

Supplementary Document

1. The Phillips & Shi (2020) real time date-stamping approach

In this paper, we use the Phillips & Shi (2020) bubble detection approach that extends the original real time date-stamping approach of Phillips & Yu (2011) and Phillips et al. (2015a,b) where the authors propose to use "*the bootstrap procedure to mitigate the potential impact of heteroskedasticity and to effect family-wise size control in recursive testing algorithms*".

The starting point of Phillips & Shi (2020) real time date-stamping approach is the standard ADF test described by,

$$\Delta y_t = d + \phi y_{t-1} + \sum_{i=1}^p \phi_i \Delta y_{t-i} + \epsilon_t, \quad t = 1, \dots, T. \quad (1)$$

The null hypothesis of the ADF test is given by $H_0 : \phi = 0$, which corresponds to the case where the time series y_t has a unit root. Phillips & Yu (2011), and Phillips et al. (2015a,b) procedure have the same null hypothesis as for the standard ADF test but their alternative is defined as follows: $H_1 : \phi > 0$. Such an alternative hypothesis reflects the presence of an explosive root in the time series y_t . To account for the effect of a bubble collapse occurring in the studied sample, Phillips & Yu (2011) introduced the SADF test, which is based on a recursive estimation of the ADF regression equation in (1). The SADF statistic is defined as follows: $SADF(r_0) = \sup_{r \in [r_0, 1]} ADF_r$ where the full sample is normalized on the interval $[0, 1]$ and r_0 is the minimum window size. The problem with the SADF test is that it may fail to detect a second bubble if it is dominated by the first bubble. To overcome this shortcoming, Phillips et al. (2015a) and Phillips et al. (2015b) introduced the GSADF test where its statistic is defined as follows:

$$GSADF(r_0) = \sup_{r_1 \in [0, r_2 - r_0]} \left\{ \sup_{r_2 \in [r_0, 1]} ADF_{r_1}^{r_2} \right\}.$$

With the GSADF procedure, the date stamping of multiple bubble periods is given by

$$\begin{aligned} \hat{r}_e &= \inf_{r_2 \in [r_0, 1]} \left\{ r_2 : BSADF_{r_2}(r_0) > cv_{r_2}^{\alpha_T} \right\}, \\ \hat{r}_e &= \inf_{r_2 \in [\hat{r}_e, 1]} \left\{ r_2 : BSADF_{r_2}(r_0) < cv_{r_2}^{\alpha_T} \right\}, \end{aligned}$$

where the GSADF statistic is related to the backward sup ADF (BSADF) as follows,

$$GSADF(r_0) = \sup_{r_2 \in [r_0, 1]} \{BSADF_{r_2}(r_0)\}.$$

and the $BSADF$ statistic can be written as follows

$$BSADF_{r_2}(r_0) = \sup_{r_1 \in [0, r_2 - r_0]} \{ADF_{r_1}^{r_2}\}.$$

The $cv_{r_2}^{\alpha_T}$ is the $100(1 - \alpha_T)\%$ critical value of the sup ADF statistic. Since heteroscedasticity can affect the forward recursion method, and consequently the SADF test can be, in this situation, quite severely oversized, Harvey et al. (2016) proposed a wild bootstrap implementation of this test. However, given the sequential nature of the SADF test and his recursive hypothesis testing, one may arrive at wrong positive conclusions. This problem is called multiplicity or family-wise size control in testing. To overcome the unconditional heteroskedasticity problem and multiplicity issue in recursive testing, Phillips & Shi (2020) propose a new bootstrap procedure that combines the two procedures of Harvey et al. (2016) and Shi et al. (2018). We refer interested readers to the original paper of Phillips & Shi (2020).

2. Robustness checks results

We check the robustness of our results using different methods: (1) First, we use the probit, tobit and linear regression models as an alternative to the logit model presented in the main text of the paper, (2) Second, we use a dummy variable for the COVID-19 pandemic (it takes the value 0 if the number of cases is 0 and 1 otherwise), (3) Finally, we use the keywords "Bitcoin", "Ethereum", "DeFi" and "NFT" for Google trend searches.

