop a new, consistent framework for stress-testing the asset portfolio of banks globally. A reduced from approach, it applies stress multiples to expected losses of different asset classes.
- Global Bank Credit Scorecard: developed an innovative credit scorecard for the Baseline Credit Assessments of global banks. The scorecard is based on a regression analysis of

bank failures during the recent financial crisis and incorporates bank balance sheet information, macroeconomic variables and assessments of sovereign credit risk.

- Corporate Defaults: lead developer of the patented Credit Transition Model, [redacted] propriety model of corporate (financial and non-financial) credit rating transitions and default. The model forecasts all rating transitions, including upgrades, downgrades, default and withdrawal at the individual issuer level by conditioning on issuer-specific information and macroeconomic drivers. Easily permits a coherent stress-test of corporate exposures based on macroeconomic scenarios. These scenarios could consider not just default, but transitions across rating boundaries (such as falling from investment-grade into speculative-grade) which may be critical to a portfolio manager.
- Credit Rating Prediction: lead developer of [redacted] proprietary Rating Predictor Model which maps credit ratios to implied credit ratings. The model significantly outperforms standard approaches such as linear regression and ordered Probit models. The model allows counter-factual analysis to determine how credit ratings might change given changes in underlying balance sheet metrics.

[redacted] (Washington, DC) **2002–2003**

Principal Analyst in the Microeconomics and Finance Division. Research and policy projected included:

- Econometric Modeling:
  - Developed a model to forecast bank deposits, assessable and insured, for use by the Budget Analysis Division
  - Estimated a discrete time, multiple-destination mixed proportional hazards model of pharmaceutical development
  - Estimated Logistic regressions of first stages of the FHA loss mitigation program
  - Specified a two-stage Probit model of additional stages of FHA loss mitigation program to correct for endogenous selection

- Financial Analysis:
  - Used derivative pricing theory to estimate the market value of risk born by the government through various contingent programs

[redacted] (Chicago) **1998–2002**

Chief Economist of the real estate investment company. Research projects included:

- Commercial Property Rent and Occupancy: developed proprietary forecasting models of rent and occupancy levels for multifamily, office, retail and warehouse properties at the MSA level.

- Optimal Property Location: developed location models for the Assisted Living and Self-Storage sectors in the U.S. and Europe. The models informed asset acquisition/disposition decisions.

EDUCATION

[redacted]
PhD, Department of Economics (2002)
Primary Fields: Econometrics, Macroeconomics and Monetary Economics, Numerical Methods
Secondary Fields: Asset Pricing, Public Finance
Awards: Award of Distinction in Econometrics, 2000
First Ever Student Awarded this Distinction in the Economics Department
MA, Economics (1997)

[redacted]
BA, Economics (1994)
Awards: Summa cum laude / Phi Beta Kappa junior year / College Honors Senior Comprehensive Distinction / *Wall Street Journal* Award for excellence in economics

EXPERT TESTIMONY

[redacted]
United States District Court, Southern District of New York
[redacted]

- Report Filed [redacted]
- Rebuttal Report Filed [redacted]
- Deposition Testimony [redacted]
- Declaration Filed [redacted]

SELECTED PUBLICATIONS, WORKING PAPERS, AND PRESENTATIONS

- [redacted] with [redacted] book chapter included in "[redacted]," published by [redacted], 2021 (forthcoming)
- [redacted] with [redacted] (forthcoming)

- [redacted] with [redacted] Working Paper, June 2021
- [redacted] with [redacted] Working Paper, June 2021
- [redacted] with [redacted]
- [redacted] with [redacted], November 2020
- [redacted] with [redacted], August 2020
- [redacted], with [redacted], November 2019
- [redacted] with [redacted], January 2019
- [redacted], with [redacted], July 2018
- [redacted], with [redacted] December 18, 2014
- Contributed book chapter to [redacted], edited by [redacted], December 2014
- [redacted] Special Comment, July 2014
- [redacted] Special Comment, July 2014
- [redacted] with [redacted] Working Paper, October 2014
- [redacted]" with [redacted] Working Paper, February 2014
    - Assisted in triggering litigation and investigations worldwide
    - Extensively discussed in the media including Bloomberg, Reuters, Wall Street Journal, The Economist, The Financial Times, Kitco
- [redacted], NBER 2014
- [redacted], NBER 2013
- [redacted] presentation to the [redacted], NYSSA, 2012
- [redacted]" with [redacted] March (1) 2012
    - Discussed in U.S. Senate Hearings on [redacted], November 2013
    - Discussed in Litigation on USD LIBOR by both Plaintiffs and Defendants

- [redacted], with [redacted] Working Paper 2011
- [redacted], Working Paper 2011
- [redacted], with [redacted], [redacted] 36, 136-150, 2012
  - [redacted], 2012
  - [redacted]
  - Featured in the WSJ, [redacted]," published March 18, 2011
  - Featured in the FT, "[redacted]," published March 25, 2011
  - Featured in The Economist, "[redacted]," The Economist, July 7, 2012, [redacted]
  - Featured in BBC Radio on [redacted], aired January 17, 2013
  - Featured in *Sky News TV*, UK, on [redacted], The Boulton and Co Today TV Show, February 6, 2013
  - Featured in Testimony in the UK Parliament on LIBOR
- [redacted], with [redacted], Working Paper, 2010
- [redacted], with [redacted], Working Paper, April 2008
- [redacted], available at SSRN, June 2007
- [redacted], available at SSRN, August 2007
- [redacted], with [redacted] (2006), 19–42
  - Presented at the [redacted] in Boston in March 2003
  - Presented at the [redacted] in Chicago in June 2003
  - Discussed in books on health care and on how to value pharmaceutical and biotech R&D pipelines
- [redacted], [redacted] (4), March 2005
- [redacted]

  - Presented at [redacted] in Copenhagen, Denmark, *May 2007*
  - Presented at [redacted] in Venice, Italy, *September 2007*
  - Presented at [redacted] in Chicago, *October 2008*
- [redacted] with [redacted], [redacted], 2004
- [redacted] with [redacted]
  - Presented at the [redacted] in Washington in March 2003
- [redacted], 2003-6
- *Estimating the Tax Shelter Value of Commercial Office Real Estate: Consequences of the Tax Reform Act of 1986*
  - PhD Dissertation in Economics, [redacted].
  - Presented at the [redacted] in [redacted]

PATENTED AND TRADEMARKED WORK

- [redacted]
- [redacted]

SELECTED INTERVIEWS AND OTHER MEDIA COVERAGE

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

Documents Relied Upon

	Legal Pleadings	Date
[1]	Complaint, Securities and Exchange Commission v. Ripple Labs, Inc., Bradley Garlinghouse, and Christian A. Larsen, 20 Civ. 10832	December 22, 2020

	Depositions and Exhibits	Date
[2]	Breanne Madigan	May 18, 2021
[3]	David Schwartz	May 26, 2021
[4]	Dinuka Samarasinghe	June 9, 2021
[5]	Monica Long	June 17, 2021
[6]	Asheesh Birla	June 23, 2021
[7]	Miguel Vias	June 28, 2021
[8]	Patrick Griffin	June 29, 2021
[9]	Ryan Zagone	July 20, 2021
[10]	Phillip Rapoport	July 22, 2021
[11]	William Hinman	July 27, 2021
[12]	Ron Will	July 30, 2021
[13]	Lawrence Angelilli	August 3, 2021
[14]	Antoinette O'Gorman	August 4, 2021
[15]	[redacted]	August 11, 2021
[16]	Ethan Beard	August 24, 2021
[17]	Christian Larsen	September 14, 2021
[18]	Bradley Garlinghouse	September 20, 2021

Produced Documents

[19] NY-9875_T_00017816
[20] RPLI_SEC 0081034
[21] RPLI_SEC 0090938
[22] RPLI_SEC0200768
[23] RPLI_SEC 0267872
[24] RPLI_SEC 0426161
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[38] Eugene F. Fama, “Efficient Capital Markets: A Review of Theory and Empirical Work,” The Journal of Finance Vol. 25 (2), 1970, pp. 383-417
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APPENDIX C

Category	Event Date	Event ID	Document Date	Document ID	Headline
[1]	[2]	[3]	[4]	[5]	[6]
Acquisition & Investment	1/16/2018	287	1/16/2018	7766	Ripple turns investor as execs lead $25M round for storage and rental startup Omni
	4/11/2018	318	4/11/2018	7555	Ripple Invests $25M in Blockchain Capital's Latest Fund
	4/11/2018	318	4/11/2018	8409	Ripple Invests $25 Million to Drive Innovation in Blockchain and Digital Assets
	2/5/2019	402	2/5/2019	7675	Investing in Dharma
	2/5/2019	401	2/5/2019	7676	Former BMG Head Zach Katz Launches Music and Tech Investment Group With Scooter Braun's Ithaca Holdings
	3/12/2019	407	3/12/2019	7674	A Big Bet on Blockchain and Gaming: Ripple and Forte Announce $100 Million Fund
	6/17/2019	418	6/17/2019	7539	Ripple Announces Strategic Partnership with Money Transfer Giant, MoneyGram
	6/17/2019	418	6/17/2019	7668	Ripple to Invest Up to $50 Million in MoneyGram
	9/27/2019	426	9/27/2019	7664	Ripple's Xpring Looks to Build XRP DeFi Products With New Acquisition
	9/30/2019	427	9/30/2019	8341	Ripple Continues Acquisition Streak, Expands European Operations to Iceland
	10/14/2019	433	10/14/2019	8337	Our Investment in Bitso
	10/14/2019	433	10/14/2019	7659	Ripple invests in Mexican broker Bitso, targets Brazil and Argentina
	11/25/2019	444	11/25/2019	7653	Ripple completes $50 million investment in MoneyGram
	10/28/2020	507	10/28/2020	7616	Ripple to Invest in Japan's SBI Subsidiary MoneyTap
Case Study	12/13/2014	28	12/13/2014	7901	Small Bank in Kansas Is a Financial Testing Ground
	6/27/2016	155	6/27/2016	7820	Canada to Germany Ripple bank transfer breakthrough for banking industry
	6/27/2016	155	7/12/2016	7819	Sent in Seconds, Not Days: Canadian Bank Tries Distributed Ledger
	7/15/2016	158	7/15/2016	8521	Watch Real Money Cross Borders in Real Time
	2/1/2017	206	2/1/2017	8479	National Bank of Abu Dhabi: First Middle East Bank to Use Ripple for Cross-Border Payments
	7/10/2017	231	7/10/2017	8460	Results of the Bankof England/Ripple Proof of Concept Published Today
	12/18/2017	262	12/18/2017	8430	Krungsri Collaborates with Petrochemical Company to Expedite Cross-border Payments and Retain Customers
	1/29/2018	293	1/29/2018	7761	In Their Own Words: Real Companies Talk Ripple XRP Pilots
	5/10/2018	328	5/10/2018	7553	Ripple Reports Positive Results From xRapid Pilots
	5/10/2018	328	5/10/2018	8402	First Pilot Results for xRapid
	5/10/2018	328	5/10/2018	7715	Ripple: XRP Pilot Cuts Payment Fees Up to 70%
	5/10/2018	328	5/10/2018	7716	Ripple Reveals Results Of First Pilot Tests Using XRP Cryptocurrency
	6/29/2018	345	6/29/2018	7700	Santander, Ripple Use Blockchain To Settle Global Payments
	10/1/2018	368	10/1/2018	8376	Swell 2018: How Banco Santander Launched a Payment App for Millions
	10/2/2018	370	10/2/2018	8373	TransferGo On Solving for Real-Time Cross-Border Settlement at Swell 2018
	10/18/2018	375	10/18/2018	8370	How Payments Improved InstaReM and BeeTech's Customer Experience
	11/15/2018	385	11/15/2018	8361	Swell 2018: Siam Commercial Bank Seeks a Payments Vendor, Finds a Business Partner in Ripple
	11/21/2018	386	11/21/2018	8360	Swell 2018: How Bloackchain Can Learn from eBay, the Original Digital Cross Border Payments Company
	12/10/2018	388	12/10/2018	8358	Coinone Transfer Offers South Korea's First Blockchain-Powered Remittance Service
	11/8/2019	443	11/8/2019	8331	Swell 2019: MoneyGram CEO Says 10% of Transactions Between Mexico and U.S. Use On-Demand Liquidity
	12/12/2019	447	12/12/2019	8330	SendFriend Uses On-Demand Liquidity to Save Customers Up to 80% In Remittance Fees
	1/29/2020	452	1/29/2020	8326	goLance Leverages On-Demand Liquidity to Deliver Faster, Cheaper Payments to Their Global Marketplace of Freelancers
	2/12/2020	454	2/11/2020	8324	Amendments: Ensuring Sensible Evolution of the XRP Ledger
	3/5/2020	459	3/5/2020	8320	Bitso and Ripple Are Delivering Friction-Free Exchange Across Latin America
	3/26/2020	462	3/26/2020	8319	Siam Commercial Bank Drives Innovation and Customer Growth With Help From Ripple
	4/2/2020	464	4/2/2020	7642	Money transfer service Azimo partners with Siam Commercial Bank for faster payments to Thailand
	4/2/2020	464	4/9/2020	8318	Azimo and SCB Runs on Ripple for Instant Payments Into Thailand
	4/29/2020	469	4/29/2020	8315	TPBank Uses RippleNet to Drive Transparent Global Payments Between Vietnam and The World
	5/7/2020	473	5/7/2020	8312	BTC Markets Drives Sustainable Growth of Its Exchange with XRP
	5/27/2020	476	5/27/2020	8311	Tapping the Power of RippleNet Cloud
	6/8/2020	478	6/8/2020	8310	Staying the Course in Remittances and SME Payments
Charity	4/23/2015	61	4/23/2015	8585	RippleWorks Launches to Support Global Entrpreneurs Building Paths out of Poverty
	10/16/2017	246	10/16/2017	8444	Ripple & the Gates Foundation Team Up to Level the Economic Playing Field for the Poor
	12/26/2017	268	12/26/2017	8425	The Season for Giving: Auctioning Off Ripple-Branded Patagonia Jackets for Charity
	3/27/2018	315	3/27/2018	8411	Ripple and Its Executives Proud to Support America's Public Schools with $29 Million XRP Donation to DonorsChoose org
	3/27/2018	315	3/28/2018	7727	Bay Area startup donates $29 million to classrooms all over U.S.

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Charity	3/27/2018	315	3/28/2018	7728	Ripple donates $29 million after nonprofit's founder 'dared' himself to ask
	3/27/2018	315	3/28/2018	7729	Ripple gives away $29 million of its cryptocurrency to public schools
	3/27/2018	315	3/28/2018	7730	Cryptocurrency Company's $29 Million Donation Funds Thousands Of Classroom Projects
	3/27/2018	315	3/29/2018	7724	A $29 Million Cryptocurrency Donation Just Funded Every Project On DonorsChoose.Org
	3/27/2018	315	3/29/2018	7725	San Francisco based Ripple donates $29M to schools across country
	3/27/2018	315	3/29/2018	7732	Bonanza for schools as SF crypto king Ripple gives $29M to DonorsChoose.org
	3/27/2018	315	4/2/2018	7726	Every single teacher on a crowd-funding site just got their wishes fulfilled
	5/23/2018	332	5/23/2018	7713	Ellen DeGeneres Gets Emotional After Ashton Kutcher Surprises Her With $4 Million Donation to Wildlife Fund
	7/30/2018	350	7/30/2018	8389	Ripple and Raising Malawi Launch Campaign to Sponsor Children in Need
	7/30/2018	350	7/31/2018	7697	Ripple Partners With Madonna to Fundraise for Orphans in Malawi
	9/27/2018	364	9/27/2018	7547	Ripple Announces Ripple for Good, Social Giving Will Top $100 Million
	9/27/2018	364	9/27/2018	7689	'Ripple for Good': Ripple Commits $100 Million to Social Giving Program
	3/7/2019	406	3/7/2019	8348	Ripple Partners with Tipping Point to Improve Economics Mobility for Bay Area Workers and Families
	4/16/2020	465	4/16/2020	8317	Giving in Place: Ripple Is Proud to Be Part of the Tech Community's Response to COVID-19
	4/16/2020	465	4/25/2020	7639	Blockchain firm Ripple donates $5 million to Bay Area food banks
	5/22/2020	475	5/22/2020	7637	Ripple And Chris Larsen Make Waves With Covid-19 Donations In Bay Area
	10/15/2020	503	10/15/2020	8297	Mercy Corps: Leveraging the Potential of Fintech To Accelerate Financial Inclusion in Emerging Markets
	12/20/2020	514	12/20/2020	8292	Our Commitment To Combating Food Scarcity With Eat. Learn. Play.
Corporate Activity & Announcement	6/19/2014	4	6/19/2014	7933	Creating Faster Foundations
	10/20/2014	15	10/20/2014	7593	21 Top Bitcoin and Digital Currency Companies Endorse New Digital Framework for Digital Identity, Trust and Open Data
	10/20/2014	15	10/20/2014	7920	Manifesto Vows to Give Consumers Control of Digital Identities
	10/20/2014	15	10/21/2014	7918	Why 20 Bitcoin Companies Are Backing a New Deal for Digital Identity
	12/24/2014	30	12/24/2014	7899	The 10 Most Influential People in Bitcoin 2014
	2/9/2015	42	2/9/2015	7590	Ripple Labs Named Fourth Most Innovative Company in Money for 2015 by Fast Company
	2/9/2015	42	2/9/2015	8589	Ripple Labs Makes Fast Company's 2015 Most Innovative Companies List
	2/9/2015	42	2/9/2015	7881	The World's Top 10 Most Innovative Companies Of 2015 In Money
	3/30/2015	55	3/30/2015	7871	EBAday attracts titans of transaction banking
	4/30/2015	63	4/30/2015	8583	European Payments Council: Ripple for Inter-bank Payments
	5/1/2015	65	5/1/2015	7861	An infrastructure approach to improving Financial Inclusion
	8/5/2015	90	8/5/2015	7582	Ripple Labs Awarded as Technology Pioneer by World Economic Forum
	8/5/2015	90	8/5/2015	8571	Ripple Labs Named a Technology Pioneer by World Economic Forum
	12/9/2015	110	12/9/2015	7830	The Fintech 50: The Complete List 2015
	12/21/2015	114	12/21/2015	8557	Looking Forward to Davos 2016
	1/16/2016	121	1/16/2016	7648	The 35 Best Small and Medium Workplaces in the Bay Area
	2/2/2016	130	2/2/2016	8545	Join the Interledger Community Meeting
	2/22/2016	133	2/22/2016	8541	Looking Forward to the W3C Interledger Payments Community Group Meeting
	3/16/2016	137	3/16/2016	8537	Chris Larsen to Guest Lecture for MIT Future Commerce
	4/15/2016	142	4/15/2016	8534	Looking Forward to NACHA #PAYMENTS2016
	4/26/2016	144	4/26/2016	8532	Nilesh Dusane Recognized as BAFT Future Leader
	7/29/2016	161	7/29/2016	8518	Looking Forward to Sibos 2016
	9/26/2016	175	9/25/2016	8508	Sibos 2016: Ripple Has Arrived
	9/27/2016	176	9/27/2016	8507	Ripple Executive Marcus Treacher Appointed to CHAPS Board
	10/17/2016	183	10/17/2016	8499	Interledger.js Joins the JavaScript Foundation
	1/18/2017	204	1/18/2017	8480	Ryan Zagone Recognized as BAFT Future Leader
	7/21/2017	234	7/21/2017	8456	Federal Reserve Task Force: Ripple Improves Speed and Transparency of Global Payments
	8/24/2017	236	8/24/2017	8454	Announcing Swell by Ripple
	10/15/2017	237	10/15/2017	8445	A Rising Tide of Anticipation Builds for Swell
	2/21/2018	304	2/21/2018	8415	Continued Decentralization & the XRP Ledger Consensus Protocol
	3/2/2018	306	3/2/2018	7556	Ripple Applauds Mexico's Lower House of Congress for Passing FinTech Rules
	3/23/2018	313	3/23/2018	8412	Tour de Schwartz
	4/17/2018	320	4/17/2018	7720	Ripple's Brad Garlinghouse and Michael Arrington to talk cryptocurrency at Disrupt SF

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Corporate Activity & Announcement	4/24/2018	321	4/24/2018	8407	XRP Community Comes Together for Blockchain Week
	5/15/2018	331	5/15/2018	8399	Growing Support for an XRP Symbol
	5/23/2018	333	5/23/2018	8398	Schwartz Rides Again: Tour de Schwartz EU
	7/31/2018	351	7/31/2018	7551	President Bill Clinton Keynotes Ripple's Swell Conference 2018
	7/31/2018	351	7/31/2018	8388	President Bill Clinton Keynotes Swell 2018
	9/7/2018	359	9/7/2018	8385	President Bill and Counting Crows Headline Swell 2018
	9/30/2018	366	9/30/2018	8379	Swell 2018 Kicks Off Tomorrow
	10/3/2018	373	10/3/2018	8372	Swell 2018: Wrapping Up a Historic Year for Ripple
	10/19/2018	376	10/19/2018	8369	Ripple Leadership Front and Center at Money20/20
	12/18/2018	390	12/18/2018	8357	Ask Me Anything with Brad Garlinghouse and Monica Long
	4/8/2019	410	4/8/2019	7672	World Changing Ideas 2019: All the winners, finalists, and honorable mentions
	4/16/2019	412	4/16/2019	7671	Blockchain 50: Billion Dollar Babies
	8/19/2019	422	8/19/2019	8344	A New Reality Unfolds: Announcing Swell 2019 Keynote Speakers
	9/4/2019	423	9/4/2019	7665	Top Startups To Work For In 2019 According To LinkedIn
	9/12/2019	424	9/12/2019	8343	Ambassador Chan Heng Chee to Highlight U.S.-China Politics and Geoeconomics at Swell 2019
	9/25/2019	425	9/25/2019	8342	DBS Group CEO Piyush Gupta to Discuss the Future of Digital Banking at Swell 2019
	10/4/2019	429	10/4/2019	8339	Academia, Take the Wheel: UBRI Enters Its Sophomore Year in High Gear
	10/16/2019	435	10/16/2019	8336	MoneyGram CEO to Highlight the Impact of Digital Assets and Blockchain Technology at Swell 2019
	2/19/2020	456	2/19/2020	7646	Forbes Blockchain 50
	4/28/2020	468	4/28/2020	7631	World Changing Ideas Awards 2020: Experimental Finalists and Honorable Mentions
	5/5/2020	471	5/5/2020	8313	Block Stars: How Digital Assets Will Help Create a Sustainable Global Economy
	5/29/2020	477	5/29/2020	7636	Meet the Most Influential Women in Bay Area Business 2020
	6/16/2020	481	6/16/2020	7635	DISRUPTOR 50 202028. Ripple
	7/29/2020	486	7/29/2020	7629	100 Best Workplaces for Innovators
	7/31/2020	488	7/31/2020	7628	Top Bay Area Corporate Philanthropists
	8/3/2020	490	8/3/2020	7627	Annual Inc5000 2020
	9/15/2020	494	9/15/2020	8302	The World Economic Forum's Sheila Warren Keynotes Ripple Swell Global 2020
	10/22/2020	505	10/22/2020	8295	Creating a More Inclusive Financial System With Crypto
Customer & Product	5/5/2014	1	5/5/2014	7598	Ripple Labs Announces Fidor Bank AG as First Bank to Use the Ripple Protocol
	6/12/2014	2	6/12/2014	7597	AstroPay Launches First Latin American Money Service Business on Ripple Protocol
	6/12/2014	2	6/13/2014	7935	Ripple LatAm Looks To Streamline Remittences and Cross-Border Payments
	7/21/2014	7	7/21/2014	7930	Ripple Labs Unveils Proposal for New Smart Contract System
	7/29/2014	9	7/29/2014	7596	Anyone Can Now Trade, Send and Spend Physical Gold Online via GBI's Ripple Gateway
	7/29/2014	9	7/30/2014	7926	You Can Now Use Ripple to Buy, Spend and Trade Gold
	7/29/2014	9	7/30/2014	7927	The Bitcoin Crowd Reaches Out to the Gold Bugs
	9/24/2014	11	9/24/2014	7594	Hundred-Year-Old CBW Bank One of the First U S. Banks to Integrate Ripple as Transformational Money Transfer Protocol
	9/24/2014	12	9/24/2014	7595	Cross River Bank to Integrate Ripple for Real-Time International Payments
	9/24/2014	13	9/24/2014	7923	Two US banks are ready to embrace the Ripple protocol, allowing instant global money transfers
	9/24/2014	13	9/24/2014	7924	Ripple Signs First Two U.S. Banks to Bitcoin-Inspired Payments Network
	9/24/2014	13	9/25/2014	7919	US Banks: Why We Embraced Ripple
	9/24/2014	13	9/25/2014	7925	Ripple Brings Real Time Payments To The U.S.
	10/27/2014	17	10/27/2014	7916	Ripple Ecosystem Expands with British Startup Ripula
	11/4/2014	21	11/4/2014	7912	Ripple protocol integrated into risk management system from Yantra
	12/3/2014	26	12/3/2014	7592	Earthport and Ripple Labs Announce Global Partnership to Improve the Efficiency and Speed of Cross-Border Payments
	12/3/2014	26	12/4/2014	7903	BitBeat: Ripple Partners With Global Payments Service Earthport
	12/3/2014	26	12/4/2014	7904	Ripple Labs, Earthport Cut Open Source Deal
	12/3/2014	26	12/4/2014	7905	Earthport and Ripple Bring Crypto Tech to Cross-Border Payments
	12/3/2014	26	12/4/2014	7906	Ripple to plug into Earthport payment network
	12/3/2014	26	12/4/2014	7907	Ripple Labs Partnership Brings Real-Time Transactions to Global Payments Hub
	4/29/2015	62	4/29/2015	8584	Milken Institute: Bringing Financial Inclusion to the Underserved
	4/29/2015	62	4/29/2015	7864	New Moves by Coinbase, Ripple Advance Digital Money Tech

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Customer & Product	4/29/2015	62	4/29/2015	7865	Western Union Will Give Ripple a Chance
	6/9/2015	77	6/9/2015	7853	Westpac, ANZ trial Ripple payments, but big four reluctant on bitcoin
	10/6/2015	97	10/6/2015	7579	New Ripple Settlement and FX Solutions Lower the Total Cost of Settlement for Banks and Their Customers
	10/13/2015	98	10/13/2015	7837	D+H adopts Ripple distributed ledger to reduce costs
	12/16/2015	112	12/16/2015	8558	Distributed Ledger Technology Offers Solutions for Trade Finance in Asia
	1/12/2016	119	1/12/2016	8554	Earthport Launches Distributed Ledger Hub
	4/12/2016	141	4/12/2016	7575	MIT Adopts Ripple Validator to Advance Consensus and Blockchain Research
	4/12/2016	141	4/12/2016	8535	MIT Running a Ripple Validator
	4/19/2016	143	4/19/2016	8533	Introducing CGI's Ripple-Enabled Intelligent Gateway
	5/26/2016	148	5/26/2016	8528	Santander Becomes the First U.K. Bank to Use Ripple for Cross-Border Payments
	5/26/2016	148	5/26/2016	7833	Santander first UK bank to do blockchain-based international payments using Ripple
	6/22/2016	154	6/22/2016	7574	More Financial Institutions Join Ripple's Global Network
	6/22/2016	154	6/22/2016	8523	Seven Leading Banks Join Ripple's Global Network
	6/22/2016	154	6/22/2016	7823	Banks trial Ripple blockchain to make money transfers 'like sending an iMessage'
	6/22/2016	154	6/22/2016	7825	Banks to use cutting-edge blockchain technology to speed up transactions
	6/22/2016	154	6/23/2016	7827	More Banks Are Trying Out Blockchains For Fund Transfers
	6/22/2016	154	7/2/2016	7828	Seven banks kick-off Ripple's blockchain network including Santander, UBS and UniCredit - '90 more in the pipeline'
	6/22/2016	154	6/22/2016	7822	Banks claim blockchain breakthrough in money transfer
	7/18/2016	159	7/18/2016	8520	Mizuho to Pilot Ripple for Cross-Border Payments
	8/16/2016	165	8/16/2016	8514	Multi-Signing in Ripple: A Q&A with David Schwartz
	8/19/2016	169	8/19/2016	8513	SBI Ripple Asia Announces Japanese Bank Consortium
	9/15/2016	171	9/15/2016	7572	Ripple Adds Several New Banks to Global Network
	9/15/2016	171	9/15/2016	8511	Several Globl Banks Join Ripple's Growing Network
	9/28/2016	177	9/28/2016	8506	Sibos Day 2: Standard Chartered and CGI Share News
	9/28/2016	177	9/28/2016	8505	Live from Sibos: Bankers Talk Ripple
	10/20/2016	185	10/20/2016	7570	R3 Trials Interbank Cross-Border Payments With Ripple's Digital Asset XRP
	10/20/2016	185	10/20/2016	8497	Ripple and R3 Team Up with 12 Banks to trial XRP for Cross-Border Payments
	10/20/2016	185	10/20/2016	7806	U S. start-up R3, banks test Ripple's cross-border payments technology
	10/20/2016	185	10/20/2016	7807	Ripple and R3 Achieve Breakthrough in Cross-Border Bank Payments
	11/16/2016	191	11/16/2016	8492	Ripple Announces An Upgrade to RippleCharts
	12/12/2016	197	12/12/2016	8486	FlashFX Uses Ripple and XRP
	1/9/2017	199	1/9/2017	7801	Axis Bank becomes third lender to offer block chain service
	2/15/2017	209	2/15/2017	8477	BitGo Builds Enterprise Wallet for XRP
	2/28/2017	212	2/28/2017	8474	Ripple Consensus Ledger Can Sustain 1000 Transactions per Second
	3/2/2017	213	3/1/2017	8473	Forty Seven Japanese Banks Move Towards Commercial Phase Using Ripple
	3/2/2017	213	3/1/2017	7797	Ripple takes money transfers to the cloud
	3/7/2017	214	3/7/2017	8472	Ripple Can Help Banks Evaluate Their Cross-Border Payment Costs
	3/17/2017	216	3/17/2017	8470	Ripple Selected to Participate in the Bank of England FinTech Accelerator
	3/31/2017	219	3/31/2017	8468	New Features Increase XRP Ledger Transaction Throughput to Same Level as Visa
	4/26/2017	222	4/26/2017	7568	Ten More Financial Institutions Join Ripple's Global Payments Network
	4/26/2017	222	4/26/2017	8465	Ten New Customers Join Ripple's Global Payment Network
	5/11/2017	224	5/11/2017	8464	How We Are Further Decentralizing the XRP Ledger to Bolster Robustness for Enterprise Use
	6/29/2017	229	6/29/2017	7566	SCB, Ripple Launch First Blockchain-Powered Payment Service Between Japan and Thailand
	6/29/2017	229	6/29/2017	8461	It's Now Faster and Easier to Send Money Between Japan and Thailand
	7/10/2017	230	7/10/2017	8459	Sumitomo Mitsui Banking Corporation and Japan Post Bank Join SBI Ripple Asia's Bank Consortium
	7/17/2017	232	7/17/2017	8458	XRP Ledger Decentralizes Further With Expansion to 55 Validator Nodes
	9/11/2017	241	9/11/2017	8450	SBI Ripple Asia partners with DAYLI Financial Group to bring Ripple to South Korea
	10/10/2017	244	10/10/2017	7565	Ripple's Blockchain Network Is Now More Than 100 Strong
	10/10/2017	244	10/10/2017	8447	RippleNet Grows to More Than 100 Financial Institutions
	11/16/2017	252	11/16/2017	7564	American Express Introduces Blockchain-enabled, Cross-border Payments
	11/16/2017	252	11/16/2017	8438	American Express Joins RippleNet - Giving Visibility and Speed to Global Commercial Payments
	11/22/2017	255	11/22/2017	8436	Ripple-powered Instant Payment Services Now Live with Axis Bank, RAKBANK, and Standard Chartered

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Customer & Product	11/22/2017	255	11/22/2017	7790	Standard Chartered, Axis Launch Payments Service With Ripple Tech
	12/5/2017	258	12/5/2017	8434	Japan Bank Consortium Moves to Become Production-ready
	12/12/2017	261	12/14/2017	8431	Top Korean Banks Work with Japan Banks Consortium to Modernize Cross-border Payments
	1/11/2018	284	1/11/2018	7562	Ripple and MoneyGram Partner to Modernize Payments
	1/11/2018	284	1/11/2018	8422	MoneyGram to Use XRP for Faster International Payments
	1/11/2018	284	1/11/2018	7768	MoneyGram shares jump on partnership with bitcoin rival Ripple
	1/11/2018	284	1/11/2018	7769	MoneyGram Signs Deal to Work With Currency Startup Ripple
	1/11/2018	284	1/11/2018	7770	Ripple surges after news of deal with MoneyGram
	1/11/2018	284	1/14/2018	7767	MoneyGram teams up with cryptocurrency Ripple on ‘payment flow’ project
	1/24/2018	290	1/24/2018	8420	More Global Payment Providers, IDT and MercuryFX, Sign Up to Use XRP
	1/24/2018	290	1/24/2018	7763	Ripple Adds New Partners in Push to Make Case for XRP
	1/29/2018	292	1/29/2018	7760	MoneyGram CEO Plans Waves With Ripple
	2/7/2018	296	2/7/2018	7561	Ripple Partners with LianLian International to Power Instant Payments to China
	2/7/2018	296	2/7/2018	8418	LianLian International Joins RippleNet to Provide Faster Payments into China
	2/7/2018	296	2/7/2018	7758	Ripple Blockchain Network Adds China Payments Provider
	2/8/2018	297	2/10/2018	7560	UAE Exchange Partners with Ripple for Instant Cross-Border Payments
	2/8/2018	297	2/11/2018	7757	Ripple Signs International Payment Deal with Foreign Exchange Giant UAE Exchange
	2/8/2018	297	2/12/2018	7755	UAE Remittance Firm Partners With DLT Startup Ripple
	2/8/2018	297	2/12/2018	7756	UAE Exchange Partners With Ripple
	2/13/2018	299	2/13/2018	7752	Western Union Says It's Testing Transactions With Ripple
	2/13/2018	299	2/14/2018	7751	Western Union says it's testing transactions using Ripple technology
	2/13/2018	299	2/14/2018	7753	Western Union Is Testing Ripple and XRP for Money Transfers
	2/14/2018	300	2/14/2018	7559	Ripple and Saudi Arabian Monetary Authority (SAMA) Offer Pilot Program for Saudi Banks
	2/14/2018	300	2/14/2018	8417	Ripple and Saudi Arabian Monetary Authority (SAMA) Offer Pilot Program for Saudi Banks
	2/14/2018	300	2/14/2018	7754	Saudi Central Bank to Test Ripple Payments Tech
	2/14/2018	300	2/15/2018	7749	Saudi Arabia's central bank signs blockchain deal with Ripple
	2/21/2018	302	2/21/2018	7558	Ripple Extends its Reach into Emerging Markets With Five New Customers
	2/21/2018	302	2/21/2018	8416	RippleNet Strengthens Emerging Markets Access into India, Brazil and China
	2/21/2018	302	2/21/2018	7745	Ripple Adds 5 New Clients Across 4 Countries
	2/21/2018	302	2/21/2018	7746	Ripple Adds Top Latin America Bank to Its Cash-Transfer Network
	2/21/2018	303	2/21/2018	7747	Ripple Papers Pledge New Start for $40 Billion XRP
	3/1/2018	305	3/1/2018	7557	FLEETCOR & Ripple Team Up to Modernize Payments Using Blockchain
	3/1/2018	305	3/1/2018	8414	Cambridge to Use XRP for Faster Global Payments
	3/1/2018	305	3/1/2018	7744	Payment Provider Fleetcor to Pilot Ripple’s XRP Cryptocurrency
	3/6/2018	308	3/6/2018	8413	Ripple Powered Mobile App to Provide On-Demand Domestic Payments in Japan
	3/6/2018	308	3/7/2018	7739	Japanese Banks to Harness Ripple DLT for Consumer Payments App
	3/6/2018	308	3/7/2018	7741	Ripple Develops Blockchain Payments App With 61 Japanese Banks
	3/6/2018	308	3/7/2018	7742	Ripple develops blockchain-powered payment app with 61 banks to speed up transactions in Japan
	3/24/2018	314	3/24/2018	7734	Santander is set to launch an international money transfer app with Ripple
	4/12/2018	319	4/12/2018	8408	Santander Launches First Mobile App for Global Payments Using Ripple's xCurrent
	4/12/2018	319	4/12/2018	7721	Blockchain dreams do come true: A big Spanish bank’s customers can now use it to transfer money
	4/12/2018	319	4/12/2018	7723	Santander launches a blockchain-based foreign exchange service that uses Ripple’s technology
	4/12/2018	319	4/12/2018	7722	Santander launches blockchain-based foreign exchange service
	4/26/2018	324	4/26/2018	7554	Ripple Grows Its Global Payments Network With Five New xVia Customers
	4/26/2018	324	4/26/2018	8404	xVia Opens New Doors in Emerging Markets
	5/7/2018	327	5/8/2018	8403	Korea's Coinone Transfer Joins RippleNet
	5/7/2018	327	5/9/2018	7717	Crypto Exchange Coinone Taps Ripple for New Remittance Service
	5/14/2018	329	5/14/2018	8400	Mitsubishi Corporation, Krungsri and Standard Chartered Pilot Payments from Thailand to Singapore on RippleNet
	5/26/2018	335	5/31/2018	7709	Money Transfer Firms Join Ripple’s Payment Network
	6/27/2018	344	6/27/2018	8394	Ripple Improves Access to India with Kotah Mahindra Bank
	9/5/2018	358	9/5/2018	7692	TransferGo Opens Payments Corridor to India Using Ripple Tech
	9/13/2018	361	9/13/2018	8384	National Commercial Bank of Saudi Arabia Joins RippleNet

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Customer & Product	9/19/2018	362	9/19/2018	7548	PNC Treasury Management Joins RippleNet
	9/19/2018	362	9/19/2018	8382	PNC Bank Embraces Blockchain and Join RippleNet
	9/19/2018	363	9/19/2018	8383	RippleNet Now Reaches 40 Countries Improving Remittances and SME Payments
	9/19/2018	362	9/19/2018	7690	Blockchain startup Ripple signs up PNC as a customer for its payment tech
	9/28/2018	365	9/28/2018	8380	Siam Commercial Bank Drives Pioneers RippleNet's "Multi-hop" Feature
	10/1/2018	367	10/1/2018	7546	Ripple Highlights Record Year, xRapid Now Commercially Available
	10/1/2018	367	10/1/2018	8378	Ripple Highlights Record Year, xRapid Now Commercially Available
	10/1/2018	367	10/1/2018	7684	Ripple says 3 clients are putting xRapid into full commercial use
	10/1/2018	367	10/1/2018	7685	Ripple is Real, as Global Money Transfers Fueled by XRP Go Live Today
	10/1/2018	367	10/1/2018	7686	Startup Ripple signs up payments firms for crypto-based platform
	10/1/2018	367	10/1/2018	7687	Ripple Debuts XRP-Based Cryptocurrency Product for International Payments
	10/1/2018	367	10/1/2018	7688	Ripple's cryptocurrency product goes live for the first time with three financial firms
	11/14/2018	384	11/14/2018	7545	CIMB Group Joins RippleNet to Power Instant Payments Across ASEAN
	11/14/2018	384	11/14/2018	8362	CIMB Group Joins RippleNet to Power Instant Payments Across ASEAN
	12/13/2018	389	12/13/2018	7682	Finablr's UAE Exchange, Ripple to begin blockchain payments by first quarter
	1/8/2019	392	1/8/2019	8355	RippleNet Surpasses 200 Customers Worldwide
	1/8/2019	394	1/8/2019	7680	Could Ripple's XRP replace correspondent banks? This bank says yes
	1/8/2019	392	1/9/2019	7544	RippleNet Reaches Milestone, Surpasses 200 Customers
	10/9/2019	431	10/9/2019	7537	Ripple to Bring Blockchain Technology to Finastra's Banking Customers
	10/9/2019	431	10/9/2019	8338	Ripple to Bring Blockchain Technology to Finastra's Banking Customers
	10/9/2019	431	10/16/2019	7658	Finastra taps Ripple for real-time payments across borders
	11/6/2019	441	11/6/2019	7535	Ripple Announces More Than 300 Customers, RippleNet Growth
	11/6/2019	441	11/6/2019	8332	RippleNet Growth: Announcing More Than 300 Customers
	11/6/2019	441	11/6/2019	7654	Ripple Surpasses 300 Customers As Swell 2019 Kicks Off In Singapore
	12/10/2019	445	12/10/2019	7651	Xpring Releases New XRP Tools, XRPL 1.4.0 Released
	1/21/2020	450	1/21/2020	8328	How Blockchain and Crypto Meet Growing SME Demand
	2/4/2020	453	2/4/2020	8325	Enabling Faster Cross-Border Payments Between the U.S. and Mexico
	2/25/2020	457	2/25/2020	7534	Ripple on Full-Scale to Tap into South Korean Market
	2/25/2020	457	2/25/2020	8322	Sentbe, Hanpass, WireBarley and More Leverage RippleNet to Improve Remittances in Korea
	2/26/2020	458	2/26/2020	7533	Azimo and Ripple Partner to Deliver Faster, Cheaper Payments to the Philippines
	2/26/2020	458	2/26/2020	8321	Azimo Uses On-Demand Liquidity for Faster International Payments Into the Philippines
	2/26/2020	458	2/26/2020	7645	Ripple claims a big win in the elusive quest to use cryptocurrency in banking
	3/19/2020	460	3/18/2020	7532	DeeMoney Partners with Ripple to Power Faster and Cheaper Cross-Border Money Transfers
	4/27/2020	467	4/27/2020	7531	SCB Partners with Ripple Extending SCB Global Payment Strategy
	6/15/2020	480	6/15/2020	7530	RippleNet Cloud Reaches New Milestone, Signs First Bank Customer
	6/15/2020	480	6/15/2020	8308	Banco Rendimento Runs on RippleNet Cloud
	10/6/2020	498	10/6/2020	7528	Lemonway Joins RippleNet to Power Instant, Cost-Effective Euro-to-Euro Payments
	10/6/2020	498	10/6/2020	8299	Lemonway Leverages RippleNet To Unlock Faster Euro-To-Euro Payments
Litigation	5/5/2015	66	5/6/2015	7862	What Ripple's Fincen Fine Means for the Digital Currency Industry
	9/10/2018	360	9/10/2018	7549	Ripple and R3 Reach Settlement
	4/21/2020	466	4/21/2020	8316	Enough Is Enough: It's Time to Protect the Community
	4/21/2020	466	4/21/2020	7640	Ripple sues YouTube over cryptocurrency scams
	4/21/2020	466	4/21/2020	7641	Covid Scammers Are Taking Advantage of Big Tech Platforms, Says Ripple CEO
Market Commentary & Company Overview	6/13/2014	3	6/13/2014	7934	Cryptocurrency News Round-Up: Bitcoin Auction, Dogecoin Hacked & Ripple Swells
	7/9/2014	6	7/9/2014	7932	30 Innovators to Watch: Key Executives Shaping the Industry in 2014
	7/14/2014	5	7/14/2014	7931	Cross Border Remittance Ripe for Startups as Bank Abandon Business
	7/22/2014	8	7/22/2014	7929	Bitcoin for the Underbanked
	7/29/2014	10	7/29/2014	7928	BankThink Bank Payment Systems Still Operate Like CompuServe and AOL
	9/27/2014	14	9/27/2014	7922	The Internet's Missing Link
	10/22/2014	16	10/22/2014	7917	Apple's Mobile Buzz Impacts Bitcoin, but Regs Still Unclear

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Market Commentary & Company Overview	10/28/2014	18	10/28/2014	7915	When We Don't Own Who We Are
	11/3/2014	19	11/3/2014	7913	Money20/20 Day 1: Regulators, Finance Giants Forecast Bitcoin's Future
	11/3/2014	20	11/3/2014	7914	Ripple Labs CEO looks to revolutionise online payments
	11/20/2014	23	11/20/2014	7910	Why banks fear Bitcoin
	11/24/2014	24	11/24/2014	7909	Susan Athey On How Digital Currency Could Transform Our Lives
	12/2/2014	25	12/2/2014	7908	MasterCard Seeks 'Level Playing Field' for Bitcoin Regulation
	12/10/2014	27	12/10/2014	7902	Bitcoin for Rockstars
	12/21/2014	29	12/21/2014	7900	Why Bitcoin's Erratic Price Doesn't Matter
	12/29/2014	31	12/29/2014	7898	Rethink Identity So Personal Data Can Stay Personal
	1/6/2015	32	1/6/2015	7896	Block Chain 2.0: The Renaissance of Money
	1/8/2015	33	1/8/2015	7895	The magic of mining
	1/13/2015	34	1/13/2015	7894	There's a blockchain for that!
	1/14/2015	35	1/14/2015	7893	Did we solve a payments problem that no longer exists?
	1/18/2015	36	1/18/2015	7892	Federal Reserve Bank VP: We're a Protocol Just Like Bitcoin
	1/21/2015	38	1/21/2015	7887	Bill Gates on Mobile Banking, Connecting the World and AI
	1/21/2015	38	1/22/2015	7884	Bill Gates: Bitcoin Alone Won't Solve Global Payments Challenges
	1/22/2015	39	1/22/2015	7885	5 ways digital currencies will change the world
	1/26/2015	40	1/26/2015	7883	The Fed Has a Vision for Faster Payments; Does It Have the Will?
	1/29/2015	41	1/29/2015	7882	Fed's Payments Leaders Show Interest in Cryptocurrency, Privacy Tech
	2/11/2015	44	2/11/2015	7880	The Fed's Unexpectedly Bold Payments Idea
	2/16/2015	46	2/16/2015	7879	Policy Experts Talk Transparency in Bitcoin at Foreign Affairs Event
	2/23/2015	47	2/23/2015	7876	Digital-Only German Bank to Enter U.S. Market, Court Millennials
	2/25/2015	48	2/25/2015	7878	Heads and Tails: How Can Cryptocurrencies Enable Legal Cross-Border Money Transfers?
	3/3/2015	49	3/3/2015	7874	Welcome to the Internet of Value
	3/3/2015	50	3/3/2015	7875	Cryptocurrency Technology Set to Shake Up Correspondent Banking
	3/11/2015	52	3/11/2015	7873	Goldman Sachs Report Says Bitcoin Could Shape 'Future of Finance'
	3/15/2015	53	3/15/2015	7872	Coolest Brands 2015: Ripple Labs
	4/7/2015	57	4/7/2015	7870	Banks Can Cherry-Pick the Best Bits from Bitcoin: Report
	4/8/2015	58	4/8/2015	7868	What's missing from Facebook's digital payments plan
	4/15/2015	59	4/15/2015	8586	Ripple Labs and Aite Group Host Webinar on Global Payments
	5/1/2015	64	5/1/2015	8582	CGAP: Why an Open Payments Infrastructure Matters for Financial Inclusion
	5/1/2015	64	5/1/2015	7859	The 'Ripple' Effect: Why an Open Payments Infrastructure Matters
	5/7/2015	67	5/7/2015	7860	The next big thing
	5/13/2015	68	5/13/2015	7858	EBAday: banks still best placed for payments
	5/14/2015	70	5/14/2015	8581	European Banking Association Emphasizes Promise of Distributed Ledgers
	5/14/2015	69	5/14/2015	7857	Blockchain manoeuvres: applying Bitcoin's technology to banking
	5/19/2015	72	5/20/2015	8579	NACHA Banks Approve Same-Day Settlement in U S.
	5/29/2015	73	5/28/2015	8578	McKinsey: Why Banks Should Invest in Payments Infrastructure
	6/2/2015	75	6/2/2015	8577	Gates Foundation: Lessons Learned About Payments Systems
	6/4/2015	76	6/4/2015	8576	Daily Fintech: Real-time Payments is a Game-changer
	6/16/2015	79	6/16/2015	8574	Santander: Distributed Ledger Tech Could Save Banks $20 Billion a Year
	6/19/2015	80	6/19/2015	7849	The Sea Change Ripple Labs Sees For FinTech
	6/19/2015	81	6/19/2015	7851	RBS pledges to boost resilience spend after latest IT failure
	7/2/2015	82	7/2/2015	8573	World Economic Forum Report: The Rise of Non-Traditional Payment Systems
	7/6/2015	83	7/6/2015	7850	Ravi Menon: A smart financial centre
	7/13/2015	84	7/13/2015	7848	FinTech: Will Blockchain Enable Better Banking?
	7/20/2015	85	7/20/2015	8572	McKinsey: New Partnership Models in Transaction Banking
	7/23/2015	86	7/23/2015	7847	BankThink Ripple's Overlooked Path to Decentralization
	8/1/2015	88	8/1/2015	7844	Ripple Labs: Opening Access to Finance
	8/3/2015	89	8/3/2015	7845	Ripple's Chris Larsen adds up savings for banks using distributed ledgers
	8/5/2015	90	8/5/2015	7842	49 Technology Pioneers to watch in 2015
	8/7/2015	91	8/7/2015	7843	Ripple Labs: smoothing the path to better payments

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Market Commentary & Company Overview	8/13/2015	92	8/13/2015	7841	Ripple well-placed for global adoption
	8/27/2015	93	8/27/2015	7840	Internet of Value: New Protocol Could Usher in Real-time Payments
	9/3/2015	95	9/3/2015	7839	Why we need a common standard for moving e-money
	9/22/2015	96	9/22/2015	8570	WEF Report: Distributed Financial Technology Goes Mainstream by 2027
	10/26/2015	100	10/26/2015	8569	BIS Describes Peak Correspondent Banking
	10/29/2015	101	10/29/2015	8568	Needham Report: Welcome to the Internet of Value
	10/30/2015	102	10/30/2015	8567	McKinsey: The Powerful Forces Reshaping the Payments Landscape
	11/2/2015	103	11/2/2015	8566	Money 20/20: How Banks Can Leverage Distributed Financial Technology
	11/5/2015	104	11/5/2015	8565	Blockchain Investment By Financial Institutions in One Chart
	11/10/2015	105	11/10/2015	8564	Correspondent Banking's Steady Decline
	11/12/2015	106	11/12/2015	8562	What the Blockchain Means for Banks
	11/12/2015	107	11/12/2015	8563	Financial Inclusion Can Generate $380 Billion in Revenues for Banks
	11/19/2015	108	11/19/2015	8561	Why Banks Are Abandoning Traditional Cross-Border Paymnets in One Chart
	12/3/2015	109	12/3/2015	8560	Accenture Report: APAC Fintech Investments Signal Major Opportunity in Payments
	12/11/2015	111	12/11/2015	8559	Capgemini: Blockchain Tech Can Transform Global Financial Network
	12/17/2015	113	12/17/2015	7829	Ripple chief Chris Larsen: Sorting out payments will aid innovation in securities settlements
	1/4/2016	115	1/4/2016	8556	Every Business is a Payments Business
	1/6/2016	116	1/6/2016	8555	Wired: A Global Standard for Payments
	1/6/2016	117	1/6/2016	7836	The Plan to Unite Bitcoin With All Other Online Currencies
	1/12/2016	118	1/12/2016	7835	Blockchains Poised To Be The Hot Tech For Moving Money In 2016
	1/14/2016	120	1/14/2016	8553	Mike Hearn: Bitcoin Has Failed
	1/20/2016	122	1/20/2016	8551	IMF at Davos: Distributed Ledger Technology is Extremely Beneficial
	1/20/2016	123	1/20/2016	8552	Vermont Realizes They Don't Need the Blockchain
	1/22/2016	124	1/22/2016	8550	Chris Larsen at Davos: The Merging of the Web, the Physical Web and the Value Web
	1/25/2016	125	1/25/2016	8549	New DTCC White Paper Gets Real About Blockchain Hype
	1/27/2016	126	1/26/2016	8548	Highlights from the World Economic Forum 2016
	1/28/2016	128	1/28/2016	8547	Bank of England: How Our Modern Payment System Began at a Bar
	2/2/2016	129	2/2/2016	8544	Fed Releases Faster Payments Progress Report
	2/12/2016	131	2/12/2016	8543	The Block Chain Conference 2016: Highlights
	2/16/2016	132	2/16/2016	8542	Accenture on Ethics: Banks Could Boost Earnings by $500 Million a Year
	2/23/2016	134	2/23/2016	8540	Ripple and XRP Can Cut Banks' Global Settlement Costs Up to 60 Percent
	3/11/2016	136	3/11/2016	8538	White & Case: the Blockchain Revolution in Financial Services
	4/7/2016	139	4/7/2016	7834	Ripple Aims to Put Every Transaction on One Ledger
	5/6/2016	145	5/6/2016	8531	Highlights from Consensus 2016
	5/10/2016	146	5/10/2016	8530	ECB Weighs in on Distributed Ledger Tech
	5/23/2016	147	5/23/2016	8529	Interledger: Beyond Blockchain
	6/2/2016	149	6/2/2016	7832	Meet the Real Bank of Mom and Dad
	6/14/2016	151	6/14/2016	8526	Japan Explores the Future of Blockchain
	6/16/2016	152	6/16/2016	8525	Goldman Sachs: Blockchain Billions
	6/27/2016	156	6/27/2016	7821	These are the 5 Hottest Companies in Fintech
	7/11/2016	157	7/11/2016	8522	Citi Reseach: Blockchain Tech Could Remake Payments Infrastructure
	7/20/2016	160	7/20/2016	8519	Bain: Distributed Ledger Tech Will Make Winners and Losers in Banking
	8/8/2016	162	8/8/2016	8517	Credit Suisse: Solving the Problems of Cross-Border Payments
	8/9/2016	163	8/9/2016	8516	SEPA in the Age of Real-Time Payments
	8/15/2016	164	8/15/2016	8515	WEF: Distributed Ledgers Are the Foundation of New Financial Infrastructure
	8/18/2016	166	8/18/2016	7818	Man Who Introduced Millions to Bitcoin Says Blockchain Is a Bust
	8/19/2016	167	8/19/2016	7816	Google and Apple like Ripple's Interledger Protocol for interoperability - and because it's not Visa
	8/19/2016	168	8/19/2016	7817	Overseas remittances' costs to reduce with new system
	9/15/2016	172	9/15/2016	7814	It Might Take Longer Than You Think For The Future Of Banking To Arrive
	9/21/2016	173	9/21/2016	8510	Chris Larsen on the Internet of Value
	10/5/2016	178	10/5/2016	8504	Three Key Takeaways from the Capgemini World Payments Report
	10/6/2016	179	10/6/2016	8503	Clearing Away the Debris With Distributed Ledger Technology

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	10/14/2016	182	10/14/2016	8500	McKinsey Report: By 2020, Payments Will Generate $400 Billion More Per Year
	10/18/2016	184	10/18/2016	8498	Bank of England: Scaling Real-Time Gross Settlement
	11/10/2016	188	11/10/2016	8494	Keep Calm and Blockchain On
	11/14/2016	190	11/14/2016	8493	BNY Mellon: Reinventing Payments
	11/14/2016	189	11/14/2016	7802	Where Finance and Technology Come Together
	11/22/2016	192	11/22/2016	8491	KPMG: Future Bright for Next-Generation Payment Solutions
	11/28/2016	193	11/28/2016	8490	Santander and Reisebank Both Recognized for Innovation
	12/6/2016	195	12/6/2016	8488	Fed Distributed Ledger Tech Report Singles Out Interledger
	12/7/2016	196	12/7/2016	8487	McKinsey: Corporates Need Faster Payments, Too
	12/14/2016	198	12/14/2016	8485	Key Strengths of Distributed Ledger Tech from the Hong Kong Monetary Authority
	1/9/2017	200	1/9/2017	8484	Three Forces Shaping Payments: BCG Global Report
	1/12/2017	202	1/12/2017	8482	SWIFT GPI Part 3: the Empire Strikes Back
	1/13/2017	203	1/13/2017	8481	XRPに関する６つの迷信 (English translation follows)
	1/27/2017	205	1/27/2017	7799	Will Tech Titans Enter Payment Industry?
	2/6/2017	207	2/6/2017	8478	BAFT Europe Bank to Bank Highlights
	2/15/2017	208	2/15/2017	7798	Why Blockchain and Asia are A Perfect Match
	3/9/2017	215	3/9/2017	8471	Discussing Trends in Global Payments at the GCC Financial Forum
	3/20/2017	217	3/20/2017	7796	Sending Money Overseas to Get Faster Once Banks Pick a Winner
	5/4/2017	223	5/4/2017	7795	Financial technology is proving less of a battleground than feared
	6/14/2017	228	6/14/2017	7792	Inside Ripple's plan to make money move as fast as information
	7/31/2017	235	7/31/2017	8455	Ripple's Product Suite is Growing
	10/6/2017	243	10/6/2017	8448	10 Things You Need to Know About XRP
	10/17/2017	247	10/17/2017	8443	Swell Day 1: A former Fed Chair Speaks, The Practical Applications of Digital Assets, Blockchain and More
	10/18/2017	248	10/18/2017	8442	Swell Day 2: Words of Wisdom from the Inventor of the Web and Industry Leaders Discuss Which Blockchain Should Rule Them All
	10/26/2017	250	10/26/2017	8440	Top 3 Takeaways From Swell
	11/13/2017	251	11/13/2017	8439	Ripple Hosts World's Central Banks to Explore Next Generation of Payments
	11/17/2017	253	11/17/2017	7787	Ripple boss predicts central bank adoption of blockchain
	11/17/2017	253	11/17/2017	7791	Why the CEO behind one of the largest cryptocurrencies left AOL and Yahoo for blockchain
	12/5/2017	257	12/5/2017	7788	What will next year bring for cryptocurrencies? Ask our banking editor and Daniel Aranda, managing director for Europe at Ripple.
	12/7/2017	260	12/7/2017	8433	Internet of Value Depends on Interoperability, Not Blockchain Alone
	12/21/2017	267	12/21/2017	8427	Happy 5th Anniversary, XRP Ledger!
	12/22/2017	265	12/21/2017	7785	Bitcoin Is So 2017 as Ripple Soars at Year End: Chart
	12/26/2017	269	12/26/2017	7784	The Death of the ICO (And 4 Other 2018 Predictions)
	12/28/2017	270	12/28/2017	8424	The Most Popular Ripple Insights Posts of 2017
	12/28/2017	271	12/28/2017	7783	What is ripple, and what is XRP?
	12/29/2017	273	12/29/2017	7781	What the heck is Ripple? A brief look at the hottest cryptocurrency of the moment.
	12/29/2017	272	12/29/2017	7780	Ripple cryptocurrency surges as Japanese groups agree to use it
	12/30/2017	274	12/30/2017	7782	Digital currency ripple soars nearly 56 percent, becomes second-largest cryptocurrency by market cap
	12/31/2017	275	12/31/2017	7779	Ripple: cryptocurrency enjoys end-of-year surge – but will it endure?
	1/1/2018	276	1/1/2018	7777	Here are the top 10 cryptoassets of 2017 (and bitcoin's 1,000% rise doesn't even make the list)
	1/2/2018	277	1/2/2018	7776	These 3 Cryptos Have A Bigger Market Cap Than Exxon
	1/3/2018	278	1/3/2018	7775	Bitcoin May be King, but Ripple Dark Horse in Crypto Race
	1/4/2018	279	1/4/2018	7774	Cryptocurrency boom: Why everyone is talking about ripple
	1/5/2018	280	1/5/2018	7773	Ripple Steals Bitcoin's Thunder, Surges 1,135% in a Month
	1/9/2018	281	1/9/2018	8423	Who Really Cares About Real-time Payments?
	1/10/2018	283	1/10/2018	7772	Ripple, the Company behind Cryptocurrency XRP, is betting big on Asia
	1/10/2018	282	1/10/2018	7771	Ripple's XRP is the Hot New Cryptocurrency - Here's How You Buy It
	1/11/2018	285	1/11/2018	7778	Looking To Start A Blockchain Business? Ripple Founder Chris Larsen Has One Piece Of Advice
	1/16/2018	286	1/16/2018	7765	Ripple is sitting on close to $80 billion and could cash out hundreds of millions per month — but it isn't
	1/18/2018	288	1/18/2018	8421	Top 9 Frequently Asked Questions About Ripple and XRP
	1/20/2018	289	1/20/2018	7764	Ripple Founder Chris Larsen Talks About The Many Use Cases For Blockchain

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	2/13/2018	298	2/13/2018	7750	Ripple CEO Favors More Regulation of the Crypto Market
	2/16/2018	301	2/16/2018	7748	Is it Ripple or Bitcoin Bringing Life To Cryptos?
	3/4/2018	307	3/4/2018	7743	How XRP Fits Into Ripple's Payments Products Explained
	3/7/2018	309	3/7/2018	7737	Ripple CEO Brad Garlinghouse on Fast Money
	3/7/2018	309	3/7/2018	7738	Ripple CEO tells cryptocurrency industry to 'work with the regulators'
	3/7/2018	310	3/7/2018	7740	Data Sheet—How Ripple Wants to Enhance, Not Kill, the Global Payments System
	4/25/2018	322	4/25/2018	8405	Ask Me Anything with Brad and Cory
	4/27/2018	325	4/27/2018	7719	7 Facts You Might Not Know About Ripple
	5/4/2018	326	5/4/2018	7718	The battle for the remittances market
	5/30/2018	334	5/30/2018	7710	Bitcoin's influence over cryptocurrency prices could end soon, says Ripple CEO
	5/30/2018	334	5/30/2018	7711	Momentum for Ripple continues to build: Ripple CEO
	6/4/2018	337	6/4/2018	7703	Brad Garlinghouse explains the difference between Ripple and XRP
	6/5/2018	340	6/5/2018	8396	Ripple CEO at Money20/20 Europe: Blockchain Hype Outpaces Reality
	6/5/2018	338	6/5/2018	7704	Bitcoin is not the 'panacea' people thought it would be, Ripple CEO says
	6/5/2018	339	6/5/2018	7705	Ripple and Swift slug it out over cross-border payments
	6/7/2018	341	6/7/2018	8395	American Express and Ripple at Money20/20 Europe: Changing the Cross-Border Payments Experience for SMEs
	6/18/2018	342	6/18/2018	7702	Everything you need to know about the blockchain
	7/13/2018	347	7/13/2018	8391	Ask Me Anything with David Schwartz and Asheesh Birla
	7/26/2018	349	7/26/2018	7698	Bitcoin is slow when you talk about moving money: Cory Johnson
	8/15/2018	352	8/15/2018	7696	Ripple 'definitely' wants to target China with its blockchain-based payments tech, exec says
	8/16/2018	354	8/16/2018	7695	Ripple's CTO invented a distributed computer system 20 years before blockchain – ask him about it
	8/22/2018	355	8/22/2018	8386	Ask Me Anything with Brad and Cory
	8/29/2018	356	8/29/2018	7693	Ripple's Chris Larsen: The Richest Person In Cryptocurrency
	9/5/2018	357	9/5/2018	7691	Ripple's Trillion-Dollar Man
	10/1/2018	369	10/1/2018	8377	CEO Brad Garlinghouse Talks Internet of Value and Customer Traction at Swell 2018
	10/2/2018	371	10/2/2018	8374	Swell 2018: Report Finds Tipping Point for Mass Adoption of Blockchain Is Near
	10/2/2018	372	10/2/2018	8375	Global Regulatory Policies Took Center Stage On Day One of Swell 2018
	10/11/2018	374	10/11/2018	8371	Crypto Regulation Around the World
	10/23/2018	377	10/23/2018	8368	David Schwartz Makes the Case for Blockchain in Payments at Money20/20 USA
	10/24/2018	378	10/24/2018	8367	Chris Larsen Reflects on Disruption, Regulation and the Internet of Value at Money20/20
	10/29/2018	380	10/29/2018	8365	The Ripple Drop - Episode 6
	11/7/2018	381	11/7/2018	8364	The 800 Pound Gorilla: Digital Asset Adoption
	11/12/2018	382	11/12/2018	8363	Blockchain and Digital Asset Use in ASEAN: CEO Brad Garlinghouse in Convo with IMF's Ross Leckow at Singapore Fintech Festival
	11/13/2018	383	11/13/2018	7683	Ripple Is Aiming to Overtake Swift Banking Network, CEO Says
	11/30/2018	387	11/30/2018	8359	The Ripple Drop - Episode 7
	12/26/2018	391	12/26/2018	8356	The Ripple Drop - Episode 8
	1/8/2019	393	1/8/2019	7681	Ripple wants a piece of the global payment system while it fights a cryptocurrency 'holy war'
	1/17/2019	395	1/17/2019	8354	A Global Look at the Future of Blockchain and Fintech Innovation
	1/30/2019	399	1/30/2019	7678	Ripple CEO: Decentralized payment systems are likely to win
	1/31/2019	400	1/31/2019	8352	The Ripple Drop - Episode 9
	2/8/2019	404	2/8/2019	8350	What's on the Regulatory Horizon for Digital Assets in the E.U.?
	2/28/2019	405	2/28/2019	8349	The Ripple Drop - Episode 10
	3/26/2019	408	3/26/2019	8347	Southeast Asia's Perfect Payments Storm
	3/28/2019	409	3/28/2019	8346	The Ripple Drop: Episode 11
	5/20/2019	415	5/20/2019	7670	Ripple CEO Brad Garlinghouse explains why big banks should get into cryptocurrencies
	5/30/2019	416	5/30/2019	7669	Ripple courting banks, paytech and big fintech to beat Swift to emerging markets
	7/29/2019	419	7/29/2019	7667	Ripple's Senior VP on the U S. Senate Cryptocurrency Hearing
	8/7/2019	421	8/7/2019	7666	The current state of crypto regulation is hurting US companies
	10/7/2019	430	10/7/2019	7662	Ripple CEO Not Bullish on Facebook's Ability to Launch Libra Cryptocurrency
	10/8/2019	434	10/14/2019	7661	Brad Garlinghouse, CEO of Ripple: One on One with the Man Running Ripple and XRP
	10/10/2019	432	10/10/2019	7660	Altcoins: Ahead of Libra, XRP cryptocurrency gains toehold in commerce

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[1]	[2]	[3]	[4]	[5]	[6]
Market Commentary & Company Overview	10/20/2019	437	10/20/2019	7657	XRP Is Up 30% On September As Bitcoin Flatlines—Ripple Sees It Going Even Higher
	10/23/2019	439	10/23/2019	7656	Ripple CEO: Facebook has a 'trust deficit'
	11/5/2019	440	11/5/2019	8333	Blockchain in Payments Report 2019: Flywheel Set in Motion
	11/6/2019	442	11/6/2019	7655	Ripple CEO Expects Volatility in Cryptocurrencies to Continue
	12/10/2019	446	12/10/2019	7652	Selling Blockchain To Enterprises: How Ripple And Others Make Money
	1/5/2020	449	1/5/2020	7649	Cross-border transactions key to connecting a fragmented region | Opinion
	3/27/2020	463	3/27/2020	7643	"XRP is Not Centralized": Ripple SVP Addresses Crypto Community Criticism
	5/7/2020	472	5/7/2020	7638	The financial world's nervous system is being rewired
	5/16/2020	474	5/16/2020	7632	Navigating payments: emerging markets, COVID-19 and M&As
	6/18/2020	483	6/18/2020	8307	Policy Framework for Digital Assets in India
	6/20/2020	484	6/20/2020	7633	Ripple suggests a regulatory framework to keep India from banning cryptocurrencies — yet again
	7/28/2020	485	7/28/2020	7630	The Ripple Story: CTO David Schwartz on the Founding, Ledger & XRP
	7/30/2020	487	7/30/2020	8305	How the U S. Can Pave the Way for Global Digital Asset Regulation - And Why It Should
	8/21/2020	491	8/21/2020	7626	The tech cold war is here — and the US isn't winning
	9/11/2020	493	9/11/2020	7624	Your Next Bank Will Be a Tech Giant
	10/1/2020	496	10/1/2020	7622	Blockchain Management Styles At 3 Systemically Important Financial Institutions Show A Diversity Of Strategies
	10/5/2020	497	10/5/2020	8300	Ripple's Mission in Action
	10/14/2020	501	10/14/2020	7619	'China is well ahead' of every country on global financial infrastructure: Ripple CEO
	10/15/2020	502	10/15/2020	8296	Blockchain in Payments Report 2020: From Adoption To Growth
	10/21/2020	504	10/21/2020	7618	Pandemic Put Tailwind Behind Crypto Markets: Ripple Labs
	11/13/2020	510	11/13/2020	7614	Brad Garlinghouse explains how regulatory uncertainty around XRP has affected Ripple
	11/19/2020	511	11/19/2020	7613	Bitcoin bulls and bears: Tech execs discuss what's in store for cryptocurrency
	12/2/2020	512	12/2/2020	7612	Ripple CEO on what's driving cryptocurrency
Markets Report	4/18/2017	221	4/18/2017	8466	Q1 2017 XRP Markets Report
	7/20/2017	233	7/20/2017	8457	Q2 2017 XRP Markets Report
	10/19/2017	249	10/19/2017	8441	Q3 2017 XRP Markets Report
	4/25/2018	323	4/25/2018	8406	Q1 2018 XRP Markets Report
	7/24/2018	348	7/24/2018	8390	Q2 2018 XRP Markets Report
	10/25/2018	379	10/25/2018	8366	Q3 2018 XRP Markets Report
	1/24/2019	397	1/24/2019	8353	Q4 2018 XRP Markets Report
	4/24/2019	413	4/24/2019	8345	Q1 2019 XRP Markets Report
	10/18/2019	436	10/18/2019	8335	Q3 2019 XRP Markets Report
	1/22/2020	451	1/22/2020	8327	Q4 2019 XRP Markets Report
	4/30/2020	470	4/30/2020	8314	Q1 2020 XRP Markets Report
	8/3/2020	489	8/3/2020	8304	Q2 2020 XRP Markets Report
	11/5/2020	509	11/5/2020	8294	Q3 2020 XRP Markets Report
Milestone	5/18/2015	71	5/18/2015	7585	Ripple Labs Closes $28 Million Series A Funding Round
	5/18/2015	71	5/18/2015	8580	Ripple Labs Raises $28 Million From IDG Capital Partners, CME Group, Seagate, and Others
	5/18/2015	71	5/19/2015	7855	Ripple Labs Closes $28 Million in Funding
	5/18/2015	71	5/19/2015	7856	BitBeat: NYSE Launches Bitcoin Index, Ripples Gets $28 Million
	10/6/2015	99	10/6/2015	7580	Ripple Adds Santander InnoVentures Fund as Series A Investor
	10/6/2015	99	10/6/2015	7838	Ripple Gets $4M From Santander Arm, Inks Partnership With Accenture
	10/6/2015	99	10/22/2015	7831	Santander plans to become 'Ripple evangelist'
	1/29/2016	127	1/28/2016	7578	Ripple Strikes Multi-National Deal with SBI Holdings to Meet Growing Demand for Ripple Solutions Across Asia
	1/29/2016	127	1/28/2016	8546	Ripple's Deal With Japanese Multinational Opens Door for Rapid Asian Expansion
	6/13/2016	150	6/13/2016	8527	Ripple Receives New York's First BitLicense for an Institutional Use Case of Digital Assets
	6/13/2016	150	6/13/2016	7824	Ripple Wins BitLicense from New York Regulator
	9/15/2016	170	9/15/2016	7573	Ripple Raises $55 Million in Series B Funding
	9/15/2016	170	9/15/2016	8512	Ripple Raises $55 Million in Series B Funding
	9/15/2016	170	9/15/2016	7809	Fintech Firm Ripple Gets $55 Million In Funding

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Milestone	9/15/2016	170	9/15/2016	7810	Blockchain payments startup Ripple raises $55 million
	9/15/2016	170	9/15/2016	7811	Ripple Just Raised $55 Million and Signed on These Major Bank Partners
	9/15/2016	170	9/15/2016	7812	StanChart invests in blockchain startup Ripple
	9/15/2016	170	9/15/2016	7813	Google-backed blockchain start-up Ripple raises $55 million from big banks
	9/15/2016	170	9/15/2016	7815	Ripple Raises $55 Million, Adds Seven More Banks to Its Network
	5/16/2017	225	5/16/2017	8463	Ripple to Place 55 Billion XRP in Escrow to Ensure Certainty of Total XRP Supply
	5/26/2017	227	5/26/2017	7793	Bitcoin rival Ripple is suddenly sitting on billions of dollars worth of cryptocurrency
	12/8/2017	259	12/7/2017	8432	Ripple Escrows 55 Billion XRP for Supply Predictability
	12/20/2019	448	12/20/2019	8329	Ripple Caps Record Year With $200 Million Series C Funding
	12/20/2019	448	12/20/2019	7650	Ripple Raises $200 Million as Part of Bid for XRP Adoption
Miscellaneous	11/17/2014	22	11/17/2014	7911	RBS embraces crypto-currencies in hackathon challenge
	11/28/2017	256	11/28/2017	8435	TechCrunch Founder Michael Arrington Launches $100M Crypto Fund with XRP
	11/28/2017	256	11/28/2017	7789	Michael Arrington Has a New $100 Million Hedge Fund That Will Be Valued in Ripple's XRP
	6/27/2018	343	6/27/2018	7701	Coinbase CEO Launches Crypto Charity Fund, Aims to Raise $1 Billion
	10/6/2020	499	10/6/2020	7621	Ripple threatens to leave U S. over crypto regulation
	10/23/2020	506	10/23/2020	7617	$10 billion crypto firm Ripple considers relocating to London over U.S. regulation
Office & Staff	1/20/2015	37	1/20/2015	7591	Former Chief White House Advisor Gene Sperling Joins Ripple Labs Board of Directors
	1/20/2015	37	1/20/2015	7890	Ripple Labs Names Former Obama Advisor to Board of Directors
	1/20/2015	37	1/20/2015	7891	Ripple Labs appoints ex-White House advisor Gene Sperling to board of directors
	1/20/2015	37	1/21/2015	7888	Transition: Sperling Joins Ripple Labs Board
	1/20/2015	37	1/20/2015	7889	Bitcoin company Coinbase lands $75m investment from NYSE and BBVA
	3/18/2015	54	3/18/2015	7588	Ripple Labs Names Former State Department Official Anja Manuel as Advisor
	4/6/2015	56	4/6/2015	7587	Ripple Labs Expands to Asia Pacific to Serve Regional Demand for Ripple's Real-Time Settlement Protocol
	4/6/2015	56	4/8/2015	7869	Asia-Pacific's Heating Up for U.S. Payment Expansion Plays
	4/16/2015	60	4/16/2015	7586	Brad Garlinghouse Joins Ripple Labs as Company's First Chief Operating Officer
	4/16/2015	60	4/16/2015	7866	Ripple Labs Hires Brad Garlinghouse As Its COO
	4/16/2015	60	4/16/2015	7867	Garlinghouse, Former Yahoo Executive, Joins Startup Ripple Labs
	6/1/2015	74	6/1/2015	7584	Ripple Labs Names Donald Donahue as Advisor
	6/1/2015	74	6/1/2015	7854	Ripple Labs names former DTCC boss Donahue as an advisor
	7/29/2015	87	7/29/2015	7583	Ripple Labs Names Michael S. Barr as Advisor
	7/29/2015	87	7/29/2015	7846	Ripple Labs names Michael Barr as advisor
	8/31/2015	94	8/31/2015	7581	Bret Allenbach Joins Ripple Labs as Chief Financial Officer
	3/21/2016	138	3/21/2016	7577	Ripple Continues Global Growth With New London Office to Serve European Bank Demand
	4/11/2016	140	4/11/2016	7576	HSBC Executive and SWIFT Board Member Joins Ripple to Support Continued Global Growth
	4/11/2016	140	4/11/2016	8536	HSBC Executive and SWIFT Board Member Joins Ripple
	6/20/2016	153	6/20/2016	8524	Ripple Continues Global Growth with New Luxembourg Office to Support Protocol Neutrality
	11/1/2016	187	11/1/2016	7569	Amid High Growth, Ripple's Chris Larsen Appoints Brad Garlinghouse Chief Executive Officer
	11/1/2016	187	11/1/2016	8495	A New Chapter for Ripple
	11/1/2016	187	11/1/2016	7804	Bitcoin-Technology Pioneer Chris Larsen to Step Down as Ripple CEO
	11/1/2016	187	11/1/2016	7805	Brad Garlinghouse takes over as CEO of payments startup Ripple
	11/30/2016	194	11/30/2016	8489	CME Group Executives Miguel Vias Joins Ripple
	2/23/2017	211	2/23/2017	8475	Ripple Welcomes Ken Kurson to its Board of Directors
	4/12/2017	220	4/12/2017	8467	Ripple Hires Former Business Director at SWIFT gpi Marjan Delatinne
	8/25/2017	238	8/25/2017	8453	Former State Department Official Anja Manuel Joins Ripple's Board of Directors
	9/5/2017	240	9/5/2017	8451	Ripple Launches New Mumbai Office to Serve India's Digital Economy
	9/25/2017	242	9/25/2017	8449	Ripple Supports Singapore's Fintech Hub Aspirations With New Office
	11/21/2017	254	11/21/2017	7563	Ripple Appoints Former New York State Superintendent of Financial Services Benjamin Lawsky to Its Board and Ron Will as CFO
	11/21/2017	254	11/21/2017	8437	Ripple Welcomes New Board Member Benjamin Lawsky
	12/19/2017	264	12/19/2017	8429	Zoe Cruz Joins Ripple's Board of Directors
	3/8/2018	311	3/8/2018	7736	Ripple hires Bloomberg TV's Cory Johnson as chief market strategist

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Office & Staff	3/17/2018	312	3/17/2018	7735	Ripple's new chief market strategist: Crypto regulation will 'separate the wheat from the chaff'
	7/11/2018	346	7/11/2018	8392	Ripple Welcomes Kahina Van Dyke as Senior Vice President in Business and Corporate Development
	7/11/2018	346	7/11/2018	8393	Two Big Changes to Our Leadership Team
	7/11/2018	346	7/11/2018	7699	Ripple Hires Facebook Payments Exec and Names New CTO
	1/30/2019	398	1/30/2019	7543	Stuart Alderoty Joins Ripple as General Counsel
	1/30/2019	398	1/30/2019	7677	Ripple Hires General Counsel from Lending Giant CIT Group
	4/8/2019	411	4/8/2019	7673	Ripple aims to make a splash in Asia with expansion of Singapore office
	4/25/2019	414	4/25/2019	7541	Yoshitaka Kitao Joins Ripple Board of Directors
	6/11/2019	417	6/11/2019	7540	Provider of Solutions for Global Payments from Silicon Valley Officially Launches Operations in Brazil
	10/22/2019	438	10/22/2019	7536	Craig Phillips Joins Ripple Board of Directors
	10/22/2019	438	10/22/2019	8334	Ripple Expands Global Regulatory Team in D.C. and Joins the Blockchain Association
	3/18/2020	461	3/18/2020	7644	Ripple Taps Senior Exec for Regional Expansion
	12/15/2020	513	12/14/2020	8293	Ripple Adds Sandie O'Connor To Board of Directors
	12/15/2020	513	12/15/2020	7527	Ripple Adds Sandie O'Connor to Board of Directors
	12/15/2020	513	12/15/2020	7611	Ripple Board Lands JPMorgan Veteran and Regulatory Expert Sandie O'Connor
Other Initiatives	2/10/2015	43	2/10/2015	8588	Ripple Labs joins the Center for Financial Services Innovation
	2/12/2015	45	2/12/2015	7589	Ripple Labs Joins W3C Web Payment Interest Group to Help Set Standards for the Value Web
	3/4/2015	51	3/4/2015	8587	Ripple Labs Joins International Payments Framework Association
	6/15/2015	78	6/15/2015	8575	Ripple Labs Elected to Fed Steering Committee for Faster Payments
	6/15/2015	78	6/19/2015	7852	Ripple Labs' Ryan Zagone Joins Fed's Faster Payment Task Force
	1/30/2018	294	1/30/2018	7759	SBI Ripple Asia Forms Consortium to Bring DLT to Securities
	3/28/2018	316	3/28/2018	7733	Ripple Joins Hyperledger Blockchain Consortium
	6/4/2018	336	6/4/2018	7552	Ripple Announces $50M University Blockchain Research Initiative
	6/4/2018	336	6/4/2018	8397	Ripple Introduces the University Blockchain Research Initiative
	6/4/2018	336	6/4/2018	7706	Ripple Pumps $50 Million Into Academic Research on Blockchain
	6/4/2018	336	6/4/2018	7707	Why Classes on Cryptocurrency, Blockchain, and Bitcoin Are About to Boom at Colleges
	6/4/2018	336	6/4/2018	7708	Crypto start-up Ripple donates $50 million to top universities to boost blockchain adoption
	1/23/2019	396	1/23/2019	7679	Ripple Partners With Chinese University for Blockchain Research Program
	2/7/2019	403	2/7/2019	8351	University Blockchain Research Initiative Expands Global Footprint with 11 New Partners
	2/7/2019	403	2/8/2019	7542	Ripple Announces New University Blockchain Research Initiative Partners, Expands to China and Singapore
	7/30/2019	420	7/30/2019	7538	Ripple Expands University Blockchain Research Initiative Program to Japan, Supports 33 University Partners Across 14 Countries
	6/10/2020	479	6/10/2020	8309	ISO 20022: Shaping the Future of Cross-Border Payments
	6/18/2020	482	6/18/2020	8306	Why Ripple Supports PayString
	6/18/2020	482	6/18/2020	7634	Ripple launches PayID allowing users to send digital payments across different platforms
	8/26/2020	492	8/26/2020	8303	UBRI Expands To New Global Markets With More Than 35 University Partners
	9/30/2020	495	9/30/2020	7529	Ripple Leads Sustainability Agenda to Achieve Carbon Neutrality By 2030
	9/30/2020	495	9/30/2020	8301	Leading the Way on Global Crypto and FinTech Sustainability
	9/30/2020	495	9/30/2020	7623	Energy Web Is Starting With Ripple in Its Bid to Make Crypto Provably Green
	11/2/2020	508	11/2/2020	7615	Cryptocurrency's carbon footprint is massive and not sustainable
Ripple Commercialization Initiatives	9/23/2016	174	9/23/2016	7571	Major Banks Launch Global Payments Steering Group
	9/23/2016	174	9/23/2016	8509	Announcing Ripple's Global Payments Steering Group
	3/30/2017	218	3/30/2017	8469	MUFG Joins Ripple's Global Payments Steering Group
	10/13/2017	245	10/13/2017	8446	Ripple Rolls Out $300M RippleNet Accelerator Program to Grow Volume and XRP Utility
	12/19/2017	263	12/19/2017	8428	Exploring Innovation in Payment System Infrastructures
	12/19/2017	263	12/21/2017	7786	Ripple Ramps Up Focus On Blockchain Infrastructure
	5/14/2018	330	5/14/2018	8401	Welcome to Xpring
	5/14/2018	330	5/14/2018	7714	Ripple is going after startups to build an ecosystem around the XRP cryptocurrency
	5/14/2018	330	5/24/2018	7712	Ripple's Xpring Isn't Quite a Venture Fund—It's More
	10/2/2019	428	10/2/2019	8340	Announcing the Next Chapter of Xpring, Ripple's Developer Platform
	10/2/2019	428	10/2/2019	7663	Ripple's Xpring Releases Technology To Bring XRP To The Internet

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Ripple Commercialization Initiatives	10/8/2020	500	10/8/2020	8298	Fund Instant Cross-Border Payments With a Line of Credit From RippleNet
	10/8/2020	500	10/8/2020	7620	Ripple Enters Lending With XRP Credit Lines to Fund Global Payments
Trading Platforms	2/29/2016	135	2/29/2016	8539	Ripple Partners with Crypto Facilities for XRP Derivatives
	10/9/2016	181	10/10/2016	8501	Ripple Announces XRP Futures Trading on Crypto Facilities
	10/27/2016	186	10/27/2016	8496	Coincheck Lists XRP on Its Digital Asset Exchange
	1/10/2017	201	1/10/2017	8483	Bitstamp Now Trading XRP with 0% Fees
	1/10/2017	201	1/10/2017	7800	Bitstamp adds Ripple currency XRP to trading platform
	2/16/2017	210	2/16/2017	8476	XRP/BTC Now Available on Bitstamp
	5/18/2017	226	5/18/2017	7567	XRP Liquidity to Increase With Listings on Six New Exchanges
	5/18/2017	226	5/18/2017	8462	XRP Liquidity to Deepen with Listings on Six New Exchanges
	8/31/2017	239	8/31/2017	8452	It's Never Been Easier to Access and Store XRP
	12/21/2017	266	12/21/2017	8426	XRP Now Available on 50 Exchanges Worldwide
	1/30/2018	295	1/30/2018	8419	SBI Virtual Currencies to Exclusively List XRP at Launch
	3/28/2018	317	3/28/2018	7731	Ripple's XRP now available from US-based crypto bank Uphold
	3/28/2018	317	3/29/2018	8410	XRP Ecosystem Grows with New Listing on Uphold
	8/16/2018	353	8/16/2018	7550	xRapid Brings on Three New Exchange Partners
	8/16/2018	353	8/16/2018	8387	xRapid Brings on Three New Exchange Partners
	8/16/2018	353	8/16/2018	7694	Ripple Endorses 'Preferred' Crypto Exchanges for XRP Payments
	2/12/2020	455	2/12/2020	8323	BRD Supports XRP and Launches Enterprise Expansion

Notes:
[1]: Assigned news classification.
[2]: Identification number assigned to event.
[3]: Date assigned to event in UTC time.
[4]: Identification number assigned to document.
[5]: Document date of publication expressed in local time.
[6]: Headline of document.

