BACHELOR THESIS

[International Bachelor Economics and Business Economics]

Coinbase Effect: the effect of Coinbase inclusion of crypto assets on its price.

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Date Final Version: 12 August 2021

Note: The views stated in this thesis are those of the author and not necessarily those of the supervisor, second assessor, Erasmus School of Economics or Erasmus University Rotterdam.

Abstract

This paper intends to identify and quantify the presence of the Coinbase effect. In this phenomenon, a cryptocurrency sees a significant price jump upon the announcement of getting listed on Coinbase, a central cryptocurrency trading platform. (Talamas, 2021)
For this study, data has been sourced from Coingecko daily trading rates, Coinbase blog for announcements dates, Coinmarketcap for identifying equivalent exchange to Coinbase, and Kucoin trading rates to calculate abnormal returns over a 200-day window, including a 180-day trail leading to the day of the announcement of the reference crypto coins on Coinbase. Additionally, upon confirming the existence of the coinbase effect, the study will compare the impact of coinbase asset picking and signaling abilities versus any other crypto exchange. Finally, this study will help assess the market sentiment towards coinbase, and will allow the reader to compare it to the effect that S&P 500 has on stocks, concerning their ability to boost the price of stocks to be listed. Thus, the following brings the narrative of efficient market hypothesis into question (Malkiel, 2003).
This paper allows us to ascertain the effect of the Coinbase brand on Crypto and by having a comparison in place with a critical equity benchmark like the S&P 500. The results show evidence of the existence of the Coinbase effect. Additionally, results also confirm that the cause of the effect is the investor's belief in better asset picking and signaling abilities of the crypto-exchange Coinbase.

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1 Introduction

The release of Bitcoin, the first decentralized cryptocurrency, in 2009 was a remarkable shift in the promise of traditional financial institutions and the image they hold of being the centralized custodians of value. While bitcoin's usage and acceptance has been questioned and marred by the use it saw in its early years (Eldefrawy et al., 2019), the inherent value seen in a decentralized store of value is accepted by the market, and has gained traction over time despite various attempts by the centralized ecosystem to push it down due to its untraceability (Houben & Snyers, 2018).

Two points gained further ground with continued acceptance and the rise of other crypto coins on the market. First, the ambiguity of the nature of crypto assets pivoted from the primary intent of being a means of exchange to be seen as a store of value and asset. This means that crypto today is seen as a hedge against inflation and a store of value similar to gold or equity (Cryptocurrency: The top things you need to know, 2019).

Secondly, as any means of value gains popularity, the volume and velocity of transactions become critical, and thus the need for online exchanges comes into play. Crypto assets are no exception to the norm, and as of this date, there are over 300 exchanges present for the cryptocurrency market (CoinMarketCap, n.d.).

With the increasing volatility in the market, exchanges are expected to be the north star to identify and highlight better research, control mechanisms and pick currencies that are expected to perform better than the market. One exchange that has gained the lead in this race is Coinbase, with one of the primary reasons being that it is listed on NASDAQ as a registered company with the SEC. This makes Coinbase the only exchange to be governed by the norms of the SEC. In addition, it has the backing of one of the conventional banks to help it list as an IPO and is increasingly becoming the accepted benchmark despite having a high transaction fee. (Coinbase, n.d.). The asset-picking knowledge of Coinbase received enormous publicity,

and it is now referred to as the "Coinbase Effect". According to Christanto (2021), "Coinbase effect means Average 91% Token price gain in 5 days".

Thus, the rapid ascent of coinbase as the preferred guide to picking values in crypto-currencies forms the first research question:

"Is the Coinbase effect a real and tangible phenomenon?"

This is an essential question as the existence of this phenomenon will be a base to assess the influence of the trading exchanges beyond that of a facilitator to also signaling the brand value and credibility of their research acumen to enlist crypto-assets seen of high value, similar to S&P 500 for US equity stocks. Secondly, it also contests the efficient market hypothesis for the cryptocurrency market and highlights its demand for signaling better quality assets backed by a neutral platform. Lastly, there is growing research on the abnormal return strategies in crypto-currencies, and therefore, the following paper contributes to the growth of academic research in the field. Coinbase, in this regard, benefits from the fact that it has not released its own cryptocurrency like Binance, thus making it a more neutral and impartial voice in the ecosystem (Reuters, 2021).

The data for the study is obtained from Coingecko API, Coinbase blog, and Kucoin blog. The database contains information about the historical prices, volume, and Market Cap. The formation of two hypotheses answers the research question. Firstly, the first hypothesis is analyzed by conducting an event study to verify the existence of the Coinbase effect. Data sample includes the 200-day pre-announcement daily price of cryptocurrencies leading upto the day of the listing announcement, followed by the 20-day post-announcement price. Ten event windows are formed to examine short-run effects for a variety of days. The results show the existence of the Coinbase effect with nine event windows suggesting significant positive cumulative average abnormal return.

Then, for the second part of the research, to ascertain if the fluctuation in question is due to the Coinbase brand and its signaling of better asset picking abilities, the listings are compared with similar listings on a comparable exchange, namely Kucoin, to find the significant delta in

the performances of the listings to confirm the brand effect of Coinbase. The results claim the significant positive abnormal return experienced due to the brand Coinbase, further suggesting the reputation effects of Coinbase to signal better asset picking abilities.

The remainder of the paper looks at the literature in-depth to identify the critical narratives and findings for cryptocurrencies and their exchanges, followed by hypothesis statements for which the quantitative methodology and the definition of critical variables are used to capture the Coinbase effect. Next, the Methodology section thoroughly explains the methodological framework of the study. Then, the Data section will systematically explain the data.
Finally, by using regression, one-sample t-test, and non-parametric tests in the Results section, the results are drawn to measure the abnormal returns generated by the listings, and the summary of the paper is provided in the Discussion and Conclusion sections.

2 Theoretical Framework and Hypothesis Development

2.1 Literature Review

2.1.1 Crypto-currency as an asset

Financial institutions have been highly resistant to the appeal of cryptocurrencies. There has been a negative sentiment regarding cryptocurrencies as a viable store of value and assets due to their historical price volatility and lack of central authority (Goldman Sachs, 2021). While there is some merit in the challenges seen and highlighted, the threat cryptocurrencies and, at a more significant level, the decentralized blockchain recording of financial transactions pose to governments and private bodies; the criticism needs to be taken with a pinch of salt (Livemint & Reuters, 2021). Therefore, the rise of stablecoins and their resilience in the recent pandemic driven era show their capacity and capability as stores of values similar to other asset classes, even if their use as the fluid exchange is still contested despite the emergence of novel experiments, such as El Salvador’s acceptance of bitcoin as legal tender. (Livemint & Reuters, 2021)

This, coupled with the identification of limited addresses and wallets on the darknet using these currencies for allegedly illegal trades, helps ease the concerns around illegal financial activity and the abstract relationship with the fundamentals of economics.
(Houben & Snyers, 2018)

2.1.2 Formation of Crypto exchanges

The first challenge in accepting crypto was the concept of mining, and how some major reserves still hold considerable reserves of certain currencies with them. However, with the larger number of offerings coming into play, the conversation has moved away from the dependency on a singular coin to the robustness of the entire ecosystem (Humanjets, 2020). Furthermore, with the asset class continuously gaining traction, the phenomenon has only spiked further with the arrival of exchanges helping facilitate the transactions and easier entry to the ecosystem (Humanjets, 2020).

However, this does not imply that the exchanges do not come with their own set of challenges. As a new asset class, these exchanges, based on their headquarters, may or may not be answerable to numerous governments and organizations. Secondly, having over 300 players present as sizable exchanges, the focus for many players is on rampant growth, which leaves users and, in turn, exchanges exposed to hackers and miners, who can significantly wipe off the market value present on the mentioned exchanges (Harrison et al., 2021).

Therefore, it becomes apparent that a bridge between the old centralized system and the new decentralized ecosystem needs to be in place to act as a fulcrum on the speed and trust the decentralized system promises to bring and be under the scrutiny and radar of a leading federal investigative authority (Harrison et al., 2021).

2.1.3 Coinbase listing on NASDAQ

With Coinbase, a leading exchange getting listed on NASDAQ, a key part of the trust gets added to the overall ecosystem. The listing brings an example of the functionality of the

exchange under the current norms. Also, it acts as a catalyst for government and centralized figures to accept the notion that there is value to be derived by accepting and adding cryptocurrencies to the forum of eligible assets despite its teething issues and concerns (Dhawan, 2021).

