

Exhibit 18

**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 (AT)

SUPPLEMENTAL REPORT OF DANIEL R. FISCHER

May 13, 2022

I. INTRODUCTION, ASSIGNMENT, AND SUMMARY OF CONCLUSIONS

1. On October 4, 2021, the SEC submitted the Expert Report of [REDACTED], Ph.D. (“[REDACTED] Report”). On November 12, 2021, I submitted a rebuttal report responding to the analysis in the [REDACTED] Report.¹ In that report, I concluded that the analysis in the [REDACTED] Report is fundamentally flawed for multiple reasons and provides no support for the SEC’s claim that XRP is a security:²

- (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.

2. On February 28, 2022, the SEC submitted the Supplemental Expert Report of [REDACTED], Ph.D. (“[REDACTED] Supplemental Report”). In that report, Dr. [REDACTED] purports to “quantify

¹ Expert Rebuttal Report of Daniel R. Fischel, November 12, 2021 (“Fischel Rebuttal Report”). For a description of my qualifications, prior cases in which I provided expert testimony, and my compensation in this matter, see Fischel Rebuttal Report, Sections I and III and Appendix A. For background information and a description of the SEC claims, see Fischel Rebuttal Report, Section II. Capitalized terms that are not otherwise defined herein are defined in the Fischel Rebuttal Report.

² Fischel Rebuttal Report, ¶ 14.

the economic significance of [] XRP price reactions”³ on 100 event days⁴ and reaches two conclusions:

- (i) “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.”⁵
- (ii) “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.”⁶

A. Dr. [] Analysis of the Alleged “But-For” Price of XRP

3. Dr. [] claims that “[he] can interpret statistically significant abnormal returns following the Event Days as attributable to those public statements” because “[t]he [] Report establishes that XRP prices react to certain news and public statements related to Ripple.”⁷ Therefore, he argues that “the best estimate of the but-for, counterfactual XRP price is found by replacing the actual returns in those instances with the expected returns.”⁸ (Emphasis omitted).

4. Specifically, for each of his 20 regression models, Dr. [] constructs a counterfactual price series using the following methodology:⁹

³ [] Supplemental Report, ¶ 7.

⁴ See [] Supplemental Report, ¶ 8. Note that the Dr. [] originally analyzed 105 event days in the “Select Categories” analysis in his opening report—however, in the [] Supplemental Report, Dr. [] excludes “5 instances of Digital Asset Trading Platform Listings which [he] could not definitively attribute to the efforts of Ripple Labs based on the set of news [he] analyzed.” *Id.*

⁵ [] Supplemental Report, ¶ 9 (p. 2). See also, *id.*, ¶¶ 10-19.

⁶ [] Supplemental Report, ¶ 9 (p. 3). See also, *id.*, ¶¶ 20-24.

⁷ [] Supplemental Report, ¶ 10.

⁸ [] Supplemental Report, ¶ 10.

⁹ See [] Supplemental Report, ¶ 12. Dr. [] assesses the statistical significance of the event days’ (cumulative) abnormal returns based on the 5% one-sided level.

- For event days where the one-day abnormal return is statistically significant and positive, Dr. [REDACTED] replaces the actual return with the expected return predicted by the model.
- For event days where the two-day cumulative abnormal return is statistically significant and positive (and the one-day return is not statistically significant and negative), Dr. [REDACTED] replaces the actual returns for those two days with the expected returns predicted by the model.
- For event days where the three-day cumulative abnormal return is statistically significant and positive (and neither the one-day nor two-day returns are statistically significantly and negative), Dr. [REDACTED] replaces the actual returns for those three days with the expected returns predicted by the model.
- For event days where none of the above are true, Dr. [REDACTED] does not adjust the actual return.

5. Based on this analysis, Dr. [REDACTED] finds that 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.”¹⁰

B. Dr. [REDACTED] Analysis of Investment Returns Around Event Days

6. Dr. [REDACTED] conducts an analysis to (supposedly) “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?”¹¹ Specifically, he compares the average 1-, 3-, 7-, and 28-day returns for three categories of hypothetical investors: (1) those who invest in XRP on an event day (i.e., purchase XRP at the closing price

¹⁰ [REDACTED] Supplemental Report, ¶ 16.

¹¹ [REDACTED] Supplemental Report, ¶ 20.

the day before the event); (2) those who invest in XRP on a non-event day; and (3) those who invest in XRP on non-event days and have no event days in the holding period.¹²

7. Among other things, Dr. ██████ analysis finds that “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” and that “[e]xcluding those 28 day holding periods which include Event Days, the average return falls to just 7.5%.”¹³ Therefore, he concludes that an “investor who timed investments in XRP around these Ripple Events would have earned substantially greater returns than an investor who did not.”¹⁴

C. Assignment and Summary of Conclusions

8. I have been asked by counsel for Ripple to review, evaluate, and respond to the analysis and conclusions in the ██████ Supplemental Report from an economics perspective. Based on my review of the economic evidence, I conclude as follows.¹⁵

9. The analysis in the ██████ Supplemental Report is predicated on Dr. ██████ false and misleading claim that “[t]he ██████ Report demonstrates that XRP prices reacted to certain news and public statements related to Ripple.”¹⁶ As discussed in the Fischel Rebuttal Report, the analysis in the ██████ Report cannot and does not establish that XRP prices reacted solely or

¹² See ██████ Supplemental Report, ¶ 21. See also, *id.*, Figures 6 and 7 (pp. 10-11).

¹³ ██████ Supplemental Report, ¶ 22.

¹⁴ ██████ Supplemental Report, ¶ 24.

¹⁵ A list the materials we have relied upon in connection with the preparation of this report is attached as Appendix C.

¹⁶ ██████ Supplemental Report, ¶ 7. See also, *id.*, ¶ 10.

primarily to information about Ripple’s efforts.¹⁷ Therefore, there is no economic basis for Dr. [REDACTED] to “quantify the economic significance of those XRP price reactions,”¹⁸ when he has not and cannot established that those XRP price reactions are primarily or solely related to information about Ripple’s efforts.

10. In summary, the [REDACTED] Supplemental Report does not address any of the fundamental flaws that were discussed in the Fischel Rebuttal Report, and thus his new analysis suffers from the exact same fundamental flaws. In other words:

- (i) The findings of Dr. [REDACTED] analysis do not demonstrate that XRP holders profit solely or primarily from the efforts of Ripple.
- (ii) Dr. [REDACTED] once again misinterprets his own findings by failing to recognize that many of the announcements that he finds to be statistically significant are confounded.
- (iii) Dr. [REDACTED] once again fails to appreciate the significance of his own admission that XRP did not trade in an efficient market.
- (iv) Dr. [REDACTED] once again fails to provide any explanation as to why the findings of his analysis would shed any light on whether XRP holders are engaged in a “common enterprise” with Ripple.

¹⁷ See e.g., Fischel Rebuttal Report, ¶¶ 17-20.

¹⁸ [REDACTED] Supplemental Report, ¶ 7.

II. THE ANALYSIS IN THE ██████████ SUPPLEMENTAL REPORT IS FUNDAMENTALLY FLAWED AND PROVIDES NO SUPPORT FOR THE SEC’S CLAIM THAT XRP IS A SECURITY

A. The Findings of Dr. ██████████ Analysis Do Not Demonstrate That XRP Holders Profit Solely or Primarily from the Efforts of Ripple

11. Although Dr. ██████████ has testified that he is not offering an opinion on whether XRP holders profit solely or primarily from the efforts of Ripple and that his event study methodology cannot answer such questions,¹⁹ the analysis in the ██████████ Supplemental Report attempts (at least in part) to respond to my opinion that the findings of Dr. ██████████ event study methodology do not demonstrate that XRP holders profit solely or primarily from the efforts of Ripple.²⁰ However, the findings of Dr. ██████████ new analysis still do not demonstrate that XRP holders profit solely or primarily from the efforts of Ripple.

12. To begin with, Dr. ██████████ finding that removing significant, positive abnormal returns on event days results in an estimate of the alleged “but-for” price of XRP being lower than the actual price of XRP is a tautology that does not establish that XRP holders profit solely

¹⁹ See e.g., Deposition Transcript of ██████████, February 18, 2022 (“██████████ Dep. Tr.”) at 228:25-229:8 and 231:3-232:3.

²⁰ See e.g., ██████████ Supplemental Report, ¶ 13 and note 20 (citing to Fischel Rebuttal Report, ¶ 20). See also, *id.*, note 10 (citing to Fischel Rebuttal Report, ¶ 18). For example, Dr. ██████████ claims that his analysis of the alleged “but-for” price of XRP is “precisely the analysis which Prof. Fischel endorses” because “Prof. Fischel questions the extent to which XRP holders profited from the events studied in the ██████████ Report, *even assuming the abnormal returns related to those events are the results of Ripple’s efforts.*” (Emphasis added.) ██████████ Supplemental Report, note 10. However, this is a clear misreading of the Fischel Rebuttal Report because the paragraph that Dr. ██████████ cites actually states: “Even if one were to assume that the event days analyzed in Dr. ██████████ ‘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.” (Emphasis added.) Fischel Rebuttal Report, ¶ 18.

or primarily from the efforts of Ripple. That is to say, by definition, removing positive abnormal returns²¹ on any days (i.e., event days or non-event days) will always result in a lower “but-for” price estimate. As discussed in the Fischel Rebuttal Report, 76.3% to 89.5% of days with significantly positive XRP returns had no news about Ripple’s efforts analyzed by Dr. [REDACTED]²² However, Dr. [REDACTED] did not attempt to analyze the impact of removing positive significant abnormal returns on non-event days, nor did he compare the impact of removing positive significant abnormal returns on event days vs. non-event days.

13. Dr. [REDACTED] also claims that that “investor who timed investments in XRP around these Ripple Events would have earned substantially greater returns than an investor who did not.”²³ Specifically, he claims that “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” and that “[e]xcluding those 28 day holding periods which include Event Days, the average return falls to just 7.5%.”²⁴ However, Dr. [REDACTED] analysis of investment returns around event days is misleading and does not demonstrate that XRP holders profit solely or primarily from the efforts of Ripple for multiple reasons.

- First, in this analysis, Dr. [REDACTED] not only fails to do anything to account for the impact of confounding information or the fact that the XRP market was not efficient, he also inexplicably fails to control for any other market factors that

²¹ As discussed in the Fischel Rebuttal Report, Dr. [REDACTED] event study methodology is designed to identify event days with significantly positive XRP returns. See Fischel Rebuttal Report, ¶ 12(iii).

²² See Fischel Rebuttal Report, ¶ 20 and Exhibit 1.

²³ [REDACTED] Supplemental Report, ¶ 24.

²⁴ [REDACTED] Supplemental Report, ¶ 22.

affect XRP prices—in direct contrast to his event study methodology and analysis of the alleged “but-for” price of XRP.

- Second, as discussed below, Dr. [REDACTED] event days are confounded by, among other things, other announcements that Dr. [REDACTED] identified. On average, Dr. [REDACTED] 100 event days have two additional announcements falling within +/- 3 days from the event day, four announcements falling within +/- 7 days from the event date, and five announcements falling within +/- 10 days from the event day. See Exhibit 3. Longer periods, such as the 28-day holding period that Dr. [REDACTED] uses in his analysis, are even more likely to include confounding announcements.
- Third, Dr. [REDACTED] event days only generate higher returns on average through 2017, a period during which the XRP market was particularly inefficient.²⁵ Therefore, any inference drawn from price reactions during that period are particularly unreliable. After 2017, an individual investing on an event day (i.e., purchasing at the closing price of the day before) would earn an average 28-day return of 1.5% compared to an average 28-day return of 1.3% earned when investing on any other days or an average 28-day return of 9.9% when there is no event day in the investment period. See Exhibit 4.
- Finally, Dr. [REDACTED] averages are driven entirely by a small number of days with extraordinarily high returns. If one excludes the top 10 event days, the average 28 day return for an investor investing on the event day (i.e., purchasing at the closing price of the day before) falls from 63.1% to 7.4%, which is similar to the 7.5% average 28-day return for an investor with no event day in the investment period. See Exhibit 4.

²⁵ See e.g., [REDACTED] Report, Appendix F, Figure 1 (p. 3), showing statistically significant autocorrelation in XRP returns occurred throughout the period analyzed by Dr. [REDACTED] and particularly prior to 2018. Dr. [REDACTED] states that “during these periods [where autocorrelation is statistically significant], [he] can reject the hypothesis that XRP prices are even weak form efficient.” *Id.*, p. 2.

B. Dr. ██████ Once Again Misinterprets His Own Findings by Failing to Recognize that Many of the Announcements that He Finds to be Statistically Significant are Confounded

14. As discussed in the Fischel Rebuttal Report, the announcements that Dr. ██████ analyzed confound information about Ripple’s efforts with information about market conditions for XRP and may also be further confounded by other announcements that fall on or near the event day, which may not be related to Ripple’s efforts.²⁶ In his deposition, Dr. ██████ acknowledged that the presence of confounding events could “potentially” undermine the reliability of his findings.²⁷ However, he also claimed that, given his “robustness checks” (i.e., he uses models that control for the returns of other digital tokens, he did not find any correlation between events and price movements three days before the announcement, and his results hold for 1-day and 7-day event windows), “it becomes so implausible to suggest that [] hypothetical confounding news could be driving [his] results.”²⁸

15. In fact, Dr. ██████ “robustness checks” cannot address the fact that the announcements that Dr. ██████ analyzed themselves contain confounding information about market conditions for XRP, such as 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.²⁹ Likewise, given the fact that the XRP market is not semi-strong efficient (i.e., it takes XRP prices longer to fully reflect new information without bias), as discussed below,

²⁶ See Fischel Rebuttal Report, Section IV.B.

²⁷ ██████ Dep. Tr. at 193:16-20.

²⁸ ██████ Dep. Tr. at 195:2-197:20.

²⁹ See Fischel Rebuttal Report, ¶ 21.

Dr. ██████ “robustness checks” also cannot address the potential impact of confounding announcements that fall on or near the event day.

16. As discussed in the Fischel Report, Dr. ██████ himself identifies a number of potentially confounding announcements on or near his event days.³⁰ On average, Dr. ██████ 100 event days have two additional announcements falling within 3 days of the event day, four announcements falling within 7 days of the event date, and five announcements falling within 10 days of the event day. See Exhibit 3. This exhibit also shows that potentially confounding announcements fall on or near the specific event days that Dr. ██████ finds to be statistically significant. For example, there are 14 event days that are statistically significant in at least 95% of Dr. ██████ models (i.e., statistically significant in 19 or more models), and these event days have, on average, two additional announcements falling within 3 days of the event day, three additional announcements falling within 7 days of the event date, and five additional announcements falling within 10 days of the event day. See Exhibit 3.