All the robustness check results are reported in this supplementary document in Tables S1-S7. First, we find that the probit, tobit and linear regression models results reported in Tables S1-S3 confirm the general findings of our logit model and consolidate this paper's conclusions.

Second, Tables S4-S7 report the results of using general Google trend keyword searches and a dummy variable for COVID-19. These results are overall similar to using COVID-19 total global cases and google trend tickers, with two minor differences. First, while the positive association between Google trend and bubble occurrences is confirmed (13 out of the 14 coefficients), the relationship is however less pronounced as we find that 8 out of the 14 coefficients are positive and significant. Second, the results of the relationship between COVID-19 and bubbles are overall confirmed, except for REN, RUNE, and THETA. For the rest of the variables, the general tendency is also confirmed.

3. Tables results for robustness checks

3.1. Robustness checks results using probit, tobit and linear regression model (total global cases of COVID-19 and Google trend search using tickers)

Table S1: Probit Regression Results

| | Dependent variable: <i>Bubble_{et}</i> | | | | | | | | | | | | | |
|----------|--|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|
| | BTC | ETH | LINK | MKR | ZRX | REN | LUNA | SNX | FTM | RSR | RUNE | THETA | ENJ | MANA |
| Volume | 0.1543*** (0.0141) | 0.0687*** (0.0109) | 0.1425*** (0.0110) | 0.0141** (0.0068) | 0.0523*** (0.0053) | 0.0658*** (0.0119) | 0.0685*** (0.0085) | 0.0305** (0.0120) | 0.0465*** (0.0086) | -0.0261 (0.0165) | -0.0387** (0.0179) | 0.0750*** (0.0072) | 0.0208*** (0.0039) | 0.0588*** (0.0064) |
| TVL | - (0.0022) | -0.0123*** (0.0099) | -0.0407*** (0.0099) | -0.1453*** (0.0423) | -0.0176*** (0.0047) | -0.0159*** (0.0025) | -0.0689** (0.0068) | 0.0743*** (0.0249) | -0.0378** (0.0188) | -0.2088*** (0.0464) | -0.4194*** (0.0425) | 0.0816*** (0.0161) | 0.0209 (0.0148) | -0.0020 (0.0064) |
| Covid-19 | 0.1149*** (0.0073) | 0.0365*** (0.0051) | 0.0332*** (0.0051) | 0.0836*** (0.0285) | 0.0129*** (0.0034) | -0.0215*** (0.0053) | 0.0638*** (0.0235) | -0.0349*** (0.0123) | 0.0165** (0.0082) | 0.0380*** (0.0123) | 0.0830*** (0.0138) | 0.0123*** (0.0077) | 0.0408* (0.0230) | 0.0597*** (0.0046) |
| EPU | -0.0571*** (0.0196) | 0.0140 (0.0138) | 0.1026*** (0.0202) | -0.0247** (0.0197) | -0.0109 (0.0098) | 0.0704*** (0.0254) | 0.0276 (0.0213) | 0.0879*** (0.0267) | -0.0097 (0.0183) | -0.0298 (0.0334) | 0.0236 (0.0377) | -0.0147 (0.0159) | -0.0064 (0.0104) | -0.0147 (0.0134) |
| VIX | -0.6179*** (0.0469) | -0.3820*** (0.0485) | 0.0153 (0.0396) | -0.0199 (0.0258) | -0.2575*** (0.0428) | 0.0434 (0.0597) | 0.0109 (0.0515) | -0.0312 (0.0648) | -0.0862 (0.0573) | 0.1577** (0.0661) | 0.1609* (0.0959) | -0.0630 (0.0497) | -0.0035 (0.0245) | -0.2026*** (0.0490) |
| G'Trend | 0.0057*** (0.0013) | 0.0022*** (0.0005) | 0.0081*** (0.0010) | 0.0004 (0.0003) | 0.0016*** (0.0003) | 0.0091*** (0.0026) | 0.0016** (0.0005) | 0.0017** (0.0078) | 0.0018*** (0.0005) | 0.0014** (0.0007) | -0.0033 (0.0021) | 0.0022*** (0.0006) | 0.0003 (0.0003) | -0.0003 (0.007) |
| Gold | -2.1171*** (0.1947) | 0.1637 (0.1539) | -0.9001*** (0.1893) | 0.0516 (0.1332) | 0.0651 (0.0990) | 0.7456*** (0.2329) | 0.3144* (0.1817) | 1.4682*** (0.2481) | 0.0853 (0.1696) | 2.0231*** (0.3403) | 1.3031*** (0.4654) | -0.5827*** (0.1643) | -0.2961** (0.1316) | 0.2703* (0.1441) |
| Brent | -0.2464*** (0.0520) | 0.1268** (0.0601) | 0.5822*** (0.0674) | -0.0910*** (0.0283) | -0.0699** (0.0356) | 0.6017*** (0.1354) | 0.0553 (0.0624) | 0.9190*** (0.1285) | 0.0688 (0.0845) | 0.7811*** (0.1326) | 1.2885*** (0.1276) | -0.0408 (0.0613) | 0.0683 (0.0873) | 0.0236 (0.0547) |
| Obs. | 1424 | 1424 | 1198 | 1154 | 1231 | 1049 | 550 | 1029 | 805 | 611 | 553 | 1083 | 1128 | 1200 |
| McFadden | 0.353 | 0.620 | 0.459 | 0.645 | 0.658 | 0.205 | 0.738 | 0.331 | 0.489 | 0.240 | 0.413 | 0.661 | 0.689 | 0.586 |