Therefore, despite not being the largest exchange in terms of transactional volume, Coinbase's role as a voice of the cryptocurrency ecosystem gets accentuated and highlighted further. Its listings get higher visibility as they benefit from the ripple effect approval of the conventional checks and measures in place on a NASDAQ-listed entity (Dhawan, 2021).

Therefore, all the listings on Coinbase are followed with considerable interest and investment sentiment, and the following study can observe the benefits of the same and study it under "the coinbase effect."(Hackett & Morris, 2021).With coinbase coming as a standard equity offering on NASDAQ and acting as an exchange for crypto-currencies, its place as a comparative to the S&P 500 benchmark is unique (Dantes, 2021).

2.1.4 Similarity with S&P 500 inclusion effect.

Previous studies have found something similar in stock markets for the last few decades. The effect is known as the "S&P inclusion effect," where the S&P inclusion of stock receives a positive excess return on the stock price (Jain, 1987). It is argued that the S&P announcement is an information-free event, as it does not include any fundamental information regarding the stock or the company. However, this study still observes positive abnormal returns (Elliott et al., 2006). It has been found that the positive abnormal returns are caused by the increase in investor's awareness (Elliott et al., 2006). This increased investor awareness can be credited to the reputation of Standard & Poor. A similar kind of awareness is expected and examined in the paper

2.2 Hypothesis Development

Since the literature shows the rise in blockchain technology and cryptocurrencies, the investment class is receiving enormous attention from all kinds of investors. The question emerges if the Coinbase platform provides similar investor's awareness as Standard & Poor do for the stock market. This leads to the first hypothesis:

Hypothesis 1. *Ha: Coinbase listing causes a positive abnormal return on the newly announced crypto-asset.*

Furthermore, while observing the coinbase effect as a phenomenon, it is crucial to identify the reason for the coinbase effect. The question emerges if crypto-exchanges, similar to Coinbase, would realize the same effects on their announced assets. Therefore the second part of the research and the second hypothesis lead to identify the reputation effects of Coinbase on the abnormal returns observed:

Hypothesis 2. *Ha: Reputation of Coinbase reflects its better asset picking abilities and it causes the 'Coinbase Effect'.*

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3 Methodology

This section describes the methodological framework used in the paper. The first part explains the event study framework to investigate the first hypothesis. The second part explains the regression framework used to analyze the second hypothesis.

3.1 Event Study

To measure the impact of Coinbase listing on the crypto-asset, the paper uses a traditional event study approach to evaluate the effects of Coinbase announcement on the coin's price. However, the method is more beneficial to measure the announcement's short-term effects than long-term effects.

Assuming an efficient market, the effects of announcements should be incorporated into the coin price. According to Mackinlay (1997), the event's effect will be reflected in the security prices immediately. Therefore, the effect can be measured by observing the security prices over a relatively short period. (MacKinlay, 1997) Commonly, shorter periods are more accurate to quantify the effects of the announcement. However, as the trading usually starts after 24 hours of announcement on the Coinbase exchange, the analysis includes multiple event windows. Therefore, the event windows (-20,+20), (-10,+10), (-5,+5), (-3,+3), (-2,+2), (-1,+1), (0), (-1,+3), (-1,+5), (-1,+10), and (-1,+20) are analyzed in the event study. As the event window includes several prior days, the model can incorporate any potential information leak regarding the announcement. Moreover, multiple event windows can test for the robustness of the results.

The paper evaluates abnormal return over multiple event windows for the event study. Abnormal return is calculated as the observed excess return over the expected return during the event window:

$$AR_{it} = R_{it} - E(R_{it})$$

AR_{it}, R_{it} and $E(R_{it})$ represent abnormal, actual, and expected return of stock i on day t given the average return R_{it} respectively.

To calculate the abnormal return, it is necessary to compute the expected return, and therefore, the expected returns are calculated using a constant mean return model. The constant mean return model assumes that the average return for security is constant over time. (MacKinlay, 1997). The method is preferred over the market model as the cryptocurrency asset class does not contain a reliable market benchmark. Thus, the expected returns will be calculated as the mean of historical daily returns on the security:

$$R_{it} = \mu_i + \zeta_{it} \qquad \text{where} \quad E(\zeta) = 0, \quad var(\zeta_{it}) = \sigma^2$$

R_{it} is the period t return on cryptocurrency i, and ζ_{it} is the time disturbance for the crypto-currency.

The framework for analyzing abnormal returns is considered and developed using a constant mean model. To conduct the analysis, the window of 180 days before 20 days prior to the announcement is considered as an estimation window. The 20 days prior to the announcement and 20 days after the announcement are selected as the event window.

Figure 1: Timeline of the Event study

Hence, the expected return for the event timeline is average daily returns from 200 days prior to announcement (referred as -200) to 20 days prior to the announcement (referred as -20).

Furthermore, Cumulative abnormal return (CAR) is calculated for event windows containing multiple return days. CAR is also utilized as the dependent variable in the next section of regression analysis.

$$CAR(a, b) = \sum_{t=a}^{b} ARit$$

The average of cumulative abnormal returns for all the observations in each event window sample will be referred to as a cumulative average abnormal return. It will be used for statistical tests and making inferences. For example, if the market responds to the exchange inclusion positively, the study should observe positive cumulative average abnormal returns in this scenario. However, factual inferences can only be drawn after performing statistical tests.

One sample t-test with an alternative hypothesis as Cumulative average abnormal return >0 is implemented to assess hypothesis 1 - "Coinbase listing causes a positive abnormal return on the newly announced crypto-asset."

The one-sample t-test is parametric in nature and assumes distributed abnormal returns. To increase the robustness of the results, further alternative non-parametric tests are executed. Non-parametric sign test and Wilcoxon signed-rank test are utilized along with a one-sample t-test to make conclusions for hypothesis 1.

3.2 Regression Analysis

The second part of the analysis evaluates the Coinbase brand effect on the observed cumulative average abnormal returns.

Therefore the following multivariate regression is employed to evaluate hypothesis 2.

$$CAR(t_1, t_2) = \alpha + \beta\ Exchange\_Coinbase + \gamma ln(MarketCap) + \delta ln(Volume) + \epsilon_1$$

Table 1. Description of regression variables.

Category	Name	Description
Dependent Variable	$CAR(t_1, t_2)$	Measures the cumulative abnormal returns for the selected event window. Eg. (-3,+3),(-2,+2)
Exchange specific control-variable	$Exchange\_Coinbase$ *(Hypothesis 2)*	The selected variable compares the initial coinbase scenario with a control group of similar crypto-exchange. The dummy value = 1 if the exchange is Coinbase and the dummy value = 0 if the exchange is similar crypto-exchange (i.e. Kucoin)
Independent variable of Interest	$ln(MarketCap)$	The average Market cap of the traded security during the event window.
	$ln(Volume)$	The total volume of trading during the event window.

Note: This table describes the regression variables used in the multivariate regression to examine hypothesis 2. The first column explains the category of variables for the multivariate regression. The second column mentions the name of the variable used in the regression. The third column describes the variable. The full sample consists of 40 observations over different event windows.
Explanation of abbreviations: CAR(t1,t2) = Cumulative Abnormal return for the period t1 to t2., Exchange_Coinbase = dummy variable differentiating between Coinbase and Kucoin.

The regression involves the binary variable Exchange_Coinbase, which will state the difference between the crypto-exchanges abnormal returns. The regression includes the natural logarithm of total volume traded during the event window. It is evident that trading volume is responsible for price changes and abnormal returns (Hiemstra & Jones, 1994). The natural logarithm of the Average Market Cap is included in the regression to capture the effect caused by the cryptocurrency's market cap. As the market cap represents the network's value, it is responsible for affecting prices in the market (Morton & Neill, 1997).

Finally, to analyze the hypothesis 2 i.e. Reputation of Coinbase reflects its better asset picking abilities and it causes the 'Coinbase Effect', the value of βshould be greater than zero. One-sample t-test is performed in the regression to make final conclusions regarding hypothesis 2.

4 Data

The section describes all the necessary data for the study. First, it explains the data collection method and the obtained sample. Secondly, it describes the data descriptives of all the transformed data to conduct the analysis efficiently.