APPENDIX D

ADDITIONAL DETAILS OF THE ANALYTICAL METHODOLOGY

1. In this Appendix I provide additional details on certain aspects of the analytical methodology. I begin with a detailed primer on event studies in general, and then proceed to discuss my method for dating the events identified in my news sources.

A. THE EVENT STUDY METHODOLOGY

2. An event study is conducted by first specifying a model of *expected* price movements and then testing the extent to which *actual* price movements differ from those expectations. The key question an event study answers is whether the differences between actual and expected price movements are sufficiently large that, from a statistical standpoint, such differences are unlikely to be explained by randomness. In this context, "randomness" refers to the tendency for *actual* outcomes (in this case, the actual price movement) to deviate from the *expected* outcomes in ways which appear random in nature. Below is a simple example to illustrate these ideas.

3. Suppose that Company X flips a coin 100 times each day, and the stock return of Company X is equal to the percentage of times the coin comes up Heads. Suppose that we know that the coin is fair, meaning there is a 50/50 chance of getting Heads. This means we expect to record 50 Heads out of 100 flips. However, in practice, we will not always record 50. Some days we will record a few more, and some days a few less. The *actual* outcomes will often differ from the *expected* outcome in any particular case (though, by definition, not "on average").

4. Figure 1 below presents some simulated data of this process: 100 random flips each day for 120 days, each flip having a 50% chance of generating a "Head." In this set of simulated data, the average number of Heads per day is 49.95. However, only 10 out of the 120 days resulted in an outcome of exactly 50 Heads. Statisticians have a well-developed understanding of this problem and use what are called "confidence intervals" to describe the likelihoods of different outcomes. Figure 1 plots the expected number of Heads (50) and the statistical 95% confidence interval (indicated by the dotted lines). The "95% confidence interval" means that there is only a 5% chance (based on pure randomness) of observing an outcome which is outside the interval. Figure 1 shows that 95% of the time the number of Heads will range between 40 and 60, and only 5% of the time will it be less than 40 or more than 60, *if the coin is fair*. In other words, "random variation" can account for approximately 95 percent of outcomes ranging from 40 to 60 Heads from Company X flipping a fair coin 100 times.

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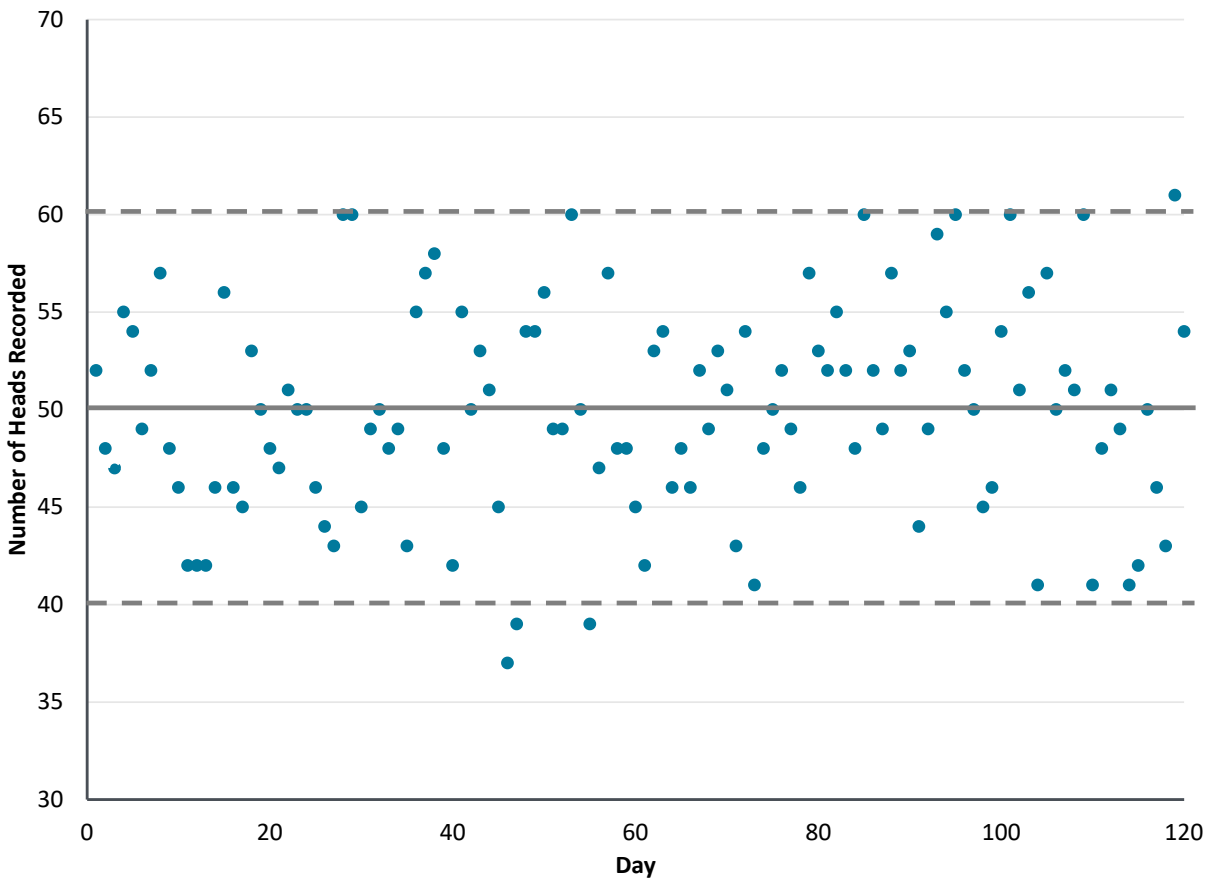
FIGURE 1: DISTRIBUTION OF REPORTED HEADS WITH 95% CONFIDENCE INTERVAL
(Expected Value = 50, 100 Tosses)



5. Now suppose that tomorrow, Company X will purchase a new coin which might (or might not) be a fair coin. If tomorrow we record 42, or 58, or 47, or indeed any number of Heads between 40 and 60, we would not regard such an outcome as unusual for flipping a fair coin. In other words, we could not reject the hypothesis that Company X was still using a fair coin in order to generate returns.

6. But what if instead we record 65 Heads? That represents a deviation of 15 away from our expectation of 50 and is well outside the "95% confidence interval." Statistically we can say that the likelihood of observing an *actual* outcome which is 15 or more away from our expected outcome is less than 0.5% (i.e., this would occur approximately once in 300 days).[1] While such an outcome is not impossible from a fair coin, we can say that it is highly unlikely. Instead, it is more likely that the weight of the coin has changed. Suppose further that we find news reports indicating that Company X was hoping to purchase a heavier coin designed to produce more Heads. This qualitative information, combined with our statistical observation, suggests that the outcome of 65 Heads was most likely caused by a new coin that is not a fair coin. This is the basic logic applied in an event study methodology.

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[1] The cumulative probability of observing 65 or more Heads or 35 or fewer Heads across 100 tosses of a fair coin is 0.35%, which is approximately equal to 1/300 = 0.33%.

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7. Returning to the matter at hand, I specify several models of expected XRP price movements and then test the extent to which actual price movements differ from those expectations. A well-accepted method for performing such a statistical analysis is to estimate a regression model over some period of time (an "estimation window") to quantify the typical relationship between the market price of the relevant instrument on the one hand and explanatory factors (often other market prices) on the other.

8. I consider several regression models using data from the prior 180 trading days (roughly six months) up to four days prior to the date of interest.[2] In each model, I regress the XRP return on a set of explanatory factors. As an example, one of the models (Model 7) I consider may be written as ("**Equation 1**"):

$$XRP_t = \alpha + \beta_1 BTC_t + \beta_2 ETH_t + \beta_3 XLM_t + \varepsilon_t$$

9. Here, XRP_t is the XRP return on date *t*, BTC_t, ETH_t, XLM_t are the return on Bitcoin, Ether, and Lumens on date *t*, respectively, α is the average difference, and ε_t is the random factor on date *t*.[3]

10. In the framework above, the estimation window (i.e., the 180-day window used to estimate the regression) will change with different dates of interest. This is typically referred to as a "rolling estimation window" (since the estimation window is "rolled forward" for each subsequent date of interest and the length of the estimation window remains the same). By using a rolling estimation window, I allow for the relationship between the XRP prices and the explanatory factors, as well as the volatility of the random factor, ε_t, to change over time. Use of a rolling model to account for changing volatility and evolving relationships among factors is well accepted in practice and peer-reviewed literature.[4]

11. I then use the model to estimate the expected XRP return on each date, and measure the corresponding unexpected or abnormal return, i.e., the difference between the actual XRP return and the expected XRP return predicted by the model. The estimates from the regression model are also used to form a measure of the "statistical significance" of that abnormal return.

12. For example, the return on XRP on May 17, 2018 (a day selected at random) is -6.8%. My analysis examines whether this return is statistically significantly different from expectations where "expectations" are based on the model I described above. Applying the model yields an expected (or "predicted") return of -5.7% for XRP for May 17, 2018.[5] The excess or abnormal return is then calculated as the difference between the actual return and the predicted return, which equates to -1.1%.

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[2] A. Craig MacKinlay, "Event Studies in Economics and Finance," Journal of Economic Literature Vol. 35, 1997, pp. 13-39 at p. 15: "For example, in an event study using daily data and the market model, the market model parameters could be estimated over the 120 days prior to the event." For traditional securities, 120 trading days corresponds to about six calendar months, or about 180 trading days for a digital token such as XRP which trades every day.

[3] Following standard practice, I calculate the return to any instrument on date *t* as the difference in log prices of dates *t* and *t* – 1.

[4] Phillip A. Braun, Daniel B. Nelson, & Alain M. Sunier, "Good News, Bad News, Volatility, and Betas," *The Journal of Finance* Vol. 50 (5), 1995, pp. 1575-1603 at pp. 1575, 1597.

[5] The returns on BTC, ETH, and XLM on the same day are -3.3%, -5.0%, and -6.5% respectively. The predicted return is found as follows: -5.7% = -0.14 * -3.34% (Coefficient on BTC *times* BTC return) + 0.56 * -4.99% (Coefficient on ETH *times* ETH return) + 0.49 * -6.54% (Coefficient on XLM *times* XLM return) - 0.15% (constant term from regression).

APPENDIX D

13. To test whether an abnormal return value of -1.1% falls within a statistically defined confidence interval, or whether it is statistically unusual, I need a measure of the statistical variation of the abnormal return. The test for whether randomness alone can account for an abnormal return of -1.1%, or whether some other factor not currently controlled for in the regression likely contributed to such a return, is often based on what is known as the "t-statistic." The t-statistic is the value of the abnormal return divided by its standard deviation and represents the number of standard deviations between the actual return and the predicted return. Under fairly general conditions, one would expect that 95% of the time, a value drawn at random would fall within +/-1.96 standard deviations of its expected value, or that 95% of the time, the value would be less than +1.6649 standard deviations of its expected value.[6] Values further away become statistically unlikely if the underlying model of the data remains valid. Returning to the coin-flipping example, it's similar to saying that an outcome of 65 Heads is unlikely *if Company X is continuing to flip a fair coin*. Instead, it becomes more likely that some other factor, outside the model is, is driving the abnormal return that day (e.g., Company X has purchased a new coin that is not a fair coin).

14. In this example of the XRP return on May 17, 2018, an abnormal return of -1.1% is within the range of "typical" values; its t-statistic is just -0.13. In other words, there is no statistical evidence to suggest that anything beyond the usual random variation is affecting XRP returns on May 17, 2018.

15. The regression methodology I apply in this matter thus provides a scientific basis to test whether the actual XRP returns will fall within a reasonable distance of the predicted return unless there is some non-random explanation. Such a non-random explanation could be the influence of company-specific news revealed to the market on the event day.

B. IDENTIFYING THE DATE OF THE NEWS

16. The universe of documents comprised of Ripple Press Releases, Insight Articles, and Newsroom Articles identifies a set of events. To incorporate an event into my event study, it is necessary to assign a Coordinated Universal Time ("UTC") date to that event since my data on digital token prices are measured in UTC-defined days.

17. For example, for a Ripple press release dated January 1 PT, it is possible that its UTC date is January 2. To account for time zone differences, I may review the published time indicated in the html code of the web page presenting the document if my statistical conclusions would be sensitive to such a difference.

18. It is also possible that a party other than Ripple, or a party other than the source Ripple linked to in its Newsroom, reported the news of the event earlier than my source would indicate. In some cases I conduct a broader search including Factiva, LexisNexis, and internet searches to determine if the event was reported earlier through some other news channel. I also consider the time stamps on related Tweets issued by the official Ripple account. I date an event by the earliest day I am aware of that the information was released to the market.

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[6] This is the case when data are distributed according the Gaussian or "Normal" distribution. The cutoff point of 1.96 is known as the "critical value" for a "two-sided" test. The critical value of the t-test may be adjusted from 1.96 if there is reason to believe the abnormal returns are not Normally distributed, or if a different level of significance is sought, or if a one-sided test is appropriate. The critical value of 1.6449 corresponds to the 5% one-sided test.

Significance of Correlation Between XRP Price Increases and Announcements: Milestone Events

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.00***	0.00***	0.01***	5.70*
2	0.01***	0.04***	0.82***	4.52**
3	0.02***	0.06***	0.01***	0.05***
4	0.19***	0.42***	0.07***	0.04***
5	0.02***	0.06***	0.01***	0.16***
6	0.26***	0.74***	0.12***	0.08***
7	0.01***	0.05***	0.00***	0.00***
8	0.21***	0.77***	0.10***	0.06***
9	0.02***	0.00***	0.01***	0.69***
10	0.23***	0.06***	0.05***	0.51***
11	0.00***	0.00***	0.00***	0.60***
12	0.22***	0.55***	0.82***	0.64***
13	0.02***	0.05***	0.01***	0.07***
14	0.24***	0.60***	0.08***	0.06***
15	0.02***	0.06***	0.01***	0.19***
16	0.38***	0.91***	2.57**	2.57**
17	0.02***	0.05***	0.00***	0.00***
18	0.32***	1.00**	0.12***	2.57**
19	0.02***	0.00***	0.00***	0.00***
20	0.02***	0.07***	0.08***	0.07***

Notes:

Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements: Milestone Events Excluding Escrow Events

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.07***	0.14***	0.46***	3.26**
2	0.05***	0.11***	0.32***	2.57**
3	1.12**	1.96**	0.55***	0.27***
4	0.78***	1.40**	0.36***	0.23***
5	1.99**	3.13**	1.21**	0.89***
6	1.26**	2.55**	0.74***	0.57***
7	1.48**	3.09**	0.83***	0.66***
8	1.10**	2.62**	0.64***	0.47***
9	1.14**	0.20***	0.46***	3.71**
10	0.89***	0.16***	0.30***	3.04**
11	0.08***	0.16***	0.40***	0.23***
12	0.05***	0.14***	0.32***	0.25***
13	1.06**	1.84**	0.49***	0.35***
14	0.92***	1.81**	0.40***	0.31***
15	1.90**	3.13**	1.11**	1.01**
16	1.62**	2.93**	0.83***	0.83***
17	1.68**	2.89**	0.74***	0.85***
18	1.45**	3.13**	0.76***	0.83***
19	1.06**	0.18***	0.41***	0.33***
20	0.07***	0.20***	0.39***	0.36***

Notes:

Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements: New Trading Platform Listings

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.13***	0.26***	0.32***	0.17***
2	0.60***	1.32**	0.16***	0.09***
3	0.14***	0.40***	0.47***	0.19***
4	0.58***	1.39**	0.21***	0.14***
5	0.14***	0.38***	3.35**	2.30**
6	0.51***	1.70**	1.82**	1.31**
7	0.67***	0.37***	2.02**	1.58**
8	0.40***	1.79**	1.47**	0.97***
9	1.00**	0.40***	0.30***	0.18***
10	0.65***	1.83**	0.14***	0.11***
11	0.15***	0.34***	0.28***	0.18***
12	0.09***	0.26***	0.01***	0.01***
13	0.13***	0.35***	0.39***	0.32***
14	0.09***	0.31***	0.02***	0.02***
15	1.00**	0.38***	3.00**	2.68**
16	0.09***	0.33***	0.23***	0.23***
17	0.84***	2.10**	0.20***	0.26***
18	0.07***	0.38***	0.02***	0.02***
19	0.12***	0.33***	0.30***	0.22***
20	0.12***	0.37***	0.02***	0.02***

Notes:

Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements: New Trading Platform Listings Indicating Ripple Action

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.07***	0.12***	0.39***	0.24***
2	0.65***	1.21**	0.23***	0.15***
3	0.07***	0.18***	0.54***	0.27***
4	0.63***	1.27**	0.29***	0.20***
5	0.07***	0.17***	5.71*	4.39**
6	0.57***	1.49**	3.75**	2.98**
7	0.71***	0.17***	4.02**	3.39**
8	0.48***	1.55**	3.22**	2.43**
9	0.97***	0.18***	0.38***	0.26***
10	0.69***	1.58**	0.21***	0.17***
11	0.07***	0.15***	0.36***	0.25***
12	0.05***	0.12***	0.01***	0.01***
13	0.07***	0.16***	0.46***	0.39***
14	0.05***	0.14***	0.02***	0.01***
15	0.97***	0.17***	5.29*	4.88**
16	0.05***	0.15***	0.31***	0.31***
17	0.84***	1.77**	0.28***	0.33***
18	0.04***	0.17***	0.01***	0.01***
19	0.06***	0.15***	0.38***	0.30***
20	0.06***	0.17***	0.02***	0.01***

Notes:

Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements: Customers & Product Developments (Select)

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	1.77**	1.19**	8.26*	3.04**
2	0.31***	0.35***	5.14*	0.61***
3	2.52**	0.17***	3.14**	9.64*
4	3.13**	1.28**	0.57***	3.61**
5	0.50***	0.85***	0.24***	0.05***
6	0.07***	0.11***	0.01***	0.01***
7	0.15***	0.28***	0.25***	0.34***
8	0.06***	0.48***	0.02***	0.10***
9	1.28**	0.09***	2.05**	2.02**
10	1.59**	0.17***	0.41***	1.45**
11	0.83***	0.71***	7.27*	1.45**
12	0.15***	0.07***	2.20**	1.38**
13	2.20**	1.98**	2.60**	2.61**
14	3.94**	0.96***	0.76***	5.14*
15	0.40***	0.35***	0.17***	0.07***
16	0.20***	0.09***	0.01***	0.03***
17	1.96**	0.23***	0.21***	0.06***
18	0.48***	0.37***	0.05***	0.04***
19	2.12**	0.99***	1.89**	6.81*
20	0.83***	0.61***	0.63***	3.20**

Notes:

Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements: Customer & Product Developments (All)

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	3.43**	2.56**	12.39	4.88**
2	0.70***	0.34***	7.97*	1.11**
3	4.75**	0.49***	5.41*	13.84
4	5.60*	2.74**	1.13**	5.73*
5	1.09**	1.90**	0.51***	0.12***
6	0.17***	0.30***	0.02***	0.02***
7	0.34***	0.71***	0.51***	0.65***
8	0.14***	0.42***	0.06***	0.20***
9	2.64**	0.29***	3.64**	3.44**
10	3.09**	0.49***	0.84***	2.53**
11	1.77**	1.66**	11.02	2.53**
12	0.37***	0.21***	3.74**	2.41**
13	4.19**	4.09**	4.55**	4.39**
14	6.92*	2.17**	1.50**	7.97*
15	0.89***	0.86***	0.37***	0.16***
16	0.47***	0.25***	0.03***	0.08***
17	3.61**	0.58***	0.44***	0.13***
18	1.00**	0.35***	0.12***	0.10***
19	4.05**	2.25**	3.37**	10.36
20	1.77**	1.50**	1.25**	5.31*

Notes:

Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements: Ripple Commercialization Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	1.68**	2.74**	0.60***	0.43***
2	8.45*	12.84	4.20**	3.37**
3	1.91**	3.41**	1.02**	0.43***
4	9.46*	13.82	6.06*	4.09**
5	2.07**	3.47**	1.10**	0.66***
6	8.59*	14.99	5.81*	4.20**
7	1.34**	3.36**	6.44*	5.21*
8	8.17*	15.83	32.34	27.79
9	1.83**	3.52**	0.70***	5.57*
10	10.05	15.83	31.65	29.92
11	1.87**	3.41**	0.56***	0.43***
12	1.31**	2.69**	4.42**	4.64**
13	1.87**	3.09**	0.91***	0.60***
14	1.57**	3.04**	0.75***	0.53***
15	1.91**	3.41**	0.96***	0.72***
16	10.80	17.39	6.06*	5.69*
17	1.57**	3.09**	6.06*	6.44*
18	10.05	18.27	35.01	34.68
19	1.72**	3.14**	0.70***	0.54***
20	1.75**	3.41**	0.66***	0.56***

Notes:

Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements: Other Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	70.83	77.24	58.49	100.00
2	67.16	75.26	54.40	100.00
3	71.90	78.58	100.00	100.00
4	68.58	75.08	59.39	100.00
5	100.00	100.00	100.00	100.00
6	100.00	100.00	100.00	100.00
7	100.00	100.00	100.00	100.00
8	100.00	100.00	100.00	100.00
9	72.93	79.69	100.00	100.00
10	70.17	78.58	100.00	100.00
11	71.90	79.22	57.27	100.00
12	30.53	77.75	54.40	100.00
13	71.69	43.32	100.00	100.00
14	32.88	43.56	100.00	100.00
15	100.00	100.00	100.00	100.00
16	100.00	100.00	100.00	100.00
17	100.00	100.00	100.00	100.00
18	100.00	67.94	100.00	100.00
19	100.00	79.22	100.00	100.00
20	100.00	19.23	100.00	100.00

Notes:

Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements: New Office & Staff

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	22.32	55.90	53.58	42.25
2	64.76	76.14	79.80	72.28
3	71.89	80.49	87.07	78.35
4	90.25	93.74	83.82	100.00
5	58.86	68.44	80.22	73.47
6	79.96	88.40	100.00	100.00
7	51.48	67.86	39.09	69.51
8	79.44	89.43	70.64	100.00
9	73.55	82.68	56.77	80.88
10	91.54	95.52	82.89	100.00
11	24.03	59.98	51.93	45.43
12	39.25	55.90	79.52	77.44
13	71.61	80.49	86.32	81.15
14	69.55	80.28	85.33	79.80
15	57.12	69.05	79.20	38.68
16	83.51	90.76	100.00	71.39
17	54.18	66.70	38.25	37.37
18	82.86	91.70	73.82	72.81
19	71.89	82.11	55.59	81.41
20	72.17	83.79	54.79	82.41

Notes:

Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements: Acquisitions & Investments, Customer & Product Developments, Milestone Events, Trading Platform Listings, and Ripple Commercialization Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.00***	0.00***	0.00***	0.00***
2	0.00***	0.00***	0.00***	0.00***
3	0.00***	0.00***	0.00***	0.00***
4	0.01***	0.00***	0.00***	0.00***
5	0.00***	0.00***	0.00***	0.00***
6	0.00***	0.00***	0.00***	0.00***
7	0.00***	0.00***	0.00***	0.00***
8	0.00***	0.00***	0.00***	0.00***
9	0.00***	0.00***	0.00***	0.00***
10	0.00***	0.00***	0.00***	0.00***
11	0.00***	0.00***	0.00***	0.00***
12	0.00***	0.00***	0.00***	0.00***
13	0.00***	0.00***	0.00***	0.00***
14	0.00***	0.00***	0.00***	0.00***
15	0.00***	0.00***	0.00***	0.00***
16	0.00***	0.00***	0.00***	0.00***
17	0.00***	0.00***	0.00***	0.00***
18	0.00***	0.00***	0.00***	0.00***
19	0.00***	0.00***	0.00***	0.00***
20	0.00***	0.00***	0.00***	0.00***

Notes:
Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements
* Indicates significance at the 10% level
** Indicates significance at the 5% level
*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Decreases and Announcements: Acquisitions & Investments, Customer & Product Developments, Milestone Events, Trading Platform Listings, and Ripple Commercialization Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	56.73	58.84	42.28	15.37
2	25.74	44.21	33.66	19.76
3	67.77	52.71	66.48	28.49
4	50.55	74.10	54.46	36.66
5	44.85	36.62	51.64	9.99*
6	30.48	47.50	24.83	23.91
7	71.18	73.54	56.77	61.68
8	70.09	90.93	39.48	78.41
9	32.37	90.39	58.83	79.61
10	67.14	93.67	73.01	88.64
11	39.81	65.32	38.68	17.50
12	21.18	32.73	11.97	23.36
13	42.06	49.34	59.03	29.15
14	33.86	73.23	49.36	40.84
15	34.23	20.88	42.01	56.11
16	43.36	47.58	13.93	25.46
17	75.90	74.16	94.10	67.75
18	95.63	85.96	76.31	73.56
19	24.54	78.79	79.33	50.61
20	67.77	92.82	89.17	66.49

Notes:
Tables report p-values of the hypothesis that significant XRP price decreases are independent of the indicated announcements
* Indicates significance at the 10% level
** Indicates significance at the 5% level
*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements Measured 3 Days Early: Acquisitions & Investments, Customer & Product Developments, Milestone Events, Trading Platform Listings, and Ripple Commercialization Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	70.51	77.44	54.48	38.30
2	39.21	61.43	45.26	34.43
3	86.47	94.30	72.75	58.53
4	58.52	70.66	61.80	68.60
5	58.31	58.31	40.38	26.78
6	58.31	58.31	40.38	19.92
7	58.31	63.38	46.77	26.78
8	58.31	38.09	46.77	26.78
9	78.98	90.13	76.59	58.53
10	60.66	82.41	70.57	53.77
11	68.52	82.19	63.92	55.79
12	58.03	63.06	45.26	42.78
13	82.61	93.72	82.21	77.60
14	74.25	92.02	59.42	58.53
15	58.59	43.49	40.62	33.89
16	58.59	63.66	40.62	33.89
17	58.59	68.25	53.04	33.89
18	58.59	72.38	47.03	40.62
19	86.47	85.26	83.72	75.09
20	83.98	84.97	72.75	66.26

Notes:
Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements
* Indicates significance at the 10% level
** Indicates significance at the 5% level
*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements (90 Day Estimation Window): Acquisitions & Investments, Customer & Product Developments, Milestone Events, Trading Platform Listings, and Ripple Commercialization Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.00***	0.00***	0.00***	0.00***
2	0.00***	0.00***	0.00***	0.00***
3	0.00***	0.00***	0.00***	0.00***
4	0.00***	0.00***	0.00***	0.00***
5	0.00***	0.01***	0.00***	0.00***
6	0.00***	0.00***	0.00***	0.00***
7	0.00***	0.00***	0.00***	0.03***
8	0.00***	0.00***	0.00***	0.00***
9	0.00***	0.00***	0.00***	0.01***
10	0.00***	0.00***	0.00***	0.01***
11	0.00***	0.00***	0.00***	0.00***
12	0.00***	0.00***	0.00***	0.00***
13	0.00***	0.00***	0.00***	0.00***
14	0.00***	0.00***	0.00***	0.00***
15	0.01***	0.01***	0.01***	0.01***
16	0.01***	0.02***	0.00***	0.00***
17	0.00***	0.00***	0.00***	0.00***
18	0.00***	0.00***	0.01***	0.00***
19	0.00***	0.00***	0.00***	0.00***
20	0.00***	0.00***	0.00***	0.00***

Notes:
Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements
* Indicates significance at the 10% level
** Indicates significance at the 5% level
*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements (360 Day Estimation Window): Acquisitions & Investments, Customer & Product Developments, Milestone Events, Trading Platform Listings, and Ripple Commercialization Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.00***	0.00***	0.00***	0.00***
2	0.00***	0.00***	0.01***	0.01***
3	0.00***	0.00***	0.00***	0.00***
4	0.00***	0.00***	0.00***	0.01***
5	0.00***	0.00***	0.00***	0.00***
6	0.00***	0.00***	0.00***	0.02***
7	0.00***	0.00***	0.00***	0.01***
8	0.01***	0.00***	0.00***	0.02***
9	0.00***	0.00***	0.00***	0.00***
10	0.00***	0.00***	0.00***	0.00***
11	0.00***	0.00***	0.00***	0.00***
12	0.00***	0.00***	0.00***	0.00***
13	0.00***	0.00***	0.00***	0.00***
14	0.00***	0.00***	0.00***	0.00***
15	0.00***	0.00***	0.00***	0.00***
16	0.00***	0.00***	0.00***	0.00***
17	0.00***	0.00***	0.01***	0.00***
18	0.00***	0.00***	0.00***	0.00***
19	0.00***	0.00***	0.00***	0.00***
20	0.00***	0.00***	0.00***	0.00***

Notes:
Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements
* Indicates significance at the 10% level
** Indicates significance at the 5% level
*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements (1 Day Event Window): Acquisitions & Investments, Customer & Product Developments, Milestone Events, Trading Platform Listings, and Ripple Commercialization Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.00***	0.00***	0.00***	0.02***
2	0.00***	0.00***	0.01***	0.01***
3	0.00***	0.00***	0.00***	0.00***
4	0.00***	0.01***	0.00***	0.00***
5	0.00***	0.01***	0.00***	0.00***
6	0.00***	0.01***	0.00***	0.00***
7	0.00***	0.01***	0.01***	0.01***
8	0.00***	0.01***	0.00***	0.00***
9	0.01***	0.00***	0.00***	0.01***
10	0.01***	0.02***	0.01***	0.03***
11	0.00***	0.00***	0.00***	0.01***
12	0.00***	0.00***	0.01***	0.00***
13	0.00***	0.00***	0.00***	0.00***
14	0.00***	0.00***	0.00***	0.00***
15	0.00***	0.00***	0.00***	0.00***
16	0.00***	0.00***	0.00***	0.00***
17	0.00***	0.01***	0.01***	0.00***
18	0.00***	0.00***	0.00***	0.00***
19	0.00***	0.00***	0.00***	0.00***
20	0.00***	0.00***	0.00***	0.01***

Notes:
Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements
* Indicates significance at the 10% level
** Indicates significance at the 5% level
*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements (7 Day Event Window): Acquisitions & Investments, Customer & Product Developments, Milestone Events, Trading Platform Listings, and Ripple Commercialization Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.04***	0.01***	0.10***	0.18***
2	0.01***	0.00***	0.13***	0.01***
3	0.00***	0.00***	0.00***	0.03***
4	0.04***	0.00***	0.01***	0.01***
5	0.00***	0.01***	0.00***	0.00***
6	0.00***	0.01***	0.00***	0.00***
7	0.00***	0.00***	0.00***	0.00***
8	0.00***	0.02***	0.00***	0.01***
9	0.02***	0.00***	0.01***	0.05***
10	0.09***	0.01***	0.04***	0.05***
11	0.01***	0.01***	0.08***	0.04***
12	0.00***	0.00***	0.00***	0.00***
13	0.00***	0.00***	0.00***	0.01***
14	0.00***	0.00***	0.00***	0.00***
15	0.01***	0.02***	0.00***	0.00***
16	0.00***	0.00***	0.00***	0.00***
17	0.00***	0.00***	0.00***	0.00***
18	0.00***	0.01***	0.00***	0.00***
19	0.02***	0.03***	0.02***	0.00***
20	0.01***	0.00***	0.00***	0.00***

Notes:
Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements
* Indicates significance at the 10% level
** Indicates significance at the 5% level
*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Random Exclusion of Events From: Acquisitions & Investments, Customer & Product Developments, Milestone Events, Trading Platform Listings, and Ripple Commercialization Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.00***	0.00***	0.00***	0.01***
2	0.00***	0.00***	0.01***	0.00***
3	0.00***	0.00***	0.00***	0.00***
4	0.01***	0.00***	0.00***	0.00***
5	0.00***	0.00***	0.00***	0.00***
6	0.00***	0.00***	0.00***	0.00***
7	0.00***	0.00***	0.00***	0.00***
8	0.00***	0.01***	0.00***	0.00***
9	0.00***	0.00***	0.00***	0.00***
10	0.00***	0.00***	0.00***	0.01***
11	0.00***	0.00***	0.00***	0.00***
12	0.00***	0.00***	0.00***	0.00***
13	0.00***	0.00***	0.00***	0.00***
14	0.00***	0.00***	0.00***	0.00***
15	0.00***	0.00***	0.00***	0.00***
16	0.00***	0.00***	0.00***	0.00***
17	0.00***	0.00***	0.00***	0.00***
18	0.00***	0.00***	0.00***	0.00***
19	0.00***	0.00***	0.00***	0.00***
20	0.00***	0.00***	0.00***	0.00***

Notes:
Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements
* Indicates significance at the 10% level
** Indicates significance at the 5% level
*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Random Inclusion of Events To: Acquisitions & Investments, Customer & Product Developments, Milestone Events, Trading Platform Listings, and Ripple Commercialization Initiatives

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	0.00***	0.00***	0.02***	0.04***
2	0.00***	0.00***	0.04***	0.01***
3	0.00***	0.00***	0.00***	0.01***
4	0.03***	0.01***	0.00***	0.01***
5	0.00***	0.00***	0.00***	0.00***
6	0.00***	0.00***	0.00***	0.00***
7	0.00***	0.00***	0.00***	0.00***
8	0.00***	0.02***	0.00***	0.00***
9	0.01***	0.00***	0.00***	0.01***
10	0.03***	0.01***	0.01***	0.02***
11	0.00***	0.00***	0.01***	0.01***
12	0.00***	0.00***	0.01***	0.00***
13	0.00***	0.00***	0.00***	0.00***
14	0.00***	0.00***	0.00***	0.00***
15	0.00***	0.00***	0.00***	0.00***
16	0.00***	0.00***	0.00***	0.00***
17	0.00***	0.00***	0.00***	0.00***
18	0.00***	0.02***	0.00***	0.00***
19	0.00***	0.00***	0.00***	0.00***
20	0.00***	0.00***	0.00***	0.00***

Notes:
Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements
* Indicates significance at the 10% level
** Indicates significance at the 5% level
*** Indicates significance at the 1% level

Significance of Correlation Between XRP Price Increases and Announcements: Acquisitions & Investments

Model Number	One-Sided 5%		Two-Sided 5%	
	Parametric	Nonparametric	Parametric	Nonparametric
1	100.00	15.66	100.00	100.00
2	11.70	3.17**	32.32	27.80
3	50.44	20.22	41.18	26.45
4	50.44	3.91**	40.62	31.05
5	52.31	58.78	100.00	34.79
6	48.00	59.58	100.00	33.57
7	100.00	59.18	100.00	100.00
8	100.00	60.76	100.00	100.00
9	54.12	61.90	100.00	35.40
10	52.77	61.14	100.00	36.00
11	100.00	19.56	100.00	100.00
12	12.28	4.14**	32.32	32.32
13	48.99	18.57	100.00	32.95
14	13.79	5.00**	41.73	34.79
15	47.50	59.18	100.00	36.00
16	49.48	61.90	38.92	36.59
17	52.31	59.98	100.00	100.00
18	52.31	63.02	100.00	100.00
19	51.38	57.55	100.00	33.57
20	51.85	5.52*	40.62	36.59

Notes:

Tables report p-values of the hypothesis that significant XRP price increases are independent of the indicated announcements

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

Significance of Generalized Rank Test Applied to Milestones, Trading Platform Listings, Customer & Product Announcements, Acquisitions & Investments, and Ripple Commercialization Initiatives

Model Number	Minimum T-Statistic	Maximum T-Statistic
1	3.06***	3.25***
2	2.48**	2.82***
3	4.04***	4.24***
4	3.47***	3.89***
5	3.74***	3.99***
6	3.17***	3.28***
7	3.28***	3.81***
8	2.75***	3.48***
9	3.83***	4.35***
10	3.33***	4.12***
11	3.08***	3.30***
12	2.41**	2.76***
13	4.15***	4.43***
14	3.45***	3.85***
15	3.80***	3.90***
16	3.01***	3.43***
17	3.33***	3.97***
18	2.87***	4.03***
19	3.74***	4.44***
20	3.01***	4.02***

Notes:

* Indicates significance at the 10% level

** Indicates significance at the 5% level

*** Indicates significance at the 1% level

APPENDIX F

INFORMATIONAL EFFICIENCY OF XRP PRICES

1. In this Appendix I provide additional discussion on the informational efficiency of XRP prices during the period from February 1, 2014 to December 31, 2020. In the literature of economics and finance, in an informationally efficient market, prices "fully incorporate the expectations and information of all market participants."[1] There are three forms of efficiency:[2]
   a. Weak Form Efficiency: Prices reflect past prices;
   b. Semi-Strong Form Efficiency: Prices reflect all public information; and
   c. Strong Form Efficiency: Prices reflect all private information.

2. This taxonomy represents an order. Since "all private information" includes "all public information" which includes "past prices," if a market is not weak-form efficient, then it cannot be semi-strong and hence cannot be strong.

3. A key implication of weak form efficiency is that returns must be unpredictable based on past returns alone, meaning that intertemporal correlation of an asset's returns—called "autocorrelation"—must be zero.[3] Finding a counter example, that is, establishing that an asset's return at t is correlated with its returns at $t - s$, effectively establishes that the market for that asset is not weak form efficient, which establishes that it is not semi-strong or strong.

4. As discussed in my report, academic researchers have found that the digital token markets, including the XRP market, are generally less informationally efficient than the stock market, though there is evidence that efficiency is increasing over time.[4]

---

[1] See, e.g., John Y. Campbell, Andrew W. Lo, and A. Craig MacKinlay, "*The Econometrics of Financial Markets*," 2nd Edition, p. 20 ("In an informationally efficient market…price changes must be unforecastable if they are properly anticipated, i.e., if they fully incorporate the expectations and information of all market participants.").

[2] See, e.g., John Y. Campbell, Andrew W. Lo, and A. Craig MacKinlay, "*The Econometrics of Financial Markets*," 2nd Edition, p. 22 ("The classic taxonomy of information sets, due to Roberts (1967), distinguishes among Weak-form Efficiency: The information set includes only the history of prices or returns themselves. Semistrong-Form Efficiency: The information set includes all information known to all market participants (*publicly available* information). Strong-Form Efficiency: The information set includes all information known to any market participant (*private* information).").

[3] See, e.g., Zvi Bodie, Alex Kane, and Alan J. Marcus, "*Investments*," 9th Edition, 2010, p. 358 ("Weak-Form Tests: Patterns in Stock Returns … Early tests of efficient markets were tests of the weak form. Could speculators find trends in past prices that would enable them to earn abnormal profits? ... One way of discerning trends in stock prices is by measuring the *serial correlation* of stock market returns. Serial correlation refers to the tendency for stock returns to be related to past returns. Positive serial correlation means that positive returns tend to follow positive returns (a momentum type of property). Negative serial correlation means that positive returns tend to be followed by negative returns (a reversal or 'correction' property).").

[4] See, e.g, Andrew Urquhart, "The Inefficiency of Bitcoin," *Economics Letters* Vol. 148, 2016, p. 5 ("…we do show that Bitcoin may becoming more efficient with some of the tests for market efficiency suggesting that Bitcoin returns are random in the second subsample. … Since it is a relatively new investment asset and still in its infancy, it is similar to an emerging market and therefore the inefficiency finding is not surprising.

APPENDIX F

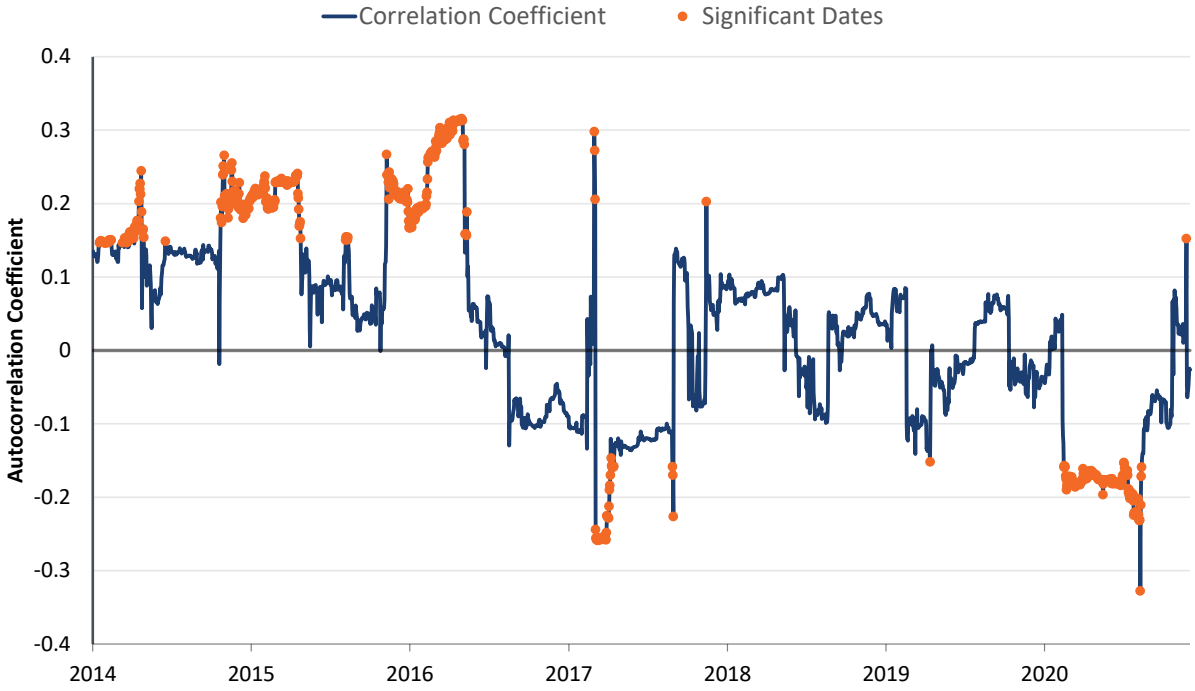
5. I examined the autocorrelation of XRP returns and my findings are consistent with this literature. Figure 1 below plots the autocorrelation of XRP returns from February 1, 2014 to December 31, 2020. Specifically, I examine the correlation between XRP's daily returns and its previous day's returns over a 180-day rolling window, a measure of "first-order autocorrelation."

6. Figure 1 shows that XRP returns exhibit both positive and negative autocorrelation between February 1, 2014 and December 31, 2020 (the blue line). Days where the autocorrelation is statistically significantly different from 0 are identified by orange dots. For both positive and negative autocorrelation, there are periods where such autocorrelation is statistically significant. During these periods, I can reject the hypothesis that XRP prices are even weak form efficient.

Consistent with this argument is that Bitcoin will become more efficient over time as more investors analyse and trade Bitcoin."); Aurelio F. Bariviera, "The Inefficiency of Bitcoin Revisited: A Dynamic Approach," *Economics Letters* Vol. 161, 2017, Abstract ("…daily returns exhibit persistent behavior in the first half of the period under study, whereas its behavior is more informational efficient since 2014."); Aviral Kumar Tiwari, R.K. Jana, Debojyoti Das, and David Roubaud, "Informational Efficiency of Bitcoin—An Extension," *Economics Letters* Vol. 163, 2018, Abstract ("We report that the market is informational efficient as consistent to recent findings of Urquhart (2016), Nadarajah and Chu (2017) and Bariviera (2017).") and pp. 6-7 ("We observe that the market is largely efficient with some exception to the period of April-August, 2013 and August-November, 2016."); and Ahmet Sensoy, "The Inefficiency of Bitcoin Revisited: A High-Frequency Analysis with Alternative Currencies," *Finance Research Letters* Vol. 28, 2019, Abstract ("We find that BTCUSD and BTCEUR markets have become more informationally efficient at the intraday level since the beginning of 2016, and BTCUSD market is slightly more efficient than BTCEUR market in the sample period.").

APPENDIX F

FIGURE 1: AUTOCORRELATION OF XRP RETURNS BETWEEN FEBURARY 1, 2014 AND DECEMBER 31, 2020



7. Not finding significant first-order autocorrelation, as holds during some periods, is not sufficient to establish that this market is semi-strong or strong form efficient. However, I note that my statistical conclusions hold even at a one-day test window, as shown in Appendix E. Even if one were to believe that this market is informationally efficient in the semi-strong sense and hence believe that prices should fully reflect all public information "quickly," the hypothesis that the XRP market is independent of news of actions of Ripple Labs can be rejected at any reasonable significance level.

Exhibit B

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK
- - - - - - - - - - - - - - - - - -x
SECURITIES AND EXCHANGE
COMMISSION,

Plaintiff,

against

Case No.
20-cv-1(AT)(SN)

RIPPLE LABS, INC., BRADLEY
GARLINGHOUSE, and CHRISTIAN A.
LARSEN,

Defendants.
- - - - - - - - - - - - - - - - - -x

VIDEOTAPED DEPOSITION OF [redacted], Ph.D.

New York, New York

Friday, February 18, 2022

Reported by

JEFFREY BENZ, CRR, RMR

JOB NO. 206137

February 18, 2022

9:16 a.m.

Videotaped Deposition of [redacted], Ph.D., taken at Debevoise & Plimpton LLP, 919 Third Avenue, New York, New York, before Jeffrey Benz, a Certified Realtime Reporter, Registered Merit Reporter and Notary Public of the State of New York.

A P P E A R A N C E S:

FOR THE PLAINTIFF:

U.S. SECURITIES AND EXCHANGE COMMISSION
175 West Jackson Boulevard
Chicago, Illinois 60604
BY: ROBERT MOYE, ESQ.
-and-
200 Vesey Street
New York, New York 10281
BY: MARK SYLVESTER, ESQ.
BENJAMIN HANAUER, ESQ (remotely)
DAPHNA WAXMAN, ESQ. (remotely)

A P P E A R A N C E S: (Ctd.)

FOR DEFENDANT RIPPLE LABS:

KELLOGG, HANSEN, TODD, FIGEL & FREDERICK
1615 M Street, NW
Washington, District of Columbia 20036
BY: REID FIGEL, ESQ.
CLAYTON MASTERMAN, ESQ.
KYLIE KIM, ESQ.
COLLIN WHITE, ESQ. (remotely)
BETHAN JONES, ESQ. (remotely)
GAVAN GIDEON, ESQ. (remotely)
ELIANA PFEFFER, ESQ. (remotely)
JUSTIN BERG, ESQ. (remotely)
-and-
DEBEVOISE & PLIMPTON
919 Third Avenue
New York, New York 10022
BY: DANIEL MARCUS, ESQ. (remotely)
-and-
801 Pennsylvania Avenue NW
Washington, District of Columbia 20004
BY: MATT HIRSCH, ESQ.

A P P E A R A N C E S: (Ctd.)

FOR DEFENDANT BRADLEY GARLINGHOUSE:

CLEARY GOTTLIEB STEEN & HAMILTON

2112 Pennsylvania Avenue, NW

Washington, District of Columbia 20037

BY: JORGE BONILLA LOPEZ, ESQ. (remotely)

FOR DEFENDANT CHRISTIAN A. LARSEN:

PAUL, WEISS, RIFKIND, WHARTON & GARRISON

1285 Avenue of the Americas

New York, New York 10019

BY: MARTIN FLUMENBAUM , ESQ. (remotely)

EMILY GLAVIN, ESQ. (remotely)

ALSO PRESENT:

MATTHEW CHIN-QUEE, Videographer

DEBORAH McCRIMMON, Ripple Labs, Inc. (remotely)

KYLE E. CHERMAK, Debevoise & Plimpton (remotely)

[redacted]

THE VIDEOGRAPHER: We're now on the record. This is the start of Tape Number 1 of the videotape deposition of [redacted], in the matter Securities and Exchange Commission v. Ripple Labs, Inc., et al., in the United States District Court, Southern District of New York, Number 20-CV-1 (AT)(SN).

The deposition's being held at 919 Third Avenue, New York, New York, on February 18, 2022, at approximately 9:16 a.m.

My name is Matthew Chin-Quee, from TSG Reporting, and I'm the legal video specialist. The court reporter is Jeffrey Benz, in association with TSG Reporting.

Will counsel please introduce yourselves.

MR. FIGEL: Reid Figel, with Clayton Masterman and Kylie Kim, representing defendant, Ripple Labs, Incorporated.

MR. MOYE: Robert Moye and Mark Sylvester here for the SEC.

MR. FIGEL: And we have an agreement

[redacted]

that counsel who's participating by video conference, appearances are already noted for the court reporter record, and the -- deemed included in the video record.

THE VIDEOGRAPHER: Thank you.

Will the court reporter please swear in the witness.

[redacted], Ph.D.,

called as a witness, having been first duly sworn by Jeffrey Benz, a Notary Public within and for the State of New York, was examined and testified as follows:

EXAMINATION BY MR. FIGEL:

Q. Good morning. Could you state your name for the record, please.

A. [redacted].

Q. And, Mr. [redacted] do you prefer to be called Mr. [redacted] or Dr. [redacted]

A. I suppose for this setting, why don't we say Dr. [redacted]

Q. You understand you're testifying under the same oath that you would take if you were testifying in a courtroom --

[redacted]

A. I understand.

Q. And you also understand that the two reports that you submitted in this litigation are also submitted under oath?

A. I understand.

Q. Any reason today that you can't give your best truthful and accurate testimony?

A. No reason.

Q. Have you ever been deposed before?

A. Yes, I have.

Q. How many times?

A. One time.

Q. In what matter?

A. SEC versus Rio Tinto.

Q. And have you ever testified in any other proceeding in any context?

A. No. I've submitted written testimony in that matter, I've been deposed, but that's the extent of my testimony experience.

Q. No personal litigation in which you were a testifying witness?

A. Correct.

Q. You submitted both an expert report and a rebuttal report in connection with this

[redacted]

case. Is that correct?

A. Yes, that's correct.

Q. I'd like to show you what's been marked as -- we'll start with Exhibit 1.

(Amended expert report of [redacted] was marked Exhibit 1 for identification, as of this date.)

MR. FIGEL: This is for the court reporter.

THE COURT REPORTER: That's very nice but it's not necessary.

MR. FIGEL: All right.

MR. FLUMENBAUM: Excuse me. It's hard to hear Dr. [redacted] if he could speak up, please.

THE WITNESS: Is this mic doing anything?

THE VIDEOGRAPHER: It's just for the video.

MR. FIGEL: Why don't we --

THE VIDEOGRAPHER: Maybe I can put that --

THE WITNESS: Is this better?

MR. FIGEL: Mr. Flumenbaum, are you

[redacted]

able to hear Dr. [redacted] now?

MR. FLUMENBAUM: Is he talking now?

THE WITNESS: Testing, testing. Is this satisfactory?

MR. FLUMENBAUM: Thank you.

Q. I show you what's been marked as [redacted] Exhibit 1. Do you recognize that document?

A. I do. It appears to be my opening report in this matter.

Q. And does Exhibit 1 set forth all the affirmative opinions you intend to offer in this case?

A. I believe so, yes.

Q. And does it contain the bases for all of the opinions that you intend to offer?

A. Well, I have opinions also expressed in my rebuttal report.

Q. We'll get to that. I'm just talking about in your open report.

A. My opening report represents the opinions of my opening report.

Q. And you understand that that Exhibit 1 is also submitted under penalty of perjury, correct?

[redacted]

A. Yes, I understand.

Q. And nothing was omitted from that report that you deemed to be necessary to support the opinions that you express in that report; is that correct?

A. I believe that's correct. Yes.

Q. I'd like to now show you what we'll mark as [redacted] Exhibit 2.

(Rebuttal report of [redacted] was marked Exhibit 2 for identification, as of this date.)

Q. Do you recognize this document, Dr. [redacted]

A. I do. This appears to be my rebuttal report in this matter.

Q. And does your rebuttal report include all the rebuttal opinions you intend to offer in connection with this litigation?

A. Well, I have been directed by the SEC to do some additional analysis in response to the reports of Dr. Marais and Professor Fischel. Those are not yet contained in this rebuttal report.

MR. FIGEL: Let me inquire of

[redacted]

Mr. Moye. Do you intend to seek leave of the court to submit additional expert reports from Dr. [redacted]

MR. MOYE: The plan, what we expect to do is to supplement within the expert discovery period, so in other words, the few additional comments that we believe are appropriate to make based on the rebuttal report will be included in a very short supplement under 26(e).

MR. FIGEL: All right. Just so the record's clear, we have not yet been provided with a copy of any supplemental reports of Dr. [redacted] I don't think it's fair for us to be expected to examine him based on his prognostication about what may be included in those reports so we --

MR. MOYE: We agree.

MR. FIGEL: -- we reserve our rights to call Dr. [redacted] back in the event you submit a supplemental report.

MR. MOYE: We agree, and we'll discuss that, and we'll be happy to make him available for a reasonable amount of time.

[redacted]

Q. With respect to your rebuttal report, Dr. [redacted] as you sit here today, do you have any opinions about the matters contained in your rebuttal report, other than what's set forth in the report?

A. No. The rebuttal report stands complete as of today.

Q. Okay. And your rebuttal report includes all the facts and data that you considered in support of the opinions you expressed in Exhibit 2, correct?

A. I believe so, yes.

Q. All right. Other than --

MR. FIGEL: And, Mr. Moye, what I propose that we do is we will treat whatever engagement that he is working on now as postdating the dates of his two reports.

MR. MOYE: Sure.

MR. FIGEL: So none of my questions are going to go to any other opinions you may be working on now. Fair enough?

But we reserve our rights with respect to any supplemental or subsequent opinions

[redacted]

you provide.

Q. Other than what's set forth in Exhibits 1 and 2, and other than whatever you may be working on prospectively, were you asked to analyze any issues in this case that are not discussed or reflected in either Exhibit 1 or Exhibit 2?

MR. MOYE: So I'm going to object to that question to the extent that it would require Dr. [redacted] to disclose any conversations he had with counsel for the SEC because that would infringe on work product.

Q. Do you understand Mr. Moye's instruction?

A. I believe so.

Q. All right. Without revealing any communications you may have had with the SEC, in the course of your engagement for this matter, have you or people working under your direction performed any work that's not reflected in either Exhibit 1 or Exhibit 2?

A. That's a very broad question, have they done any work.

[redacted]

I -- that's so broad that I don't think I can -- I can -- I can say no, that nobody did any work.

Q. Tell me what work you're aware of, as you sit here today, that is not -- in the -- in the context of this engagement, in this litigation, that's not reflected in Exhibits 1 and 2.

A. I can't think of any examples. But if you're asking me to testify whether somebody in my support team may have done something, they may have done something, but I'm not aware, I cannot -- sitting here today, I cannot think of any work that was done that's not reflected in either of these two reports, setting aside ongoing work.

Q. Are you aware of any models that anyone working under your direction in this case tested or considered in connection with the preparation of your report?

MR. MOYE: Same objection as before.

Please make sure your answer does not reveal any communications that you've had with SEC attorneys about this matter.

[redacted]

A. Again, that's so very broad.

I expect that in the ordinary course of doing research, we may have considered some alternative parameterizations of some econometric models.

As I say, I -- that's -- that's -- I consider that routine and normal and ordinary.

So I'm not going to say that -- that there are no alternative models which may have been run at any point.

Q. Are you aware of any?

A. Well, as an example, when considering the estimation period behind the econometric models, we settled on a 180-day window ending three days prior to an event date to be tested. We may have considered models ending one day prior to the event date being tested. We may have considered models ending five days prior.

Again, that's -- that's -- the ordinary -- the ordinary course of doing research. That -- that's one example that I can think of. But I --

Q. Other than the endpoint for the periods tested, can you think of any other

[redacted]

models or regressions or consideration of events or categorizations that you or your staff considered that's not reflected in the report?

MR. MOYE: Same objection as before.

A. We may have experimented with volume-weighted indices at one point.

But that would be -- that's -- that's -- sitting here today, that's about all I can remember, is something -- an alternative we may have considered that is not in these reports.

Q. Did you consider any other estimation models other than the ones set forth in your opening report?

MR. MOYE: Same objection, work product.

A. Again, beyond sort of the ordinary flow as we've already discussed, no. I can't remember any.

Q. When you said that you -- just a second.

When you say you experimented with volume-weighted indices, what do you mean?

A. Well, we have data on -- we have

[redacted]

pricing data for several digital tokens. From those pricing data, we can construct returns. And one can build an index of those returns, in a number of different ways.

Two easy ways or two common ways are what's called an equal-weighted index, where one simply takes the simple average return across different tokens. And another one would be some sort of volume-weighted index, where those digital tokens that have, for example, a larger market cap get greater weight in the construction of that index.

In the case of digital tokens, bitcoin is so overwhelmingly dominant in a volume sense that, as a practical matter, there's very little difference between a volume-weighted index and simply bitcoin.

So after some normal experimentation, I decided that there was -- there was no utility in a volume-weighted index in the context of these kinds of assets that we're discussing because bitcoin just dominates everything.

So we settled, I think, fairly quickly on considering just equal-weighted indices.

[redacted]

Q. If I understand your answer, in substance, what you're saying is that if you look at the dollar volume of cryptocurrencies traded on various exchanges, the vast majority of that is dominated by bitcoin, correct?

A. Correct.

Q. And that the amounts of both volume and, call it dollar value of Ether lumens is trivial in comparison to the information that's available about bitcoin? Correct?

A. Well, I mean, "trivial" is a word. Again, just as an arithmetic fact, a volume-weighted index, again, just arithmetically, is simply not going to be very different from bitcoin's return.

Q. And did you elect to use equal-weighted indices as opposed to volume-weighted indices or bitcoin, representation-weighted indices, because the weighted indices undermined the force of the conclusions that you're expected -- that you have expressed in your report?

A. No, not at all.

We have one -- some of the models that

[redacted]

are here are based only on bitcoin. Others have bitcoin plus Ether. Some have bitcoin plus Ether plus lumens.

And then when it came time to add some of the other tokens that -- whose history begins much later, at that point, we -- I switched to an equal-weighted index. But there are results here, which are -- which consider only bitcoin, for example, as an alternative driver.

So I -- I simply felt that a volume-weighted index was effectively redundant, to a bitcoin-based model.

Q. All right. Now, if you turn to paragraph 11 on page 2 of Exhibit 1.

You'll see that you reserve the right to modify or to supplement this report?

A. Yes. I see that.

Q. Just so the record is clear, is there anything today that you would like to modify or supplement about the information contained in Exhibit 1?

A. Well, as we've discussed, I'm -- I am continuing to work on a supplemental analysis.

Q. Well, a -- are you finished with your

[redacted]

answer?

A. Yes.

Q. As I understood your prior testimony, the supplemental analysis went to rebuttal issues. Do you intend to provide a supplemental analysis to any of the opinions or data or other information that's set forth in your opening report, Exhibit 1?

A. The -- if I -- if I had to characterize it, I suppose the more helpful characterization is that it is a supplement to Exhibit 1 in the sense that it is primarily addressing issues that were raised in some rebuttal reports which were written in response to Exhibit 1.

That's why I say the rebuttal -- it's a rebuttal analysis in a sense. But if -- if I have to characterize and -- and pick one and say whether I'm supplementing my first report or my second report, I suppose the better characterization is that I am supplementing the first report.

Q. And let's make sure that we're making a clear record here. When you say "supplement,"

[redacted]

I want to make sure that -- withdrawn.

With respect to whatever work you're doing that may lead to additional reports, is there anything that is in Exhibit 1 that, as you sit here today, you believe is inaccurate or incomplete?

A. No, not at all.

Q. All right. Same question with respect to Exhibit 2. Is there -- putting aside whatever it is you're doing prospectively, is there anything in Exhibit 2, as you sit here today, that you believe is inaccurate or incomplete?

A. I don't believe so, no.

Q. According to your resume, you spent a lot of time working in the private sector at [redacted]; is that correct?

A. I worked at [redacted] for approximately 15 years. I think it was a little over 15 years.

Q. Why did you decide to leave [redacted]?

A. To pursue other career -- a different career direction.

Q. And what was that different career

[redacted]

direction that you decided to pursue when you left [redacted]?

A. I decided to become an economic consultant.

Q. How long have you been an economic consultant?

A. I joined my first consultancy, I believe, in [redacted].

Q. [redacted]

A. [redacted].

Q. And why did you leave your prior consulting firm to [redacted]?

A. Discussions with [redacted] and decided that it would be a -- a good environment to -- to join.

Q. In connection with why your current employment [redacted], obviously the SEC is one of your clients, correct?

A. The SEC has engaged me, yes.

Q. Have they engaged you on any other litigation or matter or investigation other than this one?

A. Yes, they have.

Q. Approximately how many other

[redacted]

engagements do you have with the SEC with respect to litigation other than this litigation?

A. I have two other engagements that -- that I consider litigation engagements, in addition to this one.

MR. FIGEL: Mr. Moye, just so we can avoid a spat, are those engagements confidential?

MR. MOYE: So [redacted] obviously is not.

I don't believe the others are public.

A. Nothing has been -- I haven't filed any reports in the other one.

MR. MOYE: So until the filing of the report, we would consider those confidential.

Q. Do you have any clients or are you doing work for any entity other than the Securities and Exchange Commission, currently?

A. I -- I support other experts at [redacted] in helping them to prepare reports and conduct analyses for a variety of clients.

As -- as an expert witness, I'm not

[redacted] currently doing work for any entity besides the SEC.

Q. Have you ever done any work with you as the expert for any entity while employed at [redacted] other than the SEC?

A. Serving as the expert, no.

Q. So the only person or entity that's retained you as an expert since you've joined [redacted] is the SEC. Correct?

A. That is correct.

Q. What is the area of expertise that you claim you have that you believe allows you to offer expert testimony in this case?

A. Well, I have a Ph.D. in economics, with focus on [redacted].

I've been a practicing economist for 20-some years, focused on -- primarily on empirical economic research. I've conducted event studies as part of my employment. I've testified on event studies on one occasion.

And I believe I have adequate credentials to offer opinions in this matter.

Q. Okay. Other than in the field of economics and econometrics, do you claim any

[redacted]

expertise that would allow you to express an opinion, an expert opinion, in this case?

A. I --

MR. MOYE: I'm sorry. Can I clarify that question? Did you mention statistics or just econometrics?

In your question.

MR. FIGEL: My question -- wait a second.

-- was limited to the field of economics and econometrics.

MR. MOYE: Okay. I'm going to object to the extent that you mischaracterize his prior testimony.

A. Well, as I define the words "economics and econometrics," which would include statistics, my opinions -- I would characterize my opinions as being offered within that broad umbrella. I'm not offering, for example, legal opinions, and I -- I'm not a software engineer.

Q. Do you claim to be an expert in statistics?

A. I am an expert in econometrics, which is the application of statistics to economic

[redacted]

data and economic problems.

Q. You don't consider statistics to be a separate discipline for which one could or could not be qualified from being an economist or an econometrician?

MR. MOYE: Objection. Argumentative.

A. I recognize that one can get a degree purely in statistics.

Q. And you don't have one, correct?

A. I -- I do not have a degree purely in statistics.

Q. And you never practiced as a statistician, have you?

A. Statistics is integral to the work that I've done professionally for 20 years. I've described myself as an economist. I do not describe myself as a statistician, but statistics is, as I said, an integral part of the work I've been doing professionally for 20 years.

Q. So the answer to my question is no, you've never practiced as a statistician, correct?

A. The only way I can address that

[redacted]

question is to say I haven't personally described myself as a statistician.

However, in my professional work, I routinely use statistics as part of my work. So in the sense that my practical work requires and utilizes statistics, the answer's yes.

Q. Have you ever held an academic position?

A. No, I have not.

Q. Now, you said you've only testified once in any proceeding in -- in litigation anywhere during your lifetime. Correct?

A. I believe that's true.

Q. And have you ever been found qualified by a court to offer expert opinion testimony?

MR. MOYE: Objection to the extent you're asking him for a legal opinion.

A. All I can say is that my testimony, or -- no part of my testimony has ever been disqualified.

Q. I'm asking a different question. I'm asking the question whether a court has ever found you competent and qualified to offer expert opinion testimony.

[redacted]

MR. MOYE: It's the same objection.

A. I -- I don't know how to answer the question. If -- if you're asking have I ever received a letter from the court saying, Congratulations, you're qualified, no, I haven't.

I have -- I've submitted written testimony, I've submitted deposition testimony. The matter is still pending and outstanding. That's all I can say.

Q. Has Judge Torres in the Rio -- Judge Torres is the presiding judge in the Rio Tinto case, correct?

A. I'll take your word for it. I'm not very good with names.

Q. To your knowledge, have you been qualified to offer expert opinion testimony in the Rio Tinto case?

MR. MOYE: Same objection as before.

A. I have not -- all I can say is I have not been disqualified. My -- my testimony is still pending. The matter is still pending. The trial has not yet been scheduled. As far as I know, I will be testifying at trial.

[redacted]

Q. So to your knowledge, if you're found to be competent and qualified to offer an opinion in this case, it will be the first time, to your knowledge, that you've ever been qualified as an expert, correct?

MR. MOYE: Objection. Argumentative and vague.

A. I -- I apologize, Mr. Figel. I mean, I am -- I've only been doing consulting for a couple of years. If -- if there is some affirmative step in which somebody says, You're qualified, that affirmative step has not yet happened.

Based on the schedule, it's more likely to happen first in the Rio Tinto matter, simply because that's so much further along than in this matter.

Q. And isn't it true that your testimony in the Rio Tinto matter is subject to a disqualification motion?

A. Yes. They've filed motions against me, and I believe -- I think we filed motions against them, and those motions are still pending.

[redacted]

Q. So it hasn't been decided whether you're qualified to give opinion testimony in the Rio Tinto case, correct?

MR. MOYE: Objection to the extent you're asking for a specific legal opinion.

A. To the best of my knowledge, the judge has not ruled on any of those motions.

Q. What academic background, if any, do you have about the cryptocurrency markets?

A. Cryptocurrencies were not a subject of my formal academic training. I would say they didn't exist yet.

Q. So the answer is none?

A. I would say that's fair.

Q. And you said you've never held an academic position, correct?

A. Correct. Beyond maybe a teaching assistantship in college, but not -- not a professorship.

Q. So you've never taught a course about the digital asset market, correct?

A. Correct.

Q. Have you ever published a paper that addressed digital assets or cryptocurrency in

[redacted]

any way?

A. I don't believe so, no.

Q. Have you ever given a public talk that discussed digital assets or cryptocurrency in any way?

A. No, I have not.

Q. Other than in this case, have you ever conducted an event study that related to the cryptocurrency market?

A. No.

Q. Other than in this case, have you ever conducted an event study that applied to digital assets in any respect?

A. No.

Q. Other than in this case, have you ever done an event study that applied to the pricing of digital assets or cryptocurrencies?

A. No.

Q. Are you claiming to be off-- to be qualified to offer an expert opinion about the functionality or capabilities of various digital assets?

A. If you're asking about what I would describe as the software, software engineering,

[redacted]

exactly how blockchains work, that's not my domain of expertise. My domain of expertise relates to economics, asset pricing and the matters that I'm offering opinions on.

Q. Are you claiming to be qualified to offer an expert opinion about the uses of various digital assets?

A. Consistent with how an economist might understand how people use assets and invest, I suppose so. If -- if -- again, if you're asking about -- expert opinion on whether the consensus algorithms of XRP, how those compare to bitcoin, then no.

Q. What training or prior work have you done that would allow you to express an opinion on how people use digital assets or invest in digital assets?

MR. MOYE: I'm going to object to the extent that you're mischaracterizing his prior answer.

Go ahead.

A. Well, economists study markets. They study market prices. They study transactions in markets.

[redacted]

To the extent that we're discussing prices of digital tokens and markets around digital tokens, I feel that as an economist, I'm qualified to offer opinions related --

MR. FLUMENBAUM: If you lean back, I can't hear him anymore.

THE WITNESS: Sorry.

MR. FIGEL: Why don't we go off the record for just a second, do an experiment and try and move the mic closer to Dr. [redacted] That might --

THE VIDEOGRAPHER: We're going off the record at 9:49 a.m.

(Discussion off the record.)

THE VIDEOGRAPHER: We're back on the record at 9:54 a.m.

Q. Dr. [redacted] I'm not sure you finished your answer. Do you remember the question?

A. No, I'm sorry, I don't.

MR. FIGEL: Maybe we could ask the court reporter to read back the last question and Mr. Metz's answer up to the point where he stopped speaking.

(The record was read back.)

[redacted]

A. -- thereto.

Q. As I understand your testimony, the only study of markets or market prices that you've done that relate to digital assets or cryptocurrency occurred in connection with your engagement in this case. Is that correct?

A. That's correct, yes.

Q. So the entirety of your background as it relates to the digital assets or crypto-- cryptocurrency markets relate to the work you did in connection with your engagement in this case. Correct?

A. Sorry, could you repeat the question?

MR. FIGEL: Would you mind reading back.

(The record was read back.)

MR. MOYE: Objection. Argumentative.

A. I -- I -- I just don't -- I just don't think I can accept -- I don't think that's a fair characterization.

The entirety of my background as a -- both my academic training and my professional work as an economist has equipped me, I believe, to address economic issues in this market and

[redacted]

many other markets.

I -- I have not conducted empirical analyses of digital token prices outside of the work I've done in this matter.

Q. So is it your testimony that expertise in one market qualifies you to offer expert opinion testimony about another market?

MR. MOYE: Objection to the extent that mischaracterizes his answer.

A. I don't think that's what I said. Economists study prices and study markets.

An economist could discuss stock prices, bond prices, commodity prices, could discuss the price of oil, could discuss the price of bitcoin, has econometric tools to investigate and apply to data from a variety of different markets.

That's routine in the ordinary course of being an economist.

Q. Let me just see if I can break up your answer, Dr. Metz. We agree you have never studied digital assets or the cryptocurrency market other than in connection with your engagement in this case. Correct?

[redacted]

A. I'll repeat my prior testimony. I have never conducted an empirical analysis of digital token prices outside of the work I've done in this case.

Q. So your testimony is that whatever work you've done in other markets and in other cases qualifies you to express an expert opinion about the use of digital assets, trading in digital assets, pricing in digital assets in the cryptocurrency and in digital asset markets, correct?

MR. MOYE: Objection. Asked and answered. Objection to the extent you're mischaracterizing his prior testimony instead of asking a new question. And argumentative.

MR. FIGEL: Mr. Moye, we've had a very collegial relationship; but I think the standing rule is you get to say, Objection to form. Speaking objections are really not permitted, and I view that as coaching the witness.

So if we could have an agreement, in the future you'll just say, "Objection,"

[redacted]

I'll either reformat my question or I'll ask him to answer.

MR. MOYE: I'm sorry, Reid. I'm not trying to be difficult. I don't believe that's been our prior stipulation, and I certainly don't want to coach the witness. But I don't know how you can correct a question if I don't give you some information about what I think the problem with the form is.

MR. FIGEL: If I have a question about your problem with the form of my question, I'll ask you; but, otherwise, I would prefer if you could just say, "Objection."

MR. MOYE: No. I understand that. But if there's an issue some day about the transcript and whether it's acceptable and I've only objected to form because of your instruction, I feel like you would have cut me off from explaining in the moment what I thought was wrong with the answer.

I certainly don't want to belabor the objection -- the record with things that I don't need to say.

[redacted]

MR. FIGEL: My request would be that if you have an objection to form, you just say, "Objection," and not have a speaking objection, which I view as an effort to coach the witness.

MR. MOYE: Well, I'll consider your request, and I'll try to be helpful. But I cannot agree that I -- that I will not give a proper form objection. And "argumentative" is proper form objection, in my experience.

Q. Mr. [redacted] -- Dr. [redacted] did you understand my question?

A. Could we repeat the question, please.

MR. FIGEL: I can read it back.

Q. So your testimony is that whatever work you've done in other markets and in other cases qualifies you to express an expert opinion about the use of digital assets, trading in digital assets, pricing in digital assets in the cryptocurrency and digital asset markets, correct?

A. I believe I'm qualified to offer the opinions that I've offered in this matter. I've

[redacted]

conducted numerous event studies in different markets, on different type of assets. There is -- I can apply that same methodology and technique and analytical background to this market.

Q. In connection with any of the opinions expressed in Exhibits 1 or Exhibit 2, did you make any assumptions about any connection between XRP and Ripple?

A. That's an interesting question.

Q. Thank you.

A. The -- the way I would answer that question is, the experimental analytical design of primarily my -- my opening report, the -- now I'm going to sound like an economist. But the null hypothesis that's being tested is that there is no connection between Ripple Labs and XRP markets. That's the hypothesis to be tested. And I go about testing that hypothesis.

So from a statistical point of view, the assumption is that Ripple Labs and XRP markets are independent of each other.

Q. My question is, as you applied your judgment and your background to the opinions you

[redacted]

reached in your report, did you make any assumptions about the relationship between Ripple and XRP?

A. I can't think of any particular assumption I made. If -- at least as I'm thinking about that question. For example, I did not assume that Ripple could do things that would move XRP prices.

I did not assume that that was true.

Q. We'll come back to that.

Let me direct your attention now to paragraph 24 of your report.

Are you with me?

A. My -- paragraph 24 of my opening report?

Q. Yes.

A. Yes.

Q. And you write, Ripple has sold more than 1.4 billion worth of XRP tokens through various channels.

A. Yes. That's what's written here.

Q. Was that an assumption you made about the relationship between Ripple and XRP?

A. I wouldn't characterize that as an

[redacted]

assumption about the relationship. I -- that's a summary of data that we took from certain Ripple reports.

Q. And let me direct your attention now to Figure 6 on page 13.

You with me?

A. Yes.

Q. This reflects data that you included in your report that set out what you believe to be the total amount of Ripple sales of XRP by quarter. Is that correct?

A. This summarizes the sales of XRP as reported in Ripple's XRP market reports.

Q. And did you prepare this?

A. It was prepared at my direction.

Q. When you say it was prepared at your direction, what do you mean?

A. I had a team working with me at [redacted] and I directed them to prepare certain exhibits or conduct some analysis. And this was an -- this was an exhibit that I asked them to prepare.

Q. And when you say you have a team, how large is your team?

[redacted]

A. I don't know precisely. I would say at any one time, on the order of four, five, or six people, maybe sometimes more, maybe sometimes less.

Q. And did you review Figure 6 for accuracy before you included it in your report?

A. I did not personally audit the numbers in the exhibit. I asked that this exhibit, as all other exhibits in this report, go through standard practices of audit and confirmation.

Q. Did you write your report?

A. I'm certainly responsible for my report. I wrote -- some sections may have been initially drafted by other parties. But in all cases, I reviewed and edited and assumed responsibility for the report in its entirety.

Q. Which parties drafted portions of your report, other than you?

A. We're going back in time. But -- well, for example, this -- I -- a principal at [redacted] who was working with me named Sujay -- that's S-U-J-A-Y, D-A-V-E -- was working with me and may have prepared the first draft of some portions or -- some portions of the report.

[redacted]

Q. Anyone else other than people at [redacted]

A. No.

Q. Let me direct your attention to paragraph 25.

Your report states, with a typo, As show in Figure 5, Ripple reported that it raised approximately 1.4 billion from sales of XRP, through the fourth quarter of 2020.

Do you see that?

A. I do see that.

Q. What do you mean by "raised" in that sentence?

A. I mean sold from its inventory of XRP tokens into the market and received proceeds of approximately 1.4 billion.

Q. When you say "proceeds," what do you mean?

A. They -- they sold or perhaps, through market makers, directed to be sold tokens in exchange for U.S. dollars, and the amount of U.S. dollars was approximately 1.4 billion.

Q. And you observe in paragraph 26 that Ripple reported its sales of XRP on its

[redacted]

financial statements in two categories. Correct? Programmatic sales and OTC sales?

A. I see that, yes.

Q. And in paragraph 26(a), you talk about programmatic sales of XRP on digital asset trading platforms?

Correct?

A. I see that written there, yes.

Q. So those are cash sales?

A. My understanding is that the tokens were sold for cash.

Q. And in paragraph 26(b), you talk about OTC sales were negotiated, block sales of XRP, to large purchasers, including wealthy individuals, hedge funds, other investment firms, and financial institutions. Correct?

A. Yes, I see that.

Q. And those were also cash sales?

A. Well, I -- depending on what you mean by "cash sales," I believe they were sold in exchange for U.S. dollars. Whether that was -- I doubt very much it was delivered in slips of green paper to the door. But I -- my understanding is they were sold for U.S.

[redacted]

dollars.

Q. And as you state in paragraph 27, referring to Figure 6, your opinion is that these two categories, approximately 745 million in programmatic sales and approximately 698 million in OTC sales, which total about 1.5 billion, are the two components of the 1.4 billion in sales of XRP that you identified in your report? Is that correct?

A. Yes, that's correct.

Q. Why did you include Ripple's sales or alleged sales of XRP in your report?

A. This section is a background section on Ripple Labs, its -- its businesses, its products and some data on its finances. This is simply intended as a -- as a background section to provide some context and information.

Q. In what respects do you think that this background is relevant to the opinions you express in Exhibits 1 and 2?

A. I -- it's included to be helpful to the reader to provide some context to know what Ripple Labs is, the products that it engages in, which, of course, I do discuss later,

[redacted]

analytically.

I -- there's nothing -- there -- there's nothing in this section which was intended to be here which I had any reason to believe was in any way controversial. It's a reporting of data from Ripple's own reports.

Q. And did you rely on the dollar value of these sales in connection with any of the econometric models that you performed that led to the opinions you express in Exhibits 1 and 2?

A. No. The econometric models and econometric analysis that I conduct does not incorporate information of Ripple's sales of XRP.

Q. So what's the relevance, in your mind, to the observations that you make about Ripple's sales to the opinions you express?

A. Again, I can only repeat my prior testimony. This section was meant to be a brief background section on Ripple Labs, its businesses, some financial information.

I consider this a routine type of section, when analyzing a company, to simply provide some basic information, hardly

[redacted]

exhaustive, of what that company does and some information about its finances.

I -- that was -- that was the intention of this section.

Q. Well, in your mind, aren't transactions over an exchange or through the OTC market the transactions that -- the source data that you rely on for your opinion? In other words, you're -- you're -- withdrawn.

You -- you -- one of the variables that you look at is the price impact of XRP. Correct?

A. Of the variables -- I -- I --

Q. The dependent variable in your study --

A. The dependent variable are -- I'm sorry. Please continue.

Q. The dependent variable in your study is the price of XRP. Correct?

A. Strictly speaking, the change in the log of the price of XRP. But, yes.

Q. And so transactions, either programmatic sale transactions or OTC transactions are relevant to the price impact

[redacted]

that you purport to measure, correct?

A. To the extent that they -- these transactions moved the price, that would be reflected in the price data that I use.

To the extent that Bob selling XRP to Alice impacts the price, that price is reflected in the data that I use.

Q. And your understanding is, is that the 1.4 billion of sales that you identify in Exhibit 6 are the transactions in which Ripple sold XRP that would be the part of the data that you relied on in your modeling and reports, correct?

A. I -- I'm sorry, could you repeat the question?

Q. I'll withdraw it.

Did you review any of the contracts by which Ripple sold or transferred XRP to any third party?

A. No, I have not reviewed any such contracts.

Q. Why not?

A. It wasn't pertinent to the opinions that I was offering in this matter.

Q. You're not a certified public accountant, are you?

A. No, I am not.

Q. Are you claiming to be an expert in financial accounting?

A. I'm familiar with financial accounting. I've used financial accounting in my professional work for many years. I'm not a certified public accountant, and I don't believe I'm offering any accounting opinions in this matter.