17. In other words, Dr. ██████ assertion that “[he] can interpret statistically significant abnormal returns following the Event Days as attributable to those public statements”³¹ is false and misleading because he ignores the fact that some or all of his estimated significant abnormal returns may be attributed to: (1) confounding information about market conditions for XRP disclosed in the announcements that Dr. ██████ analyzed, and (2) confounding information disclosed in other announcements that fall on or near the event day.

³⁰ See Fischel Rebuttal Report, ¶ 25 and Exhibit 2.

³¹ ██████ Supplemental Report, ¶ 10.

C. Dr. ██████ Once Again Fails to Appreciate the Significance of His Own Admission that XRP Did Not Trade in an Efficient Market

18. In his analysis of the “but-for” price of XRP, Dr. ██████ attempts to use the same event study methodology from the ██████ Report to quantify the alleged impact of the event days that he finds to be significant—that is to say, his counterfactual XRP price series are constructed based on the output of his event study methodology. In doing so, Dr. ██████ once again fails to appreciate the significance of his own admission that XRP did not trade in an efficient market.³²

19. In his deposition, Dr. ██████ claimed that semi-strong market efficiency is only necessary to draw certain inferences from an event study, such as drawing an inference from an absence of price movement, but he claimed that the types of inferences that he draws from his event study methodology do not require semi-strong market efficiency.³³ This claim is fundamentally incorrect with regards to the analysis in the ██████ Report (wherein Dr. ██████ uses his event study methodology to “test whether XRP returns are associated with news about Ripple”³⁴) and even more so with regards to the analysis in the ██████ Supplemental Report (wherein Dr. ██████ uses his event study methodology to estimate counterfactual XRP prices).

20. As discussed in the Fischel Rebuttal Report, when an event study is used to measure the impact of certain events on market prices, it is explicitly assumed that the market is semi-strong or informationally efficient, i.e., that market prices adjust to new information quickly and without bias.³⁵ It is an undisputed fact that the XRP market was not efficient during

³² The significance of the lack of market efficiency with regards to Dr. ██████ event study methodology was discussed in detail in Section IV.C of the Fischel Rebuttal Report.

³³ See e.g., ██████ Dep. Tr. at 94:12-96:8.

³⁴ ██████ Report, ¶ 28.

³⁵ Fischel Rebuttal Report, ¶ 27.

the relevant period.³⁶ As a result, it is not appropriate to use an event study methodology to quantify the impact of events on XRP prices—which is exactly what Dr. ██████ attempts to do in constructing his counterfactual XRP price series.

21. In other words, because XRP prices during the relevant period did not adjust to new information quickly and without bias, Dr. ██████ estimates of the “but-for” price of XRP are unreliable, biased estimates. For example, if price reactions to certain announcements overshoot during the first three days before ultimately correcting, Dr. ██████ counterfactual XRP price series would be adjusted to exclude the overshooting (i.e., he would replace the actual returns for those three days with the expected returns predicted by his models) but would not be adjusted to exclude the eventual price correction—resulting in a downward biased estimate.

22. Moreover, Dr. ██████ assertion in his deposition that the inferences that he draws from his event study methodology do not require semi-strong market efficiency is particularly incorrect with regards to the analysis in the ██████ Supplemental Report because he is attempting to use his event study methodology to quantify the magnitude of price reactions in addition to the materiality of price reactions. In fact, Dr. ██████ analysis of the alleged “but-for” price of XRP is analogous to a common application of event studies to quantify damages in securities fraud litigation³⁷—an application which is predicated on the assumption that the subject security trades in a semi-strong efficient market.

³⁶ Dr. ██████ agrees that XRP did not trade in efficient market during the relevant period. See e.g., ██████ Report, ¶ 35; see also, ██████ Dep. Tr. at 93:22-94:3.

³⁷ See e.g., Kevin L. Gold, Eric Korman, and Ahmer Nabi, “Federal Securities Acts and Areas of Expert Analysis,” Chapter 27 in Litigation Services Handbook: The Role of the Financial Expert (Roman L. Weil, Daniel G. Lentz, and Elizabeth A. Evans eds., 6th ed. John Wiley & Sons, 2017), p. 12: “For the out-of-pocket measure of damages used in most cases filed

23. In his deposition, Dr. █████ claimed that it was unnecessary for him to “assign causality to a particular event” or to “assign causation to one or the other [event]” and instead claimed that “[i]t’s enough that prices moved around that announcement.”³⁸ However, the analysis in the █████ Supplemental Report attempts to do exactly that—both in his analysis of the alleged “but-for” price of XRP, where he concludes that “approximately two dozen events are, in fact, economically significant,”³⁹ and in his analysis of investment returns around event days, where he concludes that his results “demonstrates the economic significance of the Ripple Events in the history of XRP prices.”⁴⁰ There is no economic basis for Dr. █████ to assess the supposed “economic significance” of these event days with statistically significant XRP price reactions when he has not and cannot established that those price reactions are primarily or solely related to information about Ripple’s efforts.

under § 10(b) of the Securities Exchange Act of 1934, experts estimate the but-for price: the value of the security absent (i.e., but-for) the fraud. ... Many of these approaches use the event study method. ... to measure the security’s price decline associated with curative disclosures.”

See also, David I. Tabak and Frederick C. Dunbar, “Materiality and Magnitude: Event Studies in the Courtroom,” Chapter 19 in Litigation Services Handbook: The Role of the Financial Expert (Roman L. Weil, Michael J. Wagner, and Peter B. Frank Elizabeth A. Evans eds., 3rd ed. John Wiley & Sons, 2001), p. 3: “Event studies can also measure the size of a stock price movement as the basis for a damages calculation. For example, in cases of securities fraud, experts commonly measure changes in the alleged inflation in a stock price by the movement in that stock price in the wake of a corrective disclosure, after controlling for market, industry, and other company-specific influences. This results from the disclosure’s removing the inflation, and an event study measures the change in inflation in the stock at the time of the disclosure. Often, courts find that this is the best estimate of the inflation per share if the defendant had a duty to disclose the same information that the corrective disclosure revealed. As a result, an event study is a common method that serves as the basis for quantifying damages in securities fraud cases.”

³⁸ █████ Dep. Tr. at 205:9-207:2.

³⁹ █████ Supplemental Report, ¶ 15.

⁴⁰ █████ Supplemental Report, ¶ 24.

24. Dr. █████ acknowledged in his deposition that his event study methodology can only demonstrate that there is some correlation between his event days and statistically significant XRP returns but cannot prove causation.⁴¹ However, Dr. █████ also argued that “[t]he question of what kind of inference you can draw from a statistical result depends on your economic understanding of the [] facts of the matter and maybe some other robustness checks that you may run to rule out alternative explanations” and then opined that his findings support “an inference of [] likely causation.”⁴² Dr. █████ has not explained how or why his “economic understanding” of the facts of this litigation support an inference of “likely” causation. Additionally, Dr. █████ “robustness checks” cannot address the fact that many of the announcements that he finds to be statistically significant are confounded (as discussed above) and, likewise, cannot address the fact that the XRP market is not semi-strong efficient (i.e., it takes XRP prices longer to fully reflect new information without bias).

25. In his deposition, Dr. █████ also claimed that, even though the XRP market is not semi-strong efficient, his application of the event study methodology in the █████ Report is appropriate because the academic literature he cited similarly applied the event study methodology in cryptocurrency markets, many of which are also not semi-strong efficient.⁴³ In fact, none of the articles that Dr. █████ cited use event studies to test whether or not digital tokens are securities (or whether returns are “associated” with the announcements of a specific entity),

⁴¹ See e.g., █████ Dep. Tr. at 242:9-15 and 242:24-25.

⁴² █████ Dep. Tr. at 242:16-24.

⁴³ See e.g., █████ Dep. Tr. at 93:14-17, 94:16-18, 95:24-96:4.

nor do they attempt to construct but-for counterfactual prices based on the results of their event studies.⁴⁴ For example:

- Feng et al. (2018) does not actually use an event study methodology, but they do perform a regression that includes dummy variables for positive and negative Bitcoin events.⁴⁵ However, unlike the event study methodology, the dependent variable in their regression is not returns but instead an “order-size based measure to detect informed trading.”⁴⁶ Based on this regression, they “find evidence of informed trading in the Bitcoin market prior to both positive and negative large events.”⁴⁷
- Joo et al. (2020) “attempt to explore reactions of the cryptocurrency market to positive and negative events utilizing event study methodology” and uses their results to “identify the possible profit-making opportunities based on the speed of information flow.”⁴⁸ They state that the objective of their article is “to provide evidence of potential positive trading opportunities in the market.”⁴⁹ In other

⁴⁴ As discussed in the Fischel Rebuttal Report, there are two primary reasons to use an event study: 1) to test the null hypothesis that a market is 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. See Fischel Rebuttal Report, ¶ 32.

⁴⁵ Wenjun Feng, Yiming Wang, and Zhengjun Zhang, “Informed Trading in the Bitcoin Market,” *Finance Research Letters* Vol. 26, 2018, pp. 63-70 at p. 65.

⁴⁶ Weng et al. (2018), p. 64. “First, we propose a novel indicator to detect and assess informed trades ahead of cryptocurrency events, based on the buy-sell trade size imbalances.” *Id.*

⁴⁷ Weng et al. (2018), p. 64. “Applying a novel indicator that we design for the cryptocurrency market, we find evidence of informed trading in the Bitcoin market ahead of cryptocurrency-related negative Bitcoin market events, and ahead of large positive events. ... The evidence of informed trading in the Bitcoin market suggests that people who get information before it’s widely available, profit on their private information, at the cost of other market participants’ losses.” *Id.*, p. 68.

⁴⁸ 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. 4796.

⁴⁹ Joo et al. (2020), p. 4796.

words, they use an event study to demonstrate how the lack of semi-strong efficiency in digital token markets can result in positive trading opportunities.

- Gerritsen et al. (2021) uses an event study to examine Bitcoin abnormal returns to bullish, neutral, and bearish predictions of crypto experts published by various sources such as business news outlets (e.g., Bloomberg and CNBC) and Bitcoin-specific news agencies and forums to which bitcoin.org refers (e.g., CoinDesk, CoinTelegraph, etc.).⁵⁰ They find that neutral and bearish predictions are associated with statistically significant negative abnormal returns, but bullish predictions do not result in statistically significant abnormal returns, and conclude that “crypto experts are an important contributor to price discovery on the Bitcoin market and that especially their nonpositive predictions improve the market’s efficiency.”⁵¹
- Schaub (2021) uses an event study to examine the returns of Bitcoin, Ether and three stablecoins (Tether, BinanceCoin, and USDCoin) to the January 4, 2021 announcement by the Office of the Comptroller of the Currency (OCC) that federally chartered banks and thrifts were now allowed to utilize stablecoins as payment instruments.⁵² His event study does not use any regression models to predict cryptocurrency returns and instead examines actual daily and cumulative returns during the event window.⁵³

⁵⁰ Dirk F. Gerritsen, Rick A.C. Lugtigheid, and Thomas Walther, “Can Bitcoin Investors Profit from Predictions by Crypto Experts?” *Finance Research Letters*, 2021 (forthcoming) at p. 2.

⁵¹ Gerritsen et al. (2021), p. 6.

⁵² 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, pp. 154-158 at p. 154.

⁵³ See Schaub (2021), pp. 155-157.

D. Dr. [REDACTED] Once Again Fails to Provide Any Explanation as to Why the Findings of His Analysis Would Shed Any Light on Whether XRP Holders are Engaged in a “Common Enterprise” with Ripple

26. As discussed in the Fischel Rebuttal Report, Dr. [REDACTED] has not explained the relationship between his findings and the SEC’s claim that XRP is a security under the *Howey Test*, and 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.⁵⁴ In his deposition, Dr. [REDACTED] agreed that “[a]n event study is not going to answer a legal question,” although he also claimed (without providing any further explanation) that “[i]t may provide information which might be useful to the finder of fact who’s ultimately going to settle the legal question.”⁵⁵ He also testified that he is not offering an opinion on whether XRP holders profit solely or primarily from the efforts of Ripple.⁵⁶

27. Dr. [REDACTED] has not addressed these issues in the [REDACTED] Supplemental Report and, for all of the reasons discussed above, his analysis 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.

⁵⁴ Fischel Rebuttal Report, ¶ 31.

⁵⁵ [REDACTED] Dep. Tr. at 68:13-18.

⁵⁶ See e.g., [REDACTED] Dep. Tr. at 228:25-229:8, 231:3-232:3.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on May 13, 2022.