The table reports the average marginal effects with their corresponding standard errors in brackets. *, **, and *** represents significance at the 10%, 5%, and 1% level, respectively.

Table S2: Tobit Regression Results

| | Dependent variable: Truncated [0, 1] p-value | | | | | | | | | | | | | |
|----------|--|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | BTC | ETH | LINK | MKR | ZRX | REN | LUNA | SNX | FTM | RSR | RUNE | THETA | ENJ | MANA |
| Volume | 0.0489*** (0.0046) | 0.0501*** (0.0058) | 0.0369*** (0.0032) | 0.0248*** (0.0031) | 0.0544*** (0.0038) | 0.0197*** (0.0033) | 0.8929*** (0.0478) | 0.0167*** (0.0033) | 0.0349*** (0.0023) | -0.0410*** (0.0064) | -0.0338*** (0.0068) | 0.0335*** (0.0023) | 0.0177*** (0.0015) | 0.0431*** (0.0021) |
| TVL | - (0.0014) | -0.0056*** (0.0029) | -0.0115 (0.0029) | -0.0229*** (0.0037) | -0.0089*** (0.0022) | -0.0147*** (0.0053) | -0.0116 (0.1473) | 0.0264*** (0.0075) | -0.0260*** (0.0078) | -0.0302** (0.0160) | -0.1429*** (0.0185) | 0.0142*** (0.0034) | 0.0133*** (0.0021) | -0.0066*** (0.0017) |
| Covid-19 | 0.0435*** (0.0026) | 0.0333*** (0.0025) | 0.0029*** (0.0011) | 0.0102*** (0.0019) | 0.0083*** (0.0016) | -0.0045*** (0.0013) | 0.1751*** (0.0469) | -0.0146*** (0.0035) | 0.0145*** (0.0019) | 0.0255*** (0.0051) | 0.0332*** (0.0057) | 0.0193*** (0.0018) | 0.0036*** (0.0006) | 0.0039*** (0.0012) |
| EPU | -0.0376*** (0.0036) | 0.0021 (0.0070) | 0.0252*** (0.0062) | -0.0033 (0.0063) | 0.0071 (0.0051) | 0.0147** (0.0061) | -0.0692 (0.1257) | 0.0147* (0.0079) | -0.0084 (0.0054) | -0.00196 (0.0132) | -0.00014 (0.0163) | -0.0069 (0.0048) | 0.0056* (0.0029) | -0.0067** (0.0032) |
| VIX | -0.1289*** (0.0245) | -0.0672*** (0.0142) | -0.0344*** (0.0129) | 0.0214 (0.0138) | -0.0438*** (0.0105) | 0.0184 (0.0136) | -1.3125*** (0.2257) | -0.0065 (0.0176) | 0.0488*** (0.0118) | 0.1035*** (0.0241) | 0.1398*** (0.0278) | 0.0016 (0.0107) | 0.0132* (0.0074) | -0.0039 (0.0077) |
| GTrend | 0.0068*** (0.0005) | 0.0054*** (0.0141) | 0.0024*** (0.0003) | 0.0022*** (0.0003) | 0.0023*** (0.0005) | 0.0019*** (0.0005) | -0.0219*** (0.0062) | 0.0033*** (0.0003) | 0.0007*** (0.0001) | 0.0043*** (0.0012) | -0.0025*** (0.0008) | 0.0042*** (0.0012) | 0.0027*** (0.0010) | 0.0018*** (0.0004) |
| Gold | -0.2836*** (0.05377) | -0.3601*** (0.0638) | -0.1828*** (0.0687) | 0.0281 (0.0003) | 0.0281 (0.0398) | 0.2401*** (0.0607) | -9.4708*** (1.3182) | 0.4345*** (0.0688) | -0.2961*** (0.0459) | 0.6996*** (0.1429) | 0.0294 (0.1626) | -0.4356*** (0.0378) | -0.2489*** (0.0298) | -0.1029*** (0.0304) |
| Brent | -0.1428*** (0.0268) | 0.1736*** (0.0201) | 0.1513*** (0.0183) | 0.0857*** (0.0184) | -0.0382 (0.0149) | 0.1632*** (0.0193) | 0.1731 (0.2941) | 0.1653*** (0.0231) | 0.0247* (0.0141) | 0.2977*** (0.0306) | 0.4092*** (0.0352) | 0.0637*** (0.0137) | 0.0709*** (0.0102) | 0.0321*** (0.0105) |
| Const. | 2.6738*** (0.2511) | 1.1248*** (0.4415) | 0.0094 (0.4844) | 0.0099 (0.4099) | -0.5822* (0.3140) | -2.4457** (0.4049) | 60.638*** (9.4623) | -4.330*** (0.4874) | 1.8369*** (0.3204) | -5.3461*** (1.0055) | 0.6794 (1.1019) | 1.7481*** (0.2825) | 1.0098*** (0.2237) | 0.0088 (0.2276) |
| Obs. | 1424 | 1424 | 1198 | 1154 | 1231 | 1049 | 550 | 1029 | 805 | 611 | 553 | 1083 | 1128 | 1200 |

