

## 5. Supplementary Document

### 5.1. Variables Description and Data Sources

**Table 5:** Description of Variables and Data Sources.

Variable	Description	Data Source
<b>Coin-specific Factors</b>		
MktCap	Average market capitalization of coin during the sample period.	CG API
Vol	Average daily trading volume of coin during the sample period.	CG API
CSupply	Circulating supply of coin.	CG API
ComScore	Community Score, measured based on social media activity.	CG API
DevScore	Developer Score, measured based on GitHub & Bitbucket activity.	CG API
LiqScore	Liquidity Score, based on cryptocurrency trading activity.	CG API
PubScore	Public Interest Score, based on website ranking and search engine queries.	CG API
NumExch	Number of exchanges a coin is listed on.	CG API
Age	Months between the coin's inception and May 2024.	Various
<b>Market-based Factors</b>		
BTCRet	Return on Bitcoin prices during the period.	CMC API
BTCVar	Variance in daily returns during the period (Monthly and Weekly). Garman Klass Volatility (Daily).	CMC API
UMCSent	University of Michigan: Consumer Sentiment.	FRED
VIX	CBOE Volatility Index average during the period.	FRED
EPU	Economic Policy Uncertainty Index.	FRED
Inflation	First log difference of CPI less Food and Energy (Monthly). 5-Year Breakeven Inflation Rate (Weekly and Daily).	FRED
Interest	Market Yield on 10-Year U.S. Treasury Securities.	FRED
AltSent	Crypto Fear & Greed Index.	alternative.me
COVID-19	Dummy variable for the period between March 1 and May 1, 2020.	Authors
Time-effects	Dummy variables for specific months or days of the week.	Authors

## 5.2. Descriptive Statistics for Daily and Monthly Data

**Table 6:** Descriptive Statistics for Independent Variables (before ASINH transformation) for Daily and Monthly data.

	BTCRet	BTCVar	VIX	EPU	Inflation	Interest	Unemp	UMCSent	AltSent
Daily									
Mean	0.0008	0.0326	20.92	161.11	1.86	1.85	-	-	46.11
Median	0.0014	0.0266	19.36	118.94	1.84	1.68	-	-	41.00
St. Dev.	0.0402	0.0254	8.07	125.41	0.52	0.81	-	-	22.48
Minimum	-0.4647	0.0033	9.15	4.05	0.14	0.52	-	-	5.00
Maximum	0.1718	0.2793	82.69	861.10	3.17	3.24	-	-	95.00
Monthly									
Mean	0.08	0.16	20.23	244.69	0.24	0.38	5.26	88.38	46.20
Median	-0.09	0.11	18.74	233.16	0.20	0.34	4.00	92.20	42.64
St. Dev.	0.72	0.16	8.07	63.56	0.22	0.55	2.50	10.85	19.49
Minimum	-1.51	0.01	11.06	123.84	-0.50	-0.41	3.50	67.40	16.03
Maximum	1.52	1.02	57.74	427.87	0.77	1.31	14.70	101.40	92.13