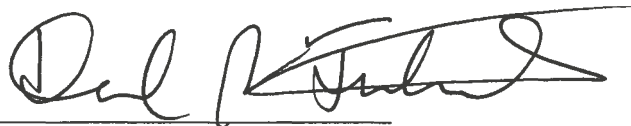


Exhibit 3**Number of Other Announcements Identified by Dr. [REDACTED] On or Near Event Days**

	[A]: # of Other Announcements Identified by Dr. [REDACTED] On or Near the Event Day			[B]: # of Models Where Dr. [REDACTED] Finds the Event Day to Be Statistically Significant	
	+/- 3 Days	+/- 7 Days	+/- 10 Days		
Average:					
All Event Days	2	4	5	4	
Event Days that are Significant in 1 or More Models	1	3	5	13	
Event Days that are Significant in 10 or More Models	2	4	6	18	
Event Days that are Significant in 19 or More Models	2	3	5	20	
By Event Day:					
1	05/05/2014	-	-	-	2
2	06/12/2014	1	2	2	-
3	07/21/2014	1	2	4	-
4	07/29/2014	1	2	3	-
5	09/24/2014	1	1	1	-
6	10/27/2014	1	5	6	-
7	11/04/2014	2	3	4	-
8	12/03/2014	1	2	4	-
9	04/29/2015	3	5	6	-
10	05/18/2015	1	4	4	-
11	06/09/2015	-	4	7	-
12	10/06/2015	-	1	1	5
13	10/13/2015	-	2	2	-
14	12/16/2015	1	4	4	-
15	01/29/2016	2	6	8	12
16	02/29/2016	-	2	2	-
17	04/19/2016	-	3	4	-
18	05/26/2016	1	2	2	-
19	06/13/2016	2	3	4	20
20	06/22/2016	1	4	6	16
21	07/18/2016	2	3	3	-
22	08/19/2016	4	5	6	-
23	09/15/2016	1	2	4	20
24	09/23/2016	2	4	7	20
25	09/28/2016	2	5	7	16
26	10/09/2016	2	4	6	12
27	10/20/2016	2	4	4	-
28	12/12/2016	1	3	3	-
29	01/09/2017	3	4	5	-
30	01/10/2017	4	4	5	20
31	02/15/2017	2	2	4	-
32	02/28/2017	1	3	4	-
33	03/02/2017	1	4	4	20
34	03/07/2017	1	3	4	18
35	03/17/2017	1	1	3	4
36	03/30/2017	1	1	2	20
37	03/31/2017	1	1	1	20

Exhibit 3**Number of Other Announcements Identified by Dr. [REDACTED] On or Near Event Days**

	[A]: # of Other Announcements Identified by Dr. [REDACTED] On or Near the Event Day			[B]: # of Models Where Dr. [REDACTED] Finds the Event Day to Be Statistically Significant	
	+/- 3 Days	+/- 7 Days	+/- 10 Days		
	Average:				
All Event Days	2	4	5	4	
Event Days that are Significant in 1 or More Models	1	3	5	13	
Event Days that are Significant in 10 or More Models	2	4	6	18	
Event Days that are Significant in 19 or More Models	2	3	5	20	
By Event Day:					
38	04/26/2017	-	-	2	3
39	05/16/2017	1	2	3	10
40	05/18/2017	1	2	3	-
41	06/29/2017	-	-	-	-
42	07/10/2017	1	2	3	-
43	09/11/2017	-	1	1	-
44	10/10/2017	1	5	7	-
45	10/13/2017	3	7	7	-
46	11/16/2017	2	4	4	-
47	11/22/2017	1	4	5	-
48	12/05/2017	3	5	5	-
49	12/08/2017	3	4	6	19
50	12/12/2017	-	7	10	20
51	12/19/2017	5	8	12	13
52	01/11/2018	4	9	13	-
53	01/16/2018	2	8	10	-
54	01/24/2018	1	7	9	-
55	02/07/2018	1	4	9	1
56	02/08/2018	1	4	9	18
57	02/13/2018	3	5	8	-
58	02/14/2018	3	8	8	-
59	02/21/2018	2	4	8	-
60	03/01/2018	2	6	9	-
61	03/06/2018	4	6	6	-
62	03/24/2018	2	5	5	-
63	04/11/2018	1	2	2	3
64	04/12/2018	1	2	2	2
65	04/26/2018	4	4	6	-
66	05/07/2018	2	4	6	-
67	05/14/2018	1	3	6	-
68	05/26/2018	2	3	8	-
69	06/27/2018	2	2	3	-
70	08/16/2018	2	3	3	20
71	09/05/2018	2	4	5	8
72	09/13/2018	1	4	6	-
73	09/19/2018	-	1	4	20
74	09/28/2018	5	9	11	-

Exhibit 3**Number of Other Announcements Identified by Dr. [REDACTED] On or Near Event Days**

	[A]: # of Other Announcements Identified by Dr. [REDACTED] On or Near the Event Day			[B]: # of Models Where Dr. [REDACTED] Finds the Event Day to Be Statistically Significant	
	+/- 3 Days	+/- 7 Days	+/- 10 Days		
Average:					
All Event Days	2	4	5	4	
Event Days that are Significant in 1 or More Models	1	3	5	13	
Event Days that are Significant in 10 or More Models	2	4	6	18	
Event Days that are Significant in 19 or More Models	2	3	5	20	
By Event Day:					
75	10/01/2018	8	9	10	-
76	11/14/2018	3	5	5	-
77	12/13/2018	1	2	2	-
78	01/08/2019	1	1	2	-
79	02/05/2019	2	5	5	-
80	03/12/2019	-	1	1	-
81	06/17/2019	-	1	1	2
82	09/27/2019	2	4	5	-
83	09/30/2019	2	5	8	-
84	10/02/2019	2	7	8	-
85	10/09/2019	3	7	9	-
86	10/14/2019	1	7	10	14
87	11/06/2019	3	3	3	4
88	12/10/2019	2	2	3	-
89	12/20/2019	-	-	3	-
90	01/21/2020	1	1	2	-
91	02/04/2020	-	1	3	20
92	02/12/2020	1	2	3	19
93	02/25/2020	1	2	3	-
94	02/26/2020	1	2	3	-
95	03/19/2020	1	2	3	4
96	04/27/2020	3	4	7	20
97	06/15/2020	3	6	6	-
98	10/06/2020	3	5	8	-
99	10/08/2020	3	7	8	-
100	10/28/2020	-	4	5	-

[A]: Same analysis as presented in Exhibit 2 of the Fischel Rebuttal Report.

[B]: Reports the number of Dr. [REDACTED] models where the event day was significant under the one-sided parametric test (the baseline test in the [REDACTED] Report). Based on Dr. [REDACTED] backup production.

Exhibit 4

Expansion of Dr. [REDACTED] Analysis of Investment Returns Around Event Days

[A]: Return on Investment by Holding Period

	1 Day	3 Day	7 Day	28 Day	
Average Return - Invest on Event Day:					
Full Period*	3.0%	11.5%	13.2%	63.1%	
Through 2017	5.4%	19.2%	23.5%	122.2%	
After 2017	0.5%	3.4%	2.6%	1.5%	
Top 10 Event Days**	27.3%	102.4%	122.6%	563.8%	
Excl. Top 10 Event Days**	0.3%	1.4%	1.1%	7.4%	
Average Return - Do Not Invest on Event Day:					
Full Period*	0.3%	1.0%	3.5%	21.3%	
Through 2017	0.6%	1.8%	5.8%	34.3%	
After 2017	(0.0%)	(0.1%)	(0.0%)	1.3%	
Average Return - No Event Day in Investment Period:					
Full Period*	0.3%	0.8%	2.6%	7.5%	
Through 2017	0.6%	1.5%	4.2%	6.2%	
After 2017	(0.0%)	(0.2%)	(0.1%)	9.9%	
Investment Return by Event Day:					
1	05/05/2014	3.8%	26.4%	14.5%	(18.6%)
2	06/12/2014	(8.4%)	(9.1%)	(3.9%)	(12.3%)
3	07/21/2014	(0.4%)	14.1%	11.9%	(3.8%)
4	07/29/2014	(1.5%)	(15.7%)	(19.6%)	(19.2%)
5	09/24/2014	1.2%	0.1%	0.7%	12.6%
6	10/27/2014	7.5%	5.0%	2.6%	89.1%
7	11/04/2014	(0.1%)	1.4%	1.9%	161.1%
8	12/03/2014	(0.2%)	4.7%	14.5%	83.9%
9	04/29/2015	3.1%	5.1%	3.7%	(11.0%)
10	05/18/2015	(9.2%)	4.9%	7.6%	28.7%
11	06/09/2015	(0.1%)	0.5%	7.2%	23.4%
12	10/06/2015	6.4%	0.5%	5.0%	3.0%
13	10/13/2015	2.2%	2.6%	(4.1%)	(12.4%)
14	12/16/2015	1.1%	(4.4%)	(7.3%)	(12.4%)
15	01/29/2016	9.9%	2.8%	11.9%	28.9%
16	02/29/2016	0.4%	1.8%	(0.4%)	1.8%
17	04/19/2016	1.9%	6.4%	4.2%	(13.8%)
18	05/26/2016	(1.5%)	(1.3%)	0.9%	12.8%
19	06/13/2016	(0.5%)	17.7%	16.4%	14.0%
20	06/22/2016	5.2%	4.2%	9.7%	3.8%
21	07/18/2016	(0.9%)	(2.2%)	(3.9%)	(8.3%)
22	08/19/2016	(0.0%)	(1.1%)	(0.7%)	35.6%
23	09/15/2016	39.3%	17.7%	14.6%	33.4%
24	09/23/2016	5.4%	14.8%	30.3%	32.9%

Exhibit 4

Expansion of Dr. [REDACTED] Analysis of Investment Returns Around Event Days

[A]: Return on Investment by Holding Period

		1 Day	3 Day	7 Day	28 Day
25	09/28/2016	10.0%	7.3%	(4.6%)	8.0%
26	10/09/2016	3.2%	12.6%	11.4%	12.6%
27	10/20/2016	5.4%	4.0%	2.4%	(9.1%)
28	12/12/2016	0.5%	(0.6%)	(2.5%)	(7.6%)
29	01/09/2017	(1.1%)	2.9%	7.9%	3.4%
30	01/10/2017	8.6%	4.2%	10.1%	4.6%
31	02/15/2017	(2.1%)	(5.5%)	(7.1%)	1.6%
32	02/28/2017	(1.3%)	6.8%	8.0%	71.1%
33	03/02/2017	10.8%	16.5%	20.4%	86.8%
34	03/07/2017	7.9%	7.3%	5.4%	445.2%
35	03/17/2017	(4.3%)	8.1%	65.5%	437.7%
36	03/30/2017	31.5%	116.7%	251.9%	224.8%
37	03/31/2017	57.3%	360.5%	145.9%	162.2%
38	04/26/2017	1.4%	37.5%	66.6%	899.7%
39	05/16/2017	29.3%	34.8%	17.5%	(6.2%)
40	05/18/2017	(7.4%)	(10.8%)	(24.9%)	(29.4%)
41	06/29/2017	(5.4%)	(9.2%)	(8.6%)	(38.0%)
42	07/10/2017	(12.9%)	(12.0%)	(36.5%)	(22.7%)
43	09/11/2017	0.7%	(5.7%)	(16.2%)	31.4%
44	10/10/2017	3.5%	(1.4%)	1.7%	(18.2%)
45	10/13/2017	4.9%	6.3%	(13.4%)	(12.4%)
46	11/16/2017	6.6%	7.3%	12.2%	121.2%
47	11/22/2017	2.4%	4.8%	28.2%	239.2%
48	12/05/2017	(3.0%)	(12.1%)	(0.7%)	842.4%
49	12/08/2017	13.2%	6.5%	287.9%	1,336.3%
50	12/12/2017	48.4%	243.4%	209.3%	877.4%
51	12/19/2017	1.7%	52.9%	43.9%	115.8%
52	01/11/2018	(1.0%)	2.5%	(33.5%)	(63.3%)
53	01/16/2018	(29.8%)	(4.8%)	(19.0%)	(35.7%)
54	01/24/2018	1.5%	(9.0%)	(14.9%)	(18.7%)
55	02/07/2018	(6.8%)	22.9%	32.7%	18.9%
56	02/08/2018	11.2%	47.8%	57.5%	20.3%
57	02/13/2018	(4.6%)	6.5%	5.6%	(25.8%)
58	02/14/2018	10.7%	10.7%	5.8%	(23.3%)
59	02/21/2018	(6.4%)	(8.4%)	(13.1%)	(34.9%)
60	03/01/2018	2.6%	0.4%	(3.7%)	(36.1%)
61	03/06/2018	(3.8%)	(13.9%)	(16.5%)	(47.8%)
62	03/24/2018	(0.3%)	(6.8%)	(20.8%)	43.7%
63	04/11/2018	9.7%	29.7%	33.5%	65.5%
64	04/12/2018	16.5%	17.2%	31.4%	48.7%
65	04/26/2018	6.5%	7.9%	7.3%	(25.1%)
66	05/07/2018	(4.5%)	(8.0%)	(14.4%)	(23.0%)
67	05/14/2018	(0.6%)	(4.2%)	(6.1%)	(21.1%)

Exhibit 4**Expansion of Dr. ██████ Analysis of Investment Returns Around Event Days**

[A]: Return on Investment by Holding Period

		1 Day	3 Day	7 Day	28 Day
68	05/26/2018	0.3%	(9.6%)	2.0%	(20.3%)
69	06/27/2018	3.2%	(0.6%)	6.4%	0.4%
70	08/16/2018	3.7%	16.0%	13.4%	(4.2%)
71	09/05/2018	(14.5%)	(12.1%)	(20.5%)	57.0%
72	09/13/2018	3.9%	4.4%	20.7%	71.2%
73	09/19/2018	1.3%	74.4%	63.7%	46.1%
74	09/28/2018	(0.4%)	7.4%	(2.7%)	(15.4%)
75	10/01/2018	(0.9%)	(9.2%)	(17.1%)	(20.5%)
76	11/14/2018	(7.0%)	(7.5%)	(14.8%)	(40.9%)
77	12/13/2018	(2.4%)	(7.0%)	14.5%	20.7%
78	01/08/2019	0.3%	(8.7%)	(8.4%)	(17.6%)
79	02/05/2019	(0.3%)	(2.9%)	0.8%	1.6%
80	03/12/2019	(0.3%)	0.6%	2.0%	15.1%
81	06/17/2019	4.8%	2.2%	9.5%	(28.3%)
82	09/27/2019	0.1%	(1.0%)	1.7%	14.2%
83	09/30/2019	6.0%	5.0%	6.8%	23.5%
84	10/02/2019	1.6%	1.7%	11.6%	21.0%
85	10/09/2019	1.1%	(2.7%)	3.7%	8.2%
86	10/14/2019	6.7%	2.4%	5.9%	0.9%
87	11/06/2019	2.9%	(8.1%)	(9.6%)	(27.0%)
88	12/10/2019	(0.5%)	(2.5%)	(8.1%)	(1.8%)
89	12/20/2019	2.4%	3.2%	(0.2%)	19.8%
90	01/21/2020	1.7%	(3.1%)	(0.9%)	22.8%
91	02/04/2020	4.8%	10.8%	7.7%	(6.2%)
92	02/12/2020	8.7%	19.5%	6.4%	(24.2%)
93	02/25/2020	(6.4%)	(12.4%)	(11.8%)	(41.8%)
94	02/26/2020	(8.9%)	(6.7%)	(7.5%)	(36.0%)
95	03/19/2020	15.3%	10.6%	12.9%	26.7%
96	04/27/2020	0.6%	15.5%	11.5%	(0.7%)
97	06/15/2020	0.8%	0.9%	(3.1%)	4.6%
98	10/06/2020	(2.2%)	0.3%	2.2%	(6.1%)
99	10/08/2020	1.2%	2.3%	0.4%	(4.3%)
100	10/28/2020	(2.8%)	(5.4%)	(5.3%)	173.7%

[A]: Calculated based on XRP daily returns data from Dr. ██████ backup production.