Q. If you'd listen to my question, Dr. [redacted] Do you consider yourself to be an expert in financial accounting?

A. I can -- I can only restate my answer. I'm not a certified public accountant. As a professional practicing economist, I utilize financial accounting, and I believe I understand the basic principles. I'm not offering any accounting opinions in this matter.

MR. FIGEL: Can we get Tab 3, please.

Q. I show you what's been marked as Exhibit 3. And I will represent to you that this is a copy of the consolidated financial

[redacted]

statements of Ripple Labs, Incorporated, for the year ending December 31, 2019.

(Copy of consolidated financial statements of Ripple Labs, Incorporated, for year ending December 31, 2019, was marked Exhibit 3 for identification, as of this date.)

A. Okay.

Q. Have you seen this document before, Dr. [redacted]

A. It looks familiar.

Q. It's not listed as one of the documents that you considered, in the appendix to your report. Do you recall reviewing this in connection with the preparation of your report?

A. I recall reviewing some financial data. If this was not among it, I -- I don't have the list memorized.

Q. Well, if you had reviewed it, would you have included it on the list of items considered?

A. Well, I believe that the list is items relied upon, not items considered.

Q. Why don't we go to Exhibit 1, if you

[redacted]

would.

MR. MOYE: Appendix B?

MR. FIGEL: Appendix B, yes, thank you.

Q. So -- I see what you're saying, Dr. [redacted]

So your Appendix B is only the documents you relied on. Is that correct?

A. That's my understanding of what Appendix B is meant to reflect.

Q. And so it doesn't reflect all the documents you considered in connection with the preparation of your report, correct?

A. Correct.

Q. So there are documents that you considered that are not included on Exhibit B; is that right?

A. Exhibit B is not intended to be an exhaustive list of every document that I may have looked at, no.

Q. That's not my question.

My question was, there are documents that you considered in the preparation of your report that are not included on Exhibit B; is

[redacted]

that correct?

A. There -- there are documents that I reviewed that may not be listed in Appendix B if I didn't rely on them to form the opinions in this report.

Q. Do you recall any documents that you considered but didn't rely on in connection with the preparation of your report?

MR. MOYE: Initial report?

MR. FIGEL: Initial report, yes.

Thank you.

A. Well, I remember reading a -- a Wells Submission from Ripple Labs. It's a document that I looked at but I ultimately didn't rely upon in any way to form my opinions.

Again, I think that I've looked at some financial statement data, maybe just briefly, but didn't consider myself relying on it to form any of the opinions in my report.

That's what comes to mind sitting here.

Q. And you think you may have considered Ripple's 2019 financial statement?

A. I -- I seem to recall looking at

documents like this. Whether this was particularly one that I ever looked at, I -- I simply can't say.

Q. Could you take a look at page 3 of Exhibit 3, and it bears the Bates number RPLI_SEC 0301117.

Can you tell me what --

A. I'm sorry. So it's -- is that page 1 that's page 2 and that's page 3?

MR. MOYE: No, at the bottom.

THE WITNESS: Oh, page 3 on the bottom of the page.

Q. Yes. It's easier if you go by Bates numbers. The one ending in 117.

Are you with me?

A. Yes.

Q. Can you tell me what information's reflected on this page.

A. Well, it appears to be some statements of operations for the years ending December 31, 2019, 2018. Some information on revenues, costs, with some detail provided.

Q. Let me direct your attention to the two line items under "Revenues."

[redacted]

Do you see that?

A. I see "Revenues," yes.

Q. And do you see that under "Revenues" there's XRP transactions and nonmonetary XRP transactions?

A. I see that.

Q. Can you explain the difference between XRP transactions and nonmonetary XRP transactions?

MR. MOYE: Objection. Foundation.

A. Sitting here right now, I'm not exactly sure what they mean by XRP transactions and nonmonetary transactions.

Q. In your opinion, do they both reflect Ripple's sales of XRP?

A. At -- at the moment, I -- I can't say. This is 2019 and 2018.

Let me try to do a little quick math in my head, which is always dangerous.

Q. I have a calculator if you'd like one.

A. Well, I -- I -- let's see. All right, 2019.

251. Let's do it this way.

22330.

[redacted]

718.

I -- well, maybe with the calculator. I -- I don't -- I don't know if these two numbers sum to be the programmatic sales that are reported in my report.

Q. Do you know what a Hewlett-Packard 12C is?

A. I think so. If you would like me to use it.

Q. If you would like to. I just don't want you to restrict your answer because you don't have a calculator. You said you needed one.

A. Okay. This is old school.

All right. So what are we doing?

Okay. How do you work your calculator?

Let me use -- well, I don't have my phone.

Q. Yeah. Why don't we move on. Yeah, let's do that.

A. So you're asking if -- I suppose you're asking if these numbers correspond to what's in my report. I don't know offhand. If

[redacted]

that was your question.

Q. It was. Let's -- let me direct your attention now to page 6 of Exhibit 3.

First of all, can you tell me what a consolidated statement of cash flows is in a financial statement?

A. Well, it's a statement that summarizes cash flows, generally from operating activities of a company. These would be revenues collected and costs of operation.

Q. What do "cash flows" mean?

A. Well, it can to be on an accrued basis or a collected basis. But these are dollars in and dollars out in the operation of the business.

Q. By "dollars," you mean -- I don't mean greenbacks --

A. I don't mean green slips of paper, but --

Q. Let's not talk over each other.

Give me just one second, Dr. [redacted]. I was about to ask you a question.

And by "dollars," you don't mean green slips of paper. You mean cash transactions that

[redacted]

are recorded in bank and accounting ledgers, correct?

A. Correct. I certainly don't mean green slips of paper handing back and forth.

Q. All right. Now, let me direct your attention to the first line under cash flows from the operating activities.

Do you see that?

A. Uh-huh.

Q. And do you see the net income line?

A. Yes.

Q. And do you recognize that as, the [redacted], approximately, as the net income amount on page 3?

A. Yes. They're the same number.

Q. Okay. And if you go down the next -- the first line under net income is adjustments to reconcile net income to net cash providing by -- provided by operating activities.

Do you see that?

A. Uh-huh.

Q. What's your understanding of what that adjustment refers to?

A. Well, generally, you have income

[redacted]

statements and cash flow statements, balance sheet statements. This might be an adjustment to reconcile an income statement to a cash statement.

Q. What's the difference between income and cash in the context of this item?

A. Well, income statements, you have -- income statements are -- reflect the operation of the business, as moneys come in and go out, very often on an accrued basis.

Cash statements represent an accounting of final cash balances at the end of the fiscal year. Sometimes those two things may not line up because you might be -- on your income statement, you might be reflecting moneys, for instance, that have been billed but not yet received or costs that have been charged but not yet paid. And so you may have to do a reconciliation to bring them into balance.

Q. Basically an adjustment from noncash to cash items; is that correct?

A. Correct.

Q. And you'll see -- on the first line under that adjustment, you'll see realized and

[redacted]
unrealized gains on XRP derivatives.

Do you see that?

A. I do.

Q. And you see that's a negative [redacted] number?

A. Yes. It appears to be.

Q. And what's your understanding of what the net-income-to-cash adjustment of [redacted] for realized and unrealized gains on XRP derivatives relates to?

MR. MOYE: Objection. Foundation.

A. Well, I -- I mean, I haven't reviewed these statements in anywhere the sort of detail that we're doing here today.

Presumably, Ripple Labs had some derivative position on XRP; and perhaps on a mark-to-market basis, there were gains on losses to those positions. But in -- I have spent essentially -- I spent very little time with these documents. I just don't want to speculate out of turn.

Q. Does it cause you to question the statements in your opening report that Ripple had 1.4 billion of cash sales during the

[redacted]

timeframe reflected in your Figure 6?

A. No. My Figure 6, I think, is based -- is simply a restatement of their own market reports. I'm simply tabulating data from the XRP market reports.

Q. Let me direct your attention now to page 11 of Exhibit 3.

A. Uh-huh.

Q. Are you familiar with notes to financial statements?

A. Generally, yes.

Q. Fair to say that's where an issuer, a company describes some of the line items on their financial statements?

A. Correct.

Q. Before you signed your opening report, did you read the footnote in which Ripple described the difference between XRP transactions, nonmonetary XRP transactions?

Do you see that?

A. I see this note. I had not read this note prior to signing my opening report.

Q. Could you read the sentence under XRP transactions into the record, please?

[redacted]

A. XRP transactions revenue consists of sales of XRP for fixed monetary consideration and is recognized upon delivery of XRP to the customer.

Q. What's your understanding of that explanation in the note under XRP transactions?

A. Well, I take it to mean that this -- this refers to proceeds collected upon the delivery of XRP to some customer in exchange for money.

Q. And can you read for me the first sentence under nonmonetary XRP transactions?

A. Nonmonetary 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.

Q. What's your understanding of that sentence?

A. I believe it's describing situations where Ripple delivers XRP tokens in exchange for something other than money.

Q. And do reading these two explanations of the footnote cause you to reconsider the

[redacted]

statements you made about Ripple's sales of 1.4 billion between the first quarter of 2017 and the fourth quarter of 2020?

A. By themselves, no. What I report in Figure 6, the numbers there are taken simply from XRP markets reports.

Q. And you think those are sales of XRP for cash? Correct?

A. Combination of programmatic sales and over-the-counter sales expressed in a certain value.

Q. And when we talk about cash, I'm using the definition that Ripple used in its notes, fix monetary consideration.

So just to be clear, you are not modifying, based on the information I showed you, the statements you made that Ripple sold 1.4 -- 42.45 billion in XRP for a fixed monetary consideration. Correct?

MR. MOYE: Objection. Asked and answered.

A. The value of the XRP that Ripple sold, as reported in their markets reports, represents a certain amount -- a certain value that's put

[redacted]

on it. If we're now parsing whether that was -- whether they received a hundred dollars or whether they received services that they valued at a hundred dollars, that's not a distinction that -- that was important to me in creating Figure 6, which, again, is just a tabulation of data from Ripple's XRP market reports.

Q. So even understanding that some not -- withdrawn.

Even understanding the large percentage of the sales that you have in Figure 6 were sales for something other than fixed monetary consideration, that doesn't change the relevance of the information in Figure 6 to your study. Correct?

MR. MOYE: Same objection.

A. Correct. Figure 6 is simply a tabulation of data from market reports indicating the value of XRP tokens that Ripple released. I -- with this information and -- perhaps jogging my memory, it might be that sometimes they collected a hundred dollars in money, and sometimes they collected services worth a hundred dollars. I'm not sure that

[redacted]

that's a -- necessarily an important distinction.

But in any event, this data is not part of the econometric analysis that I conducted. This is provided simply for informational and background purposes.

Q. Now, you testified earlier, I believe, that you never conducted, other than in this case, an event study involving digital assets.

Correct?

A. Correct.

Q. Right. And apart from your work in this case, do you know of any event study involving a digital asset that's been used to support the argument that a digital asset is a security?

A. To support -- well, the -- generally, that sounds like a -- a legal issue, whether something is a security or not.

I'm personally not aware of other legal proceedings, but I -- I wouldn't necessarily be aware of other legal proceedings.

Q. Well, do you know of anyone else, other than you, that's conducted an event study

involving a digital asset for the purpose of demonstrating that the digital asset was a security?

A. Well, I don't even know that I've done what you just said. I conducted an event study for the purpose of determining whether there is a connection between Ripple Labs and the XRP market, and I found that there is. That's the -- the -- that's my analysis and that's my opinion.

Q. So --

A. How that relates to a legal question is not for me to say.

Q. So as far as you know, the event study that you conducted is not relevant to the question of whether XRP is a security. Correct?

MR. MOYE: Objection. Argumentative.

A. That's certainly not what I said.

Q. Well, let me ask you the question. In your mind, is the event study that you conducted as reflected in your report, in Exhibit 1, relevant to the question of whether XRP is a security?

A. I -- I -- you seem to be asking me for

[redacted]

my legal opinion, which I'm fully -- which I'm not qualified to -- to offer. I'm not offering any legal opinions.

I was engaged by the SEC to conduct an analysis, and I conducted the analysis to the very best of my ability.

Q. Dr. [redacted] I'm asking you for your opinion, as an economist, as to whether you believe the event study that you prepared is relevant to the question of whether XRP is a security.

A. As an economist opining on a legal question? I'm not sure I -- I -- I understand your question.

Q. So I take it you don't have an opinion?

A. The question of whether Ripple Labs impacted the XRP market is -- as far as I understand, was in dispute. I was asked to conduct an analysis, and I conducted an analysis and prepared my opinions and wrote a report about them.

Q. Let's go back to precedents of using an event study for the purpose of supporting an

[redacted]

argument that a digital asset is a security.

Are you with me? I'm ask-- the question I'm asking is, are you aware of anyone else who's ever done an event study for the purpose of demonstrating that a digital asset is a security.

MR. MOYE: Objection. Asked and answered.

A. Again, as I've -- as I've tried to explain, the question of whether it is or is not a security is a legal question.

An event study is not going to answer a legal question. It may provide information which might be useful to the finder of fact who's ultimately going to settle the legal question. But an event study is not a legal test.

Q. Are you aware of any academic literature that supports the use of an event study to demonstrate that a digital asset is a security?

A. No, I'm not aware of any academic literature on that point. That's again, a -- generally a legal question, and I would be --

[redacted]

it's a -- it's ultimately a legal question.

Q. So I may be able to save everybody in the room a little bit of time then, Dr. [redacted] So fair to say that all of the academic publications that you cite in your report, in your mind, do not support the use of an event study to support an argument that a digital asset is a security. Correct?

MR. MOYE: Objection. Argumentative.

A. With respect to that -- I -- I need to hear that back. That was very convoluted.

Q. Let me -- give me just a second.

You agree that none of the academic literature cited in your report, either report, endorses the use of an event study to support an argument that a digital asset is a security. Correct?

A. The academic literature applies the event study methodology to the digital token markets, including the XRP market.

Those event studies resolved around the question of whether a set of events was associated with an increase in -- in digital token -- and sometimes decrease, in digital

[redacted]

token prices.

I applied that well-accepted, peer-reviewed methodology to the matter at hand, as I was asked to investigate a question by the SEC.

MR. FIGEL: We've been going about an hour and 20 minutes. I'm happy to keep going, but if you'd like to take a short break, I'm happy to do that, too.

MR. MOYE: Why don't we take a short break.

MR. FIGEL: Yeah.

THE VIDEOGRAPHER: We're going off the record at 10:40 a.m.

(A recess was taken from 10:40 to 10:59.)

THE VIDEOGRAPHER: We're back on the record at 10:59 a.m.

Q. Dr. [redacted] before we broke, you made an observation about the academic literature that you relied on.

Apart from your work in this case, are you aware of any event study that's been used to evaluate whether news events published by a

[redacted]

company had an impact on the market price of a digital asset?

A. Whether -- whether news events -- I'm sorry, just one more time?

Q. Sure.

Apart from your work in this case, are you aware of any event study that's been used to evaluate whether news events published by a company had an impact on the market price of a digital asset?

A. Yes.

Q. What study is that?

A. The -- the Joo, et al. study. I believe -- and maybe it's the Gerritsen. I might be confusing them.

But one of those studies, in its set of events for XRP, included -- perhaps among other things, but I remember that it included the BitLicense being awarded to Ripple.

There may be other examples, but that one comes to mind.

Q. And you consider the BitLicense being issued to Ripple to be a news event published by a company?

[redacted]

A. Well, Ripple published -- published that event. Other people may have also, but Ripple certainly announced the event.

Q. Well, that would -- that would identify a correlation between the award of a BitLicense and the market -- the impact on market price. Correct?

A. Correct.

Q. And the Joo study that you refer to didn't identify the source of the publication of the award of the BitLicense, correct?

A. It probably wasn't pertinent to them.

Q. But you're --

A. Sorry, go ahead.

Q. My question is, are you aware of an event study that sought to evaluate the impact on the market price of a digital asset from a news event announced by a specific company?

A. They may have sourced the news event from Ripple's own announcement. I don't know where they sourced the news event. I don't see what difference it would make.

Q. You don't see a difference --

A. No.

[redacted]

Q. Let me finish.

A. Sorry.

Q. Thank.

You don't see a difference between -- a correlation between the fact of an event and a -- and a market price of a digital asset and an announcement by a company on the digital price of a -- on the market price of a digital asset?

A. You're parsing distinctions that I just don't follow.

An event that is unannounced and unknown presumably will not have any impact. Therefore, whenever we talk about the impact of an event, we are really invariably talking about the impact of the announcement of the event.

And that is -- that's just one that I happen to remember. There may be others, I -- but that's just one that happens to come to mind of an event that was announced by Ripple -- may have also been announced by other people -- that was included in an event study in peer-reviewed academic literature on the XRP market.

Q. I want to make sure I understand your

[redacted]

answer, Dr. [redacted]

And let -- bear with me for a second. Let's take the BitLicense event that you identified.

A. Uh-huh.

Q. As I understand the Joo and -- I believe it's Nishikaw and others study, one of the things they looked at was a correlation between the award of the BitLicense and the market price of digital assets. Correct?

A. Just to be clear, I don't remember if it was the Joo study or the Gerritsen study. I -- I -- I might be conflating the two.

So I don't know if we want to keep referring to it as the Joo study. May have been.

But one of those two studies had a set of events that it considered relevant to XRP, and the BitLicense was among those events.

Q. Correct. But in your mind, it doesn't matter, when you're measuring market impact of an event, whether the event is announced by one source or 50 source. Correct?

A. Generally -- and -- and with the

caveat that one can -- with any rule, one might be able to think of an exception, but as a general proposition, no, it doesn't matter to me whether it was announced by one or several.

Q. Did the events that you used in your event study as reflected in Exhibit 1 make a distinction between whether the event was announced by one source or by multiple sources?

A. That is not a distinction that I drew in my analysis. Nor is it a distinction that -- no, it was not a distinction that I drew in my analysis.

Q. All right. Could we go to Exhibit 1, please. Paragraph 30.

A. Yes.

Q. Could you read for me the first sentence in paragraph 30.

A. In the matter at hand, I understand that the XRP token is not a claim on the assets or earnings of Ripple Labs, and that Ripple Labs maintains that market participants do not view Ripple Labs' efforts as relevant to the XRP market price.

Q. Are you aware of an event study that

[redacted]

sought to determine whether news events about a company had an impact on the market price of an asset that did not have a claim on the assets or earnings of the company?

A. Yes. I -- the same study that we've been discussing, whether that's Gerritsen or Joo.

Q. All right. Other than that study, are you aware of any other event study that sought to determine whether news events about a company had an impact on the market price of an asset that did not have a claim on the assets earnings of the company?

A. I don't have the -- the list of events from those studies memorized. There may have been other events of that type. Offhand, sitting higher today, I can't think of another event study in the digital token market that did that, but I haven't done an exhaustive search on that question.

Q. Can you take a look at paragraph 46, please.

A. Uh-huh.

Q. Could you read into the record,

[redacted]

please, the second sentence in paragraph 46.

A. The question, therefore, is not whether a particular Ripple action or event is associated with a particular XRP price response, as is the case in many event study disputes, but instead whether Ripple actions or events are collectively associated with significant XRP price reactions.

Q. And what are the disputes you're referring to when you use the phrase "many event study disputes"?

A. What I had in mind when I wrote that was, other litigation contexts which, in my experience, often focus around a particular event. For example, a corrective disclosure of earnings and the impact that that may or may not have had on the stock price.

Q. And you say the question in this case is whether Ripple action or events are collectively associated with significant XRP price reactions.

Do you see that?

A. Yes.

Q. What do you mean by "collectively

[redacted]

associated"?

A. I'm testing a -- I'm testing whether there is a correlation or association between Ripple Labs and some of its events or actions and XRP prices.

Q. And what do you -- what's the definition of "collective association" or "collectively associated"?

A. I would think of that in the context of a joint test of significance, testing whether a set is jointly significant as opposed to looking at any one event.

Q. And is -- can we call that collective association? Is that a fair description of what you just described?

A. That's what was in my mind when I wrote the words. It's -- a more rigorous statistical discussion would probably speak in terms of joint significance, but I'm happy to use the language that's here.

Q. Is collective association a term of art in econometrics?

A. Not especially, as I just described. What I meant there was the sort of joint

[redacted]

significance. That would be in a more -- in an academic paper, we would probably speak about whether the set of events was jointly significant.

I meant the phrase in that spirit.

Q. So the record is clear, let's just make sure we have an agreement on the term. Do you want to use "joint significance" or "collective association"?

A. I suppose with the formality of these proceedings, maybe we should speak about joint significance.

Q. Are you aware of any peer-reviewed articles that assess whether many events, jointly have significance with a significant price impact on a digital asset?

A. Yes.

Q. Which ones?

A. Papers that I've referred to in my report, Gerritsen and Joo. That's -- they both do that. They have a set of events, and they test whether that set of events is jointly -- that set of events is jointly significant.

Q. Other than the articles that you cite

[redacted]

in your two reports, are you aware of any other academic literature that you rely on to support your claim that there are other event studies that collectively -- that measure whether there are collective events associated with significant market impact on digital assets?

A. The -- the event study -- the academic peer-reviewed event studies that I rely on are the ones that I cite in my report and include in my list of documents relied upon.

Q. You're not aware of any others?

A. Sitting here today, I -- no. Those are the ones that I recall.

Q. All right. In this case, you initially identified 514 news events. Is that correct?

A. That -- that sounds correct.

I'm sure I say that somewhere. But that sounds correct.

Sorry. I'm just -- yes, 514 events, from paragraph 49.

Q. And you only tested 105 of those events; is that correct?

A. No, no, that's not correct.

[redacted]

Q. Let's go to paragraph 98.

A. Uh-huh.

Q. Well, maybe I should give you a chance to explain.

Let me rephrase my question. You only tested events occurring on 105 days. Correct?

A. No, that's not correct.

Q. How many event days did you test in your methodology?

A. In total, I don't know the number offhand. But what you're -- if I, maybe some assistance.

Q. Feel free.

A. You're missing the other categories that I discuss previously, for instance, office and staff announcements, the noncommercial XRP initiative announcements. That's -- that would need to be added to the 105, to get the total number of days that I ever tested.

Q. Didn't you effectively exclude the office and staff announcements in the noncommercial XRP events --

A. I tested them. Sorry. I don't mean to speak over you. I apologize.

[redacted]

Q. And you found no correlation, correct? Or no statistically significant correlation?

A. That's correct.

Q. So you can't look to those events to support an opinion that actions by Ripple Labs had a statistically significant impact on the market price of XRP. Correct?

A. Those events do not -- those events do not provide statistical evidence of an association between Ripple Labs and XRP prices. I agree.

And I'm sorry. I'm really not trying to be difficult, but your question was how many I had tested. I just wanted to be clear that I tested more than this final set here.

Q. So how many event days did you test in your regression analysis?

A. Again, I -- I don't have the -- the total offhand. There -- I -- but 105-plus unique days in -- among the sets of news categories that we've just discussed, which was -- on the -- I mean, 20, another 20, another 30. I don't know.

There may be some overlap in days. I

[redacted]

don't know.

But 105-plus.

Q. The aspect of the study that you're -- you conducted, that's described in paragraph 98, which is a combination of the categories for which you found statistical significance, was limited to 113 unique relevant events on 105 days. Correct?

A. Almost correct. Section F is based on 113 unique events on 105 days.

What I'm -- just want to make sure we're clear on is you said, categories for which I found significant correlation. I believe that was part of your question.

And this set of 113 events on 105 days includes a category called acquisition and investments, which in isolation, I do not find a statistically significant correlation.

So it's not a combination of subsets, each of which by themselves produced a correlation. Most of them did. One of them in isolation did not. I put them all together, and in Section F studied that superset of 113 events on 105 days.

[redacted]

Q. And this is the portion of your event study that you primarily rely on to support your observations about whether there is a collective association between actions by Ripple and a market impact on XRP. Correct?

A. Well, I -- I'm not sure about your use of the word "primarily."

It is -- it is a set on which I do a great deal of testing and robustness testing, and it is certainly part of my opinion that there is an association between Ripple Labs and XRP prices.

Q. And that combination, reflects a reduction from the 14 categories that you initially identified as important events, correct?

A. I wouldn't characterize it that way. I did not identify them as important events. Those were news found in -- among Ripple Labs' curated news sources.

So whether I had an opinion that they were important or not is not how that set was formed.

Q. Didn't you select -- withdrawn.

[redacted]

Let's just talk about your methodology so the record is clear.

A. Sure.

Q. You started off, with respect to your effort to identify events, by pulling events that were reported by Ripple on its website and in other publications of Ripple, sponsored. Correct?

A. Taking all of them. Yes. Right.

Q. And you assumed that Ripple would not have put them on there unless Ripple thought that they were important. Correct?

A. I assumed that Ripple Labs would presumably have some basis for identifying some things and not other things, yes.

Q. And that yielded an initial selection of almost 700 news events, correct?

A. 700 articles, yes.

Q. And you then, with some adjustments, categorized all of those events into 14 categories. Correct?

A. Yes. That is correct.

Q. And then with respect to the aspect of your study that's reported or that you describe

[redacted]

in paragraph 98, you excluded 9 of those 14 categories. Correct?

A. I just want to refresh.

Q. I think that's right, 14 minus 5 is 9, I believe.

A. The analysis in Section F is based on five and, therefore, not based on nine, that's correct.

Q. So for the study that you did in paragraph 98 --

A. Yeah.

Q. -- you excluded nine categories --

A. Yes.

Q. -- correct?

A. That sounds right.

Q. And in those nine categories were approximately 400 Ripple news events, correct?

A. That's -- that sounds correct.

Q. Are you aware of any academic studies that support the exercise of subjective judgment that reduces the number of events studied by more than 80 percent?

A. Of course.

Q. And tell me why -- what you mean by

[redacted]

"of course."

A. I mean, I'm tempted to say "obviously."

Well, many event studies can be conducted on a single event and, therefore, are not considering dozens or hundreds or maybe thousands of other events.

It -- a -- a routine part of the event study methodology is the selection of events. That's how an event study methodology begins, is with a selection of events.

Q. Would the results of your test of collective events be different if you tested or included all of the 514 news events in all of the 14 categories that you initially identified?

MR. MOYE: Objection. Calls for speculation.

A. I -- I don't know the answer. It's not -- it's not pertinent to my opinions what the answer to that question is.

I don't believe I ever tested all events because it just wasn't -- it wasn't a relevant or pertinent exercise to undertake.

Q. Would you agree with this statement

[redacted]

that mathematically, a set of events is more likely to be jointly significant than individual events? Correct?

Well, why don't I rephrase that.

A. Yeah, please.

Q. Mathematically, a set of events is more likely to be jointly significant than an individual event. Correct?

A. I -- I apologize. The question just doesn't really make a great deal of sense to me. A single event is a single event. A set of -- a set of events, you can test the joint significance of a set of events.

By definition, you cannot test the joint significance of a single event. So I -- I'm just struggling with the question.

Q. Well, let's make it probabilistic. In what circumstance are you more likely to find a statistically significant correlation, randomly picking one of your 514 news events from Ripple and testing whether that event had a statistically significant market impact, or testing a larger number of Ripple events, to test whether it has a statistically significant

[redacted] market impact? And by "market impact," I mean on XRP.

A. I -- I simply cannot engage with that question. I don't understand it.

I'm sorry. I don't understand it.

Q. You don't think your odds of finding a statistically significant correlation is greater if you pick 105 news events than if you pick a single one?

A. Absolutely not. There's no reason to believe that it is.

Q. All right. Let me show you what we'll mark as -- apologies. Where are we?

MR. MASTERMAN: 4.

MR. FIGEL: Thanks. Tab 4, and that's the "Litigation Services Handbook, The Role of a Financial Expert."

(Litigation Services Handbook, The Role of a Financial Expert, was marked Exhibit 4 for identification, as of this date.)

Q. Are you familiar with this document, Dr. [redacted]

A. I don't think so.

[redacted]

MR. MOYE: Can you clarify whether you're talking about the entire handbook or just the section you've got here?

MR. FIGEL: Fair question.

Q. Why don't we start with the caption, which is "Litigation Services Handbook." Are you familiar with that publication?

A. I think I've heard of it.

Q. What context?

A. I don't know. Discussions.

Q. Would you agree this is a widely accepted handbook that discusses the application of economics and econometrics to litigation?

MR. MOYE: Objection. Foundation.

A. I -- I don't know that I'm in a position to characterize it that way. It may be.

Q. You don't know one way or the other?

A. No.

Q. All right. If you could -- the page number's a little awkward here, but if you go to the upper left-hand corner, you'll see something that looks like 19 Bullet Point 2.

A. Uh-huh.

[redacted]

Q. And there's a section that says a romanette a, "Overview of the Event Study Technique."

Do you see that?

A. Uh-huh.

Q. Can you read the first sentence into the record for us.

A. Event studies of the type used in litigation rely on two well-accepted principles. First, the semi-strong version of the efficient market hypothesis, which states that stock prices in an actively traded security reflect all publicly available information and respond quickly to new information.

Second, the price of an efficiently traded stock is equal to the present value of the discounted future stream, a free cash flow.

Q. Do you agree with the statement in the Litigation Services Handbook that, Event studies used in litigation should be based on a finding of the existence of the semi-strong version of the efficient market hypothesis?

A. As an absolute rule? No, I don't agree.

[redacted]

Q. Why not?

A. I think it depends very much on the context and the question being addressed.

I -- I would not be surprised that in many contexts, that assumption is necessary.

But I don't think that in all contexts that assumption is necessary.

Q. Do you believe that assumption is necessary with respect to an event study that seeks to prove the correlation between press announcements by Ripple Labs and impact on the market price of XRP?

A. Sorry, could you repeat the question?

Q. Do you believe that assumption, i.e., that you need a semi-strong version of the efficient market hypothesis, is necessary to identify, with reliability, the correlation between press announcements by Ripple Labs and any impact on the market price of XRP?

MR. MOYE: Objection. Compound.

A. May I restate the question back just to make sure I understood it?

Q. Well, why don't -- yes, go ahead.

A. You're asking do I believe that the

[redacted]

market must be -- or we must -- we must assume semi-strong efficiency to identify the correlation between set of events and an impact on market prices? Is that the question?

Q. No, it's broader than my question. So I'll withdraw my question and try again.

Do you believe you need to have evidence of a semi-strong efficient market in order to conduct the event study that you conducted in this case?

A. No.

Q. Why not?

A. Well, again, following the accepted methodology and peer-reviewed literature, we don't need the semi-strong hypothesis to hold to conduct the event study of the type that I did.

Q. But you agree that the semi-strong version of the efficient market hypothesis is not present with respect to the market for XRP. Correct?

A. Yes. I discussed this at length in my report. The received evidence and the economic literature, consistent with my own analysis, is that the XRP digital token market was likely not

[redacted]

semi-strong efficient during the period of interest.

Q. So if the Litigation Services Handbook is correct that you need a semi-strong version of the efficient market hypothesis to do an event study of this nature, then the conclusions of your event study would not be reliable, correct?

A. You've -- you've put together a lot of things in that question.

The semi-strong efficient hypothesis is necessary to draw certain inferences from an event study.

Those are not the inferences that I'm drawing from my event study. They're not the inferences that the Joo article draws from its event study or Gerritsen or any other article.

If, if you conduct an event study, and you find that there is no statistically significant reaction in price following an event -- so let's just -- let's just have an example to fix ideas.

XYZ Enterprises issues a corrective disclosure on January 1, and the question is,

[redacted]

Well, did that corrective disclosure cause the stock price to drop. Or change.

You conduct an event study, and you find no statistical evidence that stock prices moved in the statistically significant way following January 1.

Okay?

Question is what inference do you draw from that lack of movement. If you want to say, Well, because the price did not move, therefore, the corrective disclosure was not important, if you want to draw that inference from that statistical result, you can only draw that inference if you've established semi-strong efficiency of the market.

Because otherwise, you're left wondering, Well, perhaps the stock price simply hasn't moved yet, perhaps we need to wait, perhaps it will move next week.

The semi-strong efficient hypothesis allows you to draw an inference from an absence of movement.

I am not drawing inferences from the absence of movement in this case, as the

[redacted]

peer-reviewed academic literature that applies my event study methodology to markets, including XRP, are not drawing inferences of that type.

So, that hypothesis, while necessary in many contexts, is not necessary for the purposes of the analysis that I'm conducting here.

Q. Dr. [redacted] how do you know, if you don't have a efficient market, that the price impact that's reflected and that you are correlating isn't due to an event -- another event that predated the event you're measuring?

A. That's a very good question. And in my opinion, one has to conduct some robustness checks to reject that possibility. So, for example, I conducted an analysis to see if there was any correlation between events and price movements three days before the announcement. And I found across all of my models that there was no correlation.

I've -- I've conducted robustness checks on the length of the event window that I considered. The report focuses on three days. But I also conducted a robustness check on one

[redacted]

day and as long as seven days.

So, taken all together, it seems clear to me that the prices were not moving before this news was released, and yet began to move even in a few hours of the news being released, which is why I'm comfortable with the conclusions and opinions that I've offered.

This, again, is consistent with the accepted methodologies that you'll find in the literature.

Q. What was the data that you relied on to support the statement you just made that you observed a statistically significant market impact on XRP within hours of a news event?

A. It's -- it would be in, I think, Appendix E of my report, if we can flip there. I don't remember exactly -- I don't remember the table number. But if you allow me to flip through it, I'll point you to it.

I have a lot of appendices there. So I just need to -- I just need to find it.

(Witness reviewing document.)

A. I'm getting my pages confused. Hang on one second.

[redacted]

Q. Do you want to take a break and collect your thoughts?

A. No, no. It will just take a second. I'm just -- I'm turning the pages, and I just don't want to get everything out of order.

I'm getting there. Too many tables.

That's the three days early.

Here it is. Page 15 of Appendix E.

This is the significance of the correlation between --

Q. Give me just a second. I want to make sure I am with you. I'm sorry. You said page 15 of Appendix E?

A. Page 15 of Appendix E.

Q. Okay.

A. So that's the significance of correlation between XRP price increases and announcements in a one-day event window. That means we're comparing -- so, again, suppose the news comes out on January 1. We're comparing the price at the end of the day on January 1, with the price at the end of the day on December 31, meaning with the news released at some point in between, the markets had a few

[redacted]

hours to react to the event.

Q. Well, how do you know -- what data do you have to support the claim that the markets reacted within a few hours?

24 hours is the most you can say; isn't that right?

A. Well, no. The news is -- 24 hours is the longest it could be; one minute is the shortest it could be. So, presumably, we're talking about some time period in the interval between one minute and 24 hours.

Q. Did you have data that allowed you to measure the time between the release of the press release and the market impact?

A. Yes, because when we review the time stamps on our events, there is a UTC hour and minute.

Q. And what about the price data?

A. The price data is taken at the end of the day UTC time.

Q. So it's somewhere between 24 hours --

A. And one minute.

Q. -- and one minute. But you can't say more specifically --

[redacted]

A. I could. I mean, I'd have to go --

Q. Let me finish my question, please, Dr. [redacted]

You can't say more specifically than you believe you observed a price impact between the release of event and the market price, other than somewhere within one minute and 24 hours. Correct?

A. Well, if this -- I could, because we have the time stamps on the articles. So we could go article by article, and we could calculate the elapsed time between the publication of that article and the -- and the close of the day.

Q. Did you do that study, Dr. [redacted]

I know you -- I know you say you could. My question is, did you do it?

A. No, I did not do that.

Q. You don't have a basis to say that the observed price impact on the market for XRP occurred within hours of a news event unless you mean within 24 hours, correct?

A. No, that's not correct. Of course, I have a basis for that, I looked at those UTC

[redacted]

times, they were not all 12:01 a.m. of day.

Many of them were in the afternoon; some were in the morning. So, yes, I have a basis to know that in many cases, the close of the day is just within a few hours of the publication of the news.

Q. Did you control for number of minutes or number of hours between release of an event and an observed price impact?

A. That is not a control variable in these regressions, no.

Q. So if I understand your testimony, you're contending that your study with the one-day event window is sufficient to overcome the absence of an efficient market. Correct?

A. No, that's not my testimony.

Q. Well, are you contending that the fact that you used a one-day event window in some of your robustness studies is sufficient to remove any reliability issues from the fact that XRP does not trade in a weak form or semi-strong form efficient market?

A. No, that was not my testimony either.

Q. Let's be clear about it.

[redacted]

What, if anything, are you saying about the fact that you conducted a one-day event -- a one-day event window, and the absence of what you concede is the lack of an efficient market for XRP?

A. I pointed to a number of robustness tests and studies that I did as part of my research. So one possible view, which as a logical matter cannot be precluded a priori, is that when we see price reactions on these days, it might possibly be due to something that happened before the event in question. If the market is not semi-strong efficient, one cannot say in principle that that's impossible. It could be true.

So to test that hypothesis, I looked -- I looked at the question. I said, well, were prices -- is there a correlation between the news and price movements in the days leading up to the news?

And answer was no. In addition to that, I looked at a very short window, a one-day horizon, which in many cases is only allowing a few hours of response. And I found a

[redacted]

correlation that was yes.

This plus the other work that I did allows me to reach the opinion that what we are seeing in the prices is due to events on the day in question and not due to events prior to that or after that.

Q. And my question is, you believe that that methodology that you just described allows you to reach a reliable conclusion conceding that XRP does not trade in an efficient market. Correct?

A. Correct. Because the methodology that I'm applying, again, is found -- it's well-accepted methodology found in the literature where the -- where the -- academics studying a different set of events, but essentially investigating a similar question, asking does this set of events move XRP prices, those studies acknowledge the relative inefficiency of this market, they apply the methodology, and they reach their inclusions.

Q. Just so the record is clear, you're not contending that the -- that proof of an efficient market is necessary for you to reach

[redacted]

those conclusions, correct?

MR. MOYE: Objection. Asked and answered.

A. I -- as I've testified my report acknowledges that this market is almost certainly not as informationally efficient as the stock market. Academic studies acknowledge the same thing. They then proceed to apply a methodology, which I apply to the matter at hand. They apply it to the XRP market as I apply it to the XRP market. And the inferences that we draw are perfectly valid, even in the absence of semi-strong market efficiency.

Q. All right. If we could now go to Tab 5, which is the binder article that you cite in your report.

MR. MOYE: Are you marking a new Exhibit 5?

MR. FIGEL: Yes. Yes. I think we're up to 5.

(Academic Paper titled "The Event Study Methodology Since 1969" was marked Exhibit 5 for identification, as of this date.)

[redacted]

Q. You're familiar with this academic paper, correct?

A. I am.

Q. And you cite it in your report?

A. Uh-huh.

MR. MOYE: You have to say yes or no.

A. Yes.

Q. If you could read into the record the portion of this article beginning at the -- near the bottom of the first full paragraph under "introduction," beginning with "event study" and ending with "securities holders."

A. I'm sorry. The -- in the second paragraph below --

Q. The first -- well, the first -- I'm sorry. Second -- yeah, there is a paragraph there. The second paragraph under "introduction." Right after Footnote 1, just read the -- the sentences to the end of the paragraph, beginning with "event study."

A. The event study methodology has, in fact, become the standard method of measuring security price reaction to some announcement or event.

[redacted]

Want me to continue reading?

Q. Yes. Continue to the end the paragraph, if you would.

A. In practice, event studies have been used for two major reasons: To test the null hypothesis that the market efficiently incorporates information (See Fama 1991 for a summary of this evidence); and, two, under the maintained hypothesis of market efficiency, at least with respect to publicly available information, to examine the impact of some event on the wealth of the firm's security holders.

Q. All right. And what's your understanding of what Binder says is the first reason for conducting an event study?

A. So the -- the event study, meaning the -- the statistical analysis of regression and the interpretation of the results, can be used to test whether prices adjust quickly to certain announcements such as earnings announcements.

That can be part of an investigation into whether or not a particular market is efficient.

[redacted]

Q. And you didn't do that study in connection with the opinions expressed in your two reports in this case. Correct?

A. I didn't -- I didn't conduct that particular study, no.

Of course, I reviewed the academic literature on efficiency and digital token markets. And I did conduct another type of econometric test of efficiency to satisfy myself that I agreed with those academic results.

But I didn't conduct precisely the test that's described in this first point here.

Q. And the point of that test is to determine whether the market is efficient. Correct?

A. As described here, yes, that -- that could be a use of the event study methodology.

Q. And you didn't do that because we are in agreement that the market for XRP is not efficient. Correct?

A. It is certainly -- or I say "certainly." There's a significant amount of evidence that this market is less informationally efficient than, say, the U.S.

[redacted]

stock market. I don't dispute that.

Q. And you just gave us a long exegesis on all the reasons why you thought that proof of an efficient market was not necessary in order for you to reach a reliable conclusion, correct?

MR. MOYE: Are you describing his prior -- his prior answers? When you say long exegesis?

MR. FIGEL: Yes, that's what I mean.

MR. MOYE: Thanks.

A. You're asking me whether it's correct that it's been a long exegesis, or --

Q. I think that's undisputed.

No, I'm asking you whether the takeaway from your long answers was that you did not believe that it was a prerequisite to the reliability of the opinions you're expressing that XRP traded in an efficient market, correct?

A. Sure, right.

Consistent with the peer-reviewed academic literature, that's correct.

Q. All right. And then going on back to Mr. Binder, you'll see he says that the second reason for using an event study assumes, in his

[redacted]

words, the maintained hypothesis of market efficiency.

And in your study, you have not -- you do not have an assumed hypothesis of market efficiency with respect to the market for XRP, correct?

A. Correct.

Q. And under Point 2 in Mr. Binder's study, he refers to market efficiency, and he describes it as, At least with respect to publicly information -- publicly available information. Correct?

A. Correct.

Q. And that's economist code for semi-strong efficiency?

A. That's how I would interpret that, yes.

Q. Let's go to what I'll ask to be marked as Exhibit 6, and directing your attention to the work you did in the Rio Tinto case.

A. Uh-huh.

(Sworn declaration of Dr. Albert Metz in Rio Tinto case was marked Exhibit 6 for identification, as of this date.)

[redacted]

A. Yes.

Q. All right.

Just take moment. This is a -- copy of your declaration in Rio -- in the Rio Tinto case?

A. It appears to be, yes.

Q. And give us the context in which you prepared this declaration.

A. Well, that might be another long answer. But -- if that's okay.

Q. All right. I withdraw it. I'm sorry.

A. No, it's -- you want me to answer the question?

Q. No, I don't, not if it's going to be a long answer.

Let's go to page 11. I'm sorry, paragraph 11.

A. Page 11 only has my signature.

Q. I'm sorry, it's paragraph 11 on page 6.

A. Got it.

Q. Can you read -- read the whole paragraph for us.

A. Excuse me.

[redacted]

Statistical results such as the output of a regression model are necessary but not sufficient to conduct a complete analysis of the type I present in my reports concerning the ADRs. Assessing market efficiency is necessary to support certain conclusions and form certain opinions.

Q. And this was a sworn declaration, correct?

A. Correct.

Q. So in substance what you're saying is that assessing market efficiency is necessary to form certain opinions reached through conducting an event study, correct?

A. Yes, that's correct.

Q. And is it correct, in your opinion, that an assessment of market efficiency was necessary to conclude that Ripple's news events had an impact on the market price of XRP?

A. I'm sorry, could you repeat it? Sorry.

Q. And is it correct that in your opinion, an assessment of market efficiency was necessary to conclude that Ripple's news events

had an impact, a statistically significant impact, on the market price of XRP?

A. So, I -- I thought you were going to ask about Rio Tinto, but you're asking about Ripple.

Q. Uh-huh.

A. So the question is, in my opinion, was an assessment of market efficiency necessary to form an opinion?

Q. Uh-huh.

A. That was the -- that was the question?

Q. Reliable opinion.

A. Well, as I -- as I've testified, it depends on the nature of the opinion. It -- the market -- the XRP market does not need to be semi-strong efficient in order for -- in order to draw the inferences and reach the conclusions that I did for XRP and that other academics have in the XRP market.

The -- it comes down to what inference are you trying to draw from the statistical result. And I -- I don't know what I'm allowed to talk about in Rio Tinto, but let's just say hypothetically -- and maybe I don't even have

[redacted]

to -- I don't know -- I don't know the rules.

Hypothetically, it's possible that you could be arguing about the meaning of a non-result; in other words, the price does not move statistically. And so what does that mean?

Well, depending on the inference you want to draw from that null result, you may need to have established at least semi-strong market efficiency.

Q. The opinion you expressed in your declaration in Rio Tinto was that assessing market efficiency was necessary to support certain conclusions and form certain opinions, correct?

A. Certain conclusions and certain opinions, yes.

Q. Okay. And my question was, was an assessment of market efficiency necessary, in this case, in Ripple -- in the Ripple case, to support the conclusions and opinions that you reached?

A. Well -- so I've testified about this a few times now. Your -- your question now is a little bit different.

[redacted]

I think it is important to assess the efficiency, yes, because understanding whether the market is, let's say, as informationally efficient as the stock market or if it is less informationally efficient than the stock market, understanding that could inform how you conduct the test.

For instance, do you only look at a one-day event window, do you look at a three-day event window, so on, so forth.

So I do think it is important, and, of course, I did it to assess the efficiency. However, establishing that the market is semi-strong efficient is not necessary to reach the opinions that I've reached in the Ripple matter.

Q. So I understand your testimony, you said that market efficiency is not relevant to reaching an opinion about the absence of market impact. Correct?

Is that a fair summary of what you said?

A. I don't know.

I'm trying to go through the

[redacted]

negatives.

I apologize, just walk -- could you repeat it?

Q. As I understood your testimony, you said market efficiency is not necessary to conduct an event study that proves the absence of market impact.

A. No.

If you're going to draw an inference from a single event, which, of course, is not what we're doing in the Ripple matter, but may, for instance, have been something that was being done in the Rio Tinto or other matters, if you're going to draw an inference from a single event which presents a statistical result that prices do not appear to react in a statistically significant way, if you then want to draw an inference, Well, then, therefore, this event did not impact this price, that inference requires establishing semi-strong market efficiency.

Other types of inferences do not necessarily require establishing semi-strong efficiency.

Q. Does the presence or absence of market

[redacted]

efficiency effect a result in which you are -- you are rejecting a null hypothesis?

A. Does the presence or absence -- I'm -- please, one more time.

Q. Sure. Does the presence or absence of market efficiency -- sorry.

I've got a glitch here on the LiveNotes.

No, this -- I think I've got it now.

All right. Does the presence or absence of market efficiency effect a result in which you reject a null hypothesis?

A. Does it effect a result in which you reject a null hypothesis? Which null hypothesis are we rejecting?

Q. Whichever one you posit.

MR. MOYE: Objection. Compound.

A. Let me try and -- let me try and understand this question.

The null -- so I'll just tie it to the null hypothesis that was at issue in my analysis in this case.

The null hypothesis is that Ripple Labs and its actions and news about its

[redacted]

actions is independent of the XRP market price. That's the null hypothesis.

All right. Assuming that that is true, assuming that they are independent, certain things follow. If those things do not follow to a statistically significant extent, one can reject the hypothesis of independence.

Q. I'm sorry. One can or cannot?

A. Can.

All right. So -- so if it's independent, certain things should be true. If those things are not true, in the sense of they are so unlikely, then that allows a researcher to reject the null hypothesis of independence.

The analysis that I conducted did not -- did not and does not require that the XRP market be semi-strong efficient, just as the academic studies we've been talking about this morning do not require semi-strong efficiency to reject the hypotheses that they reject.

Q. Go back to your Rio Tinto declaration, paragraph 16. You mention a 10-factor review you did to market efficiency for the bond market for -- in Rio Tinto, correct?

[redacted]

A. All right. Not to the bond market, but to the ADR -- ADR market.

Q. Did you conduct a 10-factor analysis of the efficiency of the market for XRP in this case?

A. No, I did not. I didn't see any need to.

Q. All right. If we could go to Appendix F of Exhibit 1.

A. Yes.

Q. Why did you include Appendix F in your report?

A. A couple reasons.

It -- it may have been, probably was, adequate to cite to the academic literature on the relative inefficiency of the XRP market. But nevertheless, I wanted to conducted at least a -- a simple analysis of that question.

Probably more importantly, I wanted to explain why half -- why my statistical models or at least half of them correct for serial correlation in the XRP market. Since I'm going to maker that correction, I thought I should show the evidence that the serial correlation is

present at least at some times in the history of the XRP market.

So it was with those two objectives that I included Appendix F.

Q. And with respect to market efficiency, what you found was -- and I'm going to use rough numbers here -- approximately 50 percent of the days, you found that the market for XRP was not even weak-form efficient, correct?

A. I don't -- you may be right. I don't remember the 50 percent of days.

Q. I'm eyeballing it based on Figure 1.

A. Yeah, I mean, I might agree with your eyeball. It might be about 50 percent the days. It's certainly not just one.

Q. And just so the record is clear -- I think it's clear from your report -- you put an orange dot --

A. Right, where it's significantly different --

Q. Let me just finish my question.

You put an orange dot on the graph to reflect those days in which, based on your autocorrelation study, you found that the market

[redacted]

was not -- was not even weak-form efficient, correct?

A. Yes, that's correct.

Q. Did you calculate an autocorrelation study for Figure 1 using a period other than 180-day rolling window that you reference in paragraph 5?

A. I don't -- I don't remember if I did anything other than 180 days.

To me, it was enough that with 180-day window, you'd find evidence of serial correlation. That was enough to motivate me to make sure that I used regression models that correct for autocorrelation.

MR. FIGEL: It's noon. This is really just -- you're the -- you're the person on the hot seat. Would you like to take a break and go to 1:00? Do you want to break for lunch now? I'm indifferent to whatever your preference is.

THE WITNESS: How long have we been going since our last break.

MR. FIGEL: Hour and 20 minutes --

THE WITNESS: I suppose that's

Metz

appropriate. Why don't we --

MR. MOYE: Let's take lunch break now.

MR. FIGEL: Lunch break now. Okay.

THE VIDEOGRAPHER: We are going off the record at 12:01 p.m.

(Luncheon recess at 12:01)

[redacted]

A F T E R N O O N S E S S I O N

(12:56)

[redacted], Ph.D.

resumed, having been previously duly sworn by a Notary Public, was examined and testified further as follows:

CONTINUED EXAMINATION BY MR. FIGEL:

THE VIDEOGRAPHER: We are back on the record at 12:56 p.m.

Q. Good afternoon, Dr. [redacted] I would like to direct your attention back to the approximately 514 events that you divided into the 14 categories.

A. Yes.

Q. First, did you do an individualized assessment on each of those 14 events to determine whether, standing in isolation, they had a statistically significant impact on the --

A. No.

Q. -- price of XRP?

A. No. I did not test each of those events individually.

Q. What methodology, if any, did you use

[redacted]

in developing, or identifying, the 14 categories?

A. Categorizing events is part of the event study methodology. And I applied my understanding of economics and general judgment to try and create a taxonomy of categories which was helpful and complete.

Q. Was there any academic literature, accounting -- I mean any academic literature or econometric guidance that you looked to in formulating those categories?

A. Well, again, categorizing news is simply part of the event study process. So, for example, in -- and I -- I tend to mix the two studies up, but either Gerritsen or Joo or both, they collect a set of events, and they then categorize them by whether it's positive or negative. That's part of the process.

But -- other event studies, looking at other topics, will collect a set of events and will characterize them by different types.

So characterizing events, categorizing them, I view as simply part of the event study methodology.

[redacted]

Q. But the categories reflect your subjective judgment, correct?

A. The categories reflect judgment of what I think is a helpful taxonomy of how to organize these 700 articles.

Q. But it's your judgment, correct?

A. It is my judgment, yes.

Q. And it's not guided by any economic or econometric guidance or protocols that informs how you allocate the events into specific categories. Is that correct?

A. Well, it is guided by my understanding, general understanding of economics, in terms of how it might be useful when formulating an event study analysis to group certain events together as separate from other events.

Again, I -- I don't view that as separate and distinct from the event study methodology. I view it simply as part of the event study methodology.

Q. Do you disagree with this statement: Classifying news is necessarily a subjective exercise?

[redacted]

A. I agree that there is necessarily an element of subjectivity in the categorization of news. Again, that's part of the accepted event study methodology. It's an irreducible part of the event study methodology.

Q. Other than your judgment, did you rely on any external guidance or factors to help you identify the categories?

A. I -- I discussed the categorization with members of my team. But ultimately, it reflects my judgment on a useful taxonomy of these categories -- or, I'm sorry, of these events.

Q. And as we discussed previously, your opinion that statistically significant price movements in XRP are correlated with Ripple news events is based on your analysis of just 5 of those 14 categories. Correct?

A. No, I don't agree with that. It's -- I reviewed several categories in reaching that opinion. I also conducted robustness checks, including robustness around the possibility that I had miscategorized or misclassified news events. And I found that the statistical

[redacted]

results were robust. They held across all of those variations.

Q. Let's go to paragraph 48(b) of your report, Exhibit 1.

A. Yes, 48(b).

Q. These are the categories that you selected?

A. That's correct.

Q. All right. And five of these categories are categories that you -- the events for which you put together in a single collective study that you described in paragraph 100, correct?

A. Yes, I believe it was five.

Q. And those are milestones, trading platform listings, customer and product acquisition and investment, and Ripple commercialization. Correct?

A. Yes, that's correct.

Q. So that's five; is that right?

A. Yes.

Q. Put those aside.

Of the remaining nine, how many did you examine as a stand-alone category to see

[redacted]

whether you could find a statistically, quote, significantly -- statistically significant correlation between the events in that category and the market price of XRP?

A. In addition to those five, I performed an analysis on other initiatives, and office and staff announcements.

Q. And just so the record's clear, you then did not do an independent statistical analysis on case study, charity, corporate activity and announcement, litigation, market commentary and company review, markets reports, or miscellaneous. Correct?

A. That's correct. It wasn't necessary to reach my opinions.

Q. And with respect to the studies you did, or the analysis you did of the other initiative and office and staff announcement category, what was the conclusion of your analysis as to whether the events in those categories had a statistically significant impact on the price of XRP?

A. I found no evidence of a -- no evidence of a correlation between the

[redacted]

announcements in those categories and significant XRP price increases.

Q. So now we've got seven that I'm going to ask you to put aside, and the remaining seven, the ones that you said you did not perform an analysis of with respect to the events in that category. You with me?

A. Yes.

Q. With respect to those seven other categories, as you sit here today, you don't know whether the events in those categories, standing alone or collectively, had a statistically significant impact on the price of XRP, correct?

A. Correct, sitting here today, I do not know the answer to that question. It wasn't germane to my -- I -- it wasn't necessary for me to reach my opinion.

Q. And fair to say that the reason you didn't perform a -- an analysis of the events in those categories is, your judgment was that based on the nature analyses, it was unlikely that they would have a statistically significant impact on the price of XRP. Correct?

[redacted]

A. I -- I'd say it was a little bit more nuanced than that.

That's -- that's partially true, and certainly true of some categories. I would say, you know, even if we believe that Ripple Labs impacts XRP markets, even if we take that as true, for example, when they publish a couple of paragraphs talking about somebody who has used the product and -- and had a good experience with it, I -- my expectation before running an analysis would be, I don't -- I would be surprised if that moved prices. It just doesn't seem like the sort of thing that would move prices.

So in some cases, I agree, we could probably go through categories and -- and I would give you the answer that my expectation -- even presuming a link between Ripple Labs and XRP, my expectation would be you probably wouldn't see an association there.

But the -- the -- the real point is, it wouldn't -- it wouldn't particularly interest me whether we saw an association there.

So let me explain that for a second.

[redacted]

If there was no correlation between customer and product announcements of banks signing up to RippleNet and all those other things, if there was no correlation there, and yet there was a correlation among, you know, corporate overviews, or announcing who's going to speak at an upcoming conference, right?

So suppose there's no correlation among customer and product but there is a correlation among the announcements and speakers of upcoming events. Personally, I wouldn't find that terribly persuasive of a connection between Ripple Labs and XRP markets.

On the other hand, if there is a connection between customer and products announcing growth in RippleNet and new people signing up, and yet there was no correlation among announcements of upcoming speakers at conferences, again, I -- first of all, that wouldn't surprise me. But second of all, it wouldn't -- it wouldn't alter my opinion.

So I viewed some categories as meaningful to test in the sense that if we found a correlation, or if we did not find a

[redacted] correlation, that would be economically interesting to the question at hand.

And then there were other categories that I set aside where, in my view, whether you found it or didn't find it wouldn't really provide any -- much compelling evidence one way or the other.

So I just didn't think they were worth testing.

Q. All right. And just so the record's clear, of the seven we're talking about now that you didn't test, why don't you identify for us which ones you expect would not have a statistically significant correlation between the event and the impact on the price of XRP.

A. Well, I'm happy to do that, just -- just so we understand, you -- you're really just asking for my just prior expectation. And I haven't run the analysis, I don't know the answer.

My prior expectation is that the events in the case study category, which generally are articles on the Ripple Insights page where a bank or a financial institution,

[redacted]

you know, discusses how they've used RippleNet and -- and how it was fast and it was inexpensive --

Q. I don't mean to interrupt you. I'm just asking you to identify which ones -- as you sit here today, you don't have an expectation today or you --

A. Sorry.

Q. A list would be fine. The reasons why are less important and they're not responsive to the question I'm asking you.

A. Okay. I -- I understand.

Q. I'm sorry to interrupt you.

A. Again, I would -- case study.

Probably charity.

The litigation category, I -- you might expect a negative reaction, but there are very few events there so it was awfully small to test.

Market commentary and company overview, again, those are sort of puff piece articles. I wouldn't -- I wouldn't think that would move the price but --

The markets report, I wouldn't have

[redacted]

expected to move the price.

The miscellaneous, I'm trying to remember what's in there. I think the -- what is it, the Arrington XRP hedge fund. There's not -- there are very few things in there. May I consult Appendix C to remind myself?

Q. You're welcome to consult anything you need to make sure your testimony is complete and accurate.

A. Okay. Thank you.

I just -- just want to remind myself what's in that category.

(Witness reviewing document.)

A. Miscellaneous. So yeah, hackathon challenge, yeah, the Arrington fund. The Arrington fund, you know, that's an interesting event, but it doesn't really belong in any other category, at least in -- in my estimation.

Right, so, you know, this -- this set of events, it's kind of a mixed bag. I really don't know what my prior expectation would be on that set of events. And I think that's -- that's it.

Q. That's all. That's correct. Thanks.

[redacted]

So let me direct your attention to general market commentary.

A. Uh-huh.

Q. And I guess what -- I guess what the category is -- market commentary and company overview is the category.

A. Correct.

Q. All right.

So you rejected the possibility that XRP might have a statistically significant price impact on XRP -- withdrawn.

So you reject the likelihood that -- of -- press releases about market commentary and company -- and Ripple company overview would have a statistically significant impact on the price of XRP?

A. Well, with respect to your language, it's -- to reject the likelihood, that sounds like a --

Q. Well --

A. -- scientific procedure. You asked me my ex ante expectations. That's -- that's all they were.

Q. All right. As you sit here today,

[redacted]

it's your view, your judgment, that the events that were -- that you put in the category of market commentary and company overview would not have a statistically significant impact on the price of XRP, correct?

A. I still think your language is overstating the strength of my conviction. My -- my ex ante expectation is that it won't. I wouldn't -- I wouldn't elevate that to a -- to a view or an opinion. I -- you asked my opinion, you know. You asked me, do I think it would. I -- my expectation is that it wouldn't. That's all I can say.

Q. And just so the record's clear, and you didn't do a -- an analysis of this category to de-- to answer that question. Correct?

A. Correct. I don't recall doing an analysis of this category to determine one way or the other.

It -- I mean, it -- a lot of the things in this category -- this is, I think, the single largest category. A lot of it is third-party articles about what is cryptocurrency, and maybe they have a paragraph

about what is XRP, who is Ripple. It's a lot of just general market commentary, as the name suggests.

And my expectation is, I'd be surprised if that moved prices. It might. But I just -- I would be surprised.

Q. Okay. And the consequence, or the result, of excluding the events in the nine categories that you didn't include in the regression that you described in paragraph 100, was to reduce the number of Ripple events from approximately 514 to 113. Correct?

A. Well, that's -- yes, that's -- that's correct. We start with 514 events, and we end up studying 113 events, if I recall.

Q. Now, when you describe the process by which you conducted your analysis in your report, if I understand it correctly, the first thing you did was to regress market prices of XRP against 20 different models to determine what days there was a statistically significant change in the price of XRP. Correct?

A. Rather than XRP prices, if you had said XRP returns, yes. I -- I conduct -- I run

[redacted]

20 different regression models of XRP returns, against different -- 20 different sets of control variables.

Q. I accept the clarification, and I appreciate it.

But as a result of running the price data of XRP, against those 20 different models you are able to identify on a day-by-day basis each day in which there was a statistically significant price return of XRP, correct?

A. That sounds generally correct. Yes.

Q. Did you consult the results of that aspect of your study before you decided to exclude the approximately 401 events, that you put in the nine categories that we just discussed?

A. No. No. My -- my -- my organization of the news events was conducted without reference to results from the statistical models. It was based on my economic understanding of -- my economic understanding.

Q. I'm not sure your answer was responsive to my question. Let's just talk about temporally or chronologically.

[redacted]

As you described in your report, the first thing you did was identify the days in which there's a statistically significant price return for XRP. Correct?

A. Now, you -- all right. You really want to talk about the temporal sequence in which certain things were done.

We pulled -- you know, I -- we collected the news from Ripple Labs as one of the very first thing we did. Perhaps in parallel and simultaneously, we collected pricing data on digital tokens. But I certainly don't want to leave any suggestion that there was some kind of review of the statistical results which then informed the selection of news categories. That's categorically not true.

Q. How do you know that?

A. Because I conducted the study.

Q. I thought you said you had a team of people that were evaluating the data and making recommendations to you.

A. All I -- I conducted the study. It is -- it was my determination of how to categorize the news. I just -- I -- I can state

[redacted]

categorically that it was not -- the selection of events or categories, was not informed by a review of statistically significant results. That would be an improper procedure.

Q. But at least the way you described the process in your report -- give me just a second. Sorry.

So let's go to page 28 of Exhibit 1.

A. Yes.

Q. You -- you -- you there -- you set out on this page in -- in Section E a summary of the empirical methodology. Correct?

A. Yes.

Q. And you say, first, you specify the regression model of XRP returns, correct?

A. Uh-huh.

Q. And you identify the event window.

A. Uh-huh.

Q. And then you estimate the cumulative abnormal returns for each trading day, correct?

A. Uh-huh.

Q. And then you --

MR. MOYE: You have to say yes or no.

THE WITNESS: I'm sorry.

[redacted]

A. Yes.

MR. FIGEL: Thanks.

Q. You tested using you both parametric and nonparametric approaches, correct?

A. Correct.

Q. And that tells you on a day-by-day basis which days there is a statistically significant price return for XRP, correct?

A. Correct.

Q. And then the last thing you say you do here is, finally, you examine the interaction between the set of news days you've identified and the set of days with positive returns.

A. Correct.

Q. It suggests that you had identified the number of days with a statistically significant price return before you applied the event days in which you were looking for a correlation.

A. I'm genuinely surprised that you read it that way. I read it -- of course, I know what was done -- as saying, these are -- these are the -- the steps of the empirical analysis to which we then apply that to a set of news,

[redacted]

that we have identified. It doesn't say, we do this analysis to then determine the set of news that we will then test. I mean, you're inserting that step that's not there.

Q. Well, the first thing that you describe in your summary of the empirical methodology is a process by which you identify the days on which there is a statistically significant price return. Correct?

A. This is laying out the -- in a way that is meant to be helpful, a sequence of events that must be conducted in this order. In other words, you have to begin by specifying a regression, et cetera, et cetera, et cetera. All of that then gets applied to a set of events that you want to study.

Now, if -- if it would -- if you would like -- I mean, we could have inserted a paragraph in the beginning that says, first, select the events and then do all of these things.

I considered that to be there by implication. That is certainly how any event study is connected. You begin with a set of

[redacted]

events; then you run through the statistical analysis to get the -- to get the -- identify which days are significant. And then we test to see whether the events are correlated with the days of statistical significance. That's how it was done; that's how event studies are generally conducted.

Q. But what you just described is not how testified earlier. What you testified earlier to was that you took 500-some events, put them into categories, and then effectively rejected nine of the categories. Correct? And then you applied the remaining five categories to the days to which you --

A. And having -- having done that --

Q. Let me finish. I'm sorry.

A. -- I then followed these steps and this work --

Q. Let me just finish.

The -- what you described was that you did the regression that identified days with statistically significant price returns, correct?

A. I'm sorry. Say it again.

[redacted]

Q. You conducted a regression analysis that allowed you to identify what you believed were the days for which there was a statistically significant price return for XRP.

Correct?

A. I did conduct such regression analysis, yes.

Q. And then you also had a set of 500-some events that you had identified, correct?

A. Correct.

Q. And you reduced those -- the 514 events that you had in 14 categories to 105 events in five categories. Correct?

A. 113 events in five categories, yes.

Q. And 105 event days?

A. Event -- 105 unique days, yes.

Q. Right. And it was only the 105 event days that you applied to the days on which -- or that you correlated to the days on which there was a statistically significant price return.

Correct?

A. No. Again, I -- we've -- we've gone over this a few times. I tested categories in

[redacted]

addition to those 105. Remember, I tested office and staff announcements and noncommercial XRP initiatives, in addition to those other 113 events.

But, again, I just want to make it very clear, because I -- I worry that -- I just want to make it very clear, and I hope you're not trying to insinuate that I looked at which days were significant and then decided how to organize the news. That would be improper, and that's not how -- that's not what was done. And that's not how I conduct my work.

Q. Why would it be improper?

A. It would be improper because it's become circular. Obviously -- and this really is -- is criticism I have of the rebuttals of Dr. Marais and Professor Fischel. It is not proper to begin with a set of statistically significant days and then go look to see whether or not you can find news on those days.

That does seem to be the methodology that they're endorsing. It's not the correct methodology. Becomes completely circular. I'll give you an example.

[redacted]

It may very well be true -- I do not know if it is true or false, but it would not surprise me if Ripple Labs, some combination of Ripple Labs and Mr. Garlinghouse and Mr. Larsen and Mr. Schwartz probably issue a tweet every day. It wouldn't surprise me. May not be true, but it wouldn't surprise me if they're issuing a tweet every day.

So if I started with, well, here, a set of statistically significant days; let me go look and see whether or not I can go find something. I'd be willing to bet that the answer is, yes, I can go find something on each and every one of those days. Here's a tweet from Mr. Garlinghouse. Here's a statement from Mr. Schwartz. That's a meaningless exercise.

Dr. Marais and Professor Fischel seem disappointed I didn't do that exercise, but it's an utterly meaningless exercise. And that's not how I conducted this analysis, and it's not proper.

To be meaningful, you have to start with a set of events and ask the question: Does this set of events, is it associated with

[redacted]

statistically significant price changes or not?

Q. I want to do just a -- a simple little bit of arithmetic.

Had you tested for all of the 514 events -- I may have the numbers wrong -- 514 events against the regression analysis that identified statistically significant price returns, you still would have come up with 24 points of coincidence. Maybe a few more, maybe a few less. But your assumption is that the nine categories you excluded were unlikely to have a correlation with a statistically significant price impact on XRP. Correct?

A. Again, that was -- as we went through them, that was my prior expectation. I -- I don't think I had an expectation on the miscellaneous category, and the litigation category I probably would expect an association with negative returns rather than positive returns.

But certainly, if in the nine -- if in the five categories that we study, there are 24 days, if we add categories, we will always have at least 24 days, and, of course, we may

[redacted]

have more.

Q. Right. And given that we don't know what we don't know since you didn't do the test, you agree with me, rough numbers, that 24 over 105, which is the results of the corr-- the correlation between the Ripple events that you included and the days on which you found -- I'm sorry.

Withdrawn.

You agree with me that the -- of the 105 events that were included in the -- event days that were included in the five categories that you describe in paragraph 100, you found a correlation with 24 days of statistically significant price returns on XRP. Correct?

A. I think -- I think we'd have to -- we'd have to specify which model, because not every model covers the entire time period. But there -- I -- I -- there may be some models which -- to which the answer to your question is yes. I just don't have it memorized.

Q. Why don't we go to paragraph 100.

A. Yes.

Q. All right. Tell me if I'm reading

[redacted]

this right.

You identify 105 event days spanning 2,369 trading delays, correct?

A. Uh-huh.

MR. MOYE: Say yes.

A. Yes. I'm sorry, yes.

Q. And you had 105 Ripple event days, correct?

A. Yes, that's correct.

Q. And of those 105 Ripple event days, you found 24 days on which there was a statistically significant price return, correct?

A. Per the -- per one of the models. Just to -- just to be clear, again, using -- I'm reading this second sentence of paragraph 100 -- again, using the constant mean return model as an example. So these numbers all apply to that model.

Q. And that's Model 1, correct?

A. That's Model 1, correct.

Q. And so the simple arithmetic is 24 over 105, correct? Using the constant --

A. I mean, that -- that is --

Q. -- mean return model.

[redacted]

A. Sorry.

That is a simple arithmetic calculation one could do. That is not the arithmetic calculation that I did to reach my conclusion. I just want to be clear.

But one could divide 24 by 105.

Q. And you'd get about 23 percent, correct?

A. That sounds right.

Q. And if you had run 514 event days against the price returns you found through the constant mean return model, and you still found 24 days of correlation, you'd have about 5 percent, correct?

A. Well, if, if, if. That would -- that would be what the arith-- the arithmetic would show.

Q. Was that a factor in your subject-- the exercise of your subjective judgment to exclude 9 of the 14 categories, from the analysis that you conducted as described in paragraph 100?

A. No. There -- there's -- there is no economic significance to that result.

[redacted]

There's no economic significance to that result whatsoever. It's not an interesting result. I'm not -- didn't run the analysis because it's not interesting to run that analysis.

Q. And why is it not interesting from an economic perspective?

A. Because it -- because once you start throwing in a bunch of articles that are not breaking any news, they don't even purport to break any news, once you -- one you throw in a bunch of things which have nothing to do with whether Ripple Labs is going to impact XRP prices, testing whether they impact XRP prices just becomes an uninteresting exercise.

For example, we could do an event study on whether earnings announcements impact stock prices. That's an interest question. That's an interesting analysis. People have done it.

It is not an interesting question to say, Well, to those earnings announcements, let's add every press release that the company ever issued about anything whatsoever and see if

[redacted] there's an association with price movements.

The reason that's not interesting is because, even before you do it, you sort of know that the answer is going to be, it won't. Because if it were -- if it were that easy to move a stock price, if all a company had to do to move a stock price is issue a press release about something, they'd do it all the time and move their stock price all the time, so it's just not an interesting question.

It was interesting to me to see if these categories, product announcements, customer announcements, things related to growing the XRP ecosystem, if that moves the XRP market, that's an interesting result.

Finding that every time the New York Times wrote an article about cryptocurrency as a mentioned XRP, that that does not move the XRP market, is neither here nor there. It's just irrelevant.

Q. But that's not the source of events that you collected, Dr. [redacted] The source of events that you collected were what you described as publications by Ripple that you

[redacted]

deemed that Ripple thought was important. Correct?

A. No. What I collected were news on Ripple's curated web page, which includes, for example, links to third-party articles. They link to a New York Times -- I mean, maybe not a New York Times, but they will link to somebody else who wrote an article saying, The 50 best places to work in the Bay area and Ripple Labs is, I don't know, Number 23. Right? They want to trumpet that. They want say, Hey, great, we're a great place to work, so they link to an article like that.

Now, testing whether the XRP market is going to move in response to that kind of announcement is just a waste of time. It's uninteresting.

My expectation is that it won't. But it wouldn't matter to me if it did.

Q. Could you read for me the portion of your report set forth in paragraph 48(a).

Just the first sentence.

A. 48A.

I start with the news which

[redacted]

Ripple Labs has identified to be important by virtue of, 1, having issued a press release about the event, or 2, having written about it on its Insights news page, or 3, having linked to a third-party news outlet in its curated newsroom page.

Q. And then read the last sentence of paragraph 48A.

A. I simply assume that based on its understanding of its business and industry, Ripple had some basis to highlight certain events and not others.

Q. So you -- in your methodology, you substituted your judgment for Ripple about what events you thought were important to evaluate as to whether it had a statistically significant impact on the XRP price return. Correct?

A. No, that is not correct. That is not a fair characterization of what happened. Ripple did not assemble these articles for the purposes of conducting an event study on whether there's an impact on XRP markets.

They assembled a set of articles that conveyed information that they generally wanted

[redacted]

to convey, whether that would impact XRP markets or not.

So they had their objectives in mind, and I have my objectives in mind, and they are not same objectives.

So they're perfectly free to link to an article trumpeting Ripple Labs as one of the best places in the Bay area to work, that's perfectly fine. But that is not suitable material for an event study of the type that we're conducting.

Q. You wrote in your report, that you assumed that Ripple had some basis to highlight certain events and not others. Correct?

A. I did write that, yes.

Q. And you said, in your report, that you started with news which Ripple has identified to be important. Correct?

A. Correct.

Not for the purposes of conducting an event study but just news that they thought was important.

Q. Why do you think -- what is your assumption about why Ripple thought it was

[redacted]

important to include these events on its website?

A. I wouldn't presume. Most of them were -- almost all of them were positive in nature, saying good things about Ripple, good things about cryptocurrency, good things about XRP.

I -- I don't find it surprising that a company would want to almost retweet, if you will, if not literally, but -- but call attention to press accounts and press reports that are favorable or shed -- put their products in a -- in a good light, I don't find that surprising.

Q. Did you assume that the reason Ripple had these events on its website and publicize them was to increase the market price of XRP?

A. I -- I'm not going to speculate on their motive for linking to things. It's not -- it's not the domain of an economist to speculate on their motive.

Q. All right. Let's now go to paragraph 85.

A. Yes.

[redacted]

Q. All right. And you note there that, Not all product developments might be expected to lead directly to increased utilization of XRP.

Correct?

A. I just -- bear with me one second.

Correct.

Q. Why did you consider it important to observe that not all product developments might be expected to lead directly to increased utilization of XRP?

A. Again, it -- if there is a -- an announcement or event, the nature of which wouldn't be expected to have any sort of impact on XRP, even if there is a link, which there may not be -- that, again, is what we're testing -- even if there is a link between Ripple Labs and XRP markets, it's not -- it doesn't become an interesting event to test, because whether you find something or whether you don't find something doesn't provide evidence one way or the other that's helpful to the matter at hand.

So announcing that MIT is opening up a validator, that's fine. They're welcome to

[redacted]

announce that. Some people may find that interesting. The link between that and somebody saying, Oh, well I guess I'll go buy XRP, seems somewhat tenuous.

So whether that event is or is not associated with XRP price increases is not an interesting question.

I note that in Appendix E, again, one of the robustness tests I run is to take all of these events that I've excluded here and add them back just to show that my statistical results do not depend in any way on these exclusions.

Q. You didn't write that not all product developments might be expected to lead to a statistically significant price impact on XRP, did you? In paragraph 85.

A. I did not write -- I'm sorry. Say it again.

Q. You did not write in paragraph 85 that not all product developments might be expected to lead to a statistically significant price impact on XRP, did you?

A. No, I did not write that.

[redacted]

Q. So here you're focusing on increased utilization of XRP. Correct?

A. Correct.

Q. And that's not what you were testing for, was it?

A. No. I'm testing for price impacts.

Q. So are you assuming that only news events that lead to increased utilization of XRP will result -- will result in a price impact?

A. Certainly not.

Q. But the basis on which you excluded six events from this category was based on a judgment that those events would not lead to an increased utilization of XRP. Correct?

A. These events did not seem relevant to testing for a link between Ripple Labs and the XRP market, hence I excluded them. Again, my results hold if you want to add them back. I have that result in Appendix E. So nothing hinges on this exclusion.

But it struck me as appropriate to exclude events that didn't speak to XRP utilization.

Q. Just to be clear, the study you talk

[redacted]

about with the add-backs, you didn't add back all of the events, did you?

A. No. I added back these -- these sorts of exclusions. So, for instance, when I say, Identify some announcements as being stale, or in this case, I identified some announcements as being -- I think I used the phrase "direction uncertain," I do a -- one of the robustness checks that I do in Appendix E is to add them back them, just to demonstrate that my results are not dependent on these exclusions.

I still think they're appropriate. I still think they're the right thing to do. But if somebody strongly disagrees and thinks that we ought to add back the event of MIT announcing a new validator, we can add it back. It doesn't change the results.

Q. Let's just be clear about what events you added back in, in the study or the analysis that you just described.

You added back in the events from particular categories that you excluded based on a subjective judgment that you believed it wouldn't have -- wouldn't lead to an increased

[redacted]

utilization of XRP. Is that correct?

A. I added back -- before I -- may I consult Appendix E? I just want to make sure I -- I don't want to say something that's not true. Let me just check one thing in Appendix E. I certainly add back those events. I think I also added back events that were stale.

Q. If you wouldn't mind, as you do that, would you just make sure that the record is clear what information you're referring to.

A. Sure. So I did a robustness check in Appendix E, which I'm just looking for now. And I just want to remind myself exactly of the parameters of that robustness check. And I have so many robustness checks that I just -- it takes me a minute to find them.

(Witness reviewing document.)

A. Oh, okay. So I'm looking at page 6 of Appendix E.

So page -- let's look at both page 5 and page 6. Page 5 are the specific test statistics on the select set of customer and product developments. So that's the set that

[redacted]

we've been discussing where, starting with customer and product announcements, I exclude those that are stale or have an uncertain directional implication for XRP utilization.

So what's on page 5 of Exhibit E are the test statistics which underlie the exhibit in the body of the report, if you follow me.

Q. Uh-huh.

A. Page 6 is exactly that same set except you'll see customer and product developments, all. So here I've just added back everything that I had excluded from the first one, just to show that the results are essentially unchanged.

Q. All right. Let's go to Appendix C.

A. I'll definitely need my reading glasses for this.

Q. If you have them, put them on.

Appendix C lists all of the individual events that you collected and placed in the various categories. Is that right?

A. It does. Strictly speaking, it lists all of the documents, but it also lists all of the events.

Q. And pages 3 through 6, going back to

[redacted]

where we were, is the customer and product category. Correct?

A. Excuse me.

Yes, that appears to be correct.

Q. And do you see, event ID 255 on the last line of page 4?

A. Yes.

Q. And you see there's another Event 255, on the first page of page 5?

A. Yes.

Q. And the date of that event is November 22, 2027; is that correct?

A. 2017.

Q. 2017. I'm sorry. Yes.

A. Yes.

Q. And this is one of the events you included in your analysis. Is that right?

A. It's certainly part of the category. I would have to go back and see if it was on the list of excluded events. I don't think it was.

So --

Q. So let's go to page -- I think it's page 20 of your report.

I'm sorry. Page 40, Figure 20, I

[redacted]

think, is what it is.

A. Right. Yeah, no, it doesn't appear to be on that list.

So it should have been -- I believe it was included.

Q. So Event 255 is not listed. Is that correct?

A. I didn't see it listed, no.

Q. And you don't have an event dated November 22, 2017?

A. On that list, no.

Q. Going back to -- apologize for this, but I don't have a better way to do it.

All right. The second document or the second event or document, you give Document ID 7790. Is that right?

A. This -- this second document for Event 255, is Document ID 7790. That's correct.

Q. Right. And that's in Appendix C, Standard Chartered, Axis launch payment services with Ripple Tech, correct?

A. Correct.

Q. All right. If we could go to the press release from November 22.

[redacted]

This will be the CoinDesk.

So I think this will be Exhibit 7.

(Press Release titled "Standard Chartered, Axis Launch Payments Service with Ripple Tech" was marked Exhibit 7 for identification, as of this date.)

MR. MOYE: I'm sorry. I have 6. Did I miss one?

MR. FIGEL: I had 6 as his declaration from Rio Tinto.

MR. MOYE: Got it. Thank you.

Q. Do you recall looking at this press release?

A. It seems familiar, yes.

Q. And this talks about a new cross-border platform that's being built on top of technology developed by Ripple. Correct?

A. Uh-huh.

Q. And if you look at the last paragraph, could you just read the -- the first sentence of the last paragraph.

"Not included."

A. Not included in the cross-border platform is Ripple's XRP digital asset. The

[redacted]

spokesperson for the start-up confirmed that SC -- which I assume is Standard Chartered -- and Axis are not using XRP to facilitate transactions between Singapore and India.

Q. So fair to say that the events described in this press release would not lead to increased utilization of XRP, correct?

A. As described here, this particular product, it says it is not using XRP.

It's a cross-border payment platform built on top of Ripple technology. But this particular technology, it says, is not using the XRP token.

Q. Can you tell us why you didn't exclude Event 255, from your analysis on consumer and product announcement events?

A. Because this is an announcement of banks using Ripple technology to effect cross-border payments. The particular corridor, I agree, it says it's not using XRP. But this is, I would say, an expansion or enhancement to the ecosystem that Ripple is interested in building.

It is an interesting question, it

[redacted]

seems to me, to know whether or not this event moved XRP prices. May it did; maybe it didn't.

Q. He didn't perform a test to determine whether it didn't or it didn't even though it was an interesting question, correct --

A. I --

Q. -- Dr. [redacted]

A. I did not look at this event in isolation to determine whether or not to include it in the study. I do not know, sitting here today, whether XRP prices move following this event or whether they do not.

Q. Now, if you go to the second paragraph of this release, you see where it says, According to SC's release?

A. I'm sorry, where?

Q. Second paragraph, second line at the right.

A. Yes.

Q. And SC presumably is Standard Chartered?

A. That would be my interpretation.

Q. Did you go to -- look at Standard Chartered's release?

[redacted]

A. Unless it was in the Ripple set, if they didn't link to it, no, I didn't go look at it.

Q. Why not?

A. I didn't see the need to.

Q. Do you know how many other press releases you considered in which you included as an event an announcement about a customer who was using a Ripple-related product that did not include the use of XRP?

A. In many of the announcements, it's difficult to know explicitly whether XRP is going to be utilized or not.

It struck me as an interesting question to know if announcements of this type, announcing new customers using Ripple technology, whether that moved XRP prices or not.