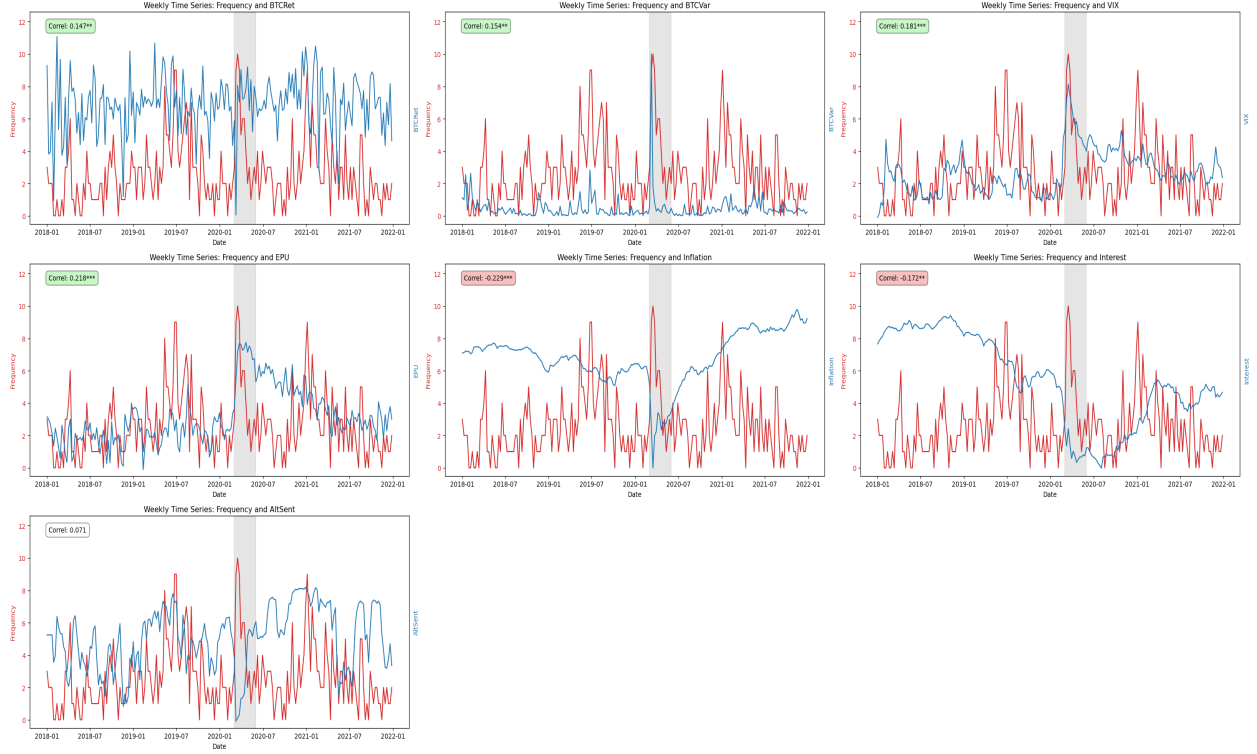
## 5.3. Daily, Weekly, and Monthly Time-series Plots

**Figure 2:** Daily Market-based Factors Time Series



Daily Comparative Time Series, showing the co-movement of pump frequency and various variables. The shaded area represents the initial three-month period of the COVID-19 lockdowns. Spearman Rank Correlation coefficients inside the boxes are denoted with asterisks to indicate levels of statistical significance, where \*  $p < 0.10$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$ . The blue and red time-series have different scales.

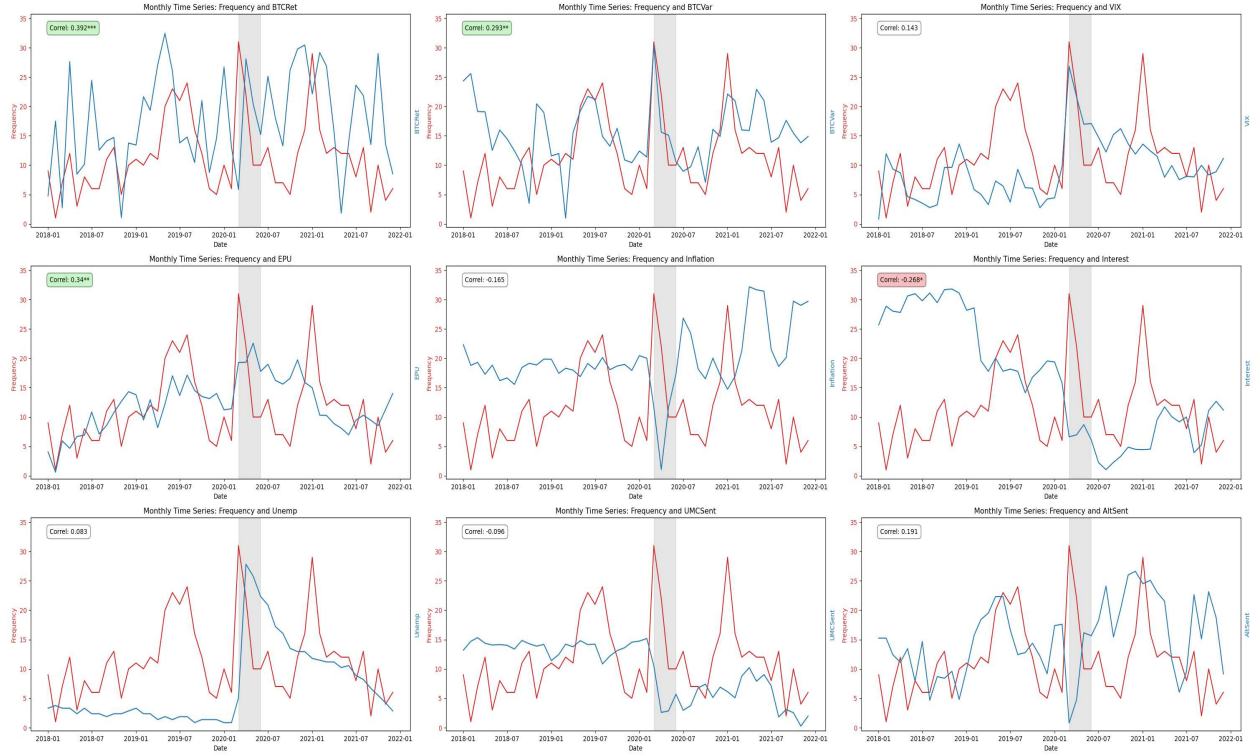
**Figure 3: Weekly Market-based Factors Time Series**