* Returns reported in Figures 6 and 7 in the ██████ Supplemental Report (pp. 10-11).

** For each holding period, the event days with the 10 highest returns are denoted by blue shaded boxes.

APPENDIX C
Materials Relied Upon

Legal Documents & Expert Reports

Securities and Exchange Commission v. Ripple Labs, et al., First Amended Complaint, February 18, 2021

Expert Report of [REDACTED], Ph.D., October 4, 2021

Expert Rebuttal Report of Daniel R. Fischel, November 12, 2021

Deposition Transcript of [REDACTED], February 18, 2022

Supplemental Expert Report of [REDACTED], Ph.D., February 28, 2022

Academic Literature & Textbooks

David I. Tabak and Frederick C. Dunbar, “Materiality and Magnitude: Event Studies in the Courtroom,” Chapter 19 in Litigation Services Handbook: The Role of the Financial Expert (Roman L. Weil, Michael J. Wagner, and Peter B. Frank Elizabeth A. Evans eds., 3rd ed. John Wiley & Sons, 2001)

Kevin L. Gold, Eric Korman, and Ahmer Nabi, “Federal Securities Acts and Areas of Expert Analysis,” Chapter 27 in Litigation Services Handbook: The Role of the Financial Expert (Roman L. Weil, Daniel G. Lentz, and Elizabeth A. Evans eds., 6th ed. John Wiley & Sons, 2017)

Wenjun Feng, Yiming Wang, and Zhengjun Zhang, “Informed Trading in the Bitcoin Market,” *Finance Research Letters* Vol. 26, 2018, 63-70

Mohammad Hashemi Joo, Yuka Nishikawa, and Krishnan Dandapani, “Announcement effects in the cryptocurrency market,” *Applied Economics* Vol. 52, No. 44, 2020, 4794-4808

Dirk F. Gerritsen, Rick A.C. Lugtigheid, and Thomas Walther, “Can Bitcoin Investors Profit from Predictions by Crypto Experts?” *Finance Research Letters*, 2021 (forthcoming)

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, 154-158

All other documents cited in Appendix B of the Fischel Rebuttal Report.

Exhibit 19

**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.)	
_____)	

**Expert Report of M. Laurentius Marais, PhD
November 12, 2021**

Table of Contents

	Page
I. Introduction and Background.....	1
II. Dr. [REDACTED]'s Event Study	2
A. <i>Nature of the Data Used for the [REDACTED] Event Study</i>	4
B. <i>Dr. [REDACTED]'s Analysis of and Inference from His Event Study</i>	7
III. The News Events Dr. [REDACTED] Identifies Fail To Account for the Great Majority of the “Unusual” XRP Trading Days He Identifies	10
IV. The Overwhelming Preponderance of the Cumulative XRP Returns Associated with the “Unusual” Trading Days Dr. [REDACTED] Identifies Is Not Associated with the Ripple News Event Days He Identifies.....	13
V. Conclusion.....	15

Attachment A: Curriculum Vitae of M. Laurentius Marais

Attachment B: Previous Testimony of M. Laurentius Marais

Attachment C: Materials Considered

Attachment D: [REDACTED] Event Study: Coincidences Between “Unusual” Trading Days and Ripple News Days

Attachment E: [REDACTED] Event Study: Cumulative Investment Returns on “Unusual” Trading Days with and without Coincident Ripple News

I. Introduction and Background

1. I am an Executive Vice President at Compass Lexecon, a consulting firm that specializes in the rigorous empirical analysis of complex issues in business, industry, and government. I hold a PhD degree and master's degrees in business administration, mathematics, and statistics from Stanford University. I have taught and conducted scholarly research while serving on the faculties of the University of Chicago and Stanford University. I am a fellow of the Royal Statistical Society and a member of the American Statistical Association, the Society for Industrial and Applied Mathematics, and the American Economic Association, among other professional societies. I have extensive experience in applying mathematical and statistical theory and methods and in reviewing and assessing the validity of applied mathematical and statistical studies, inferences, and conclusions.

2. My qualifications and a list of my professional publications are shown in my curriculum vitae, which is appended to this report as Attachment A. A list of cases in which I have testified as an expert at trial or by deposition in the last four years is appended to this report as Attachment B.

3. Compass Lexecon bills for my work in this matter at a rate of \$1,040 per hour. My compensation does not depend on the opinions I offer or on the outcome of this proceeding.¹

4. I understand that the Plaintiff in this matter, the U.S. Securities and Exchange Commission ("SEC"), asserts as follows:²

From at least 2013 through the present, Defendants sold over 14.6 billion units of a digital asset security called "XRP," ... without registering their offers and sales of XRP with the SEC ...;

and, accordingly, that

¹ In addition to my own time spent on this matter, Compass Lexecon staff have assisted me with the preparation of this report, at their applicable hourly billing rates.

² First Amended Complaint ("FAC"), ¶¶ 1 and 9.

By engaging in the conduct set forth in this Complaint, Defendants engaged in and are currently engaging in the unlawful offer and sale of securities

I understand further that Plaintiff has engaged Dr. [REDACTED] to determine whether “actions by Ripple Labs, Inc. impact XRP prices.”³ Based on what he refers to as the results of his “well-accepted event study methodology,” Dr. [REDACTED] reached the opinion that “XRP prices react to certain news and public statements about Ripple’s actions,” particularly “news of important milestones in the history of Ripple Labs and for announcements more directly related to XRP.”⁴

5. Counsel for Ripple Labs Inc. (“Ripple”) asked me to assess, from the perspective of my areas of expertise in applied mathematics and statistics, including the econometric methods used for events studies, whether the analysis, conclusions, and opinions in Dr. [REDACTED]’s report are reliable and supported by well-accepted statistical and econometric principles and methods, and whether, based on my expertise, his opinions support the contention that, in economic substance, movements in XRP prices solely or predominantly reflect responses to disclosures about Ripple’s actions.

II. Dr. [REDACTED]’s Event Study

6. In relevant part, Dr. [REDACTED] defines his assignment from the Plaintiff as follows:⁵

I have been retained by the [SEC] ... to perform an empirical analysis of XRP’s price movements and assess whether actions by Ripple Labs, Inc. impact XRP prices.

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

³ Amended Expert Report of [REDACTED], Ph.D., October 6, 2021 (“[REDACTED] Report”), ¶ 10.

⁴ [REDACTED] Report, ¶ 12(a).

⁵ [REDACTED] Report, ¶¶ 10 and 30.

tested ... by evaluating the likelihood that news about Ripple Labs would occur at the same time as a significant XRP price change.

Based on his “empirical analysis of XRP’s price movements,” Dr. [REDACTED] opines, in relevant part, as follows:⁶

I find statistically significant evidence that XRP prices react to news about Ripple’s actions.... The results hold for nearly all statistical models I examine at scientifically accepted levels of statistical significance.... Taken together, this evidence indicates that XRP prices react to the news of actions by Ripple Labs.

7. This language invites a reader of the [REDACTED] Report to conclude that Dr. [REDACTED] has identified statistical “evidence” showing that XRP price movements are driven largely—and causally—by actions taken by Ripple. As I explain below, Dr. [REDACTED]’s event study is not designed to investigate this proposition and does not, in fact, support such a conclusion. Properly interpreted, Dr. [REDACTED]’s event study rebuts rather than supports the conclusion that the price of XRP is primarily a function of disclosures about Ripple’s actions.

8. Dr. [REDACTED] summarizes the statistical support for his opinion as follows:⁷

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.

⁶ [REDACTED] Report, ¶ 12(a).

⁷ [REDACTED] Report, ¶ 12(a).

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.

9. In the following subsections, I provide a brief explanation of the methodology by which Dr. █████ created the table above, on which Dr. █████ bases the opinion quoted in ¶ 6 above.

A. Nature of the Data Used for the █████ Event Study

10. The █████ event study involves data on XRP market prices on approximately 2,740 consecutive trading days^{8, 9} during the period February 4, 2014 – August 5, 2021. For each trading day in this range, Dr. █████ obtained the

⁸ Some of Dr. █████’s 20 predictive models are limited to subperiods of the full █████ analysis period due to data limitations.

⁹ Dr. █████ further limits the time period for his analyses based on occurrence of specific Ripple news events. More specifically, he drops days before the first news day and days after the last news day of each █████ news events category. Dr. █████ provides no justification for his decision to exclude those days, and none is self-evident. I did not apply Dr. █████’s exclusions in my own analyses reported here.

reported “closing” price of XRP in U.S. dollars. For all but the first trading day, he then calculated the corresponding daily percentage return on a unit of XRP for that day. For example, if XRP closed at \$0.90 on day 0 and \$1.00 on day 1, the day 1 return is 11.1% ($= \$1.00/\$0.90 - 1$).¹⁰

11. By analogy to well-established methods and accepted academic research, as applied to the study of price movements for equity securities traded on public exchanges, it is reasonable to hypothesize that these daily XRP returns are driven in part by noise trading but also in part by information-based trading in response to both XRP-specific information and more general, market-influencing information that affects prices of cryptocurrencies and other assets more broadly. The event study methodology applied to price movements of equity security returns typically attempts to partition such returns data into one component that reflects the impact of market-wide information, from which the “normal” or expected return on the same day can be estimated, and a second, residual, component that remains after removing the market-wide components and pertains specifically to the individual security of interest: the so-called “abnormal return.”

12. Dr. ██████ attempts to apply an analogous approach to his event study in this matter. He posits 20 distinct statistical regression models¹¹ for removing from each day’s total XRP return the component due to market-wide effects, leaving an XRP-specific “abnormal return” (*i.e.*, residual percentage change) for each trading day. Each of his 20 alternative statistical models produces a series of daily abnormal XRP returns for each day in his analysis period.

13. For each of his 20 models, Dr. ██████ also posits four distinct approaches for identifying what he labels “significantly positive” return days (hereinafter “Unusual” trading days): a “Parametric Approach” and a “Nonparametric

¹⁰ More precisely, Dr. ██████ actually uses an essentially equivalent formula that defines returns in terms of the natural logarithms of price ratios.

¹¹ ██████ Report, ¶¶ 39–42.

Approach,” each implemented on either a “one-sided ” or a “two-sided” basis, for a total of four “approaches.”¹² Thus, Dr. █████ posits a total of 80 distinct methods (= 20 models × 4 approaches) for identifying a particular daily XRP return as Unusual or, alternatively, Regular (shorthand for *not* Unusual).¹³ In sum, Dr. █████ employs 80 alternative methods to convert the single series of XRP daily closing prices to 80 alternative corresponding series of binary classifications of each XRP trading day as “Unusual” or “Regular.”¹⁴

14. The stated objective of Dr. █████’s event study is to detect any association between news events concerning Ripple’s actions and Unusual XRP pricing. Thus, the second major data input of his event study consists of labeling each XRP trading day as either involving or not involving a Ripple news event. For this purpose, Dr. █████ subjectively creates five main categories of Ripple news events, which he labelled: Key Milestones, Digital Asset Trading Platform Listings, Customer and Product Announcements, Commercialization Initiatives, and an aggregate category of “Select” events that includes all events in the first four categories.¹⁵ Dr. █████ then determines, based on his own subjective judgments, without apparent reliance on any generally accepted statistical or economic methodology, on which of the trading days in his analysis there was a significant, new Ripple news event. Each category thus yields a corresponding series of binary

¹² █████ Report, ¶¶ 62–63.

¹³ I use the descriptive terms “Unusual” and “Regular” in my discussion of Dr. █████’s event study rather than his own term (“significantly positive”) because “statistical significance” (at a specified level, typically 5%) is an unambiguously defined term of art, while Dr. █████’s procedure involves many more steps and choices than a straightforward textbook determination of statistical significance.

¹⁴ For determining whether a trading day is “Unusual,” Dr. █████ focuses on the three-day period starting on that day. He flags a trading day as “Unusual” if any of the one-day, two-day, or three-day returns is statistically significantly positive and none of the three is statistically significantly negative (█████ Report, ¶ 63).

¹⁵ █████ Report at 3, Figure 1. “Select” news events also include one additional category of news: Acquisitions & Investments.

classifications for each XRP trading day as “Yes” or “No,” reflecting the occurrence (or not) of what Dr. █████ determined to be a Ripple news event.

15. In sum, therefore, Dr. █████ posits a total of 400 alternative configurations (= 80 methods × 5 categories of news events) of methods and data for analyzing XRP pricing in relation to Ripple news events.

B. Dr. █████’s Analysis of and Inference from His Event Study

16. In this subsection, I use one of Dr. █████’s 400 configurations of methods and data as an illustrative example to explain his basis for the conclusion he draws from his event study, as well as my assessment of the validity and scope of his conclusion. Specifically, I use his Model 5 in conjunction with his “one-sided” “Parametric Approach” in relation to his “Key Milestones” category of Ripple news events.

17. Table 1 below shows the disposition of the 2,007 trading days in this variant of the █████ event study.¹⁶

Table 1: █████ Analysis of Ripple Key Milestone News Events in Relation to Unusual XRP Return Days as Identified by Dr. █████’s Model 5 and One-Sided Parametric Approach

		Daily XRP Return		All
		Unusual	Regular	
News Event?	Yes	4	1	5
	No	179	1,823	2,002
	All	183	1,824	2,007

Source: █████ backup.

The table shows that Dr. █████’s methods classified a total of 183 (9.1%) of the 2,007 trading days as Unusual, and a total of five trading days (top row, right-hand column) as containing a Key Milestone news event. Of these five news days, *four* days with Key Milestone events (80% = 4/5) coincided with Unusual trading days.

¹⁶ Here too (see fn. 9 above), I do not adopt Dr. █████’s implicit assumption that days before the first Key Milestone news event (May 18, 2015) and days after the last Key Milestone news event (December 20, 2019) are irrelevant to his analysis.

18. Dr. ██████'s analysis of this observed outcome consists essentially of recognizing that the Ripple news days tend to coincide with Unusual XRP trading days. Put differently, it is extremely unlikely that a sample of only five trading days chosen *at random* from among 2,007 trading days (including only 183 Unusual trading days) will be found to contain as many as *four* Unusual days. Accordingly, Dr. ██████ concludes that this observed coincidence is a “statistically significant” departure from complete independence between Ripple news days and Unusual XRP trading days, indicating that there existed a nonzero correlation between Unusual XRP returns and the Key Milestones category of Ripple news events.

