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News Announcement Study

Effect of News Announcement on Token Price

July 2020

crypto.com

Research and Insights

Data Report

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1. Executive Summary

Welcome to our Data Report on the News Announcement Study.

Key Takeaways:

- We proposed a method to testify tokens' price movement before and after news announcement;
- 20 hand-picked events (across 17 tokens) from 2019 June to 2019 December were used;
- Price momentum effect lasts for the first 20 minutes after announcement;
- Price persistency effect lasts for at least 1 day after announcement;
- There are no strong evidences that price movement occurred prior to announcement.

2. Introduction

Cryptocurrency market can be easily influenced by news announcement from tokens. In addition, some may suspect that insider trading exists to profit from those announcements. Therefore, we performed this study to investigate the following questions:

- Have prices already rallied before announcement?
- How long will price movement hold after announcement?
- Will the price pump persist after certain period or fall back?

In this article, we aim to:

- Provide a methodology for analyzing the effect of news announcement on token price;
- Check the relationship between news announcement and token price;
- Testify and summarize the results.

In summary, our methodology is mainly based on hypothesis test with the null hypothesis that the individual token's price movement is Bernoulli trial. Hence, list of tokens' price movements follows binomial distribution. The price changes are calculated not only based on different time intervals (e.g. 10 minutes and 2 hours), but also on two different ways: incremental price changes and price changes regarding to baseline. By calculating the p-value and comparing to the significant thresholds, we can draw the conclusions.

3. Methodology

3.1 Data and Data Extraction

We have hand-picked 20 events (across 17 tokens) of news announcement and extracted prices (in BTC) and volume (24h rolling) of the related tokens. The events happened between 2019 June and 2019 December.

To perform the study, both 10 minutes and 2 hours intervals are used to get tokens' price data. For 10 minutes interval data, a 3-hour duration (between -1 hour to +2 hours) is used. For 2 hours interval data, a 1.5-day duration (between -0.5 day to +1 days) is used.

Data was extracted from CoinMarketCap.

The 20 selected events are listed on the next page.

#	Datetime	Symbol	Icon	Event
1	2019/11/7 3:20 p.m. HKT	CRO		CRO Token Freeze
2	2019/11/5 7:00 a.m. HKT	XLM		Stellar Token Burn
3	2019/11/28 8:05 p.m. HKT	BNT		Airdrop on Binance
4	2019/8/2 8:06 a.m. HKT	ALGO		Token Buyback
5	2019/11/7 3:00 a.m. HKT	XTZ		Coinbase Staking Listing
6	2019/10/14 4:41 p.m. HKT	NKN		CZ's tweet on listing
7	2019/6/25 4:06 p.m. HKT	MCO		MCO US Card Launch
8	2019/6/25 11:15 a.m. HKT	VET		Partnership with Walmart and PwC
9	2019/11/19 3:32 p.m. HKT	MCO		MCO Competition on Binance
10	2019/12/5 5:11 p.m. HKT	CRO		Crypto.com Syndicate
11	2019/10/29 12:06 a.m. HKT	IOTA		Partnership with Linux and Dell
12	2019/11/18 11:40 p.m. HKT	LSK		Token Listing on Kraken
13	2019/12/5 8:29 a.m. HKT	ENJ		Partnership with Microsoft
14	2019/12/6 3:00 a.m. HKT	ENG		Partnership with Chainlink
15	2019/11/25 10:47 p.m. HKT	ONT		Partnership with Chainlink
16	2019/9/27 8:40 p.m. HKT	HBAR		Binance Listing
17	2019/11/26 1:09 a.m. HKT	AVA		Partnership with Hotels.com
18	2019/11/6 11:03 p.m. HKT	REN		Testnet launch
19	2019/8/10 4:00 a.m. HKT	ALGO		Coinbase Pro Listing
20	2019/10/8 11:41 p.m. HKT	SC		Kraken Listing

3.2 Price Change

Two price change methods are used in this study. The first one is the incremental price change and the second one is the baseline price change. All prices are measured in BTC to eliminate *systematic effect* in general.