Weekly Comparative Time Series, showing the co-movement of pump frequency and various variables. The shaded area represents the initial three-month period of the COVID-19 lockdowns. Spearman Rank Correlation coefficients inside the boxes are denoted with asterisks to indicate levels of statistical significance, where \*  $p < 0.10$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$ . The blue and red time-series have different scales.

Figure 3 demonstrates the time-series nature of the market-based factors data (weekly). Visually, we can observe the co-movement of each of the explanatory variables (blue line) and the frequency of pumps (red line). We can also see that there was a significant increase in the frequency of pumps during the period of COVID-19.

**Figure 4: Monthly Market-based Factors Time Series**



Monthly Comparative Time Series, showing the co-movement of pump frequency and various variables. The shaded area represents the initial three-month period of the COVID-19 lockdowns. Spearman Rank Correlation coefficients inside the boxes are denoted with asterisks to indicate levels of statistical significance, where \*  $p < 0.10$ , \*\*  $p < 0.05$ , and \*\*\*  $p < 0.01$ . The blue and red time-series have different scales.

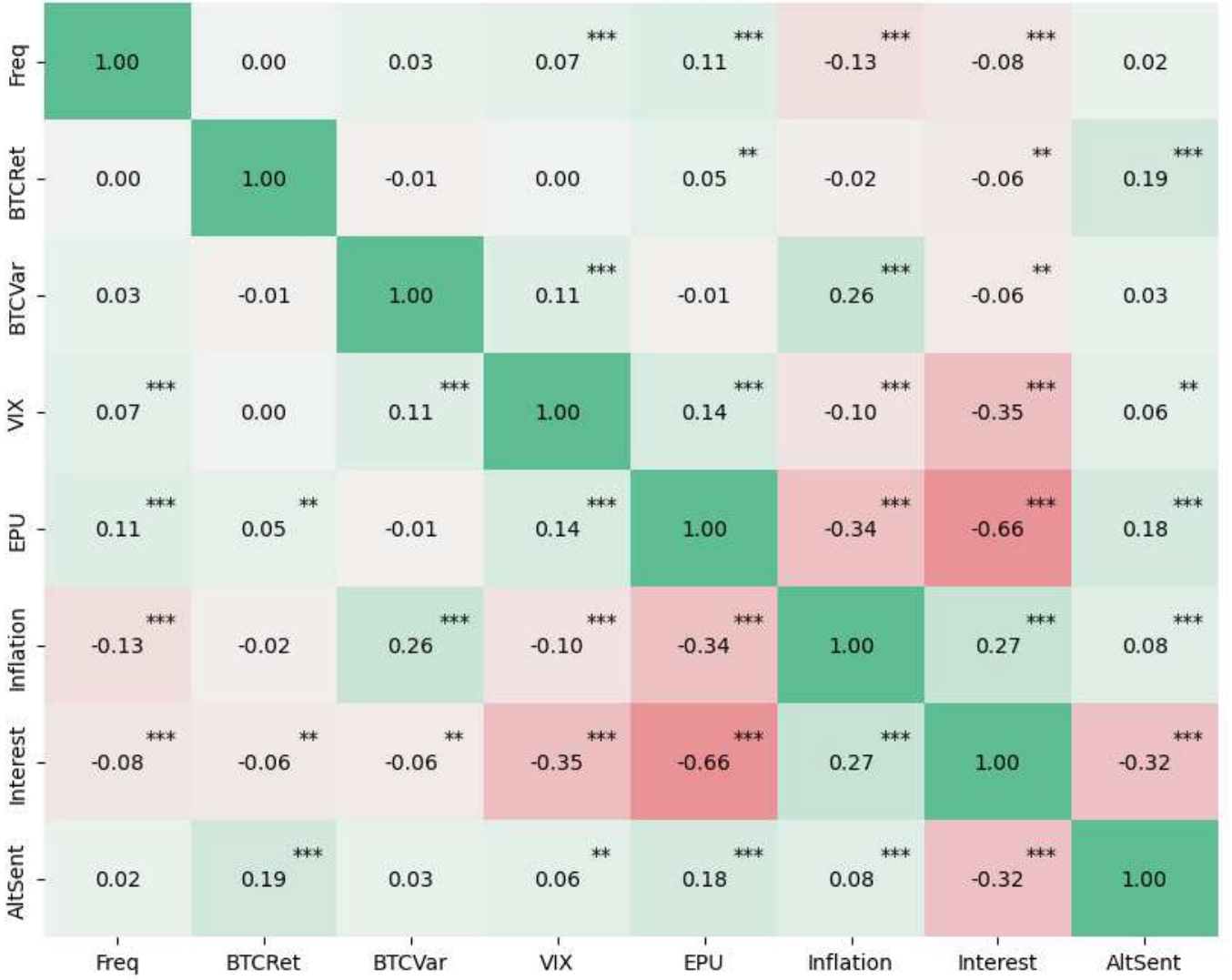