19. One striking feature of Dr. ██████'s analysis of the tallies shown in Table 1 above—not highlighted by Dr. ██████—is that it offers no account of what factors or events caused the remaining 179 (= 183 – 4) Unusual trading days to have Unusual XRP returns. Put differently, Dr. ██████'s analysis advances an explanation for four out of 183 Unusual XRP returns but is silent about any causation of the great majority¹⁷ of the Unusual XRP returns identified by that same analysis.

20. Nothing in Dr. ██████'s analysis rules out that the unaccounted-for factors driving the 179 *non*-coincident Unusual returns—rather than the Ripple news event—may also have operated during the four *coincident* trading days, and may thus have driven the Unusual returns on those days as well, in whole or in part. In sum, the association between Dr. ██████'s subjectively selected days with Ripple news events and Unusual trading days, as a matter of fundamental statistical principles and common sense alike, does not per se establish that the Ripple Key Milestones news *caused* the abnormal XRP returns on the four

¹⁷ There are almost 45 times as many *non*-coincident Unusual returns as *coincident* Unusual returns.

coincident days. Thus, Dr. █████ overreaches in his apparent *causal* claim that “XRP prices *react to* the news of actions by Ripple Labs.”¹⁸

21. Simple tallies of news event occurrences with and without coincidences with Unusual XRP returns, lacking any consideration of the magnitudes of these returns, provide no indication of the economic magnitude of the disparity between the four coincident and 179 *non*-coincident trading days. To illustrate this point, if \$1.00 were invested and reinvested for the four coincident days found in Dr. █████’s study (plus the two days following each coincident day)¹⁹, the proceeds would be an accumulated total value of \$1.99.²⁰ In striking contrast, the same dollar invested and reinvested for the 179 *non*-coincident Unusual trading days (plus the two days following each non-coincident day) would have compounded to a total value of \$4,198,673, more than 2.1 *million* times \$1.99.²¹ This overwhelming disparity suggests that, from the perspective of a speculative XRP investor, the 179 Unusual return days *without* Ripple news were of considerably greater consequence than the four Unusual return days *with* Ripple news.

22. In sum, Ripple news events are associated with a relative handful of the Unusual XRP returns in Dr. █████’s analysis, while the great majority of Unusual days and the overwhelming preponderance of compounded investment returns associated with Unusual trading days occurred on days that did *not* coincide with Ripple news events identified by Dr. █████.

¹⁸ █████ Report, ¶ 12(a) (emphasis added).

¹⁹ I use three-day windows for this analysis to parallel Dr. █████’s reliance on three-day windows for his identification of Unusual trading (see fn. 14 above).

²⁰ For example, \$1.99 represents the compounded final hypothetical proceeds, at the end of the final day among the four Unusual trading days (plus the two days following each) that coincided with Ripple news events in Dr. █████’s Key Milestones category, from purchasing \$1.00 in XRP at the last closing price before the first of these Unusual days, selling at the closing price two days later, and then reinvesting the proceeds in the same way for each Unusual day in succession.

²¹ See Table 3 and ¶ 28 below.

III. The News Events Dr. ██████ Identifies Fail To Account for the Great Majority of the “Unusual” XRP Trading Days He Identifies

23. The Model 5 example from § II.B above represents just one of the 400 configurations of the ██████ event study (see ¶¶ 12–15 above). Table 2 below summarizes those 100 among these 400 configurations that use the first of Dr. ██████’s four distinct analytical approaches (described in ¶ 13 above). The results of the other three ██████ approaches are displayed in the same format in Attachment D. The Model 5 example above appears in row 5, under “Key Milestones.”

Table 2

**Event Study: Coincidences Between "Unusual" Trading Days and Ripple News Days
"Unusual" Trading Days Identified by Dr. [REDACTED]'s "One-Sided Parametric Approach"**

Ripple News Event Category:			Key Milestones (Max N=8)			Digital Asset Trading Platform Listings (Max N=11)			Customer and Product Announcements (Max N=73)			Commercialization Initiatives (Max N=7)			"Select" Categories (i.e., All News Dates) (Max N=105)		
Model No.	All Trading Days in Analysis Period	"Unusual" Trading Days in Analysis Period	"Unusual" Trading Days ... Coincident			"Unusual" Trading Days ... Coincident			"Unusual" Trading Days ... Coincident			"Unusual" Trading Days ... Coincident			"Unusual" Trading Days ... Coincident		
			with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days
1	2,740	235	6	229	2	5	230	6	12	223	61	3	232	4	24	211	81
2	2,723	204	5	199	3	4	200	7	13	191	60	2	202	5	24	180	81
3	2,740	238	5	233	3	5	233	6	12	226	61	3	235	4	25	213	80
4	2,723	212	4	208	4	4	208	7	11	201	62	2	210	5	21	191	84
5	2,007	183	4	179	1	5	178	6	12	171	48	3	180	4	24	159	66
6	1,990	146	3	143	2	4	142	7	12	134	48	2	144	5	21	125	69
7	2,007	161	4	157	1	4	157	7	12	149	48	3	158	4	22	139	68
8	1,990	146	3	143	2	4	142	7	12	134	48	2	144	5	20	126	70
9	2,740	244	5	239	3	4	240	7	13	231	60	3	241	4	25	219	80
10	2,723	221	4	217	4	4	217	7	12	209	61	2	219	5	22	199	83
11	2,739	237	6	231	2	5	232	6	13	224	60	3	234	4	25	212	80
12	2,722	213	4	209	4	5	208	6	14	199	59	3	210	4	26	187	79
13	2,739	232	5	227	3	5	227	6	12	220	61	3	229	4	25	207	80
14	2,722	220	4	216	4	5	215	6	11	209	62	3	217	4	24	196	81
15	2,006	176	4	172	1	4	172	7	12	164	48	3	173	4	23	153	67
16	1,989	162	3	159	2	5	157	6	12	150	48	2	160	5	22	140	68
17	2,006	167	4	163	1	4	163	7	10	157	50	3	164	4	21	146	69
18	1,989	158	3	155	2	5	153	6	11	147	49	2	156	5	21	137	69
19	2,739	233	5	228	3	5	228	6	12	221	61	3	230	4	25	208	80
20	2,722	227	5	222	3	5	222	6	13	214	60	3	224	4	25	202	80

Source: [REDACTED] backup.

Notes: Median ratio of the number of non-coincident Unusual days to the number of coincident Unusual days is 40.3, 5th percentile is 6.6, 95th percentile is 79.2.

24. The 20 rows of the table correspond to Dr. ██████'s 20 Models (described in ¶ 12 above). The columns of the table are grouped into five categories that correspond to Dr. ██████'s five categories of Ripple news events, from Key Milestones on the left to ██████ "Select" on the right (¶ 14 above). Within each of these groupings, there are three columns, representing counts of Unusual trading days that *coincide* with Ripple news days in the indicated category, Unusual trading days that do *not* coincide with Ripple news days in the indicated category, and Ripple news days that coincide with Regular (that is, *not* Unusual) trading days, respectively.

25. The ratio of "almost 45 times as many *non*-coincident Unusual returns as *coincident* Unusual returns" from fn. 17 above is that of 179 to 4 in the first and second columns of row 5 under the header Key Milestones. This ratio reflects the disparity between Unusual returns without an apparent association with Ripple news identified by Dr. ██████, and those that *do* coincide with such news. It can be calculated for each of the 100 ██████ analysis configurations shown in the table. The median of these 100 ratios is 40.3, and 90% of them fall in the range from 6.6 to 79.1. This shows that the predominance of non-coincident Unusual returns over coincident Unusual returns that is quantified by the ratio of "almost 45 times" in the Model 5 example in § II.B above is no aberrant outlier limited to that particular example; rather, this predominance is pervasive throughout the many configurations of Dr. ██████'s event study (because "almost 45 times" is well within the range "from 6.6 to 78.4").

26. In sum, Ripple news events are associated with a relative handful of the Unusual XRP returns in Dr. ██████'s analysis, while the great majority of Unusual returns occurred on days that did *not* coincide with Ripple news events identified by Dr. ██████.

IV. The Overwhelming Preponderance of the Cumulative XRP Returns Associated with the “Unusual” Trading Days Dr. ██████ Identifies Is Not Associated with the Ripple News Event Days He Identifies

27. Table 3 below parallels Table 2 above but summarizes cumulative, compounded Unusual XRP returns instead of the simple tallies of Unusual trading days discussed in § III above. Table 3 again summarizes those 100 ██████ event study configurations that use the first of Dr. ██████’s four distinct analytical approaches (described in ¶ 13 above). The results of the other three ██████ approaches are displayed in the same format in Attachment E.

Table 3

Event Study: Cumulative Investment Returns on "Unusual" Trading Days With and Without Coincident Ripple News Accumulated over Three-Day Holding Periods at Each "Unusual" Trading Day Identified by Dr. [REDACTED]'s "One-Sided Parametric Approach"

Ripple News Event Category:		Key Milestones					Digital Asset Trading Platform Listings			Customer and Product Announcements			Commercialization Initiatives			"Select" Categories (i.e., All News Dates)		
Model No.	in [REDACTED] All Trading Days Analysis Period	"Unusual" Trading Days ...		"Unusual" Trading Days ...		"Unusual" Trading Days ...		"Unusual" Trading Days ...		"Unusual" Trading Days ...		"Unusual" Trading Days ...		"Unusual" Trading Days ...		"Unusual" Trading Days ...		
		in [REDACTED] Analysis Period	with Coincident Ripple News	No Coincident Ripple News	with Coincident Ripple News	No Coincident Ripple News	with Coincident Ripple News	No Coincident Ripple News	with Coincident Ripple News	No Coincident Ripple News	with Coincident Ripple News	No Coincident Ripple News	with Coincident Ripple News	No Coincident Ripple News	with Coincident Ripple News	No Coincident Ripple News	with Coincident Ripple News	No Coincident Ripple News
1	\$34.26	\$4,404,943,559	\$2.05	\$1,814,870,743	\$1.08	\$2.45	\$1,939,936,630	\$0.51	\$91.55	\$29,032,638	\$0.51	\$3.80	\$1,158,169,642	\$1.06	\$586.66	\$2,939,472	\$0.33	
2	\$26.06	\$274,588,059	\$1.52	\$152,500,970	\$1.46	\$2.18	\$126,121,683	\$0.57	\$107.28	\$1,560,391	\$0.44	\$2.49	\$71,973,458	\$1.62	\$510.31	\$212,832	\$0.38	
3	\$34.26	\$1,623,199,077	\$2.04	\$687,687,307	\$1.09	\$2.45	\$714,856,684	\$0.51	\$108.63	\$8,762,771	\$0.43	\$3.80	\$426,779,564	\$1.06	\$713.15	\$885,706	\$0.27	
4	\$26.06	\$82,554,034	\$1.52	\$47,145,813	\$1.47	\$2.18	\$37,918,086	\$0.57	\$85.93	\$590,142	\$0.54	\$2.49	\$21,638,593	\$1.62	\$372.69	\$90,291	\$0.52	
5	\$92.55	\$8,352,186	\$1.99	\$4,198,673	\$1.03	\$2.45	\$3,678,302	\$0.51	\$75.49	\$64,976	\$0.48	\$3.80	\$2,195,998	\$1.06	\$482.20	\$7,776	\$0.29	
6	\$70.39	\$259,267	\$1.48	\$175,689	\$1.39	\$2.18	\$119,084	\$0.57	\$75.49	\$2,735	\$0.48	\$2.49	\$67,958	\$1.62	\$318.56	\$495	\$0.44	
7	\$92.55	\$908,467	\$1.99	\$456,689	\$1.03	\$2.18	\$450,661	\$0.57	\$64.68	\$8,595	\$0.56	\$3.80	\$238,859	\$1.06	\$358.01	\$1,204	\$0.39	
8	\$70.39	\$124,990	\$1.48	\$84,698	\$1.39	\$2.18	\$57,409	\$0.57	\$64.68	\$1,604	\$0.56	\$2.49	\$32,762	\$1.62	\$266.41	\$302	\$0.53	
9	\$34.26	\$311,247,562	\$2.04	\$131,863,677	\$1.09	\$2.18	\$154,399,767	\$0.57	\$117.43	\$1,849,615	\$0.40	\$3.80	\$81,834,755	\$1.06	\$684.41	\$210,117	\$0.28	
10	\$26.06	\$35,805,980	\$1.52	\$20,448,450	\$1.47	\$2.18	\$16,446,128	\$0.57	\$92.90	\$342,822	\$0.50	\$2.49	\$9,385,260	\$1.62	\$402.89	\$52,335	\$0.48	
11	\$34.91	\$4,993,983,115	\$2.05	\$2,057,559,586	\$1.08	\$2.45	\$2,199,349,582	\$0.51	\$125.88	\$31,311,651	\$0.37	\$3.80	\$1,313,042,848	\$1.06	\$806.64	\$3,170,216	\$0.24	
12	\$26.55	\$175,818,959	\$1.43	\$107,244,603	\$1.55	\$2.45	\$71,693,590	\$0.51	\$100.03	\$1,059,140	\$0.47	\$3.80	\$46,227,194	\$1.06	\$501.64	\$141,294	\$0.39	
13	\$34.91	\$1,518,622,995	\$2.04	\$643,382,425	\$1.09	\$2.45	\$668,801,390	\$0.51	\$118.16	\$8,391,536	\$0.40	\$3.80	\$399,283,901	\$1.06	\$775.67	\$848,183	\$0.25	
14	\$26.55	\$104,448,189	\$1.52	\$59,649,354	\$1.47	\$2.45	\$42,590,774	\$0.51	\$85.93	\$602,651	\$0.54	\$3.80	\$27,462,037	\$1.06	\$542.89	\$74,866	\$0.36	
15	\$87.93	\$5,910,838	\$1.99	\$2,971,398	\$1.03	\$2.05	\$2,828,966	\$0.61	\$70.23	\$69,101	\$0.52	\$3.80	\$1,554,107	\$1.06	\$375.27	\$8,987	\$0.37	
16	\$66.87	\$603,304	\$1.48	\$408,821	\$1.39	\$2.45	\$246,009	\$0.51	\$75.49	\$4,804	\$0.48	\$2.49	\$158,135	\$1.62	\$358.83	\$775	\$0.39	
17	\$87.93	\$939,991	\$1.99	\$472,537	\$1.03	\$2.18	\$466,299	\$0.57	\$40.79	\$13,752	\$0.89	\$3.80	\$247,147	\$1.06	\$230.69	\$1,891	\$0.61	
18	\$66.87	\$164,742	\$1.48	\$111,636	\$1.39	\$2.45	\$67,177	\$0.51	\$60.29	\$2,331	\$0.60	\$2.49	\$43,181	\$1.62	\$285.81	\$363	\$0.49	
19	\$34.91	\$327,751,160	\$2.04	\$138,855,619	\$1.09	\$2.45	\$144,341,573	\$0.51	\$92.90	\$1,917,968	\$0.50	\$3.80	\$86,173,963	\$1.06	\$609.85	\$193,431	\$0.32	
20	\$26.55	\$30,566,988	\$1.52	\$17,376,707	\$1.46	\$2.45	\$12,464,282	\$0.51	\$93.32	\$277,056	\$0.50	\$3.80	\$8,036,824	\$1.06	\$454.49	\$37,665	\$0.43	

Source: [REDACTED] backup.