The table reports coefficient with their corresponding standard errors in brackets. *, **, and *** represents significance at the 10%, 5%, and 1% level, respectively.

Table S3: Linear Regression Results

| | Dependent variable: <i>PS</i> statistic | | | | | | | | | | | | | |
|-----------|---|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|------------------------|
| | BTC | ETH | LINK | MKR | ZRX | REN | LUNA | SNX | FTM | RSR | RUNE | THETA | ENJ | MANA |
| Volume | 0.3940*** (0.0460) | 0.3590*** (0.0419) | 0.4100*** (0.0356) | 0.1667** (0.0215) | 0.5389*** (0.0414) | 0.2190*** (0.0372) | 0.8929*** (0.0413) | 0.2071*** (0.0467) | 0.7223*** (0.0569) | -0.3617*** (0.0596) | -0.2917*** (0.0596) | 0.4988*** (0.0358) | 0.3709*** (0.0321) | 0.7652*** (0.0384) |
| TVL | - (0.0097) | -0.0407*** (0.0323) | -0.0127 (0.0423) | -0.1544*** (0.0234) | -0.0954*** (0.0579) | -0.1627*** (0.0147) | -0.0161*** (0.0940) | 0.3279*** (0.1633) | -0.5372*** (0.0981) | -0.2666*** (0.1606) | -1.2336*** (0.1606) | 0.7092*** (0.0508) | 0.2785*** (0.0436) | -0.1183*** (0.0310) |
| Covid-19 | 0.2892*** (0.0213) | 0.2390*** (0.0189) | 0.0329*** (0.0109) | 0.0685*** (0.0123) | 0.0895*** (0.0236) | -0.0495*** (0.0015) | 0.1761*** (0.0473) | -0.1815*** (0.0446) | 0.2996*** (0.0406) | 0.2247*** (0.0421) | 0.2861*** (0.0513) | 0.2872*** (0.0265) | 0.0759*** (0.0128) | 0.0686*** (0.0216) |
| EPU | -0.209*** (0.0623) | 0.0152 (0.0505) | 0.2798*** (0.0698) | -0.0225 (0.0436) | 0.0756 (0.0552) | 0.1635** (0.0681) | -0.0691 (0.1267) | 0.1828*** (0.0982) | -0.1741* (0.0984) | -0.1728 (0.1170) | -0.0117 (0.1418) | -0.1021 (0.0718) | 0.1174** (0.0463) | -0.1168 (0.0664) |
| VIX | -1.7133*** (0.1159) | -0.4815 (0.1020) | -0.3821*** (0.1437) | 0.1446 (0.0936) | -0.4569*** (0.1123) | 0.2039 (0.123) | -1.3127*** (0.2278) | -0.0802 (0.2191) | 0.9885*** (0.2435) | 0.9138*** (0.2146) | 1.2062*** (0.2425) | 0.0244 (0.1593) | 0.2755* (0.1467) | -0.0705 (0.1377) |