4.1 Data Collection

The data necessary for the event study is acquired through Coingecko API available on coingecko.com. The Google Sheets Add-on called "API Connector" is utilized to download daily historical market prices, market cap, and volume for the crypto-asset. The event dates are collected from Coinbase Blog, which is the first place to receive all the asset inclusion announcements. Furthermore, the assets with overlapping event windows are removed to solve problems related to clustering. The final sample includes ten crypto-assets: Cardano, Synthetix, Loopring, Numeraire, Maker, Cosmos, Dash, Chainlink, Ripple, and Zcash.

The second part of the analysis involves comparing asset inclusion with a control group of similar crypto-exchange. The control group is selected using 'Exchange Score' from Coinmarketcap.com, which rates the major crypto exchange based on average liquidity, volume, web traffic factor, and confidence level (CoinMarketCap, n.d.). Hence, the crypto-exchange proxy chosen for the control group is Kucoin.com which is rated similar to Coinbase.com. The analysis of Kucoin similarly takes place as an event study for Coinbase. Regression analysis excludes the crypto-asset unavailable on the Kucoin exchange to make better predictions regarding asset picking and signaling abilities. Therefore the second part of the analysis

involves the following eight crypto-assets: Cardano, Synthetix, Loopring, Maker, Dash, Chainlink, Ripple, and Cosmos.

4.2 Data Transformation and Data descriptives.

The dataset obtained for the study includes Open, Close, High, and Low prices for each asset. As the crypto-currency exchange works 24 hours a day for all year, the study uses Closing prices to maintain consistency over the data. Additionally, data is sorted to include estimation window and event window for each asset. After sorting, each asset includes prices from 200 days before the announcement to 20 days after the announcement. Table 2 presents the descriptive statistics for the observed data.

Table 2. Descriptive Statistics (Prices)

Crypto-asset	Obs	Mean	Std. Deviation	Min.	Max
Cardano	221	0.412407	0.42616	0.0766277	1.383004
SNX	221	4.101531	1.772051	0.745445	8.434667
Loopring	221	0.0957369	0.0714709	0.0243644	0.2627187
Numeraire	221	20.2148	11.39323	4.64851	57.03964
Maker	221	453.4006	121.0076	203.3193	696.5594
Cosmos	221	3.671966	0.9532768	1.94593	6.827506
Dash	221	115.6423	30.23056	68.62421	178.0682
Chainlink	221	0.8567744	0.8427488	0.2039735	3.801608
Ripple	221	0.370316	0.0821402	0.2638364	0.5816128
Zcash	221	148.9491	59.59642	49.07059	357.896

Note: Table 2 presents the descriptive statistics for the crypto-assets prices relative to its announcement day. The first columns represent the name of the asset/coin/crypto-currency used in the sample. The

second column mentions the number of observations in the sample for each asset. The third column shows the mean values in the sample. The fourth column describes the standard deviation for the sample. The fifth column mentioned the minimum value in the sample. The sixth column mentions the maximum value in the sample. The sample consists of 221 observations for ten crypto-assets resulting in 2210 observations.
Explanation of abbreviation: Obs = Observation, Std. Deviation = Standard Deviation, Min. = Minimum, and Max. = Maximum.

Further, daily gains are calculated for each asset using the following formula:

$$Daily\ Gain_t = ln(Price_t) - ln(Price_{t-1})$$

Table 3 presents the descriptive statistics for the daily gains for each of the assets. The crypto-assets are incredibly volatile and thus involve major daily movements. Figure 2 indicates the daily gains of the assets for 220 days included in the study.

Table 3. Descriptive Statistics (Daily Gains)

Crypto-asset	Obs	Mean	Std. Deviation	Min.	Max
Cardano	220	0.0133782	0.0703294	-0.1769334	0.3089113
SNX	220	0.0139685	0.0785308	-0.1860426	0.2189002
Loopring	220	0.0105846	0.080006	-0.4535565	0.2333864
Numeraire	220	0.0210267	0.1965044	-0.4300028	1.99665
Maker	220	0.0026867	0.0818325	-0.5856452	0.55576
Cosmos	220	-0.0002332	0.0557142	-0.1432861	0.2519894
Dash	220	0.0002416	0.041899	-0.1761605	0.2178614
Chainlink	220	0.0146031	0.0827751	-0.1500382	0.6097386
Ripple	221	0.0018097	0.0578237	-0.1735242	0.3791704
Zcash	221	-0.0061482	0.052742	-0.1509794	0.1576657

Note: Table 3 presents the descriptive statistics for the crypto-assets daily gains relative to its announcement day. The first columns represent the name of the asset/coin/crypto-currency used in the sample. The second column

mentions the number of observations in the sample for each asset. The third column shows the mean values in the sample. The fourth column describes the standard deviation for the sample. The fifth column mentioned the minimum value in the sample. The sixth column mentions the maximum value in the sample. The sample consists of 220 observations for ten crypto-assets resulting in 2200 observations.
Explanation of abbreviation: Obs = Observation, Std. Deviation = Standard Deviation, Min. = Minimum, and Max. = Maximum.

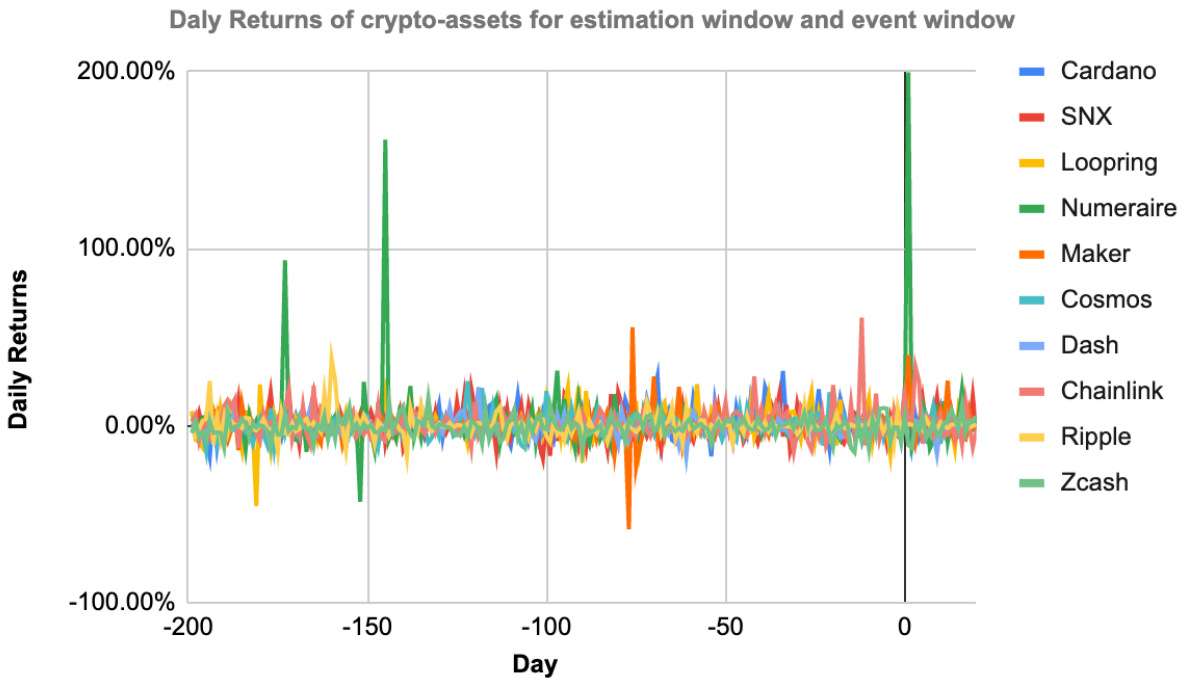

Figure 2. Daily Returns of all the crypto-assets in the sample for 200 days prior to announcement to 20 days after the announcement.

The second part of the analysis involves regression analysis. Table 4 includes additional descriptives to gain a better understanding of the underlying sample.