Notes: Median ratio of the cumulative (3-day window) return associated with non-coincident Unusual days to the cumulative (3-day window) return associated with coincident Unusual days is 109,684, 5th percentile is 5.8, 95th percentile is 340,794,133.

28. The structure of this table parallels that of Table 2 as explained in ¶¶ 23–24 above. The ratio of “more than 2.1 *million* times” from ¶ 21 above is that of \$4,198,673 to \$1.99 in the first and second columns of row 5 under the header Key Milestones. This ratio again reflects the disparity between Unusual returns without an apparent association with Ripple news events identified by Dr. █████, and those that *do* coincide with such news events. It can again be calculated for each of the 100 █████ analysis configurations shown in the table. The median of these 100 values is 109,684, and 90% of them fall in the range from 5.8 to 340.8 million. Thus, the predominance of *non*-coincident Unusual returns over *coincident* Unusual returns from the Model 5 example in § II.B above is again no aberrant outlier; rather, this predominance is pervasive throughout the many configurations of Dr. █████’s event study (because “more than 2.1 million times” is well within the range “from 8.0 to 336.8 million”).

29. In sum, Ripple news events are associated with a relative handful of the Unusual XRP returns in Dr. █████’s analysis, while the overwhelming preponderance of compounded investment returns associated with Unusual trading days occurred on days that did *not* coincide with Ripple news events identified by Dr. █████.

V. Conclusion

30. In sum, it would be wrong to interpret Dr. █████’s event study as establishing that XRP price movements are essentially a function of Ripple’s actions. Instead, the █████ event study cannot prove a causal relationship between Ripple’s actions and XRP price movements. And, even if it could do so, the █████ 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.

31. 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 November 12, 2021.

M. L. Marais

M. Laurentius Marais

Attachment A:

Curriculum Vitae of M. Laurentius Marais

November 2021

M. LAURENTIUS MARAIS

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332 S Michigan Ave, Ste 1300
Chicago, IL 60604

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EDUCATION:

PhD Stanford University (Business Administration, Mathematics), 1985
MS Stanford University (Statistics), 1983
MS Stanford University (Mathematics), 1976
BSc Stellenbosch University (Mathematics, Applied Mathematics, Computer Science), 1973

EMPLOYMENT:

2019–present Compass Lexecon, Executive Vice President
1993–2019 William E. Wecker Associates, Vice President and Principal Consultant
1994–1998 Stanford University School of Law, Consulting Professor
1992–1993 William E. Wecker Associates, Senior Consultant
1982–1991 University of Chicago Graduate School of Business, Instructor,
Assistant Professor, and Associate Professor

ACTIVITIES:

Referee for: *Journal of Business and Economic Statistics*
Journal of Financial Research
Journal of Accounting Research
Journal of Accounting and Economics
The Accounting Review
Contemporary Accounting Research
Journal of Money, Credit and Banking

Editorial Board, *Journal of Accounting Research*, 1987-1992

Member of: American Statistical Association
Royal Statistical Society
Mathematical Association of America
Society for Industrial and Applied Mathematics
American Accounting Association
American Economic Association

PUBLICATIONS and WORKING PAPERS:

The experimental design of classification models: an application of recursive partitioning and bootstrapping to commercial bank loan classifications, (with James M. Patell and Mark A. Wolfson), *Journal of Accounting Research*, 1984.

An application of the bootstrap method to the distribution of squared, standardized market model prediction errors, *Journal of Accounting Research*, 1984.

An analysis of a multivariate regression model in the context of a regulatory event study by computer intensive resampling, Working Paper, Institute of Professional Accounting, University of Chicago, July 1986.

A note on the algebraic and statistical properties of the multivariate market model, Working Paper, Institute of Professional Accounting, University of Chicago, September 1986.

On drawing inferences about market reactions to the regulation of accounting for oil and gas exploration: An application of computer intensive resampling methods, Working Paper, Institute of Professional Accounting, University of Chicago, September 1986.

On detecting abnormal returns to a portfolio of nonsynchronously traded securities, Working Paper, Institute of Professional Accounting, University of Chicago, October 1986.

Reduced demands on recovery room resources with Diprivan compared to thiopental-isoflurane, (with Michael W. Maher et al.), *Anesthesiology Review*, January/February 1989.

Wealth effects of going private for senior securities, (with Katherine Schipper and Abbie J. Smith), *Journal of Financial Economics*, 1989.

Consequences of going-private buyouts for public debt and preferred stock: 1974 to 1985, (with Katherine Schipper and Abbie J. Smith), in *Proceedings of the 25th Annual Conference on Bank Structure and Competition: Banking System Risk - Charting a New Course*, Federal Reserve Bank of Chicago, 1989.

Discussion of 'Post-earnings-announcement drift: Delayed price response or risk premium?', *Journal of Accounting Research*, 1989.

Using relative productivity assessments for allocating housestaff to departments, (with Michael W. Maher, Michael F. Roizen, et al.), *Medical Care*, 1990.

An adaptable computer model of the economic effects of alternative anesthetic regimens in outpatient surgery, (abstract; with Michael W. Maher et al.), *Anesthesiology (Supplement)*, September 1990.

On the finite sample performance of estimated generalized least squares in seemingly unrelated regressions: nonnormal disturbances and alternative standard error estimators, Working Paper, Institute of Professional Accounting, University of Chicago, January 1991.

Exploiting tax attributes of spinoffs to structure takeovers and takeover-related defenses, (with Katherine Schipper), Working Paper, Institute of Professional Accounting, University of Chicago, August 1991.

Technological innovation and firm decision-making: accounting, finance and strategy, (with Paul J. H. Schoemaker), Working Paper, Institute of Professional Accounting, University of Chicago, September 1991.

Process-oriented activity-based costing, (with Michael W. Maher), Working Paper, Institute of Professional Accounting, University of Chicago, June 1992.

A field study on the limitations of activity-based costing when resources are provided on a joint and indivisible basis (with Michael W. Maher), *Journal of Accounting Research*, 1998.

Correcting for omitted-variables and measurement-error bias in regression with an application to the effect of lead on IQ (with William E. Wecker), *Journal of the American Statistical Association*, June 1998.

Event study methods: detecting and measuring the security price effects of disclosures and interventions (with Katherine Schipper), in *Litigation Services Handbook: The Role of the Financial Expert, Cumulative Supplement*, 3rd ed., John Wiley & Sons, 2005.

Estimating Cost Behavior (with Michael W. Maher), in *Handbook of Cost Management*, 2nd ed., John Wiley & Sons, 2005.

Audit Committee Financial Literacy: A Work in Progress (with Douglas J. Coates and Roman L. Weil), *Journal of Accounting Auditing and Finance*, March 2007.

Statistical Estimation of Incremental Cost from Accounting Data (with William E. Wecker and Roman L. Weil), in *Litigation Services Handbook: The Role of the Financial Expert*, 6th Ed., John Wiley & Sons, 2017.

The Length of Civil Trials and Time to Judgment in Canada: A Case for Time Limited Trials (with Kevin LaRoche and David Salter), *Canadian Bar Review*, September 2021.

Attachment B:

Previous Testimony of M. Laurentius Marais

M. Laurentius Marais
Deposition and Trial Testimony
January 2017 – November 2021

1. Glaxosmithkline v. Teva Pharmaceuticals. United States District Court for the District of Delaware. Civil Action No. 14-878-LPS-CJB.
2. In Re Testosterone Replacement Therapy Products Liability Litigation. United States District Court for the Northern District of Illinois. MDL No. 2545. Master Docket Case No. 1:14-cv-01748.
3. Guarantee Trust Life Insurance v. Platinum Services, American Arbitration Association. Case No. 01-15-0005-9328.
4. Fairfield Sentry Limited v. PriceWaterhouseCoopers. Ontario Superior Court of Justice. Case No. CV-14-10550-00CL.
5. Graci v. Omega Flex. United States District Court for the District of Connecticut. Case No. 3:15-cv-00513.
6. The People of the State of California v. General Motors. California Superior Court of Orange County. Case No. 30-2014-00731038-CU-BT-CXC.
7. Wolf v Thomas. California Superior Court of Sonoma County. Case No. SCV-251845.
8. Mitchell v AbbVie. United States District Court for the Northern District of Illinois. Case No. 14 C 9178.
9. Couch v. AbbVie. Circuit Court of Cook County, Illinois. Case No. 2014 L 005859.
10. Super98 v. Delta Air Lines. United States District Court for the Northern District of Georgia, Atlanta Division. Case No. 1:16-cv-1535-LMM.
11. Risperdal and Invega Product Liability Cases. California Superior Court of Los Angeles County. Judicial Council Coordination Proceeding No. 4775.
12. Konrad v. AbbVie. United States District Court for the Northern District of Illinois, Eastern Division. Case No. 15 C 966.
13. Jordan v. Nationstar and Federal Housing Finance Agency, United States District Court for the Eastern District of Washington. Case No. 2:14-CV-00175-TOR.
14. Cotromano v. United Technologies and Adinolfi v. United Technologies. United States District Court for the Southern District of Florida. Case Nos. 13-CV-80928-RYSKAMP and 10-80840-CIV-KLR.
15. Nolte v AbbVie. United States District Court for the Northern District of Illinois, Eastern Division. Case No. 14 C 8135.
16. In Re General Motors LLC Ignition Switch Litigation. United States District Court for the Southern District of New York. Case No. 14-MD-2543.

17. Pinares v. United Technologies. United States District Court for the Southern District of Florida. Case No. 10-CIV-80883-Marra/Hopkins.
18. Reinard v. Crown Equipment. Iowa District Court for Black Hawk County. Case No. LACV130248.
19. Snyder v. California Insurance Guarantee Association. California Superior Court of Alameda County. Case No. RG-13-666656.
20. United States v. J-M Manufacturing. Case No. CV 6-55-GW (cf. No. 5:06-cv-00055-GW-PJW) (C.D. Cal.), Phase 2
21. Williams v. Crown Equipment. Superior Court of New Jersey, Camden County. Case No. L-511-16.
22. In Re National Prescription Opiate Litigation. United States District Court for the Northern District of Ohio, Eastern Division. MDL No. 2804.
23. State of Oklahoma v. Purdue Pharma. District Court of Cleveland County. Case No. CJ-2017-816.
24. George v. Omega Flex. United States District Court for the Western District of Missouri. Case no. 6:17-CV-03114-MDH.
25. Noven Pharmaceuticals v. Amneal Pharmaceuticals. United States District Court for the District of Delaware. Case No. 1:18-cv-699-LPS.
26. In Re Opiate Litigation. Supreme Court of the State of New York, County of Suffolk. Index No. 400000/2017.
27. KAIFI LLC v. AT&T. United States District Court for the Eastern District of Texas, Marshall Division. Case No. 2:19-CV-138.
28. Club Champion v. True Spec Golf. United States Patent and Trademark Office, Patent Trial and Appeal Board. Case No. IPR2019-01148.
29. Lundquist and Lara v. First National Insurance, LM General Insurance, and CCC Information Services. United States District Court for the Western District of Washington. Case No. 3:18-cv-05301-RJB.
30. Syngenta Crop Protection v. FMC. American Arbitration Board. Case No. 01-19-002-4208.
31. MV3 Partners LLC v. Roku, Inc. United States District Court for the Western District of Texas, Waco Division. Case No. 6:18-cv-00308.
32. Par Pharmaceuticals v. Amneal Pharmaceuticals. United States District Court for the District of Delaware. Case No. 18-cv-2032-CFC.
33. Arendi S.á.r.l. v. LG Electronics, Apple, Blackberry, Motorola, Sony, Google, and Oath. United States District Court for the District of Delaware. Case Nos. 12-1595-LPS–12-1597-LPS, 12-1601-LPS, 12-1602-LPS, 13-919-LPS, and 13-920-LPS.
34. People of the State of North Carolina v. JUUL Labs. General Court of Justice, Superior Court Division, Durham County. File No. 19CVS2885.

35. Jama v. State Farm Fire and Casualty, and Ngethpharat v. State Farm Fire and Casualty. United States District Court for the Western District of Washington at Seattle. Case Nos. 2:20-cv-00652-MJP and 3:20-cv-00454-MJP.
36. Olberg v. Allstate. United States District Court for the Western District of Washington. Case No. 18-cv-00573-JCC.
37. Treehouse v. Valve Corporation. United States District Court for the Western District of Washington. Case No. 2:17-cv-01860-RAJ.
38. State of New Hampshire v. Johnson and Johnson. New Hampshire Superior Court. Case No. 217-2018-CV-00678.
39. Fintiv v. Apple. United States District Court for the Western District of Texas, Austin Division. Case No.: 1:19-cv-01238.
40. State of California v. Purdue Pharma et al. California Superior Court, Orange County. Case No. 30-2014-00725287-CU-BT-CXC.
41. Vallee v. Crown Equipment. United States District Court for the Eastern District of Louisiana. Case No. 20-1571.
42. County of Dallas v. Purdue Pharma et al. District Court of Dallas County, Texas. MDL Pretrial Cause No. 2018-77098.
In Re: Texas Opioid Litigation. District Court of Harris County, Texas. Master File No. 2018-63587.
43. KAIFI LLC v. T-Mobile US. United States District Court for the Eastern District of Texas, Marshall Division. Case No. 2:20-CV-00281-JRG.
44. In Re JUUL Labs, Inc., Marketing, Sales Practices, and Products Liability Litigation. United States District Court for the Northern District of California, San Francisco Division. Case No. 19-md-02913-WHO.
45. KAIFI LLC v. Verizon. United States District Court for the Eastern District of Texas, Marshall Division. Case No. 2:20-CV-00280-JRG.