Your expectation might be that this announcement wouldn't. You might be right.

Q. And just so the record's clear, even though you find that to be an interesting question and even though you acknowledge that at least with respect to this press release,

there's not a direct increase in the utilization of XRP, you didn't test to see whether it was statistically significant. Correct?

A. I included it in a set of events and tested the joint significance of that set of events.

To the extent that this one has nothing to do with XRP and XRP prices don't react, my results get a little bit weaker. That's -- that would be the downside.

Q. Why do they get weaker?

A. Well, if you add an event -- I mean, if you add an event and there is no price reaction, that makes the joint significance of your set of events weaker.

Q. So the 400 or so events that you excluded, had you included them, would have made the results of -- the joint significance of the set of events weaker. Correct?

A. Meaningless and almost surely weaker.

But the important point is that it's a meaningless exercise to run.

Q. Let's go to -- apologize for having to go back and forth like this -- page 5 of

[redacted]

Appendix C.

You with me?

A. Uh-huh.

Q. And you see there's three events, or three -- I guess press releases or documents that you associate with Event 296.

A. Yes, I see three documents with Event 296.

Q. And then going back to page 40, this was not one of the events you excluded from your study with respect to consumer product announcements, correct?

A. I think that's correct, yes.

Q. Did you personally review the documents that you've associated with Event 296?

A. I believe so.

Q. Understood them?

A. I believe I did.

Q. The third document, which you have identified as Document 7758. You with me?

A. Uh-huh.

Q. And the headline of that is, "Ripple Blockchain Networks Adds China Payments Provider."

[redacted]

Do you see that?

A. I do.

Q. Do you know -- why don't we go to that document.

This will be Exhibit 8.

(Article titled "Ripple Blockchain Network Adds China Payments Provider" was marked Exhibit 8 for identification, as of this date.)

Q. And I'm showing you what I believe is Document 7758, which is an -- an article dated February 7, 2018.

A. Uh-huh.

Q. If you go to the last -- well, let me just read it to you and save a little time. I'm reading to you from this document.

The product differs from Ripple's xRapid solution, which, unlike xCurrent, uses the company's custom cryptocurrency XRP.

So this is another announcement in which a customer utilized a Ripple-related product that didn't require the use of XRP. Correct?

A. It appears to be.

[redacted]

Q. And why didn't you exclude this event from your study if it didn't -- if it announced an event that didn't result in an increased utilization of XRP?

A. Because this is an example of a customer and product announcement. A major payment provider in China joining RippleNet using Ripple's technology strikes me as particularly interesting to know whether XRP prices respond to events of this general type.

Q. And you don't know the answer to whether there was a statistically significant price impact on XRP as a result of this announcement. Correct?

A. This particular event? I don't know -- I don't know the answer to that.

Q. Now, as with this one, you -- certain of the events that you identified had multiple documents associated with them, correct?

A. That is correct.

Q. What methodology did you use to determine whether multiple documents should or should not be associated with a specific event?

A. I read the content of the documents to

[redacted]

see if they provided substantively similar information.

I looked at the dates of the documents to see if they were adjacent in time, if not simultaneous in time, to determine if they were essentially referring to the same event.

Q. And again, this was just your subjective judgment as to whether there was one event or more than one event?

A. It's a -- it's a judgment exercise. In many cases, I think there would be very little controversy. You may perhaps find a case where you think there is some controversy. But generally I think it's fairly straightforward, at least in this set of events, to say that certain documents were essentially talking about the same thing.

Q. And as I understood your answer, other than reading the documents that you have listed in Appendix C, you didn't do any additional research. Correct?

A. Well, again, we -- I -- I looked at the dates of publication. If they were two years apart, that would probably make it

[redacted]

unlikely that they were referring to exactly the same event.

If they're on the same day, or a day apart, or maybe two days apart -- so it was a -- a -- based on the content of the announcement but also some consideration to publication date.

Q. All right. But that's all information that appears within the four corners of the document, correct?

A. Generally, yes.

Q. My question is, did you look outside the four corners of the document to get more information that it allow -- would allow you to have a more informed judgment about whether a series of documents should be correlated with a single event or multiple events?

A. I can't say that I particularly did more than read the documents to see if they were talking about the same thing.

Q. Can you think of any instance where you did anything to investigate whether documents should be associated with a single event or multiple events, other than reading the documents themselves?

[redacted]

A. Just trying to remember.

There -- there may have been times, I -- I seem to -- I seem to recall there may have been times when a document might say -- this is just a -- this is just a -- an example of type, not a literal quote.

Seven banks join RippleNet, and then another document, maybe published the same day, lists seven banks and says, These joined RippleNet. I may have done a little bit of work to make sure that these were talk-- that the one document was talk-- was referring to the same set.

There may have been instances like that. I think they were few and far between.

Q. You may have done many things, Dr. [redacted] Do you have a specific recollection, as you sit here today, of doing that, of looking beyond the four corners about -- beyond the four corners of the documents that you pulled off the -- the Ripple website to investigate whether they related to one event or more than one event?

A. Yes, I -- I --

Q. Which event?

A. I can't tell you which event it was. There was -- there -- I -- I do recall there was an event. There were documents that were separated by a couple of days of publication, and I wanted to see if they were really describing the same thing. I don't remember what the event was.

Q. Other than that investigation as to that one event, do you recall doing that on any other occasion?

A. I don't have a specific recollection.

Q. Could you now go to page 22, paragraph 48(c)?

A. Page 22.

Yes.

Q. Can you read for the record the sentence you wrote beginning with the word "First."

A. First, the announcement may substantially repeat a previous announcement. I term such announcements as stale.

Second, the nature of the announcement may not have a particular directional

[redacted]

implication for XRP prices, even assuming the hypothesis of independence is false. I describe such announcements as direction uncertain.

Q. All right. Directing your attention to the events you believe to be stale. Can you tell us what you mean by "stale"?

A. There may be a document published on a certain date that announces some new information, and there may be another document a week later that essentially repeats that information but doesn't appear to be providing new information.

Q. Okay. If we could go to page 3 of Appendix C.

A. Yes.

Q. And directing your attention to Events 11, 12, and 13 in the customer product category.

You with me?

A. Yes.

Q. You identify all those events as -- or the document date for all those events as September 24, 2014. Is that correct?

A. The documented date is September 24,

[redacted]

2014. Yes.

Q. And you didn't exclude any of these three events from your analysis as stale. Correct?

A. Correct.

Q. So all three of these events -- and these are individual events, right? There are three events here?

A. Three events all on the same day, so they get counted once. You can exclude them if you want. Doesn't make any difference.

Q. And that was all part of your analysis that found the correlation between customer and product news and XRP returns. Correct?

A. That single-event day is part of the analysis, yes.

Q. Let's go to what I believe is Document 7594 in Appendix C, which is titled, I believe, Hundred-year-old CBW Bank, one of first U.S. banks to integrate Ripple's transformational money-transfer protocol.

You see that? I think this would be Exhibit 9.

(Article titled "Hundred-Year-Old CBW

[redacted]

Bank One of the First U.S. Banks to Integrate Ripple as Transformational Money Transfer Protocol Ripple" was marked Exhibit 9 for identification, as of this date.)

A. 7594, one of the September 24 documents. Yes.

MR. MOYE: Are we marking this as 9?

MR. FIGEL: Yes.

Q. You with me, Dr. [redacted]

A. Yes.

Q. The first paragraph, it suggests that CBW Bank continues its pioneering spirit as one of the first U.S. banks to use the Ripple protocol for modern real-time payments between the United States and other countries globally.

Do you see that?

A. Yes, I see that.

Q. And this, again, is a press release talking about use of the Ripple protocol?

A. Yes.

Q. What's your understanding of what the Ripple protocol was?

A. Some documents seem to describe it as

[redacted]

the open-source blockchain technology. I suppose that's -- that's essentially my understanding of what they mean by Ripple protocol.

Q. Go to the second page. I guess it's on the back of the one you have.

A. Uh-huh.

Q. Can you read the first two sentences, under the heading, About Ripple.

A. Ripple Labs developed the Ripple protocol, which makes transacting as easy as emailing. The San Francisco Bay start-up is funded by Google Ventures on --

Q. I'm sorry. I don't mean to interrupt, but you're reading about Ripple Labs. I would -- about Ripple.

A. I'm sorry.

Ripple is an open-source distributed payment protocol. It enables the free and instant transfer and exchange of any type of value, including dollars, yen, euros, and even loyalty points.

Businesses of any size can easily build payment solutions -- build payment

[redacted]

solutions, pardon me, such as banking or remittance apps, and accelerate the movement of money on Ripple. Ripple enables the world to move value like information moves today. For more information about Ripple, please visit a website.

Q. No mention of XRP, correct?

A. XRP does not appear in that paragraph, no.

Q. Any -- anything you see in Exhibit 9, to suggest that this document would be associated with the increased utilization of XRP?

A. This document describes a bank joining the Ripple protocol. How that might impact XRP prices is an interesting point to study. I include it in a test to see whether there's a correlation, and I found that there was.

Q. So you were aware at the time you were doing your event selection that some of these press releases specifically stated that XRP was not going to be used in the product that was being described. Correct?

A. In some cases, yes.

[redacted]

Q. And you elected to include those events in your study, notwithstanding your awareness that they explicitly stated that XRP would not be used.

A. Correct. You might have a hypothesis that XRP prices should not react following such announcements. That's a perfectly valid hypothesis to have.

In fact, let's remember that is the null hypothesis of the experiment, is that XRP prices are not going to react following these events. I tested that hypothesis. I was able to reject it.

Q. So if I showed you the other documents that you have correlated with Exhibits 11, 12, and 13 and I showed you that they also didn't involve a product that would require the use of XRP, it wouldn't change the conclusions you're reaching in your report. Correct?

A. No, not at all.

Q. Well, the answer to my -- I had the "correct" question. So the answer is, no, it would the not change --

A. No, it would not change my opinion.

[redacted]

Yeah.

MR. MOYE: Just for clarification, are you making representation that those other documents do not refer to XRP or describe it?

MR. FIGEL: Why don't we -- if we want, before I make that representation, let me just double-check.

MR. MOYE: Right, because I would ask the same clarification about this document.

MR. FIGEL: I'm sorry. Which document?

MR. MOYE: I would ask whether you're making that same representation about this document. Exhibit 9.

MR. FIGEL: That document, I believe -- this is 9 you're talking about?

Well, this document, we can ask Dr. [redacted]

Q. Do you see anything in this document to suggest that the product or the institutions described here, will be using XRP in any of the products?

A. I certainly don't see any -- I don't

[redacted]

see any statement that they're not. I think somebody might read this and think, if they're using the Ripple protocol, they may very well be using its native digital token, XRP.

So I -- I can imagine that some people might read an announcement like this and think that XRP is being used. But it doesn't say -- that I can see, it doesn't say whether it is or isn't.

But in any event, it wouldn't -- it wouldn't alter my opinion.

Q. All right. So let's go to -- just -- I will withdraw my representation so we don't have any confusion about misleading the witness.

MR. MOYE: Fine. Thanks.

Q. Let's go to Document 79 -- I'm sorry. My eyes are getting bad, too. I believe it's 7595.

And that is, I believe, Cross River Bank to integrate Ripple for real-time international payments.

Do you see that?

A. I do.

MR. FIGEL: We'll mark that as

[redacted]

Exhibit 10.

(Article titled "Cross River Bank to Integrate Ripple for Real-Time International Payments Ripple" was marked Exhibit 10 for identification, as of this date.)

Q. Have you seen this document before, Dr. [redacted]

A. I have.

Q. This is a document with the same date, as Exhibit 9, that you have included as a separate event.

Do you see that?

A. Yes.

Q. If you recall from Exhibit 9 -- withdrawn.

What do you understand the substance of the information included in Exhibit 10?

A. I understand it to be substantially similar to Exhibit 9, just a different bank joining the Ripple protocol.

I believe there also -- there's an article or a press release from Ripple which I think joins these two things and talks about

[redacted]

both of them in the same context. But --

Q. And do you see anything in this document to suggest that the banks or the products that are being described contemplate the use of XRP?

A. Well, I certainly think somebody might draw that inference. If they're joining the Ripple protocol, they might reasonably think that they're going to use its native token. It doesn't say, We will use XRP. And I don't see that it says, We will not use XRP.

But again, that's -- it doesn't really have any bearing on my opinion.

Q. Now let's go to Event 13. That's associated with three documents. Is that correct?

A. Yes.

Q. Actually, four documents.

A. Yes, four.

MR. MOYE: That's so small. I'm sorry.

MR. FIGEL: Yeah, I know.

Q. So the first of these four documents that you correlate with Event 13 have the

[redacted]

headlines, Two U.S. banks are ready to embrace the Ripple protocol allowing instant global money transfers.

Do you see that?

A. I do.

Q. Let's -- let me show you what we believe is -- it's 11, but it is the article that says -- yeah, it's 7923, Two U.S. banks are ready to embrace.

MR. MOYE: Do you want him to look at it?

MR. FIGEL: I think so, yeah.

Well, why don't we do -- let me see if I can cut through this.

Q. We have four press releases or four documents that you associate with a single event, correct?

A. Yes.

Q. And we have two other events with documents that you associate with separate events?

A. Yes.

Q. All occurring at or about the same day?

[redacted]

A. On the same day. I think that's --

Q. Well --

A. -- an important point.

Q. Some are the 24th, some are the 25th?

A. But the event day, I believe I assign 9/24 to all.

Q. So why do you -- why did you decide to treat those various press releases as different events?

A. Since they're all on the same event date, it's immaterial how I do that. I could have grouped them all together as -- and given them one event number, it wouldn't make any difference.

One document talks about CB -- or Cross River Bank, the other talks about CBW Bank, and then you have a series of documents that talk about both.

They all came out basically on the same day and maybe one came out the following day. The event date is September 24. We could call that one event, we could call it ten events.

Q. How do you know, then, which of the

[redacted]

various announcements are associated with the statistically significant price return on that day?

A. Well, I don't know that there is a statistically significant price return on that day. But in any event, it doesn't make any difference to me which one of them is.

Recall that Ripple Labs has to take the position, or has taken the position, that none of them can be driving the price. Whether it was the C-- again, assuming there was a significant return on that day, which I -- I'm not conceding is true, I don't know if it's true, but even if it were true, it doesn't make any difference to my opinion whether that was driven by the Cross River Bank joining or the C-- I keep saying CBW. Yeah, CBW Bank joining.

It -- it wouldn't make any difference to my opinion if it was a little of one, a little of the other, a little of both. Ripple Labs has taken the position that there would no association, it couldn't be either one. So it -- it doesn't matter to my analysis which one it is.

[redacted]

Q. So if I understand your answer, all your methodology is seeking to prove is that on one day and one action by Ripple Labs, if there is a correlation, that you have disproved the hypothesis you're seeking to disprove; is that correct?

A. No, that's not correct at all.

Q. Well, you just said, if I understood it right, that what you understood Ripple to be saying is that no Ripple action ever had an impact on the price of XRP. Correct?

A. I understand Ripple disputes that the XRP market looks to them to create value, and they dispute -- also some of the expert reports they submitted in this matter dispute that there's any connection between Ripple Labs and XRP prices.

Q. And so what exactly is it that you believe your study is relevant to with respect to the issues you just identified?

A. I'm testing that hypothesis.

Q. Well, which hypothesis? You named about five.

A. I think I've named one. I'm testing

[redacted]

the hypothesis of whether news about Ripple's actions and news about Ripple is correlated with significant XRP price increases.

That is the essential statistical and economic analysis of my report. And I find, through a variety of measures, that the hypothesis that they are independent can be rejected at any reasonable degree of significance.

Q. And how many days do you have to find a correlation between a Ripple action and a price impact on XRP for you to reach the conclusion that you reach?

A. I -- I'm not aware of a bright-line number. We can -- you know, some categories I test. For instance, the milestone category has as few as -- what is it, six or eight events. I think it's eight.

That is actually a large enough sample to test.

And then, of course, other categories have many more events. So I don't have a bright-line number in mind.

MR. FIGEL: I can't remember what time

[redacted]

we got on the record.

MR. MOYE: Close to 1.

MR. FIGEL: Close to an hour, so should we take a break?

MR. MOYE: Sure.

THE VIDEOGRAPHER: We're going off the record at 2:25 p.m.

(Recess from 2:25 to 2:40.)

THE VIDEOGRAPHER: We're back on the record at 2:20 [sic] p.m.

Q. All right. Dr. [redacted] if you could go to your -- Exhibit 1, your report, and go to page 20, paragraph 45.

A. Yes.

Q. You look in the middle, paragraph 45, you write, If there is a statistically significant price reaction, and if certain conditions can be established, then one might conclude the market reacted significantly to the announcement.

Correct?

A. Yes, I see that.

Q. And in Footnote 57, you describe the conditions that need to be established.

[redacted]

Correct?

A. I -- I don't intend it to be an exhaustive list, but it's certainly some of the conditions. Yes.

Q. And -- and one of them, in romanette i, is, There is no other confounding news that day which might explain such movement. Correct.

A. Correct.

Q. What's confounding news?

A. Confounding news is generally information released on or about the same time as the -- let me back up.

There's an event that you're interested in. Confounding information would be news released on or about the same time, which might reasonably be expected to impact the security price that you're questioning.

So a canonical example might be ABC Enterprises issues a corrective disclosure on January 1 and the stock price drops. Everybody agrees that the stock price drops. People want to say, Well, the stock price dropped because of the corrective disclosure.

[redacted]

And somebody comes along and points out, Well, wait a minute, ABC Enterprises was also named as a defendant in a class action suit on the very same day, so how do you know if it was the corrective disclosure or the lawsuit.

That would be an example of confounding information.

Q. And so if there are compounding events present on a given day in which there's a statistically significant price impact, that would undermine the confidence that you could have that one event or the other caused that price impact. Correct?

A. It -- it could. Yes.

Q. And the presence of confounding events would undermine the reliability of any finding you made in this case through your event study, correct?

A. Potentially.

Q. Well, in your own judgment do you believe it was necessary to establish that there was no confounding news on an event day, with whatever the Ripple event that you identified was, before you could reach a reliable opinion

[redacted]

that the market for XRP reacted in a statistically significant manner to the Ripple news event?

A. Yes, I think one has to take steps to rule out the likelihood of confounding information before drawing any sort of causal inference from a correlation result.

Q. And for the three-day event window that you use primarily in your study to support your opinion, would it also be necessary to rule out confounding events on each of those three days?

A. One would -- one has to consider the possibility of confounding information, I agree.

Q. Okay. What steps did you take to ensure that the analysis in your -- withdrawn.

What steps did you take to satisfy yourself that there were no confounding events on any of the Ripple news event days that you considered?

A. So I took a number of steps.

So this might be one of those long answers.

Q. If you must.

[redacted]

A. So let's begin by thinking about what -- what this confounding information might be. It might be news that impacts the digital token market broadly.

Well, we can rule that out. We can rule that out because 18 of the 20 regression models that I consider control for other digital token returns such as bitcoin.

So if it's simply that XRP prices are going up at the same time that the -- the broader cryptocurrency market is going up, we can rule that out as a possible explanation.

Another type of confounding information, the example that I gave earlier, is -- is company-specific information.

Well, we can rule that out, too. Because, of course, Ripple Labs has taken the position that such information does not exist as a matter of logical possibility. Because they've said nothing that -- there -- Ripple Labs is independent of the XRP market, so there's nothing that could be announced about Ripple Labs that should move XRP price.

So we can rule that out as a

[redacted]

possibility.

What we're left with is speculating that there might be something which wasn't specific to Ripple Labs, didn't impact the broader market, but impact the XRP market uniquely. Okay. Let's consider that.

This would have to be something, first of all, that's only good news, because, remember, we look for -- one of the robustness checks that I do is to see if there's a correlation between these event days and negative returns. And there is no correlation.

So this has to be good news, unique to the XRP market.

Okay.

It has to be good news, unique to the XRP market, that Ripple Labs chose not to discuss or link to or reference in any way, among 700 articles on its news page.

Okay.

It would have to be good news for XRP markets that, on the other hand, didn't impact the number of XRP accounts, because remember, that is a control variable in half of the

[redacted]

regression analyses that I do.

It would have to be something that is released exactly on the day in question.

It can't be the second day, and it can't be the third day. And the reason I say that, again, is one of the robustness checks that I did was to look at that one-day event window, and we continue to get the statistical result that we've been discussing all along.

It couldn't have been something that came out before the news day in question. How do I know that? Because I looked a few days before the news event, and there is no correlation between these events and XRP price increases.

So I think it -- it's -- it becomes so implausible to suggest that this hypothetical confounding news could be driving these results. I think that possibility can be dismissed.

Q. You've referred several times to what you believe to be Ripple's position that no action by Ripple had any impact on the price of XRP. What's your basis for that?

A. That's my understanding from some of

[redacted]

issues that are being considered in this litigation. That's, of course, the position that Dr. Ferrell has taken, and his experts report.

I believe that was position taken in Ripple Labs' Wells submission that I looked at some time ago.

That's just my general understanding, that they maintain they are independent of the XRP market.

Q. So other than the inferences you draw from the Ferrell report, is there anything in writing that you are -- that you can identify, that has caused you to reach that opinion?

A. I -- I read the complaint some time ago. I -- I don't remember if it's specifically in there.

I think in some of the deposition testimony that I reviewed, executives of Ripple Labs are asked repeatedly about their impact on XRP prices, and they insist that there's no connection.

I -- I really didn't think that this was a contentious or controversial point.

[redacted]

Q. Can you recall which depositions you read that caused you to have that understanding?

A. I believe -- I mean, I know the depositions were lengthy.

I think there's discussion on XRP and Ripple Labs and price in the deposition of Mr. Garlinghouse and Mr. Larsen and Mr. Schwartz, and -- maybe Monica Long and probably others. I don't -- I don't claim to have a photographic memory of which depositions include which.

I believe that if we review the deposition transcripts, we'll find questions and answers on this subject.

Q. As you sit here today, other than the Wells submission, you can't think of a specific transcript or document in which Ripple Labs has stated that no action by Ripple would have any impact on the price of XRP.

A. I -- again, I would point to the deposition transcripts. At least the officers of Ripple Labs have said statements to that effect, I believe.

Q. And if you were wrong about that

[redacted]

assumption, would that change the results of your analysis?

A. No. That would simply mean if everybody wants to stipulate that Ripple -- things Ripple Labs does moves the market, then I suppose we would all stipulate to that.

Q. I'm going back to the steps you took to identify confounding events.

As I understood your answer, you did not seek on a particular day to identify whether there were actions or events that could have had an impact on the price of XRP. Is that correct?

A. No, I don't think that's correct. Again, I took -- I took a number of steps that I've described, so that with -- with -- so that I could reasonably rule out the possibility that the statistical results I was observing were being driven by confounding events outside of the new set that I'm studying.

Q. Did you do any investigation or research to determine whether there were any other events that occurred on a day in which you found a overlap between a statistically significant price return on XRP and the 105

[redacted]

Ripple events that you tested for to see whether there was anything else happening in the world, in the market for -- that could have had an impact on the price of XRP?

A. Well, again, there was no need to do what you're suggesting. It couldn't -- it couldn't be a factor that impacts the -- the digital token market broadly. I don't have to go look for it. It can't be the case. It can't be something specific to Ripple Labs. I don't have to look for it. It can't be the case as a logical possibility.

And I have enough statistical controls to -- there seemed no point to this sort of exercise that you're describing.

Q. So you have such confidence in your economic modeling that you can rule out with certainty, under oath, that there's not an event that occurred on a day in which there was -- a confounding event that occurred on a day in which you found a statistically significant price impact -- price return. Correct?

A. No, I didn't say that.

Could you find and -- could you find a

particular day where you want to point to something and argue that it might be confounding? And we could have a discussion about it.

I am confident that the statistical result that the null hypothesis of independence can be rejected, I do not believe that that result would change through any exploration of confounding news.

Q. You would agree, though, that if there was confounding news on an event day with a statistically significant price return of XRP, that that would undermine the reliability of your opinion. Correct?

A. Again, no. We'd have to see -- no. We'd have to see what kind of news we're talking about. I mean, we're speculating about things that might be. We'd have to review it, what it is. We would have to demonstrate that news of that type does move XRP prices.

There would be an awful lot of work that we would have to do before we could even determine that the news actually was confounding, let alone that it had any bearing

[redacted]

or any impact on my overall results and overall conclusion.

Q. There were 105 days in which there were Ripple events. Correct?

A. One of the sets of categories I study is based on 105 days, yes.

Q. And on 24 of those days, you found a coincidence with a statistically significant impact on Ripple returns. Correct?

A. According to one model, yes.

Q. And just so the record is clear, you took no steps with respect to those 24 days to do any sort of investigation or review to determine whether there was an event that occurred on that day?

A. No. Again, I took a number of steps. May not like the steps that I took. But I took a number of steps to make sure that these results were not being driven by confounding information.

Q. Well, the steps you took were the ones described, which were effectively built into the models that you created. My question is a different one. Did you go on Lexis or Nexis on

[redacted]

a day in which there was a -- on one of those 24 days to see, is there anything else happening that might explain this result?

A. The steps that I took are in some cases matters of model design; in some cases they are matters of variations of model runs to check alternative explanations, such as the possibility of confounding news.

I'm satisfied that these results are not being driven by hypothetical, speculative possibilities of maybe something else.

Q. Let's go back to Exhibit 4, if -- I'm sorry.

It's Exhibit 4, which is the Litigation Services Handbook.

And if you look -- we are going back to the paragraph we looked at before. And if you could just read the -- the -- the fourth of the four conditions that need to be present for an event study to be able to make the kind of correlations that you claim to have made.

MR. MOYE: Is this 19.2 at A?

MR. FIGEL: Yes, and then sub 4.

MR. MOYE: Thanks.

[redacted]

A. It is possible to isolate the effect of the news from market, industry, and other firm-specific factors simultaneously affecting the firm's stock price.

Q. Do you agree with that?

A. Do I agree with -- what are you asking me to agree with?

Q. That that is a condition that must be present in order for an event study to reveal the effects of an event on -- it talks about future cash flows, but I assume you would agree that price impact would also follow from -- from the -- the correlation that the author is making here.

A. If the purpose of the study is to assign causality to a particular event, then one needs to take steps to rule out the possibility that it might have been some other event.

Q. Did you identify any day in which -- any day of the 24 -- let's just try to keep the models and the studies clear.

Of the 24 days in the study that you described in paragraph 100, did you find any confounding event?

[redacted]

A. Please define what you mean by "confounding event" when you ask that question.

Q. I mean what you said, which was an event -- well, let's just make sure the record is clear.

Why don't you define, for the purpose of answering my question, what you understand confounding event to be.

My question is, on any of the 24 days in which you found the coincidence of a -- a price impact and a Ripple news event, did you identify a confounding event on that day?

A. As I would define it, no.

There is -- for example, one of the events simultaneously lists, I think it's Series B funding along with new product, new customers on RippleNet. I don't consider that confounding.

I -- it's not necessary for me to assign causation to one or the other. It's enough that prices moved around that announcement.

So the answer to your question is, no, I didn't find anything that I would consider to

[redacted]

be confounding.

Q. What factors, if any, in your model, other than account growth of -- of XRP accounts, do you contend are unique to XRP?

You understand my question?

A. I think that I do.

Well, in half the models that correct for serial correlation, we have the lagged return of XRP itself, on the right-hand side of the regression, I suppose that would qualify.

Q. Anything else?

A. No, there's nothing -- there's no other right-hand side control factor that is unique to XRP, besides its account growth and its lag return.

Q. And just so the record is clear, I mean, it's clear what you've testified to with respect to what you feel you've done to identify and rule out confounding events.

I just want to ask you whether there are additional steps that you did or did not take. You with me? In other words, I'm not looking for you to repeat what you've done. I'm asking a specific -- I'm going to ask you a

[redacted]

series of specific questions about whether you took particular steps.

A. Okay.

Q. All right. And let's just -- for the purposes of keeping the record clear, we're going to talk about the 24 days of confluence that you identified in paragraph 100 of your report. You with me?

A. All right.

Q. On any of those days, did you do a news review to see whether there was any news about the cryptocurrency markets generally?

A. Yes.

Q. What specifically did you do to look, on that particular day, for news about the cryptocurrency markets?

A. So on some days which were -- which had statistically significant price returns associated with them, I directed my team to take some extra steps to make sure that certain facts about those days were known.

Some of those steps included LexisNexis searches around certain keywords related to XRP.

[redacted]

Q. Anything else?

MR. FLUMENBAUM: Would you lean up, please?

THE WITNESS: Sorry, I thought the microphone was working.

A. I'm sorry, what's the question?

Q. Anything else?

A. I don't think anything uniquely to those days. Again, we -- we -- I want to be careful. We checked the UTC -- I'm trying to remember if we checked the UTC publication date on the host web pages for every day or only days associated with statistically significant returns, and I think it may have been the latter. I -- I'm fairly sure it was the latter.

So that means we -- we also would have clicked on the web page hosting the document, looked at the -- now I'm going to get this wrong, but the HTML code or the XML code or -- some computer scientist is going to tell me I got the wrong term -- but the underlying script for hosting the web page to look for the -- the UTC date stamp for the web page, and did Internet searches to see -- to look for other

[redacted]

information around these events and XRP.

That's what I can recall doing.

Q. What was the work product that was generated in connection with these efforts to conduct Internet searches on the days in which there was the event?

A. I don't know that it necessarily led to the creation of work product, if analysts were searching for keywords and not finding results. I don't necessarily know that work product was created.

Q. So was there any document that you or your staff has that would reflect the efforts that you claim were made to determine, based on an Internet search or a LexisNexis search on one of those 24 days, as to whether there was confounding events?

A. Well, I think in my report I discuss the steps we took, for instance, to carefully date the events, and I think in my report I also mention conducting Internet searches around key dates.

Q. Can you show me where in your report you reported that?

[redacted]

A. I'm happy to, if I can go through it.

(Witness reviewing document.)

MS. KIM: Paragraph D, Appendix 18.

THE WITNESS: Right, Appendix D.

Thank you very much.

A. We talk about how we search for UTC dates. And part of that process was searching for keywords around -- around those dates.

Q. Can you point to me the paragraph or the portions?

A. Yes, it's Appendix D, paragraph 18.

Q. All right. As I read paragraph 18, that looks to confirm the dates of events.

A. Yes, but it also refers to Factiva, LexisNexis and Internet searches around keywords related to the event.

Q. To determine if the event was reported earlier through some other news channel. It's the same event. I'm asking for a search for confounding events.

A. Yes, but in -- in conducting a LexisNexis and Internet search with keywords related to XRP, confounding events could very possibly have come up. If they had come up, I

[redacted]

would have noted -- we would have taken note. No confounding events came up.

Q. The sentence you wrote, Dr. [redacted] is that you conducted these various Internet searches to determine if the event was reported earlier through some other news channel. So you're looking for stale news there.

A. Correct. I mean, that -- that was the principal motivation for doing it, but your question was if we did other research around the 24 days. The answer is yes. And you asked if we did -- if we did Internet searches, the answer is yes.

Q. Well, let me be clear about my question to make sure we have a clear record here.

Did you do Internet searches, or any other searches, in an attempt to identify confounding events on the 24 days in which -- that we've been talking about?

A. We -- I did not do additional searches beyond what's described here for the purpose of searching for confounding events.

I was satisfied with the statistical

[redacted]

properties and analytical methods that I adopted and didn't feel that such efforts were necessary.

Q. So the sentence you just identified as conducting Internet searches was not for the purpose of identifying confounding events on any one of those 24 days. Correct?

A. It was not for that purpose, it may have had that effect. It was for the purpose of making sure that we dated events correctly.

Q. So you didn't direct your staff, and you didn't personally, conduct any Internet or other searches in order to determine whether there were confounding events on any of the 24 days that we're talking about?

A. No. Again, it wasn't necessary.

Q. Based on your experience, does the daily trading volume of financial -- of a financial instrument on a given day have an impact on the market price of that instrument on that day?

A. That's a -- that's a difficult question. And I -- I don't know that there's a settled answer in the literature about the

[redacted]

relationship between volume and price. I don't know that I have a view on the relationship between volume and price.

I don't think I -- I would say that that's not settled.

Q. Well, have you -- are you aware of studies that look at price discovery of common stock on public -- public exchanges?

A. Generally, yes.

Q. And isn't it a fact that those studies generally suggest that more thinly traded stocks are more volatile and more price sensitive to news?

A. I would agree that there is a general result that volume may relate to volatility, within some thresholds perhaps. But not necessarily on the level of price.

Q. Well, isn't volatility a proxy for --

A. No.

Q. -- price movement?

A. For price movement but not for the level of price. The price is a hundred dollars, the price is a hundred dollars, if there's a lot of volume or a little volume.

[redacted]

Could that price fluctuate more or less depending on the depth of the volume? Perhaps.

Those are different questions.

Q. Well, then, do you agree with me as a general proposition, financial instruments that are more thinly traded are more volatile?

A. As a general proposition, I think that's consistent with empirical findings. Again, there may be exceptions here or there.

Q. Any reason that that would not carry over to the market for digital assets?

A. I -- I have no reason to think that digital assets are necessarily different in that respect.

Q. Now, earlier you testified about bitcoin essentially being the big whale in the cryptocurrency market. Is that a fair lawyer summary?

A. I would say that that's a fair summary.

Q. And it follows that a digital token or asset like lumens has less trading volume than bitcoin on a given day.

[redacted]

A. Not having specifically looked at it, that would certainly be my expectation.

Q. And do you have a view as to whether the trading volume of XRP was more or less than the trading volume of bitcoin?

A. Again, my expectation is that on most days that you would want to look, you would probably find the trading volume was less.

Q. What about Ether? Same question, relative to bitcoin?

A. Again, I would expect it would be less than bitcoin on any day you select at random.

Q. So with respect to an event that would apply generally to cryptocurrencies, would you expect to see a different price impact on lumens or Ether as a compared to bitcoin?

A. I -- I don't know. I just -- I just -- it would depend on the event.

I don't know.

Q. Well, a more thinly traded financial instrument responding to the same news, presumably, based on what you said, would be more volatile, correct?

A. More volatile, I mean if -- if China

[redacted]

announces that it's shutting down the digital token market, you might expect that that would negatively impact almost all digital tokens.

Q. And would the price change be the same -- would you expect the price change to be the same for all digital tokens?

A. Certainly not. Bitcoin is trading at tens of thousands of dollars per token, and most tokens are trading at a fraction of a penny per token; therefore, the price change would almost certainly not be the same. The return may not be the same, but there's no particular reason to think it would be identical.

Q. And where would you expect to see larger percentage changes? You call it price return.

A. I -- I don't know. I don't have a prior -- and I don't -- it would depend on the news. I don't know.

Q. That was something that you could have -- withdrawn.

There are economic empirical models that allow an economist to test for the impact of trading volume on price. Correct?

[redacted]

A. Yes. Such models exist.

Q. And you didn't incorporate any of those models into your regression analyses in which you were estimating the return of XRP based on the models that referred to bitcoin, Ether, and lumens, correct?

A. I generally followed the accepted methodology and peer-reviewed academic literature and applied similar regression models you'll find there.

No, I did not incorporate a factor related to trading volume.

Q. And the same is true for XRP, correct?

A. Well, all of these are models of XRP.

Q. No. I'm talking about when you were using -- let's just break it up into two pieces. You have your 20 models or so that show each model and what the components of each model were, correct?

A. Correct.

Q. And in none of those models did you include reference to the trading volume of any of those digital assets. Correct?

A. Correct. Trading volume not a control

[redacted]

factor in any of my models, as it is not a control factor in peer-reviewed event studies related to crypto markets.

Q. And similarly, when you were measuring the price impact of XRP, you didn't consider the volume of XRP that was traded in a given day, correct?

A. I did not consider the volume. No, I did not.

Q. And why not?

A. Following accepted methodology, it's not typically included in an event study model of the type that I'm doing.

What the -- one concern is that, for instance, volatility, generally moves over time. That's a concern. And that's one of the reasons that researchers, myself included and the researchers in the literature that I cite to, use what are called rolling estimation windows, precisely to allow changing volatility and changing relationships, between returns and control factors.

That's -- that's a common methodology for addressing these sorts of concerns, and

[redacted]

that's what I did.

Q. Show me where in your report you make reference to rolling estimation windows, to account for changing volatility and changing relationships.

A. All right. I'll start Appendix D this time.

(Witness reviewing document.)

A. Appendix D, paragraph 10.

Q. Other than paragraph 10, do you describe in any other place in your report what steps you took to address changes in volatility and change in relationships over time?

A. Well, section -- changing relationships over time is the subject of Section 7 of my report?

So Section 7 is entirely devoted to documenting changing relationships between XRP and at least bitcoin and Ether, just to make the point that relationships change over time.

I have to flip back to my earlier methodology section to see if I relate the rolling window specifically to volatility. Of course, I discuss rolling windows.

[redacted]

(Witness reviewing document.)

A. So I haven't read it yet, so I -- let's see if it talks about volatility. But paragraph 42 and the footnotes there, 51 and 52, I'm just reading them.

Footnote 51, A well-accepted method for performing the event study is to estimate a regression model over some period of time to quantify typical relationships.

That -- that establishes the -- the -- the commonality of the six-month estimation period. Footnote 52 in my analysis, the estimation window, i.e., the 180-day window used to estimate the regression, will change with different dates of interest. This is typically referred to as a rolling estimation window since the estimation is rolled forward for each subsequent date of interest.

By using a rolling estimation window, I'll allow for the relationship between the XRP prices and the explanatory factors as well as the volatility of the random factor to change over time. Use of a rolling model to account for changing volatility and evolving

[redacted]

relationships among factors is often applied and is accepted in peer-reviewed literature. See -- and then there are various citations.

Q. Anything else?

A. I'm sorry?

Q. Anything else?

A. Possibly, but I don't think so. I imagine that those are the only places I discuss it.

Q. In Appendix B to your initial report, Exhibit 1, you list the complaint filed by the SEC in this case as one of the documents that you considered. Is that correct?

A. Strictly documents relied upon, but yes.

Q. Did you read the complaint?

A. I did.

Q. How many times?

A. I don't know.

Q. Did you understand it?

A. I -- as a layperson reading a legal filing, I would like to think I understood it as well as a layperson would.

Q. Do you understand that the SEC

[redacted]

contends that the opinions that you reached in your initial report support the allegations in the complaint?

A. I'm sorry. Your question is -- do I -- do I understand that -- I'm sorry. Could you repeat the question.

Q. Do you understand that the SEC contends that the opinion reached in your reports support the allegations in the complaint?

MR. MOYE: It's a yes-or-no question, right? I'm going to object to the extent you're asking for work product.

Q. I'm not asking you about communications with counsel. I'm asking for his understanding about whether the SEC is sponsoring his opinion in support of its theories as outlined in the complaint.

A. I would say that -- certainly, yes, in the sense they asked me to conduct the study and they're submitting my expert report as part of their proceedings. Beyond -- I mean, beyond that, I can't say.

Q. And you read the report before you

[redacted]

crafted your methodology, correct?

A. I assume you mean I read the complaint?

Q. I'm sorry. Yes. Read the complaint.

A. Yes, I read the -- reading the complaint was one of the very first things that I did.

Q. Okay. What's your understanding of the violation of law alleged in the complaint?

A. I don't know.

MR. MOYE: Object to the extent you're asking for a legal conclusion.

Q. And just so Mr. Moye can continue to have a relaxed afternoon, I'm not asking you for communications you had with counsel for the SEC.

A. Right. But, I mean, I'm not a lawyer. I'm not -- I'm not qualified to offer a legal opinion.

Q. I'm not asking for a legal opinion. I'm asking for your understanding about what the violations alleged in the complaint are.

A. Well, answering as just a layperson, I -- my understanding is the SEC believes that XRP should be classified as an investment

[redacted]

contract, and certain requirements that I don't fully understand follow therefrom.

Q. Okay. And, again, I'm asking for your understanding. What is your understanding as to why the opinions that you reached support the SEC's contention that XRP, or transactions in XRP, are investment contracts?

MR. MOYE: Same objection. Work product.

A. I just -- I'm -- I -- again, I'll say it again. I'm not a lawyer. I'm not qualified to offer a legal analysis.

I was asked to investigate whether there's -- whether actions or news of actions by Ripple Labs impacts XRP prices. I conducted the best analysis that I could, and I found that there is overwhelming evidence that it does. That's -- that's -- there it is.

Q. Have you read the Supreme Court's opinion in Howey -- in SEC versus W.J. Howey Company?

A. No, I have not.

Q. Are you familiar with the Howey test?

A. Broadly familiar with it, yes.

[redacted]

Q. What's your understanding of it?

A. Well, as a layperson, just recollecting what I think I understood, the Howey test describes an investment contract as a -- a -- an investment in a common enterprise with an expectation to earn profit from the efforts of a third party or promoter or something like that.

Q. And are you aware, generally, that courts apply the Howey test to determine whether a contract, scheme, or transaction, qualifies as an investment contract under the federal securities laws?

A. Again, I'm not a lawyer, I -- I'm not familiar with the law or the case law or the -- the legal issues.

I do recall the Howey test being mentioned in the complaint. I assume it is germane to the discussion, but that's just my lay understanding.

Q. You write, in paragraph 12A, that Using a well accepted event study methodology, I find statistically significant evidence that XRP prices react to news about Ripple's actions.

[redacted]

Do you see that?

A. Yes.

Q. And are you aware that the Howey test requires proof that an offeree makes -- the question in the Howey test is whether an offeree makes an investment in a common enterprise and is led to expect profit solely or primarily as a result of the efforts of others.

MR. MOYE: Objection. Calls for legal conclusion. Very explicitly.

A. So I'm sorry, what is your question? I mean, I recognize those words when the Howey test is being described.

Q. Well, what's your understanding, from an economic perspective, of what it means for the price impact on an asset to come solely or primarily from a person or entity?

A. As an economist, I don't think those words have very much meaning at all.

Very few things, speaking as an economist, could be said to derive solely from the efforts of one person.

The -- the stock price of XYZ Enterprises does not depend solely on the

[redacted]

efforts of XYZ Enterprises. So as an economist, I -- I'm not quite sure what meaning or significance I would attach to those words.

I'm sure they're well defined legally, but as an economic matter, I -- I don't think it's clear what those words would mean.

Q. So as a result, you didn't attempt, in your event study methodology, to answer the question whether offerees or holders of XRP were led to expect any increase in the value of their XRP based solely or primarily on the efforts of Ripple. Correct?

A. Since that's not an economic question, I did not conduct an economic analysis of such a question. I conducted an analysis which demonstrates that Ripple Labs -- some of the things Ripple Labs does moves XRP prices.

Q. And your methodology didn't rely on any information about the expectations of XRP holders, correct?

A. That is correct. I -- I don't know the motives of people who buy XRP. That has no bearing on my analysis.

Q. And your methodology didn't seek to

[redacted]

answer the question whether XRP price returns were caused solely by the actions of Ripple. Correct?

A. Yeah, I would -- I would say that that is not a question that an economist could answer, whether something is due solely to something else.

In -- in the field of economics, I -- I'm hard pressed to think of any example of anything that is due solely to something else. If Party A and Party B make an exchange, Party A and Party B are involved, as an economic matter.

Again, legally, I mean, perhaps it's a well-defined term.

Q. So the answer to my question is your methodology did not seek to answer the question whether XRP price returns were caused solely by the efforts of Ripple Labs. Correct?

MR. MOYE: Objection. Asked and answered.

A. I would -- I would say, as I testified before, that that question is not an economically well-formed question.

Q. And so your methodology doesn't answer

[redacted]

it. Correct?

MR. MOYE: Same objection.

A. My methodology establishes that Ripple Labs does things to move XRP prices.

Q. If you would, Dr. [redacted] I'd like an answer to my question. Does your methodology allow you to answer the question whether the actions of Ripple Labs are the sole cause of XRP price returns?

MR. MOYE: Objection. Calls for legal conclusion.

A. I'm struggling to -- to understand that as an economist. As an economist, the question doesn't make a great deal of sense.

That's all I can say.

So -- that's all I can say.

Again, it may be a very well-defined legal term, but I don't think an economist could render an opinion one way or another whether something was due solely to the actions of one person versus another.

Every -- as I said, every act of exchange involves at least two parties. It's just not a -- not a term that economists tend to

[redacted]

use.

Q. So you're not offering an opinion in this case that Ripple's actions were the sole factor impacting the price of XRP; is that correct?

A. Correct. I -- I -- nowhere do I offer such an opinion. I offer the opinions as laid out in my report.

Q. And similarly, your methodology doesn't allow you to answer the question whether XRP price returns were caused primarily by the actions of Ripple Labs. Correct?

MR. MOYE: Objection. Calls for legal conclusion.

A. Again, as an economist, I -- I -- I'm not comfortable using the word "primarily."

What I have -- what I have shown, what I've attempted to show and what I think the data clearly show, is that XRP -- I'm sorry, Ripple Labs does things to move XRP prices.

XRP prices react to things that Ripple Labs does. XRP prices react to things that happen to Ripple Labs.

That's -- that's what I was asked to

[redacted]

investigate, that's what I did investigate, and that's what I found.

Q. And on how many days, in the approximately 2400 days covered by your study, did you find evidence that the price of XRP was statistically correlated with an action of Ripple Labs?

A. Well, the only number that I can recall offhand is one that we discussed. I provide an example of one case in my report, Model Number 1, the constant mean model, and under that model, out of the 105 days being tested in Section 6(f), 24 are associated with statistically significant positive XRP price increases.

Q. All right. Your methodology did not seek to answer the question whether XRP price returns were caused primarily by the actions of Ripple Labs. Correct?

MR. MOYE: Asked and answered.

A. I think we asked that question, but --

Q. We asked it about solely. Now I'm asking it primarily.

A. I thought we also had discussed that

[redacted]

way, but fine.

Again primarily, the word "primarily" just is not a word that, as an economist, I -- I would apply to an analysis like this, or any other analysis.

If -- if Alice sells an apple to Bob, you could say, Alice sold the apple or you could say Bob bought the apple. I -- parsing out the primary-- who primarily did what is just not something that is usually in the domain of an economist.

Q. And you're not offering an opinion in this case that the XRP price returns were caused primarily by the actions of Ripple Labs. Correct?

MR. MOYE: Asked and answered.

A. As I testified, I -- I was asked to investigate a question, and I found significant evidence, statistical evidence, that XRP prices react to actions by Ripple Labs.

Q. Now, you say "primarily" is not a word that economists --

A. I -- I do -- I'm just wondering how much -- are we coming up on a break? I'm just

[redacted]

asking.

Q. Sure, we can take a break.

A. I don't want -- I don't want to derail things. If it's convenient at some point.

Q. As I say, we can do this for 16 hours so --

MR. MOYE: No, we can't.

MR. FIGEL: Any time to break is as good as any other time. Let's go off the record.

THE VIDEOGRAPHER: We're going off the record at 3:36 p.m.

(Recess from 3:36 to 3:50.)

THE VIDEOGRAPHER: We're back on the record at 3:50 p.m.

Q. Dr. [redacted] do you recall your testimony about how the word "primarily" doesn't -- isn't -- isn't a term an economist would use?

A. Beyond how a -- a layperson might use it, but I meant as a scientific term in a context like this, I don't think it's very well defined.

Q. So take a look at page 22 of your report.

[redacted]

A. Yes.

Q. In the fourth bullet from the top you say, Ripple Commercialization Initiative. Initiative launched by Ripple Labs primarily described as being related to the commercialization or promotion of Ripple's products or technology.

A. Yes.

Q. What did you mean by "primarily" there?

A. I meant that a reading of the announcement and description of the initiative made it sound largely related to commercialization or promotion of its products or the general ecosystem.

Q. So there you're using "primarily" and "largely" synonymously?

A. There I'm using the word "primarily" as -- as used in common speech, I would say.

Q. And going back to your opinion, you're not offering the opinion that the price impact -- any price impact on XRP was primarily or largely caused by actions of Ripple Labs. Correct?

[redacted]

A. I'm not offering that opinion, that is correct. The -- to -- to insert those words into an analysis like that I just think is economically not well defined.

Q. And -- and --

A. Let me -- if I may finish.

I mean, the value of a citrus grove is going to depend on the weather. It's going to depend on the general conditions of supply and demand for citrus.

So, I -- you know, inserting the word "solely" and "primarily," I don't know what standard needs to be met, or how it would be determined by an economist, to know whether those words, which have a legal meaning, could be applied to -- to a result like this. So I'm -- I'm not going to do it.

Q. And the substance of your opinion is that you found evidence that XRP prices react to news about Ripple's actions. Correct?

A. I think I may have said "select actions." But in substance, yes.

Q. And you found that on about 1 percent of the days during the period that you examined.

[redacted]

Correct?

24 days out of about 2400.

A. I mean, that's -- that's not a calculation that has any meaning.

One could divide 24 by 2400, but that doesn't mean anything in this context. Out of 105 events -- and, again, this isn't the only basis for my opinion.

But focusing on that, out of 105 events, 24, plus or minus, are associated with significant positive returns, and that is an outcome that is so unlikely, but for some kind of a correlation or association or dependence between Ripple Labs and XRP prices. That is the statistical basis of my opinion.

Q. But what you found when you found that correlation, you only found it on that model 24 times out of approximately 2400 days. Correct?

A. I -- I reject the -- the formulation of your question, 24 out of 2400. It's 24 out of 105.

I'm testing 105 days. And I find 24 of them, again according to one model, have statistically significant returns. And that

[redacted]

outcome is incredibly unlikely.

Q. And you found no correlation between the actions of Ripple Labs on the 2400 minus 24 days that you -- that were encompassed in your study, correct?

A. I don't accept your characterization at all. I think you're misstating, or -- the basis of my analysis. It's not the right way to think about it. I had a set of events. This is how events studies work.

I had a set of events. I look to see if there are price reactions in that set of events. And I found that there were far more than could be accounted for under the hypothesis that Ripple Labs and XRP are independent of each other.

Q. I understand that, and you've testified to that.

My point is, the only time you found a statistical correlation between a Ripple news event and a statistically significant XRP price impact was on 24 days.

Correct?

MR. MOYE: Objection. Argumentative.

[redacted]

A. According to Model 1, the intersection between -- and according to Model 1, studying the superset of various news categories, the intersection between news days and significant market days numbered 24.

Q. All right. To do a proper event study, you are required to state a hypothesis, correct?

A. I would say that statistical tests revolve around the acceptance or rejection of certain null hypotheses.

Q. And what was the hypothesis that you sought to accept or reject, in connection with the opinion you're offering in this case?

A. The null hypothesis is that Ripple Labs and XRP price increases are independent of each other.

Q. And your conclusion is they're not independent, correct?

A. That is correct.

Q. You weren't asked to determine whether the actions of Ripple Labs were the sole or primary reason that we see significant price increases, correct?

[redacted]

A. Again, it's not a well-formed economic question, but that was not the question that was posed to me.

Q. And you didn't seek to answer the question whether the actions by any person or entity other than Ripple had an impact on XRP prices. Correct?

A. I think that's fair. I certainly did look at how XRP returns correlate with broad crypto -- other broad digital token returns. Now, that's not -- I acknowledge that's not exactly what you asked.

But I did look at that question.

I was not investigating whether the actions of, say, XYZ Enterprises, impacts XRP prices.

Q. So the answer to my question is no. You didn't conduct any analysis to determine whether actions by any person or entity outside of Ripple had an impact on XRP prices. Correct?

A. I -- I'm going to agree with that.

I would say that that's fair. I was looking for a relationship between Ripple Labs and XRP prices. I was not looking for a

[redacted]

relationship between something else and XRP prices. Again, above and beyond a general exploration of correlation in the digital token market.

Q. All right. And couple times you have included in your answer that XRP prices react to certain news, and public statements about Ripple's actions. Correct?

A. Yes, that's correct.

Q. And your methodology demonstrated that there's not a statistically significant price return on XRP with respect to all news about Ripple. Correct?

A. Correct.

Q. And similarly, you did not find a statistically significant price return on XRP, with respect to all public statements about Ripple. Correct?

A. That's correct. I wouldn't expect such a finding.

Q. And your methodology didn't determine whether a particular Ripple news event caused any particular price movement. Correct?

A. My methodology, based on the

[redacted]

statistical results and analysis that I conducted, I believe XRP prices reacted to news of certain actions from Ripple Labs.

Q. So are you -- is your opinion that your study proves causation between Ripple events and a statistically significant XRP price movement -- price return?

A. Causation is not a question which is generally subject to proof as a matter of economics. Correlation or independence is a question which may be subject to proof.

So the statistical test, the -- the statistical test, the null hypothesis, is expressed in terms of correlation.

The question of what kind of inference you can draw from a statistical result depends on your economic understanding of the -- of the facts of the matter and maybe some other robustness checks that you may run to rule out alternative explanations.

The sum total of all of that work supports a -- an inference of likely or -- of likely causation. But I wouldn't say that one could prove causation.

[redacted]

Q. So it's -- it's an inference of causation, but you don't claim that you have proof that any Ripple action or event caused a statistically significant price return on XRP. Correct?

A. I would say that I have the type of economic evidence which is often used when assigning or assessing loss causation, on asset prices. Whether a philosopher would say I've proven something, I don't know.

I fully accept the truism that correlation doesn't prove causation, but I think correlation in conjunction with other analysis can support an inference of likely or reasonable causation.

Q. What do you mean by the -- I want to make sure I got your -- when you say, I fully accept the truism that correlation doesn't prove causation, what is the truism you're referring to?

A. Well, it's generally understood that, just because two things -- let's call them A and B.

Pardon me. My apologies.

[redacted]

Just because two things, A and B, are correlated, that alone doesn't tell you whether A caused B or B caused A, or whether X caused both A and B.

Independence, finding that A and B are independent of each other is generally evidence that A didn't cause B. But simply finding correlation by itself wouldn't be enough to make a statement of, because A and B are correlated; therefore, I know that A caused B.

Q. And to make the point in a slightly different way, on the days in which you did not find a correlation between one of your 105 Ripple events and a statistically significant price return on XRP, you're not offering an opinion about the presence or absence of causation with respect to that relationship. Correct?

A. Sorry. I'm trying to understand that question.

Can you repeat it, please.

Q. Let me see if I can ask it differently.

Just as you said that your methodology

[redacted]

doesn't prove causation between a Ripple news event and a statistically significant price return for XRP on the 24 days in the model that we've been talking about, you similarly don't attempt to explain why there was not a correlation between a Ripple news event and the absence of a statistically significant XRP price return. Correct?

A. If by that you mean on the 75-, 79-odd days where there is news but no significant price reaction, did I do an exploration to understand why there was no significant price reaction on those days? Is that your question?

Q. Well, why don't you answer that one.

A. The answer to that question is, per standard practice and event studies, no, I did not do an investigation to see why there was not a significant price reaction on those 79 days.

Obviously, it doesn't make any difference to my analysis or opinion why there was not a price reaction on those days.

Q. And that's because your methodology seeks to prove a correlation, not causation. Correct?

[redacted]

A. I would be a little bit careful about that. My -- the event study methodology is a statistical analysis of correlation, which could be accepted or rejected per scientific standards, generally, as a -- as part of an inference of likely causation.

Again, we want to -- if you want to use the word "proof," I don't know what proof would mean there.

But the event study usually -- a typical event study would proceed something along the lines of, I observe a statistically significant price reaction; I -- I check certain boxes; and I, therefore, am willing to make the statement that the price reacted to the event.

Q. Well, let me give you a hypothetical which is counterfactual, right?

On a day in which you have a Ripple news event and a -- that -- that coincides with a date on which there is a statistically significant XRP price return, right?

A. Uh-huh.

Q. That price return could have been caused by any number of factors. Correct?

[redacted]

A. No.

Q. Well, you don't know if the reason the price went up was because John Doe in Albania decided to buy a billion units of XRP, correct?

A. Well, wait a minute. The -- the price went up presumably because there was change in relative supply and relative demand. Whether that was John Doe in Albania or Sally Smith in Arkansas, I don't know, and I don't see what difference it would make.

There was a change in relative supply and demand, which is another way of saying, The price moved, and the question is, Why did the price move. Why was there a change in supply and demand.

And the reasonable explanation is there was a change in supply and demand because of the news of this event.

Q. Well, your methodology didn't test to see whether supply changed in response to a Ripple news event, did it?

A. No event study methodology asks the question of whether the increase in price was because supply moved or because demand moved.

[redacted]

I've never seen an event methodology -- event study methodology that concerns itself with that. They moved relative to each other, and, therefore, the price changed.

Q. Well, you don't know, do you? You're --

A. I do know that.

Q. Well, tell me what data you studied to determine whether it was an increase in demand that caused a price impact or a reduction in supply that caused a price impact.

A. Again, I just said, it doesn't make any difference to the event study methodology which of demand or supply moved. It doesn't make any difference. Nobody ever asks that question.

The price moved. It is, therefore, axiomatic that there was a change in relative supply and demand. The question is, Why was there a change in relative supply and demand, that's the question.

And a reasonable answer, the answer that I think the evidence supports is, there was a change in relative supply and demand because

[redacted]

of news of the actions of Ripple Labs.

Q. Did you -- on any of the 24 days in the model we're talking about, did you look at the volume of XRP trading on that day?

A. Since it's not relevant, no, I did not.

Q. And as a result, you're not in a position to offer an opinion as to whether the price moved because there were more buyers than sellers, or fewer sellers than buyers, correct?

A. I'm sorry, I shouldn't laugh. I've never seen any event study concern itself with the questions you're posing.

I will, therefore, say that you're correct that I did not attempt to determine whether supply moved more than demand or whether demand moved more than supply.

I would further point out that looking at trading volume can't help you answer any question like that, but it's -- it's such a strange exercise and question, it would never occur to me, or I think anybody else, to even attempt anything along the lines of what you're suggesting.

[redacted]

So no, I didn't do it.

Q. All right. If you could turn to paragraph 75 on page 32.

A. Yes.

Q. And in the bottom of paragraph 75, you write, From an economic perspective, one explanation, of course, is that news of the event causes the XRP price response.

You wrote that, correct?

A. Yes.

Q. And why did you add "one explanation"?

A. Well, I wanted to acknowledge -- this -- this goes back to the truism that we were discussing a few minutes ago. Simply establishing the two things are correlated, by itself, doesn't tell you which one is causing the other, or whether there's even a third event or third force causing both.

So I wanted to say here, one possibility is that the news is causing the price, and then in Footnote 71, I try and lay out what the other logical possibilities are, but why, you know, I -- I don't think those are at all plausible or -- or reasonable.

[redacted]

Hence, I'm -- I'm comfortable in offering the opinion that in my opinion, the evidence indicates that the news is causing the price.

Q. And you say that -- you outline, in Footnote 71, logical possibilities. What do you mean by logical possibilities?

A. Well, so, let's accept that A and B are correlated.

A could cause B, or B could cause A, or X could cause both.

So in this case, the A is the news from Ripple Labs, and the B is the XRP price increase. Let's just accept for a moment that those two things are correlated. Okay. What's causing that?

What I lay out here is, you know the first one, another explanation might be what I say is the reverse, that the price caused the news, rather than the news caused the price.

Now, what that would mean, and why I think we could dismiss that immediately as unreasonable, is that Ripple Labs, with its crystal ball, knowing that the price of XRP was

[redacted]

about to go up, strategically decided to release certain announcements at exactly the right time.

I -- I simply reject that as at all possible. So in that -- going back to the A and B terminology, the idea that B could cause A, the idea that the price could cause the news, I -- I just think is -- is unreasonable and we can dismiss it.

Then the question of, Well, could there be some X factor that's causing both. Again, we've discussed this at length this morning. This is the idea of some confounding event that is driving both things; I think we can dismiss that as also unreasonable.

And that leaves sort of the last -- the last person standing, that the most likely explanation of the statistical evidence is that the news caused the price.

Q. Tell us what you mean by an X factor?

A. I mean what some might term confounding event.

So something else both causes, you know, in this case, Ripple Labs to get venture funding and also causes XRP prices to go up.

[redacted]

Q. But you acknowledge that an X factor is a possibility, correct?

A. I acknowledge, of course, that it is a logical possibility. Therefore, I take a number of steps to rule it out as not probable.

Q. And it's a logical possibility on any of the 24 days in which you found the correlation between the Ripple news event and a statistically significant price impact on XRP, correct? It's a possibility on every one of those events.

A. Not -- I cannot say as a matter of logic, that it is impossible. I can say that following all the steps that I took, I don't think it's at all likely or reasonable with an explanation.

Q. And you gave some examples of possible X factors in Footnote 71, correct?

A. I don't -- I don't think I actually do provide examples of what these X factors might be. I just simply label them "X factor."

Q. Well, what did you mean when you wrote, These events -- following the sentence about the X factor, what did you mean when you

[redacted]

wrote, These events, of course, are disparate in their nature, including venture funding rounds involving multiple investors, joint ventures in Asia and licensing decisions made by the State of New York.

A. I'm referring to the events being studied here. This is the milestone category. Those are the milestones.

So we -- we'd have -- we'd have to be positing some X factor that is causing venture founding rounds, New York regulatory decisions, various other things, all -- so that -- causing it in such a way that the day that we happen to announce that we're getting venture funding Round A also happens to be the day that XRP price go up.

Again, I just -- I just don't think that's -- that's a plausible or reasonable explanation. I acknowledge here in the footnote I cannot rule it out as logically impossible. I -- I do end up dismissing it as a reasonable explanation.

Q. Can you posit, or imagine, any factor that could have a different price impact on XRP

[redacted]

as opposed to bitcoin or Ether?

A. Besides actions by Ripple Labs?

Q. Yes.

A. Well, sure. I think -- I think -- what is it, the Arrington fund, when -- when he announces setting up an XRP-denominated fund, that might be something that would spur interest in XRP.

Of course, it also presumably would spur creation of XRP accounts, but that might be an example of something that might move the XRP price. I don't know.

Q. Anything else?

A. I -- I mean, not without just descending into wild speculation of things that might be.

Q. Well, John Doe's been thinking about buying XRP for six months and, on that particular day, decides he wants to buy a lot of XRP. That would be an X factor, wouldn't it?

A. An X factor that cause-- why would John Doe buying XRP cause the price to go up?

Q. Didn't you just testify that increased demand and fixed supply --

[redacted]

A. That's -- that's simply a component of demand. I said that demand relative to supply changes, and so price moves. John Doe buying XRP is just an example of demand --

Q. Doesn't it --

A. -- not an example of demand changing relative to supply.

Q. Doesn't it depend on what size purchase he makes?

A. Possibly.

But whether it causes the price to go up or down -- sometimes people want a volume discount. If he buys a lot of XRP, maybe he'll want a volume discount and execute that trade at a slightly lower price than the prevailing market price. I -- who can say?

Q. So let's go to page 1 of Appendix D of your report.

A. Uh-huh.

Q. Tell us why you had to add an Appendix D to explain your methodology.

A. Well, of course, I -- I detail aspects of my methodology in the main body of my report.

Certain details, which I don't think

[redacted]

are necessary to understand in order to understand the basic approach that I took, I -- I moved to an appendix, really for readability issues.

But, thinking about, you know, who might be reading this report and how familiar they may or may not be with event studies, I decided to provide some additional detail.

Q. All right. Could you read the first sentence of paragraph 2 of Appendix D, please, for the record.

A. An event study is conducted by first specifying a model of expected price movements and then testing the extent to which actual price movements differ from those expectations.

Q. And you go on to say, The question an event study answers is whether the differences between actual and expected price movements are sufficiently large that, from a statistical standpoint, such differences are unlikely to be explained by randomness.

Is that correct?

A. I did write that, yes.

Q. And then you note, In this context --

[redacted]

and by "this context," we're talking about the market for XRP, correct?

A. No. I'm speaking specifically in the -- in the general context of an event study, to explain what randomness means.

I mean, it's true of XRP as well, but I wasn't specifically referring to XRP when I said "in this context."

Q. But the sentence you wrote, In this context, randomness refers to the tendency for actual outcomes, in this case the actual price movement, to deviate from the expected outcomes in ways which appear random in nature, applies equally to XRP, correct?

A. Yes.

Q. And on page 28, paragraph 60, you note that you considered 20 different models estimated using 188-day estimation windows; is that correct?

A. 180 days, not 188 days.

Q. It's getting -- I thought I said 180.

A. I heard 188.

Q. You might well have, but I agree it says 180.

[redacted]

And then you test the tendency for the actual XRP price returns to deviate from the expected XRP price returns that are predicted by your 20 models. Correct?

A. Correct.

Q. And in the models that you have created, the expected return is derived primarily from the price returns of other cryptocurrencies. Is that correct?

A. Several of the models -- yes, that -- I mean, in many of the models that would be true.

Q. And you have a demonstrative to assist the reader on page 19. That's your Figure 7. Is that correct?

A. I -- I hope I didn't have -- shuffle things out of order.

Okay. Page 19, yes. Yes, that's correct.

Q. You with me?

The only independent variables in these various models are the growth in XRP accounts and the returns of other cryptocurrencies. Is that correct?

[redacted]

A. Except in half the models where we're controlling for serial correlation, in which case you also control for lags of those things, as well as lagged XRP returns.

Q. So your lagged independent variables are all factors independent of XRP; is that correct?

The lagged independent -- the column on the far right?

A. They are the independent variables. So whatever independent variables you have, whether that's bitcoin, Ether, whatever it may be, you have those returns measured contemporaneously with XRP returns, and then you also include the one-day lag of those returns.

Q. But again, those lagged independent variables are exclusively related to data derived with respect to bitcoin, Ether, and lumens, correct?

A. And XRP account growth.

Q. So your estimation models, is that a fair description of what these are?

A. Yes, I would say so.

Q. Your estimation model suggests that a

[redacted]

reasonable investor's expectations of XRP price returns would be based on the performance of the three other cryptocurrencies that you use in your models. Correct?

A. Well, I have models with one, two, three, five. But, I mean, framing it as the expectations of a reasonable investor, sort of adding words that one doesn't usually add, but we can decompose or project XRP returns on these factors. I mean, it's standard practice, I would say.

Q. But the baseline expectation of how -- how XRP prices will move, according to your model, is predicted by the movement of other cryptocurrencies or the three other cryptocurrencies that you have in Figure 7, correct?

A. In different combinations. And, again, the equal-weighted index adds two other cryptocurrencies to the mix.

Q. And if we could go to page 6, paragraph 15.

I'm sorry, of your rebuttal report. I got that wrong. Sorry.

[redacted]

A. Sorry. Page 6.

Page 6, paragraph 15. Yes?

Q. I'm just going to read the sentence so we can move along. You write, Even accepting all of his -- and that's Professor Ferrell's -- results as correct, Dr. Ferrell's analysis would only serve to establish that, romanette i, there is a relationship between XRP returns and those of other digital tokens (which is not disputed and which I established in the [redacted] report).

Do you see that?

A. I do see that, yes.

Q. What do you mean when you say that there is a relationship between XRP returns and those other digital tokens?

A. I mean that there is a correlation between XRP returns and the returns of other digital tokens. Or that in the context of a factor model of the type that Dr. Ferrell is running, that you would find that -- that other digital token returns enter that factor model with some degree of statistical significance.

Q. And you say that's not disputed and you establish that in the [redacted] report.

[redacted]

What do you mean by that?

A. I mean that I -- I don't -- I certainly didn't dispute it, and I -- I certainly don't dispute it. I can't -- I can't speak to whether other people dispute it.

Perhaps I should have inserted the word "I." I don't dispute.

But my opening report has -- what is it? -- Section 7, which shows at some length how XRP returns correlate with, for instance, bitcoin and how they -- how it relates to bitcoin and Ether at different points in time.

So that's what I meant when I said, I -- I -- again, I should have inserted the word "I" -- don't dispute that there is an association between XRP returns and other digital token returns, and I demonstrated that in my opening report.

Q. And in your opening report, that was the data that you relied on, to predict the expected XRP return. In order to provide the -- the data from which you would identify statistically significant XRP price returns. Correct?

[redacted]

A. I'm tempted to say correct. That sounds right.

Q. Well --

A. There are too many words there, but that sounds right. That sounded right. That is the data that I used in my analysis.

Q. Let's see if we can make the record clear here. As I understand it, your methodology -- withdrawn.

As I understand it, the way in which you identify the expected XRP price return was by the 20 models that you have in Figure 7, most, if not -- most of which relied on the price returns of bitcoin, Ether, and lumens, correct?

A. In some -- let's insert the word "in some combination," right? Not all of them have lumens. But generally speaking, yes.

Q. And that -- those were the -- those were the factors -- withdrawn. I don't want to use "factors."

That was the data from which you predicted the expected XRP return. Correct?

A. With XRP account growth in some models

[redacted]

and lags in other models, but broadly speaking, yes.

Q. And I -- I don't have it memorized. But in some of the models -- I think it's 2, 4, 6, and 8 -- the only data that you looked to for predicting XRP price returns was your constant variable and either bitcoin alone or bitcoin plus Ether or bitcoin plus Ether plus lumens, correct?

A. That is correct.

Q. And for each of those models, you determined that they were -- you determined that each of those models were reliable estimators of expected XRP price returns. Correct?

A. I considered all of those models to be reasonable factor models, and they are in the class of factor models.

Reasonable factor models of XRP returns.

Q. And, in fact, you relied on those results in reaching your opinions. Correct?

A. Among other results, yes.

Q. And so one way in which someone who wanted to expect the returns, the future returns

[redacted]

of XRP, and estimate what those returns would be, would be able to look to the returns of bitcoin, Ether, and lumens in order to reach that -- that -- make that judgment, correct?

A. Well, I would just be a little carefully. It's not a useful forecasting model if that's what -- if that's what you're trying to suggest. Because remember that the returns are measured at the same time as XRP returns.

Q. Fair enough.

Would you --

A. So I'm not saying you would look at what happened on bitcoin today to form a forecast of what will happen in XRP tomorrow.

Q. Well, you do use that as one of your models, but let's -- let's -- I take it as let's take the forecasting point.

If you wanted to understand what the expected return of XRP was during the period that you examined, the models you used established that using the various models with XRP -- I'm sorry, with bitcoin, Ether, and lumens, were reliable estimators of the returns of XRP. Correct?

[redacted]

A. I -- I -- they -- I thought they were all reasonable factor model specifications. And so I wanted to consider -- I wanted to make sure that my results were robust across these different specifications.

You know, you've inserted the word "reliable." Did I come to a point of view that I think bitcoin is the perfect factor? It's certainly a factor that you'll find in the literature, and it seems like a reasonable factor to use.

Q. Well, if you made the judgment -- withdrawn.

Let me -- let's get the models out, I think it will be easier.

So let's go back to page 19, Figure 7.

A. I have it.

Q. All right.

Model 2.

I'm sorry. Model 3 --

A. Uh-huh.

Q. -- the two independent variables you used to predict estimated XRP price returns were the constant and bitcoin. Correct?

[redacted]

A. Model 3 is constant, bitcoin, and XRP account growth.

Q. All right. This is why I need better glasses.

A. Oh, no, no. You're shaking your head, you're right. The odd number ones do not have account growth, I apologize. I was remembering back before with the 2, 4, 6, 8.

You're correct, Model 3 --

Q. So --

A. -- Model 3 is just bitcoin and constant. You're right.

Q. And Model 5 is constant, bitcoin, and Ether. Correct?

A. Correct.

Q. And Model 7 is constant, bitcoin, Ether, and lumens. Correct?

A. Correct.

Q. And each of those models, you determined, were reliable for predicting the expected return of XRP. Correct?

A. I thought each of those models was a reasonable factor model for XRP return.

Q. And if you thought it wasn't

[redacted]

reasonable and reliable, you wouldn't have -- you wouldn't have relied on it, correct?

A. If -- certainly if I thought it was unreasonable and unreliable, I wouldn't have used it.

Q. Now, in Model 9, you add in what you call an e-Index. Can you tell us what an E Index is?

A. E is for equal, equal-weighted index. So I -- I think the notes at the table, or -- or footnote in -- in that section generally, explains that the equal-weighted index is an equal weighted -- is an equal-weighted average return across bitcoin, Ether, lumens, Binance or Binance coin, and then -- now I need to look at it to remember the name of the fifth one.

Q. I'll help you. ADA?

A. Right.

Q. What is Binance coin?

A. Those -- those other two tokens are currently -- or at least in and around the time that -- that I was preparing the report, those were some of the largest market cap digital tokens.

[redacted]

At that time. I don't know if they still are today.

Q. Are you aware of any academic literature in which the Binance returns were used as a variable in an XRP regression model?

A. I can't say that I can think of an academic literature that specifically used that factor.

Of course, Dr. Ferrell uses a variety of digital tokens in -- in his analysis.

But no, I can't point -- I can't remember an academic study that specifically used that token as an explanatory variable.

Q. What, if anything, did you do to satisfy yourself that using Binance returns would be an appropriate or reliable comparator for XRP returns?

A. Again, I -- I took some of -- I took the returns of what were, at the time, the -- the largest by market cap digital tokens, and what I wanted to do was satisfy myself that the correlation results I was going to focus on would not change or would not be sensitive to adding these other major coins. That was --

[redacted]

that was the purpose of these different model specifications.

Q. Did you consider using any other digital assets in this model?

A. No. Those -- between those -- those tokens, plus lumens, we spanned a -- I don't remember the number but a very large share of the digital token market by volume. So no, I didn't -- I didn't think it was necessary to -- to continue to add tokens to the other side.

The other -- the other thing that happens, just as a practical point, is, some of these digital tokens don't necessarily have a very long pricing history.

So, if -- when you're going to study these events back further in time, you don't necessarily have, you know, a wide library of tokens that you could possibly choose from.

As time goes on, more tokens are created, and I agree, you could continue to expand that index, but I -- I didn't see the -- the need or benefit of doing that.

Q. And in the E Index, you weighted each of these tokens equally, correct?

[redacted]

A. Correct. The alternative -- the common alternative would be value weighted as we discussed this morning. Once you value weight them, you basically just end up with bitcoin again. So I -- I already had a model with bitcoin. A value-weighted index model struck me as being largely redundant.

Q. Just so the record's clear, did you say value weighted or volume weighted?

A. Value, usually in the sense of market cap, so it's a combination of volume and price.

Q. And what do you mean by "market cap"?

A. I mean the combination of volume and price.

Q. Well, by "market cap," do you mean all of the outstanding units of that digital asset multiplied times the market price?

A. Sometimes it's all that are outstanding. Sometimes it's all that's been traded over some window. Different people may compute it slightly differently, but conceptually, yes.

Q. And did you take -- did you investigate what the -- we'll call it the market

[redacted]

cap, of ADA was?

A. I know -- I know that again when we pulled the data, the instruction was to pull the largest by market cap at the time we were assembling the data set. I don't recall offhand what the market cap of ADA was.

But I think -- I imagine I have a footnote, in and around this table, where I cite the source of my market cap data which indicated it was a -- one of the larger coins at that time.

Q. Now, you included in your model what you called account growth?

A. Correct.

Q. Are you aware of any publications or studies that support using the number of accounts for digital asset as a predicter of price impact?

A. I -- I cite to a literature that explores network effects on digital token prices, and -- and accounts was one proxy that they used for network effects.

Q. That study also used four other criteria, correct?

[redacted]

A. It did.

Q. Including the number of active addresses, the number of transaction count and the number of payment count?

A. I don't have the study in front of me, but that sounds familiar.

Q. Does that sound generally correct? I can show you the study if you like.

A. It sounds generally correct.

Q. And you elected not to use the other three variables that were cited in that study. Correct?

A. I -- correct. I elected to focus on account growth.

Q. And why was that?

A. It was a -- if -- I think if we look at the study, you'll see that it's a significant factor in their models. The data were readily available and seemed cleanly measured, and it seemed like a useful factor to include.

I found that many of the models put a statistically significant weight on that factor at different points in time.

Q. The article you're referring to is

[redacted]

in -- published in the Review of Financial Studies, "Risk and Returns of Cryptocurrency" by Yukun Liu and Aleh Tsyvinski; is that correct?

A. I mean, I -- I think so. I'm happy to look at my report and look at the footnote. Maybe you have it in front of --

Q. Why don't -- why don't I just show you what we'll mark as Exhibit 11.

(Article titled "Risks and Returns of Cryptocurrency" was marked Exhibit 11 for identification, as of this date.)

Q. Why don't you take a look at page 2699 of Exhibit 11.

A. Uh-huh.

Q. You see they say, We construct network factors of cryptocurrency and test whether these factors can account for variations of cryptocurrency prices?

A. I see that, yes.

Q. And then it says, we then use -- We use four measures to -- to proxy for the network effect, the number of wallet users, the number of active addresses, the number -- or transaction count and the number of payment

[redacted]

count.

A. I see that.

Q. It says, Then we measure cryptocurrency network growth using the wallet user growth, active address growth, transaction count growth and payment count growth.

Do you see that?

A. I see that.

Q. What are network factors?

A. Well, the phrase can mean different things in different contexts. But here, I take them to mean the idea -- the idea of -- of sort of a network effect in value, meaning the value of something depends in part on how many other people are associated with it. That's generally what a network effect is.

So as -- as it grows, as the network of people involved grow, the value of the network increases.

Q. So the study -- what was discussed in this article was how to measure the growth of a network. Correct?

A. I don't know if I would characterize it that way. I would say what the study's

[redacted]

testing and showing is whether some proxies, some variables, which you might say they proxy for network growth, how those variables are associated or correlated with digital token returns to see whether -- you know, to test this hypothesis, whether network factors help drive prices.

Q. And this portion of the study, though, is, as you say, using factors or proxies for measuring network growth. Correct?

A. Correct.

Q. It doesn't say that those factors are relevant to determining price impact on a digital asset. Correct?

A. No. I think that's exactly what they're saying.

Q. They're measuring network growth and then measuring network growth as a predicter for --

A. For price impacts.

Q. Right. So you've picked one factor that they use to measure network growth and skipped the step of figuring out whether there's network growth and apply it directly to price

[redacted]

impact on a digital asset. Correct?

A. I don't see that I skipped a step. They're testing a hypothesis of whether certain proxies of network growth were associated with price increases. They generally find that they are.

So taking that result, and -- I decided to have a version of -- one version of all of my models, which adds a proxy for network growth, again, just to make sure that my results are robust to whether a proxy for network growth is included or not.

Q. Well, you picked one of four factors that was used as a proxy for network growth, correct?

A. That's correct.

Q. And the data for the other factors was available to you. Correct?

A. Correct.

Q. You --

A. I mean, I assume so because --

Q. You could identify the -- let's not talk over each other.

You could have identified the number

[redacted]

of wallet users, correct?

A. Presumably. I --

Q. You could have identified number of active addresses?

A. Well, that's what I have.

Q. And you could identify the number of transaction count?

A. I -- I presumably could have gotten some transaction count data.

Q. And you could have identified the number of payment count. Correct?

A. I mean, not having attempted to obtain all of those things, possibly they're all obtainable. I took the -- I took the account growth, which appears to be, you know, the most significant factor that they have.

Q. All right. Are you aware of any professional or academic work that has used the prices of other digital assets as variables in a regression model to identify XRP returns?

A. The event studies I've seen generally do not have other digital token price factors. They correspond to my Model 1, and they correspond to my Model 11.

[redacted]

But the use of factor models, generally, is established. And, of course, you know, Dr. Ferrell does sort of the same thing.

I'm trying to remember if -- if I saw an event study. The -- the reason I'm -- I'm thinking about it is a lot of the event studies include bitcoin as -- you know, they're looking at the -- the response of bitcoin to certain events. And so, obviously, you can't put bitcoin returns on the other side of a bitcoin model.

Q. I don't want to interrupt you. I have -- the question is very specific.

A. Yeah.

Q. The question is whether you're aware of any publications, academic literature, that use the price other digital assets as a variable in a regression model to predict XRP returns.

I'm looking specifically for publications that focus on XRP returns.

A. Sitting here today, the event studies related to XRP returns with which I am most familiar only use the constant mean return model that I used, my Model 1. And I believe

[redacted]

Gerritsen also does a correction for serial correlation, which is my Model 11.

Q. But neither of those two studies involve the use of other cryptocurrencies to predict XRP prices. Correct?

Serial correlation is not a -- does not depend on the returns of other cryptocurrencies, correct?

A. Correct. Correct.

Q. So the answer to my question is, no, you're not aware of any other academic or professional studies that use the price of other digital assets as variables in a regression model to predict XRP price returns?

A. Sitting here today, I can't think of one, no.

Q. Are you aware of any professional or academic studies that have used the growth of XRP accounts as a variable in a regression model to predict XRP returns?

A. Well, now I just have to remind myself whether -- whether XRP was one of the price series used in the -- in the paper that we're studying.

[redacted]

It -- they may have been -- they may have based it on bitcoin prices.

A lot of the literature does focus on bitcoin prices.

Just trying to -- I'm just trying to remember.

My recollection is that this study is looking at bitcoin prices and suggesting network factors for bitcoin.

I just want to make sure that I'm not -- I'm not misremembering. It's been a long time since I looked at this.

(Witness reviewing document.)

A. Oh, no. That's -- no. Right. I'm sorry. They're studying an index, constructed index of cryptocurrency market returns, value-weighted returns on all coins with capitalizations of more than a million, da, da, da, da, da.

I'm trying to see if they indicate whether XRP was picked up as part of that. I expect it would have been.

I'm just trying to -- I'm sorry. I'm just trying to see where they list exactly which

digital tokens go into their index. They describe it as being above a market cap of a million, which I assume would have picked up XRP. I'm just trying to see if I can -- if I can just see a list of the tokens that they -- that they consider.

I don't think they -- I'm not seeing -- and I apologize if I'm just missing it. I'm not seeing an explicit list of which tokens are in -- no. Wait. I'm sorry.

Table 1 -- okay. Table 1 compares the properties, bitcoin, Ether, Ripple, and so on and so forth. So I -- I have every reason to think that Ripple is part of their index, of digital token returns that they are comparing against market factors.

Q. Well, it's one of several. My question was, are you aware of any professional or academic publications that use the growth in XRP accounts in a variable, in a regression model, looking specifically at XRP returns?

A. That very narrow question? No, I'm not aware of one.

Q. Are you familiar with the concept of

[redacted]

error rate?

A. I -- I -- I think I am, yes.

Q. Did you do any work to determine whether there was an error rate in any of the data or the application of data to the event study that you conducted in this case?