Table 4. Descriptive Statistics of the Multivariate Regression

Event Window	Event Window	Obs	Mean	Std. Dev.	Min	Max
CAR	(-1,+1)	16	0.0646217	0.1605846	-0.1855071	0.4187
	(-2,+2)	16	0.0593687	0.1610166	-0.1907225	0.4572665
	(-3,+3)	16	0.0822185	0.2590821	-0.2304947	0.5743
	(-1,+3)	16	0.0866031	0.2197578	-0.2017445	0.5208
	(-1,+5)	16	0.0688973	0.2361382	-0.203638	0.6495
Market_Cap	(-1,+1)	16	5.20E+09	8.96E+09	2.47E+08	3.41E+10
	(-2,+2)	16	5.38E+09	9.66E+09	2.45E+08	3.73E+10
	(-3,+3)	16	5.35E+09	9.59E+09	2.45E+08	3.70E+10
	(-1,+3)	16	5.43E+09	9.83E+09	2.43E+08	3.82E+10
	(-1,+5)	16	5.42E+09	9.91E+09	2.43E+08	3.87E+10
Volume	(-1,+1)	16	3.13E+10	6.36E+10	2.41E+08	2.52E+11
	(-2,+2)	16	3.55E+09	7.90E+09	703392.2	3.18E+10
	(-3,+3)	16	5.03E+09	1.14E+10	1399610	4.62E+10
	(-1,+3)	16	3.76E+09	8.99E+09	982323.4	3.65E+10
	(-1,+5)	16	5.19E+09	1.19E+10	1275932	4.84E+10

Note: Table 4 presents the descriptive statistics for each event windows used in the multivariate regression. The first column represents the regression variable. The second column mentions the event window. The third column shows the total observations. The fourth column shows the mean values in the sample. The fifth column describes the standard deviation for the sample. The sixth column mentioned the minimum value in the sample. The sixth column mentions the maximum value in the sample. The sample consists of 240 observations.

Explanation of abbreviation: Obs = Observation, Std. Deviation = Standard Deviation, Min. = Minimum, and Max. = Maximum., Market_Cap = Average Market cap of the crypto asset in Dollars during the event window, Volume = Total trade volume of crypto-asset in Dollars during the event window.

5. Results

The research question has resulted in the formation of two hypotheses. The first one is related to the existence of the Coinbase effect, which is discussed in section 5.1. The second part focuses on the reputation effects, and the results are shown in section 5.2.

5.1 Event Study

Hypothesis 1 attempts to study the impact of Coinbase listing announcement on its price. An event study is performed to calculate the abnormal returns in multiple event windows. Figure 3 represents cumulative abnormal returns for the entire event window (-20,+20), and Figure 4 represents the cumulative average abnormal return for the entire event window (-20,+20).

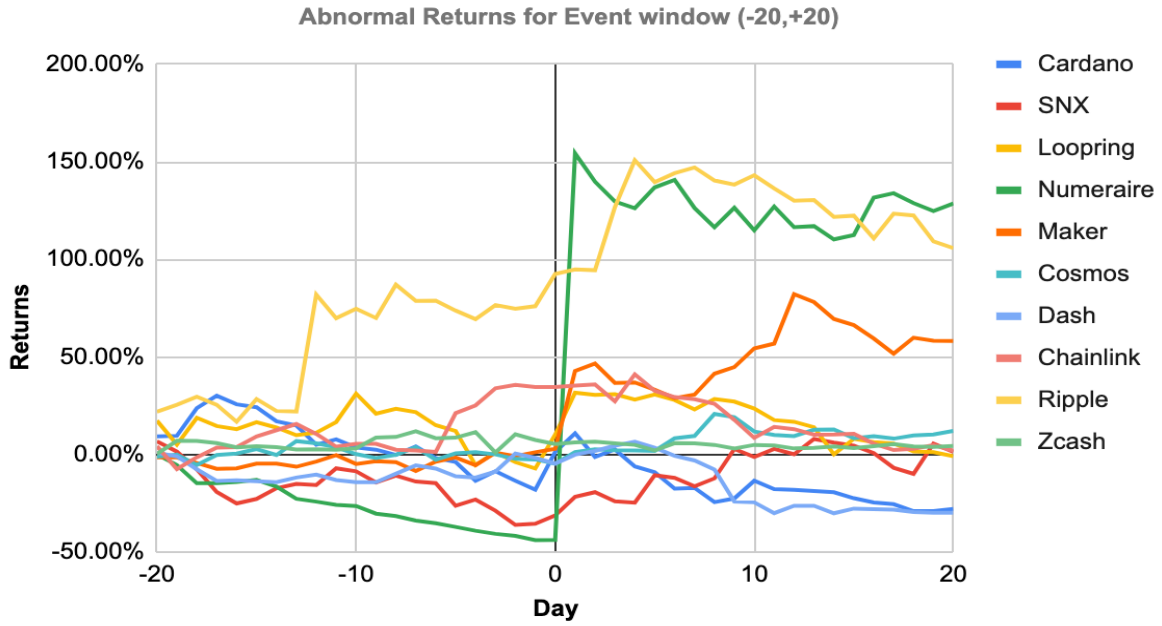

Figure 3: Cumulative abnormal returns for all crypto-assets in the sample for the event window (-20,+20)

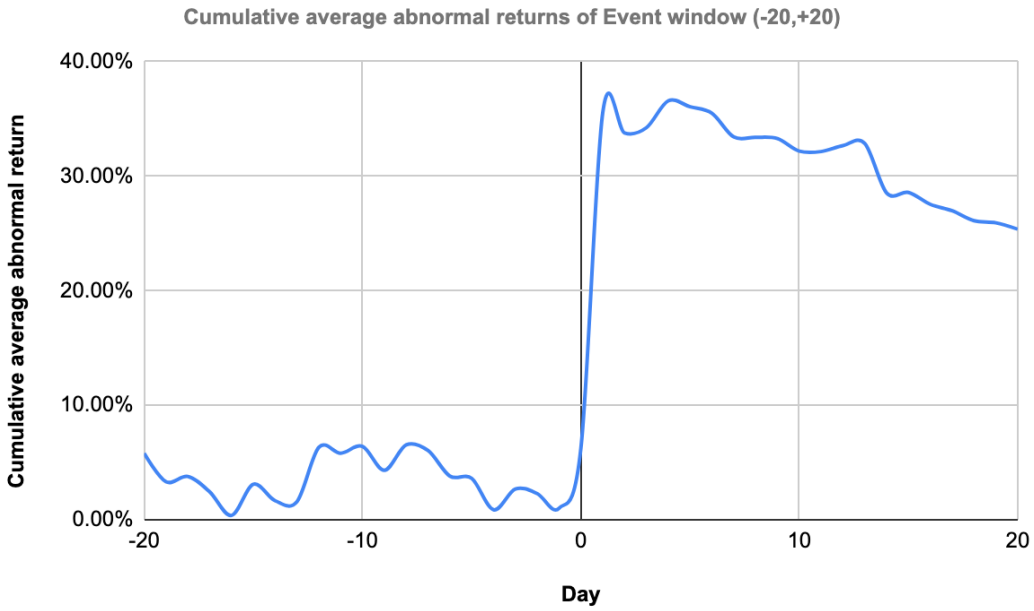

Figure 4 : Cumulative average abnormal returns of the sample for the event window (-20,+20)

From the initial perspective, a spike in cumulative average abnormal return is visible on the day of announcement for the event window (-20,+20). Similar kinds of spikes are visible for other event windows as well (refer to Appendix). Therefore, a one-sample t-test, sign test and Wilcoxon signed-rank test are performed to test whether the announcement has a significant short-run effect on the price.

Table 5. Parametric Tests for DIfferent Windows of Cumulative Abnormal Returns.