| G'Trend | 0.0637*** (0.0038) | 0.0388*** (0.0020) | 0.0271*** (0.0039) | 0.0148*** (0.0023) | 0.0249*** (0.0056) | 0.0216*** (0.0054) | 0.0219*** (0.0062) | 0.0418*** (0.0047) | 0.0353*** (0.0033) | -0.0218*** (0.0022) | 0.0064*** (0.0009) | 0.0064*** (0.0015) | 0.0565*** (0.0049) | 0.0257*** (0.0036) |
| Gold | -3.6333*** (0.5748) | -2.5801*** (0.4587) | -2.0283*** (0.7645) | -0.8013** (0.3356) | 0.3014 (5.3965) | 2.6650*** (4.298) | -9.4708*** (1.3291) | 5.3886*** (0.8583) | -6.1165*** (0.9534) | 6.1725*** (1.2708) | 0.2540 (1.4147) | -6.4758 (0.5587) | -5.1963*** (0.6235) | -1.8255*** (0.5421) |
| Brent | -0.4396*** (0.1598) | 1.2435*** (0.1446) | 1.6794*** (0.2040) | 0.5769*** (0.3565) | -0.4098*** (1.8645) | 1.8006*** (2.1478) | 0.1731 (0.2965) | 2.0503*** (0.2881) | 0.5095* (0.2850) | 2.6268*** (0.2719) | 3.5308*** (0.3062) | 0.9472*** (0.2053) | 1.4794*** (0.2144) | 0.5701*** (0.1879) |
| Const. | 23.466*** (3.8578) | 6.4647*** (3.1859) | -1.4872 (5.3965) | 1.8645 (2.7708) | -8.6187*** (3.190) | -29.102*** (4.5138) | 60.6387*** (9.5407) | -55.568*** (6.0718) | 35.987*** (6.6567) | -49.616*** (8.9247) | 3.9023 (9.5869) | 23.939*** (4.2179) | 19.329*** (4.6387) | -3.4798 (4.0511) |
| Obs. | 1424 | 1424 | 1198 | 1154 | 1231 | 1049 | 550 | 1029 | 805 | 611 | 553 | 1083 | 1128 | 1200 |
| R-Squared | 0.4651 | 0.5835 | 0.3556 | 0.1938 | 0.2288 | 0.2354 | 0.6480 | 0.4350 | 0.4171 | 0.3104 | 0.4573 | 0.6862 | 0.3990 | 0.4005 |

The dependent variable is the calculated *PS* statistic. The independent variables are described in in Section 2. The table reports the coefficients with their corresponding standard errors in brackets. *, **, and *** represents significance at the 10%, 5%, and 1% level, respectively.