A. Well, of course, the -- the regression results incorporate error -- not necessarily error, but variance of the data and the variance of the error term of a regression.

So that's -- that's naturally part of it.

The generalized rank test that I applied is a test of significance against a measure of standard error. So that's incorporated there.

And the exact sample hypergeometric test, which is basically the Fisher test, is an exact sample test.

So thinking through the various sources of error, I believe they are all properly accounted for in my analysis.

Q. Well, you assume that the error rate based on the statistical analysis you did was

[redacted]

5 percent. Correct?

A. That's not an error rate.

So no. No. I think you're -- I think you're misstating things. 5 percent is not an assumed error rate.

Q. Well, the 5 percent means the -- the correlation or the value assigned could be 5 percent higher or 5 percent lower. It's a level of statistical significance, correct?

A. No. That's not what it means in this context.

Q. Well, why don't you tell us what the 5 percent significance that you have -- has asterisks. You have 5 percent, 1 percent. Let's just talk about 5 percent.

What does that 5 percent reflect?

A. That means that the probability of observing the outcome that we observe is -- would be 5 percent, assuming the null hypothesis of the model.

So, for example, assuming Ripple Labs and XRP markets are independent of each other, the probability that you would draw 24 significant days out of a group of 105 is on the

[redacted]

order of 1 in a hundred thousand. So much less than 5 percent.

That's what the 5 percent significance test means.

And that is customarily, or at least a very common standard in scientific research, to say, if the probability of this outcome under the model, under the null hypothesis of the model, is less than 5 percent, then I can reject the null hypothesis. That's what 5 percent means in this -- in this context.

Q. What is the error rate in concluding or determining that XRP had a statistically significant price return when making that determination based on the expected returns predicted by other digital assets?

A. I'm going to try and understand your question.

In the context of any one of 20 regression models, the context of any one date that we're considering, we have a predicted return and we have an actual return and we have a difference.

We also have a measure of the

[redacted]

statistical -- the statistical difference -- distance of that difference. So, you can think of it as how many standard deviations away from expectations are you.

That statistical distance reflects uncertainty and parameter estimates and a whole host of things.

Okay. If that statistical distance is such that the odds of observing -- the obs of -- the odds of observing a difference between expected returns and actual returns is less than 5 percent, then we would -- then we would flag that as a statistically significant abnormal return.

Did that answer your question?

Q. I don't know. Let me try another one.

What that -- if I understood you correctly, what it suggests is that not every time you find a coincidence of a statistically significant XRP price return and a Ripple event do you have confidence of a correlation?

In other words, that could -- that could happen by random chance, some percentage of the time. Correct?

[redacted]

A. Well, I would not accept the way you framed the question.

Of course, it is -- and I make this clear in the report. There -- there is a one in a hundred thousand chance, by random chance, that we could draw 24 significant days out of a set of 105.

It's not impossible, you know. By the laws of physics, there is a one in about a hundred thousand possibility of doing that by random chance.

But the standard for statistical significance and scientific research is, is there a 1 in 20 chance that this outcome could be due to random chance?

So that's why I say these results are well within any reasonable standard of significance that would be recognized in academic research.

I would -- I would just refer you back to the jar of marble example. As I say there, it is possible to draw ten red marbles out of the jar. It's not impossible, it's possible. But you have to wait and do it millions and

[redacted]

millions and millions and millions of times before you grabbed all ten red marbles. You'd probably win the lottery a few times over. So that's generally how statistics works.

Q. All right. And other than your confidence in the statistical significance, as you just described it, did you do anything to determine whether there were any errors that was in the data or in the application of the data to the -- the model that you used?

MR. MOYE: Asked and answered.

A. Well, I mean, it -- of course, we have procedures, among my team, to look for errors. The implementation of the statistical models and all of the analysis that you see was done by a second independent person to make sure that numbers tied out and there were no errors in code or anywhere else.

And to the very best of my knowledge, there are no errors anywhere in my work in this matter.

Q. All right. Turn to Dr. Ferrell.

As I understand his report, he's testing --

[redacted]

A. My rebuttal or -- or I --

Q. Right now I'm asking you about --

A. Okay.

Q. -- Dr. Ferrell's report. We'll get to your rebuttal.

A. Sure.

Q. As I understand it, he's testing a hypothesis, using the principal component analysis, that the returns of other cryptocurrencies explain, to a level of statistical certainty, the entirety of the XRP returns. Is that correct?

A. I'm sorry, I don't -- I don't understand that description of what he's doing. That doesn't sound -- I -- I -- that's not how I would describe anything that he's doing.

Q. Why don't we -- do we have Dr. Ferrell's report?

(Expert Report of Dr. Allen Ferrell was marked Exhibit 12 for identification, as of this date.)

Q. All right. Let me -- let me try in Dr. Ferrell's own words. Take a look at page 48, Footnote 178.

[redacted]

A. Sure. Page 48.

Footnote 178. Yes.

Q. And why don't you read the --

A. You just want me to read the footnote?

Q. Yeah, up to "et cetera," and then the cite.

A. If the null hypothesis of the constant term equals zero are rejected, which is not the case in Exhibits 3-7, that would merely mean that the factors used in the model were insufficient to explain the average monthly XRP price return and that there were potentially additional factors that needed to be included.

A rejection of the null of the zero constant term cannot be used to learn the nature or identity of the additional factors that should be added to the model and whether those factors are related to the cryptocurrency market, other asset markets, political sentiment, changes to regulation, et cetera.

Q. Do you agree with Dr. Ferrell's characterization of rejecting or accepting the null hypothesis of the constant equaling zero?

A. I would not have characterized it this

[redacted]

way, to be perfectly honest with you.

I -- I just -- I just wouldn't -- would never have described it this way.

Q. Well, do you have an understanding of what he's referring to when he's talking about the constant term?

A. I -- I -- I understand -- I understand what he's trying to say up to a point. And then he says things that I don't quite understand what --

Q. Let's just stick with my question.

A. Sure.

Q. Do you understand what the -- what the phrase, "constant term," refers to as used in Footnote 178?

A. I do.

Q. And what is your understanding?

A. It refers to the intercept or constant in a factor regression model.

Q. And what does it mean to reject the null hypothesis of the constant term equaling zero?

A. So, when you estimate the model, you will have an estimated value for that constant

[redacted]

term.

And, coincidence aside, the number will not actually be zero. It will be something.

I think in his case, if I remember correctly, it's .058, if memory serves.

So that's the estimate of alpha, or the constant term. 058.

Now, around that estimate, there is some uncertainty. That range of uncertainty might be narrow, it might be wide. In his case, one standard deviation is .042, if memory serves. Again, this is just period one of his model.

So what does that mean?

That means that 95 percent of the time, the actual alpha, so he -- so he's got an estimate of alpha -- backing up a second.

He has an estimate of alpha. You have to imagine that there is an actual true alpha out there, somewhere. He's got an estimate of it.

Under certain conditions, 95 percent of the time, the true alpha lies within a range

[redacted]

around his estimate of alpha.

I just want to make it -- with me so far?

Okay.

Q. It doesn't matter. Just answer the question.

A. Okay. All right. So I just -- I want to make sure I'm being understood.

So what he's saying is that that range, centered at .058 plus or minus 1.96 times .042, includes the number zero. So 058, it goes below zero, and then, of course, it goes up to 14.

And so he would say, quite correctly, that under customary standards, you could not reject the hypothesis that -- that the true alpha is the number zero.

Q. Okay. And fair to say, because I can't put all of the --

A. I'm trying, I'm trying.

Q. -- econometric qualifications into my question every time.

If I say alpha is zero, can we agree that what I'm referring to is what you just

[redacted]

described, that the difference between the true alpha and his estimated alpha is statistically insignificant? Is that a fair summary?

A. You were so close right up to the end. I -- I will agree we can -- we can use the phrase, alpha is zero, to refer to cases where we cannot reject the hypothesis that alpha is zero. Is that satisfactory?

Q. As long as you understand and we agree, the record's clear --

A. I understand.

Q. -- when we say alpha's zero.

A. It's clear to me. If it's satisfactory to you, then that's fine.

Q. All right. And in substance, again at a high level, what Dr. Ferrell is trying to test is whether the alpha in his principal component study is zero. Correct?

A. That's one of the things he's trying to test, yes.

Q. And, in fact, he concluded, using his principal component analysis, that the alpha was zero. Is that right?

A. That is correct.

[redacted]

Q. All right.

MR. MOYE: Reid, when you have a minute, could we take a break?

MR. FIGEL: Sure. Now is as good time as any.

THE VIDEOGRAPHER: We're going off the record at 5:11 p.m.

(Recess from 5:11 to 5:25.)

THE VIDEOGRAPHER: We're back on the record at 5:25 p.m.

Q. All right. Dr. [redacted] in your rebuttal report, you don't report or state that you did any econometric analysis that indicates that the correct alpha in Dr. Ferrell's principal component content study is not zero, did you?

A. Well, that's -- that's -- there are a lot of nuances to that question.

Q. Could you start with yes or no if you can?

A. Well, I can't. I genuinely can't. Because what I do show in my report is that a parameter like alpha, in Dr. Ferrell's specification, is -- is there's evidence and reason to believe that it changes over time.

[redacted]

And so I show in -- in one section of my report that if you allow alpha to change over time, take everything else Dr. Ferrell is doing as given, you can get nonzero estimates that way.

I will say, yes, that if I simply replicate what Dr. Ferrell did, I get Dr. Ferrell's numbers.

But that's -- that's a sort of narrow yes.

Q. Are you offering an opinion in this case that the proper application of Dr. Ferrell's principal component analysis should have resulted in a nonzero alpha?

A. As I explain in my report, the question is, frankly, not interesting. It could be zero. It could be nonzero. It doesn't shed any light on any helpful question that I can see in this matter. They -- the presumption when running a factor model is that alpha will be zero. That is ordinarily what you would expect.

Finding a zero alpha is unremarkable.

Q. So is the answer to my question that you will not be offering an opinion in this

litigation that a proper application of Dr. Ferrell's principal component analysis would have yielded a nonzero alpha?

A. I struggle to say yes to that, because in my view, a proper application would allow for parameters to change over time.

And when you do that, there is evidence that alpha is not zero.

Q. Can you show us where in your report -- that's Exhibit 2 -- you describe the opinion you intend to offer, that whatever adjustments you feel are appropriate to Dr. Ferrell's principal component analysis, would have resulted in a nonzero alpha?

A. It's -- so I would point you to page 3, the second bullet, beginning, The statistical analyses employed by Dr. Ferrell are not robust in many respects.

Sub-bullet 2 to that, Dr. Ferrell does not appear to have considered that certain parameters of his model can and do change over time.

That is further developed -- I believe it's the very last section of my report --

[redacted]

Q. Before you go to that -- I don't mean to interrupt. Just on these two points --

A. Yes.

Q. -- what I heard you say was a criticism of Dr. Ferrell's study, not that you are offering a contrary opinion that had he done the study the way you believed it should have been done, it would have resulted in a nonzero alpha. Is that correct?

A. I -- I'm not sure that that's correct. As I say here, in my opinion, a proper analysis would have allowed parameters to change. And I show in my report, I -- allowing alpha to change can produce a nonzero alpha. So I --

Q. I understand that it's theoretically possible. My question is, are you offering the opinion that if he had done -- withdrawn. Let me start over.

Are you offering the opinion in this litigation that had Dr. Ferrell done the analysis that would have, as you say, allowed the parameters to change, that that would have resulted in a nonzero alpha?

A. To that I have to say, yes, because it

[redacted]

does.

Q. Where do you set out the calculations that show that with the adjustments you believe are appropriate, the result is a nonzero alpha?

A. That is Exhibit -- Figure 17, literally the last page before Appendix A.

It's precisely what I am doing in this exhibit, is I'm showing that allowing alpha to change over time, can produce estimates of alpha that are significantly different from zero. And it can produce estimates of a change in alpha, that is significantly different from zero.

Q. Right. So let's go -- you have -- you have -- Figure 17 in front of you?

A. I do.

Q. All right. As I understand Figure 17, the second column is the alpha that Dr. Ferrell calculated. Correct?

A. It's an alpha of the type that Dr. Ferrell calculated, yes.

Q. And then your middle column is your data or your calculations or the results of your calculations that showed, had he made the adjustments that you contend were necessary,

[redacted]

alpha would have changed in the amounts that you set forth. Correct?

A. So to be clear, the particular analysis that I'm running here, which is -- which is a demonstration of principle, is to say, as an example of allowing a parameter to change, imagine that alpha changed once Ripple Labs received its BitLicense.

Now, I'm not saying it has to change. It might change. I'm just allowing it to change.

And so what Figure 17 is showing is, if you -- if you make that allowance, you can find, in several cases, that with that allowance, alpha becomes significantly negative, and that change in alpha post BitLicense is significantly positive.

Q. Well, the -- let's just make sure we're -- the record is clear here. The center column under the heading, Post BitLicense Period Change in Alpha, is the amount of the change in alpha. Correct? It's not the resulting alpha.

A. That is correct.

Q. So the resulting alpha would have been

[redacted]

the -- let's just talk for September 4, 2015 -- would have been the negative .04 plus the .05, correct?

A. Correct. The way to interpret -- the way to interpret this --

Q. Just stay with me.

Correct, right?

A. Well --

Q. So had you added a column that said, Alpha Post BitLicense Period, you would have put in the number .01; is that correct?

A. Correct. Alpha -- alpha -- what -- the column called alpha, you could describe as alpha pre BitLicense. Then there's a change. You would add those two numbers to get alpha post BitLicense.

Q. Correct. And just doing the arithmetic, which I can do, you'd start with a negative .04. And you add positive .05. That results in positive .01. That's what the post-BitLicense alpha would be. Correct?

A. In that case, yes, that is correct.

Q. And where in your report do you say that the post-BitLicense alpha is nonzero?

[redacted]

A. Well, I -- that was not your question, and that's not what I said. You asked me about alpha. So everywhere here that you see a significant negative, under the alpha column, that would correspond to a significantly negative pre-BitLicense alpha.

So to the question, Is alpha always zero? The answer is no. It's not always zero. Pre-BitLicense alpha is sometimes significantly negative.

To that you can couple sometimes a significantly positive increase once Ripple Labs gets its BitLicense. The net result of those two things, the post-BitLicense alpha, is sometimes going to be numerically greater than zero. I can't tell from looking at this whether it is statistically greater than zero.

Q. So what you are saying is that the alpha that you calculate after the BitLicense was awarded should be used to change the alpha before the BitLicense was awarded?

A. I'm saying that alpha -- what does alpha represent? Alpha represents an average excess return in XRP prices after controlling

[redacted]

for all the factors that you're controlling for. That's what alpha represents.

Pre BitLicense, that average is sometimes significantly negative.

Then with the BitLicense, there is a change, which is sometimes significantly positive. And post BitLicense, that average is the combination of the two. The post license -- post-BitLicense average may or may not be statistically different from zero. I can't tell by looking at this table. I don't know the answer to that.

But the table is already enough to establish that the pre-BitLicense alpha is statistically different from zero. So to the question, Is alpha always zero? I would have to say that the answer is no.

Q. Why does the change you calculate in alpha following the BitLicense affect the alpha prior to that time?

A. It doesn't.

So you had -- it was earning -- there was -- there was an alpha for the several months before it got its BitLicense, which was in some

[redacted]

cases significantly negative. And then there's an alpha in the several months after it gets its BitLicense, which is sometimes significantly much more positive.

So you go from here to here. That's -- that's what this is saying.

Q. Well, let's just start: Do you contest Dr. Ferrell's calculation of alpha in your Figure 17 in the second column?

A. All of Figure 17 is a criticism of Dr. Ferrell's approach to dealing with alpha. Dr. Ferrell's approach is to assume that alpha remains unchanged for five years or seven years.

And my examination of cryptocurrency data leads me to think that none of these parameters is going to be stable for five years or seven years.

And I'm simply demonstrating here that if we had simply allowed, just allowed the possibility for alpha to be different before and after Ripple gets its BitLicense, you would find significant evidence that alpha is different before and after it gets its BitLicense. That's what Table 17 reflects.

[redacted]

Q. Did you do any calculations or studies that allows you to demonstrate that alpha should have been different before Ripple got its BitLicense?

A. Yes. And I would point you to Figure 17.

Q. And what Figure 17 shows, as I understand it -- and correct me if I'm wrong -- is the amount of change in alpha that you observe following the award of the BitLicense. Correct?

A. Correct.

Q. So -- and the BitLicense is a factor, correct, or an event?

A. It's an event, yes.

Q. Yes. That has an impact. Correct?

A. I think so.

Q. And according to you, it results in a change in alpha, correct?

A. Correct.

Q. So what about that makes the alpha that Dr. Ferrell calculated for the period before the award of the BitLicense nonzero?

Or inaccurate. Let's not even get to

[redacted]

nonzero; the -- the values that he created are inaccurate.

A. The val-- Dr. Ferrell is producing an estimate of alpha under the assumption that there -- that it is constant, that it does not change.

Now, that assumption might be true. That assumption might be false. It's a testable assumption. We can get the data, and we can go look.

And that's what I do in Figure 17. And what I show is that that assumption is false. It's not a good assumption to make.

So if you estimate a model, saying, I'm going to find a parameter estimate assuming it's constant for seven years, or five years, whatever the length of time is here, and your assumption is false, you have a misspecified model at the outset. And that's what I'm demonstrating.

Q. So let me make sure I follow you. As I understand it, based on the work that you did, you think there are two different alphas, there are two periods, right? There's a pre

[redacted]

BitLicense alpha and a post BitLicense alpha; am I correct?

A. I'm showing that if you allow for that possibility, you'll find evidence that it's true.

Q. All right. Did you do an analysis as to whether the two alphas considered jointly were statistically significant in rejecting nonzero?

A. I've shown that the pre BitLicense alpha is significantly different from zero, and I've shown that the change to the pre BitLicense alpha is statistically different from zero.

Q. By "statistically different from zero," you're rejecting the hypothesis that alpha is zero. Is that correct?

A. That is correct.

MR. MOYE: Excuse me. Mark's going sub in for me. I'm going to head out.

MR. FIGEL: Just for the record, Mr. Moye has a plane to catch. We view these as a -- a justification to depart from the rule that each party can only have one lawyer representing a party at a

[redacted]

deposition.

And so, Mr. Sylvester will pitch in, but we don't view this as a basis to argue that there can be a swap in any other circumstance.

MR. MOYE: Thanks very much.

Q. Did you ever do a test to determine whether these alphas, the two that you have here, are jointly significant?

A. Strictly speaking, no. I haven't conducted a test of whether they are jointly significant.

Q. And why not?

A. My point here was simply to show that they can change over time. And that if you allow them to change over time, you'll find significant evidence that they do change over time.

My expectation is that a joint test on some of these days would reject the hypothesis that they're both zero. I'd be surprised if it didn't, but for the record, I haven't done it and I don't know for sure.

Q. So you're not offering an opinion that

[redacted]

the -- the two alphas considered jointly are nonzero, correct?

A. Based on this analysis, I -- I wouldn't be prepared to say that. I would certainly say that there is substantial evidence that alpha changes, and any model that doesn't allow for that possibility is misspecified.

Q. Let me direct your attention now to Footnote 174 of Dr. Ferrell's report.

A. What page is that, please?

Q. 46.

A. Okay.

Q. All right. He writes, The R-squared measures the percentage of the various -- of the variation in the dependent variable, (e.g., XRP price return) that the regression model explains.

Do you agree with that statement?

A. I do, yes.

Q. Do you agree that a decrease in R-squared itself does not disprove Dr. Ferrell's conclusion that alpha -- that under a principal component analysis, alpha is statistically insignificant?

[redacted]

A. The -- the two points are unrelated.

Q. So a decrease in R-square values doesn't disprove a conclusion that alpha is statistically insignificant? Correct?

A. It doesn't -- it doesn't -- correct, it doesn't speak to the question of whether alpha is statistically different from zero.

Q. And I direct your attention to page -- paragraph 25 on page 10 of your rebuttal report.

A. Yes.

Q. All right. You claim that Professor Ferrell's principal component analysis is, quote, concentrated on three months with extreme returns, while the model explains relatively little of the variation on XRP's prices outside of those three months.

A. Correct.

Q. If you could turn the page to Figure 3 on page 11. You with me?

A. I am.

Q. And the three events that you contend should have been excluded are identified in Figure 3, correct?

A. I'm not saying they should have been

[redacted]

excluded. I'm -- I'm pointing out three outlier returns among his 70 return observations.

Q. So you agree that it was appropriate for Dr. Ferrell to include these three returns in his principal component analysis. Correct?

A. I didn't say that either. I'm pointing out that in the set of 70 months, there are three returns that are unusually large compared to the other 70. That's what I'm showing here.

Now, the question becomes, So what. And I proceed to investigate the implications and consequences of that.

It's possible that it doesn't matter. It turns out in this case, that these three returns are driving a lot of his results.

Q. Just before we get to -- move on from this, why did you not raise the same set of concerns with respect to the price return on the far right of the horizontal axis?

A. I -- I simply went -- I simply went from the first to the second to the third. That -- that next one is surely the fourth. And with three months, one can account for

[redacted]

94 percent of the variation in the set of 70.

With another four months, you know, that would rise to something else. But I -- I stopped where I -- where I needed to stop, which is how many months account for 94 percent of the variation in his data.

Q. Let's turn the page and go to Figure 4?

A. Yes.

Q. This effectively is an effort to replicate Professor Ferrell's analysis with omitting those three days; is that correct?

A. No, no, that's not what this is at all.

Q. Well, why don't you tell us what you purport to do in Figure 4.

A. So Figure 4 is simply taking the 70 observations that Dr. Ferrell -- so let's back up.

Dr. Ferrell has 70 observations, he has a number of factors, he runs a regression, he reports a very high R-squared.

I'm taking the same 70 observations, and I'm simply putting a fixed effect on three

[redacted]

of those months. I don't have any of his other factors. I just say, Let's put a fixed effect for this month, this month, and the other month. And that alone accounts for 94 percent of the variation.

The purpose of this table is simply to demonstrate an empirical fact, that three months out of 70 accounts for 94 percent of the variation in the entire set of 70.

This right now is just a -- demonstrating a fact.

Q. What do you mean by "fixed effect"?

A. They're also -- they -- they're sometimes called dummy variables. Back when I was a student, they were dummy variables, and at some point that fell out of favor because it -- maybe it sounds dumb. And so people started to say fixed effects instead. But it's just a -- it's just a flag to pick up this -- this observation.

Q. How is that different than omitting it from the study?

A. Well, you're almost right, with respect.

[redacted]

And I'm not suggesting that he do this, but you would be correct that in the context of his model, if he wanted to, he could have put dummies for each of these three months, and that would be effectively the same thing -- in terms of the other parameters of his model, that would effectively be the same thing as removing three observations from the model.

But that's not what I'm doing here, and that's not the point that -- that I'm making in this section of my report.

Q. So if I understand your testimony, it's just observational; is that right? You're just explaining how much of the variation can be traced to those three --

A. To those three months. At this point in this section, that's all I'm doing. Three months account for 94 percent of the variation.

This is not yet -- if you stopped here, this is not yet a criticism of anything that Dr. Ferrell has done. Simply documenting an empirical fact.

Q. And you're not challenging or

[redacted]

contesting the accuracy of the price returns that he calculated on those three instances.

A. That is correct. I'm not -- I'm not arguing that those returns were not real and did not actually happen in XRP prices.

Q. All right. If you could turn the page and go to -- give me just a second.

Let's go to Figure 5. Can you tell us what Figure 5 represents.

A. So, out of these 70 months in his factor model, Dr. Ferrell reports an R-squared of about 93 percent, plus or minus. That's Fact Number 1.

Fact Number 2, I show just three of those 70 months accounts for 94 percent of the variation. That's Fact Number 2.

Now, the question becomes, is Dr. Ferrell getting a high R-squared only because his model explains those three months and doesn't explain the other 67?

That's possible.

Or is Dr. Ferrell getting his R-squared because his model does a really good job of explaining all 70 months including the

[redacted]

three outliers? That's also possible.

I -- I don't know yet.

So that is what I'm going to test.

And so in this figure, what I've done is I've replicated Dr. Ferrell's model, I've taken his predictions for 67 of the 70 months. And I'm asking the question: How powerful is his model outside of the three months that we've been talking about? That's the question.

And, of course, I don't know the answer before I -- before I do the analysis. It might be very powerful. Or it might not be powerful. What I find is, it's not powerful.

In fact, outside of those three months, Dr. Ferrell's model is actually worse than no model. He would be better off with no model.

So that's -- that's the point that I want to make, is the high R-squared he reports is not because he's done a very good job of explaining every point in his data set. It's because he's done a good job of explaining three points in his data set and really is not explaining anything that happens the other

[redacted]

67 months.

Q. So when you testified with respect to Figure 5, you've taken his predictions for 67 of the 70 months and asking the question: How powerful is his model? In Figure 5, you are excluding the three outlier dates. Correct?

A. Correct. I'm taking his model estimated on all 70, and I'm simply taking the predictions of that model for the other 67 months besides the three that we're talking about.

Q. And what is the -- what is the basis in the academic literature that causes you to believe that it's appropriate to remove three days of data out of 70 that you don't contest is a mismeasurement and exclude it from your model?

A. Well, there's -- first of all, that's not what I'm doing.

But to answer your question, there's an entire literature of how to handle outlier data points and regression models.

The data may be correct. Being an outlier doesn't necessarily mean the data are false. It simply means that they have -- they

[redacted]

are overly influential in your parameter estimates.

So, for example, you have 70 points, and they're all kind of bouncing around a little bit like this. And then you've got one point, which is just way out of scale for the others. That might be the data. Nothing wrong with the data.

If you fit a model to that series of data, what can happen is that your model, which is just trying to solve a problem that you've given it, your model will say, Well, okay, if you want me to solve this problem, what I'm going to do is I'm going to figure out how I can match this one point that's way outside of everything else, and I'm going to not do a very good job on these other points. That might be okay, or that might not be okay. But that's what can happen with outlier or influential points.

That appears to be what happened here.

Now, if in response to this, Dr. Ferrell decided that he wanted to do something in the sense of he wants to have

[redacted]

better -- a better, more robust, more reliable model by taking account of those outliers, there's plenty of literature that discusses appropriate ways to do that.

Q. I'm going to quote from you -- from the Litigation Services Handbook again. This is Section 9.4.

It says, Practitioner should not eliminate outlier data points without first investigating them. The removal of data points can prove dangerous. Although eliminating outliers will typically improve a regression's fit, it can also destroy some of the model's most important information. One should investigate whether substantive information exists regarding these points and whether the analysis should exclude them. Do they involve possible measurement errors? If not, then the analyst should consider including them.

We agree that you're not contending that the three points are measurement errors, correct?

A. Correct. I'm not -- I'm not saying that.

[redacted]

Q. What did you do to investigate the circumstances of those three data points?

A. That's what this section is.

Q. I'm not talking about the --

A. This set --

Q. Not talking about the effect on the R-squared. I'm talking about what happened in the real world as to why there were those -- call them outlier results.

A. Well, one I point to, I mean, I -- I didn't -- again, I have no reason to doubt the data. I didn't concern myself with that question.

I identify single largest outlier here, happens to land -- or maybe not happens, but lands on the day that Ripple Labs announces its intention to escrow tokens. That might be what's causing the outlier.

But that was -- I -- but I didn't concern myself with trying to understand everything that was happening on -- on these three dates.

What the handbook is saying, I completely agree with, which is if you've got

[redacted]

outliers, you need to do some work. That's really what the handbook is saying. If you've got outliers, you need to do some work to see whether you want to keep them or deal with them, and that's what I'm doing here.

Q. And the only work that you did was to associate the largest, call it outlier, with the announcement of escrow --

A. No, no. That's not --

Q. Let me finish my question.

A. Please.

Q. -- and you did nothing to investigate the circumstances or the context of the other two outliers. Correct?

A. No. No. That's -- that's --

Q. When you said --

A. -- incorrect.

Q. -- you didn't know what happened on the other two dates.

A. The work -- the work of the type the handbook is discussing and the type that I'm discussing is to investigate whether those outlier points are having undue influence in your model. That's the work.

[redacted]

And that's the kind of -- this is the kind of work that I'm doing here. This is the type of investigation that an -- that an analyst might do to determine if these three outlier points are biasing the model.

Q. Well, if the data is accurate, what basis is there to exclude it as having an impact on the model that purports to describe what's actually happening in the real world?

A. Well, the handbook lays out some of these reasons, and I've explained some of those reasons. An outlier point, accurate though it may be, may be biasing your model, right?

Your model may adjust its parameters in such a way that it will get that one point right, but get a lot of other points wrong. And in some circumstances, you might say that's fine. And in other circumstances, you might say that's not fine.

Because I don't want a model that doesn't work most of the time. And that's what we have here.

Dr. Ferrell's model does not work, 67 out of 70 months.

[redacted]

So if -- if -- I would -- if it were me, I would deal with these outliers, because I -- I don't want to have a model that does not work 67 out of 70 months.

Q. So when the handbook says one should investigate whether substantive information exists regarding these points and whether the analysis should exclude them, you don't think that requires an investigation into the factual circumstances that led to the data?

A. No, I don't believe that that -- that is necessarily -- or at least I certainly didn't read that to be some kind of investigation into the circumstances that created the data.

I interpret that to mean, you should see if those points have information that is consistent with your model with respect to the rest of the points. That's what outlier analysis is. That's what I've done here.

No -- no researcher would -- worth his salt -- his or her salt would say, Just because the data are accurate, I therefore cannot deal with them as outliers in a model.

That -- that's -- not a proper

[redacted]

position to take.

Q. So just so the record's clear, you did no factual investigation of the circumstances that led to what you call the outlier price points. Correct?

A. I had no reason to doubt that the pricing data were accurate.

Q. But you don't know what the circumstances were that were associated with the outlier data. Correct?

A. Again, I -- one of them, I happened to recognize the date. But what the circumstances are that are causing those prices is not the point of this analysis.

The point of this analysis is, do these three data points, correct though they may be, are they biasing the model and rendering it worthless in 67 out of 70 months?

And the answer is yes.

Q. All right. And in Figure 5, you come up with an unadjusted R-square of .328.

And you state that -- well, Professor Ferrell's model explains 93.5 percent of the variation in -- of all 70 months, at

[redacted]

best, it only explains 32.8 percent of the variation of 67 of those 70 months.

A. That is what I wrote, yes.

Q. Right. And if you could read paragraph 30, the first sentence, please.

A. From Figure 5, we see that Dr. Ferrell's model is statistically unbiased. Alpha is numerically close to zero, and one cannot reject the hypothesis that it is zero at any reasonable significance level.

Q. And that is true with respect to the information you calculated in Figure 5, correct?

A. That is the sentence describing what's in Figure 5, yes.

I should point out, just so there's no confusion, this alpha is different from Dr. Ferrell's alpha. But the sentence is true.

Q. Excuse me a second.

All right. If you could go to paragraph 39. And page 19.

A. Yes.

Q. You with me?

A. Yes, I am.

Q. These are other outlier data.

[redacted]

Correct?

A. Correct.

Q. But this is for a particular digital asset, THC?

A. Correct.

Q. And you identify three days in which the THC prices appear to be incorrect.

A. That is correct.

Q. Right. And those are days where the price per unit, I guess, is 11- or $12 million?

A. Correct.

Q. Now, Professor Ferrell calculated his returns by looking to prices on a start date and an end date. Correct?

A. That is correct.

Q. And didn't look at price information in between.

A. That is correct.

Q. All right. And in order to calculate the return, between August and September, Professor Ferrell compared the prices of August 8 and September 5. Correct?

A. I -- I don't have the sequence of dates memorized, but he would have had a start

[redacted]

date and a date 28 days later, and he would have compared those two prices.

Q. And so the price spikes that you identify in Figure 10, if they didn't occur on a date where he was getting price data, they wouldn't affect his results, correct?

A. Correct. Which is why I -- I'm speculating that he didn't notice the problem in the data.

Q. And does the -- do these price spikes affect the calculations based on the data that he used?

A. It speaks to the robustness of his approach.

So if he's going to start on the particular day that he starts, he will not land on these particular prices, and they will not impact his results.

But the choice of start date is fairly arbitrary, and had he chosen another date, which would have just as valid from a principal point of view, he would have landed on these days, and that's when he would have discovered this problem.

[redacted]

That's, for instance, one of the ways that came to my attention.

Q. But are you offering an opinion that Dr. Ferrell's conclusions are unreliable because the reported price of THC spiked on the three days that you set forth in your report?

A. I'm very careful to say that these price spikes do not impact the calculations that Dr. Ferrell uses.

Of course, I think his conclusions are unreliable for a host of reasons.

But his calculations, because of the particular start date that he picked and the particular sequence of dates that follows therefrom, do not land on these dates. It does raise questions, in my mind, about the integrity of his data source.

But to your question, that's correct. These particular prices, though I think they're clearly wrong, are not altering his calculations.

Q. All right. You identified another outlier month, one return date in which the price return for THC equaled 8,916 percent.

[redacted]

That was in January of 2016.

Do you see that?

A. Yes, I do.

Q. He used 6,370 return dates in his primary component analysis. Correct?

A. I -- I'm sorry, he used what?

Q. A total of 6,370 return dates in his --

A. I haven't done that arithmetic. I -- I don't know.

Q. And he didn't include THC in estimated -- Estimation Period 1, did he?

A. It is not part of Estimation Period 1, that's correct.

Q. And it was only one out of 11 principal components in Estimation Period 2, correct?

A. It dominates the second principal component in Estimation Period 2.

Q. And what analysis did you perform to determine that this one month in one currency dominated his -- sorry.

Dominated his results, I think is what you said.

[redacted]

A. I said dominated his second principal component.

Q. So what is your basis for your testimony that a single-event day dominated his second principal component?

A. Well, I said that the coin dominated his -- the second principal component. And I -- I would refer you to Figure 13 of my report.

Q. Let's go to Figure 14.

What does Figure 14 purport to do?

A. Showing how things would have been different had Dr. Ferrell noticed the flaw in his methodology. The flaw in his methodology, which doesn't apply just to THC but it's a general flaw in his entire approach, is splicing two pricing data series together in the way that he does.

This is just an example of the problems that that creates. It's a particularly stark example, but it's just one example.

By doing that, he creates a variation or a variance in his principal components, which is not real. It's not part -- it's not real in the data. It's created by this -- this -- this

[redacted]

poor methodology.

And so what I'm just showing here is, if -- if we draw -- if we didn't have the THC dominating the second principal component, I'm just showing how the second principal component that emerges is much more correlated with XRP than what Dr. Ferrell's second principal component is.

Q. Does your Figure 14 show a statistically significant alpha on your recalculated numbers?

A. No. In -- in Figure 14, with just two principal components, whether Dr. Ferrell's or whether a corrected second principal component, alpha is not statistically different from zero in either case.

Q. So it wouldn't change his results. Correct?

A. No, no, I don't know that.

Again, the general method, the general problem here, is you have pricing data from one source and you have pricing data from another source, and you just slap one on top of the other. That's the problem. This is -- this is

[redacted]

an example of that problem.

Now, he does that for virtually and maybe literally every single coin in his data set. And you can't do that. That's -- that's -- that's a bad methodology. That is the wrong way to combine data sets.

The right way to combine data sets is in return space. Dr. Ferrell didn't do that. He just took one price and superimposed another price on top of it.

That creates problems. This is just an example of a problem that that methodology creates.

Had he -- had he done it correctly, had he corrected it -- I didn't investigate it, I don't know if that would have created a statistically significant different alpha, I don't particularly care. I don't know whether it would or not, but I'm simply pointing out that his methodology is fundamentally flawed.

Q. Without quibbling with your testimony about his methodology, you didn't do the calculations to determine whether having used the methodology that you would have preferred

would have resulted in a different result, with respect to rejecting the nonzero conclusion for alpha. Isn't that correct?

A. I did not undertake that analysis, no.

Q. You could have, correct?

A. I could have, yes.

Q. And you didn't.

A. I didn't. I...

Q. All right. Let's go to paragraph 48. If you would.

You calculated a change in R-squared and Principal Component 1, assuming estimation period began on September 10 instead of September 3, correct?

A. Correct.

Q. And in your report, you observe that R-squared would vary based on the start date that Dr. Ferrell selected. Correct?

A. Correct.

Q. And you demonstrated that you can come up with differing R-squared calculations, correct?

A. Yes.

Q. You don't recalculate any alphas

[redacted]

associated with a change in start date, do you?

A. No, not here, no.

Q. And so you're not offering an opinion as to whether the alphas that Dr. Ferrell determined in his principal component analysis would have been different, in other words, if it would have been able to -- if he would have been able to reject the nonzero conclusion, had he used different start dates. Correct?

A. I'm not investigating that particular question in this section, that is correct.

I just want to demonstrate that different start dates can move things around quite a lot, and that's not a desirable property of this kind of framework.

MR. FIGEL: How much time do we have left?

THE VIDEOGRAPHER: About two minutes.

MR. FIGEL: All right. I'll -- I'll spare you the last two minutes, even though we can go for several more hours. Let -- let's just make sure nobody on the phone wants to say anything.

Any -- any questions for Dr. Metz from

[redacted]

Cleary or Paul Weiss?

Okay. I texted him. Hearing none --

All right. Dr. [redacted] thank you for your time. No further questions.

THE WITNESS: Thank you.

MR. SYLVESTER: Thanks.

THE VIDEOGRAPHER: This marks the end of the deposition. We're going off the record at 6:16 p.m.

(Time noted: 6:16 p.m.)

_____

[redacted], Ph.D.

Subscribed and sworn to before me this day of 2022.

C E R T I F I C A T E

STATE OF NEW YORK)
) Ss.:
COUNTY OF NEW YORK)

I JEFFREY BENZ, a Certified Realtime Reporter, Registered Merit Reporter and Notary Public within and for the State of New York, do hereby certify:

That [redacted], Ph.D., the witness whose examination is hereinbefore set forth, was duly sworn by me and that this transcript of such examination is a true record of the testimony given by such witness.

I further certify that I am not related to any of the parties to this action by blood or marriage; and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 22nd of February, 2022.

JEFFREY BENZ, CRR, RMR

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----------EXHIBITS----------

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NAME OF CASE:

DATE OF DEPOSITION:

NAME OF WITNESS:

Reason Codes:

1. To clarify the record.

2. To conform to the facts.

3. To correct transcription errors.

Page _____ Line _____ Reason _____

From _____ to _____

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Exhibit C

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE COMMISSION, Plaintiff, RIPPLE LABS INC., BRADLEY GARLINGHOUSE, AND CHRISTIAN A. LARSEN, Defendants.	20 Civ. 10832 (AT)

EXPERT REBUTTAL REPORT OF DANIEL R. FISCHEL

November 12, 2021

I. QUALIFICATIONS

1. I am President of Compass Lexecon, a consulting firm that specializes in the application of economics to a variety of legal and regulatory issues. I am also the Lee and Brena Freeman Professor of Law and Business Emeritus at The University of Chicago Law School. I have served previously as Dean of The University of Chicago Law School, Director of the Law and Economics Program at The University of Chicago, and as Professor of Law and Business at The University of Chicago Graduate School of Business, the Kellogg School of Management at Northwestern University, and the Northwestern University Law School.

2. Both my research and my teaching have concerned the economics of corporate law and financial markets. I have published approximately fifty articles in leading legal and economics journals and am co-author, with Judge Frank Easterbrook of the Seventh Circuit Court of Appeals, of the book *The Economic Structure of Corporate Law* (Harvard University Press, 1991). Courts of all levels, including the Supreme Court of the United States, have cited my articles as authoritative. I have written and testified extensively about uses of event studies. My curriculum vitae, which contains a list of my publications, is attached hereto as Appendix A.

3. I have served as a consultant or adviser on economic issues to, among others, the United States Department of Justice, the United States Securities and Exchange Commission, the National Association of Securities Dealers, the New York Stock Exchange, the Chicago Board of Trade, the Chicago Mercantile Exchange, the New York Mercantile Exchange, the United States Department of Labor, the Federal Deposit Insurance Corporation, the Resolution Trust Corporation, the Federal Housing Finance Agency, and the Federal Trade Commission.

4. I am a member of the American Economic Association and the American Finance Association. I am also a former Trustee of the Becker Friedman Institute, a former member of the Board of Directors of the Center for the Study of the Economy and the State at The University of Chicago, and former Chairman of the American Association of Law Schools' Section on Law and Economics. I have testified as an expert witness in multiple proceedings in federal and state courts across the country, as detailed in Appendix A.

II. BACKGROUND

5. I understand that the relevant background is as follows. The XRP Ledger is a public blockchain technology that was developed by David Schwartz, Jed McCaleb, and Arthur Britto between 2011 and June 2012.[1] XRP is the native digital asset of the XRP Ledger.[2] In September 2012, the technology company n/k/a Ripple Labs Inc. ("Ripple" or the "Company"), was founded to "build use cases for the digital asset" XRP.[3] Shortly after the formation of the Company, the founders contributed 80 billion units of XRP to the Company, or 80% of the 100 billion units in existence.[4]

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1 See https://xrpl.org/xrp-ledger-overview.html and https://xrpl.org/history.html.

2 See https://xrpl.org/xrp-overview.html and https://xrpl.org/history.html.

3 See https://xrpl.org/history.html. I understand that the Company was initially named NewCoin and then OpenCoin before changing its name to Ripple in 2013. I also understand that the term "Ripple" initially stood for "the open-source project, the unique consensus ledger (Ripple Consensus Ledger), transaction protocol (Ripple Transaction Protocol or RTXP), the network (Ripple network), and the digital asset (known as 'ripples')" and that "[f]or clarity, the community simply started calling the digital asset by its currency code, 'XRP'." *Id.*

4 See https://xrpl.org/xrp-overview.html and https://xrpl.org/history.html. In December 2017, Ripple placed 55 billion units of XRP, or 55% of the 100 billion units in existence, into a series of escrows, which provided an upper limit on the amount of new XRP that could be brought into circulation. See https://ripple.com/insights/explanation-ripples-xrp-escrow/.

6. The Securities and Exchange Commission ("SEC") has brought this action against Ripple, Bradley Garlinghouse, and Chris Larsen ("Defendants") for alleged violations of Section 5(a) and (c) of the Securities Act of 1933 (the "Securities Act").[5] Specifically, the SEC argues that "XRP was an investment contract and therefore a security subject to the registration requirements of the federal securities laws"[6] and, therefore, Ripple engaged in "a years-long unregistered offering of securities […] by selling XRP without providing the type of financial and managerial information typically provided in registration statements and subsequent period and current filings."[7, 8]

7. In *SEC v. W. J. Howey Co.*, the Supreme Court ruled that "an investment contract for purposes of the Securities Act means a contract, transaction or scheme whereby a person invests his money in a common enterprise and is led to expect profits solely from the efforts of

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5 See *Securities and Exchange Commission v. Ripple Labs, et al.*, First Amended Complaint filed February 18, 2021 ("Amended Complaint"), p. 1 and ¶ 9.

6 Amended Complaint, ¶ 231.

7 Amended Complaint, ¶ 5.

8 I understand that "security" is defined in Section 2(a)(1) of the Securities Act as follows: "The term 'security' means any note, stock, treasury stock, security future, security-based swap, bond, debenture, evidence of indebtedness, certificate of interest or participation in any profit-sharing agreement, collateral-trust certificate, preorganization certificate or subscription, transferable share, **investment contract**, voting-trust certificate, certificate of deposit for a security, fractional undivided interest in oil, gas, or other mineral rights, any put, call, straddle, option, or privilege on any security, certificate of deposit, or group or index of securities (including any interest therein or based on the value thereof), or any put, call, straddle, option, or privilege entered into on a national securities exchange relating to foreign currency, or, in general, any interest or instrument commonly known as a 'security', or any certificate of interest or participation in, temporary or interim certificate for, receipt for, guarantee of, or warrant or right to subscribe to or purchase, any of the foregoing." (Emphasis added.)

the promoter or a third party."[9] I understand that this decision is commonly referred to as the *Howey* Test.[10]

8. The SEC submitted the initial report of Dr. [redacted] on October 4, 2021.[11] In his report, Dr. [redacted] states that he "understand[s] that the XRP token is not a claim on the assets or earnings of Ripple Labs and that Ripple Labs maintains that market participants do not view Ripple Labs' efforts as relevant to the XRP market price."[12] He also states that he "[has] been asked by the SEC's litigation counsel to test whether news about Ripple Labs and its actions is associated with statistically significant XRP price changes."[13]

9. Dr. [redacted] uses an event study methodology to "test whether XRP returns are associated with news about Ripple,"[14] specifically whether news about Ripple coincide with statistically significant price changes in XRP "more frequently than random chance could explain."[15] Dr. [redacted] argues that "[i]f there is a relationship between Ripple's actions and XRP returns," then he "would expect that (presumptively positive) news would be significantly associated with positive returns" and "that such news would [not] be significantly associated with negative returns[.]"[16]

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9 *SEC v. W. J. Howey Co.*, 328 U.S. 293 (1946).

10 "The test is whether the scheme involves an investment of money in a common enterprise with profits to come solely from the efforts of others. If that test be satisfied, it is immaterial whether the enterprise is speculative or non-speculative or whether there is a sale of property with or without intrinsic value." *SEC v. W. J. Howey Co.*, 328 U.S. 293 (1946).

11 See Expert Report of [redacted], Ph.D., October 4, 2021 ("[redacted] Report").

12 [redacted] Report, ¶ 30.

13 [redacted] Report, ¶ 30.

14 [redacted] Report, ¶ 28.

15 [redacted] Report, ¶ 31.

16 [redacted] Report, ¶ 64.

10. To identify "pertinent" news to test, Dr. [redacted] collects "news which Ripple Labs has identified to be important by virtue of (i) having issued a press release about the event, or (ii) having written about it on its Insights/News page, or (iii) having linked to a third-party news outlet in its curated Newsroom page."[17] He then classifies these announcements into various categories based on his own "judgment."[18] In total, Dr. [redacted] identifies 514 events[19] but focuses his analysis on "news announcements in [] categories related more directly to XRP[.]"[20, 21]

11. Specifically, Dr. [redacted] tests for statistically significant correlation between XRP price increases and the following categories of announcements that he assumes are more directly related to XRP: (1) Milestones ("key event[s] in the history of Ripple Labs not related to products or customers"); (2) Trading Platform Listings ("announcement[s] that XRP is available for trading on a new digital asset trading platform"); (3) Customer & Product Developments ("announcement[s] related to new customer relationship[s] … or products, including enhancements to the XRP ledger protocol"); (4) Ripple Commercialization Initiatives ("initiative[s] launched by Ripple Labs primarily described as being related to the commercialization or promotion of Ripple's products or technology in the XRP ecosystem"); and (5) "Select Categories," which combines announcements in the forgoing categories and

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17 [redacted] Report, ¶ 48.a.

18 See [redacted] Report, ¶ 48.b.

19 See [redacted] Report, ¶ 49. See also, [redacted] Report, Appendix C.

20 [redacted] Report, ¶ 50.

21 Dr. [redacted] also excludes announcements from his analysis if "the announcement may substantially repeat a previous announcement" or "the nature of the announcement may not have a particular directional implication for XRP prices, even assuming the hypothesis of independence is false." [redacted] Report, ¶ 48.c.

Acquisitions & Investments ("announcement[s] of an acquisition or investment made by Ripple Labs, including through its development arm Xpring").[22, 23]

12. To test for significant correlation between XRP price increases and these announcements, Dr. [redacted] uses an event study analysis, which has four steps:

(i) First, Dr. [redacted] specifies the regression model of XRP returns. He considers 20 different regression models and estimates each model using 180-day estimation windows.[24]

(ii) Second, Dr. [redacted] specifies the window over which to measure the changes in XRP prices following a news event, i.e., the "event window." He considers a 1-day event window (date t), a 2-day event window (dates t and t+1), and a 3-day event window (dates t, t+1, and t+2).[25]

(iii) Third, Dr. [redacted] estimates the (cumulative) abnormal returns for each trading day over the corresponding event window and then determines which are statistically

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[22] [redacted] Report, ¶ 48.b. See also, [redacted] Report, Figure 1 (p. 3) and Appendix E, pp. 1-7, 10.

[23] Dr. [redacted] also tests the significance of correlation between XRP price increases and the two other categories of announcements, which he assumes are less related to XRP: (i) Other Initiatives and (ii) Office & Staff Announcement. See [redacted] Report, ¶¶ 48.b, 91-97 and Appendix E, pp. 8-9. Additionally, I note that Dr. [redacted] identifies but does not analyze announcements in the following categories, presumably because he assumes these announcements are even less related to XRP: (i) Case Study; (ii) Charity; (iii) Corporate Activity & Announcement; (iv) Litigation; (v) Market Commentary & Company Overview; (vi) Markets Report; and (vii) Miscellaneous. See [redacted] Report, ¶¶ 48.b, 50. "For certain other categories, such as general market commentary (often written by third parties and which does not break new information), it seems self-evident that there should be no meaningful connection with the XRP market in any case, hence testing such categories is not informative." *Id.*, ¶ 50.

[24] See [redacted] Report, ¶ 60. See also, *id.*, Section V.B (¶¶ 39-43) and Figure 7 (p. 19).

[25] See [redacted] Report, ¶ 61. Dr. [redacted] states that he "conservatively limit[s] [his] analysis to a three day window – meaning, [he] associate[s] price reactions to a news event on date t only if [he] find[s] evidence of statistically significant price movements in the first three days." *Id.*, ¶ 38.

significant using a parametric approach and a nonparametric approach.[26] He evaluates the statistical significance of abnormal returns at the 5% significance level in a one-sided test and a two-sided test.[27] Dr. [redacted] classifies date t as "significantly positive" if any of its cumulative returns over the 1-, 2-, or 3-day event windows are statistically significant and positive and none of its cumulative returns over those windows are statistically significant and negative.[28]

(iv) Finally, Dr. [redacted] examines the interaction between the set of news days he identified and the set of days with significantly positive XRP returns.[29]

13. In other words, Dr. [redacted] analysis "selects different categories of news event, determines how many of those correspond to significantly positive XRP returns according to different regression models [he] consider[s], and then calculates how likely that outcome is."[30] Based on his analysis, Dr. [redacted] concludes that "XRP prices react to certain news and public statements about Ripple's actions," particularly "important milestones in the history of [Ripple] and [] announcements more directly related to XRP."[31]

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[26] See [redacted] Report, ¶ 62. Dr. [redacted] parametric approach "assesses the abnormal return against the significant thresholds from the t-distribution (approximately 1.64 for a one-sided test and 1.96 for a two-sided test)," while his nonparametric approach "assesses the abnormal return against the distribution of standardized abnormal returns observed over the 180 days used to estimate the regression model." [redacted] Report, ¶¶ 62.a-62.b.

[27] "The 'one-sided' test classifies a return as significant if there is only a 5% probability of drawing a greater (more positive) return. The 'two-sided' test classifies a return as significant if there is only a 5% probability of drawing a more extreme (whether positive or negative) return. When using the 'two-sided' standard, I continue to restrict myself only to positive returns, unless otherwise noted." [redacted] Report, note 65.

[28] See [redacted] Report, ¶ 63.

[29] See [redacted] Report, ¶ 64.

[30] [redacted] Report, ¶ 58.

[31] [redacted] Report, ¶ 12.a.

III. ASSIGNMENT AND SUMMARY OF CONCLUSIONS

14. I have been asked by counsel for Ripple to review, evaluate, and respond to Dr. [redacted] event study methodology from an economics perspective. Based on my review of the economic evidence, I have concluded that Dr. [redacted] analysis is fundamentally flawed for multiple reasons and provides no support for the SEC's claim that XRP is a security:

(i) First, the findings of Dr. [redacted] event study methodology do not demonstrate that XRP holders profit solely or primarily from the efforts of Ripple.

(ii) Second, Dr. [redacted] misinterprets his own findings by failing to recognize that many of the announcements that he finds to be statistically significant are confounded.

(iii) Third, Dr. [redacted] fails to appreciate the significance of his own admission that XRP did not trade in an efficient market.

(iv) Fourth, Dr. [redacted] fails to provide any explanation as to why his event study methodology would shed any light on whether XRP holders are engaged in a "common enterprise" with Ripple.

15. I elaborate upon and provide the bases for my opinions in Section IV of this report. In performing this work, I have received assistance from Compass Lexecon personnel working under my supervision. Compass Lexecon is being compensated for the time spent by Compass Lexecon personnel at their customary hourly rates. My current hourly rate is $1,750. My compensation is not contingent on the analyses we conducted or the opinions I offer in this report. A list of materials we have relied upon in connection with the preparation of this report is attached as Appendix B.

IV. DR. [redacted] ANALYSIS IS FUNDAMENTALLY FLAWED AND PROVIDES NO SUPPORT FOR THE SEC'S CLAIM THAT XRP IS A SECURITY

16. From an economics perspective, holders of a security issued by a company have a claim on some of the cash flows generated by a set of assets or, in certain states of the world, a claim on the assets themselves.[32] For example, stock and bond holders have a claim on the cash flows and assets of the underlying company. However, as Dr. [redacted] acknowledges, and the SEC has admitted,[33] holders of XRP do not have a claim on any of Ripple's cash flows or assets in any state of the world.[34] Instead, Dr. [redacted] uses an event study methodology to "test whether XRP returns are associated with news about Ripple,"[35] and, based on his analysis, concludes that XRP had statistically significant returns following some (but not all) announcements[36] made by Ripple.[37] For the reasons discussed below, I have concluded that Dr. [redacted] analysis is

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[32] See e.g., Aswath Damodaran, "Approaches to Valuation," in *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset* (3rd Ed., John Wiley & Sons, 1996), Chapter 2, pp. 11-26. "[D]iscounted cash flow valuation … is the foundation on which all other valuation approaches are built …. This approach has its foundation in the present value rule, where the value of any asset is the present value of expected future cash flows on it." *Id.*, p. 11.

[33] See Plaintiff's Answers and Objections to Defendants' First Set of Requests for Admission, dated July 16, 2021, pp. 19-20: "[T]he Commission admits that holders of XRP are not entitled to receive any return of principal, dividend, interest, rent, royalties, license payments, lease payments, or any other payment or consideration from Ripple, based solely on their status as a holder of XRP …. [T]he Commission admits that Ripple is not obligated to share any return of principal, dividend, rent, royalties, license payments, lease payments, or any other payment or consideration to any holder of XRP, based solely on his or her status as a holder of XRP."

[34] See [redacted] Report, ¶ 30: "I understand that the XRP token is not a claim on the assets or earnings of Ripple Labs."

[35] [redacted] Report, ¶ 28.

[36] See *infra*, Section IV.A.

[37] [redacted] Report, ¶ 12.a.

fundamentally flawed and provides no support for the SEC's claim that XRP is a security under the *Howey* Test.

A. The Findings of Dr. [redacted] Event Study Methodology Do Not Demonstrate that XRP Holders Profit Solely or Primarily from the Efforts of Ripple

17. Dr. [redacted] claims that "across major milestones in the history of Ripple Labs and across those categories of news more directly related to XRP's proposed use cases, there is statistically significant evidence that the price of XRP reacts to news of Ripple's actions."[38] While I do not agree with Dr. [redacted] identification and categorization of event days, for brevity's sake, in this section, I refer to the event days with announcements analyzed in Dr. [redacted] "Select Categories" test as "days with news about Ripple's efforts" and to all other days as "days with no news about Ripple's efforts."[39]

18. Even if one were to assume that the event days analyzed in Dr. [redacted] "Select Categories" test were solely or primarily related to the efforts of Ripple—which, as I discuss in Section IV.B *infra*, they are not—the findings of his event study methodology do not demonstrate that XRP holders profit solely or primarily from the efforts of Ripple. In fact, taken at face value, Dr. [redacted] analysis finds that (i) most days with significantly positive XRP returns

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[38] [redacted] Report, ¶ 65.

[39] As discussed above, Dr. [redacted] identifies other categories of announcements but does not analyze those announcements in his "Select Categories" test—presumably because Dr. [redacted] assumes those categories of announcements are not directly related to XRP and/or do not disclose new information about Ripple's efforts. See *supra*, note 20. Moreover, as I discuss in Section IV.B *infra*, even the announcements that Dr. [redacted] analyzes in his "Select Categories" test confound information about Ripple's efforts with information about market conditions for XRP.

had no news about Ripple's efforts and (ii) most days with news about Ripple's efforts did not have significantly positive XRP returns.

19. In his "Select Categories" test, Dr. [redacted] analyzes 105 event days[40] with announcements in any of the following categories: (1) Milestones, (2) Trading Platform Listings, (3) Customer & Product Developments, (4) Ripple Commercialization Initiatives, and (5) Acquisitions & Investments.[41] Between May 5, 2014 (the first event day tested by Dr. [redacted]) and October 28, 2020 (the last event day tested by Dr. [redacted]), there were 2,369 total trading days.[42] Dr. [redacted] estimates abnormal returns for each of these 2,369 trading days using 20 regression models and then evaluates the abnormal returns at the 5% significance level using a parametric and nonparametric approach.[43, 44]

20. Using his event study methodology, Dr. [redacted] "Select Categories" test identifies 76 to 267 days with significantly positive XRP returns and 15 to 31 event days where news about Ripple's efforts corresponded with significantly positive XRP returns. See Exhibit 1. As the exhibit shows, these findings demonstrate that (i) 76.3% to 89.5% of days with significantly positive XRP returns had no news about Ripple's efforts analyzed by Dr. [redacted] and (ii) 70.5% to 84.8% of days with news about Ripple's efforts analyzed by Dr. [redacted] did not have significantly

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40 See *infra*, note 44.

41 See [redacted] Report, Figure 1 (p. 3) and ¶ 98. See also [redacted] Report, Appendix E, p. 10.

42 See *infra*, note 44.

43 See [redacted] Report, ¶¶ 42, 54, 60-63. For both the parametric and nonparametric approach, Dr. [redacted] uses a one-sided test and two-sided test.

44 In eight out of 20 regression models, Dr. [redacted] controls for the returns of Ether (ETH), which only has pricing data beginning on August 7, 2015. For these models, Dr. [redacted] cannot estimate abnormal returns for earlier trading days and, therefore, he cannot test some of the earlier event days. See [redacted] Report, note 46. Using these models, Dr. [redacted] estimated abnormal returns for 1,725 to 1,726 trading days (depending on the model specification) and tested 90 event days. See Exhibit 1.

positive XRP returns. See Exhibit 1. In other words, taken at face value, the findings of Dr. [redacted] event study methodology do not demonstrate that XRP holders profit solely or primarily from the efforts of Ripple.

B. Dr. [redacted] Misinterprets His Own Findings by Failing to Recognize That Many of the Announcements That He Finds to Be Statistically Significant are Confounded

21. Dr. [redacted] claims that his "results indicate that the price of XRP reacts to the news about actions of Ripple Labs" and, therefore, he "reject[s] the hypothesis that XRP prices are independent of Ripple Labs."[45, 46] However, the announcements that Dr. [redacted] analyzed confound information about Ripple's efforts with information about market conditions for XRP. Such confounding information include information related to the expected supply and demand for XRP and information about the decisions and expectations of market participants other than Ripple, none of which is solely or primarily related to Ripple's efforts or under Ripple's direct or indirect control. In other words, Dr. [redacted] analysis erroneously assumes that statistically significant XRP returns following these announcements are always (and only) related to information about Ripple's efforts and never related to information about market conditions for XRP.

22. The fact that statistically significant XRP returns are correlated with announcements relating to the expected supply and demand for XRP or other market conditions does not establish that XRP is a security. Companies can and routinely do make announcements

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45 [redacted] Report, ¶ 67.

46 Specifically, Dr. [redacted] concludes that significantly positive XRP returns are correlated with the following categories of announcements: (1) Milestones, (2) Trading Platform Listings, (3) Customer & Product, (4) Ripple Commercialization Initiatives, and (5) "Select Categories," which combines announcements in the forgoing categories and Acquisitions & Investments. See e.g., [redacted] Report, Figure 1 (p. 3) and Sections VI.A-VI.D, VI.F.

that relate to the supply and demand for a commodity or good that then affect the price of the commodity or good. For example, if an oil producer announces a new oil pipeline, one could imagine that the local oil prices would be affected at the start of the pipeline (due to increased demand) and at the end of the pipeline (due to increased supply). These announcements contain information about the company's efforts as well as information about market conditions for a commodity or good, but this correlation does not make the commodity or good a security. While Ripple (because it holds a substantial amount of XRP) and holders of XRP can both simultaneously gain or lose from XRP price changes, an oil producer and oil investors (both of which hold oil) could likewise gain or lose at the same time due to oil price movements. But it is clear that an oil producer and oil investors are not in a common enterprise and oil is not a security.

23. It is evident that the "news announcements in [] categories related more directly to XRP"[47] that Dr. [redacted] analyzes provide information relating to the expected supply and demand for XRP and/or information about the decisions and expectations of market participants unaffiliated with Ripple, neither of which is solely nor primarily related to Ripple's efforts.

(i) "Milestones," such as early financing rounds for equity investments in Ripple, provide information about the expectations of Ripple's sophisticated institutional investors about the state of the market for XRP, since Ripple holds a large quantity of XRP. They also provide information about the expected supply of XRP, to the extent that market participants would expect Ripple to sell fewer XRP tokens to fund its business operations after completing an equity financing round. Similarly, announcements relating to Ripple's decision to escrow 55 billion XRP tokens, which Dr. [redacted] categorizes as milestone events, provide information

[47] [redacted] Report, ¶ 50.

about the expected supply of XRP.[48] Ripple's receiving a "New York's First BitLicense for an Institutional Use Case of Digital Assets" provides information about the expected demand for XRP and about the decisions and expectations of cryptocurrency regulators.

(ii) "Trading Platform Listings" often occurred without any involvement by Ripple, as Dr. [redacted] acknowledges,[49] and provide information about the expected supply and demand for XRP from cryptocurrency market participants currently active on those platforms and those that will be active on those platforms in the future. Moreover, the fact that a platform decides to list XRP provides positive signals about the platform's expectation of future market conditions for XRP and is not solely or primarily due to Ripple's efforts. Indeed, other cryptocurrencies such as bitcoin are listed on platforms without the effort of a company like Ripple.[50]

(iii) "Customers & Product Developments" are announcements about banks and other financial companies intending to use Ripple software.[51] These events again provide information about the decisions and expectations of market participants, as well as information about the expected supply and demand for XRP from users of the XRP Ledger. Indeed, Dr. [redacted] admits that "it is not always clear if Ripple is an active participant or not"[52] regarding these announcements, let alone whether the action is solely or primarily due to Ripple's efforts.

(iv) "Ripple Commercialization Initiatives" are announcements about Ripple launching initiatives "described as commercializing or promoting its technology and payment solutions, including some described as creating use-cases for XRP."[53] As with customers and product developments, these events provide information about the market conditions for XRP and, when these announcements

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48 [redacted] Report, Figure 13 (p. 30).

49 Of the 11 announcements identified by Dr. [redacted], he acknowledges that only six announcements involved Ripple actions. See [redacted] Report, Figure 16 (p. 34).

50 [redacted] Report, Figure 16 (p. 34).

51 See [redacted] Report, ¶¶ 48.b, 83-85.

52 [redacted] Report, ¶ 83.

53 [redacted] Report, ¶ 88.

relate to partnerships with other market participants, provide information about the decisions and expectations of those market participants.[54]

24. In contrast, when Dr. [redacted] analyzes categories of announcements that are less likely to confound information about supply and demand for XRP and/or market conditions for XRP, his event study methodology does not find a statistically significant correlation between XRP price increases and those announcements. As discussed above, Dr. [redacted] tests the significance of correlation between XRP price increases and two categories of announcements that he assumes are less related to XRP: (i) Other Initiatives ("initiative[s] not primarily described as being related to the commercialization or promotion of Ripple's products or technology in the XRP ecosystem"[55]) and Office & Staff Announcements ("announcement[s] of executive staff changes or the opening of a new office"[56]).[57] Unsurprisingly, Dr. [redacted] finds that XRP prices do not react significantly to these announcements, because these announcements are unlikely to provide information about market conditions for XRP and Ripple is not engaged in a common enterprise to share cash flows or assets with holders of XRP.

25. The announcements that Dr. [redacted] analyzes and finds to be correlated with significantly positive XRP returns may be further confounded by other announcements that fall on or near the event day, which may not be related to Ripple's efforts. As shown in Exhibit 2, for the 105 event days that Dr. [redacted] analyzes in his "Select Categories" test, on average,

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[54] For example, announcement about banks launching a "Global Payments Steering Group." [redacted] Report, ¶ 88 and note 80.

[55] [redacted] Report, ¶ 48.b.

[56] [redacted] Report, ¶ 48.b.

[57] See *supra*, note 22. See also, [redacted] Report, ¶¶ 91-97.

Dr. [redacted] has identified 5 other announcements within 10 days of the event day,[58] 4 other announcements within 7 days of the event day, and 2 other announcements within 3 days of the event day. In other words, Dr. [redacted] event study methodology cannot disentangle the impact of contemporaneous announcements on XRP prices, especially since, as Dr. [redacted] acknowledges, XRP did not trade in an efficient market.[59]

26. In summary, Dr. [redacted] analysis cannot establish that XRP prices reacted solely or primarily to information about Ripple's efforts[60] because the announcements that Dr. [redacted] analyzed (i) confound information about Ripple's efforts with information about market conditions for XRP and/or (ii) may be confounded by other contemporaneous announcements.

C. Dr. [redacted] Fails to Appreciate the Significance of His Own Admission That XRP Did Not Trade in an Efficient Market

27. In financial economics, capital markets are called "efficient" if market prices fully reflect available information.[61] When an event study is used to measure the impact of certain events on market prices, it is explicitly assumed that the market is efficient, at least with respect to publicly available information.[62] In other words, it is assumed that market prices adjust to

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[58] One of the articles Dr. [redacted] cites regarding event studies in cryptocurrency markets use a 20-day event window. See [redacted] Report, note 42.

[59] As discussed in more detail below, Dr. [redacted] fails to appreciate the significance of his own admission that XRP did not trade in an efficient market. See *infra*, Section IV.C.

[60] As discussed above, the *Howey* Test's definition of an investment contract is "a contract, transaction or scheme whereby a person invests his money in a common enterprise and is led to expect profits solely from the efforts of the promoter or a third party." See *supra*, ¶ 7.

[61] See e.g., Eugene Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 The Journal of Finance Economic Literature (May 1970), pp. 383-417.

[62] This assumption is widely discussed in academic literature on event studies, including the literature cited by Dr. [redacted]. See [redacted] Report, note 31, citing John J. Binder, *The Event Study Methodology Since 1969*, 11 Review of Quantitative Finance and Accounting (1995),

new information quickly and without bias. However, as Dr. [redacted] acknowledges, cryptocurrency markets, including the XRP market, are less efficient than many capital markets and incorporate new information into prices more slowly;[63] therefore, his event study methodology is unreliable. Indeed, Dr. [redacted] fails to establish over what time period, if ever, information is fully incorporated into XRP prices without bias.

28. Dr. [redacted] acknowledges that "[a]cademic researchers have found that the digital token markets, including the XRP market, are generally less informationally efficient than the stock market" and that his own analysis "is consistent with the academic literature in that, by one common measure of efficiency (serial correlation), the XRP market is not fully efficient during the period of interest."[64] He further acknowledges that, to account for the lack of market efficiency, academic researchers often use multi-day event windows when conducting event studies on cryptocurrency prices.[65]

29. Although the use of longer event windows allows more time for new information to be fully incorporated into XRP prices, it also introduces the potential impact from other new information, as well as noise. Different types of information may take different amounts of time to be fully incorporated into prices. For example, if price reactions to certain announcements overshoot during the first few days before ultimately correcting, an event window that is too

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pp. 111-137 at p. 111. "In practice, event studies have been used for two major reasons: 1) to test the null hypothesis that the market efficiently incorporates information … and 2) under the maintained hypothesis of market efficiency, at least with respect to publicly available information, to examine the impact of some event on the wealth of the firm's security holders." *Id.*, p. 111. (Emphasis added.)

63 See [redacted] Report, ¶ 35.

64 [redacted] Report, ¶ 35.

65 See [redacted] Report, ¶ 37. The academic literature that Dr. [redacted] cites uses event windows as long as 20 days (ten before and after the event being analyzed). See *id.*, note 42.

short and only includes the overshooting but not the correction will result in a biased estimate of price reaction.

30. For his analysis, Dr. [redacted] uses a 3-day window, with 1-day and 7-day window sensitivities. Dr. [redacted] does not, however, establish over what time period, if ever, information is fully incorporated into XRP prices without bias. As a result, his entire event study methodology is unreliable.

D. Dr. [redacted] Fails to Provide Any Explanation As to Why His Event Study Methodology Would Shed Any Light On Whether XRP Holders are Engaged in a "Common Enterprise" with Ripple

31. Dr. [redacted] has not explained the relationship between his conclusion that "XRP prices react to certain news and public statements about Ripple's actions"[66] and the SEC's claim that XRP is a security under the *Howey* Test. That is not surprising because the event study methodology used by Dr. [redacted] cannot and does not establish whether XRP holders are engaged in a "common enterprise" with Ripple, much less whether those holders were led to expect profits or returns generated solely or primarily from the entrepreneurial or managerial efforts of Ripple.

32. An event study is simply a statistical method that identifies when information about an asset is released and measures the contemporaneous market price response.[67] There are two primary reasons to use an event study: 1) to test the null hypothesis that a market is

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66 [redacted] Report, ¶ 12.a.

67 See e.g., Eugene Fama, Lawrence Fisher, Michael Jensen, and Richard Roll, *The Adjustment of Stock Prices to New Information*, 10 International Economic Review (1969), pp. 1-21; A. Craig MacKinlay, *Event Studies in Economics and Finance*, 35 Journal of Economic Literature (1997), pp. 13-39.

semi-strong efficient (i.e., to test whether market prices efficiently incorporate publicly available information); and 2) under the hypothesis of a semi-strong efficiency, to measure the impact of certain events on market prices.[68] However, an event study cannot establish whether an asset is a security because, in an efficient market, asset prices will react to publicly available information about the asset—regardless of whether or not the asset is a security.[69] Although Dr. [redacted] claims that "[a]cademic researchers have applied the event study methodology to digital token markets,"[70] none of the literature that he cites to attempts to use an event study methodology to establish whether or not digital tokens are securities.[71]

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[68] See e.g., John J. Binder, *The Event Study Methodology Since 1969*, 11 Review of Quantitative Finance and Accounting (1995), pp. 111-137 at p. 111: "In practice, event studies have been used for two major reasons: 1) to test the null hypothesis that the market efficiently incorporates information … and 2) under the maintained hypothesis of market efficiency, at least with respect to publicly available information, to examine the impact of some event on the wealth of the firm's security holders." See also, Ronald J. Gilson and Bernard S. Black, "Event Studies: Measuring the Impact of Information," in *The Law and Finance of Corporate Acquisitions* (2nd Ed., The Foundation Press, 1995), Chapter 6, pp. 185-187.

[69] See e.g., Eugene Fama, *Efficient Capital Markets: A Review of Theory and Empirical Work*, 25 Journal of Finance (1970), pp. 383-417. In my academic publications, I have discussed how all available information about a firm will be reflected in the firm's stock price in efficient capital markets. See e.g., Daniel R. Fischel, *Use of Modern Finance Theory in Securities Fraud Cases Involving Actively Traded Securities*, 38 The Business Lawyer (1982), pp. 1-20 at p. 4: "In an efficient capital market, such as American stock markets, […] the market price of a firm's stock will reflect all available information about the firm's prospects."

[70] [redacted] Report, ¶ 36.

[71] In fact, the literature that Dr. [redacted] cites is primarily concerned with testing whether digital token markets are efficient. See e.g., Wenjun Feng, Yiming Wang, and Zhengjun Zhang, "Informed Trading in the Bitcoin Market," *Finance Research Letters* Vol. 26, 2018, pp. 63-70 at p. 68: "In this study, we use transaction-level data to investigate informed trading prior to Bitcoin events … we find evidence of informed trading in the Bitcoin market ahead of cryptocurrency-related negative Bitcoin market events, and ahead of large positive events." See also, Mohammad Hashemi Joo, Yuka Nishikawa, and Krishnan Dandapani,

33. From an economics perspective, the reasons why an event study cannot establish whether an asset is a security are easily demonstrated via simple thought experiments:

(i) Companies can issue multiple types of securities, e.g., stocks and bonds. Numerous event studies have been conducted on stocks and bonds, and it is well established that (in most states of the world) stocks are more sensitive to new information about their issuers than bonds, given their position in the capital structure of a firm.[72] It is completely possible to conduct an event study where certain news about a company is significantly correlated with stock price changes but is not significantly correlated with bond price changes. However, if one were to follow the flawed logic of Dr. [redacted] event study methodology and the SEC's position that XRP is a security, the company's bonds would be misclassified as non-securities.

(ii) Companies can make announcements about their activities that provide

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"Announcement effects in the cryptocurrency market," *Applied Economics* Vol. 52, No. 44, 2020, pp. 4794-4808 at p. 4794: "The aims of this study are twofold. First, we examine market reactions during major event announcement periods using event study methodology. Second, we further investigate if the information diffusion allows arbitragers to have an opportunity to make positive profits even after the event announcement."

[72] See e.g., Larry Y. Dann, "Common Stock Repurchases: An Analysis of Returns to Bondholders and Stockholders," *J. Financial Economics* Vol. 9 (1981), pp. 113-138 ("In contrast with the returns to common stock and convertible senior securities, no significant announcement date returns are experienced by owners of straight debt and straight preferred stock."); Paul Asquith and E. Han Kim, "The Impact of Merger Bids on the Participating Firms' Security Holders," *J. Finance* Vol. 37, No. 5 (December 1982), pp. 1209-1228 ("The results show that while the stockholders of target firms gain from a merger bid, no other securityholders either gain or lose."); Narayanan Jayaraman and Kuldeep Shastri, "The Valuation Impacts of Specially Designated Dividends," *J. Financial and Quantitative Analysis* Vol. 23, No. 3 (September 1988), pp. 301-312 ("[W]e find that stock prices react positively to the announcements of specially designated dividends. In addition, our empirical evidence indicates that bond prices are not affected by SDD announcements."); Chris Veld and Yulia V. Veld-Merkoulova, "An Empirical Analysis of the Stockholder-Bondholder Conflict in Corporate Spin-Offs," *Financial Managements* (Spring 2008), pp. 103-124 ("Over a three-day event window, we find statistically significant abnormal returns of 3.07% for stocks and 0.11% for straight bonds.").

information about other companies.[73] Consider a hypothetical scenario where Company A and Company B generally have correlated earnings and where Company A typically releases earnings announcements before Company B. In such a scenario, an event study might find that Company A's earnings announcements are significantly correlated with price changes in Company B's stock. It might even show that Company B's stock price changes are more correlated with Company A's earning announcements than its own earnings announcements. However, that event study would not prove that investors in Company B stock are engaged in a common enterprise to share profits from the efforts of Company A.

(iii) Companies routinely make announcements about their activities that provide information about overall market conditions. Such information may lead to statistically significant changes in the prices of assets held by third-party investors even though those investors have no claims on the cash flows or assets of the company. In other words, even though both the company and investors are affected by the change in asset prices, the parties are not engaged in a common enterprise to share profits or returns, so the asset is not a security. For example:

[73] See e.g., Michael Firth, "The Impact of Earnings Announcements on the Share Price Behavior of Similar Type Firms," *The Economic Journal* 86 (June 1976), pp. 296-306 ("[I]nvestors use the information contained in the announcement of financial results to re-evaluate the share prices not only of the company whose results are being announced, but also of the closely competing companies.") and Stephen P. Baginski, "Intraindustry Information Transfers Associated with Management Forecasts of Earnings," *J Accounting Research* Vol. 25, No. 2 (Autumn 1987), pp. 196-216 ("[T]he management forecast of one firm (discloser) generates unexpected price reactions for firms (nondisclosers) similar to the forecaster.").

- Suppose that DeBeers announces a new advertising campaign promoting diamonds and, following this announcement, the price of diamonds on the secondary market increases by a statistically significant amount. That price reaction would not establish that diamonds are a security issued by DeBeers because DeBeers is not engaged in a common enterprise to share profits or returns with holders of diamonds.

- Suppose that Exxon announces a new oil pipeline, which leads to statistically significant changes in the price of oil at each end of the pipeline. That price reaction would not demonstrate that oil is a security issued by Exxon because Exxon is not engaged in a common enterprise with third-party holders of oil.

(iv) Consumer goods are not securities and yet, it is possible for news about a producer to result in price changes in the secondary market for its consumer goods. In such instances, those price reactions do not demonstrate that the owners of consumer goods are in a common enterprise to share profits from the efforts of producers.

- For example, when professional sports teams win games, there is often an increase in the price of tickets to future games on the secondary market.[74]

- Similarly, news about financial distress at an automobile manufacturer can impact the secondary market price for that manufacturer's used cars.[75]

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[74] See e.g., Joris Drayer, Daniel A. Rascher & Chad D. McEvoy, "An examination of underlying consumer demand and sport pricing using secondary market data," *Sport Management Review* 15:4, pp. 448-460.

[75] See e.g., Ali Hortaçsu, Gregor Matvos, Chad Syverson, and Sriram Venkataraman, "Indirect Costs of Financial Distress in Durable Goods Industries: The Case of Auto Manufacturers," *The Review of Financial Studies* Vol. 26, No. 5, May 2013, pp. 1248-1290.

34. In summary, even if Dr. [redacted] analysis demonstrates that XRP prices reacted around the time of certain announcements made by Ripple,[76] such a finding cannot and does not establish whether XRP holders are engaged in a "common enterprise" to share profits or returns generated solely or primarily by the entrepreneurial or managerial efforts of Ripple.

[76] As discussed above, Dr. [redacted] analysis cannot establish that XRP prices reacted solely or primarily to information about Ripple's efforts because the announcements that Dr. [redacted] analyzed are confounded. See *supra*, Section IV.B.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on November 12, 2021.