#### 5.4. Correlation Matrices for Market-based Factors

**Figure 5:** Monthly Spearman Rank Correlation Matrix



**Figure 6:** Weekly Spearman Rank Correlation Matrix

Freq	1.00	0.15 **	0.15 **	0.18 ***	0.22 ***	-0.23 ***	-0.17 **	0.07
BTCRet	0.15 **	1.00	0.02	0.09	0.16 **	-0.04	-0.17 **	0.44 ***
BTCVar	0.15 **	0.02	1.00	0.12 *	0.05	0.20 ***	-0.01	-0.02
VIX	0.18 ***	0.09	0.12 *	1.00	0.69 ***	-0.25 ***	-0.64 ***	0.10
EPU	0.22 ***	0.16 **	0.05	0.69 ***	1.00	-0.32 ***	-0.78 ***	0.23 ***
Inflation	-0.23 ***	-0.04	0.20 ***	-0.25 ***	-0.32 ***	1.00	0.27 ***	0.08
Interest	-0.17 **	-0.17 **	-0.01	-0.64 ***	-0.78 ***	0.27 ***	1.00	-0.34 ***
AltSent	0.07	0.44 ***	-0.02	0.10	0.23 ***	0.08	-0.34 ***	1.00
	Freq	BTCRet	BTCVar	VIX	EPU	Inflation	Interest	AltSent

**Figure 7:** Daily Spearman Rank Correlation Matrix

### 5.5. Market Capitalization and Trading Volume Quartile Analysis

**Table 7:** Logit of MktCap and Vol Quartiles

Variable		Variable	
MktCapQ1	0.31*** (4.29)	VolQ1	0.33*** (4.25)
MktCapQ2	0.21*** (2.62)	VolQ2	0.27*** (3.26)
MktCapQ3	0.16** (1.94)	VolQ3	0.18 (2.02)

Marginal effects are presented, with Z-statistics in parentheses. For this table, the dependent variable is the likelihood of a coin being pumped. The independent variables are only quartiles of the Size variable (once MktCap and once Volume).