Attachment C:
Materials Considered

Materials Considered

1. First Amended Complaint.
2. Amended Expert Report of [REDACTED], Ph.D., October 6, 2021.
3. Dirk F. Gerritsen, Rick A.C. Lugtigheid, and Thomas Walther, “Can Bitcoin Investors Profit from Predictions by Crypto Experts?,” *Finance Research Letters*, 2021.
4. Mohammad Hashemi Joo, Yuka Nishikawa, and Krishnan Dandapani, “Announcement effects in the cryptocurrency market,” *Applied Economics* Vol. 52, No. 44, 2020.
5. [REDACTED] electronic backup.

Attachment D:

**█ Event Study: Coincidences Between “Unusual” Trading Days and
Ripple News Days**

Event Study: Coincidences Between "Unusual" Trading Days and Ripple News Days
"Unusual" Trading Days Identified by Dr. [REDACTED]'s "Two-Sided Parametric Approach"

Ripple News Event Category:			Key Milestones (Max N=8)			Digital Asset Trading Platform Listings (Max N=11)			Customer and Product Announcements (Max N=73)			Commercialization Initiatives (Max N=7)			"Select" Categories (i.e., All News Dates) (Max N=105)		
Model No.	All Trading Days in Analysis Period	"Unusual" Trading Days in Analysis Period	"Unusual" Trading Days ... Coincident			"Unusual" Trading Days ... Coincident			"Unusual" Trading Days ... Coincident			"Unusual" Trading Days ... Coincident			"Unusual" Trading Days ... Coincident		
			with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days
1	2,740	172	5	167	3	4	168	7	8	164	65	3	169	4	19	153	86
2	2,723	153	3	150	5	4	149	7	8	145	65	2	151	5	17	136	88
3	2,740	190	5	185	3	4	186	7	10	180	63	3	187	4	22	168	83
4	2,723	167	4	163	4	4	163	7	11	156	62	2	165	5	21	146	84
5	2,007	147	4	143	1	3	144	8	11	136	49	3	144	4	20	127	70
6	1,990	117	3	114	2	3	114	8	12	105	48	2	115	5	19	98	71
7	2,007	129	4	125	1	3	126	8	10	119	50	2	127	5	18	111	72
8	1,990	117	3	114	2	3	114	8	11	106	49	1	116	6	17	100	73
9	2,740	178	5	173	3	4	174	7	10	168	63	3	175	4	21	157	84
10	2,723	164	4	160	4	4	160	7	11	153	62	1	163	6	19	145	86
11	2,739	168	5	163	3	4	164	7	8	160	65	3	165	4	19	149	86
12	2,722	152	3	149	5	5	147	6	9	143	64	2	150	5	19	133	86
13	2,739	183	5	178	3	4	179	7	10	173	63	3	180	4	21	162	84
14	2,722	171	4	167	4	5	166	6	11	160	62	3	168	4	23	148	82
15	2,006	142	4	138	1	3	139	8	11	131	49	3	139	4	20	122	70
16	1,989	116	2	114	3	4	112	7	12	104	48	2	114	5	20	96	70
17	2,006	125	4	121	1	4	121	7	10	115	50	2	123	5	19	106	71
18	1,989	121	3	118	2	5	116	6	11	110	49	1	120	6	19	102	71
19	2,739	175	5	170	3	4	171	7	10	165	63	3	172	4	21	154	84
20	2,722	169	4	165	4	5	164	6	11	158	62	3	166	4	23	146	82

Source: [REDACTED] backup.

Notes: Median ratio of the number of non-coincident Unusual days to the number of coincident Unusual days is 33.7, 5th percentile is 6.0, 95th percentile is 75.3.

Event Study: Coincidences Between "Unusual" Trading Days and Ripple News Days
"Unusual" Trading Days Identified by Dr. [REDACTED]'s "One-Sided Non-Parametric Approach"

[REDACTED] Ripple News Event Category:			Key Milestones (Max N=8)			Digital Asset Trading Platform Listings (Max N=11)			Customer and Product Announcements (Max N=73)			Commercialization Initiatives (Max N=7)			[REDACTED] "Select" Categories (i.e., All News Dates) (Max N=105)		
Model No.	All Trading Days in Analysis Period	"Unusual" Trading Days in Analysis Period	"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...		
			with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days
1	2,740	280	6	274	2	5	275	6	14	266	59	3	277	4	28	252	77
2	2,723	269	5	264	3	4	265	7	15	254	58	2	267	5	27	242	78
3	2,740	296	5	291	3	5	291	6	17	279	56	3	293	4	31	265	74
4	2,723	269	4	265	4	4	265	7	14	255	59	2	267	5	26	243	79
5	2,007	222	4	218	1	5	217	6	13	209	47	3	219	4	25	197	65
6	1,990	199	3	196	2	4	195	7	14	185	46	2	197	5	23	176	67
7	2,007	219	4	215	1	5	214	6	14	205	46	3	216	4	26	193	64
8	1,990	211	3	208	2	4	207	7	13	198	47	2	209	5	22	189	68
9	2,740	311	6	305	2	5	306	6	18	293	55	3	308	4	31	280	74
10	2,723	299	5	294	3	4	295	7	17	282	56	2	297	5	27	272	78
11	2,739	293	6	287	2	5	288	6	15	278	58	3	290	4	29	264	76
12	2,722	280	4	276	4	5	275	6	17	263	56	3	277	4	30	250	75
13	2,739	294	5	289	3	5	289	6	14	280	59	3	291	4	28	266	77
14	2,722	290	4	286	4	5	285	6	15	275	58	3	287	4	29	261	76
15	2,006	226	4	222	1	5	221	6	14	212	46	3	223	4	26	200	64
16	1,989	223	3	220	2	5	218	6	15	208	45	2	221	5	25	198	65
17	2,006	218	4	214	1	4	214	7	14	204	46	3	215	4	25	193	65
18	1,989	233	3	230	2	5	228	6	14	219	46	2	231	5	24	209	66
19	2,739	300	6	294	2	5	295	6	15	285	58	3	297	4	28	272	77
20	2,722	313	5	308	3	5	308	6	16	297	57	3	310	4	30	283	75

Source: [REDACTED] backup.

Notes: Median ratio of the number of non-coincident Unusual days to the number of coincident Unusual days is 51.3, 5th percentile is 7.9, 95th percentile is 107.5.

Event Study: Coincidences Between "Unusual" Trading Days and Ripple News Days
"Unusual" Trading Days Identified by Dr. [REDACTED]'s "Two-Sided Non-Parametric Approach"

[REDACTED] Ripple News Event Category:			Key Milestones (Max N=8)			Digital Asset Trading Platform Listings (Max N=11)			Customer and Product Announcements (Max N=73)			Commercialization Initiatives (Max N=7)			[REDACTED] "Select" Categories (i.e., All News Dates) (Max N=105)		
Model No.	All Trading Days in Analysis Period	"Unusual" Trading Days in Analysis Period	"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...		
			with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days	with Ripple News	No Coincident Ripple News	"Regular" Trading Days
1	2,740	140	2	138	6	4	136	7	8	132	65	3	137	4	16	124	89
2	2,723	128	2	126	6	4	124	7	9	119	64	2	126	5	17	111	88
3	2,740	147	4	143	4	4	143	7	7	140	66	3	144	4	18	129	87
4	2,723	140	4	136	4	4	136	7	8	132	65	2	138	5	18	122	87
5	2,007	119	3	116	2	3	116	8	11	108	49	3	116	4	20	99	70
6	1,990	97	3	94	2	3	94	8	11	86	49	2	95	5	19	78	71
7	2,007	113	4	109	1	3	110	8	9	104	51	2	111	5	17	96	73
8	1,990	101	3	98	2	3	98	8	9	92	51	1	100	6	15	86	75
9	2,740	155	3	152	5	4	151	7	9	146	64	2	153	5	18	137	87
10	2,723	141	3	138	5	4	137	7	9	132	64	1	140	6	17	124	88
11	2,739	151	3	148	5	4	147	7	9	142	64	3	148	4	18	133	87
12	2,722	143	3	140	5	5	138	6	9	134	64	2	141	5	19	124	86
13	2,739	159	4	155	4	4	155	7	9	150	64	3	156	4	20	139	85
14	2,722	157	4	153	4	5	152	6	8	149	65	3	154	4	20	137	85
15	2,006	124	3	121	2	3	121	8	11	113	49	3	121	4	20	104	70
16	1,989	115	2	113	3	4	111	7	11	104	49	2	113	5	19	96	71
17	2,006	123	4	119	1	4	119	7	11	112	49	2	121	5	20	103	70
18	1,989	124	2	122	3	5	119	6	11	113	49	1	123	6	18	106	72
19	2,739	161	5	156	3	4	157	7	8	153	65	3	158	4	20	141	85
20	2,722	158	4	154	4	5	153	6	9	149	64	3	155	4	21	137	84

Source: [REDACTED] backup.

Notes: Median ratio of the number of non-coincident Unusual days to the number of coincident Unusual days is 31.3, 5th percentile is 5.4, 95th percentile is 69.8.

Attachment E:

█ Event Study: Cumulative Investment Returns on “Unusual” Trading Days with and without Coincident Ripple News

Event Study: Cumulative Investment Returns on "Unusual" Trading Days With and Without Coincident Ripple News Accumulated over Three-Day Holding Periods at Each "Unusual" Trading Day Identified by Dr. [REDACTED]'s "Two-Sided Parametric Approach"

Ripple News Event Category:		Key Milestones			Digital Asset Trading Platform Listings			Customer and Product Announcements			Commercialization Initiatives			"Select" Categories (i.e., All News Dates)			
Model No.	in [REDACTED] All Trading Days Analysis Period	in [REDACTED] "Unusual" Trading Days Analysis Period	"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...		
			Coincident with Ripple News	No Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	No Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	No Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	No Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	No Coincident Ripple News	"Regular" Trading Days
1	\$34.26	\$231,276,027	\$2.04	\$95,725,130	\$1.09	\$2.18	\$114,728,496	\$0.57	\$66.33	\$1,955,161	\$0.70	\$3.80	\$60,808,242	\$1.06	\$377.33	\$222,976	\$0.51
2	\$26.06	\$21,826,605	\$1.42	\$13,374,758	\$1.56	\$2.18	\$10,025,229	\$0.57	\$66.33	\$215,810	\$0.70	\$2.49	\$5,721,065	\$1.62	\$341.98	\$33,120	\$0.57
3	\$34.26	\$113,589,327	\$2.04	\$48,123,449	\$1.09	\$2.18	\$56,347,961	\$0.57	\$58.14	\$1,251,965	\$0.80	\$3.80	\$29,865,470	\$1.06	\$338.84	\$142,539	\$0.57
4	\$26.06	\$10,043,271	\$1.52	\$5,735,615	\$1.47	\$2.18	\$4,612,998	\$0.57	\$85.93	\$101,327	\$0.54	\$2.49	\$2,632,485	\$1.62	\$372.69	\$15,503	\$0.52
5	\$92.55	\$1,446,767	\$1.99	\$727,295	\$1.03	\$1.82	\$779,957	\$0.68	\$51.07	\$18,178	\$0.71	\$3.80	\$380,391	\$1.06	\$236.51	\$2,736	\$0.59
6	\$70.39	\$121,741	\$1.48	\$82,496	\$1.39	\$1.82	\$60,768	\$0.68	\$75.49	\$1,403	\$0.48	\$2.49	\$31,910	\$1.62	\$260.15	\$284	\$0.54
7	\$92.55	\$74,892	\$1.99	\$37,648	\$1.03	\$1.82	\$40,374	\$0.68	\$40.79	\$1,580	\$0.89	\$3.31	\$22,603	\$1.22	\$164.55	\$272	\$0.85
8	\$70.39	\$38,581	\$1.48	\$26,144	\$1.39	\$1.82	\$19,258	\$0.68	\$60.29	\$551	\$0.60	\$2.17	\$11,608	\$1.86	\$180.99	\$128	\$0.77
9	\$34.26	\$55,701,613	\$2.04	\$23,598,641	\$1.09	\$2.18	\$27,631,754	\$0.57	\$58.57	\$688,272	\$0.80	\$3.80	\$14,645,345	\$1.06	\$333.20	\$80,102	\$0.58
10	\$26.06	\$6,961,014	\$1.52	\$3,975,368	\$1.47	\$2.18	\$3,197,280	\$0.57	\$86.57	\$74,335	\$0.54	\$2.17	\$2,094,416	\$1.86	\$319.28	\$13,386	\$0.61
11	\$34.91	\$151,871,877	\$2.04	\$64,342,300	\$1.09	\$2.18	\$75,338,686	\$0.57	\$51.85	\$1,886,229	\$0.90	\$3.80	\$39,930,908	\$1.06	\$294.97	\$220,188	\$0.66
12	\$26.55	\$6,253,727	\$1.42	\$3,922,496	\$1.56	\$2.45	\$2,550,078	\$0.51	\$76.64	\$60,248	\$0.61	\$2.49	\$1,639,191	\$1.62	\$445.10	\$8,976	\$0.43
13	\$34.91	\$150,491,381	\$2.04	\$63,757,437	\$1.09	\$2.18	\$74,653,867	\$0.57	\$58.14	\$1,658,694	\$0.80	\$3.80	\$39,567,942	\$1.06	\$330.74	\$193,469	\$0.59
14	\$26.55	\$3,242,315	\$1.52	\$1,851,655	\$1.47	\$2.45	\$1,322,117	\$0.51	\$85.93	\$32,787	\$0.54	\$3.80	\$852,486	\$1.06	\$418.51	\$4,963	\$0.46
15	\$87.93	\$1,652,658	\$1.99	\$830,797	\$1.03	\$1.82	\$890,954	\$0.68	\$51.07	\$20,765	\$0.71	\$3.80	\$434,525	\$1.06	\$236.51	\$3,126	\$0.59
16	\$66.87	\$33,127	\$1.39	\$23,909	\$1.48	\$2.05	\$14,680	\$0.61	\$75.49	\$382	\$0.48	\$2.49	\$8,683	\$1.62	\$281.86	\$71	\$0.50
17	\$87.93	\$86,244	\$1.99	\$43,355	\$1.03	\$2.18	\$42,783	\$0.57	\$40.79	\$1,819	\$0.89	\$3.31	\$26,029	\$1.22	\$196.69	\$288	\$0.71
18	\$66.87	\$75,062	\$1.48	\$50,865	\$1.39	\$2.45	\$30,608	\$0.51	\$60.29	\$1,071	\$0.60	\$2.17	\$22,585	\$1.86	\$243.68	\$203	\$0.57
19	\$34.91	\$53,196,612	\$2.04	\$22,537,368	\$1.09	\$2.18	\$26,389,105	\$0.57	\$58.57	\$658,821	\$0.80	\$3.80	\$13,986,718	\$1.06	\$333.20	\$76,674	\$0.58
20	\$26.55	\$2,761,401	\$1.52	\$1,577,010	\$1.47	\$2.45	\$1,126,015	\$0.51	\$86.57	\$29,556	\$0.54	\$3.80	\$726,041	\$1.06	\$421.62	\$4,030	\$0.46

Source: [REDACTED] backup.