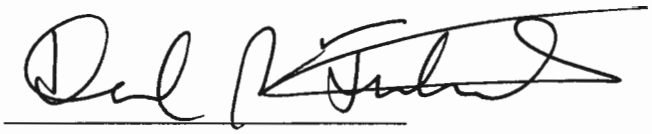

Exhibit 1

The Findings of Dr. [redacted] "Select Categories" Test Do Not Imply that XRP Holders Profit Solely or Primarily from the Efforts of Ripple

	# of Trading Days			# of Event Days			# of Non-Event Days			% of Trading Days w/ Significant Returns		% of Event Days	
	Total [A]	With Significant Returns [B]	Without Significant Returns [C]	Total [D]	With Significant Returns [E]	Without Significant Returns [F]	Total [G]	With Significant Returns [H]	Without Significant Returns [I]	Event Days [J]	Non-Event Days [K]	With Significant Returns [L]	Without Significant Returns [M]
Range for All 20 Models Used by Dr. [redacted]													
Minimum	1,725	76	1,540	90	15	64	1,635	61	1,474	10.5%	**76.3%**	15.2%	**70.5%**
Maximum	2,369	267	2,259	105	31	89	2,264	236	2,171	23.8%	**89.5%**	29.5%	**84.8%**
Range for 12 Models Without ETH Returns													
Minimum	2,369	110	2,102	105	16	74	2,264	93	2,028	10.5%	**84.5%**	15.2%	**70.5%**
Maximum	2,369	267	2,259	105	31	89	2,264	236	2,171	15.5%	**89.5%**	29.5%	**84.8%**
Range for 8 Models With ETH Returns													
Minimum	1,725	76	1,540	90	15	64	1,635	61	1,474	12.9%	**76.3%**	16.7%	**71.1%**
Maximum	1,726	185	1,650	90	26	75	1,636	161	1,575	23.8%	**87.1%**	28.9%	**83.3%**

Exhibit 1

The Findings of Dr. [redacted] "Select Categories" Test Do Not Imply that XRP Holders Profit Solely or Primarily from the Efforts of Ripple

	# of Trading Days			# of Event Days			# of Non-Event Days			% of Trading Days w/ Significant Returns		% of Event Days	
	Total [A]	With Significant Returns [B]	Without Significant Returns [C]	Total [D]	With Significant Returns [E]	Without Significant Returns [F]	Total [G]	With Significant Returns [H]	Without Significant Returns [I]	Event Days [J]	Non-Event Days [K]	With Significant Returns [L]	Without Significant Returns [M]
Model 1: Constant Mean Return													
1-Sided Parametric	2,369	199	2,170	105	24	81	2,264	175	2,089	12.1%	**87.9%**	22.9%	**77.1%**
1-Sided Nonparametric	2,369	236	2,133	105	28	77	2,264	208	2,056	11.9%	**88.1%**	26.7%	**73.3%**
2-Sided Parametric	2,369	147	2,222	105	19	86	2,264	128	2,136	12.9%	**87.1%**	18.1%	**81.9%**
2-Sided Nonparametric	2,369	120	2,249	105	16	89	2,264	104	2,160	13.3%	**86.7%**	15.2%	**84.8%**
Model 2: Account Growth													
1-Sided Parametric	2,369	181	2,188	105	24	81	2,264	157	2,107	13.3%	**86.7%**	22.9%	**77.1%**
1-Sided Nonparametric	2,369	228	2,141	105	27	78	2,264	201	2,063	11.8%	**88.2%**	25.7%	**74.3%**
2-Sided Parametric	2,369	133	2,236	105	17	88	2,264	116	2,148	12.8%	**87.2%**	16.2%	**83.8%**
2-Sided Nonparametric	2,369	110	2,259	105	17	88	2,264	93	2,171	15.5%	**84.5%**	16.2%	**83.8%**
Model 3: BTC Returns													
1-Sided Parametric	2,369	209	2,160	105	25	80	2,264	184	2,080	12.0%	**88.0%**	23.8%	**76.2%**
1-Sided Nonparametric	2,369	258	2,111	105	31	74	2,264	227	2,037	12.0%	**88.0%**	29.5%	**70.5%**
2-Sided Parametric	2,369	167	2,202	105	22	83	2,264	145	2,119	13.2%	**86.8%**	21.0%	**79.0%**
2-Sided Nonparametric	2,369	127	2,242	105	18	87	2,264	109	2,155	14.2%	**85.8%**	17.1%	**82.9%**
Model 4: BTC Returns + Account Growth													
1-Sided Parametric	2,369	191	2,178	105	21	84	2,264	170	2,094	11.0%	**89.0%**	20.0%	**80.0%**
1-Sided Nonparametric	2,369	238	2,131	105	26	79	2,264	212	2,052	10.9%	**89.1%**	24.8%	**75.2%**
2-Sided Parametric	2,369	150	2,219	105	21	84	2,264	129	2,135	14.0%	**86.0%**	20.0%	**80.0%**
2-Sided Nonparametric	2,369	124	2,245	105	18	87	2,264	106	2,158	14.5%	**85.5%**	17.1%	**82.9%**
Model 5: BTC Returns + ETH Returns													
1-Sided Parametric	1,726	151	1,575	90	24	66	1,636	127	1,509	15.9%	**84.1%**	26.7%	**73.3%**
1-Sided Nonparametric	1,726	182	1,544	90	25	65	1,636	157	1,479	13.7%	**86.3%**	27.8%	**72.2%**
2-Sided Parametric	1,726	120	1,606	90	20	70	1,636	100	1,536	16.7%	**83.3%**	22.2%	**77.8%**
2-Sided Nonparametric	1,726	100	1,626	90	20	70	1,636	80	1,556	20.0%	**80.0%**	22.2%	**77.8%**

Exhibit 1

The Findings of Dr. [redacted] "Select Categories" Test Do Not Imply that XRP Holders Profit Solely or Primarily from the Efforts of Ripple

	# of Trading Days			# of Event Days			# of Non-Event Days			% of Trading Days w/ Significant Returns		% of Event Days	
	Total [A]	With Significant Returns [B]	Without Significant Returns [C]	Total [D]	With Significant Returns [E]	Without Significant Returns [F]	Total [G]	With Significant Returns [H]	Without Significant Returns [I]	Event Days [J]	Non-Event Days [K]	With Significant Returns [L]	Without Significant Returns [M]
Model 6: BTC Returns + ETH Returns + Account Growth													
1-Sided Parametric	1,726	121	1,605	90	21	69	1,636	100	1,536	17.4%	**82.6%**	23.3%	**76.7%**
1-Sided Nonparametric	1,726	164	1,562	90	23	67	1,636	141	1,495	14.0%	**86.0%**	25.6%	**74.4%**
2-Sided Parametric	1,726	97	1,629	90	19	71	1,636	78	1,558	19.6%	**80.4%**	21.1%	**78.9%**
2-Sided Nonparametric	1,726	80	1,646	90	19	71	1,636	61	1,575	23.8%	**76.3%**	21.1%	**78.9%**
Model 7: BTC Returns + ETH Returns + XLM Returns													
1-Sided Parametric	1,726	131	1,595	90	22	68	1,636	109	1,527	16.8%	**83.2%**	24.4%	**75.6%**
1-Sided Nonparametric	1,726	180	1,546	90	26	64	1,636	154	1,482	14.4%	**85.6%**	28.9%	**71.1%**
2-Sided Parametric	1,726	103	1,623	90	18	72	1,636	85	1,551	17.5%	**82.5%**	20.0%	**80.0%**
2-Sided Nonparametric	1,726	90	1,636	90	17	73	1,636	73	1,563	18.9%	**81.1%**	18.9%	**81.1%**
Model 8: BTC Returns + ETH Returns + XLM Returns + Account Growth													
1-Sided Parametric	1,726	118	1,608	90	20	70	1,636	98	1,538	16.9%	**83.1%**	22.2%	**77.8%**
1-Sided Nonparametric	1,726	170	1,556	90	22	68	1,636	148	1,488	12.9%	**87.1%**	24.4%	**75.6%**
2-Sided Parametric	1,726	92	1,634	90	17	73	1,636	75	1,561	18.5%	**81.5%**	18.9%	**81.1%**
2-Sided Nonparametric	1,726	76	1,650	90	15	75	1,636	61	1,575	19.7%	**80.3%**	16.7%	**83.3%**
Model 9: Equal-Weighted Crypto Index													
1-Sided Parametric	2,369	214	2,155	105	25	80	2,264	189	2,075	11.7%	**88.3%**	23.8%	**76.2%**
1-Sided Nonparametric	2,369	267	2,102	105	31	74	2,264	236	2,028	11.6%	**88.4%**	29.5%	**70.5%**
2-Sided Parametric	2,369	156	2,213	105	21	84	2,264	135	2,129	13.5%	**86.5%**	20.0%	**80.0%**
2-Sided Nonparametric	2,369	133	2,236	105	18	87	2,264	115	2,149	13.5%	**86.5%**	17.1%	**82.9%**
Model 10: Equal-Weighted Crypto Index + Account Growth													
1-Sided Parametric	2,369	196	2,173	105	22	83	2,264	174	2,090	11.2%	**88.8%**	21.0%	**79.0%**
1-Sided Nonparametric	2,369	258	2,111	105	27	78	2,264	231	2,033	10.5%	**89.5%**	25.7%	**74.3%**
2-Sided Parametric	2,369	144	2,225	105	19	86	2,264	125	2,139	13.2%	**86.8%**	18.1%	**81.9%**
2-Sided Nonparametric	2,369	126	2,243	105	17	88	2,264	109	2,155	13.5%	**86.5%**	16.2%	**83.8%**

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	Total [A]	With Significant Returns [B]	Without Significant Returns [C]	Total [D]	With Significant Returns [E]	Without Significant Returns [F]	Total [G]	With Significant Returns [H]	Without Significant Returns [I]	Event Days [J]	Non-Event Days [K]	With Significant Returns [L]	Without Significant Returns [M]
Model 11: Lagged XRP Returns													
1-Sided Parametric	2,369	203	2,166	105	25	80	2,264	178	2,086	12.3%	**87.7%**	23.8%	**76.2%**
1-Sided Nonparametric	2,369	246	2,123	105	29	76	2,264	217	2,047	11.8%	**88.2%**	27.6%	**72.4%**
2-Sided Parametric	2,369	143	2,226	105	19	86	2,264	124	2,140	13.3%	**86.7%**	18.1%	**81.9%**
2-Sided Nonparametric	2,369	126	2,243	105	18	87	2,264	108	2,156	14.3%	**85.7%**	17.1%	**82.9%**
Model 12: Account Growth + Lagged Variables													
1-Sided Parametric	2,369	188	2,181	105	26	79	2,264	162	2,102	13.8%	**86.2%**	24.8%	**75.2%**
1-Sided Nonparametric	2,369	239	2,130	105	30	75	2,264	209	2,055	12.6%	**87.4%**	28.6%	**71.4%**
2-Sided Parametric	2,369	135	2,234	105	19	86	2,264	116	2,148	14.1%	**85.9%**	18.1%	**81.9%**
2-Sided Nonparametric	2,369	125	2,244	105	19	86	2,264	106	2,158	15.2%	**84.8%**	18.1%	**81.9%**
Model 13: BTC Returns + Lagged Variables													
1-Sided Parametric	2,369	205	2,164	105	25	80	2,264	180	2,084	12.2%	**87.8%**	23.8%	**76.2%**
1-Sided Nonparametric	2,369	251	2,118	105	28	77	2,264	223	2,041	11.2%	**88.8%**	26.7%	**73.3%**
2-Sided Parametric	2,369	162	2,207	105	21	84	2,264	141	2,123	13.0%	**87.0%**	20.0%	**80.0%**
2-Sided Nonparametric	2,369	139	2,230	105	20	85	2,264	119	2,145	14.4%	**85.6%**	19.0%	**81.0%**
Model 14: BTC Returns + Account Growth + Lagged Variables													
1-Sided Parametric	2,369	198	2,171	105	24	81	2,264	174	2,090	12.1%	**87.9%**	22.9%	**77.1%**
1-Sided Nonparametric	2,369	254	2,115	105	29	76	2,264	225	2,039	11.4%	**88.6%**	27.6%	**72.4%**
2-Sided Parametric	2,369	156	2,213	105	23	82	2,264	133	2,131	14.7%	**85.3%**	21.9%	**78.1%**
2-Sided Nonparametric	2,369	133	2,236	105	20	85	2,264	113	2,151	15.0%	**85.0%**	19.0%	**81.0%**
Model 15: BTC Returns + ETH Returns + Lagged Variables													
1-Sided Parametric	1,725	147	1,578	90	23	67	1,635	124	1,511	15.6%	**84.4%**	25.6%	**74.4%**
1-Sided Nonparametric	1,725	184	1,541	90	26	64	1,635	158	1,477	14.1%	**85.9%**	28.9%	**71.1%**
2-Sided Parametric	1,725	115	1,610	90	20	70	1,635	95	1,540	17.4%	**82.6%**	22.2%	**77.8%**
2-Sided Nonparametric	1,725	104	1,621	90	20	70	1,635	84	1,551	19.2%	**80.8%**	22.2%	**77.8%**

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	# of Trading Days			# of Event Days			# of Non-Event Days			% of Trading Days w/ Significant Returns		% of Event Days	
	Total [A]	With Significant Returns [B]	Without Significant Returns [C]	Total [D]	With Significant Returns [E]	Without Significant Returns [F]	Total [G]	With Significant Returns [H]	Without Significant Returns [I]	Event Days [J]	Non-Event Days [K]	With Significant Returns [L]	Without Significant Returns [M]
Model 16: BTC Returns + ETH Returns + Account Growth + Lagged Variables													
1-Sided Parametric	1,725	136	1,589	90	22	68	1,635	114	1,521	16.2%	**83.8%**	24.4%	**75.6%**
1-Sided Nonparametric	1,725	179	1,546	90	25	65	1,635	154	1,481	14.0%	**86.0%**	27.8%	**72.2%**
2-Sided Parametric	1,725	99	1,626	90	20	70	1,635	79	1,556	20.2%	**79.8%**	22.2%	**77.8%**
2-Sided Nonparametric	1,725	95	1,630	90	19	71	1,635	76	1,559	20.0%	**80.0%**	21.1%	**78.9%**
Model 17: BTC Returns + ETH Returns + XLM Returns + Lagged Variables													
1-Sided Parametric	1,725	138	1,587	90	21	69	1,635	117	1,518	15.2%	**84.8%**	23.3%	**76.7%**
1-Sided Nonparametric	1,725	176	1,549	90	25	65	1,635	151	1,484	14.2%	**85.8%**	27.8%	**72.2%**
2-Sided Parametric	1,725	101	1,624	90	19	71	1,635	82	1,553	18.8%	**81.2%**	21.1%	**78.9%**
2-Sided Nonparametric	1,725	101	1,624	90	20	70	1,635	81	1,554	19.8%	**80.2%**	22.2%	**77.8%**
Model 18: BTC Returns + ETH Returns + XLM Returns + Account Growth + Lagged Variables													
1-Sided Parametric	1,725	131	1,594	90	21	69	1,635	110	1,525	16.0%	**84.0%**	23.3%	**76.7%**
1-Sided Nonparametric	1,725	185	1,540	90	24	66	1,635	161	1,474	13.0%	**87.0%**	26.7%	**73.3%**
2-Sided Parametric	1,725	100	1,625	90	19	71	1,635	81	1,554	19.0%	**81.0%**	21.1%	**78.9%**
2-Sided Nonparametric	1,725	98	1,627	90	18	72	1,635	80	1,555	18.4%	**81.6%**	20.0%	**80.0%**
Model 19: Equal-Weighted Crypto Index + Lagged Variables													
1-Sided Parametric	2,369	204	2,165	105	25	80	2,264	179	2,085	12.3%	**87.7%**	23.8%	**76.2%**
1-Sided Nonparametric	2,369	255	2,114	105	28	77	2,264	227	2,037	11.0%	**89.0%**	26.7%	**73.3%**
2-Sided Parametric	2,369	154	2,215	105	21	84	2,264	133	2,131	13.6%	**86.4%**	20.0%	**80.0%**
2-Sided Nonparametric	2,369	141	2,228	105	20	85	2,264	121	2,143	14.2%	**85.8%**	19.0%	**81.0%**
Model 20: Equal-Weighted Crypto Index + Account Growth + Lagged Variables													
1-Sided Parametric	2,369	203	2,166	105	25	80	2,264	178	2,086	12.3%	**87.7%**	23.8%	**76.2%**
1-Sided Nonparametric	2,369	266	2,103	105	30	75	2,264	236	2,028	11.3%	**88.7%**	28.6%	**71.4%**
2-Sided Parametric	2,369	152	2,217	105	23	82	2,264	129	2,135	15.1%	**84.9%**	21.9%	**78.1%**
2-Sided Nonparametric	2,369	144	2,225	105	21	84	2,264	123	2,141	14.6%	**85.4%**	20.0%	**80.0%**

Exhibit 1

The Findings of Dr. [redacted] "Select Categories" Test Do Not Imply that XRP Holders Profit Solely or Primarily from the Efforts of Ripple

# of Trading Days			# of Event Days			# of Non-Event Days			% of Trading Days w/ Significant Returns		% of Event Days	
Total [A]	With Significant Returns [B]	Without Significant Returns [C]	Total [D]	With Significant Returns [E]	Without Significant Returns [F]	Total [G]	With Significant Returns [H]	Without Significant Returns [I]	Event Days [J]	Non-Event Days [K]	With Significant Returns [L]	Without Significant Returns [M]

Notes and Sources: In this exhibit, days with "significant returns" refers to days that Dr. [redacted] classifies as "significantly positive." In his analysis, Dr. [redacted] classifies date t as "significantly positive" if any of its cumulative returns over the 1-, 2-, or 3-day event windows are statistically significant and positive and none of its cumulative returns over those windows are statistically significant and negative. See [redacted] Report, ¶ 63. In Models 5-8 and 15-18, Dr. [redacted] controls for the return of Ether (ETH), which only has pricing data beginning on August 7, 2015. For these models, Dr. [redacted] cannot estimate abnormal returns for earlier trading days and, therefore, he cannot test some of the earlier event days. See [redacted] Report, note 46. Dr. [redacted] equal-weighted cryptocurrency index in Models 9-10 and 19-20 is an equal-weighted index across the returns of ADA, BNB, BTC, ETH and XLM subject to data availability. See [redacted] Report, ¶ 39. In Models 11-20, Dr. [redacted] regresses "XRP returns on date t on the control variables measured at t and one lag of XRP returns and the control variables" to "correct for [] autocorrelation[.]" [redacted] Report, note 50.

[A] - [B]: Per Dr. [redacted] backup production, see "Model Results.xlsx" at tab 7-1.
[C] = [A] - [B] (Except for min-max ranges).
[D] - [E]: Per Dr. [redacted] backup production, see "Model Results.xlsx" at tab 7-1.
[F] = [D] - [E] (Except for min-max ranges).
[G] = [A] - [D] (Except for min-max ranges).
[H] = [B] - [E] (Except for min-max ranges).
[I] = [C] - [F] (Except for min-max ranges).
[J] = [E] / [B] (Except for min-max ranges).
[K] = [H] / [B] (Except for min-max ranges).
[L] = [E] / [D] (Except for min-max ranges).
[M] = [F] / [D] (Except for min-max ranges).

Exhibit 2
Event Days Analyzed in Dr. [redacted] "Select Categories" Test May Be Confounded by Other Announcements On or Near the Event Day

	# of Other Announcements Identified by Dr. [redacted] On or Near the Event Days Analyzed in the "Select Categories" Test			
	Minimum	Maximum	Median	**Average**
[1] Within +/- 10 Days of the Event Day	0	14	4	**5**
[2] Within +/- 7 Days of the Event Day	0	9	4	**4**
[3] Within +/- 3 Days of the Event Day	0	8	1	**2**

Notes and Sources: Dr. [redacted] identifies 514 events in total, but focuses his analysis on "news announcements in [] categories related more directly to XRP[.]" See Fischel Report, ¶ 10. In his "Select Categories" test, Dr. [redacted] analyzes 105 event days with announcements in any of the following categories: (1) Milestones, (2) Trading Platform Listings, (3) Customer & Product Developments, (4) Ripple Commercialization Initiatives, and (5) Acquisitions & Investments. See Fischel Report, ¶ 19. For each of the 105 event days analyzed in Dr. [redacted] "Select Categories" test, we count the number of other announcements on or near the event day that were identified in Dr. [redacted] Appendix C, which includes (a) any announcements on the same event day that were not analyzed in Dr. [redacted] "Select Categories" test (for example, announcements that Dr. [redacted] categorized as Market Commentary & Company Overview) and (b) any announcements on the specified days before and after the event day.

APPENDIX A

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PROFESSIONAL EXPERIENCE

Lee and Brena Freeman Professor of Law and Business, University of Chicago Law School (1/84 – 12/2005, chair awarded in 7/89, emeritus as of 1/1/2006); Dean of Law School (1/99 – 2/01); Visiting Professor of Law, University of Chicago Law School (7/82 - 6/83).

Professor of Law and Business, Northwestern University School of Law (1/1/2006 – 5/2011); Professor, Kellogg School of Management (courtesy appointment, 1/1/2006 – 5/2011).

Jack N. Pritzker Distinguished Visiting Professor of Law, Northwestern University School of Law (6/02-6/03).

Professor of Law and Business, University of Chicago Graduate School of Business (7/87 - 6/90).

Director, Law and Economics Program, University of Chicago (1/84 - 6/91).

Assistant Professor of Law, Northwestern University School of Law (6/80 - 6/81); Associate Professor of Law, Northwestern University School of Law (6/81 - 6/82); promoted to full professor in 6/82.

Attorney with Levy and Erens, Chicago, Illinois (7/79 - 6/80).

Law Clerk for Associate Justice Potter Stewart of the United States Supreme Court (1978 - 1979).

Law Clerk for Judge Thomas E. Fairchild, Chief Judge of the Seventh Circuit Court of Appeals (1977 - 1978).

CONSULTING EXPERIENCE

President and Chairman, Compass Lexecon (formerly Lexecon).

AREAS OF SPECIALIZATION

Securities and Financial Markets, Valuation and Financial Analysis, Bankruptcy and Financial Distress Litigation, ERISA Litigation, Class Certification, Damages, Corporate Governance.

PUBLICATIONS

Payback: The Conspiracy to Destroy Michael Milken and His Financial Revolution, Harper Business (1995).

The Economic Structure of Corporate Law, Harvard University Press (1991) (with Frank H. Easterbrook).

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EDUCATION

University of Chicago Law School, Chicago, Illinois; J.D. 1977, cum laude; Order of the Coif; Comment Editor, Vol. 44, University of Chicago Law Review; Approximately top 1% of the Class. Awarded Casper Platt Award for best paper written by a student of the University of Chicago Law School; awarded Jerome N. Frank Prize for excellence in legal writing while a member of the University of Chicago Law Review, 1975 - 1977. Studied law and economics with Richard Posner and other members of the faculty.

Brown University, Providence, Rhode Island; M.A. 1974 in American History.

Cornell University, Ithaca, New York; major-American History; minor-Economics; B.A. 1972

TESTIMONY

Deposition of Daniel R. Fischel In Re: Straight Path Communications Inc. Consolidated Stockholder Litigation, In the Court of Chancery of the State of Delaware, C.A. No. 2017-0486-SG, (October 21, 2021).

Deposition of Daniel R. Fischel In Re: Abu Dhabi Investment Authority vs. Mylan N.V. and Mylan Inc., In the United States District Court, Southern District of New York, Civil Action No. 1:20-cv-01342-JPO, (August 18, 2021).

Deposition of Daniel R. Fischel In Re: Mylan N.V. Securities Litigation, In the United States District Court, Southern District of New York, Case No. 1:16-CV-07926 (JPO), (August 17, 2021).

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Deposition of Daniel R. Fischel In Re: Sjunde Ap-Fonden, et al, vs. General Electric, et al., In the United States District Court, Southern District of New York, Index No. 17-cv-08457 (JMF), (August 9, 2021).

Testimony of Daniel R. Fischel In Re: United States of America vs. Edward Bases and John Pacilio, In the United States District Court, Northern District of Illinois, Eastern Division, Docket No. 18 CR 48, (July 29, 2021).

Testimony of Daniel R. Fischel In Re: Ahmed D. Hussein vs. Sheldon Razin, Steven Plochocki, Quality Systems, Inc., And Does 1-10, Inclusive, In the Superior Court of California, County of Orange, NO. 30-2013-00679600, CU-NP-CJC (July 27, 2021).

Testimony of Daniel R. Fischel In Re: Tesla Motors, Inc. Stockholders Litigation, In the Court of Chancery of the State of Delaware, Consolidated Civil Action No. 12711-VCS (July 23, 2021).

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Deposition of Daniel R. Fischel In Re: Matthew Sciabacucchi and Hialeah Employees' Retirement System vs. John Malone, et al., and Charter Communications, Inc., In the Court of Chancery for the State of Delaware, C.A. No. 11418-VCG, (April 16, 2021).

Deposition of Daniel R. Fischel In Re: Jeld-Wen Holdings, Inc. Securities Litigation, In the United States District Court for The Eastern District of Virginia, Richmond Division, Civil Action No. 3:20-cv-00112-JAG, (February 26, 2021).

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Deposition of Daniel R. Fischel In Re: SH 130 Concession Company, LLC, Zachry Toll Road – 56 LP Cintra Texas 56 LLC et al. vs. Central Texas Highway Constructors, LLC, et al., In the United States Bankruptcy Court, Western District of Texas, Austin Division, Case No. 16-10262-TMD, Adversary No. 18-01030, (November 5, 2020).

Deposition of Daniel R. Fischel In Re: Ahmed D. Hussein versus Sheldon Razin, Steven Plochocki, Quality Systems, Inc., et al., In the Superior Court of the State of California, County of Orange, Case No. 302013-00679600 CUNPCJC, (October 22, 2020).

Deposition of Daniel R. Fischel In Re: Deutsche Bank National Trust Company, Solely in its Capacity as Trustee of the Harborview Mortgage Loan Trust Mortgage Loan Pass-Through Certificates, Series 2006-9, In the Supreme Court of the State of New York County of New York, Index No. 654208/2018 (September 25, 2020).

Testimony of Daniel R. Fischel In Re: Fairstone Financial Holdings Inc., J.C. Flowers IV L.P. and VP Canada Acquisition, L.P. vs. Duo Bank of Canada, Court File No. CV-20-00641857-00CL and Duo Bank of Canada vs. Fairstone Financial Holdings Inc., J.C. Flowers IV L.P. and VP Canada Acquisition, L.P., Court File No. CV-20-00643629-00CL, In the Ontario Superior Court of Justice, (September 11, 2020).

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Deposition of Daniel R. Fischel In Re: AB Stable VIII LLC vs. Maps Hotels and Resorts One LLC, et al., In the Court of Chancery of the State of Delaware, Case No. 2020-0130-JTL (August 14, 2020).

Deposition of Daniel R. Fischel In Re: Willis Towers Watson PLC Proxy Litigation, In the United States District Court for the Eastern District of Virginia, Alexandria Division, Master File No. 1:17-cv-1338-AJT-JFA (August 12, 2020).

Deposition of Daniel R. Fischel In Re: Forescout Technologies, Inc. et al. vs. Ferrari Group Holdings, LP, and Ferrari Merger Sub, Inc., et al., In the Court of Chancery of the State of Delaware, Civil Action No. 2020-0385-SG (July 13, 2020).

Deposition of Daniel R. Fischel In Re: Brigade Leveraged Capital Structures Fund Ltd. et al. vs. Kindred Healthcare, Inc., et al., In the Circuit Court of Chancery of the State of Delaware, Case No. 2018 0165 (February 5, 2020).

Testimony of Daniel R. Fischel In Re: Gannaway Entertainment, Inc. et al vs. Frankly Inc. et al., In the United States District Court, Northern District of California, San Francisco Division, Case No. 3:17-cv-04169-RS (December 17, 2019).

Deposition of Daniel R. Fischel In Re: The Official Committee of Unsecured Creditors of Allied Systems Holdings, Inc. and its affiliated debtors et al. v. Yucaipa, et al., In the U.S. Bankruptcy Court for the District of Delaware, Bankr., D. Del., Proc. Nos. 13-50530-KBO, 14-50971-KBO (December 16, 2019).

Testimony of Daniel R. Fischel In Re: Nord Anglia Education, Inc., In the Grand Court of The Cayman Islands, Financial Services Division, Cause No. FSD 235 of 2017 (IKJ). (December 6, 9, 10 and 11, 2019).

Deposition of Daniel R. Fischel In Re: Lindie L. Banks and Erica LeBlanc, individually and on behalf of all others similarly situated vs. Northern Trust Corporation and Northern Trust Company, In the United States District Court, Central District of California, Case No. 2: 16-cv-09141-JFK (JCx) (November 22, 2019).

Deposition of Daniel R. Fischel In Re: Tesla Motors, Inc. Stockholder Litigation, In the Court of Chancery of the State of Delaware, C.A. No. 12711-VCS (November 19, 2019).

Deposition of Daniel R. Fischel In Re: Melina N. Jacobs, On Behalf of Herself and All Others Similarly Situated vs. Verizon Communications, Inc., et al., In the United States District Court for the Southern District of New York, Civil Action No. 1:16-cv-01082 (August 28, 2019).

Deposition of Daniel R. Fischel In Re: American Realty Capital Properties, Inc. Litigation, In the United States District Court, Southern District of New York, Civil Action No. 1:15-mc-00040-AKH Class Action (July 25, 2019).

Deposition of Daniel R. Fischel In Rajesh M. Shah, et al vs. Zimmer Biomet Holdings, Inc., et al, In the United States District Court, Northern District of Indiana, South Bend Division, Case No. 3:16-cv-815-PPS-MGG (May 17, 2019).

Testimony of Daniel R. Fischel In Colonial Chevrolet Co., Inc., et al., Alley's of Kingsport, Inc., et al., and Union Dodge, Inc., et al. vs. The United States (Nos. 10-647C, 11-100C, and 12-900L – Consolidated), In the United States Court of Federal Claims (May 8, 2019).

Testimony of Daniel R. Fischel In Anthem, Inc. vs. Cigna Corporation, In the Court of Chancery of the State of Delaware, C.A. No. 2017-0114-JTL (March 8, 2019).

Deposition of Daniel R. Fischel In Re: Nine West holdings, Inc., et al., Debtors, United States Bankruptcy Court, Southern District of New York, Chapter 11 Case No. 18-10947 (SCC) (January 16, 2019).

Deposition of Daniel R. Fischel In Re: Sandisk LLC Securities Litigation, United States District Court, Northern District of California, San Francisco Division, Case No. 3:15-cv-01455-VC (November 16, 2018).

Deposition of Daniel R. Fischel In Re: Colonial Chevrolet Co., Inc., Alley's of Kingsport, Inc. and Union Dodge, Inc., et al vs. The United States, In the United States Court of Federal Claims, Nos. 10-647C, 11-100C and 12-900L (Consolidated) (November 15, 2018).

Testimony of Daniel R. Fischel In Re: United States of America, et al., vs. J-M Manufacturing Co., Inc., United States District Court, Central District of California – Western Division, No. CV 6-55 GW (November 5, 2018).

Deposition of Daniel R. Fischel In Re: Appraisal of Air Methods Corp., In the Court of Chancery of the State of Delaware, C.A. No.: 2017-0317-JRS (September 27 and 28, 2018).

Testimony of Daniel R. Fischel In Re: Akorn, Inc., v. Fresenius Kabi, AG, et al., In the Court of Chancery of the State of Delaware, C.A. No. 2018-0300-JTL (July 13, 2018).

Deposition of Daniel R. Fischel In Re: Starz Stockholder Litigation, In the Court of Chancery of the State of Delaware, Consolidated C.A. No. 12584-VCG (July 12, 2018).

Deposition of Daniel R. Fischel In Re: Akorn, Inc. vs. Fresenius Kabi AG, Quercus Acquisition, Inc. and Fresenius SE & Co. KGaA, In the Court of Chancery of the State of Delaware, Index No. 2018-0300 (June 30, 2018).

Deposition of Daniel R. Fischel In Re: Physiotherapy Holdings, Inc., et al., Debtors; PAH Litigation Trust v. Water Street Healthcare Partners, L.P., et al., In the United States Bankruptcy Court for the District of Delaware, Case No. 13-12965 (KG) (Jointly Administered) (June 5, 2018).

Deposition of Daniel R. Fischel In Re: Facebook, Inc. Class C Reclassification Litigation, In the Court of Chancery of the State of Delaware, Consolidated C.A. No. 12286-VCL (May 18, 2018).

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Deposition of Daniel R. Fischel In Re: PPM America, Inc., et al. v. Marriott Corporation et al., United States District, for the District of Maryland, H-92-3068 (May 10, 1994 and March 8, 1994).

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Testimony of Daniel R. Fischel In Re: Melridge, Inc., Securities Litigation, United States District Court for the District of Oregon, CV No. 87-1426-FR (May 4 and 5, 1993).

Declaration of Daniel R. Fischel In Re: Oracle Securities Litigation, United States District Court, Northern District of California, Master File No. C 90 0931 VRW (April 20, 1993).

Deposition of Daniel R. Fischel In Re: Gillette Securities Litigation, United States District Court, District of Massachusetts, No. 88-1858-K (April 1, 1993).

Affidavit of Daniel R. Fischel In Re: Columbia Securities Litigation, United States District Court, Southern District of New York, 89 Civ. 6821 (LBS) (March 25, 1993).

Deposition of Daniel R. Fischel In Re: Westinghouse Securities Litigation, United States District Court, Western District of Pennsylvania, CV No. 91 354 (March 23, 1993).

Declaration of Daniel R. Fischel In Re: Oracle Securities Litigation, United States District Court, Northern District of California, Master File No. C 90-0931 VRW (March 22, 1993).

Deposition of Daniel R. Fischel In Re: Kroy, Inc., a Minnesota corporation et al. v. Bankers Trust New York Corporation, et al., Superior Court of the State of Arizona in and for the County of Maricopa, No. CV 89-35680 (March 18, 1993).

Deposition of Daniel R. Fischel In Re: Amos M. Ames, Helen M. Ames, Robert F. Bourke, Louise L. Bourke, Leo E. Corr, April C. Corr, Wence M. Horak, Ruth Horak, Robert T. Freas, Maurita Freas, Bruce Fink, Jr., William H. Jones, Candace A. Jones, Richard Paul, William L. Paul, Carole Paul, Steven J. Paul, Best Power Technology, Incorporated, and Best Power Technology Sales Corporation, in the State of Wisconsin, Circuit Court, Juneau County, Consolidated Case Nos. 92-CV-31, 92-CV-32 (January 26, 1993).

Deposition of Daniel R. Fischel In Re: Federal Express Corporation Shareholder Litigation, in the United States District Court, Western District of Tennessee, Master File No. 90-2359- 4B (December 3, 1992).

Deposition of Daniel R. Fischel In Re: Raymond Snyder, Individually and on behalf of all those similarly situated v. Oneok, Inc., et al., in the United States District Court, Northern District of Oklahoma, Civil Action No. 88 C 1500 E (October 15 and 16, 1992).

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Deposition of Daniel R. Fischel In Re: Pearl Newman, Shanna Lehmann & Athanasios Tsivelekidis, on their own behalf and on behalf of all other persons similarly situated v. On- Line Software International, Inc. Jack M. Berdy, John C. Crocker, Richard A. Granger, Richard R. Holtmeier, Michael S. Juceam, Edward J. Siegel, Howard P. Sorgen and Richard Ward, United States District Court, District of New Jersey, Consolidated Civil Action Nos. 88-3247, 88-3411 (July 28 and 29, 1992).

Deposition of Daniel R. Fischel In Re: Crazy Eddie Securities Litigation, Oppenheimer-Palmieri Fund, I.P., et al. v. Peat Marwick Main & Co., et al., United States District Court for the Eastern District of New York, 87 Civ. 0033 (EHN), 88 Civ. 3481 (EHN) (June 11, 1992; March 26 and 27, 1992).

Testimony of Daniel R. Fischel In Re: American Continental Corporation/Lincoln Savings and Loan Securities Litigation, in the United States District Court, for the District of Arizona MDL Docket No. 834 (June 4, 1992; May 26, 27 and 28, 1992).

Testimony of Daniel R. Fischel In Re: State of West Virginia v. Morgan Stanley & Co. Incorporated, in the Circuit Court of Kanawha County, State of West Virginia, Civil Action No. 89-C-3700 (April 27, 1992).

Affidavit of Daniel R. Fischel In Re: William Steiner, on behalf of himself and all others similarly situated v. Tektronix, Inc., et al., in the United States District Court, District Court of Oregon, Civil No. 90-587-JO (March 23, 1992).

Deposition of Daniel R. Fischel In Re: Martin Kaplan and Selma Kaplan, on Behalf of Themselves and All Others Similarly Situated v. VICORP Restaurants, Inc., Charles R. Frederickson, Robert S. Benson,

Emerson B. Kendall, Robert T. Marto and Johyn C. Hoyt, United States District Court, District of Colorado, Civil Action No. 90-C-2182 (February 11, 1992).

Deposition of Daniel R. Fischel In Re: Interco Incorporated v. Wasserstein, Perella & Co., Inc., United States District Court, Eastern District of Missouri, Eastern Division, No. 91-0151-C- 6 (February 3, 1992 and December 12, 1991).

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Deposition of Daniel R. Fischel In Re: Capital Bank of California v. Morgan Stanley & Co., Incorporated, United States District Court, Central District of California, No. 91-1650-R (January 24, 1992).

Deposition of Daniel R. Fischel In Re: Trinity Ventures, et al. v. Federal Deposit Insurance Corporation, in its own capacity and as successor to the Federal Savings and Loan Insurance Corporation, United States District Court, for the District of Oregon, No. 90-103- PA (January 6, 1992).

Deposition of Daniel R. Fischel In Re: First Republicbank Securities Litigation, United States District Court, Northern District of Texas, Dallas Division, Civil Action No. 3-88-0641-H (January 2, and 3, 1992; November 26, 1991).

Deposition of Daniel R. Fischel In Re: State of West Virginia v. Morgan Stanley & Co. Incorporated; Salomon Brothers Inc.; and Goldman Sachs & Co., in the Circuit Court of Kanawha County, State of West Virginia, Civil Action No. 89-C-3700 (December 19 and 20, 1991).

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Deposition of Daniel R. Fischel In Re: Thomas J. Caldarone, Jr. v. Isidore Brown, et al., and John E. Washburn, et al. v. Isidore Brown, et al., United States District Court, Northern District of Illinois, Eastern Division, Docket Nos. 80 C 6251 and 81 C 1475 (August 28, 29, and 30, 1991).

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Deposition of Daniel R. Fischel In Re: Ellen Rudd, on behalf of herself and all others similarly situated, and Mayer Corporation on behalf of themselves, and all others similarly situated, and Louis Brandt, and Israel Baker, Jay R. Kuhne, Pininfarina Corp., and American Transfer Co., on behalf of themselves and all others similarly situated v. Kirk Kerkorian, et al., Superior Court of the State of California, County of Los Angeles, Nos. CA 000980, CA 000981, CA 001017, CA 620279 (June 21, 1990).

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Deposition of Daniel R. Fischel In Re: Norman Kamerman, Shirley Brown, Edward Rosen, Lexim Investors Corp., and Dohsa Anstalt, on behalf of themselves and all others similarly situated, and Barnett Stepak v. Saul Steinberg, Reliance Group Holdings, Inc., Reliance Group, Inc., Reliance Financial Services corp., and Reliance Insurance Company, United States District Court, Southern District of New York, No. 84 Civ. 4440 (September 13, 1989).

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Deposition of Daniel R. Fischel In Re: Joseph B. Moorman, et al. v. Southmark Corporation, et al., Liquidity Fund, et al. v. Southmark Corporation, et al., Superior Court of the State of California for the County of San Mateo, Nos. 322135 and 332435 (July 11, 1989).

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Testimony of Daniel R. Fischel In Re: Nucorp Energy Securities Litigation, United States District Court for the Southern District of California, M.D.L. 514 (March 15, 16, 17, and 18, 1988).

Deposition of Daniel R. Fischel In Re: Nucorp Energy Securities Litigation, United States District Court for the Southern District of California, M.D.L. 514 (January 27, 1988).

Deposition of Daniel R Fischel In Re: Anheuser-Busch Companies, Inc. v. W. Paul Thayer, et al., United States District Court for the Northern District of Texas, Dallas Division, No. CA- 3-85-0794-R (January 21, 1988; December 4, 1987; and November 5, 1987).

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Deposition of Daniel R. Fischel In Re: Securities and Exchange Commission v. First City Finance Corporation, Ltd. and Marc Belzberg, United States District Court for the District of Columbia, Civil Action No. 86-2240 (December 11, 1987).

Affidavit of Daniel R. Fischel In Re: Gerald D. Broder and Constance D. Broder v. Alphonse H. Bellac and William B. Weinberger v. Combustion Equipment Associates, Inc., et al., and William B. Weinberger v. Coopers & Lybrand, United States District Court for the Southern District of New York, 80 CIV 6175 (CES) 80 CIV 6839 (CES) 84 CIV 8217 (CES) (July 22, 1987).

Deposition of Daniel R. Fischel In Re: The Irvine Company v. Athalie Irvine Smith and Athalie R. Clarke, Trustee, State of Michigan, Circuit Court for the County of Oakland, Civil Action No. 83270011-CZ (June 1, 1987).

Deposition of Daniel R. Fischel In Re: Fortune Systems Securities Litigation, United States District for the Northern District of California, Master File No. 83-3348A-WHO (May 7, 1987).

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Testimony of Daniel R. Fischel In Re: NVHomes, L.P. v. Ryan Homes, Inc.; and Ryan Homes, Inc. v. NVHomes, L.P., et al., United States District Court for the Western District of Pennsylvania, Civil Action No. 86-2139 (October 24, 1986).

Supplemental Affidavit of Daniel R. Fischel In Re: NVHomes, L.P. v. Ryan Homes, Inc.; and Ryan Homes, Inc. v. NVHomes, L.P. and NVAcquisition L.P., et al., United States District Court the Western District of Pennsylvania, Civil Action No. 86-2139 (October 24, 1986).

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Deposition of Daniel R. Fischel In Re: Activision Securities Litigation, United States District Court for the Northern District of California, No. C 83 4639 (August 18 and 19, 1986).

Deposition of Daniel R. Fischel In Re: John Mancino v. James A. McMaqhan, et al., United States District Court for the Northern District of California, Civil No. C-84-0407-TEH (August 14, 1986).

Testimony of Daniel R. Fischel In Re: Charles W. Leigh, et al. and George Johnson, et al. v. Clyde William Engle, et al., United States District Court for the Northern District of Illinois, Eastern Division, Case No. 78 C 3799 (August 1, 1986).

Reply Affidavit of Daniel R. Fischel In Re: The Amalgamated Sugar Company v. NL Industries, United States District Court for the Southern District of New York, 86 Civ. 5010 (VLB) (July 28, 1986).

Affidavit of Daniel R. Fischel In Re: The Amalgamated Sugar Company v. NL Industries, United States District Court for the Southern District of New York, 86 Civ. 5010 (VLB) (July 18, 1986).

Deposition of Daniel R. Fischel In Re: Charles W. Leigh, et al. and George Johnson, et al. v. Clyde William Engle, et al., United States District Court for the Northern District of Illinois, Eastern Division, Case No. 78 C 3799 (July 1, 1986).

Deposition of Daniel R. Fischel In Re: Seafirst Corporation v. William M. Jenkins, et al.; and Seafirst Corporation v. John R. Boyd, et al., United States District Court for the Western District of Washington at Seattle, Case No. C83-771R (February 27, 1986).

Deposition of Daniel R. Fischel In Re: Kreindler v. Sambo's Restaurants, Inc., United States District Court for the Southern District of New York, Case No. 79 Civ. 4538 (December 17, 1985).

Affidavit of Daniel R. Fischel In Re: United States of America v. S. Richmond Dole and Clark J. Matthews II (March 19, 1985).

Deposition of Daniel R. Fischel In Re: Craig T. McFarland, et al. v. Memorex Corporation, United States District Court for the Northern District of California, No. C 79-2926-WAI, C 79-2007-WAI, C 79-241-WAI (February 26, 1985; January 29 and 30, 1985).

Testimony of Daniel R. Fischel In Re: Robert J. Lawrence v. Grumman Corp. Pension Plan, et al., United States District Court for the Eastern District of New York, No. CV-81-3530 (December 19, 1983).

Testimony of Daniel R. Fishel In Re: Telvest, Inc. v. Junie L. Bradshaw, et al. and American Furniture Company, United States District Court, for the Eastern District of Virginia Richmond Division, No. CA-79-0722-R (December 4, 1981).

OTHER ACTIVITIES

Member, American Economic Association, American Finance Association.

Former Member of the Board of Overseers of the Becker-Friedman Institute at the University of Chicago.

Former Advisor to the Harvard Program on Corporate Governance at Harvard University. Former

Member, Board of Directors, Center for the Study of the Economy and the State. Former Member,

Mid-America Institute Task Force on Stock Market Collapse.

Have acted as a consultant and/or advisor to the New York Stock Exchange, the National Association of Securities Dealers, the Chicago Board of Trade, the Chicago Board Options Exchange, the Chicago Mercantile Exchange, the New York Mercantile Exchange, the Federal Trade Commission, the Department of Labor, the Securities and Exchange Commission, the Canadian Securities and Exchange Commission, the United States Department of Justice, the Federal Deposit Insurance Corporation, the Resolution Trust Corporation, the Federal Housing Finance Agency, and the Office of Thrift Supervision.

Referee, Journal of Financial Economics, Journal of Law and Economics, Journal of Legal Studies.

Participant and speaker at multiple conferences on the Economics of Corporate, Securities and Commodities Law and the Regulation of Financial Markets.

Former Chairman, American Association of Law Schools' Section on Law and Economics.

APPENDIX B
Materials Relied Upon

Legal Documents & Expert Reports

Expert Report and Exhibits of [redacted] Ph.D., October 4, 2021

Securities and Exchange Commission v. Ripple Labs, *et al*., First Amended Complaint, February 18, 2021

Securities and Exchange Commission v. Ripple Labs, *et al.*, Plaintiff's Answers and Objections to Defendants' First Set of Requests for Admission, July 16, 2021

Securities and Exchange Commission v. W. J. Howey Co. et al, 328 U.S. 293, 1946

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Exhibit D

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK
- - - - - - - - - - - - - - - - - -x
SECURITIES AND EXCHANGE
COMMISSION,

Plaintiff,

vs.

Case No.
20-civ-10832(AT)(SN)

RIPPLE LABS, INC., BRADLEY
GARLINGHOUSE, and CHRISTIAN A.
LARSEN,

Defendants.
- - - - - - - - - - - - - - - - - -x

CONTINUED VIDEOTAPED DEPOSITION OF

[redacted], Ph.D.

New York, New York

Tuesday, May 10, 2022

Reported by

JEFFREY BENZ, CRR, RMR

JOB NO. 211049

May 10, 2022

1:12 p.m.

Continued Videotaped Deposition of [redacted] [redacted] Ph.D., taken at Debevoise & Plimpton LLP, 919 Third Avenue, New York, New York, before Jeffrey Benz, a Certified Realtime Reporter, Registered Merit Reporter and Notary Public of the State of New York.

A P P E A R A N C E S:

FOR THE PLAINTIFF:

U.S. Securities and Exchange Commission
100 Pearl Street
New York, New York 10004
BY: MARK SYLVESTER, ESQ.
ROBERT MOYE, ESQ. (remotely)

FOR DEFENDANT RIPPLE LABS:

Kellogg, Hansen, Todd, Figel & Frederick, P.L.L.C.
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Washington, D.C. 20036
BY: REID FIGEL, ESQ.
KYLIE KIM, ESQ.
ELIANA PFEFFER, ESQ.
CLAYTON MASTERMAN, ESQ. (remotely)
MICHAEL KELLOGG, ESQ. (remotely)
BRADLEY OPPENHEIMER, ESQ. (remotely)

A P P E A R A N C E S: (Ctd.)

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FOR DEFENDANT CHRISTIAN A. LARSEN:

Paul, Weiss, Rifkind, Wharton & Garrison LLP
1285 Avenue of the Americas
New York, New York 10019
BY: MARTIN FLUMENBAUM, ESQ. (remotely)
CARLY LAGROTTERIA, ESQ. (remotely)

ALSO PRESENT:

DMITRY ZVONKOV, Videographer
DEBORAH McCRIMMON, Ripple Labs, Inc.
ELIZABETH GOODY, S.E.C.

[redacted]

THE VIDEOGRAPHER: We are on the record. Today's date is May 10, 2022. The time on the video screen is 1:12 p.m.

This is Video 1 in the deposition of Dr. [redacted] in the matter of the SEC versus Ripple Labs, Inc., et al., in the U.S. District Court, Southern District of New York, Case Number 20-CIV-10882 (AT) (SM).

This deposition is being taken at 919 Third Avenue, New York, New York.

My name is Dmitry Zvonkov. I'm the videographer with TSG Reporting. The court reporter is Jeff Benz, also with TSG.

All appearances are on the stenographic record. Would the reporter please swear in the witness.

[redacted], Ph.D.,

called as a witness, having been first duly sworn by Jeffrey Benz, a Notary Public within and for the State of New York, was examined and testified as follows:

[redacted]

EXAMINATION BY MR. FIGEL:

Q. Good afternoon, Dr. [redacted] Could you please state your name for the record.

A. [redacted].

Q. And any reason you can't give truthful and accurate testimony today?

A. I don't believe so, no.

Q. You've submitted an expert -- an opening expert report, or rebuttal report and a supplemental report in connection with this case.

Is that correct?

A. Yes, that's correct.

Q. And just for the record, I think we're going to be referring to at least all of them.

I show you what has been previously marked as Exhibit 1 from your prior deposition.

So I'll put that before you so you can have access to it.

MR. FIGEL: And then -- do we have the exhibit sticker? I don't need this.

Q. And just so the record's clear, that is the opening amended report that you submitted in this case?

[redacted]

Is that correct?

A. It appears to be yes.

Q. And since we have three reports, can we agree that for the purposes of the deposition, that we'll refer to that report as your opening report?

A. That's satisfactory to me.

MR. FIGEL: Okay. And so just so the record's clear, the opening report will be the amended expert report of Dr. [redacted] dated October 6, 2021.

Q. All right. I'd now like to show you what's -- we previously marked as Exhibit 2.

Is this the supplemental report that you -- I'm sorry, this was marked as Exhibit 13? Is that right?

Wasn't this Exhibit 2?

I'm sorry, Dr. [redacted] Can I borrow that back from you for a second.

It's Exhibit 2 on yours.

All right. And is Exhibit 2 the rebuttal report that you issued in this case on November 12, 2021?

A. It appears to be, yes.

[redacted]

Q. And again, so the record's clear, can we agree that when I refer to your rebuttal report, we're referring to Exhibit 2?

A. That's satisfactory to me.

Q. Okay.

And I now show you what's been marked as Exhibit 13.

(Dr. [redacted] February 28, 2022, supplemental expert report was marked [redacted] Exhibit 13 for identification, as of this date.)

Q. And is this the supplemental expert report that you issued on February 28, 2022?

A. It appears to be.

Q. And again, for the record, can we agree that when I refer to this supplemental report, we'll be -- I'll be referring to Exhibit 13?

A. That's fine with me.

Q. All right. Now, in your opening report, you offer the opinion that you found, and -- I'm quoting -- Statistically significant evidence that XRP prices react to new information about Ripple's actions.

[redacted]

Correct?

A. That -- I -- I believe so.

Q. I'll represent to you I'm trying to quote from paragraph 12A. We can -- we can let the report speak for itself.

MR. SYLVESTER: And just perhaps before we go too far down this road, I just want to note for the record that, of course, we're here pursuant to the Court's order of April 19, 2022, in which Judge Netburn stated -- I'll quote in part -- Expert discovery is reopened until May 13, 2022, for the limited purpose of, one, redeposing Dr. [redacted] regarding the analysis in his supplemental report, limited to four hours. Which he continues, close quote.

So, I'll let you have a little bit of leeway, but I want to put on the record right away that the purpose of this deposition is to explore Dr. [redacted] supplemental analysis as set forth in his supplemental report.

It's not to reopen his initial

[redacted]

deposition to give defendants more time to question when they used, I believe, 6 hours and 58 minutes for the initial deposition.

So, I'm happy to hear the question, and we can take it one question at a time, but I just want to put on the record right away that we intend to direct Dr. [redacted] to answer questions within the scope of the Court's order and -- or rather, to permit him to answer questions within the scope of the Court's order, and direct him not to answer any questions that fall outside that scope.

MR. FIGEL: I understand your position, and just so the record's clear, we intend to examine him about his supplemental report.

But as I believe we'll establish through questioning, and I intend to establish through questioning, the facts, data, methodology, and work papers, work product that he created in connection with the supplemental report, is on all fours with the work he did with his original

report.

And, as a result, we view it as impossible to not ask questions about certain aspects of his original report -- I think I've got determination right, in connection with the supplemental report.

So you can make objections. You can direct however you like, but our position is, we will be questioning him about his opening report, and we believe it's fully consistent with the judge's order that allows us to examine him with respect to the conclusions and methodologies in his supplemental report.

MR. SYLVESTER: Okay. As I said, I hear your position, we can take it one question at a time.

Q. All right. Do you recall that I was asking you about the conclusion you reached in paragraph 12A of your opening report?

A. Yes, I recall.

Q. And that conclusion was based on your finding of a statis-- significant statistical correlation between certain public announcements

made by Ripple, and price returns of XRP, as reported in public sources.

Is that correct?

MR. SYLVESTER: Let's stop right here. Objection. How is this related to his supplemental analysis?

MR. FIGEL: Well, I don't have to preview for you the questions I'm going to ask. But he found in his opening report, as I just believe I accurately summarized -- let me just make sure -- do we have an answer to the question yet, or you're not going to let him answer?

MR. SYLVESTER: Yeah, I lodged an objection. He answered the question, Do you recall that I was asking you about the conclusion that you reached in your opening report.

MR. FIGEL: And you didn't permit him to answer my question.

So I'll -- I'll have a colloquy with you, but we're not going to do this question by question.

He has a methodology in which he made

findings in his original report, which we believe carries over and are relevant to his supplemental report, and I fully intend to question him about the methodology in his original report that bears on his supplemental report.

MR. SYLVESTER: And -- and we would object to that. You had seven hours to question him about his methodology in his opening report. That's not what this deposition is for.

You -- you have an entire report before you that you can ask -- you're free to ask him any questions on his supplemental report. You're free to ask him any questions that you think are tied to his supplemental report, but what we've started on is his initial report, which, again, you had 7 hours to ask questions on and did use 6 hours and 58 minutes, so I -- I do object to this line of questioning.

If we can move to the supplemental report, then perhaps we can -- you can demonstrate how this is of relevance to --

[redacted]

and within the bounds of the Court's order, but sitting here right now, I don't see it.

MR. FIGEL: Well, Mr. Sylvester, with all respect, I don't have to demonstrate anything to you, you can make your objections, I'm going to ask my questions.

I've proffered to you the reasons why questions about his opening report are relevant to his supplemental report. And you can then do what you want, but I'm not going to change my questions or the scope of what I intend to ask him about based on what you think the permissive -- permissible scope of the Court's order is.

Q. All right.

MR. FLUMENBAUM: And I want to note for the record that it is -- in his own supplemental report, he refers to the methodology that he filed in his amended report. And -- and maybe you can establish the relevance of that through that question.

And he refers to his first report in his supplemental report. And you're

[redacted]

wasting time, Mr. Sylvester, which I'm going to ask the court reporter to take away -- to add back to the four hours.

Just either object -- no more speeches. We understand your position, but enough.

MR. SYLVESTER: Mr. Flumenbaum --

MR. FLUMENBAUM: You're just stopping the deposition --

MR. SYLVESTER: Mr. Flumen--

MR. FLUMENBAUM: -- which is your goal here, and you've been sanctioned in order to get here so just -- you know, just stop.

MR. SYLVESTER: Mr. Flumenbaum, that itself was a speech. So thank you for that.

Q. All right. So let me -- I believe Mr. Sylvester objected -- Sylvester objected before you answered my question. The conclusion in your opening report was that you found a significant statistical correlation between certain public announcements made by Ripple and price returns of XRP as reported from public sources.

[redacted]

Is that correct?

A. I -- I -- that sounds correct, yes.

Q. All right. Now, directing your attention to the rebuttal report, in your rebuttal report, your opinions were limited to various observations and arguments that you had in which you disagreed with the expert report submitted by Allen Ferrell.

Is that correct?

A. My rebuttal report, I was asked to respond to certain arguments put forward by Dr. Ferrell.

Q. And you didn't offer any new opinions in support of your own analysis in the opening report, in the rebuttal report.

Correct?

A. I -- I would say that that's correct.

Q. All right. Now, directing your attention to the supplemental report, in the supplemental report, you offer an opinion for the first time that but for the impact of news and public statements related to Ripple, the U.S. dollar price per XRP token, quote, would rarely have exceeded 2 cents per unit.

[redacted]

Is that correct?

A. Are you quoting from the report? That's --

Q. Yes.

A. That sounds correct, but I just --

Q. Yes.

A. Yes, that's correct.

Q. And you go on to say, But for the news related to Ripple on just 23 days, and I'll -- we'll put a pin in the 23 days -- the price of XRP would rarely have surpassed about a penny, and it would never/reached the actual high of $3.38.

Is that correct?

A. Can you just -- I just want to make -- where are you exactly?

Q. Well, I'm summarizing.

But if you want to look at the paragraph.

So if you look at paragraph 9, the second bullet point, the last sentence.

A. Yes. Correct.

Q. Now, is it a fair summary of the opinions expressed in your supplemental report

[redacted]

that but for what you believe is the positive price impact that certain Ripple announcements had on the price of XRP, as of October 28, 2020, the market price per unit of XRP would have been 2 cents or less at a time when the actual market price for XRP was approximately 24 cents?

A. You put a particular date there.

October --

Q. -- 28, 2020, which I believe was the --

A. Right.

Q. -- last date of your study.

A. So I'm sorry, Mr. Figel. Would you repeat the question.

Q. Yeah. Your -- your opinion as expressed in the supplemental report was that but for what you believe to be the statistically significant positive impact of certain Ripple announcements on the price of XRP as of October 28, 2020, the market price per unit of XRP would have been 2 cents or less at a time when the fair market price or the market price of XRP was 24 and a half cents.

Correct?

[redacted]

A. I'm not sure that I know exactly what the counterfactual price was on October 28, 2020, according to Model 2. You may very well be correct.

But sitting here right now, I don't know that I remember the number.

Q. Did you review your supplemental report before your deposition today?

A. I did.

Q. All right. Just so we are clear -- we asked this last time, but I want to make sure the record is clear on this. The opinions you express your opening report, the rebuttal report, and the supplemental report contain all the affirmative opinions you intend to offer in this case.

Is that correct?

A. I believe that's correct. Of course, the -- the rebuttal report, you might say, contains rebuttal opinions rather than affirmative opinions. But that notwithstanding, I -- I think that's correct, yes.

Q. Is it your testimony that the rebuttal report contains rebuttal opinions?

[redacted]

MR. SYLVESTER: Objection to the extent it calls for a legal conclusion.

A. They contain opinions. You inserted the word "affirmative opinion." I don't know -- I don't know how to characterize the rebuttal report as whether that contains rebuttal opinions or affirmative opinions. It contains opinions.

Q. Well, does your -- does your supplemental report include opinions that you are expressing for the first time in this litigation?

A. I would say that the supplemental report contains opinions -- some new opinions, yes. Prior to your supplemental report, you never offered the opinion that but for the impact of certain Ripple news announcements the price per unit of XRP would never have risen above 2 cents. You never offered that -- that's an opinion you're offering in your supplemental report.

Correct?

MR. SYLVESTER: Objection.

A. Well, you inserted the word "never."

[redacted]

I think I use words like "rarely."

But broadly speaking, you're correct that the -- my opening report and rebuttal report did not contain an opinion on the counterfactual price level but for the news of -- of Ripple.

Q. So the first time you're expressing an opinion on the but-for price of XRP is in your supplemental report.

Isn't that correct?

A. I would agree with that, yes.

Q. And your opening report, your rebuttal report, and your supplemental report sets forth all of the bases for the opinions you express in those reports.

Correct?

A. Yes. I would agree with that.

Q. Has the SEC asked you to further modify or amend your opening report in any way, other than what's in the supplemental report?

A. No.

Q. You're not doing any work as you sit here today as you were at the last deposition in which you're planning to issue new opinions, or

[redacted]

further reports.

A. Related to this case?

Q. Correct.

A. Yes, that's correct.

Q. All right. Has the -- has the SEC asked you to further modify or amend your supplemental report in any way?

A. No. The SEC has not asked me that.

I don't know if now is a time to mention, I spotted a typo when I was reviewing the supplemental report. But I spotted it.

Q. Well, let's -- let's have you correct the typo --

A. Okay.

Q. -- in your supplemental report so the record is clear.

A. I believe it's footnote 13. It's just a calculation. It reads, 0.01787 equals 0.1422. That should have said 0.01422.

Q. Okay. Any other typos or errors in your supplemental report that you're aware of?

A. Not that I'm aware of, no.

MR. SYLVESTER: Just a reminder to let him answer the question -- finish the

[redacted]

question.

THE WITNESS: I apologize.

Q. And are you doing any additional work that relates to the opinions expressed in your supplemental report or any of the methodologies or facts or data that you relied on in reaching those opinions?

A. No, I'm not.

Q. So you have no reason to further supplement or modify any of your three reports as you sit here today.

Correct?

A. That's correct. As I sit here today, I -- I have no reason and no expectation to modify or supplement any of these reports.

Q. Right. In connection with the preparation of your supplemental report, did the SEC ask you to analyze or evaluate any aspect of your prior opinions or the data that you collected that are not discussed or referred to in either your opening report or your rebuttal report?

A. I'm sorry, sir. May I hear that again?

[redacted]

Q. Sure. In connection with the preparation of your supplemental report, did the SEC ask you to analyze or evaluate any aspect of your prior opinions or the data that you collected that are not discussed or referred to in either your opening report or your rebuttal report?

MR. SYLVESTER: I'm going to object on work product grounds. I -- to the extent you can answer that question, I think it goes solely to your assignment, and I'm fine with that. But to the extent it goes beyond that into communications with the SEC, I'll object on work-product grounds.

Q. Why don't we start with yes or no.

A. Well, I'm -- I am struggling with the language that this supplemental report is an analysis using similar data from the opening report. So if your question was did they ask me to do an analysis on data in my opening report for purposes of preparing the supplemental report, I -- if I take those words literally, I think the answer to that question is, yes, as the supplemental report uses data from -- is an

[redacted]

analysis of data in the -- in the opening report. But I may be misunderstanding your question.

Q. Well, let's -- let's break it down.

Let's start with, did the SEC ask you to analyze or reevaluate any of the opinions you expressed in your opening report or your rebuttal report in connection with the preparation of your supplemental report?

MR. SYLVESTER: Objection.

A. My assignment as laid out in the supplemental report does not involve revisiting or revising prior opinions.

Q. And now the question is, did the SEC ask you to reevaluate any of the opinions that you expressed in your opening report or in your rebuttal report in connection with the preparation of the supplemental report?

MR. SYLVESTER: Objection.

A. No, they did not ask me that.

Q. All right. In your opening report at paragraph 11, in your rebuttal report at paragraph 4, and in your supplemental report at paragraph 6, you reserve the right to modify or

[redacted]

supplement your conclusions.

Do you still reserve this right?

A. Well, I -- I don't believe I've waived the right, so I suppose I reserve the right.

Q. And are you actively considering any new information or conducting new analyses that relate to either your opening report, your rebuttal report or your supplemental report?

A. Sitting here today, I am not currently actively working on additional analysis related to this matter.

Q. Do you have any plans to do any analyses or review the methodology or the opinions in your opening report or your rebuttal report?

A. Sitting here today, I have no such plans.

Q. And any plans to review any aspect of the methodology or the opinions in your supplemental report?

A. Sitting here today, I have no such plans.

Q. All right. Now, in connection with the preparation of your supplemental report, did

[redacted]

you conduct any additional regression analyses, other than the regression analyses that you conducted for the opening report?

A. No, I did not.

Q. So the opinions expressed in your supplemental report are based on the exact same regression analyses that you conducted in connection with your opening report.

Is that correct?

A. You used the words, "are based on." I might use words, utilize the same regression analysis from the opening report.

Q. Give me just a second.

So let me try it with your reformulation.

So the opinions expressed in your supplemental report are based on the same -- the exact same regression analyses that you utilized in connection with your opening report.

Is that correct?

A. My supplemental report, broadly speaking, has two threads of opinion, if you will, one of which utilizes regression analyses, which were this very same regression analyses in

[redacted]

my opening report.

The other thread of opinion in my supplemental report does not utilize any regression analyses at all.

Q. And when you say the second thread, you're referring to the investment return that would have been realized by an XRP purchaser who purchased the day before an event and held for 28 days? Just so the record's clear.

A. For various days, including 28 days, but yes, that -- that's the thread that I had in mind.

Q. Now, when you say, with respect to the first thread, that you used the very same regression analyses, by "very same," you mean without modifications or changes or additional work.

Correct?

A. Well, there's -- there's additional work, but not additional regression analysis.

Q. So the 20 models are the same 20 models you used -- the 20 model -- withdrawn.

The 20 models you used in your opening report are the same 20 models that you rely on

[redacted]

in your supplemental report.

Correct?

A. Yes, that's correct.

Q. And the results of those 20 models are unchanged with respect to the opinions you reach in your supplemental report.

Correct?

A. Yes, that's correct.

Q. Did you consider any additional events related to XRP or Ripple, other than the events you identified in your opening report, in connection with the opinions you offer in your supplemental report?

A. No, I did not.

Q. So you didn't change or modify or supplement any of the facts or data related to XRP, or Ripple, other than what you relied upon in your opening report.

Is that correct?

MR. SYLVESTER: Objection.

A. That sounds correct. Yes.

Q. Is there anything about it that sounds incorrect?

A. There was just so many words, but I

[redacted]

didn't -- I didn't rerun aggressions -- rerun regressions, modify regressions, or identify additional events or news beyond what I discussed in my opening report.

Q. And the XRP market prices that you used in your opening report are the same XRP market prices that you used in connection with the opinions you offer in your supplemental report.

Correct?

A. Yes, that's correct.

Q. Other than the calculation of the counterfactual XRP price that's set forth in your supplemental report, did you perform any other analyses, other than what you performed in connection with your opening report?

MR. SYLVESTER: Objection.

A. Well, there's -- there's a second thread of opinion, as we've discussed.

Q. Let -- let's -- apologies, that's my fault.

Let's leave the second -- what you call the second thread to the side. I'm talking just about the counterfactual XRP price that you

[redacted]

opine about in your supplemental report.

And the question is, other than the methodology that allowed you to offer the opinion that the price of XRP rarely would have gone above 2 cents per unit, whatever the -- the arithmetical backing out of the -- what you call the abnormal price returns, were there any other analyses that you did in connection with reaching the opinion you offer with respect to what you call the first thread of your supplemental report?

MR. SYLVESTER: Objection.

A. I -- I'm -- I'm just trying to digest the -- the -- I'm just not sure I understand the question. I'm sorry.

Q. All right. Let's -- let's see if we can break it down.

We'll go through this in considerable detail, but at a high level, can we agree that the opinion you express in your supplemental report, with respect to the counterfactual price of XRP, was effectively backing out what you consider to be abnormal positive price returns that were correlated with various Ripple events,

[redacted]

and recalculating what the price of XRP would have been but for those events in those price impacts?

A. Yes, I would -- I would agree with that.

Q. And I'm sure it's very complicated, but -- but --

A. I -- that --

Q. -- it can be simplified to your backing out specific price returns and price increases, to take it from what the market price was on or about October 28, 2020, to the 2 cents that -- that you offer. Correct?

MR. SYLVESTER: Objection.

A. Your summary, I think, was very fair. Again, I don't -- just don't remember what the counterfactual price is on that particular date, so I -- I don't know that it was 2 cents.

But -- but your summary up to that point, I think, was -- was fair.

Q. All right. Other than that exercise in which you backed out what you consider to be the abnormal price returns, did you conduct any other analyses that you relied on in connection

[redacted]

with what you call the first thread of your opinion as expressed in your supplemental report?

MR. SYLVESTER: Objection.

A. Well, having backed out the -- the abnormal returns attributable to those events, the result then is a counterfactual price history, and I then do very simple analysis to calculate certain summary statistics on those counterfactual price histories.

So, for instance, I calculate the fifth percentile price or the median price, so on and so forth.

But to get to the counterfactual price itself, again, I think that I -- I think that your summary was fair.

Q. All right. And you didn't offer a counterfactual price for XRP for any time period in either your opening report or your rebuttal report. Correct?

A. That's correct.

Q. And you didn't attempt to quantify the impact of any announcement by Ripple on the market price or the price return of XRP in

[redacted]

connection with your opening report or your rebuttal report. Correct?

A. No, I don't think that's correct.

Q. Okay. What respects is that not correct?

A. Well, I believe that my opening report does present information on the impact of these Ripple events on XRP prices.

Q. With all respect, that wasn't my question.

A. I'm sorry.

Q. I'll ask it again.

You did not attempt to quantify the impact of any announcement by Ripple on the market price or the price return of XRP in connection with your opening report or your rebuttal report. Correct?

A. I -- I don't know that I -- I -- I can agree with that. The opening report does present a demonstration of the quantum of impact of Ripple news on XRP prices. So I'm not quite sure that I can agree with your characterization.

Q. So why don't we turn to -- I believe

[redacted]

it's Exhibit 1 of your opening report.

And can you please identify for us where in that report you attempted to quantify the impact of any announcement by Ripple on either the market profile of XRP or the price return of XRP.

MR. SYLVESTER: Objection.

A. Well, in -- I just want to get the section -- Section 6 of the opening report contains a number of charts that show the average impact of the news items that I -- that I refer to in Section 6 on XRP prices.

Q. So can -- why don't -- just so the record's clear, why don't you give us a page or a chart number so we can --

A. As an example, Figure 31, on page 55.

Q. And where in Figure 31 do you quantify the price impact of any Ripple announcement on the -- either the market price of XRP or the price return of XRP?

A. Well, Figure 31 presents the average return on XRP prices following the -- what did I call it? The select -- the select events, which is the combination of milestones, customer

[redacted]

product and some other categories.

That's what Figure 31 is presenting.

So for instance, one can read from Figure 31, that the average one-day impact, or average one-day return following those particular news items is -- is a little more than 3 percent.

And the average three-day return is -- is about 11 percent, and so on and so forth.

Q. Just to the record's clear, explain what the 3 percent you just testified to is, is based on.

A. It's the value of the blue line at -- where the X-axis says 1, reading that as a little over 103, which would correspond to a return of a little more than 3 percent.

Q. And what announcement by Ripple does this 3 percent price increase refer to?

A. It's the average increase -- it is the increase on average following all of the announcements in the select category discussion, which is the combination of milestones, customer and product announcements, exchange listings, commercial initiatives, and I think I'm

[redacted]

forgetting one.

Acquisition and investment.

Q. And those, what you just referred to, are a number of categories. Correct?

A. Yes.

Q. And each of the categories has several Ripple announcements within the category?

A. Yes, that's correct.

Q. And your select category, I believe, included more than a hundred different events?

A. Yes, that's correct.

Q. And so your testimony is that Figure 31 quantifies the impact of a -- of an announcement by Ripple on the market price of XRP?

MR. SYLVESTER: Objection.

A. No. I said the -- the average impact, the average over those 105 -- or 113, however many it was.

Q. It doesn't attempt to quantify the impact of any single Ripple event on the price of XRP. Correct?

MR. SYLVESTER: Objection.

A. No, it doesn't attempt to identify the

[redacted]

impact of any single Ripple event on XRP. It does attempt to quantify the impact of this category or superset of Ripple announcements on XRP.

Q. It purports to quantify the average return of a hundred different events on the price of XRP --

MR. SYLVESTER: Objection.

Q. -- correct?

MR. SYLVESTER: Sorry.

A. Yes, I think that's correct.

Q. All right. Other than Figure 31, is there anywhere else in your opening report where you believe you have attempted to quantify the impact of any announcement by Ripple on the market price or price return of XRP?

A. Well, throughout this Section 6 of my opening report, as I study different categories of news, there is, I think in all cases, or at least almost all cases, a chart which is analogous in structure to Figure 31.

So, for example, there is a chart that shows the average impact following the milestone announcements or the average impact following

[redacted]

the customer and product announcements and so on and so forth.

Q. But, again, each of those charts reflect what you believe is the average price impact of a series of events that you included in a category on the price of XRP. Correct?

A. Yes, that's correct.

Q. Just so the record is clear, did you attempt to quantify the impact of any specific announcement by Ripple on the market price or the price return of XRP in your opening report?

A. My opening report does not report the impact of individual events, event by event, no.

Q. All right. And the total number of Ripple events in your opening report is more than 500. Is that correct?

MR. SYLVESTER: You can feel free to refer to your report.

A. I believe that's correct. I think -- I want to say it was 514, if memory serves.

Q. And those 514 events were also the same 514 events that you utilized in connection with the opinions you expressed in your supplemental report. Correct?

[redacted]

A. Well, I didn't utilize all 514.

Q. But the reservoir, if you will, or the universe of Ripple events that your opening report and your supplemental report was based on was the same 514 events. Correct?

MR. SYLVESTER: Objection.

A. I would say that that's correct. Yes.

Q. And then just so the record is clear, you then excluded a number of categories and reduced the number of events to approximately a hundred. Correct?

MR. SYLVESTER: Objection.

Go ahead.

A. Yes, that's correct. I studied a -- a set of categories. I did not study all 514 events.

Q. And again, just so the record is clear, no new events in -- withdrawn.

You didn't consider any new events in your supplemental report, other than the events that were -- you considered in your opening report. Correct?

MR. SYLVESTER: Objection.

Go ahead.

[redacted]

A. Again, I think that's correct. Yes.

Q. And when you narrowed down the categories to your select categories and reduced the number of Ripple announcements from approximately 514 to 100 in your opening report, that's the exact limitation or exclusion of Ripple announcements that you made in connection with the work you did in your supplemental report. Correct?

A. My supplemental report begins with that same set. As I discuss in the supplemental report, I excluded five of the exchange listings, which I had also discussed in my opening report. But broadly speaking, yes, I -- what you say is correct.

Q. And the date range in your opening report, which I believe was May 5, 2014, through October 28, 2020, was the same date range that you utilized in your supplemental report.

Correct?

A. There would have been no change to date ranges. Just to be clear, that date range is covered -- is certainly covered by Model 1. That date range may not have -- and was not

[redacted]

covered by every model.

But -- but there was no change to my treatment of date ranges in the supplemental report with respect to how they were treated in the opening report.

Q. So now applying the 20 models that you came up with in your opening report to the categories and the event days that you considered, it's the same analysis in the supplemental report. Correct?

In other words, it's the same 20 regression models applied to the same events, with the exception of the 5 that you just testified you excluded in your supplemental report. Correct?

MR. SYLVESTER: Objection.

Go ahead.

A. I -- I did not modify or alter the regression models, and I did not add new events or recategorize events between my opening report and my supplemental report.

Q. And the purpose of the 20 models in both the opening report and the supplemental report was to identify statistically significant

[redacted]

abnormal returns. Correct?

MR. SYLVESTER: Objection.

Go ahead.

A. Each of those models can be used and was used to identify statistically significant abnormal returns.

Q. And the results of applying the 20 models to the categories and the announcements that you applied them to resulted in the exact same identification, model by model, of statistically significant abnormal price returns for XRP. Correct?

MR. SYLVESTER: Objection.

Go ahead.

A. I would say that, yes, that's correct.

Q. All right. Can I direct your attention now to paragraph 4 of your supplemental report.

A. Yes.

Q. Can you just read paragraph 4 into the record, please.

A. Since submitting the [redacted] rebuttal report, I have been asked by the SEC to provide additional quantification of the economic

[redacted]

significance of the impact that certain news related to Ripple had on XRP prices.

Q. You stated that the SEC asked you to provide additional quantification of the economic significance of Ripple news events on the price of XRP. Correct?

A. That is what I wrote, yes.

Q. But you didn't provide any quantification of the economic significance of the impact that certain news related to Ripple had on XRP prices in either your opening report or your rebuttal report. Correct?

MR. SYLVESTER: Objection.

A. As I testified, no, I don't think that's correct. I did provide quantification of the impact of Ripple events on XRP prices in my opening report.

Q. Well, other than what we just went through in which you identified certain charts, where you identified the average price returns of categories of events on XRP prices, you didn't do any quantification. Correct?

MR. SYLVESTER: Objection.

Q. We've been through this. You've

[redacted]

identified all the quantification that you believe you did in your opening report with respect to the economic impact of a Ripple event on an XRP price. Correct?

A. The -- the opening report was meant to investigate whether there was a link between Ripple Labs and the XRP market.

That was the purpose of the opening report. In doing that, there is quantification of the impact of those categories on Ripple prices. But if your question is, besides -- besides the quantification that I did, did I do any other quantification, the answer, of course, is no.

Q. And is it a fair summary that the opinion you expressed in your opening report was that you were able to reject the null hypothesis of a -- of independence between Ripple announcements, and XRP prices?

A. That sounds correct, yes.

Q. In order to reach that opinion, it was unnecessary for you to quantify the impact of any specific Ripple announcement on a particular price impact of XRP on a -- on a -- on a

[redacted]

particular day.

Correct?

MR. SYLVESTER: Objection.

A. I'm struggling with that a little bit.

Q. All right. I'll withdraw the question. Let me ask it again.

In order to reject the null hypothesis in your opening report, it was unnecessary for you to quantify the price impact that any announcement by Ripple had on XRP.

Correct?

A. I -- I'm still struggling with that.

In order to test the hypothesis, I have to calculate an abnormal return and evaluate its statistical significance. So -- so I had to, in your words, quantify the impact of news on prices.

I didn't -- I didn't have a fulsome reporting of those impacts in the opening report because it wasn't necessary to have a fulsome reporting of those impacts.

But your question was, I think, did I calculate them, and it was a necessary step, in conducting the work of the opening report, to

[redacted]

make those calculations. There's -- there's no way to avoid it.

Q. And why was it unnecessary to report the specific price impact of Ripple announcements on the price of XRP in order to reject the null hypothesis, as you did in your opening report?

A. Well, it was unnecessary, or -- because I -- I was about to say it was unnecessary because it wasn't necessary; that's not a very helpful answer.

I -- the report, the opening report, focused on establishing and testing whether there was a link between Ripple Labs and XRP prices.

So the opening report, you know, goes, I think, to -- to great lengths to explain the statistical properties of that test and the various statistical results around that test.

I -- all I can say is it didn't strike me as necessary to then have tables and tables and tables showing actual -- you know, showing the abnormal returns on different dates and -- and tying them back to particular Ripple events.

[redacted]

It just didn't strike me as necessary to do.

All -- all of that information is contained in the code and the models, and the information behind the scenes, if you will, in that report, but I -- it didn't -- I -- I didn't see any benefit to having tables and tables of such numbers in the opening report.

Q. The reason that there -- it was unnecessary was because the methodology you used in your opening report was to look at categories of news events and determine whether you could correlate those news events with abnormal price returns for XRP at a higher incidence, a higher level of correlation, than you would have expected to find by random chance.

Correct?

MR. SYLVESTER: Objection.

A. I -- much of what you said is -- is true. But you said it wasn't -- I mean, again to -- to look at a -- a category is simply a set of events.

To look at a category and determine whether there is a statistically significant correlation between the events of that category

[redacted]

and XRP prices requires, as a necessary step, that you calculate abnormal returns on every day, and -- and think about events on every day.

So it's -- it's a -- it's a necessary step. It was not then necessary as -- as output or presentation, as I said, to have table after table after table saying, Model 1 through 20, here's the abnormal return on the day that they escrowed 55 billion tokens or the day they got funding Round A and so on and so forth.

So I agree that it wasn't necessary as a matter of -- of presentation. But I don't see how I could have done the calculations in the opening report without the intermediate steps of calculating abnormal returns.

Q. Was it material to the opinion you reached in your opening report as to which of the Ripple announcements was correlated with a statistically significant abnormal price return of XRP?

A. The nature of the Ripple announcements was material to my opinion, as -- as we discussed, I think, last time.

The reason I tested certain categories

[redacted]

and not others was because the nature of the news made the test more economically meaningful than some other news.

So to me, it was material to test milestones and customer announcements and so on and so forth. It was not material to test general market commentary about the state of crypto markets.

So the nature of the news was material in order for me -- in order for me to reach my opinions in the opening report.

Q. That's not my question. Let's focus on a single category.

A. Okay.

Q. Call it milestones. I don't want to get hung up on the details.

But within the milestone category, there was a large -- a number of XRP -- of Ripple announcements.

Correct?

A. Correct.

Q. Right. And based on your regression analyses, you could predict that if the correlation was random, how many of those Ripple

[redacted]

announcements would correlate to abnormal price returns.

Correct?

A. Essentially, yes.

Q. And because, with respect to certain of those categories, you found a higher number of correlations than you would have expected by random chance, you concluded that there was a statistically significant correlation.

Correct?

A. Again, without quibbling over every word, broadly, yes, I think that's -- that's correct.

Q. And that -- again, without quibbling over every word -- was the basis on which you rejected the null hypothesis.

Correct?

MR. SYLVESTER: Objection.

A. That -- that was certainly a basis on -- yeah, yes, that was the basis on which I rejected the null hypothesis of statistical independence, yes.

Q. And hypothetically, if there were 20 Ripple's announcements in a category, and

[redacted]

based on your regression analyses, you would have expected two of them to be correlated with a statistically significant abnormal price return, and you found that there were five, instead, and that was a statistically significant number, that would be a basis for you to reject the null hypothesis.

Correct?

A. Yes, especially if the set of 20 events that we're talking about was of some economic interest, as opposed to, as I said, 20 articles written by the New York Times about the crypto market.

But, as long as it's an interesting set of 20 announcements, yes, I would agree with what you said.

Q. And it didn't matter which 5 of the 20 were correlated with a statistically significant price return.

Correct?

MR. SYLVESTER: Objection.

A. That's correct. It -- it wouldn't have mattered which 5 of the 20. Yes, I would agree with that.

[redacted]

Q. All right. Now, turning to the opinion in your supplemental report, again, just for terminology, can we agree that the opinion that you offer is the counterfactual price of XRP but for the impact of certain announcements by Ripple?

A. I agree that one thread is based on that, yes.

Q. Thread 1, yes.

But let's just agree that unless I specifically address what you refer to as Thread 2, we're talking about Thread 1.

MR. SYLVESTER: Objection.

A. I -- okay. I --

Q. They're very different methodologies.

Correct?

A. They are very different methodologies.

Q. So my questions, unless I tell you differently, relate to Thread 1.

A. I -- I will try to -- try to bear that in mind.

Q. Okay.

All right. So the first step for you in calculating the counterfactual price of XRP

[redacted]

was to identify those days in which you believe the market price reflected what you believed was a statistically significant positive return.

Correct?

A. The -- I just want to -- the first step was -- I remember -- I don't want to get hung up on the word "first."

I'm sorry, could you repeat the question?

Q. The first step for you, in trying to calculate the counterfactual price of XRP, was to identify those days in which you believed the market price reflected a statistically significant positive return.

Correct?

A. Certainly a step. I don't know that I want to hang my hat on the word "first," but a step was to identify such days, yes.

Q. All right. And just so the record is clear, what do you mean when you say you were looking at price returns?

A. I mean that I was looking at the change in the log of price, which is a common transformation in academic studies to measure

[redacted]

the return on price.

Q. What do you mean by "log price"?

A. You can take any positive number. You can take the natural log of it. So we have prices on every date. We take the natural log of those prices. Then we take the difference, just one minus the other, to get the change in the log of the price. And that is a measure of the return on the price.

Q. And what's the difference between return, as you just defined it, and increase in price?

A. Well, it depends on how sort of pedantic we want to be. An increase in price might refer only to positive returns. An increase in price could be calculated as the price on one day minus the price on another day. So -- so I would say that talking about the increase in price could mean -- could mean different things.

Q. Well, let's break it down.

Assume that on Day 1, the price is 50 cents and on Day 2 the price is 55 cents.

Is there a difference between the

[redacted]

5-cent increase and the log or the price return that you just testified about?

MR. SYLVESTER: Objection.

A. Well, they will be different numbers.

Q. And why will they be different numbers?

A. Because they're based on a different calculation. One is .55 minus .5, and the other is the log of .55 minus the log of .5.

Q. So one is a percentage -- one is an absolute return; one a percentage return? Would that be a way to simplify it?

A. One is -- I -- no. I -- when you -- when you say "absolute," I start to think absolute value. One is a change in price, and one is a percentage change in price.

Q. I thought that's what I said, but I'll take your answer.

All right. Just on -- just on this point, now on your methodology, now. The way in which you identified statistically significant price returns, was based on the 20 models.

Correct?

A. Well, each model produces a measure of

[redacted]

the abnormal return and a measure of the statistical significance of the abnormal return.

Q. And the results, though, of the use of those regression -- those 20 regression models to identify statistically significant price returns was identical. In other words, the results didn't change with respect to the work you did on your supplemental report from the work you did on your opening report.

Correct?

MR. SYLVESTER: Objection.

A. I believe that's correct.

Q. All right. Now, let's go to Figure 3 of your supplemental report, which is on page 7.

With me?

A. Yes.

Q. All right. And down the vertical axis, the first column is the 20 models that you used in your opening report.

Correct?

A. Yes, that's correct.

Q. And the second column is the number -- when you say "number of significant events," that is the number of statistically significant

[redacted]

abnormal returns that were identified by using each model.

Correct?

A. Very nearly correct. It's the number of events that have positive significant abnormal returns and no negative significant abnormal returns.

So approximately correct. Right.

Q. I'll take your modification.

But the results, the yield, if you will, of the number of such events that, as you just described them, is different by model.

Correct?

A. Some models yield a different number, yes.

Q. All right. And the range here is, look like it's between 19 and 24.

A. Skimming it right now, I -- I think that looks correct.

Q. And in your supplemental report, you consistently use the number 23; and that's because that was the number of statistically significant event days that correlated with Model 1.

[redacted]

Correct?

MR. SYLVESTER: Objection.

A. That's correct. For -- for expositional purposes in this report and in my opening report, I tend to focus on the results of Model 1 to explain ideas.