3.2. Robustness Checks Results using Logit, Probit, Tobit and Linear regression model (dummy variable for COVID-19 pandemic and Google trend search for keywords "Bitcoin", "Ethereum", DeFi" and "NFT")

Table S4: Logit Regression Results

| | Dependent variable: <i>Bubble_t</i> | | | | | | | | | | | | | |
|----------|---|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|------------------------|-----------------------|-----------------------|------------------------|
| | BTC | ETH | LINK | MKR | ZRX | REN | LUNA | SNX | FTM | RSR | RUNE | THETA | ENJ | MANA |
| Volume | 0.0696*** (0.0141) | 0.0239* (0.0125) | 0.1290*** (0.0108) | 0.0391*** (0.0055) | 0.0529*** (0.0051) | 0.0378*** (0.0110) | 0.0590*** (0.0087) | 0.0256*** (0.0086) | 0.0357*** (0.0076) | -0.0031 (0.0155) | -0.1204*** (0.0142) | 0.0845*** (0.0068) | 0.0214*** (0.0035) | 0.0517*** (0.0053) |
| TVL | - (0.0021) | -0.0129*** (0.0021) | -0.0396*** (0.0098) | -0.0317*** (0.0073) | -0.0225*** (0.0050) | -0.0680*** (0.0176) | -0.0556** (0.0233) | 0.0374* (0.0221) | -0.0111 (0.0206) | -0.1461*** (0.0427) | -0.3449*** (0.0393) | 0.1015*** (0.0152) | 0.0395** (0.0152) | -0.0447*** (0.0144) |
| Covid-19 | 0.3835*** (0.0525) | 0.2262*** (0.0359) | 0.1899*** (0.0133) | - (0.0365) | 0.0582** (0.0255) | 0.1244** (0.0501) | - (0.0752) | -0.3284*** (0.0342) | 0.0210 (0.0342) | - (0.0934) | -0.2056** (0.0511) | -0.0315 (0.0511) | 0.0495** (0.0252) | 0.2799*** (0.0528) |
| EPU | -0.0165 (0.0210) | 0.0326** (0.0145) | 0.1013*** (0.0202) | -0.0167 (0.0109) | 0.0002 (0.0102) | 0.0501** (0.0254) | 0.0296 (0.0215) | 0.0650** (0.0263) | 0.0131 (0.0178) | 0.0056 (0.0334) | 0.0551 (0.0414) | -0.0223 (0.0165) | -0.0077 (0.0108) | 0.0167 (0.0129) |
| VIX | -0.4486*** (0.0439) | -0.2852*** (0.0406) | -0.0831** (0.0406) | 0.0146 (0.0203) | -0.1981*** (0.0322) | -0.1158* (0.0616) | -0.0337 (0.0500) | -0.0019 (0.0712) | -0.0694 (0.0484) | 0.2237*** (0.0674) | 0.2349** (0.0966) | -0.0804* (0.0471) | 0.0092 (0.0237) | -0.1159*** (0.0331) |
| GTrend | 0.0172*** (0.0017) | 0.0043*** (0.0004) | 0.0023** (0.0009) | 0.0002 (0.0002) | 0.0029*** (0.0008) | 0.0019** (0.0009) | 0.0014** (0.0006) | 0.0011 (0.0013) | 0.0033*** (0.0007) | 0.0001 (0.0010) | 0.0024 (0.0018) | 0.0007 (0.0006) | -0.0004 (0.0003) | 0.0007** (0.0003) |
| Gold | -0.5141*** (0.1670) | 0.5386*** (0.1416) | -1.0375*** (0.0852) | 0.0744 (0.1837) | 0.1088 (0.0905) | 0.5527*** (0.2475) | 0.2786* (0.1639) | 1.7911*** (0.2420) | -0.0070 (0.1696) | 2.3176*** (0.3294) | 2.9834*** (0.4566) | -0.4493** (0.1798) | -0.3154** (0.1399) | 0.1401 (0.1440) |
| Brent | -0.0745 (0.0543) | 0.2059*** (0.0603) | 0.4557*** (0.0753) | -0.0571** (0.0247) | -0.0397 (0.0347) | 0.2131** (0.0854) | 0.0256 (0.0603) | 0.8363*** (0.1290) | 0.0221 (0.0717) | 0.7552*** (0.1409) | 1.2197*** (0.1324) | -0.1066* (0.0628) | 0.0339 (0.0409) | 0.1067* (0.0590) |
| Obs. | 1424 | 1424 | 1198 | 1155 | 1231 | 1049 | 550 | 1029 | 808 | 611 | 553 | 1083 | 1128 | 1200 |
| McFadden | 0.2640 | 0.6170 | 0.4320 | 0.5540 | 0.6520 | 0.1860 | 0.7410 | 0.3400 | 0.5050 | 0.2080 | 0.3820 | 0.6550 | 0.7020 | 0.6750 |