Notes: Median ratio of the cumulative (3-day window) return associated with non-coincident Unusual days to the cumulative (3-day window) return associated with coincident Unusual days is 21,665, 5th percentile is 1.6, 95th percentile is 31,327,597.

Event Study: Cumulative Investment Returns on "Unusual" Trading Days With and Without Coincident Ripple News Accumulated over Three-Day Holding Periods at Each "Unusual" Trading Day Identified by Dr. [REDACTED]'s "One-Sided Non-Parametric Approach"

Ripple News Event Category:		Key Milestones					Digital Asset Trading Platform Listings			Customer and Product Announcements			Commercialization Initiatives			"Select" Categories (i.e., All News Dates)			
Model No.	in [REDACTED] Analysis Period	"Unusual" Trading Days ...		"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...						
		All Trading Days	"Unusual" Trading Days	Coincident	with	No Coincident	"Regular" Trading Days	Coincident	with	No Coincident	"Regular" Trading Days	Coincident	with	No Coincident	"Regular" Trading Days	Coincident	with	No Coincident	"Regular" Trading Days
		in [REDACTED] Analysis Period	in [REDACTED] Analysis Period	Ripple News	Ripple News		Ripple News	Ripple News		Ripple News	Ripple News		Ripple News	Ripple News		Ripple News	Ripple News		Ripple News
1		\$34.26	\$20,933,031,362	\$2.05	\$8,624,570,477	\$1.08	\$2.45	\$9,218,904,573	\$0.51	\$130.92	\$101,508,024	\$0.36	\$3.80	\$5,503,816,588	\$1.06	\$1,114.87	\$9,146,731	\$0.17	
2		\$26.06	\$13,237,688,744	\$1.52	\$7,351,959,810	\$1.46	\$2.18	\$6,449,448,808	\$0.57	\$153.77	\$61,619,473	\$0.30	\$2.49	\$3,416,406,232	\$1.62	\$768.10	\$8,489,520	\$0.25	
3		\$34.26	\$9,356,265,880	\$2.04	\$3,963,891,662	\$1.09	\$2.45	\$4,120,498,404	\$0.51	\$174.15	\$49,856,523	\$0.27	\$3.80	\$2,422,149,810	\$1.06	\$1,154.89	\$4,798,762	\$0.17	
4		\$26.06	\$1,811,720,236	\$1.52	\$1,034,655,961	\$1.47	\$2.18	\$762,311,532	\$0.57	\$170.48	\$7,932,288	\$0.27	\$2.49	\$467,571,978	\$1.62	\$1,007.19	\$970,098	\$0.19	
5		\$92.55	\$14,503,462	\$1.99	\$7,290,940	\$1.03	\$2.45	\$6,387,323	\$0.51	\$75.92	\$127,472	\$0.48	\$3.80	\$3,813,322	\$1.06	\$484.89	\$15,242	\$0.29	
6		\$70.39	\$4,502,262	\$1.48	\$3,050,902	\$1.39	\$2.18	\$1,894,402	\$0.57	\$112.21	\$35,571	\$0.32	\$2.49	\$1,180,107	\$1.62	\$473.49	\$5,898	\$0.30	
7		\$92.55	\$1,689,587	\$1.99	\$849,361	\$1.03	\$2.45	\$828,310	\$0.51	\$91.47	\$15,234	\$0.40	\$3.80	\$444,235	\$1.06	\$560.54	\$1,940	\$0.25	
8		\$70.39	\$1,674,237	\$1.48	\$1,134,526	\$1.39	\$2.18	\$768,998	\$0.57	\$66.53	\$15,305	\$0.55	\$2.49	\$438,841	\$1.62	\$269.33	\$2,650	\$0.52	
9		\$34.26	\$681,098,380	\$2.05	\$287,236,133	\$1.08	\$2.45	\$299,955,647	\$0.51	\$112.49	\$4,244,122	\$0.42	\$3.80	\$179,077,769	\$1.06	\$710.34	\$428,029	\$0.27	
10		\$26.06	\$131,974,421	\$1.52	\$75,024,757	\$1.46	\$2.18	\$60,617,479	\$0.57	\$121.67	\$895,210	\$0.38	\$2.49	\$35,274,424	\$1.62	\$507.59	\$139,357	\$0.38	
11		\$34.91	\$32,205,701,307	\$2.05	\$13,268,997,495	\$1.08	\$2.45	\$14,183,387,104	\$0.51	\$136.47	\$171,660,459	\$0.34	\$3.80	\$8,467,682,966	\$1.06	\$1,162.19	\$15,468,059	\$0.17	
12		\$26.55	\$4,713,522,744	\$1.43	\$2,875,115,850	\$1.55	\$2.45	\$2,225,508,774	\$0.51	\$149.11	\$23,735,584	\$0.31	\$3.80	\$1,220,236,617	\$1.06	\$785.25	\$3,491,389	\$0.25	
13		\$34.91	\$7,156,148,334	\$2.04	\$3,031,786,086	\$1.09	\$2.45	\$3,151,566,892	\$0.51	\$155.34	\$32,234,831	\$0.30	\$3.80	\$1,852,583,451	\$1.06	\$1,070.88	\$3,102,649	\$0.18	
14		\$26.55	\$2,354,905,754	\$1.52	\$1,344,863,974	\$1.47	\$2.45	\$1,111,878,249	\$0.51	\$144.84	\$10,693,117	\$0.32	\$3.80	\$609,637,926	\$1.06	\$960.86	\$1,464,710	\$0.20	
15		\$87.93	\$8,791,088	\$1.99	\$4,419,310	\$1.03	\$2.45	\$3,871,594	\$0.51	\$67.52	\$106,566	\$0.54	\$3.80	\$2,311,396	\$1.06	\$431.28	\$12,753	\$0.32	
16		\$66.87	\$3,768,698	\$1.48	\$2,553,811	\$1.39	\$2.45	\$1,536,760	\$0.51	\$108.97	\$29,518	\$0.33	\$2.49	\$1,007,306	\$1.62	\$517.92	\$4,840	\$0.27	
17		\$87.93	\$625,642	\$1.99	\$314,512	\$1.03	\$2.18	\$345,487	\$0.57	\$91.47	\$6,442	\$0.40	\$3.80	\$164,497	\$1.06	\$497.64	\$1,013	\$0.28	
18		\$66.87	\$335,538	\$1.48	\$227,373	\$1.39	\$2.45	\$136,822	\$0.51	\$67.15	\$3,222	\$0.54	\$2.49	\$87,564	\$1.62	\$306.22	\$506	\$0.46	
19		\$34.91	\$872,299,114	\$2.05	\$367,870,240	\$1.08	\$2.45	\$384,160,428	\$0.51	\$67.84	\$6,949,769	\$0.69	\$3.80	\$229,349,216	\$1.06	\$445.34	\$700,899	\$0.43	
20		\$26.55	\$145,263,737	\$1.52	\$82,579,461	\$1.46	\$2.45	\$68,586,859	\$0.51	\$96.63	\$744,179	\$0.48	\$3.80	\$38,193,463	\$1.06	\$623.75	\$104,852	\$0.31	

Source: [REDACTED] backup.

Notes: Median ratio of the cumulative (3-day window) return associated with non-coincident Unusual days to the cumulative (3-day window) return associated with coincident Unusual days is 450,663, 5th percentile is 11.1, 95th percentile is 3,360,749,256.

Event Study: Cumulative Investment Returns on "Unusual" Trading Days With and Without Coincident Ripple News Accumulated over Three-Day Holding Periods at Each "Unusual" Trading Day Identified by Dr. [REDACTED]'s "Two-Sided Non-Parametric Approach"

Ripple News Event Category:		Key Milestones			Digital Asset Trading Platform Listings			Customer and Product Announcements			Commercialization Initiatives			"Select" Categories (i.e., All News Dates)			
Model No.	in [REDACTED] Analysis Period	"Unusual" Trading Days in [REDACTED] Analysis Period	"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...			"Unusual" Trading Days ...		
			Coincident with Ripple News	No Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	No Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	No Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	No Coincident Ripple News	"Regular" Trading Days	Coincident with Ripple News	No Coincident Ripple News	"Regular" Trading Days
1	\$34.26	\$7,330,417	\$1.39	\$4,965,900	\$1.60	\$2.18	\$3,366,951	\$0.57	\$61.70	\$90,135	\$0.76	\$3.80	\$1,927,350	\$1.06	\$237.87	\$22,813	\$0.81
2	\$26.06	\$2,674,410	\$1.39	\$1,569,306	\$1.60	\$2.18	\$1,228,390	\$0.57	\$91.20	\$18,810	\$0.51	\$2.49	\$701,001	\$1.62	\$457.50	\$3,748	\$0.42
3	\$34.26	\$9,829,221	\$1.52	\$4,451,387	\$1.47	\$2.18	\$4,514,682	\$0.57	\$55.81	\$126,874	\$0.84	\$3.80	\$2,584,348	\$1.06	\$241.30	\$20,954	\$0.80
4	\$26.06	\$2,473,758	\$1.52	\$1,412,739	\$1.47	\$2.18	\$1,136,228	\$0.57	\$82.49	\$21,603	\$0.57	\$2.49	\$648,407	\$1.62	\$357.77	\$4,485	\$0.54
5	\$92.55	\$384,424	\$1.48	\$178,933	\$1.39	\$1.82	\$191,889	\$0.68	\$67.37	\$4,966	\$0.54	\$3.80	\$101,075	\$1.06	\$237.09	\$916	\$0.59
6	\$70.39	\$26,470	\$1.48	\$17,937	\$1.39	\$1.82	\$13,213	\$0.68	\$72.42	\$235	\$0.50	\$2.49	\$6,938	\$1.62	\$255.66	\$63	\$0.55
7	\$92.55	\$91,232	\$1.99	\$45,863	\$1.03	\$1.82	\$49,184	\$0.68	\$39.13	\$1,463	\$0.93	\$3.31	\$27,535	\$1.22	\$157.85	\$348	\$0.89
8	\$70.39	\$15,736	\$1.48	\$10,663	\$1.39	\$1.82	\$7,855	\$0.68	\$39.13	\$342	\$0.93	\$2.17	\$4,735	\$1.86	\$117.46	\$109	\$1.19
9	\$34.26	\$9,803,158	\$1.48	\$4,153,347	\$1.51	\$2.18	\$4,502,711	\$0.57	\$56.19	\$123,505	\$0.83	\$3.31	\$2,958,676	\$1.22	\$205.90	\$21,904	\$0.94
10	\$26.06	\$379,435	\$1.48	\$202,721	\$1.51	\$2.18	\$174,279	\$0.57	\$56.19	\$6,243	\$0.83	\$2.17	\$114,164	\$1.86	\$206.54	\$1,392	\$0.94
11	\$34.91	\$14,480,925	\$1.42	\$10,485,992	\$1.56	\$2.18	\$6,651,268	\$0.57	\$71.29	\$177,384	\$0.66	\$3.80	\$3,807,397	\$1.06	\$282.49	\$47,989	\$0.68
12	\$26.55	\$7,667,894	\$1.42	\$4,809,497	\$1.56	\$2.45	\$3,126,732	\$0.51	\$76.64	\$54,474	\$0.61	\$2.49	\$2,009,865	\$1.62	\$445.10	\$8,116	\$0.43
13	\$34.91	\$28,826,553	\$1.52	\$11,307,833	\$1.47	\$2.18	\$13,240,392	\$0.57	\$71.48	\$350,449	\$0.65	\$3.80	\$7,579,221	\$1.06	\$309.04	\$50,092	\$0.63
14	\$26.55	\$7,319,716	\$1.52	\$4,180,219	\$1.47	\$2.45	\$2,984,756	\$0.51	\$69.33	\$64,417	\$0.67	\$3.80	\$1,924,536	\$1.06	\$337.62	\$9,752	\$0.57
15	\$87.93	\$475,372	\$1.48	\$221,265	\$1.39	\$1.82	\$237,286	\$0.68	\$67.37	\$6,141	\$0.54	\$3.80	\$124,987	\$1.06	\$237.09	\$835	\$0.59
16	\$66.87	\$83,411	\$1.39	\$60,201	\$1.48	\$2.05	\$36,963	\$0.61	\$72.42	\$739	\$0.50	\$2.49	\$21,863	\$1.62	\$270.38	\$138	\$0.52
17	\$87.93	\$186,039	\$1.99	\$93,523	\$1.03	\$2.18	\$92,288	\$0.57	\$56.08	\$2,823	\$0.65	\$3.31	\$56,148	\$1.22	\$270.44	\$615	\$0.52
18	\$66.87	\$175,979	\$1.39	\$130,972	\$1.48	\$2.45	\$71,759	\$0.51	\$60.29	\$1,944	\$0.60	\$2.17	\$52,948	\$1.86	\$228.79	\$389	\$0.61
19	\$34.91	\$29,399,637	\$2.04	\$12,455,501	\$1.09	\$2.18	\$14,584,202	\$0.57	\$51.98	\$355,096	\$0.90	\$3.80	\$7,729,899	\$1.06	\$302.92	\$54,863	\$0.64
20	\$26.55	\$1,103,209	\$1.52	\$630,032	\$1.47	\$2.45	\$449,855	\$0.51	\$76.82	\$10,844	\$0.61	\$3.80	\$290,061	\$1.06	\$374.14	\$1,642	\$0.52

Source: [REDACTED] backup.

Notes: Median ratio of the cumulative (3-day window) return associated with non-coincident Unusual days to the cumulative (3-day window) return associated with coincident Unusual days is 20,536, 5th percentile is 2.2, 95th percentile is 4,832,779.