Incremental price change

Incremental price change measures the price movement between current price (S_t) and previous price (S_{t-1}) with a fixed time Interval. For example, Bitcoin's price at 12:00, 12:10 and 12:20 are 7,000, 7,100, 7,050 respectively, then its incremental price changes at 12:10 and 12:20 are +1.43% and -0.70% respectively. Incremental price change is denoted as:

$$\Delta_i P(t) = \frac{S_t - S_{t-1}}{S_{t-1}}$$

Incremental price change is used to capture the momentum of the price movement after the announcement.

Baseline price change

Baseline price change measures the price movement relative to the baseline. Baseline (S_b) is defined as the token's price exactly when news was announced. For example, Bitcoin's price at 12:00, 12:10 and 12:20 are 7,000, 7,100, 7,050 respectively and the baseline time is 12:10, then the baseline price changes at 12:00, 12:10 and 12:20 are -1.41%, 0.00% and -0.70% respectively. Baseline price change is denoted as:

$$\Delta_b P(t) = \frac{S_t - S_b}{S_b}$$

Baseline price change is used to capture the *persistency* of the price movement after the announcement.

3.3 Binomial Test

After calculating all price changes in a given time interval, they were divided into two groups: *positive movement* versus *negative or zero movement;* and their group sizes are counted:

$$N_{Positive} = Count\ items\ that\ \Delta P > 0$$
$$N_{Negative} = Count\ items\ that\ \Delta P \leq 0$$

Our null hypothesis (H_0) is that the positive and negative price changes are evenly distributed. In other words, price movements in a specific time interval follows a binomial distribution:

$$X \sim Binomial(n = 20, p = 0.5)\ ,$$

where *n* is the number of samples and *p* Is the probability that the price change is positive.

The alternative hypothesis (H_1) is that price movements don't follow binomial distribution.

With the sample observed, we can calculate the probability (i.e. p-value) that there are $N_{Positive}$ times for prices to increase and $N_{Negative}$ times for prices to decrease or remain the same if the null hypothesis (i.e. even distribution) is true. We reject the null hypothesis if the calculated probability is lower than the significance threshold (3% for incremental change and 1% for baseline change).

For example, assume the empirical data is $N_{Positive} = 13$ and $N_{Negative} = 7$. The probability for this to occur if $X \sim Binomial(n = 20, p = 0.5)$ is:

$$p - value = \binom{20}{13} 0.5^{13}(1 - 0.5)^{20-13} = 7.4\%$$

Since p-value > 3% (our significance threshold), we accept the null hypothesis, i.e. we cannot conclude that the price movement has a significant trend in that specified time interval.

4. Result and Analysis

4.1 Tabular Result

The study result in tabular format is summarized below.

Incremental price changes with 10 mins interval

Interval (min)	-ve	+ve	Test Stat	Sig? (3%)
-50	14	6	3.70%	N
-40	14	6	3.70%	N
-30	12	8	12.01%	N
-20	13	7	7.39%	N
-10	9	11	16.02%	N
0	13	7	7.39%	N
10	4	16	0.46%	Y
20	5	15	1.48%	Y
30	8	12	12.01%	N
40	8	12	12.01%	N
50	10	10	17.62%	N
60	10	10	17.62%	N
70	11	9	16.02%	N
80	10	10	17.62%	N
90	14	6	3.70%	N
100	12	8	12.01%	N
110	12	8	12.01%	N
120	9	11	16.02%	N

Baseline price changes with 10 mins interval

Interval (min)	-ve	+ve	Test Stat	Sig? (1%)
-50	14	6	3.70%	N
-40	18	2	0.02%	Y
-30	13	7	7.39%	N
-20	13	7	7.39%	N
-10	14	6	3.70%	N
0	20	0	0.00%	-
10	4	16	0.46%	Y
20	2	18	0.02%	Y
30	3	17	0.11%	Y
40	2	18	0.02%	Y
50	4	16	0.46%	Y
60	2	18	0.02%	Y
70	3	17	0.11%	Y
80	1	19	0.00%	Y
90	2	18	0.02%	Y
100	3	17	0.11%	Y
110	4	16	0.46%	Y
120	4	16	0.46%	Y