Q. So in your report, you use the number 23. I'm going to -- in the deposition, I'm going to use the number 23. But we can agree that the number 23 correlates to Model 1; and if we were talking about Model 17, we'd be talking about 20.

Correct?

A. Yes. I -- correct.

MR. FIGEL: Okay. I can't remember when we started. We've been going about an hour. Does anybody need a break?

MR. SYLVESTER: Dr. [redacted]?

THE WITNESS: I'm fine.

Q. All good? Okay.

If you would like one, just, you know, indicate.

A. Thank you.

Q. All right. Earlier you testified that

[redacted]

the reason you tested certain categories and not others in your opening report, because the nature of the event or the news in that category would make the test more economically meaningful than for other categories.

Correct?

MR. SYLVESTER: Objection.

A. I believe I testified to that, yes.

Q. And what was the methodology by which you determined whether news was economically meaningful?

MR. SYLVESTER: Objection.

I'm going to instruct not to answer that.

That goes to the methodology that's strictly to his opening report. It's not covered at all in his supplemental report.

MR. FIGEL: It is covered in supplemental report. It's baked into the analysis that he did. He replicated the same analysis, and he excludes certain events that we're going to talk about.

MR. SYLVESTER: That's a methodological question you could have

[redacted]

asked him and I think did ask at length in the first deposition. So we --

MR. FIGEL: Are you directing him not answer the question?

MR. SYLVESTER: In accordance with the Court's order, I am.

MR. FIGEL: We will reserve our right to challenge that. I think it's quite ill-advised, Mr. Sylvester, for you to suggest that we can't follow up on that, particularly when he just offered the testimony in the context of this deposition.

MR. SYLVESTER: I think with respect to methodological questions that go to his first report that you could and did examine him about extensively in the seven hours you had for his first report, that is well -- well without the bounds that the Court established repeatedly in her opinion.

MR. FIGEL: All right. He volunteered the explanation.

MR. FLUMENBAUM: The methodological

[redacted]

flaws, Mr. Sylvester, continue in the supplemental report. And we should be allowed to go into the -- the methodology that he used for the supplemental report. That is perfectly allowed by the -- by the -- by the Court order.

Your objection just makes no sense whatsoever. He's putting in a chart where he talks about 23 events, and it's -- and it's in Figure 3. Mr. -- Mr. Figel should be allowed to ask him about those 23 events.

MR. SYLVESTER: Mr. Flumenbaum, Mr. Figel, we had this conversation at a meet-and-confer. It may be that we differ as to what the meaning of the order is.

I read both defendants' brief seeking to strike Dr. [redacted] report and seeking, in the alternative, to question him on his additional analysis in this report. We are now beyond the additional analysis that he conducted in this report.

If you want to question him as to whether or not he took additional

[redacted]

methodological steps -- in fact, I think you already have and he's answered no. So I suggest we move on.

MR. FIGEL: Right. Well we reserve our rights to seek appropriate relief. I urge you to reconsider your direction, because I don't think it's appropriate.

He offered that explanation in this deposition today, and I'm asking a follow-up question about it. I think that's perfectly appropriate.

You want to direct him not to answer; there will be consequences or we we'll seek consequences.

You going to stand by the instruction?

MR. SYLVESTER: We disagree. We reserve our rights as well.

Please proceed.

MR. FIGEL: I just want the record to be clear. You're directing him not to answer the question after this colloquy?

MR. SYLVESTER: I am.

MR. FIGEL: All right. I think, based on that, we should take a break.

[redacted]

THE WITNESS: Okay.

THE VIDEOGRAPHER: This ends Unit 1.

We're off the record at 2:18.

(Recess from 2:18 to 2:37.)

THE VIDEOGRAPHER: This begins Unit 2.

We're on the record at 2:37.

Q. All right, Dr. [redacted] I believe we are on Figure 3 of your supplemental report.

Sorry.

Now, directing your attention to Model 1 of the supplemental report, you identify -- you found 23 statistically significant positive returns. Correct?

A. Well, as we discussed, I just want to distinguish event from return. 23 events associated with statistically significant positive returns and not negative returns.

Q. Fair enough.

And those 23 days are culled from the 514 event days that you considered in your opening report. Correct?

A. It is correct. Those 23 event days would be among -- well, I -- sorry.

514 events, I don't know how many

[redacted]

event days there are among those 514.

This -- this 23 is in terms of events, which I actually think might be event days, really should be event days.

So I -- so the events are part of the 514 events. If we're speaking in terms of days, I don't know how many unique days there were among the 514 events.

Q. Approximately 500 event days.

A. Approximately, but I don't know the exact number.

Q. And the methodology you used in your supplemental report reflects your judgment to exclude approximately 400 of those event days from your analysis. Correct?

MR. SYLVESTER: Objection.

A. I'm sorry, sir. Could you repeat the question?

Q. The methodology you used in your supplemental report reflects your judgment to exclude approximately 400 of those event days from your analysis.

Isn't that correct?

MR. SYLVESTER: Objection.

[redacted]

A. My supplemental report is meant to further quantify the economic impact of the events that I focused on in my opening report, which were some events and not others.

Q. And what was the methodology you used to exclude the approximately 400 event days from the 500 that you examined in connection with the opinions expressed in your supplemental report?

MR. SYLVESTER: Objection.

A. Well, as I think we discussed at length last time, the event study methodology is the study of certain events and not other events.

So selecting the events to study is an integral part of the event study methodology itself.

Q. And my question, what was the methodology you used to determine which events you would study and which events you would not that you relied on in connection with the opinions expressed in your supplemental report?

A. I used my understanding of economics generally to categorize the 514 events into, I believe, 14 categories and, again, used my

[redacted]

understanding of economics to determine which of those categories I thought would merit testing.

Some categories include events which, by their nature, do not appear to be breaking news. There is no theoretical reason why they should impact XRP prices.

Other categories seemed of economic interest to test to determine whether or not there was a link between Ripple Labs and XRP prices.

Q. So you -- you didn't rely on any academic research or publications to inform the judgment that you just described that led to excluding approximately 400 of the 500 events that you had collected.

Correct?

MR. SYLVESTER: Objection.

A. Well, I don't think that's a fair characterization. Again, the -- part of the event study methodology is the selection of events. And economists routinely use their understanding of economics to categorize events in ways that are meaningful to the analysis at hand. That's what I did.

[redacted]

Q. And my question is, you can't point to any external methodology, formula, guidance, that you used when you were exercising your unilateral judgment about which events to consider and which events to exclude. Correct?

MR. SYLVESTER: Objection.

A. Again, I don't think that that's a fair characterization. So for instance, the -- the principle that an article, which does not contain new information -- the principle that that would presumably not impact a market price, is, I would say, a well-established principle. That's not a principle I invented. It's a well-established principle.

So I -- I don't -- I don't know that that's a -- a fair characterization. Again, event study methodologies require -- well, let me back up.

In some cases, an event study might be conducted on -- on a particular event for some reason, but many other event study methodologies begin with categorizing sets of events to -- to study questions of interest.

Q. What I'm trying to understand is,

other than the operation, the subjective operation of your own mind, was there any framework you used, any formula, any guidance that you referred to or relied upon, in making these judgments?

Or is it just your subjective judgment about what you think is relevant and what's not?

MR. SYLVESTER: Objection.

A. We discussed this at great length last time.

I begin with a set of news articles which were culled by Ripple Labs in its curated news sources of different types, as we discussed in our prior deposition.

I then applied my understanding of economics to construct what I thought was a -- a helpful, meaningful, useful taxonomy by which to categorize those events, and, further, applied my understanding of economics to select some categories to test and not others.

Q. All right. And I just want the record to be clear. You have not identified a publication in an academic journal that you referred to or consulted or relied on in making

[redacted]

that judgment.

Is that correct?

MR. SYLVESTER: Objection.

A. Beyond my general academic training and 20 years of experience working with news and information and thinking about how news impacts prices, I -- I did not cite to an article that says, Here is how to categorize Ripple news.

Q. And focusing on the approximately 400 Ripple announcements that you excluded from your methodology, in connection with the work you did on your supplemental report, did you revisit any of those events to determine whether they were likely to be associated with a statistically significant positive price impact on XRP?

A. I'm sorry. Did I -- did I revisit any of those events -- I -- I apologize, sir. Could you repeat the question?

Q. In connection with the work you did on your supplemental report, did you go back and reexamine any of the 400, approximately 400 events, that you excluded from the methodology that you applied in your opening report?

MR. SYLVESTER: Objection.

[redacted]

A. Well, so -- again, as we discussed last time, I didn't exclude all 400. I tested some of them. For instance, the -- the office and staff announcements, and some of the other initiatives of Ripple Labs, so some of those 400 that you're referring to were indeed tested.

But in preparing my supplemental report, no, I did not revisit or reconsider any of the events outside of the category which, again, I believe I called select events -- I apologize if I'm not using the right phrase -- but that superset of five categories, that was studied in my opening report. I did not reconsider events outside of that set.

Q. All right. And with respect to the approximately 100 events, event days that you did consider in your supplemental report, you substituted, at least with respect to Model 1, 23 of your estimated returns for the actual returns.

Correct?

MR. SYLVESTER: Objection.

A. Almost correct. So for 23 events, following the methodology that I outline in my

supplemental report, 23 events are associated with a statistically significant positive abnormal return -- again, speaking about Model 1 -- and not associated with a statistically significant negative abnormal return.

In some cases, that is measured over one day, sometimes over two, sometimes over three. So for 23 events, I replaced the statistically significant cumulative abnormal return with the expected cumulative return.

So that might be somewhat more than 23 returns itself because, again, some will be two days and some might be three days. I don't know offhand the total count.

But with that larger, more-detailed explanation, the general thrust of your question was correct.

Q. So to summarize -- and I'm going to use 23, as modified by your last answer, because I accept that some may have been included or excluded based on two- and three-day window you used.

But using 23, which was the number

[redacted]

that's associated with the chart in Table 3, you replaced actual price returns, with your estimated price returns, for 23 of the 514 total events that you considered using your methodology.

Correct?

MR. SYLVESTER: Objection.

A. I followed the standard academic practice when -- in terms of dealing with abnormal returns to exclude the abnormal return associated with 23 events. Correct.

Q. Out of a universe of 514 that you had initially identified as potentially relevant Ripple announcements. Correct?

MR. SYLVESTER: Objection.

A. As we've established, 23 events would be found among the 514; that is true. What's being studied here is a set of roughly a hundred event days, 23 of which I replaced or removed the abnormal return.

Q. And that's over a period of approximately -- it's in your report, but approximately 2400 total days during the period of time that you studied, correct?

[redacted]

A. Approximately, yes.

Q. All right. And just so the record is clear, the date on which you substitute the actual -- the -- your estimated price return, your predicted price return for the actual price return is the date of Ripple's announcement. Correct?

MR. SYLVESTER: Objection.

A. So -- so there's an event date. We can look at the abnormal return over one day, two days, three days. We can establish whether any of those is statistically significantly positive with a -- with a check for whether some are statistically significant and negative.

And following standard academic practice, I removed the statistically significant abnormal returns.

I think that was your question.

Q. That wasn't my question, but I'll try and make sure the record is clear here.

My question is, assume Ripple has an announcement on, hypothetically, January 1, 2017. It's hypothetical. Right?

And you find a statistically

[redacted]

significant positive return on XRP on January 1, 2017, and January 2, 2017.

Right?

The -- the day you replace will be -- the first day you replace will be January 1 and January 2. Correct? You don't skip January 1 and go to January 2 when you substitute the predicted return for the actual return.

Correct?

A. I'm not sure I followed that.

So I'll describe what I did if that's all right.

So if -- if -- let's say that on December 31, the price was, let's just say a dollar. And during the day January 1, there's an event of interest that we're studying. And the closing price at the end of the day, January 1, is $1.25.

So the return on that day is approximately 25 percent.

If that is statistically significant, that abnormal -- and it -- if the abnormal return is statistically significant, I would then remove the abnormal return and -- which is

[redacted]

another way of saying, replace the actual 25 percent return with the expected return for that day, which would be model-specific.

So, for example, if the expected return were, let's say, 5 percent, then I would be removing a 25 percent return and replacing it with a 5 percent return so that with allowances for logs and things like that, in rough numbers, the price on December 31 is a dollar, and now the counterfactual price at the close of January 1 would be on the order of $1.05.

Q. I'm just focusing on January 1. The date you will replace on your hypothetical, in my hypothetical is January 1. Right?

A. I was trying to follow your hypothetical. Yes.

Q. And what is the cutoff time for January 1 versus January 2 in your methodology?

A. Prices are -- I use closing prices as measured by UTC time.

Q. What's UTC time?

A. I don't remember what that stands for, but I think it's essentially Greenwich Mean Time, Universal something, something.

[redacted]

Q. So if Ripple's announcement was 20 minutes before UTC cut-off time, you still would replace the actual return on XRP for the estimated return for that day. Correct?

A. Hypothetically, per standard practice, yes.

Q. Now, if any of the 23 events that you replaced in the methodology that we've been discussing were confounded because you failed to consider some omitted variable -- I think you earlier testified some x factor -- the results of your counterfactual price calculation in the supplemental report would be unreliable.

Correct?

MR. SYLVESTER: Objection.

A. Well, understand the basis of the supplemental analysis. It is really motivated by a statement Professor Fischel made in his rebuttal report where he said -- and I'm paraphrasing -- Even if the link established in my opening report were assumed to be correct, there's no economic significance at face value 23 events can't matter.

I'm paraphrasing.

[redacted]

So the supplemental report begins with the presumption, as that invites, to say, well, let's assume the analysis of my opening report is correct, which means that we can associate these abnormal returns with these events.

And on that basis, we can then proceed in the matter -- in the manner that I do, in the supplemental report.

So the -- the supplemental report does not provide additional evidence that the link was correct. The supplemental report begins with a presumption that the link is correct and proceeds to establish the economic significance of that link.

Q. And my question was, if you determined that the assumption of the link was incorrect because there was a confounding factor -- Elon Musk went a bought a billion dollars' worth of XRP that day -- and you, therefore, had a reason to know that the abnormal price return was not correlated with the Ripple event that you chose, the counterfactual price that you calculated in your supplemental report would be unreliable. Isn't that correct?

[redacted]

MR. SYLVESTER: Objection.

A. Well, I'm not going to accept your example as a -- as actually an example of confounding information.

Elon Musk may have bought whatever you said, a million, billion tokens of XRP because of the event. So that doesn't confound the event.

Q. Assume he didn't. Assume the event is confounded. Your assumption about linkage is incorrect. The methodology that you used to count -- to calculate the counterfactual price return would be unreliable. Correct?

A. The -- the methodology that I use to construct the counterfactual price assumes that the link is true.

If that assumption -- if -- if somebody were to read the opening report, for example, and say, Well, I'm not persuaded that there's a link, then that person would not be persuaded that these are the counterfactual prices. One does follow from the other.

Q. And I'm asking you if you today learned that the link, the assumption you're

making about the link for one of those 23 events was not a sound one and needed to be discarded, then the counterfactual price calculation in your supplemental report would be unreliable.

Isn't that correct?

MR. SYLVESTER: Objection.

A. I -- again, I can only repeat what I said. The counterfactual price, the methodology of -- of attributing the abnormal return to the event, which is the standard methodology in the literature, presupposes that the event drives the abnormal return.

That's -- that's the -- the starting assumption of the supplement analysis, as -- again, as suggested by Professor Fischel, to say even if the link is true, it doesn't matter. The purpose of the supplemental report is to say, well, if we assume the link is true, let's see whether or not it matters. And the results follow from that.

But the supplemental report assumes that the link is true.

Q. And if you could not assume that the link was true or you determined that that

[redacted]

assumption was incorrect, then the counterfactual price set forth in your supplemental report would be unreliable.

Isn't that correct?

MR. SYLVESTER: Objection.

A. If -- if -- if -- we wouldn't -- we would not necessarily be able to attribute the entire abnormal return to the event.

Q. So the answer to my question is yes, correct?

MR. SYLVESTER: Objection.

A. I don't know about -- you're using this word "unreliable." I agree that the methodology -- this aspect of the methodology in the supplemental report is assuming that we can associate the abnormal return to the event. If -- if we can't make that assumption, then we'd have to modify the methodology somehow in the supplemental report. I agree.

Q. And if you had to modify the methodology based on that inaccurate assumption, the opinion you reach in your supplemental report would no longer be a reliable opinion.

Correct?

[redacted]

A. I -- I can only say it again. The supplemental report presupposes this link. The opening report attempts to establish it. The supplemental report essentially is saying, all right, you know, it has been suggested that at face value, 23 events can't -- can't amount to anything. Let's go see whether or not that's true.

Could 23 events amount to something?

That's the purpose of the supplemental report.

Supplemental report does not by itself establish that -- any sort of link for those 23 events. The supplemental report assumes a link for those 23 events. As any analysis based on an assumption, if the underlying assumption is not valid, the subsequent analysis is then not valid. That's almost a tautology.

Q. And you made an assumption with respect to the methodology you used in reaching the opinion set forth in your supplemental report that it was not necessary for there to be a semi-strong efficient market for XRP during the period of time that you conducted your

[redacted]

study.

Correct?

A. Well, again, we've discussed this at great length as well. I would characterize the supplemental report as exploring a question Professor Fischel posed.

Professor Fischel asserted that even if the abnormal return on these 23 days could be entirely attributable to Ripple Labs, it doesn't matter economically. That was -- that was the assertion he made.

I am in this section of the supplemental report exploring that assertion, saying -- if -- if I could finish -- okay, those are the ground rules; let's posit that the abnormal return on these 23 days is indeed attributable to Ripple Labs. Is it true or is it false that that is then of no economic consequence?

Q. It's very interesting, Dr. [redacted] but I would like you to try and answer my question.

Let's break it down. You testified earlier, that it was not necessary for your methodology to be -- methodology to be reliable,

[redacted]

that XRP operated in a semi-strong efficient market.

Correct?

MR. SYLVESTER: Objection.

A. I testified -- testified when to that? In our previous deposition?

Q. And in your report you said that the evidence shows that the market for XRP is not semi-strong efficient.

Correct?

A. I did write that. The academic literature is consistent with that. My own studies are consistent with that, yes.

Q. And, nevertheless, you performed a methodology in which, notwithstanding your acknowledgment that the market for XRP was not semi-strong efficient, that you could calculate a counterfactual price of XRP.

Correct?

MR. SYLVESTER: Objection.

A. I -- I can only say what I said. The -- the supplemental report -- is -- is taking the formulation as suggested by Professor Fischel, which is if we can say that

[redacted]

the abnormal return is due to Ripple Labs, it then doesn't -- it doesn't matter. And the supplemental report that's part of the supplemental report is simply exploring that question. Is that true, or is that false?

Q. So is that the limit of the opinion you express in your supplemental report?

A. I'm sorry. Is what the limit of my opinion?

Q. That if you take 23 days and back out -- 23 days with statistically abnormal positive returns from the -- the price of XRP, that you get to two cents? You're just showing -- you're just disproving what you believe Professor Fischel testified? That's the sum total of the opinion that you express in your supplemental report?

MR. SYLVESTER: Objection.

A. I -- the opinions of my supplemental report are laid out. Again, there's -- there are essentially two threads of attempting to quantify the economic significance of the events that are discussed in my opening report.

Q. Are you or are you not offering the

[redacted]

opinion with respect to Model 1, that there were 23 events or announcements by Ripple that resulted in an increase or an inflation of the price of XRP well above 2 cents per unit?

MR. SYLVESTER: Objection.

A. I think so.

Q. And you say you think so.

A. I mean, I hadn't -- I hadn't put it in those words. But those words sound correct to me.

Q. Let me direct your attention to paragraph 9 of your supplemental report.

A. Yes.

Q. In Bullet Point 1, you state -- and I'm quoting: But for the news and public announcements related to Ripple to which XRP prices reacted in a statistically significant way, the U.S. dollar price for XRP token would rarely have exceeded 2 cents.

A. Yes.

Q. That is your opinion, correct?

A. Correct.

Q. That has nothing to do with anything that Professor Fischel testified to, does it?

[redacted]

MR. SYLVESTER: Objection.

Foundation.

A. That -- that is my opinion, based on an analysis, which again, was -- was motivated in response to something that Professor Fischel said.

The -- the analysis is -- is based on a -- on a presumption that we can associate the abnormal return with the event.

Q. Could you have reached --

A. I --

Q. Sorry.

A. Sorry, if I could finish.

If we can associate the abnormal return with the event, which I agree is a question -- somebody could ask, Can you or can't you? This analysis says, if we can, then certain things follow therefrom. That's what the supplemental -- that's what this part of the supplemental report is doing.

Q. Directing your attention to paragraph 9. If you were persuaded that XRP did not trade in a semi-strong efficient market, could you have offered the opinion that you

[redacted]

offer in paragraph 9?

And by the paragraph 9, I'm talking about bullet point 1, Thread 1 in your terminology.

A. Well --

MR. SYLVESTER: Objection.

A. I -- yes, because I am persuaded that XRP did not, at least at all points, trade in a semi-strong efficient market.

Q. And if you learned or if you were persuaded that you could not perform an event study in the absence of a semi-strong efficient market for XRP, could you have offered the opinion that you offer in paragraph 9?

MR. SYLVESTER: Objection.

A. It's -- I -- I'm -- I'm -- again, I -- in my opening report, I followed methodologies found in the peer-reviewed academic literature, which acknowledge that the XRP market specifically is not, at least at all points, semi-strong efficient and yet nevertheless apply event study techniques very similar to the ones that I do.

So if I were persuaded that that was

[redacted]

not valid, which would, of course, require those peer-reviewed academic articles, I suppose, to be withdrawn, with correction, if things were different, the world would be different.

But those -- you know, I'm following peer-reviewed academic literature in applying event study techniques to this market despite the apparent fact that it was not at least at all times semi-strong efficient.

Q. And my question -- I would like you to try to answer it, Dr. [redacted] -- is, if the academic literature turned from what you believe it says and said, You cannot do an event study for XRP in the absence of a semi-strong efficient market, could you offer the opinion that you offered in paragraph 9?

MR. SYLVESTER: Objection.

A. I'm just struggling. If the world were different, it would not be the same. That's true. If -- the -- the opinion in paragraph 9 of the supplemental report is essentially a mechanical exercise that says, if the abnormal return can be associated with the event, certain things follow. It's really -- as

[redacted]

I said, it's mechanical. It's arithmetic, it is what it is, 2 plus 2 equals 4.

Now, if -- if I were persuaded and convinced that in no circumstances could we attribute the abnormal return to the event, then I -- while the arithmetic would still be true, it would cease to be interesting.

Q. It would cease to be reliable, correct?

A. Well, reliable, reliable for what purpose? I agree it would cease to be economically interesting.

Q. Well, I don't want to -- I don't want to fence with you about words. The -- the question for you, as an expert in this case, is whether you are offering a reliable opinion. My question is, if a semi-strong efficient market for XRP was necessary for you to have conducted your event study, could you reliably offer the opinion that's set forth in paragraph 9?

MR. SYLVESTER: Objection. Asked and answered.

A. It has been asked. It has been answered.

[redacted]

I -- I don't -- if the world were that different from how it actually is, I -- I -- I don't know how I would respond. I...

It's -- it's an extreme hypothetical. I just -- I just don't -- I just don't know what -- I don't know what that world looks like, the world that you're describing.

Q. Can you answer this question, Dr. [redacted] If your event study that was set forth in your opening report was proved to be unreliable, could you offer the opinion in your supplemental report that's set forth in paragraph 9?

A. If I -- if I were -- if somebody could disprove or if I were convinced that my analysis in the opening report were invalid and unreliable, I would not offer the opinions that I'm offering in this supplemental report.

Q. You wouldn't offer it because it wouldn't be reliable. Correct?

MR. SYLVESTER: Objection. Asked and answered.

A. I wouldn't offer it because I don't find it -- I wouldn't find it economically

[redacted]

interesting. I'll let other people use words like "reliable."

But if -- if I were convinced that there was no link between Ripple Labs and XRP prices, then I would say, It is, therefore, uninteresting to do the sort of exercise that I've done in the supplemental report, and so I wouldn't do it.

Q. All right.

If on any given day that Ripple released an announcement, certain of your models of the 20 models that you have used identified a statistically significant price increase and others of the 20 models identified a significantly negative price increase, you couldn't reliably offer an opinion that on that day, Ripple's announcement caused a significant price impact, correct?

MR. SYLVESTER: Can I clarify? Are you asking about his 20 models or a hypothetical?

MR. FIGEL: 20 models.

MR. SYLVESTER: Okay.

Q. Do you understand my question,

[redacted]

Dr. [redacted]

A. Could you repeat the question.

Q. Yes.

The question is, you have 20 models. You have a event day with a Ripple announcement. Ten of the models says -- identifies a statistically significant price return on that day. The other ten identified a statistically significant negative price return on that day.

You with me?

A. I am.

Q. Based on the results of your regression analyses, could you conclude that there was -- that the Ripple announcement on that day caused a statistically significant positive return, abnormal positive return?

MR. SYLVESTER: Objection.

A. I would say that under -- that there was evidence that it did with some models, and some models there was evidence that it didn't.

It is -- it is not a requirement of the event study methodology that every possible model deliver exactly the same indication on an event.

[redacted]

So all I could say is that under these models, there's evidence that there was a statistically significant positive abnormal return on that day; and under some other models, there is not such evidence.

That's all I can say.

Q. And what would your opinion be as to whether the Ripple announcement on that day caused a statistically significant positive abnormal return?

MR. SYLVESTER: Objection.

A. I -- I haven't -- I -- hypothetically, if it were 10 and 10?

I don't know. Honestly, I think it -- I think I would just need more information. Which 10? What did the models look like? I probably want to understand why the models were giving such -- such opposite results on the same day.

I would probably want to -- I would probably want to investigate further before I could -- before I could answer that question.

Q. And why would you want to?

A. Because I would -- I would want to

[redacted]

understand what was happening that might lead to such an extreme outcome. I would -- I would just want to understand what it was. For example, I would just want to understand what it was.

Q. And did you analyze or compare for any specific day that Ripple released an announcement, which of your 20 models identified statistically positive abnormal price returns and which did not?

MR. SYLVESTER: Objection.

A. Those results are available. But, no, I did not -- I did not personally -- I did not do the exercise of saying, for this event, let me see what each the 20 models indicates. I did not do that exercise.

Q. And why not?

A. I -- I wasn't interested in the question -- I wasn't interested in that question. Positing 20 models, which I think are reasonable models and I'm conducting an analysis under each one. And I find, broadly speaking, that all of my results are robust and consistent across all 20 models.

[redacted]

Q. Right. In paragraph 28 of your opening report, you state that your report tested whether XRP returns are associated with news about Ripple.

Correct?

A. Sorry. Paragraph 28?

I must have misheard you. Paragraph 28? I don't see the quote at paragraph 28. I'm sorry if I misheard you.

Q. Let's go to -- apologies. I think I have a typo there. Let's go to paragraph 34.

A. Uh-huh.

Q. You wrote in paragraph 34: The econometric question of event study answers is whether the differences between actual and expected price movements are sufficiently large, that from a statistical standpoint. Such differences are unlikely to be explained by random chance.

A. I did write that, yes.

Q. And you still agree with that, correct?

A. I do.

Q. And you go on to explain that

[redacted]

sufficiently large differences between actual price movement and expected price movements are those which are statistically significant.

Correct?

A. I did write that.

Q. And those are still your views?

A. Yes.

Q. Now, when you say "associated" -- in other words, a Ripple announcement is associated with a statistically significant abnormal price return -- you're talking about this correlation.

Correct?

A. What correlation? I'm sorry.

MR. SYLVESTER: Objection.

Q. A sufficiently large difference between actual price movement and expected price movement.

MR. SYLVESTER: Objection.

A. So -- so I'm sorry. The question was?

Q. When you say "events are associated," what you mean by "association" is evidence of a statistically significant correlation.

Correct?

A. Not exactly. No.

[redacted]

Q. Well, what do you mean by when you use the word "associate" in the -- in connection with a Ripple announcement and a statistically significant price impact?

A. I mean that there is a statistically significant price impact and a Ripple announcement at the same time.

Q. And that association, that connection is established through statistical analysis.

Correct?

A. Well, not -- no. That -- that association is established by looking at the date. So when I say that an event is associated with a return, all I mean is the event came out on January 1, and there was a statistically significant return on January 1.

Therefore -- in that context, when I use the word "associated," I'm -- that's what I mean, that the event is associated.

Q. And how do you distinguish between events that occur -- announcement that occurs on the same day that you observe a statistically significant price return, to determine whether that's random or there's some form of

[redacted]

correlation?

A. Well, that is -- that question is, to a large extent, what my opening report deals with. It's precisely trying to determine whether we can -- whether we can say, Is that just a coincidence because coincidences happen? Or is it beyond coincidence?

So my opening report lays out the statistical principles that would allow us to test that question and explains the evidence that I have, which would allow me to reject that hypothesis that it's just a coincidence.

Q. And if you find that it's more than just a coincidence, you say the events are correlated, correct?

A. I -- I test the hypothesis that Ripple Labs is independent of XRP prices. I'm able to reject the hypothesis that they're independent.

THE COURT REPORTER: "Reject" or "recheck"?

THE WITNESS: Reject.

Q. Look at paragraph 30 of your opening report if you would.

[redacted]

And if you could just read the two -- the last two sentences of paragraph 30, the one that begins: I've been asked by the SEC's...

A. I've been asked by the SEC's litigation counsel to test whether news about Ripple Labs and its actions is associated with statistically significant XRP price changes. This association can be tested based on the idea of independence. That is, by evaluating the likelihood that news about Ripple Labs would occur at the same time as significant XRP price change -- as a significant XRP price change.

Q. How are you using the word "associated" in those two sentences?

A. Here I am asking whether there is a correlation or association or connection between news of Ripple Labs and XRP price changes.

DIR Q. And when you find -- and what is the methodology by which you determine whether there is a correlation or association between news of Ripple Labs and XRP price changes?

MR. SYLVESTER: Objection. We've now wandered well into his methodology in his opening report. You know, I -- I'm trying

[redacted]

to give some latitude to ask questions about the supplemental report, but you're asking him directly a question about what methodology he employed for purposes of reaching his opinion in his opening report. And that's just not within the Court's order. So I'm going to object to that question.

If you want to ask him a question about his methodology in the supplemental report, that --

MR. FIGEL: Are you directing him not answer the question?

MR. SYLVESTER: I am.

Q. Look at paragraph 9 of your supplemental report.

A. Uh-huh.

Q. Could you read the sentence under the first bullet point, beginning with Figure 1. Read that into the record, please.

A. Figure 1, below, presents the results for the constant mean return model, Model 1, described in the [redacted] report, when the statistically significant abnormal returns

[redacted]

associated with Ripple events are removed from the price history of XRP and a counterfactual price history is constructed; i.e., a price history of XRP but for the statistically significant price reactions to the Ripple events.

Q. How are you using the word "associated" in the sentence you just read?

A. I would say I'm using it in everyday speech to say the returns that are linked with -- the statistically significant abnormal returns linked with Ripple events.

Q. Well, we are talking about the statistically significant abnormal returns that you remove as part of your -- your counterfactual analysis.

Correct?

MR. SYLVESTER: Objection.

A. I believe that's correct. Yes.

Q. And those are the returns that you write in this sentence are associated with Ripple events.

Correct?

A. Yes.

[redacted]

Q. And the basis for removing those returns in your counterfactual analysis, it's because they are associated as that term is used in everyday speech.

That's the -- the association in terms of everyday speech is the reason that you exclude abnormal price returns.

Is that correct?

MR. SYLVESTER: Objection.

Q. Let me withdraw the question.

A. Yeah. I'm sorry. I don't understand.

Q. I've asked you -- I've asked you to define the word "association." You said you used that word in this paragraph as you would use it in everyday speech.

Can you -- can you explain what you mean by using the word "association" as you would in everyday speech?

A. I -- I -- I suppose I mean that there is some form of a connection between two things.

Q. What do you mean by "some form of connection" as you use the word "association" in this paragraph?

A. I mean that -- so, again, the

[redacted] supplemental report is presuming the link that the opening report establishes, which means that for the purposes of the supplemental report, we are assuming that XRP prices can react to news and actions by Ripple Labs. I understand you don't agree with that, but that's the presumption.

So now, what do we do?

Now we go event by event in the set of events that we're considering. And where a statistically significant abnormal return can be associated with or linked to or assigned to or ascribed to an event, we then remove that abnormal return, which is, again, the typical approach to -- to -- that is what you find in the literature, in event studies, when we are trying to quantify the impact of an event on a price. We do it in terms of the abnormal return.

Q. Dr. [redacted] I'm asking you to explain the connection between the Ripple announcements and the abnormal price returns that you remove as part of your counterfactual analysis.

Is it your testimony that the basis

[redacted]

for removing those abnormal price returns is because you believe the Ripple announcement caused the abnormal price return?

A. The -- again, the presumption of the supplemental report as suggested by Professor Fischel is to make precisely that assumption.

Q. And what do you mean by "precisely that assumption"?

A. The assertion was made by Professor Fischel that even if the abnormal return could be attributed to Ripple Labs at face value, 23 such abnormal returns in the history of 2400 days cannot amount to much of economic significance. I'm testing to see whether that's true or false.

So if we're going to make that assumption, which I -- I understand you don't want to make. I understand that. But if we want to make that assumption, certain things follow.

I don't know what those things are going to be until I do the work. But having done the work, I find what I find, which is, for instance, that the counterfactual XRP price

[redacted]

barely ever moves.

Q. And I'm asking you, for the purpose of the opinion you express in your supplemental report, whether you are making that assumption, you personally, Dr. [redacted]

A. The --

MR. SYLVESTER: Objection.

A. As I've testified several times, yes. That is the underlying assumption of the supplemental report. As I explained in the supplemental report, if -- if the abnormal return can be attributed to event, what does that mean?

This is what it means.

Q. Do you have an opinion as to whether the abnormal return can be attributable to the Ripple event on the 23 instances that you analyze in connection with your counterfactual report?

A. I am of the opinion that the XRP -- XRP prices do react to some news and actions from Ripple Labs. That's an opinion I laid out in my opening report.

And I am of the opinion that if the --

[redacted]

all of the abnormal return can be attributed to the event, that this is the subsequent counterfactual price history.

Q. All right.

In your prior deposition, you testified: Causation is not a question which is generally subject to proof as a matter of economics.

Do you still agree with that statement?

A. I do still agree with that statement, yes.

Q. And why is it that you agree with that?

A. Because certainly in the space of empirical economics or econometrics, which is the application of statistics to data, the sort of statistics that economists usually have access to are correlative in nature.

In other words, there's a -- and there are exceptions. There are exceptions in the sphere of behavioral economics or experimental economics, where a researcher might be able to conduct a study and manipulate it in such a way

[redacted]

that, arguably, causation could be proven through the study.

Most of the time -- well, I don't know most of the time. Let's say much of the time, economists don't have access to that kind of experimental data. They're picking up data on things that happened. Prices went up; prices went down. Output went up; output went down.

And they do statistical investigation into those data, and they establish that one thing is perhaps correlated with another.

As I testified at length last time, it is true that simply establishing that one thing is correlated with another, simply establishing that A is correlated with B by itself does not allow you to say, therefore, A caused B. There are other possible explanations which would result in a correlation between A and B.

So economists begin with statistics; but they then typically do other work, other analysis, to then draw a conclusion or an inference of likely causation.

Q. And in connection with the opinions that you offer in your supplemental report, did

[redacted]

you engage in any of the type of behavioral economics or experimental economics that would allow you to go past statistical correlation to causation?

MR. SYLVESTER: Objection.

A. I certainly didn't conduct any experiments related to my supplemental report. No.

MR. SYLVESTER: We have been going for about an hour now. Would it be a good time for a break?

MR. FIGEL: Can I just do one more question to close this out?

MR. SYLVESTER: Certainly.

Q. You just testified that you are of the opinion that XRP prices do react to some news and actions from Ripple Labs.

What do you mean by the term "react"?

A. I mean that, upon learning the news, at least some news from Ripple Labs, prices then respond.

Q. And what is the basis for the connection between learning news and price response?

[redacted]

That suggests causation, right? The news comes out, and there's a response based on the news.

A. Again --

MR. SYLVESTER: Objection.

A. -- as I explained and as I testified at our last deposition, I think that the -- the evidence, taken as a whole, supports an inference that the news causes the price.

Q. You say "supports an inference," correct?

A. I did say that.

Q. You're not -- you're not testifying that you have established causation. Correct?

A. I am testifying that I have assembled the type of economic evidence that is routinely used in assigning causation to events -- between events and prices. I've assembled precisely the same kind of evidence.

In my opinion, there is a connection between Ripple Labs and XRP prices, and the most likely explanation is that the news caused the price. Because other possible explanations seem unreasonable and unlikely.

[redacted]

Q. All right. See if you can answer this yes or no: Did you engage in any economic work to determine whether you could establish that Ripple news caused a change in the price of XRP?

MR. SYLVESTER: Objection. Argumentative.

A. I would point to my entire opening report as the work that I did to establish the linkage between the two and to explain why, in my opinion, the reasonable inference to draw from the available evidence is that the price caused the -- I'm sorry -- that the news caused the price. My entire opening report explores these questions.

Q. Are you testifying that the methodology that you used allows you to say anything more than that there is a reasonable inference that a Ripple news event impacted the price of XRP?

MR. SYLVESTER: Objection. Misstates his testimony.

A. My opinions are laid out in my opening report. I believe the evidence suggests that the price -- XRP prices are reacting to the

[redacted]

news. And I -- I -- we covered this at the previous deposition. I have an entire report on the subject.

I establish the correlation, but then I do a number of other investigations to rule out, to -- to rule out other logically possible explanations for the evidence that I have, such that what I am left with is the opinions that I have in this matter.

Q. How do you square that answer with your earlier testimony that causation is not a question which is generally subject to proof as a matter of economics?

MR. SYLVESTER: Objection.

A. As -- as we -- as I explained last time, proof in the sense of -- of positing a hypothesis that A caused B, and then accepting or rejecting the hypothesis, is not typically in the scope of what an empirical economist is able to do.

An empirical economist typically -- you can find exceptions -- typically, is positing hypotheses of the type, A is correlated with B, yes or no, true or false? That's the

[redacted]

statistical analysis.

The economic analysis is a combination of statistical analysis with other research and understanding and analysis, such that economists frequently will make a statement like, The earnings announcement caused a drop in the stock price. That's a routine statement that economists make.

Now, if you ask that -- an economist who made that statement, Did your statistical analysis allow you to say that? I think the economist would give you the same answer I did, which is, No. The statistical analysis allowed me to say there was -- there was a statistically significant price drop. My understanding of the facts and the circumstances of the case allow me to make a statement like, the earnings announcement caused the price to drop.

MR. FIGEL: Why don't we take a break.

THE VIDEOGRAPHER: This ends Unit 2. We are off the record at 3:43.

(Recess from 3:43 to 4:19.)

THE VIDEOGRAPHER: This begins Unit 3. We are on the record at 4:19.

[redacted]

Q. Dr. [redacted] you didn't rely on or consider any new academic studies of literature in your supplemental report other than what you identified in the opening report. Correct?

A. As I would interpret that, I would say yes. I cite to -- I cite to an -- to an article that I had cited to previously. I think I may have cited to a different location in that article, but not to -- not to a new article.

Q. And you knew you were under an obligation to identify and disclose any such authority, had you considered or relied on it, correct?

A. Well, I -- I understand I need to report documents relied upon. Yes.

Q. And considered.

A. I always thought it was relied upon. In this case I don't know that there's a difference, but I -- I always thought it was relied upon.

Q. And -- and just so we're clear, and what I'm particularly focused on is, you are not pointing to any additional academic literature, textbooks, studies, to support the opinions that

[redacted]

you are offering in your supplemental report beyond what was disclosed in the opening report, correct?

A. Again, I think that's correct, with the understanding that I think I might be citing to a different location in -- in an article that I had previously cited to.

But I -- I don't believe there are any new articles.

Q. And none of the academic studies or literature that you cited in your opening report or that you referred to in your supplemental report addresses calculating a counterfactual price for a digital asset by identifying statistically significant returns that coincide with events and replacing the actual returns.

Correct?

MR. SYLVESTER: Objection.

A. Well, they -- again, they -- they certainly do discuss the -- the concept of -- of attributing the abnormal return to the event in the context of an event study.

I don't know whether they say this also applies to digital tokens. I'm sure they

[redacted]

don't say it does not apply to digital tokens. My guess is they don't use the word "digital token."

But the general approach of attributing the abnormal return to an event in the context of an event study is -- is standard in the literature.

Q. And again, my question goes to the counterfactual price opinion you offered in your supplemental report.

Do any of the academic studies or any of the information that you cite, in any of your reports, discuss a methodology for determining the counterfactual price in the manner that you set forth in your supplemental report?

A. Well, I -- I would say yes.

Q. What -- what studies are those?

A. Well, the ones that I cite to in my supplemental report. I don't remember which footnote it is.

But the Campbell, Lowe and McKinley -- To appraise the event's impact, we acquire a remeasure of the abnormal return, and we interpret counterfactual... or sorry, the rest

[redacted]

of that is me.

I'm sorry, I will continue the footnote: We interpret the abnormal return over the event window as a measure of the impact of the event on the value of the firm or its equity.

So again, the basic methodology of saying the -- in the context of an event study, that the abnormal return is the measure of the impact of the event, I would say, is standard.

Once you understand that, the method of -- that I follow follows from that.

Q. Dr. [redacted] I'd like to show you what's been marked as Exhibit 14.

(Article entitled "The Econometrics of Financial Markets" was marked [redacted] Exhibit 14 for identification, as of this date.)

MR. SYLVESTER: Do you have a copy for me, please?

Thank you.

Q. Is this a copy of the article that you just referenced in your testimony?

MR. SYLVESTER: Take your time to review it.

[redacted]

A. Well, I -- I mean, it's -- it's the same authors and the same title. Whether it's the -- the same edition, I -- I -- I don't know if I know if it's the same edition or not. But it's the same authors, the same title. Is it the same edition?

Q. It's your footnote and --

A. Well, my footnote points to second edition, 1996. I see here copyright 1997. I'm just looking for where it may say second edition. I'm probably just not seeing it.

I don't know. I don't -- I don't see "second edition." If somebody else sees it and wants to point it to me.

Q. Why don't you take a look at the page citations that you have in your footnote --

A. Uh-huh.

Q. -- that you just identified as the source of the methodology for calculating the counterfactual return that you -- that you conducted in your supplemental report.

A. Uh-huh.

Q. And tell us whether, on page 151, you see anything that you believe supports your

[redacted]

testimony that this article discusses the -- the -- the counterfactual calculation that you performed in your supplemental report.

A. Well, Bullet 3, page 155 -- 151.

To appraise the event's impact, we require a measure of the abnormal return. The abnormal return is the actual ex-post return of the security over the event window minus the normal return of the firm over the event window.

It defines the normal return as the expected return. Defines the abnormal return. Discusses ways to model them, but essentially, in essence, this -- this is consistent with -- with what I'm saying, which is that in the event study literature, the impact of the event is measured by the abnormal return.

Q. And it's your testimony that this article establishes a methodological basis for the counterfactual return that is set forth in your supplemental report?

A. I believe it does, yes.

Q. All right. Other than this article, are you aware of any other publication, academic treatise, textbook, that supports the

[redacted]

counterfactual analysis, counterfactual price, methodology that you utilized in your supplemental report?

A. It is my general understanding and awareness that the abnormal return is the measure of the impact of an event. This is one citation that makes that point.

Sitting here today, I -- can I list other ones? No, I can't. But that is generally the received result that I'm aware of.

I think it's consistent, for instance, with court treatments of -- of abnormal returns, and damages in certain cases. So I -- I believe this is a very standard result.

Q. But none of the other authorities set forth in any of your reports specifically address this issue. Correct?

A. Well, I -- I don't know that that's true. I -- you're saying that none of the other authorities that I reference in my reports discuss how to measure the impact of an event. I'm not prepared to say that they don't discuss it.

Q. Well, you don't cite to any of them in

support of the methodology that you are utilizing in your supplemental report. Correct?

A. Correct. This is -- this is -- I would say this is a -- a settled, established, unremarkable result. I cite to one authority. I suppose I could have cited to a dozen, but I cited to one.

Q. And the authority that you did cite to sounds like it was published in 1996 or 1997. That doesn't endorse the methodology that you used in your supplemental report for calculating the counterfactual price of a digital asset.

Correct?

MR. SYLVESTER: Objection.

A. Well, I -- I would say that it does. It says that we measure the impact of an event, by its abnormal return. That is what I did.

Q. And show me where in Exhibit 14 there's any mention of utilizing that approach for a counterfactual price for a digital asset.

A. Well, again, I don't know that I -- based on the date of publication, I assume the words "digital asset" do not appear.

But the general principle that the

[redacted]

impact of an event is measured by the abnormal return is the principle that I'm using.

Q. And my question is -- so we agree that the -- the article that you cite doesn't endorse the use of this methodology for calculating a counterfactual return to digital assets.

My question is, are you aware of any other literature that has applied that methodology to the counterfactual price of a digital asset?

MR. SYLVESTER: Objection. Misstates his testimony. And compound.

A. Yeah, I mean, I'm -- I'm not going to agree with you that it doesn't support it.

Again, this -- this is -- in the event study literature, the impact of an event is measured by the abnormal return.

As I've said before today, I'm -- I'm really taking Professor Fischel's suggestion to say, Well, if we want to associate the abnormal return with the events, then it is of no economic consequence. And I'm exploring that question.

Associating the abnormal return with

[redacted]

the event is the standard methodology in the economics literature.

And I -- I'm following standard practice.

Q. You became a professional expert witness in approximately 2018? Correct?

A. I -- I began my career as an economic consultant in 2018, yes, that's correct.

Q. And since that time, have you ever conducted a counterfactual price analysis with respect to any asset, other than in this case?

A. I'm -- I'm -- I'm trying to remember some work that I did in -- in the Rio Tinto matter.

There was a -- there was a -- there was a price analysis in that matter that explored the question of how the price of certain bonds might have been different had circumstances been different. That's a form of a counterfactual price analysis.

There was a question of the valuation implication from an abnormal equity return on the valuation of a real asset. That's, again, essentially -- not essentially, that is saying

[redacted]

that the impact of the event is measured by the abnormal return.

Those two things come to mind. Those -- those two things come to mind.

Q. Well, one was the Rio Tinto case. What was the other matter in which you conducted --

A. Those were both -- those -- both of those examples that I mentioned were elements of the -- the Rio Tinto matter.

Q. In the Rio Tinto case, did you offer a counterfactual price analysis for an asset excluding certain events or excluding the price impact of certain events?

A. Again, in that matter, there was some discussion of -- of the quantification of a certain event. I don't -- I don't really want to go into -- because I'm just not sure that I can go into too many details. And that quantification was measured by the abnormal return.

That's -- the essential methodological approach that I'm using here.

Q. Did you --

[redacted]

A. Did I say, But for this announcement, the price would have been X?

I did not literally say that. But implicitly, in everything that we're doing, I'm saying, But for this announcement, the price would have been X because I'm saying that this -- the impact of this announcement is measured by the abnormal return.

Q. Did you express an opinion on the counterfactual price of an asset in the Rio Tinto case?

MR. SYLVESTER: Objection.

A. I would not describe my opinions in that case that way, no.

Q. So the answer to my question is no. Correct?

MR. SYLVESTER: Objection. Asked and answered.

Q. You did not offer an opinion about the counterfactual price of an asset in the Rio Tinto case.

Isn't that correct?

MR. SYLVESTER: Objection. Asked and answered.

[redacted]

A. Yeah. Again, I'm struggling just to say yes, because while I would not characterize my opinions in terms of counterfactual price, my opinions related to abnormal returns.

So by implication, if I were asked what do I think the price would have been but for this news event, I would give essentially the same type of answer that I'm giving in this case. That's -- that's the best way that I can answer your question.

Q. Now, you've not been engaged to provide an expert opinion by anyone other than the SEC. Correct?

A. No, that's not correct.

Q. Who else has engaged you to offer an expert opinion?

A. I was engaged by counsel for the debtors in an ongoing bankruptcy dispute.

Q. What bankruptcy dispute was that?

A. I suppose -- well, I suppose I can say. LATAM Air. I was engaged by Cleary Gottlieb, and I don't remember the rest of the names.

Q. Did you offer an opinion about a

[redacted]

counterfactual price of an asset, in the LATAM bankruptcy matter?

MR. SYLVESTER: You might just want to take a pause because, obviously, the SEC has nothing to do with this.

THE WITNESS: Yeah.

MR. SYLVESTER: I'll just ask you to consider your obligations in that case with respect to confidentiality or privilege.

Q. Let's start with yes or no. That doesn't seem to be...

They're public proceedings. You can answer --

A. I --

Q. If you can, answer yes or no whether you offered an opinion, an expert opinion about the counterfactual price of an asset in that proceeding.

MR. SYLVESTER: Have you offered a public opinion? Can we ask that foundational question?

MR. FIGEL: Let him answer this, and then we'll see where we go.

MR. SYLVESTER: Just trying to keep

[redacted]

him out of trouble.

THE WITNESS: Yeah, and I appreciate that.

A. The status of that -- of my involvement in that case is I've submitted an expert report and I've been deposed. I have not -- I simply don't know the extent to which any of that is public.

Q. Other than in this case, have you ever offered an expert opinion about the counterfactual price of an asset?

A. I've -- I've tried to answer your question. I -- I -- in -- in other cases, I have offered opinions about the impact of events. In all such cases, I've measured the impact of the event through the abnormal return.

Implicit in doing that is an understanding that -- what the counterfactual price would be. In those other cases, as I've said, I did not explicitly write down and say, By the way, the counterfactual price would have been X. That -- I didn't do that.

But if I were asked to do that, I would do it in exactly the same way. And it's,

[redacted]

again, implicit -- the fundamental question is, is the impact of the event measured by the abnormal return?

If you say yes, all of the rest of this follows.

If you say no, then you're at odds with the economic literature.

Q. Dr. [redacted] in this case you offered an opinion that but for the impact of certain Ripple announcements, the price of XRP would have been 2 cents -- would not have been greater than 2 cents.

Correct?

A. Would have rarely been greater than 2 cents.

Q. Have you ever offered an opinion in any other case in which you said, But for certain events, the price of an asset would not have been greater than X? Yes or no.

MR. SYLVESTER: Objection.

Argumentative.

A. To that specific question, I would say, no, I have never offered an opinion that would formally resemble what you described.

[redacted]

Q. Now, the opinions expressed in your supplemental report are based on what you believe are statistically significant correlations between Ripple news and positive XRP price returns. Correct?

A. I -- I think that's broadly correct, yes.

Q. And it's possible for Ripple news events to be correlated with statistically significant price decreases.

Correct?

A. Certainly logically possible, yes.

Q. And the actual price data that you relied on showed both positive and negative reported returns for XRP, correct?

A. That is certainly true.

Q. Sometimes the prices went up?

A. Sometimes they went down.

Q. And sometimes they went abnormally down, correct?

MR. SYLVESTER: Objection.

A. Yes, I do know that sometimes the decreases would be flagged as statistically significant.

[redacted]

Q. Just so the record is clear, the 20 models that you relied on for the opinions you've expressed in this case generated both predictions of statistically -- withdrawn.

The 20 models that you relied on in this case identified both statistically positive impact on XRP and statistically significantly negative price impact on XRP. Correct?

MR. SYLVESTER: Objection.

A. I -- well, no, I'm not prepared to say that. The 20 models identified statistically significantly positive abnormal returns and statistically significantly negative abnormal returns.

I tested, if you recall in the opening report, whether there was any correlation between the event days and the negative returns. And I found that there was no indication of correlation. In other words, the assumption of independence between the news and negative returns could not be rejected.

So I would say, based on the work in my opening report, I -- I have seen no evidence that the news is associated with, in a

[redacted]

statistically significant way, significant price decreases.

Q. And were you looking for evidence that a Ripple announcement was associated with a statistically significant price decrease?

A. I -- I explored the question, yes, because, as I explained in my opening report, while -- while a correlation between what appears to be good news and -- as I explained in my opening report, if the news is good, one would -- one might expect positive price increases. And one would not expect negative price increases.

Therefore, I thought as a -- as part of my analysis, it was worth checking: Well, is there any correlation between this news, which reads as generally good news, and negative increases?

And I found that there was not, which is -- that absence is part of my opinion that allows me to say that I think there's a -- there's a -- a relationship between the news and the price.

Q. Dr. [redacted] when you were replacing the

[redacted]

actual XRP price returns with your estimated price returns, you excluded -- or I use the word "disqualified" -- certain event days and price impact when you found a statistically significant negative return on either the first day, the second day, or the third day.

Correct?

MR. SYLVESTER: Objection.

A. That sounds correct. In other words, if -- if -- if we want to say that a Ripple event is going to be associated with a significantly positive abnormal return, we can -- we can simply ask that question.

I further asked the question: Well, I want to make sure that it's not associated with a significantly negative return.

So, yes, I -- I checked whether or not any of the returns was significantly negative as part of my procedure.

Q. And the way you checked was by referencing your 20 regression models, correct, to determine whether the estimated price, negative price in certain circumstances, was correlated with a statistically significant

[redacted]

negative XRP price. Correct?

MR. SYLVESTER: Objection.

A. I -- I really didn't understand that question. I'm sorry.

Q. Well, let me -- let me try it a different way. You said that you considered statistically significantly negative XRP price returns when you were replacing predicted returns with actual returns. Correct?

A. Correct.

Q. And how did you identify when there was a statistically significant negative XRP price return?

A. That is a part of the output of the regression analysis.

Q. When you say the regression analyses, you mean the 20 models that -- that are set forth in your opening report and that you relied on in your supplemental report, correct?

A. Correct.

Q. So those models allow you to identify statistically significant negative returns. Correct?

A. Those models identify statistically

[redacted]

significant abnormal returns, yes.

Both positive and negative.

Q. All right. But your counterfactual price methodology excluded statistically significant negative XRP price returns. Correct?

A. No.

Q. Well, if on Day 1 there -- you identified no significant return, Day 2 --

A. Uh-huh.

Q. -- you identified a statistically significant negative return, and Day 3 you identified a statistically significant positive return --

A. Correct, yes.

Q. -- and -- and the -- the aggregation or the net of those three observations was a statistically significant positive return --

A. Uh-huh.

Q. -- you would not include that in your counterfactual price analysis.

Correct?

A. Under -- under the circumstance if you lay it out, I would just adjust any of those

[redacted]

returns.

Q. And, in general, when you identified a statistically significant negative price return prior to a statistically significant positive price return, in the one-, two-, or three-day windows that you were looking at, you excluded that event from your counterfactual price analysis.

Correct?

MR. SYLVESTER: Objection.

A. I think that -- yes. I think that what you're saying is correct.

Q. And so at no point in your counterfactual calculation did you reduce any of the statistically significant positive price impacts you identified by any statistically significant negative price impacts that you identified, correct?

A. Sorry. At no -- I'm sorry, could I hear that again? I'm sorry.

Q. So at no point in your counterfactual calculation did you reduce any of the significantly -- significant positive XRP price impacts that you identified by any statistically

[redacted] significant negative XRP price impacts you identified.

A. Sorry.

I -- I -- I think that's true.

But -- but you're -- you're talking about reducing one thing by another. I didn't -- but I -- I think I understand what you're saying. And I think that what you're saying is correct.

But --

Q. Well, I want to make sure --

A. -- maybe not how I would have described it.

Q. I want to make sure the record is clear, Dr. [redacted]

As I understand the methodology for your counterfactual price analysis, you effectively replaced statistically significant positive price impact on XRP that occurred within a day, two, or three, of a Ripple announcement.

Correct?

A. If there were no significant negative returns in -- in that --

[redacted]

Q. And that -- that is exactly my point.

In other words, if you saw a statistically significant price impact on Day 3, and an either statistically significant negative or any negative price return on Day 2, you would not net them out such that the amount of the replacement would be reduced by whatever negative price returns you observed?

A. I wouldn't -- in that case I'm not making any adjustments to anything. So, therefore, no, I'm not netting one thing out from another.

I'm leaving -- in the case you describe, I'm leaving the data alone. So, just so we're clear, if -- if the price dropped but then increased a lot such that if we looked at the three-day cumulative return, we might say, Oh, well, it was significantly positive, I take the, what I would say is conservative approach to say, Well, I agree it's positive, but because of the drop, I'm not going to say that that three-day positive is due to the event.

Now, look, it might be. It might be.

But I'm not going to say that it is.

[redacted]

So I'm going to leave all of those prices alone. Meaning in my counterfactual price history, you will see the drop followed by the rise.

Q. I was with you until the last sentence.

In -- in what aspect of your counterfactual calculations will you see the impact of the drop followed by a rise?

A. Because I'm not making any adjustment. I'm leaving the drop and the rise in place.

I'm not adjusting them.

They were there before, they're there now.

Q. And is it only for drops that are not statistically negative?

MR. SYLVESTER: Objection.

A. No, it's -- it's if I see a statistically significantly negative drop somewhere in this history, somewhere in these three days, I -- I then am taking the position of -- sort of in an overabundance of caution, I'm saying, Well, I am, therefore, not going to say that -- even though I see a significant

[redacted]

increase measured over all three days, I'm not going to say that that has anything to do with the event.

Again, it might. It might. But I'm not willing to say that it does.

So, I leave those price -- I leave those returns, strictly speaking, I leave those returns alone. I don't change any of them.

So, just -- just to throw out numbers, as -- as an example, if -- the price starts at a dollar, it drops to 80 cents, and let's say that that's significant. But then it rebounds to a dollar fifty by Day 3. Okay? Hypothetical.

And somebody might look at that and say, Well, the three-day cumulative return going from a dollar to a dollar 50, is significantly positive. Okay, that might be true.

Somebody might say, Well, so then you could say that that increase from a dollar to a dollar 50 is due to the event.

I agree. Somebody might say that. And they might be right.

I'm not going to say that because when I look at that, I say, Yes, I agree with those

[redacted]

facts, but I see this drop, and I think, I think that arguably muddies the water, so I'm not going to say that the increase from a dollar to a dollar 50 was due to the event. I'm not going to adjust any of these prices. And I'm going to move on to the next event.

So then my counterfactual price history will still have the dollar, down to 80 cents, back up to a dollar 50.

Is that clear?

Q. I -- you've answered the question, and we'll -- we'll move on.

And just to make sure the record is clear, on a day in which you observe a statistically significant positive return, and the announcement that you correlate with that return occurs late in the 24-hour window that you consider that event day, you don't make any adjustment for the run-up in price prior to the announcement.

Correct?

MR. SYLVESTER: Objection.

A. Literally that's correct. I -- I was not using any intraday price data here, as we

[redacted]

discussed in the prior deposition.

In some cases, we are really having only, you know, a few hours of response, but I didn't -- I didn't factor that into -- into the analysis, no.

Q. Did you perform an analysis in which you replaced the -- the actual returns that occurred over a four-day cumulative period?

A. Over four days, that's the question?

Q. Yes.

A. I -- I don't believe so. I did -- I did three and I did one. I don't believe I ever did four.

Q. You didn't do seven?

A. Not -- I -- I don't think so. I don't remember doing seven.

Q. And why did you limit your analysis to just three days?

A. Well -- well, again, this was primarily a response to an assertion from Professor Fischel that even if we attribute these abnormal returns to Ripple Labs, it doesn't matter.

So the -- the genesis of this was to

[redacted]

say, Okay, let's associate the abnormal returns to Ripple's actions and see what happens.

So that was -- that was the -- the genesis. And since my opening report focused on three days, I -- I continue to focus on three days for the supplemental report.

I also did a one-day version of that, which I view as very conservative, to say even if we want to -- even if we're not comfortable saying that the impact could take as long as three days, even if we want to say no, no, no, the impact can -- can't possibly take more than a day, let's stop the clock there, I -- I show the results under that assumption as well.

But I start with three days because that was the basis of my opening report.

Q. And again, just so the record's clear, in your supplemental report -- and I believe it's using Model 1 -- you reduce approximately 23 days out of a total of, say, 2400 days, during the entire period. Correct?

A. Again, keeping in mind that some of those events might be associated with two days or three days, so it may be more than 23 days.

[redacted]

And I -- I don't know the number of days.

Q. But approximately 1 percent of the days.

A. On -- on the order of -- of -- is it 1 percent? Yes, on the order of 1 percent.

And just to -- so the math is a little easier, in the one-day analysis, of course, it's one to one between events and days. So in the one-day analysis where I think it's 14 events, it is, therefore, also 14 days. We know that answer.

With the three days, I just, sitting here today, I don't know exactly how many days were involved.

Q. All right. And you didn't replace any of the actual XRP returns that were statistically lower than the returns that your models estimated, correct?

A. Correct. Since I had not established any sort of link between events and negative returns, I, therefore, wouldn't say that the news caused a negative return; and so, therefore, I did not replace statistically significant negative abnormal returns. That's

[redacted]

correct.

Q. Just so the record is clear, though, the regression models that you utilized would have allowed you to both identify statistically significant negative returns and to replace those returns with estimated returns, correct, had you wanted to do so?

A. I agree that the information is available.

But I -- but there would be no economic foundation for doing it. But I agree with you that the information is available to do that exercise.

Q. And that would be true even if the statistically significant negative return coincided with a Ripple announcement. Correct?

MR. SYLVESTER: Objection.

A. Well, again, I tested in the opening report whether there was any evidence of a -- a correlation between the news and negative returns. And I was -- I never found any such evidence.

So I -- I don't think there's any evidence -- I haven't seen any evidence to

[redacted]

suggest that the news would cause a negative return, which is why I wouldn't make that -- the replacement that you suggest.

But the information to do that is certainly available.

Q. And mathematically, had you replaced the statistically significant negative returns that your model identified, it would have narrowed the gap between the observed XRP price and the counterfactual price that you calculated. Right?

A. Well, directionally, that's unambiguously true.

But I will say that in many cases, I don't -- I think there is frequently zero, sometimes one, maybe two significantly negative events. So I would be -- I haven't done it. Again, I don't think it's meaningful to do.

But I -- I don't know the practical implications of making those substitutions. But directionally, you're correct; it would narrow that difference.

Q. You said that you thought there were one, maybe two statistically negative price

[redacted]

returns. I'm asking you a question.

A. Yeah.

Q. Do you know, based on the output from your 20 regression models, how many trading days XRP's actual returns were worse or lower than the returns that your models estimated?

MR. SYLVESTER: Objection.

A. So -- so you're asking, do I know how many times the abnormal return was negative? Is that your question?

Meaning the actual return was less than the expected return?

Q. Correct.

A. The answer to your question is, no, I don't know.

I -- the answer to your question is, no, I don't know.

Q. All right. I take it from that answer -- but I want to make sure the record is clear -- that you don't know on how many days on which there was a Ripple announcement that the actual returns were statistically significantly lower than the returns your model estimated? I'm now focusing on statistically significant

[redacted]

negative abnormal returns.

MR. SYLVESTER: Objection.

A. So, sitting here today, I don't remember. I know that it's -- I can say that it's not very many, because it is certainly not more than would be expected by just random chance.

But I don't know how -- I don't know the number. I seem to recall that it's very small. But that's -- but to be clear for the record, that is me sitting here with sort of a recollection of looking at some numbers a few months ago, and I could be wrong.

But I -- but I -- but I can say, because I tested it and that test is reported in the opening report, that -- that it is not enough to infer any correlation between the news and negative returns.

Q. Did you go through the process of tabulating, counting, examining the number of instances in which one of your 20 regression models predicted a return in comparison to which the actual return was statistically significant and negative?

[redacted]

A. Well, I think this is a question you just asked a moment ago. Do I know how many times the actual return was less than the expected return. And the answer to that question is, no, I don't.

Q. My question was a different one.

I understand, as you sit here today, you don't remember that number.

My question was, did you go through the exercise of looking for that number and considering it?

MR. SYLVESTER: Objection.

A. Well, yes, in -- in a version of it -- so, yes, for the news days and the event days in question, I went through the exercise of -- of determining whether there was -- how many significantly negative returns were associated with the news days in question, because, again, I tested that question. And I report that test in my opening report.

So for the purposes of conducting that test, it's necessary to do the tabulation that you're describing.

Q. And my question, so the record is

clear, in connection with the counterfactual analysis that you set forth in your supplemental report, did you revisit that data to remind yourself or to consider on how many occasions there were statistically negative price impacts on XRP?

MR. SYLVESTER: Objection.

A. Well, for the purposes of the supplemental report, no, I did not revisit and remind myself of the number of days that we're -- that we're describing, no.

Q. Now, I'm just -- I'm going to ask you a methodological question. I want to know whether you went through the mental exercise or the econometric exercise of determining on how many days one day after a Ripple announcement the actual XRP returns were statistically lower than the returns your models estimated.

A. Significantly lower?

For the opening report or the supplemental report?

Q. Supplemental report.

A. No. Again, for the supplemental report, while my -- as part of the methodology,

[redacted]

I'm -- I'm -- the -- the computer code is necessarily checking the question you're asking, because that's part of the methodology.

I did not output that tabulation or review it. But the -- the computer code is checking what you're asking.

Q. Does it also check for the number of days in which there is a statistically significant negative XRP price return on the third day after the event?

A. It is checking, yes.

Q. So that information was available to you.

A. Yes.

Q. In connection with the preparation of your -- of the opinions expressed -- withdrawn.

In connection with the opinions that you're offering in your supplemental report, did you conduct any analysis or investigation as to whether any of the, say, 400-some events that you excluded from your methodology in the opening report were associated with a statistically significant negative return of XRP?

[redacted]

A. Well, I don't know that I want to accept your characterization of excluding them from the methodology.

The methodology was to categorize news and test certain categories versus others.

But setting that aside, for the purposes of my supplemental report, I did not investigate the frequency with which the excluded events were associated with significant negative returns. No, I did not.

Q. Dr. [redacted] I would like to show you now what has been marked as Exhibit 15.

(Table of abnormal negative return dates was marked [redacted] Exhibit 15 for identification, as of this date.)

Q. Do you recognize this table?

A. Not particularly. I don't know that I've seen this table before.

Q. I'll represent to you that this is what we believe is a document that sets forth, based on your own work papers and the results of your various regressions, each day in which your models identified a significantly negative abnormal return under the constant mean model,

[redacted]

which is your Model 1.

MR. SYLVESTER: Can I ask a clarifying question? Is this -- is this output from Dr. [redacted] work papers, or is it something that defendants created?

MR. FIGEL: We created it, based on the work papers. It's a culling of the information in the work papers.

Q. All right. Now, the column on the left indicates how many of those days there was a Ripple announcement -- I'm sorry -- how many of those days there was a -- give me one second.

A. Sure.

Q. So the column on the left is days in which there was statistically significant abnormal negative returns. And the second column, the zero or the 1, represents whether there was a Ripple announcement on that date.

A. May I ask, a Ripple announcement of what type?

Q. Of the type that you included in your methodology, one of the 100-some days.

A. So not just any Ripple announcement but -- but specifically one of those select

[redacted]

categories. Okay.

Q. Right.

So based on this, on how many days does your constant mean return model, which is Model 1, indicate that there was a statistically significant negative return for XRP on the same day that Ripple announced an event?

MR. SYLVESTER: I just want to be clear that you're asking him to -- to interpret a document that defendants created.

MR. FIGEL: Correct.

MR. SYLVESTER: That he's never seen before.

MR. FIGEL: Well, he's seen the data, but fair enough, he -- I don't believe he's seen this particular document.

A. Well, so the number -- the -- the information that's in this table, if I'm not missing something, would indicate four, one, two, three, four -- I count four days in this table where the news indicator is a 1.

Q. Correct.

A. Which would mean -- from what you have

told me, would mean that there are four days with a -- a -- a Ripple announcement of the type that we've generally been considering and a significant negative abnormal return.

Q. So let's go just down this document. I think the first one which indicates the association between a Ripple event and a negative return is on -- and this is the -- I guess the European formulation so January 16, 2018.

Are you with me?

A. I see that, yes.

Q. Right. And the -- the actual return was a negative 35 percent. The return predicted by your Model 1 was positive 1.46 percent, and so the abnormal return is the sum of those two, 36.79 percent?

A. The difference between the two, but yes.

Q. And this would be a price return that you would not include in your counterfactual price methodology, correct?

A. That's correct. Yes.

Q. And that would be true for each of the

[redacted]

four event days indicated on this document. Correct?

MR. SYLVESTER: Let me just place an objection on the record. I understand defendants' representation that this document was culled from Dr. [redacted] work product.

He hasn't seen it before. I think it's unfair to ask him to endorse data that was compiled by defendants that he's never seen.

So I just am going to object entirely to this line of questioning based on defendants' work product.

MR. FIGEL: I understand your objection, and I'm not asking him to adopt the accuracy. I'm representing to you this is our good-faith effort to replicate the information that's in his work papers.

And without asking him to obviously confirm that, I'm asking him to testify about whether he would or would not have included in his counterfactual analysis the statistically significant negative price

[redacted]

returns.

And I think the record's clear that he would not.

A. For -- for the reasons we've discussed.

Q. And I believe you said it's a truism, but just to make sure it's clear, that had you included these four statistically negative abnormal returns in your counterfactual price analysis, that would have increased your counterfactual price.

Correct?

MR. SYLVESTER: Same objection.

A. I mean, arithmetically, that's true. But again, as I explained, there would be no foundation, there would be no economic reason to do that.

I tested, explicitly tested the question of whether these news events were correlated with negative returns, and I -- I found no evidence that they were.

Therefore, I'm not saying, and I don't know that anybody is saying, that there is any reason to think that the news caused the events.

[redacted]

These events.

So I wouldn't -- I didn't do it and I wouldn't do it.

But arithmetically, yes. If we adjusted these four, the resulting counterfactual price would presumably be higher if we adjusted these four.

Q. And just to make sure the record's clear again, because you couldn't do it and wouldn't do it, you're not in a position today to offer testimony about what your counterfactual price would have been had you replaced these four statistically negative XRP price returns with the estimated price returns in your Model 1.

MR. SYLVESTER: Same objection. And vague.

A. I mean, I -- I -- I'm certainly not prepared to make any comment about what -- the results of the exercise you're describing to me.

MR. SYLVESTER: Reid, we're again at about an hour in. Is now a good time to take a break?

MR. FIGEL: Good.

[redacted]

MR. SYLVESTER: Great.

THE VIDEOGRAPHER: This ends Unit 3. We're off the record at 5:17.

(Recess from 5:17 to 5:43.)

THE VIDEOGRAPHER: This begins Unit 4. We're on the record at 5:43.

MR. FIGEL: Dr. [redacted] I would like to now show you what has been marked as Exhibit 16.

(Results of each of Dr. [redacted] 20 models with respect to predicted returns for May 16, 2017, was marked [redacted] Exhibit 16 for identification, as of this date.)

Q. Again, I'll represent to you this is our effort to put in a document the results of each of your 20 models with respect to predicted returns, for May 16, 2017, which is the date that you discuss in your supplemental report?

MR. SYLVESTER: So again for the record, Exhibit 16 is defendants' work product.

MR. FIGEL: Correct.

MR. SYLVESTER: Before we get started, I'll just make the same objection I made

[redacted]

before, which is he hasn't seen this document before, he has no way of knowing whether or not the numbers in these are a correct interpretation of his work product, and it's unfair to be asking him these kinds of questions about something that he hasn't seen.

MR. FIGEL: Right.

Q. Dr. [redacted] I'm not asking you to adopt or ratify the accuracy of the report. We'll represent this is our good-faith effort to reproduce, in this format, information that was produced as part of The Brattle Group's work papers.

And if you if go down the first vertical column, you'll see it's Models 1 through 20, which refers to the 20 models you used in the regression analysis that you've referred to in your reports.

And the second column gives the predicted returns using those models for the events of May 16, which is the date you refer to in paragraph 11 of your supplemental report, in which you talk about the announcement about the

[redacted]

escrow of the XRP tokens.

You with me?

A. Yes.

Q. And just take a look down here. You'll see that the models predict very different price returns. Correct?

MR. SYLVESTER: Same objection.

A. Well, you used the word "very." I agree they predict different price returns.

Q. Well, would you -- would you agree that the -- assuming this is accurate, and I -- you know, I believe it is -- that the predicted return of 1.79 from Model 1 is materially different than the 26.99 predicted return in Model 2?

MR. SYLVESTER: Same objection.

A. I -- I agree they're different, yes.

Q. And do you recall, in connection with the preparation of your reports and the opinions expressed in your report, focusing on the different predicted returns for May 16, that was generated by each of the 20 models?

MR. SYLVESTER: Objection.

A. I'm sorry, you're asking me in -- I'm

[redacted]

sorry, could you repeat the question?

Q. Yeah. Well, I'll try and dumb it down for you. I don't mean dumb it down, but I'll try and simplify it.

Do you recall being aware that the predicted returns for May 16, based on the 20 different models in your regression analyses, resulted in this range of predicted returns?

MR. SYLVESTER: Same objection.

A. No, I don't -- I don't recall having that awareness, no.

Q. All right. And assuming that this is correct, Models 2 and 4 show a statistically insignificant predicted return, correct?

MR. SYLVESTER: Same objection.

A. You asked did they show a statistically insignificant predicted return?

Q. Uh-huh.

A. With respect -- I don't think that's what you meant to ask. I think you meant to ask, Do they show a statistically and significant abnormal return.

Q. I thought that's what I was asking you, but I'll take your clarification.

[redacted]

The predicted returns on Model 1 and Model 3 --

A. Uh-huh.

Q. -- are relatively low single-digit percentages, correct?

MR. SYLVESTER: Objection.

Q. The return --

A. I would agree with that characterization, yes.

Q. The model returns on -- the predicted returns on Models 2 and 4 are in the range of 27 percent.

Correct?

MR. SYLVESTER: Same objection.

A. Yes, correct. Those are the numbers that are here.

Q. All right. And in addition, you'll see that some of the predicted returns on your models are negative numbers. Correct?

MR. SYLVESTER: Same objection.

A. I -- I see that in the sheet here, Exhibit 16, there are some negative numbers in the "Predicted Return Column," yes.

Q. Which of these 20 models generated the

[redacted]

correct predicted return for XRP on May 6 -- May 16, 2017?

MR. SYLVESTER: Objection.

A. Well, your -- the premise of your question is -- is faulty in that you're saying there is a correct expected return. Different models can generate different expected returns. I don't know that there's a basis to say that one is correct and another is incorrect.

They are different.

Q. So if I understand your answer, you can't say that any of the models generated what you believe to be the correct counterfactual return for XRP on May 16, 2017.

Correct?

A. I -- when I -- what I'm saying is that, presenting the question as though there is a correct number to be found is not the right way to frame the question. They produce different estimates.

That's all that I can say.

Q. And as you sit here today, assuming these are correct, which do you think is the best estimate?

[redacted]

MR. SYLVESTER: Same objection.

A. Sitting here today, I don't have -- I -- I don't have a view of which I think is the best estimate.

As I've testified, I think, today, and probably in the previous session, I think all 20 models are reasonable specifications. And my results, both in my opening report and supplemental report, are consistent across all 20 models.

I don't have a point of view that one model is better or more correct than another model. I haven't been asked to form that view, and I have not yet formed that view.

Q. So you have no opinion, for instance, whether the better prediction for the XRP price return on May 16, 2017, was the approximately 40 percent positive return that was generated by model 20, and not the negative 1.23 percent negative return generated by model 11.

MR. SYLVESTER: Same objection.

A. I have not formed a view. Clearly, you know, the pattern in these numbers is -- indicates that those models that control for the

[redacted]

account growth in XRP are generating a higher predicted return on this day than those models that do not control for account growth in XRP.

That's what this -- that's what this table seems to indicate.

Q. So you can't identify which of these models produces the most reasonable estimate of the counterfactual value of XRP on May 16, 2017. Correct?

MR. SYLVESTER: Objection.

A. I'm not -- I'm not in a position to say which of these models I think is better than any other model. Model 1 and Model 11 are models that are found in the peer-reviewed literature of event studies in XRP markets. I can say that.

The other models are, I think, reasonable models of XRP returns. And on this particular day in this particular case, they're generating different predictions of the expected return on that date.

Q. And if you go to the far-right column, you'll see the header, Does the counterfactual price analysis replace the actual return with

[redacted]

the predicted return?

And you'll see yeses and nos.

Again, I'm not asking you to confirm the accuracy of these. But fair to say that on a given day, any given day, with 20 different regression models, depending on the output of that model, under your methodology, your counterfactual methodology, there would be output that would cause you to replace the actual return with an estimated return, and there would be outputs for which you did not replace the actual return with estimated returns?

MR. SYLVESTER: Objection.

A. I -- I agree that on a particular day -- and this is, again, taking these numbers as -- as offered -- this would appear to be such a day where some models would suggest -- would indicate that the abnormal return was significant, and some models would suggest or indicate that it was not significant.

Therefore, per my procedure, I would replace the abnormal return on this day, using some models, and not others.

[redacted]

It remains true that no matter which model you want to pick or focus on, the counterfactual prices that result over the history of XRP are, I would say, fairly similar.

Q. Dr. [redacted] can you state with certainty that the Ripple announcement on May 16, 2017, did or did not result in a statistically significant price impact on XRP, based on these models?

MR. SYLVESTER: Same objection.

A. I have not formed an opinion on whether I think the announcement of May 16 caused a statistically significant price impact. That was outside the scope of what I was asked to do.

I was asked to establish the principle of whether there is any connection between Ripple Labs and XRP markets, not to establish or evaluate whether any particular announcement caused a price reaction.

It was outside the scope of my mandate to form the opinion you're suggesting. I have not formed it.

Q. So you're not offering an opinion that

[redacted]

the Ripple announcement on May 16, 2017, did or did not -- withdrawn.

You're not offering an opinion that the Ripple announcement on May 16, 2017, had a statistically significant positive price impact on XRP, correct?

A. I was asked to investigate whether there is evidence of a link between Ripple Labs and XRP markets. I found that there was.

Absent that foundational work, it wouldn't even make sense to ask the question that you're asking.

So the work that I did is a -- is a prerequisite to the question that you're asking. I was not asked the question that you're asking. I was not asked to form an opinion about whether I thought the announcement of May 16 caused a reaction. I don't have an opinion one way or the other whether the announcement of May 16 caused a price reaction. I wasn't asked to do that.

Q. And I don't want to -- we have limited time, and I don't want to belabor the point. But were I to show you a similar document that

[redacted]

showed the output from the regression analyses for any day on which there was a Ripple announcement, it -- as I understand your testimony, you will not be in a position to offer testimony whether on that day that Ripple announcement did or did not have a -- cause a statistically significant price return for XRP?

MR. SYLVESTER: Objection.

A. It -- it -- it was not in the scope of what I was asked to do to form any such opinions. I have not formed any such opinions.

Q. And that would be true for each of the 100 days that you have tested in your various regression analyses. Correct?

MR. SYLVESTER: Objection.

Q. Just -- I'm sorry. Let me make the record clear. The approximately 100 Ripple event days.

MR. SYLVESTER: Objection.

A. As I said, I was asked to investigate whether there is a link, so let's back up for a second.

Very often there are disputes about whether a particular corrective disclosure

[redacted]

caused the stock price of XYZ Enterprises to drop. People argue about that.

Part of that dispute is not the question of whether it's possible that a corrective disclosure might have caused the stock price to drop. Everybody agrees -- everybody agrees that it's possible.

The question is, did it?

And people go about answering that, and there are arguments. And some will say yes, and some will say no.

Here if I had asked the question, do I think the Ripple announcement caused a reaction in XRP markets, I haven't even established that it's possible that it might have. Right? That was in dispute. People would not have agreed with me that it was even possible that it might have, let alone whether it did. They wouldn't have agreed that it was even possible.

So my opening report is dedicated largely to that question of, is it even possible to think that the announcement caused the reaction? That's what I focused in on, on my opening report. And my supplemental report, as

[redacted] we explained this afternoon, says, okay, assuming it did, what does that mean for prices and what's the economic impact?

At no point was I asked to form an opinion of whether I thought a particular announcement caused a reaction.

So if you ask me about May 16, I'm not prepared to offer an opinion. And if you ask me about some other date, I'm not prepared to offer an opinion.

Q. Let me show you now what will be marked as Exhibit 17.

(Document describing all of the days in which Dr. [redacted] regression analysis identified a statistically significant abnormal price return in XRP was marked Exhibit 17 for identification, as of this date.)

Q. Again, just so the record is clear, so Mr. Sylvester can make his objection, this represents our work product, which was an effort to identify the days from your work papers on which there were abnormal positive -- statistically significant abnormal positive

[redacted]

returns in XRP on the -- on the various event days.

MR. SYLVESTER: I will continue to object to use of the defendants' work product that Dr. [redacted] has never seen nor had the opportunity to verify in this deposition. So when I say "same objection," that's the objection.

Q. So do you understand, in substance, what this document, we believe, purports to show? It is all of the days in which your various regression -- which your Model 1 regression analysis identified a statistically significant abnormal price return in XRP.

A. One-day price return.

Q. One-day price return, yes.

A. I understand what this is purporting to convey, yes.

Q. All right. And if you go down the second column, you'll see "news" and it's binary. It's 0 or 1. And if there's a 1, that means that is a day in which you had identified a Ripple event that was included in -- in your various reports.

[redacted]

MR. SYLVESTER: Same objection. He has no basis to know that one way or the other.

Q. And you can count them up, but I believe there's 14.

A. There should be 14.

Q. And there's approximately 101 total event days. That's consistent with the results that found and reported in your opening report and your supplemental report, correct?

MR. SYLVESTER: Same objection.

A. I remember the 14. I don't remember the 101, but that -- that doesn't -- I have no reason to think that that's not -- not the right number.

Q. It's approximately a hundred, right?

A. I --

MR. SYLVESTER: Objection.

A. I think so, but I don't remember, but again, I -- I think so.

Q. It's in -- it's in your report.

So let's go, if you would -- I just want to make clear, this is the document I'm going to spare you going through day by day.

[redacted]

But you would not be in a position, even based on Model 1, to say that the Ripple -- on days in which there's a 1, that the Ripple announcement caused a statistically significant price impact on that day.

Correct?

MR. SYLVESTER: Same objection.