## 5.6. Market-based Factors Results Table with Time Effects

**Table 8:** Market-based Factors Regression Results Table with Time Effects

	Monthly				Weekly		Daily			
	Without TE		With TE		Without TE		Without TE		With TE	
	ME	Z-stat	ME	Z-stat	ME	Z-stat	ME	Z-stat	ME	Z-stat
BTCRet	2.78**	2.44	2.56**	2.01	2.17**	2.22	-0.30	-0.89	-0.18	-0.53
BTCVar	2.63**	2.07	3.22***	2.97	1.01***	3.53	1.13**	2.31	1.45***	2.96
UMCSent	14.92**	2.35	13.69**	2.30	-	-	-	-	-	-
AltSent	1.85	0.86	1.32	0.61	0.31	0.86	0.05	1.38	0.05	1.45
COVID19	8.47**	2.42	3.78	0.81	1.54**	2.21	-0.04	-0.51	-0.01	-0.20
VIX	-	-	-	-	0.65	1.13	0.16***	3.38	0.15***	3.20
EPU	11.36***	3.17	14.30***	4.59	-	-	0.10***	2.68	0.05	1.45
Inflation	4.58	1.01	4.50	1.31	-	-	-0.28***	-3.60	-0.30***	-4.02
Interest	-	-	-	-	0.09	0.19	0.12**	2.04	0.07	1.24
January	-	-	5.94**	2.14	-	-	-	-	-	-
February	-	-	1.07	0.28	-	-	-	-	-	-
March	-	-	4.38*	1.69	-	-	-	-	-	-
April	-	-	5.62**	2.21	-	-	-	-	-	-
May	-	-	1.85	0.71	-	-	-	-	-	-
June	-	-	3.12*	1.62	-	-	-	-	-	-
July	-	-	2.87	1.18	-	-	-	-	-	-
August	-	-	6.08**	2.14	-	-	-	-	-	-
September	-	-	3.43	0.95	-	-	-	-	-	-
October	-	-	2.80	0.88	-	-	-	-	-	-
November	-	-	-3.43*	-1.73	-	-	-	-	-	-
Sunday	-	-	-	-	-	-	-	-	0.22***	3.72
Monday	-	-	-	-	-	-	-	-	0.00	0.06
Tuesday	-	-	-	-	-	-	-	-	0.08	1.36
Thursday	-	-	-	-	-	-	-	-	0.00	0.01
Friday	-	-	-	-	-	-	-	-	0.04	0.64
Saturday	-	-	-	-	-	-	-	-	0.08	1.37

This table reports the estimation results of market-based factors affecting the number of pumps during a period. Marginal effects (ME) and Z-statistics (Z-stat) are presented without time effects (Without TE) for all frequencies, and with time effects (With TE) for Monthly and Daily frequencies only. Asterisks denote significance levels: \*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ .



### 5.7. Probit Model for Coin Factors

**Table 9:** Marginal Effects for Probit Model

	MktCap		Volume	
Size	-5.94*** (-3.23)	—	-3.89** (-2.01)	—
CSupply	0.29 (0.60)	0.18 (0.37)	0.06 (0.12)	0.03 (0.06)
ComScore	9.85*** (3.40)	9.51*** (3.26)	8.63** (3.06)	8.76*** (3.07)
DevScore	3.23*** (3.61)	3.22*** (3.55)	2.76*** (3.02)	3.02*** (3.32)
LiqScore	1.63 (0.28)	0.31 (0.05)	1.85 (0.30)	1.00 (0.17)
PubScore	-4.39 (-0.68)	-6.38 (-0.97)	-7.31 (-1.06)	-7.74 (-1.13)
NumExch	-1.18*** (-2.53)	-1.29*** (-2.75)	-1.47*** (-3.13)	-1.67*** (-3.49)
SizeQ1	—	-0.25*** (-3.07)	—	-0.16* (-1.85)
SizeQ2	—	-0.11* (-1.78)	—	-0.02 (-0.38)
SizeQ3	—	-0.09* (-1.71)	—	0.01 (0.23)

Marginal effects are presented with Z-statistics in parentheses. Asterisks denote statistical significance (\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$ ).