Event Window	n	Mean	P value
(-20,+20)	10	25.37%	0.086 *
(-10,+10)	10	25.10%	0.074*
(-5,+5)	10	26.91%	0.082*
(-3,+3)	10	30.52%	0.055*
(-2,+2)	10	28.16%	0.075*
(-1,+1)	10	31.19%	0.066*
0	10	5.78%	0.032**
(-1,+3)	10	30.26%	0.056*
(-1,+5)	10	31.84%	0.056*
(-1,+10)	10	28.71%	0.071*
(-1,+20)	10	23.09%	0.126

*Note: Table 5 shows the results of one sample t-test conducted on the cumulative average abnormal returns over different event windows. The first column mentions the event window. The second column mentions the number of assets in the observations. The third column shows the mean value of the cumulative abnormal return. The fourth column shows the p-value of the one-sample t-test. Explanation of abbreviation: n = Number of assets, * denotes significance at 10% level, ** denotes significance at 5% level, and *** denotes significance at 1% level.*

Table 5 performs a one-sample t-test that tests the existence of the Coinbase effect for multiple windows. Event day 0 refers to the day of the announcement of the inclusion. As the investors and market response can vary around the announcement, multiple event windows reflect that information. For the day of the announcement, the one-sided t-test suggests the CAAR of 5.78% significant at 5% level. The result states that the newly included assets experiences 5.78% of abnormal return on the announcement day. The magnitude of the effect increases when the event window is increased from including a day prior, and after the announcement (-1,+1). Event window (-1,+1) experienced CAAR of 31.19% significant at 10% level. Thereby suggesting the high average abnormal return of 31.19% for the event window of (-1,+1). Event windows (-20,+20), (-10,+10), (-5,+5), (-3,+3), (-2,+2), (-1,+3), (-1,+5), and (-1.+10) resulted with average cumulative abnormal return of 25.37%, 25.10%, 26.91%, 30.52%, 28.16%, 30.26%, 31.84%, and 28.71% respectively, significant at 10% level. Nine out of 10 event windows results in significantly positive Cumulative average abnormal return. Therefore, the parametric tests further strengthen the claims towards hypothesis 1.

Table 6. Sign Test & Wilcoxon Signed Rank Test

Event Day	n	Median	P value (median>0)	n	Median	P value (median>0)
	Sign Test			Wilcoxon Signed-Rank Test		
(-20,+20)	10	3.12%	0.1719	10	3.12%	0.1934
(-10,+10)	10	6.34%	0.1719	10	6.34%	0.375
(-5,+5)	10	7.55%	0.1719	10	7.55%	0.1934
(-3,+3)	10	16.22%	0.1719	10	16.22%	0.084*
(-2,+2)	10	10.05%	0.0107**	10	10.05%	0.0371**
(-1,+1)	10	13.49%	0.0107**	10	13.49%	0.0195**
0	10	3.06%	0.1719	10	3.06%	0.1309

(-1,+3)	10	14.07%	0.0547*	10	14.07%	0.0645*
(-1,+5)	10	14.91%	0.0547*	10	14.91%	0.0645*
(-1,+10)	10	20.76%	0.377	10	20.76%	0.1934
(-1,+20)	10	8.74%	0.377	10	8.74%	0.375

Note: Table 6 shows the nonparametric tests conducted on the cumulative average abnormal returns over different event windows. The first column mentions the event window for the sign test. The second column mentions the number of assets in the observations for the sign test. The third column shows the median value of cumulative abnormal return during the sign test. The fourth column shows the p-value of the sign test. The fifth column mentions the number of assets in the observations for the Wilcoxon signed-rank test. The seventh column shows the median value of the cumulative abnormal return. The fourth column shows the p-value of the Wilcoxon signed-rank test.
*Explanation of abbreviation: n = Number of assets, * denotes significance at 10% level, ** denotes significance at 5% level, and *** denotes significance at 1% level.*

Non-parametric tests are performed to boost up the robustness of the results. Table 6 shows the abnormal returns for the Coinbase announcement tested with non-parametric statistical analysis. Sign test and Wilcoxon signed-rank test results have shown similar results with less power compared to parametric tests. Event windows (-1,+1) and (-2,+2) reflect the CAAR median of 13.49% and 10.05% respectively at a significance level of 5%. The results state that the median cumulative average abnormal return is significantly positive for the event windows (-1,+1) and (-2,+2). Event windows (-1,+3) and (-1,+5) have shown median CAAR of 14.07% and 14.91% significant at 5% level. However, the event window(-3,+3) has only shown a significant difference for the Wilcoxon signed-rank test. Due to Wilcoxon signed-rank test being a superior non-parametric method for the analysis, the results are inferred from the mentioned test.

One sample t-test and the combination of sign test with signed-rank test have resulted in favour of hypothesis 1. The results are valuable to conduct further analysis to separate the brand effect from the abnormal returns. Therefore, the significant windows (-3,+3), (-2,+2),

(-1,+1), (-1,+3), and (-1,+5) are used as dependent variables in the following subsection to test hypothesis 2 successfully.

5.2 Regression Analysis

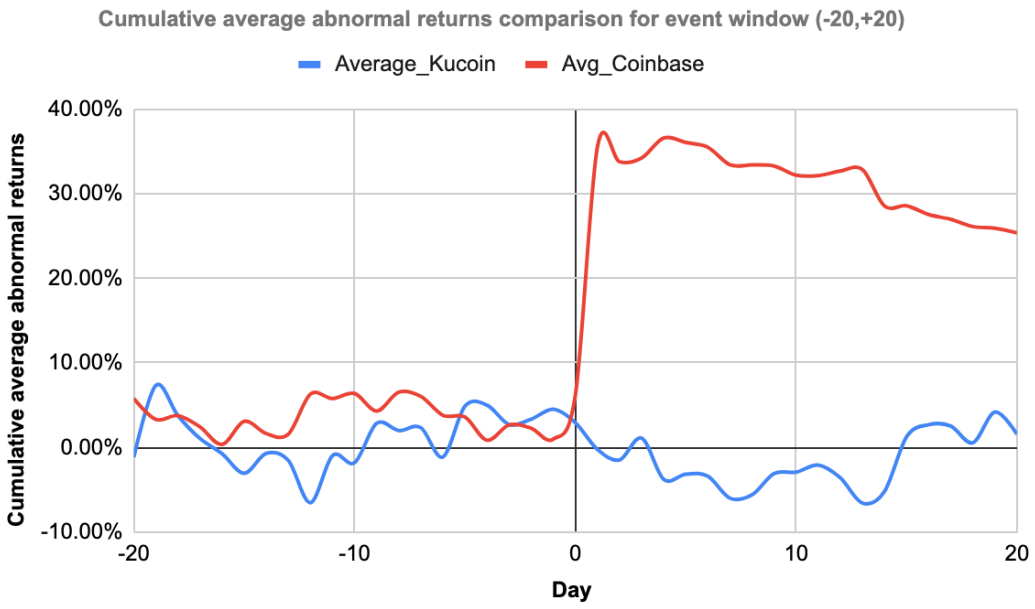

Figure 5: The comparison of Cumulative average abnormal return between Coinbase and Kucoin for the event window (-20,+20)

Figure 5 reflects the Cumulative average abnormal return of the event window (-20.+20) for both Coinbase and Kucoin. In theory, the abnormal return should be equal because of the similarity in crypto exchanges. However, Figure 5 reflects the difference in abnormal returns after the announcement, further suggesting the higher value signalling by the Coinbase entity (hypothesis 2). Table 7 reflects the results of the multivariate regression carried out to assess hypothesis 2. The control group uses the same event study method with the significant event windows found in section 5.1. The coefficient for Exch_coinbase reflects the increase in cumulative average abnormal returns when the dummy value of crypto exchange changes to 1, reflecting the announcement by Coinbase instead of Kucoin.

Table 7. Results

CAR (-t,+t)	Constant	Exch_coinbase	ln(Market_Cap)	ln(Volume)
(-1,+1)	0.444	0.231	0.022	-0.042
	(0.334)	(0.004)***	(0.526)	(0.161)
(-2,+2)	0.890	0.193	-0.042	-0.002
	(0.055)	(0.008)***	(0.208)	(0.919)
(-3,+3)	1.483	0.179	-0.118	0.049
	(0.094)*	(0.153)	(0.083)*	(0.264)
(-1,+3)	1.407	0.166	-0.102	0.037
	(0.055)*	(0.107)	(0.065)*	(0.290)
(-1,+5)	1.546	0.226	-0.101	0.026
	(0.034)**	(0.033)**	(0.061)*	(0.438)

Note: Table 7 describes the results obtained during multivariate regression. The first column represents the event window used as the dependent variable. The second column mentions the constant value obtained during the regression. The third column mentions the coefficient obtained for the dummy variable Exch_Coinbase during the regression. The fourth column mentions the coefficient obtained for the natural logarithm of the Market Cap of the asset. The fifth column mentions the coefficient obtained for the natural logarithm of Volume traded during the event window.
*Explanation of abbreviation: CAAR(t1,t2) = Cumulative average abnormal return for the event window starting from t1 to t2. * denotes significance at 10% level, ** denotes significance at 5% level, and *** denotes significance at 1% level.*

The results show that for the event window(-1,1), the Coinbase announcement results in a higher CAAR worth 23.1% compared to Kucoin with a high significance level of 1%.
Similar results were shown for the event window (-2,+2), where the Coinbase announcement pushed up the short term cumulative average abnormal return by 19.3% compared to Kucoin with a high significance level of 1%.