Incremental price changes with 2hr interval

Interval (hr)	-ve	+ve	Test Stat	Sig? (3%)
-10	10	10	17.62%	N
-8	12	8	12.01%	N
-6	7	13	7.39%	N
-4	10	10	17.62%	N
-2	11	9	16.02%	N
0	8	12	12.01%	N
2	2	18	0.02%	Y
4	12	8	12.01%	N
6	11	9	16.02%	N
8	10	10	17.62%	N
10	13	7	7.39%	N
12	10	10	17.62%	N
14	10	10	17.62%	N
16	14	6	3.70%	N
18	9	11	16.02%	N
20	12	8	12.01%	N
22	10	10	17.62%	N
24	11	9	16.02%	N

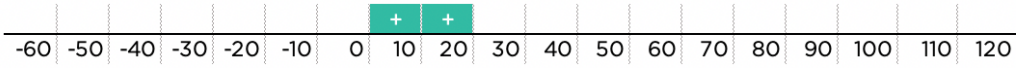
Baseline price changes with 2hr interval

Interval (hr)	-ve	+ve	Test Stat	Sig? (1%)
-10	12	8	12.01%	N
-8	14	6	3.70%	N
-6	12	8	12.01%	N
-4	12	8	12.01%	N
-2	13	7	7.39%	N
0	20	0	0.00%	-
2	2	18	0.02%	Y
4	5	15	1.48%	N
6	4	16	0.46%	Y
8	1	19	0.00%	Y
10	1	19	0.00%	Y
12	2	18	0.02%	Y
14	1	19	0.00%	Y
16	2	18	0.02%	Y
18	3	17	0.11%	Y
20	4	16	0.46%	Y
22	3	17	0.11%	Y
24	3	17	0.11%	Y

4.2 Graphic Result

3-hour duration (10 minutes interval) study

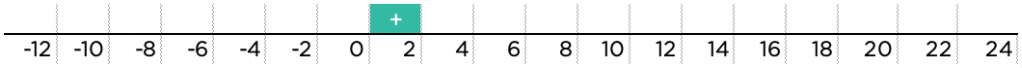
Study result indicated that (incremental) price increase was observed within 20 minutes after the announcement (with 3% significance level) but no patterns were observed in other time periods.



It also indicated that price increase (baseline mode) persisted after the news announcement (with 1% significance level). We observed that price was typically lower than the baseline price 30 minutes before announcement (with 1% significance level).

1.5 days duration (2 hours interval) study

Study result indicated that (incremental) price increase was observed within first 2 hours after the announcement (with 3% significance level) but no patterns were observed in other time periods.



Study result also indicated that (baseline) price Increase persisted (with 1% significance level) at least 1 day after the news announcement. However, such pattern was not observed during 2-4 hours after the announcement, which indicated that some sell-off might have taken place within that time period.

5. Summary

5.1 Conclusion

Key Takeaways:

- We proposed a method to testify tokens' price movement before and after news announcement;
- 20 hand-picked events (across 17 tokens) from 2019 June to 2019 December were used;
- Price momentum effect lasts for the first 20 minutes after announcement;
- Price persistency effect lasts for at least 1 day after announcement;
- There are no strong evidences that price movement occurred prior to announcement.

5.2 Limitations and Caveats

Although we have concluded the above results, we would still like to highlight some limitations and further improvements that can be performed for the study:

- 20 sample events are likely not enough. We may further increase the number of events;
- Events were hand-picked which may introduce selection bias;
- There exists event that can result in negative movement or no movement, while the study focused on only positive movement events on purpose;
- The quality / nature of the news announcement differs, but we treated all of them homogenously;
- Market efficiency / news announcement effect may change overtime;
- We would also like to study the effect on volume, but volume data are on a 24-hour basis which would make the study difficult.

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