A. Well, I would say that Model 1 indicates that it did. That's -- that's what I would say.

Q. But would you be able to offer the opinion, based on the results of Model 1, that the Ripple event on that date caused a statistically significant positive XRP price return?

MR. SYLVESTER: Same objection.

Q. This is a causation question. In other words, based on the output of Model 1, could you say that the -- that an XRP announcement caused statistically significant positive XRP price return?

MR. SYLVESTER: Objection.

A. Well, I'm trying to understand the question.

[redacted]

Model 1 -- using Model 1 and using Models 1 through 20, but also using Model 1, I tested various questions as outlined in my opening report.

And based on that, I concluded that there's a link between Ripple Labs and XRP prices, that XRP prices can react to news of Ripple Labs.

Model 1 is certainly consistent with that opinion.

So having -- having established that, if you then ask me, based on the results of Model 1, do I think that the news on some date caused a certain reaction, I would say -- so I can I would say, yes, based on the results of Model 1, that's what that would appear to indicate.

I -- and I haven't -- I haven't asked myself the question you're asking.

But the way you framed it, I think I would say, yes, based on the results of Model 1.

Q. And if I showed you the results of the other 19 models and we had the same type of differing outputs on price estimates and

[redacted]

abnormal price returns, would you continue to say that Model 1 reliably allows you to offer the opinion that a -- a particular Ripple announcement resulted in a statistically significant positive abnormal price return for XRP?

MR. SYLVESTER: Objection.

A. Well, that's a different question.

Q. It is a different question. I'd like to -- I'd like an answer to the different question, please.

A. Well -- but the premise of your different question is different from the previous question.

The previous question was, essentially, based on the results of Model 1, does it indicate one thing or another.

Now you're asking me, do I think that Model 1 is -- is -- so if -- if you showed me the results for different models, I would say based on the output of whatever model we're looking at, it says one thing or another.

Q. And based on that, on -- you could offer five or six different opinions, depending

[redacted]

on the model, as to whether a particular announcement by Ripple caused a statistically significant abnormal price return for XRP?

A. Well --

MR. SYLVESTER: Objection.

A. Again, I -- I have not been asked to form opinions of that type. I'm not -- I have not formed opinions of that type.

All I can say is based on the output of whatever model we're looking at, there's evidence that it did on this day or that day or the other day.

If you then want to say, Well, what is your opinion about what happened on that day, I haven't reached an opinion about what happened on that particular day. I --

Q. So let's --

A. -- I don't know.

Q. Let's look on --

MR. SYLVESTER: Let him finish.

MR. FIGEL: You good?

MR. SYLVESTER: Ask him.

A. I'm finished.

Q. Let's look at -- I think it's the

[redacted]

second page, and again, this is European Convention, so it's May 4, 2017?

A. I'm sorry, where are we looking?

Q. Well, look at the date in the first column, European Convention, May 4, 2017.

A. May 4, 2017. Okay.

Q. And you'll see an actual -- actual price return of 26.58 percent?

MR. SYLVESTER: Same objection.

A. I see that number in this table. Yes.

Q. And again, you see the binary zeros and ones. You'll see a zero on that line -- or on that row?

MR. SYLVESTER: Same objection.

A. I -- I see a zero on that row, yes.

Q. And that suggests that there was no Ripple news event on that day?

MR. SYLVESTER: Same objection.

A. It suggests that there was no Ripple news event in the categories that we're considering on that day.

Q. Right. Fair enough.

And so you're not offering any opinion as to whether Ripple or a Ripple announcement

[redacted]

caused the 26.58 percent price return on May 4, 2017.

Correct?

MR. SYLVESTER: Same objection.

A. I have not been asked, and I have not developed an opinion about what I think happened on May 4, 2017.

Q. And you undertook no investigation to determine what may have caused the 26.58 percent price increase in XRP on that date.

Correct?

MR. SYLVESTER: Same objection.

A. I did not concern myself with -- with what may or may not have happened on May 4, 2017.

Q. Okay. So let's go to the row for December 29, 2017.

A. December 29, 2017.

Okay.

Q. Again, you'll see no Ripple news event and a 43.53 percent price return.

Do you see that?

MR. SYLVESTER: Same objection.

A. I -- I see those numbers, yes.

[redacted]

Q. So again, because you didn't identify any Ripple news event on that day, you're not offering an opinion that Ripple caused the 45.53 percent price increase on that day?

Correct?

MR. SYLVESTER: Same objection.

A. Well, as I -- as I've testified, I'm not offering opinions about causation on any particular day.

I -- I would -- just so the record's clear, I would point out, that I don't know, for instance, if there was news on December 28, or December 27, which, when we think about the length of time that it might take for news to react -- so, so the answer to your question is it might -- I don't remember whether there's news on December 28 or December 27 which might be associated with this return. I don't remember.

There may be, there may not be.

Q. And it wasn't part of your methodology in either your opening report or your supplemental report to try and determine what factor or what causes may have led to the

[redacted]

43.53 percent price increase on December 29, 2017, correct?

MR. SYLVESTER: Same objection.

A. Well, I -- I -- I don't know that that's correct. In other words, I was asked to investigate whether there's a connection between Ripple Labs and XRP markets.

And so I was investigating that connection and whether those particular announcements are associated in a -- or if you want to say cause, XRP price increases, so I was investigating that.

I just don't remember -- I don't have the list of dates memorized -- whether there might have been news within three days of this particular return that you're talking about.

So I'm not going to say that I did not investigate this particular return. I might have investigated this particular return. I don't know.

Q. Well, on this chart, are all of the statistically significant --

A. One-day returns.

Q. -- one-day returns for XRP.

[redacted]

Correct?

A. Uh-huh.

MR. SYLVESTER: Same objection.

A. Well, that's what you say is here for Model 1. Yes.

Q. Right. Right.

Did you, as part of the work you did to reach the opinions in either your opening report or your supplemental report, engage in any effort to determine what caused the price returns on days for which there is not, on that date, a Ripple announcement?

A. Well, again, as I've explained, I was looking for a relationship between news and Ripple prices, and I considered event windows of three days. I also considered one, I also considered seven.

So I -- I simply can't say whether or not there was news within three days of this date or within seven days of this date, so I'm -- I -- I simply can't say whether I have any information about what I think might have caused this return on this particular date.

I don't remember the sequence of

dates, and I don't have them all memorized.

I -- I -- so I don't know.

Q. All right. I understand that you believe you undertook work to identify days on which a Ripple announcement was correlated with a statistically significant XRP price return.

Did you engage in any work to identify any other factors that could have been associated with a statistically significant positive XRP price return, in other words, any of the days on this sheet?

A. Did I do any work?

MR. SYLVESTER: Same objection.

A. Well, I -- you know, we testified -- I testified at length the first time about this notion of confounding news, and I took a number of steps to eliminate that as a possible explanation for the events that I was focusing on.

To the extent that there were -- I mean, I will say this. I have no doubt that there are other statistically significant abnormal returns which are not associated with Ripple news events in the set of events that I

[redacted]

studied. I have no doubt that such things exist. And, no, I -- it was not necessary for me; and so, therefore, no, I did not investigate what might possibly have happened on that day.

Maybe I -- so, no, I did not look to see what might have happened on such days. It wasn't -- it wasn't germane to my opinions. So no, I did not.

Q. And similar, for the counterfactual price analysis that you conducted in your supplemental report, you undertook no effort to identify how much of any price of XRP could be attributed to those other factors. Correct?

MR. SYLVESTER: Objection.

Q. In other words, you -- answer my question. Let's start there.

A. Well, again, as I've explained, the -- the presumption of my supplemental report, I take from Professor Fischel's argument, which is, even if we assume that the abnormal returns can be associated to the Ripple events in question, it is of no economic significance.

So, therefore, that is the basis on which the supplemental report proceeds. It --

[redacted]

it -- if you will, it picks up that challenge and says, Okay, let's make that assumption and let's see what happens, what follows from that assumption. That is the basis of that aspect of my supplemental report.

I did not -- the supplemental report does not contribute any new evidence to say that those abnormal returns should be associated with Ripple events. That is the analysis in -- in the opening report. The supplemental report takes the point of view of, let's assume that it does; what is the economic impact that follows from that assumption?

Q. I want to take you back to your answer to the previous question. You said, I have no doubt there are other statistically significant abnormal returns which are not associated with Ripple news events in the set of events that I studied. I have no doubt that such things exist.

What did you mean by that?

A. I --

MR. SYLVESTER: Objection.

A. I can repeat it. I have no doubt that

such things exist.

Q. And by "the things," you're talking about other factors that could have been correlated with a statistically significant positive price return for XRP. Correct?

MR. SYLVESTER: Objection.

A. No. No. No. I -- the things in that sentence were statistically significant at positive abnormal returns, not associated with news events that I'm studying.

I have no doubt that such things, such abnormal returns, exist.

Q. And as you sit here today, did you do any investigation as to whether those things, as you described it -- i.e., statistically significant positive XRP returns -- were correlated with any other event or factor?

MR. SYLVESTER: Objection.

A. I was only -- I only studied the events that I studied. I did not study events that I did not study.

So I -- my question was whether these events are associated with significant positive returns in a way beyond what random chance could

[redacted]

explain, and I found that they were. That was the basis of my opening study.

I did not ask the question, here is a significant abnormal return that does not appear associated with one of these events; what caused it? I did not concern myself with that question. It was not a relevant question, and I did not investigate that question.

Q. All right. Let's go to what you called Thread 2.

And let me direct your attention to paragraphs -- looks like it's 20 to 24 of your supplemental report. You with me?

A. Paragraph 20 and 24.

Yes.

Q. And if I can direct your attention now to paragraph 22.

Can you read the -- beginning with the second sentence of that paragraph to the end of the paragraph just before the header, Figure 6.

A. For example, an investor investing on event day -- i.e., purchasing at the closing price of the day before -- would earn an average 28-day return of 63.1 percent compared to an

[redacted]

average return of 21.3 percent earned when investing on any other days. Excluding those 28-day holding periods which include event days, the average return falls to just 7.5 percent.

Q. Now, you say in this paragraph, For investor investing on the event day.

And then you define that as purchasing at the closing price of the day before.

Can you explain how purchasing on the day before an event day can be described fairly as investing on the event day?

A. Well, that is typically what we mean when we talk about, again, the impact of news. That would be, how did the price change from where it was?

So that's the question that I'm asking. If we had purchased before the event and then sold after the event or 3 days after the event or 7 or 28, what return would you have earned on that investment?

Q. Well --

A. I'm not -- I'm not arguing that this is a strategy that they could have followed. They would have needed to know that the news was

[redacted]

coming out. That's a different question.

This is simply asking this question. If you invest -- if you invested around the news, what kind of return would you have earned?

Q. Well, wouldn't it have been more accurate to say, For an investor investing on the day before the event day?

A. Well, I -- again, I define the term. The -- the operative point is that when they purchase -- that they purchase XRP before the news comes out. So absent other information, I'm saying, suppose they purchased it at the same price that we observe at the close of the previous day.

I'm not saying that they purchased at the close of the previous day. I'm saying they purchased at the price equal to what we observe at the close of the previous day. They could have done it at 11:00 o'clock in the morning. I don't know when they did it. But this -- this experiment is saying, suppose you purchased at that price.

Q. And if you were seeking to calculate the return for a purchaser who purchased on the

[redacted]

event day, in other words, after the announcement of the event, you would have a different starting point for your analysis.

Correct?

A. Correct. You're asking a different question. Suppose somebody purchased after the announcement came out -- i.e., suppose they purchased at the price, at the closing price of the day of the announcement -- what would -- what return would that investor have earned? That is a different question. One could ask that question, and one could answer that question.

Q. But you didn't do that methodology, correct?

MR. SYLVESTER: Objection.

A. I did the methodology as I described here.

Q. And you said that there is no basis to assume that a purchaser would have purchased the day before an event, correct? That's an assumption.

A. Well, I --

MR. SYLVESTER: Objection.

[redacted]

Go ahead.

A. Again, I didn't -- I didn't speak to the time in which they made the investment. I spoke to the price at which they made the investment.

I'm simply saying, suppose they purchased XRP at the price equal to the closing price of the day before. Again, maybe they did that at 11:00 o'clock in the morning or 3:00 in the afternoon. I don't know. So I was focused on the price.

And then after that -- I'm sorry, sir. I forgot the rest of your question.

Q. I think you answered my question, but let's make sure the record is clear.

Fair to say that had you run your methodology based on the price observed in the market after the announcement, that the return would be lower?

A. It would be different. And I would not be -- I would expect it would be lower, because you're -- what you're describing as an experiment, where we say, suppose the investor lost out on the first part of the reaction to

[redacted]

the news, but managed to capture subsequent reaction to the news.

That's a question you could ask. My expectation is, by the way it's formulated, that such an investor would earn a lower return than an investor who captured the full impact of the news.

But I haven't done it, and so I don't know for sure.

But that would be -- that would be my prior expectation before I ran the number.

Q. And the model you ran or the methodology you used, you selected 1-, 3-, 7-, and 28-day holding periods, correct?

A. That's correct. Yes.

Q. And how did you pick those days or those numbers of days?

A. Well, three, again, is a horizon that's been of interest throughout my opening report and this report. One day was meant to show what happens literally in that first day following the -- you know, when the news comes out, which, as we discussed last time, could really just be a few hours.

[redacted]

Seven days, just holding it for a week. I just thought it was interesting to see.

And 28 days, just as a longer investment period. I -- I recall Dr. Ferrell focused on 28-day returns. So I simply wanted to show a longer horizon investment return.

Q. So you weren't relying on any academic literature, scholarship or publications for the -- the dates you chose. Correct?

MR. SYLVESTER: Objection.

A. I was reporting results for different horizons that I -- I thought might naturally be of interest.

Q. Essentially arbitrary dates, correct?

MR. SYLVESTER: Objection.

Argumentative.

A. Well, I -- I don't know that I agree they're fully arbitrary. Again, a one-day return seems like a natural question.

A three-day return, given our focus on three-day event windows, seemed like a natural question.

The 28-day return, again, Dr. Ferrell did his analysis in terms of 28-day returns.

[redacted]

I suppose you could say, did I need to include the seven days? I included it for the sake of interest. If people don't want to look at that column, I -- fine, they're free not to look at it.

Q. I meant you didn't do a similar calculation for a year holding period. Correct?

A. No, I didn't.

Q. You mentioned earlier that you were retained in the LATAM bankruptcy, provided expert testimony, correct?

A. Correct.

Q. Were you deposed in that litigation?

A. I was.

Q. And were -- was your testimony subject to a Daubert motion?

A. No.

Q. And when was that testimony?

A. The deposition was Thursday of last week.

Q. Thursday of last week?

A. Yes.

Q. And other than last week and the time we've spent together, have you been deposed in

[redacted]

any other matter? Other than Rio Tinto, which you testified to earlier.

A. No other depositions since we were depose-- since you deposed me in February.

MR. FIGEL: Could we go off the record for just a second. I want to see how much time we have.

THE WITNESS: Sure.

THE VIDEOGRAPHER: This ends Unit 4. We're off the record at 6:28.

(Discussion off the record.)

THE VIDEOGRAPHER: This begins Unit 5. We're on the record at 6:30.

Q. All right. Dr. [redacted] if you could look at paragraph 10 of your supplemental report.

I want to focus you on the last sentence, where you write, Doing so tells us what XRP prices would have been but for the news about Ripple on event days associated with significant abnormal returns.

And you cite to Mr. Fischel's rebuttal report on paragraph 18.

A. I see that, yes.

[redacted]

Q. Can you tell us what you meant by the methodology you believe that Mr. Fischel is endorsing?

A. Well, I --

MR. SYLVESTER: Objection.

A. As -- as I recall, and I'm paraphrasing, my recollection is that Professor Fischel suggests that even if we can associate the abnormal return on those days to Ripple's actions, essentially there's very -- at -- at face value, 23 or 24 days can't amount to much of any economic significance.

Again, I'm paraphrasing. But -- but I recall essentially reading that, or at least that's how I interpreted what I read.

And so that seemed to invite the analysis of -- of doing what I did, which is to say, Very well, let's associate the abnormal return with those events, and see -- see what the -- what the impact of that is.

Q. So the analysis that you contend Professor Fischel endorses is exactly what?

A. The -- to associate the abnormal return with the event. That's the essence of

[redacted]

it.

Q. All right. And then you go on to write, Without conducting any analysis of XRP prices, Professor Fischel questions the extent to which XRP holders profited from the event studied in the [redacted] report, even assuming the abnormal returns related to those events are the result of Ripple's efforts.

Let me just start with, what do you mean with the qualification, Even assuming the abnormal returns related to those events are the result of Ripple's efforts?

A. What did I mean by that?

So this is the central assumption that we've -- we've discussed at length today, which is to say, if we -- if we assume that the Ripple events caused the abnormal returns, what happens?

So that's -- that's the assumption that that's describing.

Q. Oh, I see. And so what you're writing is that you think Professor Fischel questions whether, quote, XRP holders profited from the events studied in the [redacted] report, even with the

[redacted]

assumption that they're the result of Ripple's efforts?

A. Again, I don't have it in front of me, but what I remember -- it's been a while -- is, essentially a formulation of that type. And again, I'm paraphrasing, I'm not quoting, that even if we assume that the abnormal returns are attributable to Ripple's actions, at face value, 24 events will -- cannot -- cannot amount to much of economic significance. Again, words to that effect.

Q. As I understand your testimony, that is the purpose of the supplemental report that you issued, is to show that mathematically, you do not believe that Professor Fischel is correct that 23 or 24 event days could cause the -- the price of XRP that was reported in the market.

Is that correct?

MR. SYLVESTER: Objection.

A. No, I don't -- I don't think that's a fair characterization. The -- the purpose of the supplemental report, as I -- as I think I explain, is to provide additional quantification of the economic impact of these events.

[redacted]

How are we going to do that?

Well, there are a couple of ways we could do that. One of the ways that I do that is motivated in -- in -- is motivated, at least in part, by a formulation that Professor Fischel laid out. So that's one way that I demonstrate it.

Another way that I demonstrate it has nothing to do with that, which is the -- the Thread 2, which -- which, in some sense, is a reaction to work that -- that Dr. Marais did.

But the purpose of the supplemental report, as it says, is to provide additional quantification of the economic impact of these events.

It's -- it's not to rebut anybody, just to provide additional quantification of that impact.

MR. FIGEL: All right. Thank you, Dr. [redacted] That concludes the deposition.

THE WITNESS: Thank you very much.

THE VIDEOGRAPHER: This concludes todays proceedings --

MR. FIGEL: Oh, wait, let's -- I'm

[redacted]

sorry. I should -- I'm not sure whether Mr. Flumenbaum or Mr. Lopez had questions.

MR. SYLVESTER: I don't think they have any time for any questions. We're at 4:00.

MR. FIGEL: Marty, did you have any follow-up questions, or Jorge?

MR. LOPEZ: None for me, thanks.

MR. FLUMENBAUM: I have no time, so I'll reserve all my rights.

MR. FIGEL: Okay.

THE VIDEOGRAPHER: This concludes today's proceedings. Total number of videos used is five. We're off the record at 6:36.

(Time noted: 6:36 p.m.)

[redacted] Ph.D.

Subscribed and sworn to before me this day of 2022.

C E R T I F I C A T E

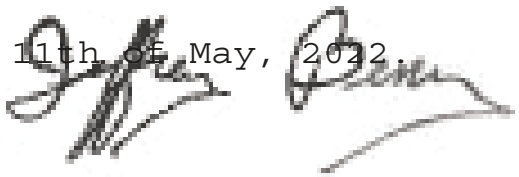
STATE OF NEW YORK)
) Ss.:
COUNTY OF NEW YORK)

I JEFFREY BENZ, a Certified Realtime Reporter, Registered Merit Reporter and Notary Public within and for the State of New York, do hereby certify:

That [redacted] Ph.D., the witness whose examination is hereinbefore set forth, was duly sworn by me and that this transcript of such examination is a true record of the testimony given by such witness.

I further certify that I am not related to any of the parties to this action by blood or marriage; and that I am in no way interested in the outcome of this matter.

IN WITNESS WHEREOF, I have hereunto set my hand this 11th of May, 2022.



JEFFREY BENZ, CRR, RMR

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ERRATA SHEET

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Deposition Date:

Deponent:

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Signature of Deponent

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(Notary Public) MY COMMISSION EXPIRES:_____

Exhibit E

UNITED STATES DISTRICT COURT
SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE COMMISSION, **Plaintiff** **v** RIPPLE LABS, INC., BRADLEY GARLINGHOUSE, AND CHRISTIAN A. LARSEN, **Defendants**	**20 Civ. 10832**

SUPPLEMENTENTAL EXPERT REPORT OF

[redacted] **Ph.D.**

[redacted]

FEBRUARY 28, 2022

CONTENTS

I. Background and Assignment

1. I have been retained by the Securities and Exchange Commission ("SEC") to provide expert opinions in the matter captioned above. I previously submitted an expert report on October 4, 2021 which was amended on October 6, 2021 ([redacted] Report") in which I performed an empirical analysis of XRP's price movements and assessed whether certain news and public statements of actions related to Ripple Labs, Inc. ("Ripple") impacted XRP prices. My qualifications, publications, and prior testimonies are described in the [redacted] Report.

2. Dr. Allen Ferrell submitted a report on October 4, 2021 ("Ferrell Report"). I was asked by the SEC to respond to certain opinions in that report, and I submitted a rebuttal report on November 12, 2021 ("[redacted] Rebuttal Report").

3. As rebuttals to the [redacted] Report, M. Laurentius Marais, Ph.D. and Daniel R. Fischel submitted separate expert reports on behalf of Ripple on November 12, 2021 (the "Marais Report" and "Fischel Report," respectively). However, neither Dr. Marais nor Prof. Fischel conducted any independent empirical analysis of XRP price data. None of the analyses or conclusions in the Marais Report or the Fischel Report have caused me to change any of the opinions I have offered in this matter.

4. Since submitting the [redacted] Rebuttal Report, I have been asked by the SEC to provide additional quantification of the economic significance of the impact that certain news related to Ripple had on XRP prices.

5. My opinions are based on my knowledge and expertise gained during my professional career, my academic training and research, and the data I have analyzed in this engagement. In forming my opinions in this matter, I have considered certain documents provided to me. Those documents and materials I relied upon for the [redacted] Report were identified in Appendix B to that report and any additional documents or materials relied upon the [redacted] Rebuttal Report were identified in Appendix A to that report. A list of additional documents I have relied upon in forming the opinions presented in this supplemental report is attached as Appendix A.

6. The opinions stated in this report are based on the evidence that has been provided to me to date. I reserve the right to modify or supplement my conclusions as additional information is made available to me, or as I perform further analysis. [redacted] $600 for my time in this matter. Staff at The Brattle Group have assisted me by performing work at my direction. My opinions are my own, and neither The Brattle Group's nor my compensation are dependent on my opinions or the outcome of this matter.

II. Summary of Opinions

7. The [redacted] Report demonstrates that XRP prices reacted to certain news and public statements related to Ripple.[1] In what follows I will quantify the economic significance of those XRP price reactions.

8. For the purposes of the analysis presented below, I begin with the 113 events on 105 unique days represented by the Select Categories analysis in the [redacted] Report.[2] To be conservative, I remove from that set 5 instances of Digital Asset Trading Platform Listings which I could not definitively attribute to the efforts of Ripple Labs based on the set of news I analyzed.[3] The final set of events I study below thus numbers 108 events on 100 unique days. I will refer to these as the "Ripple Events" and the "Event Days," respectively.

9. My findings are as follows:

   - **But-for the news and public statements related to Ripple to which XRP prices reacted in a statistically significant way, the USD price per XRP token would have rarely exceeded $0.02.** Figure 1 below presents the results for the Constant Mean Return Model (Model 1), described in the [redacted] Report,[4] when the statistically significant abnormal returns associated with Ripple Events are removed from the price history of XRP and a counterfactual price history is constructed (i.e., a price history of XRP "but-for" the statistically significant price reactions to the Ripple Events).

     As shown in the first column of Figure 1, from May 5, 2014 (the first news day I evaluate) through October 28, 2020 (the last news day I evaluate),[5] the average actual XRP price was $0.2136, while the 95th percentile actual price was $0.7003.[6] However, as shown in the second column of Figure 1, when the abnormal returns associated with the 23 statistically significant Ripple Events[7] are removed from this history of 2,369 days, the resulting counterfactual XRP price would be just $0.0044 on average and the 95th percentile counterfactual price would be just $0.0121. Put differently, but-for the news related to Ripple on just 23 days, the XRP price

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1 [redacted] Report, ¶ 12a.

2 The Select Categories combines events from the Milestone, Trading Platform Listings, Customer & Product, Acquisitions & Investments, and Ripple Commercial Initiatives categories. See [redacted] Report, ¶ 98.

3 [redacted] Report, Figure 16. Including these 5 additional listing events would make the results presented herein stronger.

4 [redacted] Report, ¶¶ 39 and 43.

5 See Brattle Workpapers.

6 This means that the actual price of XRP was less than $0.7003 for 95% of the time between May 5, 2014 and October 28, 2020, inclusive, and exceeded $0.7003 for only 5% of the time during this period.

7 Among the 100 Event Days, 23 are associated with significant positive XRP returns. See Brattle Workpapers.

would have rarely surpassed about a penny, and it would never have reached the actual high of $3.38.

FIGURE 1: ACTUAL VS. COUNTERFACTUAL XRP PRICE COMPARISON

	Actual XRP Prices	Counterfactual XRP Prices
Average Price	$0.2136	$0.0044
Standard Deviation	$0.3104	$0.0042
5th Percentile	$0.0048	$0.0003
10th Percentile	$0.0054	$0.0004
25th Percentile	$0.0068	$0.0007
Median	$0.1848	$0.0038
75th Percentile	$0.3018	$0.0067
90th Percentile	$0.4754	$0.0091
95th Percentile	$0.7003	$0.0121
Maximum	$3.3800	$0.0279

Note: Counterfactual prices calculated by removing abnormal returns related to 23 Ripple Event Days.

- **Purchasing XRP before the release of the news and public statements related to Ripple on the 100 Event Days would have resulted in greater investment returns than purchasing at other times.** As shown in Figure 7 below, buying XRP at the closing price the day before the 100 Event Days and then selling 28 days later would have generated an average return on investment of 63.1%, compared to just 7.5% if Event Days are not included.

III. But-For the Ripple Events, XRP Prices Would Have Rarely Exceeded $0.02

10. The [redacted] Report establishes that XRP prices react to certain news and public statements related to Ripple.[8] Put another way, we can interpret statistically significant abnormal returns following the Event Days as attributable to those public statements.[9] As such, the best estimate of the but-for,

[8] [redacted] Report, ¶ 12a.

[9] See, *also*, John Y. Campbell, Andrew W. Lo, and A. Craig MacKinlay, "The Econometrics of Financial Markets," 2nd Edition, 1996, p. 151 ("To appraise the event's impact we require a measure of the abnormal return.") and p. 157 ("We interpret

counterfactual XRP price is found by replacing the *actual* returns in those instances with the *expected* returns. Doing so tells us what XRP prices would have been but-for the news about Ripple on Event Days associated with significant abnormal returns.[10]

11. For example, on May 16, 2017, Ripple announced its intention to escrow 55 billion XRP tokens.[11] The XRP price closed that day at $0.3499, compared to the prior day's close of $0.2707, representing a one-day return of about 25.7%.[12] According to the Constant Mean Return Model (Model 1), the expected return for this day was just 1.8%.[13] This means the abnormal (or unexpected) return was 23.9% on May 16, 2017.[14] This abnormal return is statistically significant at the 5% level.[15] The counterfactual closing price for May 16, 2017 – that is, the XRP price but-for Ripple's announcement – would be just $0.2756 (the prior day's price plus the *expected* 1.8% return).[16] Subsequent XRP prices would therefore be lower, since all future returns would be applied beginning from this new price.

12. In order to construct a full counterfactual price series, I adopt the following methodology. Considering each of the 100 Event Days, if the one-day abnormal return is statistically significant at the 5% one-sided level and positive, I replace the actual return with the expected return.[17] If the two-day cumulative abnormal return is similarly positive and significant (and the one-day return is not significantly negative), I replace the actual return for those two days with their respective expected returns. Finally, if the three-day cumulative abnormal return is similarly positive and significant (and neither the one day nor the two-day is significantly negative), I replace the actual return for those three days with their expected returns.[18] If none of those (cumulative) abnormal returns is significant and positive, or if any is

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the abnormal return over the event window as a measure of the impact of the event on the value of the firm (or its equity).").

[10] This is precisely the analysis which Prof. Fischel endorses. Without conducting any analysis of XRP prices, Prof. Fischel questions the extent to which XRP holders profited from the events studied in the [redacted] Report, even assuming the abnormal returns related to those events are the results of Ripple's efforts. Fischel Report, ¶ 18.

[11] Brad Garlinghouse, "Ripple to Place 55 Billion XRP in Escrow to Ensure Certainty of Total XRP Supply," ripple.com insights, May 16, 2017, accessed 10/4/2021, https://ripple.com/insights/ripple-to-place-55-billion-xrp-in-escrow-to-ensure-certainty-into-total-xrp-supply/.

[12] The investment return is found as 0.2926 = 0.3499 / 0.2707 – 1. Following common practice, the modeled return in my analysis is found as 0.25664 = ln(0.3499) – ln(0.2707). See Brattle Workpapers.

[13] 0.01787 = 0.1422/0.01398 – 1. See Brattle Workpapers.

[14] This is found as 0.23876 = 0.25664 – 0.017874.

[15] See [redacted] Report, FN 1 and Section V.E and Brattle Workpapers.

[16] This is found as 0.2756 = exp(ln(0.2707) + 0.017874).

[17] For ease of exposition, I focus only on the parametric evaluation of statistical significance, as discussed in the [redacted] Report. See [redacted] Report, ¶ 62.

[18] [redacted] Report, ¶ 61.

significant and negative, I do not adjust the returns. I do this for each of the twenty regression models detailed in the [redacted] Report.[19]

13. Following this procedure, I adjust returns of about two dozen events (23 events) out of about 2,400 days. Prof. Fischel argues that "at face value" two dozen events cannot amount to much of economic significance.[20]

14. I also consider the implications of just examining the one day abnormal return and not giving any credit to significant abnormal returns for longer horizons. This leads me to adjust just 14 returns associated with 14 events.[21] This is a very conservative approach to the extent it takes the XRP price longer than a day to reflect new information.

15. Having removed the significant abnormal returns I then recalculate the XRP price history. The result for Model 1 is presented below in Figure 2. In this case, I adjust returns associated with just 23 of the 100 unique Event Days.[22] The results are striking, and demonstrate the economic significance of these 23 events. The counterfactual price almost cannot be seen on Figure 2 when compared to the actual price. This analysis shows that approximately two dozen events are, in fact, economically significant.

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[19] [redacted] Report, Figure 7.

[20] Fischel Report, ¶ 20 ("In other words, taken at face value, the findings of Dr. [redacted] event study methodology do not demonstrate that XRP holders profit solely or primarily from the efforts of Ripple.").

[21] See Brattle Workpapers.

[22] Recall that in some cases I may adjust just one day's return, sometimes two, and sometimes three depending on the indications of statistical significance of those (cumulative) abnormal returns.

FIGURE 2: ACTUAL VS. COUNTERFACTUAL XRP PRICES
2014 - 2020

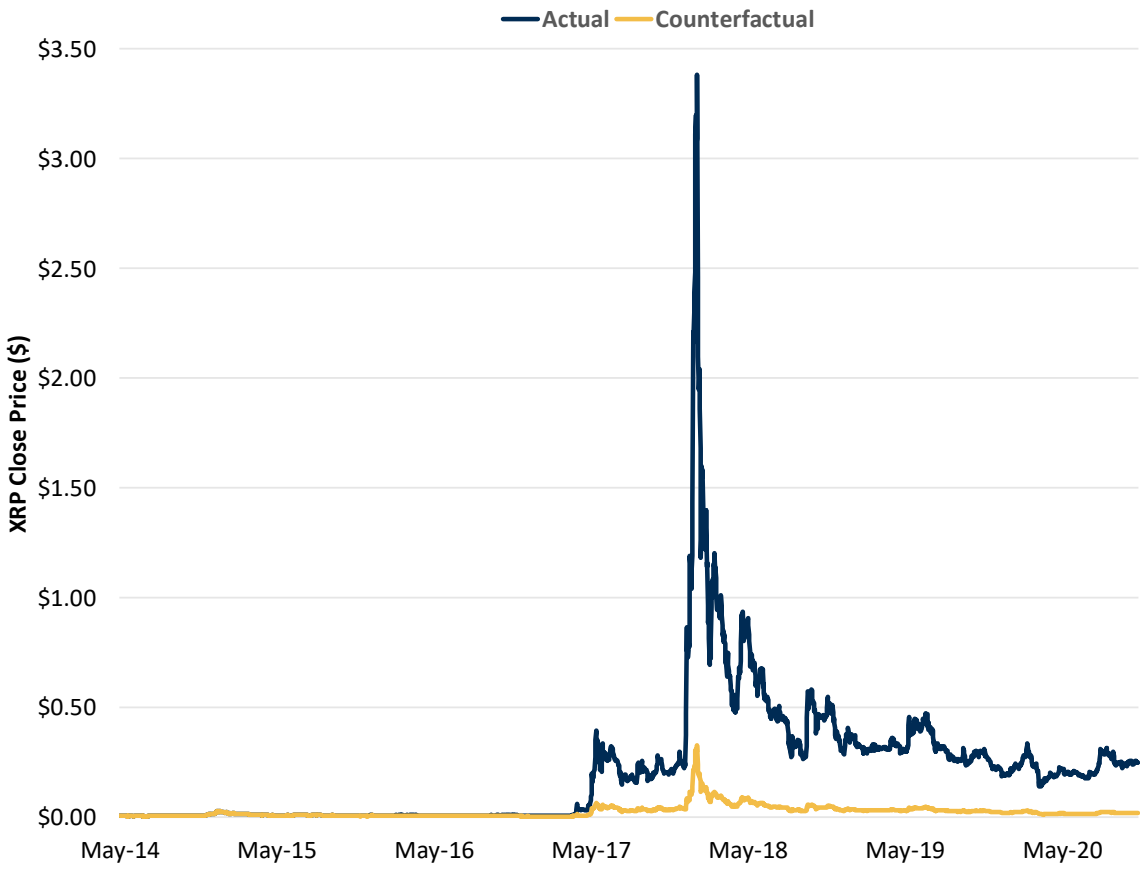
16. Figure 3 summarizes the results across all twenty models. The maximum 95th percentile counterfactual price is just $0.0242, meaning that XRP prices would have only rarely exceeded about two cents but-for the news or public statements related to Ripple Labs. Recall that the actual 95th percentile price over this period was $0.7003, almost 30 times greater.

FIGURE 3: COUNTERFACTUAL XRP PRICE SUMMARY

	No. of Significant Events	Average	Standard Deviation	Percentile Price							Maximum
				5th	10th	25th	Median	75th	90th	95th	
Actual Price	0	$0.2136	$0.3104	$0.0048	$0.0054	$0.0068	$0.1848	$0.3018	$0.4754	$0.7003	$3.3800
Counterfactuals											
Model 1	23	$0.0044	$0.0042	$0.0003	$0.0004	$0.0007	$0.0038	$0.0067	$0.0091	$0.0121	$0.0279
Model 2	22	$0.0059	$0.0060	$0.0006	$0.0008	$0.0017	$0.0044	$0.0078	$0.0134	$0.0161	$0.0598
Model 3	24	$0.0034	$0.0033	$0.0002	$0.0003	$0.0005	$0.0029	$0.0052	$0.0071	$0.0091	$0.0219
Model 4	20	$0.0058	$0.0054	$0.0007	$0.0010	$0.0017	$0.0044	$0.0077	$0.0130	$0.0159	$0.0478
Model 5	23	$0.0048	$0.0043	$0.0005	$0.0006	$0.0010	$0.0042	$0.0072	$0.0100	$0.0130	$0.0279
Model 6	20	$0.0067	$0.0065	$0.0013	$0.0016	$0.0025	$0.0048	$0.0083	$0.0143	$0.0170	$0.0704
Model 7	21	$0.0061	$0.0055	$0.0009	$0.0011	$0.0018	$0.0048	$0.0080	$0.0140	$0.0167	$0.0453
Model 8	19	$0.0080	$0.0082	$0.0017	$0.0021	$0.0032	$0.0051	$0.0087	$0.0184	$0.0229	$0.0880
Model 9	24	$0.0037	$0.0033	$0.0004	$0.0005	$0.0008	$0.0033	$0.0056	$0.0078	$0.0102	$0.0219
Model 10	21	$0.0060	$0.0055	$0.0011	$0.0013	$0.0021	$0.0046	$0.0079	$0.0129	$0.0158	$0.0534
Model 11	24	$0.0039	$0.0040	$0.0002	$0.0002	$0.0004	$0.0035	$0.0056	$0.0080	$0.0109	$0.0279
Model 12	23	$0.0053	$0.0056	$0.0005	$0.0007	$0.0014	$0.0044	$0.0074	$0.0110	$0.0143	$0.0576
Model 13	24	$0.0039	$0.0040	$0.0002	$0.0002	$0.0004	$0.0034	$0.0056	$0.0080	$0.0108	$0.0279
Model 14	22	$0.0049	$0.0045	$0.0005	$0.0006	$0.0012	$0.0042	$0.0072	$0.0104	$0.0134	$0.0332
Model 15	22	$0.0044	$0.0039	$0.0005	$0.0006	$0.0010	$0.0042	$0.0061	$0.0083	$0.0112	$0.0279
Model 16	21	$0.0077	$0.0092	$0.0019	$0.0023	$0.0033	$0.0052	$0.0085	$0.0142	$0.0207	$0.1156
Model 17	20	$0.0067	$0.0057	$0.0013	$0.0016	$0.0026	$0.0050	$0.0083	$0.0145	$0.0175	$0.0505
Model 18	20	$0.0091	$0.0106	$0.0024	$0.0028	$0.0041	$0.0054	$0.0100	$0.0189	$0.0242	$0.1290
Model 19	24	$0.0045	$0.0041	$0.0005	$0.0006	$0.0010	$0.0041	$0.0066	$0.0088	$0.0116	$0.0279
Model 20	24	$0.0049	$0.0044	$0.0007	$0.0009	$0.0014	$0.0041	$0.0069	$0.0102	$0.0133	$0.0332

17. If I limit my attention only to significant one-day abnormal returns (and thus ignore the extent to which prices might have adjusted after the closing of the Event Day) I continue to see the substantial impact that news or public statements about Ripple Labs has had on XRP prices. Figure 4, below, compares actual XRP prices with the counterfactual price according to Model 1. In this case, I am removing the abnormal returns of just 14 days out of 2,369. The counterfactual price is still substantially lower than actual XRP prices, never exceeding $0.3276.

FIGURE 4: ACTUAL VS. COUNTERFACTUAL XRP PRICES (ONE-DAY APPLICATION)



18. Figure 5 summarizes the results of this conservative, one-day application across all twenty models. The maximum 95th percentile counterfactual price is just $0.1271 (compared to the actual 95th percentile price of $0.7003), meaning that removing the abnormal returns in the hours following announcements on just 14 days, XRP prices would have only rarely exceeded about twelve cents.

FIGURE 5: COUNTERFACTUAL XRP PRICE SUMMARY (ONE-DAY APPLICATION)

	No. of Significant Events	Average	Standard Deviation	Percentile Price 5th	10th	25th	Median	75th	90th	95th	Maximum
Actual Price	0	$0.2136	$0.3104	$0.0048	$0.0054	$0.0068	$0.1848	$0.3018	$0.4754	$0.7003	$3.3800
Counterfactuals											
Model 1	14	$0.0244	$0.0289	$0.0038	$0.0044	$0.0056	$0.0165	$0.0321	$0.0477	$0.0679	$0.3276
Model 2	15	$0.0284	$0.0377	$0.0038	$0.0044	$0.0056	$0.0167	$0.0375	$0.0571	$0.0846	$0.4340
Model 3	15	$0.0234	$0.0273	$0.0037	$0.0045	$0.0059	$0.0161	$0.0306	$0.0453	$0.0642	$0.3101
Model 4	14	$0.0294	$0.0359	$0.0037	$0.0045	$0.0059	$0.0199	$0.0396	$0.0587	$0.0834	$0.4027
Model 5	13	$0.0293	$0.0357	$0.0040	$0.0047	$0.0061	$0.0218	$0.0383	$0.0577	$0.0839	$0.4047
Model 6	12	$0.0373	$0.0474	$0.0040	$0.0047	$0.0061	$0.0283	$0.0499	$0.0754	$0.1100	$0.5309
Model 7	13	$0.0339	$0.0422	$0.0041	$0.0047	$0.0061	$0.0256	$0.0450	$0.0677	$0.0984	$0.4748
Model 8	12	$0.0400	$0.0509	$0.0041	$0.0047	$0.0061	$0.0307	$0.0539	$0.0810	$0.1178	$0.5684
Model 9	14	$0.0272	$0.0326	$0.0038	$0.0046	$0.0059	$0.0202	$0.0356	$0.0531	$0.0765	$0.3694
Model 10	13	$0.0333	$0.0413	$0.0038	$0.0046	$0.0059	$0.0248	$0.0449	$0.0665	$0.0957	$0.4620
Model 11	14	$0.0236	$0.0278	$0.0037	$0.0044	$0.0056	$0.0161	$0.0309	$0.0459	$0.0654	$0.3156
Model 12	15	$0.0288	$0.0392	$0.0033	$0.0042	$0.0056	$0.0172	$0.0374	$0.0555	$0.0885	$0.4540
Model 13	15	$0.0228	$0.0265	$0.0036	$0.0044	$0.0058	$0.0158	$0.0296	$0.0439	$0.0624	$0.3013
Model 14	15	$0.0279	$0.0343	$0.0033	$0.0043	$0.0058	$0.0190	$0.0371	$0.0554	$0.0801	$0.3868
Model 15	13	$0.0285	$0.0347	$0.0040	$0.0047	$0.0061	$0.0212	$0.0372	$0.0561	$0.0816	$0.3937
Model 16	13	$0.0357	$0.0459	$0.0036	$0.0044	$0.0061	$0.0274	$0.0477	$0.0728	$0.1069	$0.5159
Model 17	13	$0.0343	$0.0432	$0.0041	$0.0047	$0.0061	$0.0249	$0.0458	$0.0692	$0.1006	$0.4856
Model 18	13	$0.0419	$0.0550	$0.0039	$0.0046	$0.0061	$0.0318	$0.0567	$0.0867	$0.1271	$0.6133
Model 19	15	$0.0262	$0.0312	$0.0038	$0.0045	$0.0058	$0.0189	$0.0343	$0.0509	$0.0734	$0.3542
Model 20	16	$0.0292	$0.0361	$0.0033	$0.0042	$0.0055	$0.0214	$0.0386	$0.0580	$0.0841	$0.4061

19. These results clearly demonstrate the substantial impact that even a few significant returns relating to news and public announcements about Ripple have had in the history of XRP prices.

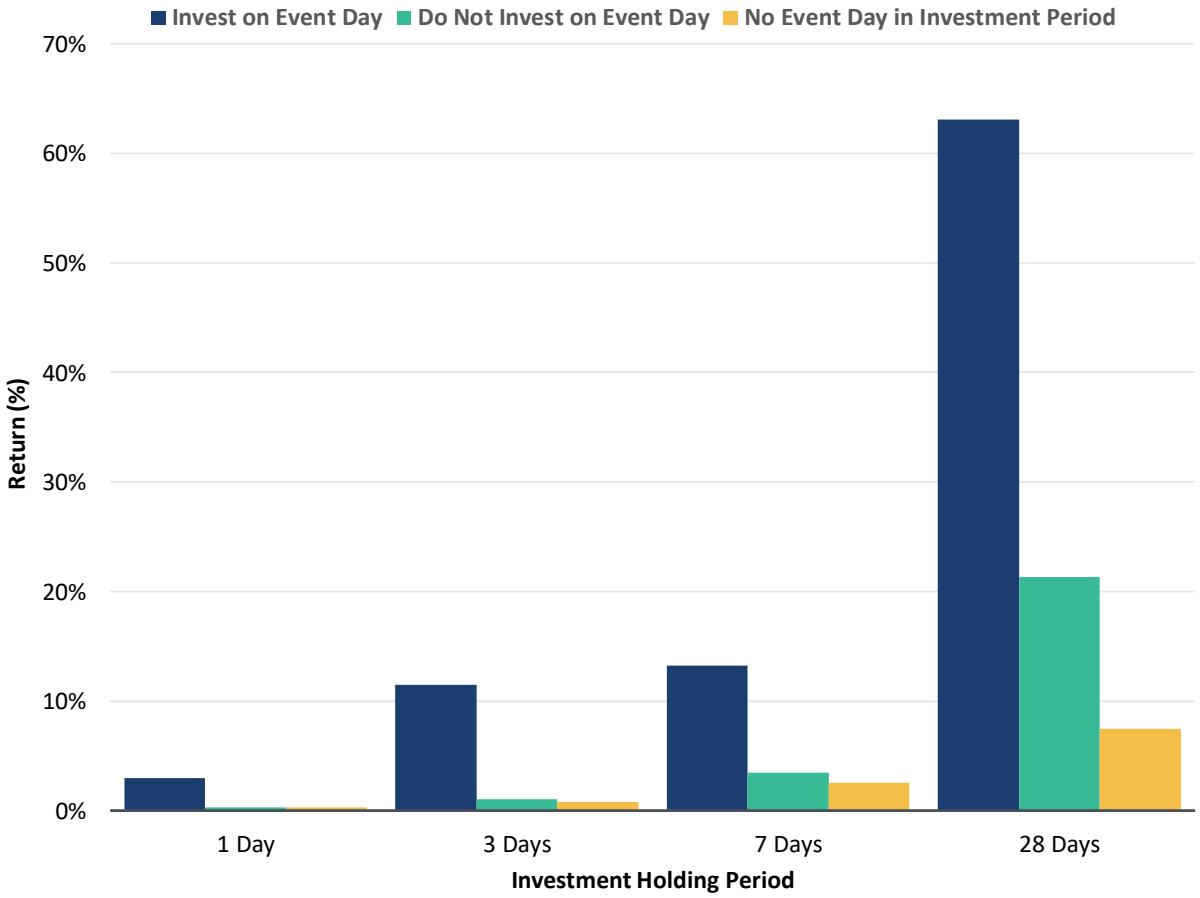
IV. Investment Returns around Ripple Events are Substantially Greater than Otherwise

20. To further address the economic significance of the Ripple Events on XRP prices, I answer the following questions: what would the average return be if an investor bought at closing prices before each of the 100 Event Days, and how would that compare to the average return if she did not?

21. To answer those questions we must specify the holding period of that investment. I consider periods of 1, 3, 7, and 28 days. When comparing the average return for the 100 Event Days to the average return for all other days, the latter may still reflect some benefit from Ripple Events as the holding period will sometimes include an Event Day. To truly isolate the influence of Ripple Events on investment returns, I also calculate the average return considering holding periods which do not contain any Event Days.

22. The results are presented below in Figure 6. For example, an investor investing on the Event Day (i.e., purchasing at the closing price of the day before) would earn an average 28-day return of 63.1% compared to an average return of 21.3% earned when investing on any other days. Excluding those 28 day holding periods which include Event Days, the average return falls to just 7.5%.

FIGURE 6: AVERAGE RETURN ON INVESTMENT COMPARISON



23. The data supporting Figure 6 are presented below in Figure 7.

FIGURE 7: AVERAGE RETURN ON INVESTMENT COMPARISON (DETAIL)

	Holding Period			
	1 Day	3 Days	7 Days	28 Days
Invest on Event Day	3.0%	11.5%	13.2%	63.1%
Do Not Invest on Event Day	0.3%	1.0%	3.5%	21.3%
No Event Day in Investment Period	0.3%	0.8%	2.6%	7.5%

24. An investor who timed investments in XRP around these Ripple Events would have earned substantially greater returns than an investor who did not. This, again, demonstrates the economic significance of the Ripple Events in the history of XRP prices.

Additional Documents Relied Upon

	Expert Reports	Date
[1]	Expert Report of Daniel R. Fischel.	November 12, 2021
[2]	Expert Report of M. Laurentius Marais, PhD.	November 12, 2021

Exhibit F

UNITED STATES DISTRICT COURT
FOR THE SOUTHERN DISTRICT OF NEW YORK

SECURITIES AND EXCHANGE COMMISSION,	)	
Plaintiff,	)	
v.	)	**CASE NO. 20 CIV. 10832**
RIPPLE LABS INC., BRADLEY GARLINGHOUSE, AND CHRISTIAN A. LARSEN,	)	
Defendants.	)	

Supplemental Report of M. Laurentius Marais, PhD
May 13, 2022

Designated Highly Confidential Pursuant to the Protective Order Filed March 9, 2021

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I. Assignment and Summary of Conclusions

1. I am the same Laurentius Marais who submitted a rebuttal expert report in this matter on November 12, 2021,[1] which listed my qualifications, billing rate, and materials I had reviewed. In my Rebuttal Report I responded to certain opinions offered by Plaintiff's expert, Dr. Albert [redacted].[2] In particular, I concluded that:

> "[I]t would be wrong to interpret Dr. [redacted] event study as establishing that XRP price movements are essentially a function of Ripple's actions. Instead, the [redacted] event study cannot prove a causal relationship between Ripple's actions and XRP price movements. And, even if it could do so, the [redacted] event study documents at best that any dependence of XRP price movements on Ripple-related news accounts for no more than a modest, far from preponderant portion of XRP's Unusual price movements since 2014."[3]

2. Dr. [redacted] has submitted a Supplemental Report dated February 28, 2022.[4] Counsel for the Defendants have asked me to review and respond, where appropriate to the [redacted] Supplemental Report.

3. Based on my review of the Metz Supplemental Report, I have formed the following opinions:

- Nothing in Dr. [redacted] Supplemental Report provides any reason for me to change any opinion in my Rebuttal Report. The opinions I stated in my Rebuttal Report remain unchanged.

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[1] Expert Report of M. Laurentius Marais, PhD, November 12, 2021 ("Marais Rebuttal Report").

[2] Amended Expert Report of [redacted] Ph.D., October 6, 2021 ("[redacted] Opening Report").

[3] Marais Rebuttal Report, ¶ 30.

[4] Supplemental Expert Report of [redacted], Ph.D., February 28, 2022 ("[redacted] Supplemental Report").

- In order to respond to his supplemental assignment from Plaintiff,[5] Dr. [redacted] departs from his own initial conceptual framework for statistical inference. Instead, he performs analyses and produces results that amount essentially to the tautology that Unusual trading days are indeed Unusual.[6]
- Dr. [redacted] event study methodology is not designed appropriately to provide a reliable basis for the novel calculations presented in his Supplemental Report; as a consequence, the results of these novel calculations are flawed and uninformative.

4. I explain the bases for these opinions below. Attachment A lists the materials I considered in reaching the opinions stated in this report.

II. Dr. [redacted] Supplemental Report Contains No Effective Response to My Rebuttal Report, and It Provides No New Insight into XRP Pricing in Relation to Ripple News Events

5. Concerning my Rebuttal Report, Dr. [redacted] states that I did not conduct "any independent empirical analysis of XRP price data."[7] In stating this claim, Dr. [redacted] simply ignored the bulk of my Rebuttal Report, which sets forth an extensive empirical analysis of the relative economic significance of Unusual trading days that *do* and do *not* coincide with the Ripple news events identified by Dr. [redacted]. Dr. [redacted] incorrect claim is particularly odd given the *evident* parallel between the novel stated assignment for his Supplemental Report and the empirical analysis in my Rebuttal Report. Specifically, Dr. [redacted] states that his assignment was "to provide additional quantification of the economic significance of the impact that

[5] [redacted] Supplemental Report, ¶ 4: "… I have been asked by the SEC to provide additional quantification of the economic significance of the impact that certain news related to Ripple had on XRP prices."

[6] "Unusual" trading days are defined in ¶ 13 of my Rebuttal Report.

[7] [redacted] Supplemental Report, ¶ 3.

certain news related to Ripple had on XRP prices."[8] In fact, I summarize my own extensive analysis of this "economic significance" in § IV of my Rebuttal Report under the heading "The Overwhelming Preponderance of the Cumulative [Financial or Economic] XRP [Investment] Returns Associated with the 'Unusual' Trading Days Dr. [redacted] Identifies Is Not Associated with the Ripple News Event Days He Identifies."[9] Dr. [redacted] simply disregarded my prior analysis.

6. Unlike Dr. [redacted] novel calculations, the analyses I presented in my Rebuttal Report evaluated the comprehensive economic significance of Unusual XRP returns *generally* in relation to Ripple news events. Out of the profusion of econometric models, estimation approaches, and sets of Ripple news days in the [redacted] Opening Report,[10] Dr. [redacted] chose to highlight in his Supplemental Report the exemplar case of a modified subset[11] of his "Select" news days, using his Constant Mean Return model (Model 1) to partition XRP returns into "expected" and "abnormal" components, and assessing statistical significance using his parametric approach at a 5% one-sided level.[12] In fact, in my Rebuttal Report, I presented the results of an analysis of the relative economic importance of Ripple news days on cumulative hypothetical XRP investment returns for precisely this exemplar case (excerpted from the first row and rightmost columns of Table 3 of my Rebuttal Report):

[8] [redacted] Supplemental Report, ¶ 4.

[9] Marais Rebuttal Report, p.13.

[10] In total, Dr. [redacted] analyzed 400 different "configurations" in his Opening Report. Marais Rebuttal Report, ¶ 23.

[11] Although one of the five "Select" news days Dr. [redacted] removed for his analyses in his Supplemental Report, one, December 21, 2017, is classified by Dr. [redacted] (model 1, one-sided parametric test) as Unusual, the overall results described in this report continue to hold.

[12] [redacted] Supplemental Report, ¶¶ 8-9, 12, and fn. 17.

[redacted] "Select" Categories (i.e., All News Dates)		
"Unusual" Trading Days ...		
Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days
$586.66	$2,939,472	$0.33

The corresponding section of Table 2 of my Rebuttal Report shows the numbers of trading days underlying the calculated results shown in Table 3 (and excerpted above):

[redacted] "Select" Categories (i.e., All News Dates) (Max N=105)		
"Unusual" Trading Days ...		
Coincident with Ripple News	*No* Coincident Ripple News	"Regular" Trading Days
24	211	81

7. The results for all other cases in Dr. [redacted] profusion of combinations of sets of Ripple news events, econometric specifications of event study models, and approaches to the assessment of statistical significance are shown in the remainder of Tables 2 and 3 as well as the tables shown in Appendices D and E to my Rebuttal Report. Based on this ensemble of results, I reached the opinion that "any dependence of XRP price movements on Ripple-related news accounts for no more

than a modest, far from preponderant portion of XRP's Unusual price movements since 2014."[13]

8. Rather than address my analyses and opinions head-on, or materially add to what my own prior analysis teaches about XRP returns and Ripple event days as identified by Dr. [redacted] the [redacted] Supplemental Report presents a suite of calculations that are either irrelevant or consistent with what can be learned from my own Rebuttal Report. I describe Dr. [redacted] new calculations in greater detail in the following section, but here I address the two high-level summary opinions that he bases on the empirical analyses described in his Supplemental Report: (i) but for Ripple news, XRP prices "would have rarely exceeded $0.02;" and (ii) XRP investment returns on Ripple news days are greater than those on other days.[14]

9. In his high-level opinion (i), Dr. [redacted] unaccountably focuses on a statistic with no obvious relevance to any question I understand to be at issue: the relative frequency of trading days with an XRP closing price above $0.02. He appears to think this question and its answer should be of interest to a reader of his Supplemental Report, but provides no further explanation of why, for example, he focuses on a threshold price level of $0.02 as opposed to, say, $0.002, or any other, equally unprincipled and arbitrary threshold. As I show below, when adjusted for abnormal returns on *non*-Ripple news days in the manner of Dr. [redacted] Supplemental Report, the price of XRP would never have exceeded $0.007 (the comparable upper bound for Dr. [redacted] analysis of prices is, in fact, $0.328).[15] While none of these specific absolute price levels or relative frequencies has any particular relevance to any question I understand to be at issue, all are consistent with my opinion from my Rebuttal Report that investment returns around Unusual trading days *without* [redacted]-identified Ripple news overwhelmingly outweigh

[13] Marais Rebuttal Report, ¶ 30.

[14] [redacted] Supplemental Report, ¶ 10.

[15] [redacted] Supplemental Report, Figure 5 (top row, maximum value).

investment returns around Unusual trading days *with* [redacted] identified Ripple news events. This can be seen by comparing the $586.66 and $2,939,472 figures from the Table 3 excerpt above (supra ¶ 6) under the subtitles "Coincident with Ripple News" and "*No* Coincident Ripple News," respectively.[16]

10. In his high-level opinion (ii), Dr. [redacted] focuses on investment returns from a hypothetical investment strategy based on purchasing and holding XRP during the [redacted]-identified Select Ripple news days. Understanding that Dr. [redacted] Opening Report documents a degree of association of Ripple news with Unusual trading days, and comparing the $586.66 and $0.33 figures from the Table 3 excerpt above (supra ¶ 6) under the subtitles "Coincident with Ripple News" and "'Regular' Trading Days," respectively, suggest that this hypothetical strategy should yield (somewhat) superior investment returns. This suggestion is what Dr. [redacted] confirms and states as his high-level opinion (ii). [redacted] high-level opinion (ii) does not address the vastly greater hypothetical investment return reflected in the $2,939,472 figure from the same Table 3 excerpt above under the subtitle "*No* Coincident Ripple News."

III. In His Supplemental Report, Dr. [redacted] Departs from his Original Statistical Methods and "Proves" a Tautology: that Unusual Returns are Indeed Unusual.

11. In his Opening Report, Dr. [redacted] attempted to "correlate" the incidence of "Unusual" trading days (days with high positive abnormal XRP returns) with the "Ripple news" trading days he identified.[17] He concludes that his analyses show that Unusual trading days coincide with Ripple news days more often than could be explained by random chance alone. Moreover, Dr. [redacted] attached causal

[16] My Rebuttal Report provides a detailed explanation and discussion of analogs of these figures for [redacted] Model 5. *See* Marais Rebuttal Report, § II.B.

[17] Dr. [redacted] calls these "Unusual" days "statistically significant." However, as I explained in my Rebuttal Report, it is not appropriate to refer to Dr. [redacted] Unusual returns as "statistically significant" because statistical significance has a very precise meaning in statistical science. Dr. [redacted] approach does not match that meaning precisely. *See* Marais Rebuttal Report, fn. 13.

interpretation to his "correlation" results by concluding that he can interpret "[Unusual] abnormal returns following the [news] Days as attributable to those public statements."[18] I explained in my Rebuttal Report why Dr. [redacted] results are flawed, and why he cannot interpret his results as indicating that Ripple news caused high abnormal XRP returns.[19] Dr. [redacted] did not respond to these criticisms.

12. Instead, in his Supplemental Report Dr. [redacted] departs from his flawed "correlation" framework and presents calculations that amount to showing that Unusual days are Unusual – a tautology. In essence, his calculations quantify the size of the abnormal returns on Unusual days without linking them to Ripple's actions. Although he focuses on Unusual days that coincide with Ripple news, analogous calculations may be performed based on days not coincident with Ripple news or selected in any number of ad hoc ways from the pool of Unusual days. The common denominator for any and all such exercises is that abnormal returns are analyzed only on Unusual days. That this produces unusual cumulative returns is not surprising, since the Unusual days were selected precisely because, within the context of Dr. [redacted] models, they appear to show unusually high returns.

13. More specifically, Dr. [redacted] removes the "abnormal" portion of the total return on those days he selected to show that the overall prices are affected.[20] Dr. [redacted] focuses on only Unusual days coincident with Ripple news he identified and ignores any Unusual days not coincident with Ripple news.

14. As a thought experiment, Dr. [redacted] could, for instance, have selected all Wednesdays among the Unusual trading days he identified. As an alternative selection procedure among his Unusual trading days, choosing Wednesdays is

[18] [redacted] Supplemental Report, ¶ 10.

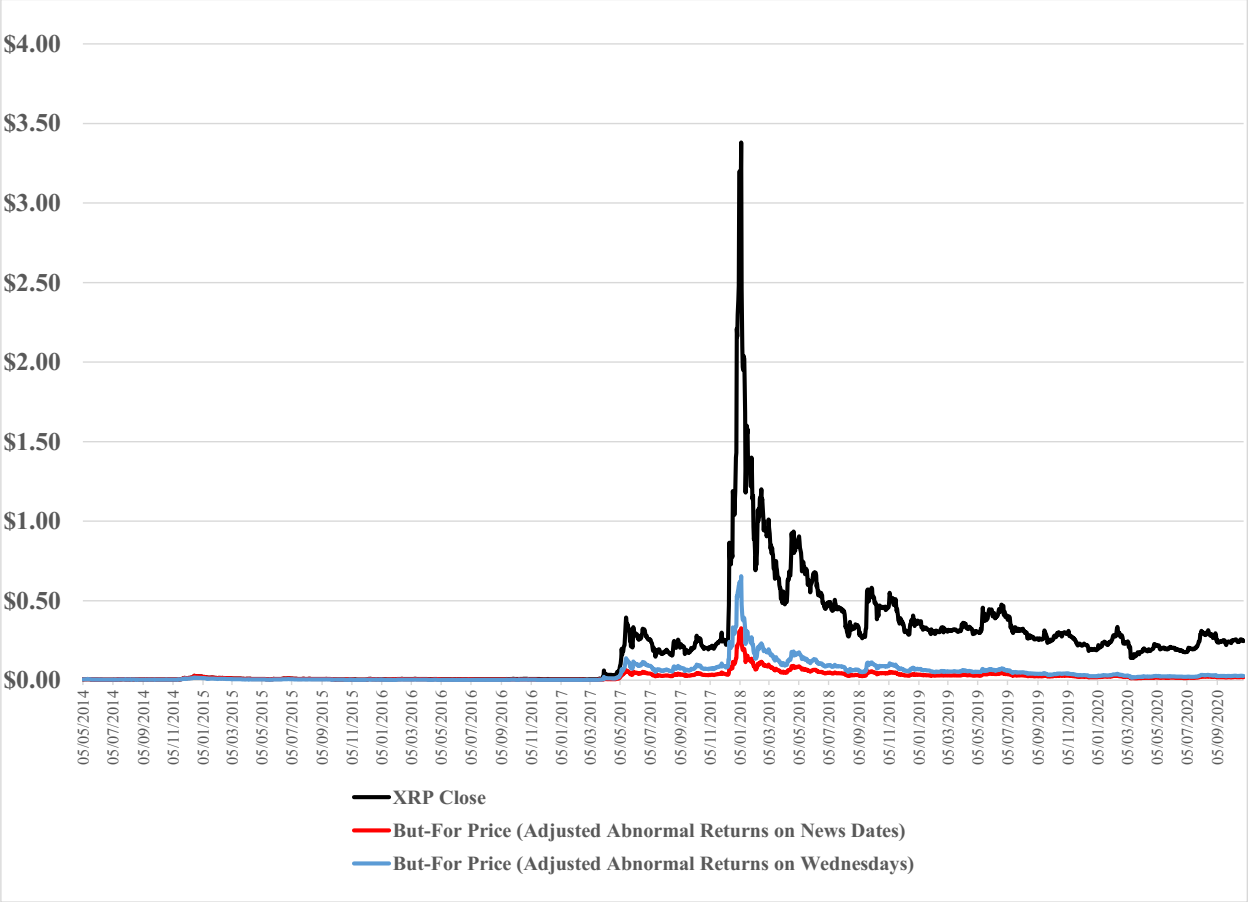
[19] Marais Rebuttal Report, ¶¶ 18-20.

[20] Dr. [redacted] price charts focus on the wrong quantity in any case – whether or not the price of XRP exceeded some arbitrary point is not relevant for whether returns were affected or not by the Ripple news.

facially not related to Ripple news.[21] I have implemented this thought experiment by applying Dr. [redacted] methodology of removing abnormal returns to Unusual Wednesdays, and compared the resulting price series to his "but-for" prices. Figure 2 below is based on Dr. [redacted] Figure 4, where he removes the 1-day abnormal returns on Unusual Ripple news days and calculates the resulting would-have-been prices of XRP. He points, based on his own version of this chart, to the fact that the actual price of XRP (black line) is substantially higher than his but-for price of XRP (red line). The figure below demonstrates that removing abnormal returns on Unusual Wednesdays (blue line) produces results very similar to removing abnormal returns on Unusual days that coincide with Ripple news (red line). In other words, one can achieve Dr. [redacted] "results" by picking virtually any arbitrary subset of Unusual days and removing abnormal returns on those days. It is obvious that this striking reduction in prices occurs because the selected days are Unusual, not because they coincide specifically with Ripple news or with Wednesdays.

[21] Two of the 16 Unusual Wednesdays also have Ripple news identified by Dr. [redacted].

Figure 1: Based on [redacted] Figure 4: Actual vs. Counterfactual XRP (One-Day Application) Adjusted for Abnormal Returns on News Days and Wednesdays



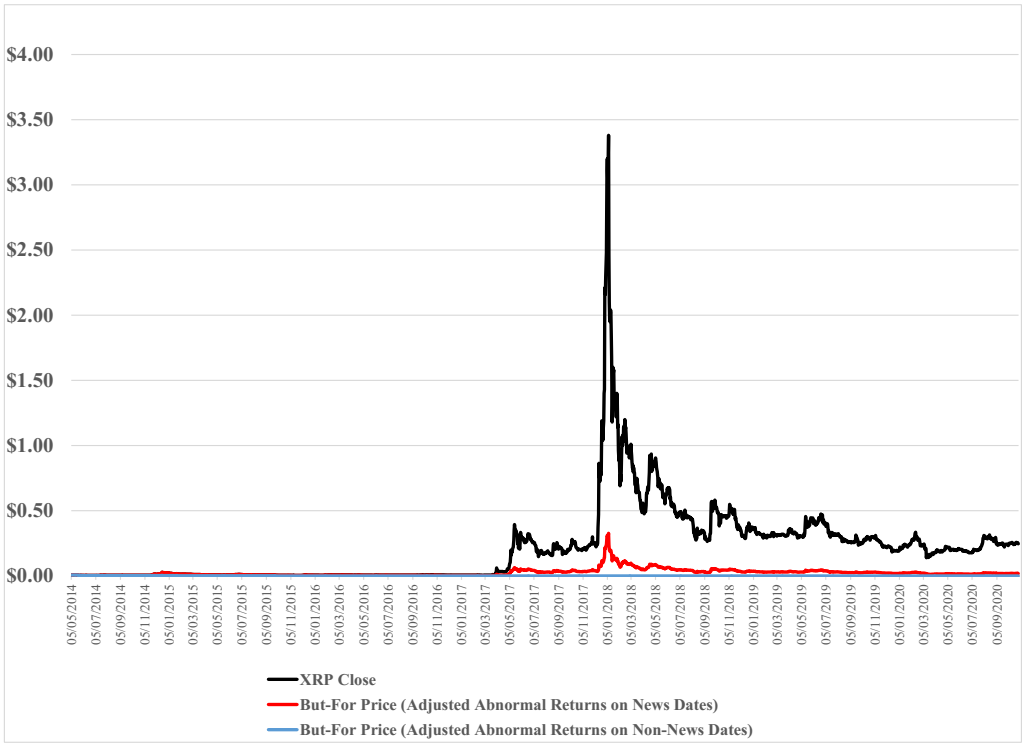
15. As I explained in my Rebuttal Report, most "Unusual" days are not coincident with "Ripple news" identified by Dr. [redacted].[22] For instance, the excerpt in ¶ 6 above shows that out of 235 Unusual trading days Dr. [redacted] identified using his Model 1, only 24 coincided with his Select Ripple news days while 211 did not coincide with Ripple news. In fact, I demonstrated that the overall impact of returns on such Unusual-no-news days is much larger than the impact of returns on Unusual-news days Dr. [redacted] chose to focus on. Below I demonstrate that an analogous result holds within Dr. [redacted] newly introduced would-have-been price

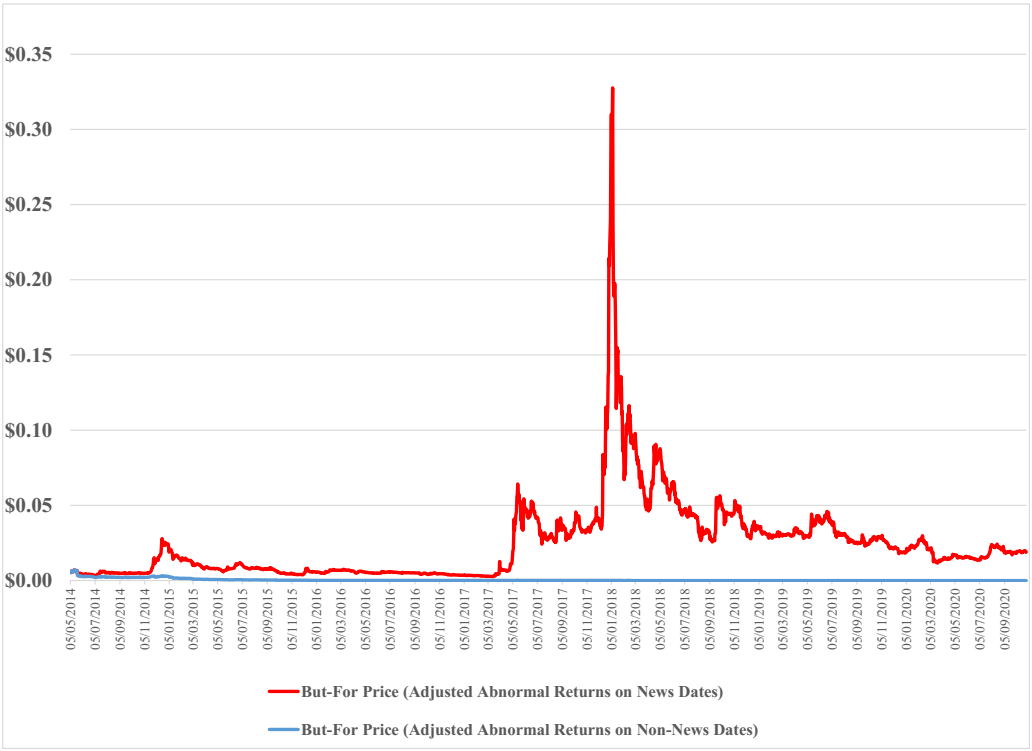
[22] Marais Rebuttal Report, ¶ 22.

charts where he selectively removes abnormal returns on some, but not all, Unusual days.

16. Figure 2 below presents XRP price series after removing abnormal returns on Unusual days that do *not* coincide with Ripple news. As before, black and red lines indicate the actual price of XRP and Dr. [redacted] "but-for" price, respectively. The blue line indicates the would-have-been prices of XRP obtained by removing the abnormal portion of the total return on Unusual days *not* coincident with Ripple news. The second panel of the chart presents a magnified image of a portion of the same chart. It is obvious that the "but-for" prices obtained by removing abnormal returns on Unusual-not-news (blue line) days, rather than on Unusual-news days, fall substantially below Dr. [redacted] but-for prices (red line).

Figure 2: Based on [redacted] Figure 4: Actual vs. Counterfactual XRP (One-Day Application) Adjusted for Abnormal Returns on News Days and Non-News Days





17. Removal of the abnormal returns components on virtually any arbitrary set of Unusual days is expected to reduce the would-have-been prices; Unusual days are so labeled precisely because prices increased by unusual margins over the expected values (based on Dr. [redacted] flawed models) on those days. Therefore, Dr. [redacted] novel results in his Supplemental Report amount to a tautology. Moreover, his results do not link abnormal returns to Ripple news generally. Dr. [redacted] focuses only on Unusual-news days and ignores all remaining Unusual days. Therefore, one cannot draw any conclusions, let alone a conclusion about a specific causal relationship, about any alleged relationship between XRP returns (or prices) and Ripple news based on his new analyses.

IV. The [redacted] Event Study Methodology Is Not Designed Appropriately to Provide a Reliable Basis for the Novel Calculations Presented in His Supplemental Report; as a Consequence, their Results Are Flawed and Uninformative

18. For constructing the hypothetical, would-have-been XRP price series shown in his Supplemental Report, Dr. [redacted] must replace the observed total XRP return on each trading day with Ripple news with an *imputed* return that would, supposedly, have been observed, but for the Ripple news he identified. This "normal" return imputation calculation is a novel aspect of the [redacted] Supplemental Report with no clear analog in the [redacted] Opening Report or my Rebuttal Report. Put differently, this is a novel analysis directed at a novel concept.

19. Unlike the total XRP returns, which are observed and known with certainty, the portion that is attributable to any news event — including Ripple news — cannot be observed directly and must be estimated. Dr. [redacted] employs his event study methodology for this purpose. Like any statistical estimation procedure, Dr. [redacted] event study calculations are subject to both potential specification error and sampling error. Dr. [redacted] makes no express allowance for either in the calculations he presents in his Supplemental Report. I show below that his event study approach suffers from substantial statistical uncertainty,

which renders his approach ill-suited for his calculations. Moreover, the estimation errors are *compounded* in his calculations because he sums portions of returns (estimated with error) over time.

20. In his Opening Report, Dr. [redacted] presented a total of 20 distinct regression models for estimating an "expected" XRP return on each trading day, *i.e.*, the return supposedly *expected* to have been observed had no idiosyncratic XRP-specific information — such as Ripple news — affected XRP's closing price on that day. Each regression model is re-estimated for each trading day based on a trailing 180-day estimation period. Dr. [redacted] does not identify any of his proposed models as a preferred choice, uniquely or otherwise. His different models sometimes imply very different expected return values. For instance, the exemplar news day Dr. [redacted] chose to use for describing his calculations, May 16, 2017, illustrates this phenomenon.[23] Based on his Model 1, which does not control for *any* factors that might affect the price of XRP, he claims that the abnormal return on that day was a *positive* 23.9 percent, effectively the difference between a total return of 25.7 percent and an expected return of 1.8 percent.[24] However, Dr. [redacted] overlooks the fact that his other models produce essentially opposite results. For instance, his Model 16, which controls for Bitcoin and Ethereum returns and their lagged values, the lagged value for XRP, and account growth and its lagged value, yields for that same trading day a *negative* abnormal return of -20 percent (the difference between the total return of 25.7 percent and expected return of 45.7 percent). Moreover, Dr. [redacted] found this negative abnormal return to be statistically significant using his non-parametric approaches. Figure 3 below shows that Dr. [redacted] expected returns (blue diamonds) are often above the actual returns (green diamonds), implying negative abnormal returns.

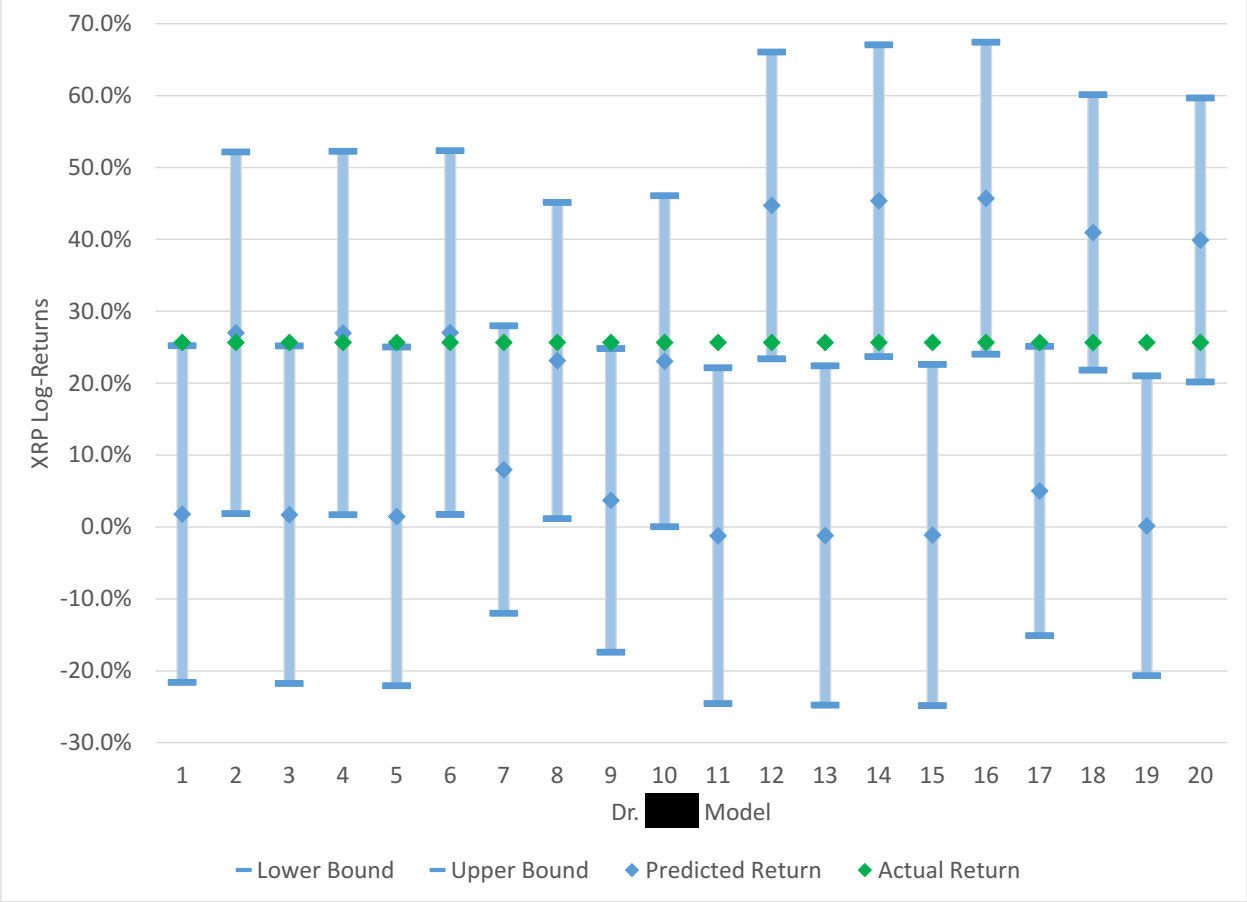
[23] [redacted] Supplemental Report, ¶ 11.

[24] Note that these are log-returns and the precise returns are different. In this section, I follow Dr. [redacted] convention for simplicity.

21. Further, Dr. [redacted] has not established that any of his 20 alternative models can be used to reliably forecast XRP returns. Many of his regression models result in very imprecise predictions, as measured by the standard errors of the forecasts.[25] Figure 3 below illustrates this issue. In addition to the actual and predicted returns for Dr. [redacted] exemplar Ripple news day of May 16, 2017, the figure shows the 95 percent confidence intervals associated with his predicted returns. His parametric two-sided approach would fail to reject the hypothesis that his predicted return is indistinguishable from the actual return for any model in the chart where the actual return (green diamond) overlaps with the 95 percent confidence interval (blue bar). Even for statistically significant returns where the actual return (green diamond) is outside of the confidence interval, the difference between upper or lower bound and the actual return is relatively small. In other words, Dr. [redacted] models produce very imprecise estimates. Dr. [redacted] simply ignores — and in no way accounts for — this statistical uncertainty, which is over and above the specification uncertainty illustrated by the fact that his alternative models sometimes produce markedly differing predictions (see ¶ 20 above).

[25] A related issue is that some of Dr. [redacted] models have no, or almost no, explanatory power as measured by the R2. In other words, some of his models explain close to zero variation in XRP returns observed in the data.

Figure 3: XRP Predicted Log-Returns for May 16, 2017 Based on Dr. [redacted] 20 Event Study Models



22. In addition, Dr. [redacted] uses moving (trailing) 180-day estimation windows to predict expected XRP returns on each trading day. Thus, his novel calculation is internally inconsistent in that his estimation windows *include* the Unusual days he previously identified, which are, in effect, the information-driven outlier observations he identified. This jumbling of "normal" observations with outlier observations may affect his results. Dr. [redacted] does not consider or explain what effect the inclusion of such days has on the predictive performance of his regression models.

V. Conclusion

23. I hold each opinion expressed in this report to a reasonable degree of economic, mathematical, and statistical certainty. My opinions are based on

information, data, and analyses of types typically and reasonably relied upon by experts in economics, statistics, and applied mathematics. I may perform further work, and I may supplement this report in light of additional information or analysis. In particular, I understand that I may be asked to assess and respond to any opinions or exhibits offered by the parties at or before a trial in this matter.

I declare under penalty of perjury that the foregoing is true and correct. Executed on May 13, 2022.

M. Laurentius Marais

Attachment A:

Materials Considered

Materials Considered

1. Expert Report of M. Laurentius Marais, PhD, November 12, 2021.
2. Amended Expert Report of [redacted], Ph.D., October 6, 2021.
3. Supplemental Expert Report of [redacted], Ph.D., February 28, 2022.

Exhibit G

[redacted] Model results for May 16, 2017

	Predicted return	Lower bound of confidence interval	Upper bound of confidence interval	Does the counterfactual price analysis replace the actual return with the predicted return?
Model 1	1.79%	-21.63%	25.21%	Yes
Model 2	26.99%	1.85%	52.13%	No
Model 3	1.69%	-21.78%	25.16%	Yes
Model 4	26.96%	1.69%	52.22%	No
Model 5	1.47%	-22.09%	25.02%	Yes
Model 6	27.03%	1.74%	52.31%	No
Model 7	7.98%	-12.03%	27.98%	No
Model 8	23.13%	1.14%	45.13%	No
Model 9	3.70%	-17.42%	24.81%	Yes
Model 10	23.06%	0.04%	46.08%	No
Model 11	-1.23%	-24.58%	22.12%	Yes
Model 12	44.72%	23.39%	66.04%	No
Model 13	-1.19%	-24.78%	22.40%	Yes
Model 14	45.36%	23.69%	67.04%	No
Model 15	-1.13%	-24.83%	22.58%	Yes
Model 16	45.71%	24.01%	67.40%	No
Model 17	5.00%	-15.12%	25.13%	Yes
Model 18	40.96%	21.80%	60.11%	No
Model 19	0.16%	-20.70%	21.01%	Yes
Model 20	39.90%	20.15%	59.66%	No

Note: Actual return on May 16, 2017 was 25.6%.