Event windows (-1,+5) have shown 22.6% higher CAAR when compared to Kucoin at a significance level of 5%.

The coefficients for the variable Exch_coinbase are positive for event windows(-3,+3) and (-1.+5), but the P-value could not reject the null hypothesis of mean difference as zero. Three out of five event windows showing highly significant results further strengthens the claims for hypothesis 2.

6. Discussion

This paper aims to focus on the popular cryptocurrency markets. In the first half of 2021, the popular crypto database CoinMarketCap experienced a listing of 2655 new assets (Handagama, 2021). In addition, a popular cryptocurrency created as a joke called 'Dogecoin' received 3000% gains this year (Bambrough, 2021). As the fundamental values are always hard to justify, investors seem to look for abnormal returns in the market. One popular way is to invest in all newly announced assets by Coinbase. This popular belief became very popular, and is known as the "Coinbase effect". The paper investigates the existence of this effect by an event study approach. The results suggest the existence of such short-term positive abnormal returns for the assets.

The importance of the results is not overlooked. The second part of the research conducts the analysis to find out the advantage that Coinbase has in order to enjoy the reputation of creating abnormal returns for the crypto-assets. The results suggest that the abnormal return is due to the brand Coinbase and not other factors such as Volume, Liquidity, and customer reach. The reputation effect is thus explained by investor's belief in coinbase better asset picking abilities.

7. Conclusion

The paper aims to investigate the existence of the "Coinbase Effect", which refers to the positive abnormal return to all newly added Coinbase crypto-coins.

The event study uses ten crypto assets launched in the last three years (2018-2021) to perform the analysis. The historical price data and announcement information is collected to conduct the analysis. The study is conducted by utilizing historical price information upto 200 days before the announcement. Further, an estimation window of 180 days and an event window of 41 days are formed to determine the coinbase effect. The sample is chosen carefully to avoid overlapping event windows to avoid clustering issues. The first part of the research analyzes multiple event windows of Cumulative average abnormal returns. Ten event windows are formed and statistically tested using a one-sample t-test, sign test, and Wilcoxon signed-rank test. Nine out of ten event windows have shown statistically positive cumulative average abnormal returns in the one-sample t-test. In contrast, five out of 10 windows have shown statistically significant positive cumulative average abnormal return in the non-parametric tests.

The results discussed above lead the way towards the first hypothesis of the abnormal returns after the Coinbase exchange announcement, and strengthen the claims regarding the Coinbase effect.

The second part of the research involves the study to quantify the asset picking abilities of the exchange. The abnormal returns are compared with crypto-exchange with similar liquidity, volume, and popularity. The chosen crypto exchange is Kucoin. The chosen assets are the same amongst both exchanges to identify better signalling of asset picking abilities. Multivariate regression is carried out with the significant Cumulative average abnormal return windows found in the first part of the research with dummy variable comparing crypto-exchanges, natural logarithm of total volume traded during the event window, and natural logarithm of average

market cap during the event window. The regression results have shown significant results coming from the Coinbase asset picking and signalling abilities, which strengthens the claims of hypothesis 2- the effect is observed due to Coinbase better signalling of asset picking abilities. The results suggest that the leading cause of the effect is the perception of Coinbase as a gatekeeper for selecting high-quality assets amongst crypto investors. This signalling phenomenon is responsible for the observed effect.

Therefore, the study concludes with the evidence of the existence of the "Coinbase effect" and its better signalling of asset picking abilities.

However, this paper is subject to various limitations. For one, the research is biased due to the lower number of announced assets available. A lower number of observations can lead to spurious results. Secondly, the crypto-currency market lacks a market benchmark to justify the abnormal returns correctly. Therefore, the constant mean model can be troublesome to make firm conclusions. Additionally, with the launch of more decentralized applications and networks, the asset picking abilities of exchanges would be scrutinized, and the effect should fade away. Lastly, crypto-currency is a deregulated market and is often a victim of various pump and dump scams for the recently arrived asset, which may justify this effect.

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9 Appendix

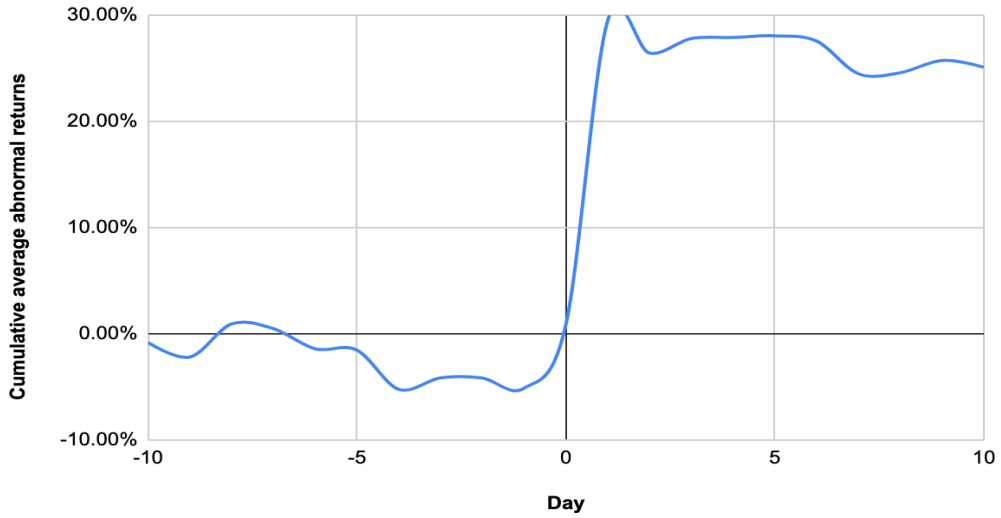

Figure 6: Cumulative abnormal returns for all crypto-assets in the sample for the event window (-10,+10)

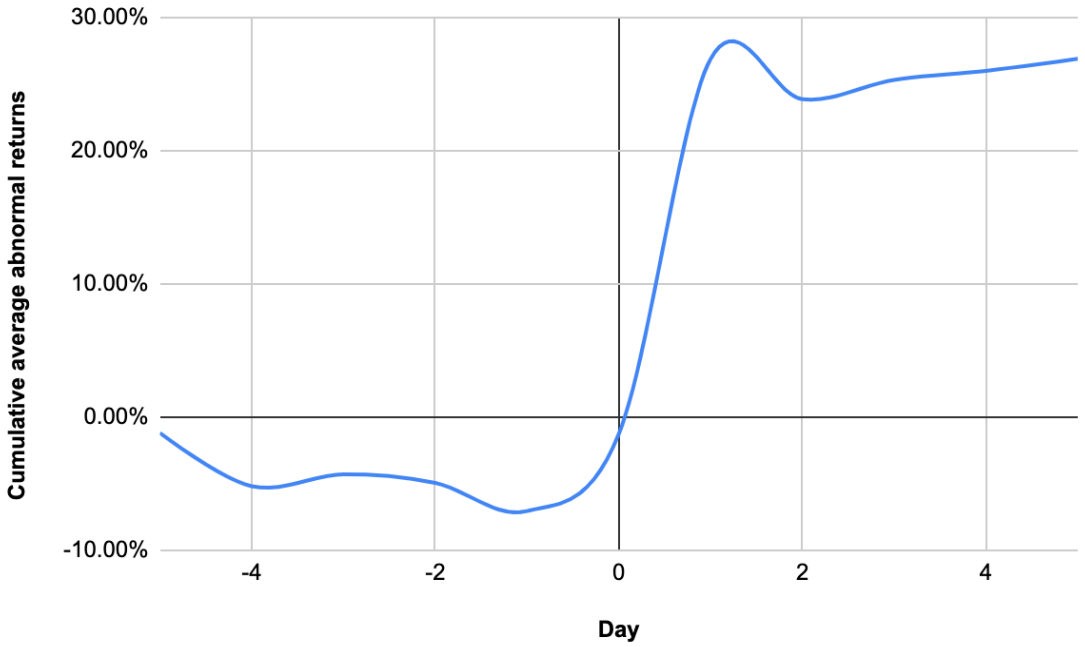

Figure 7: Cumulative abnormal returns for all crypto-assets in the sample for the event window (-5,+5)

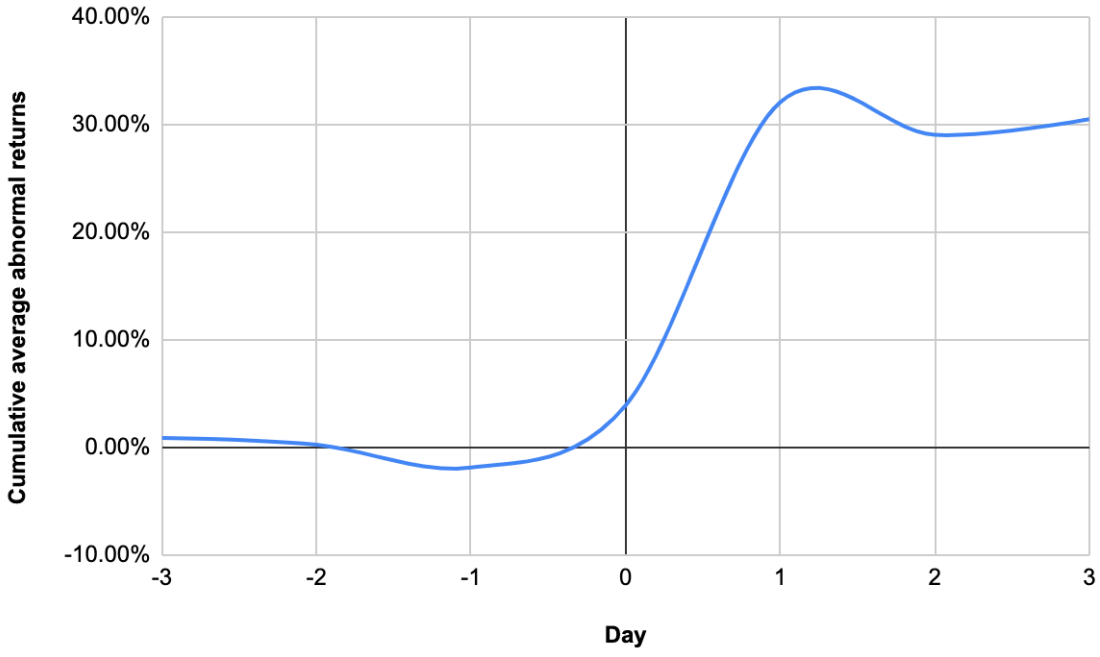

Figure 8: Cumulative abnormal returns for all crypto-assets in the sample for the event window (-3,+3)

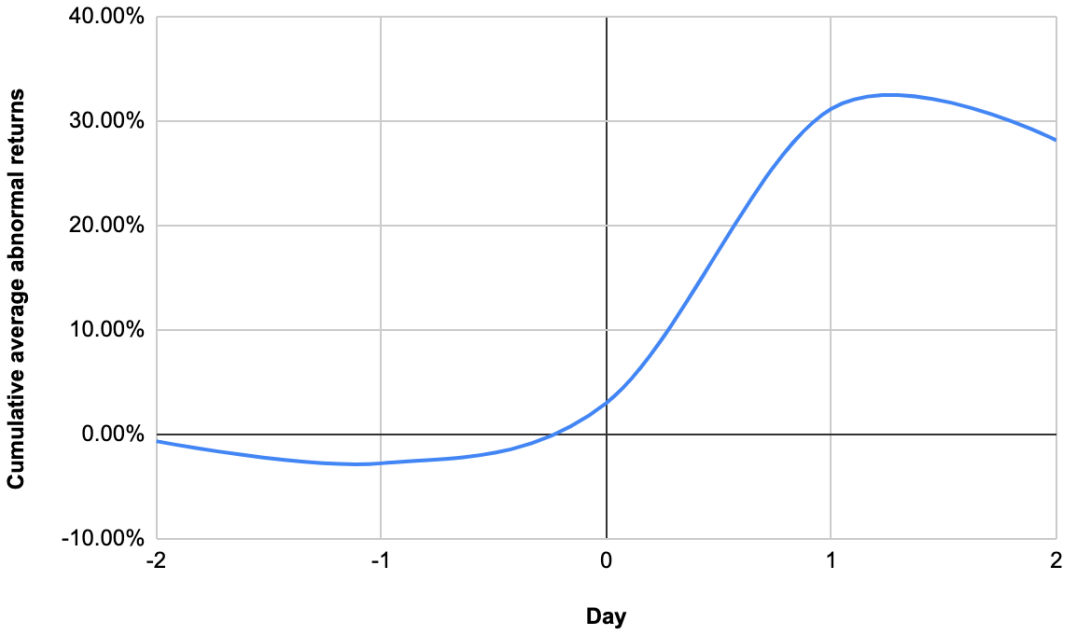

Figure 9: Cumulative abnormal returns for all crypto-assets in the sample for the event window (-2,+2)

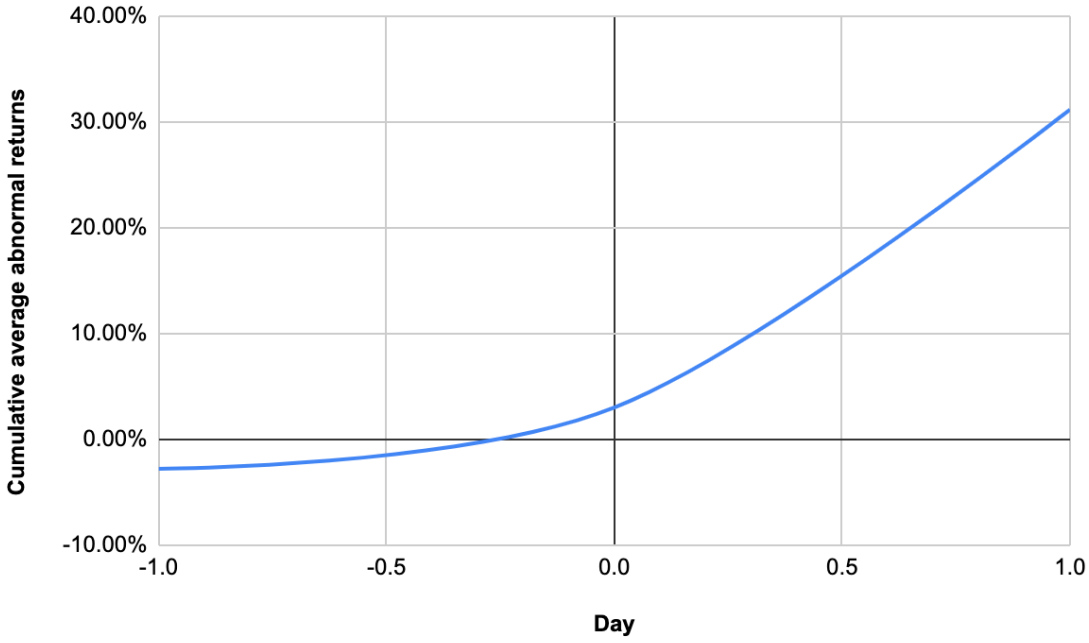

Figure 10: Cumulative abnormal returns for all crypto-assets in the sample for the event window (-1,+1).

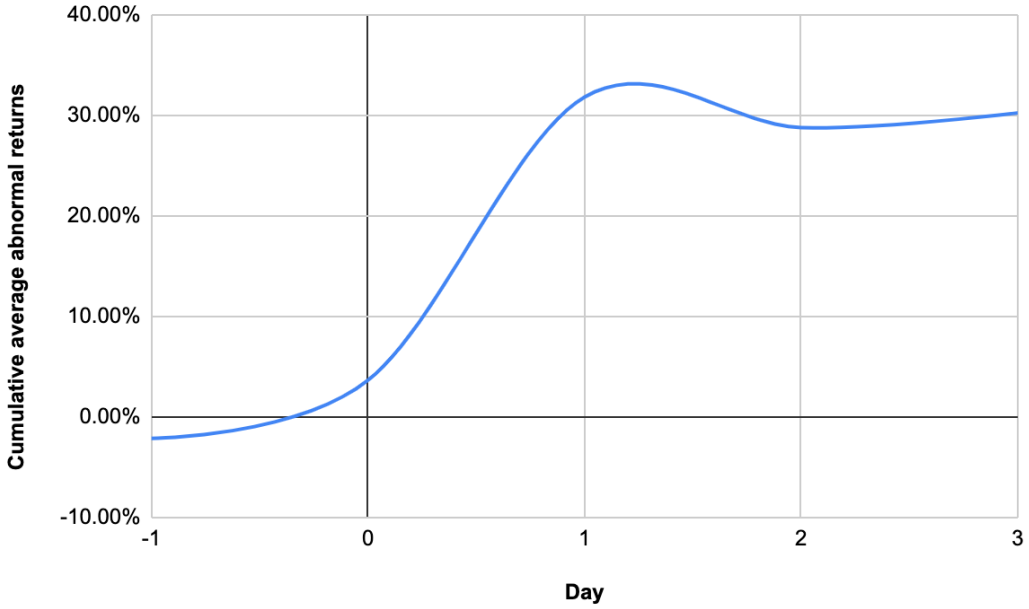

Figure 11: Cumulative abnormal returns for all crypto-assets in the sample for the event window (-1,+3)

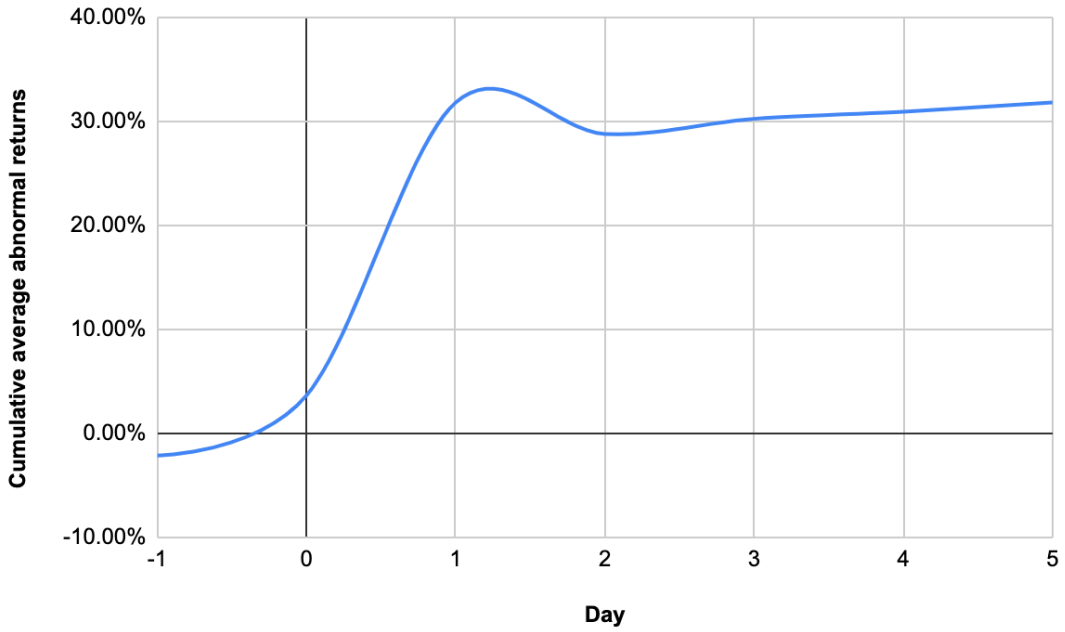

Figure 12: Cumulative abnormal returns for all crypto-assets in the sample for the event window (-1,+5)

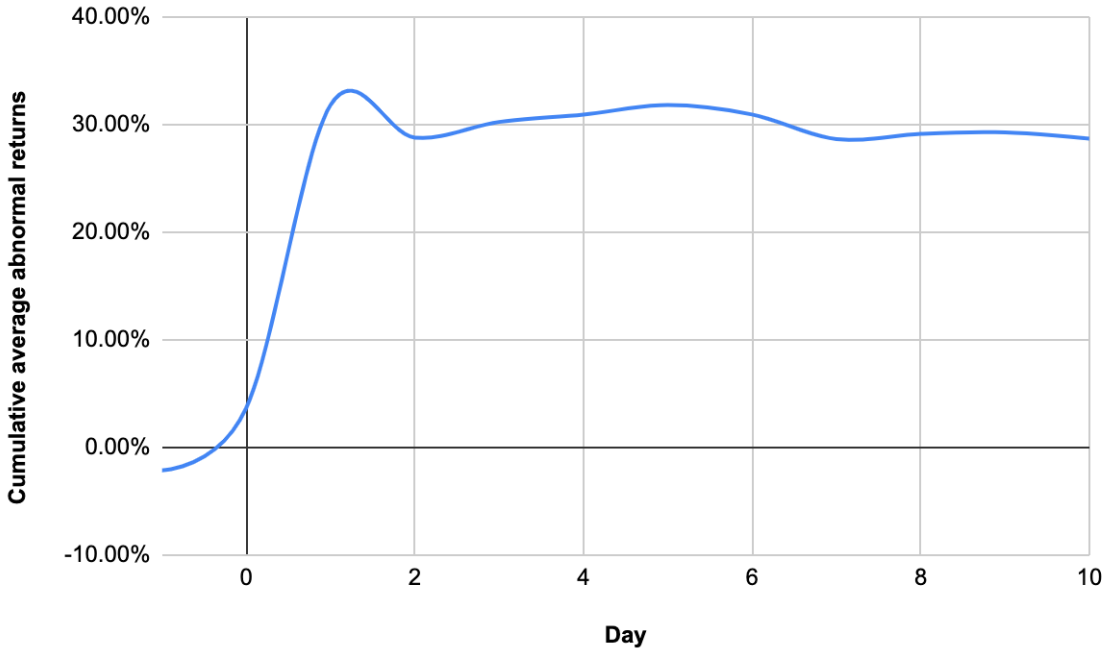

Figure 13: Cumulative abnormal returns for all crypto-assets in the sample for the event window (-1,+10)

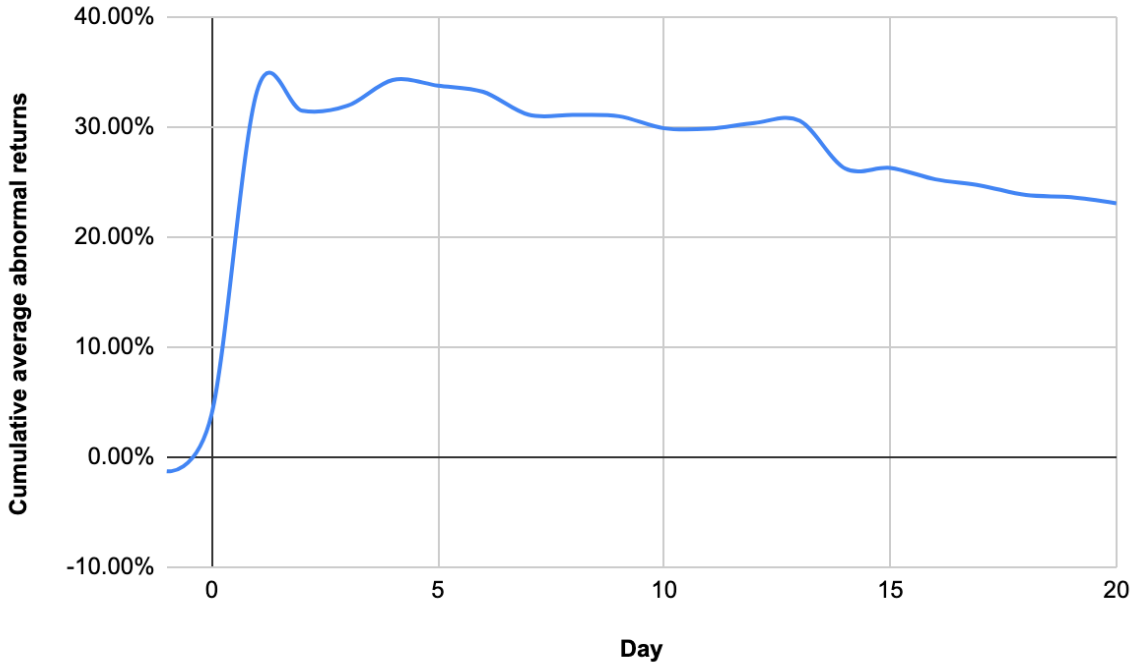

Figure 14: Cumulative abnormal returns for all crypto-assets in the sample for the event window(-1,+20)