The table reports the average marginal effects with their corresponding standard errors in brackets. *, **, and *** represents significance at the 10%, 5%, and 1% level, respectively.

Table S5: Probit Regression Results

| | Dependent variable: <i>Bubble_t</i> | | | | | | | | | | | | | |
|----------|---|------------------------|------------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|-----------------------|------------------------|------------------------|------------------------|-----------------------|------------------------|
| | BTC | ETH | LINK | MKR | ZRX | REN | LUNA | SNX | FTM | RSR | RUNE | THETA | ENJ | MANA |
| Volume | 0.0752*** (0.0144) | 0.0304*** (0.0113) | 0.1234*** (0.0105) | 0.0407*** (0.0058) | 0.0541*** (0.0054) | 0.0376*** (0.0105) | 0.0609*** (0.0085) | 0.0260*** (0.0085) | 0.0402*** (0.0152) | -0.0028 (0.0141) | -0.1235*** (0.0070) | 0.0846*** (0.0037) | 0.0235*** (0.0037) | 0.0499*** (0.0052) |
| TVL | - (0.0021) | -0.0132*** (0.0021) | -0.0362*** (0.0097) | -0.0331*** (0.0072) | -0.0215*** (0.0044) | -0.0579*** (0.0177) | -0.0565** (0.0233) | 0.0464** (0.0220) | -0.0021 (0.0201) | -0.1538*** (0.0417) | -0.3534*** (0.0155) | 0.1046*** (0.0155) | 0.0316** (0.0147) | -0.0500*** (0.0142) |
| Covid-19 | 0.4370*** (0.0540) | 0.2143*** (0.0323) | 0.2073*** (0.0323) | - (0.0384) | 0.0422* (0.0229) | 0.1173** (0.0504) | - (0.0726) | -0.3401*** (0.0357) | 0.0285 (0.0357) | - (0.0914) | -0.2086** (0.0485) | -0.0261 (0.0485) | 0.0482** (0.0224) | 0.2979*** (0.0533) |
| EPU | -0.0188 (0.0215) | 0.0335** (0.0142) | 0.0987*** (0.0201) | -0.0121 (0.0109) | -0.0017 (0.0099) | 0.0581** (0.0252) | 0.0258 (0.0205) | 0.0696*** (0.0255) | 0.0181 (0.0182) | 0.0052 (0.0322) | 0.0387 (0.0400) | -0.0226 (0.0153) | -0.0066 (0.0103) | 0.0179 (0.0128) |
| VIX | -0.4611*** (0.0431) | -0.2589*** (0.0413) | -0.0774* (0.0413) | 0.0166 (0.0191) | -0.2040*** (0.0331) | -0.1045* (0.0600) | -0.0277 (0.0470) | 0.0223 (0.0699) | -0.0724 (0.0500) | 0.2150*** (0.0659) | 0.2139** (0.0990) | -0.0779 (0.0478) | 0.0144 (0.0225) | -0.1097*** (0.0317) |
| GTrend | 0.0133*** (0.0013) | 0.0041*** (0.0004) | 0.0025*** (0.0002) | 0.0002 (0.0004) | 0.0010*** (0.0004) | 0.0019* (0.0010) | 0.0014** (0.0006) | 0.0013 (0.0013) | 0.0036*** (0.0007) | 0.0001 (0.0010) | 0.0027 (0.0018) | 0.0009 (0.0007) | -0.0005 (0.0003) | 0.0008** (0.0003) |
| Gold | -0.6212*** (0.1722) | 0.4535*** (0.1375) | -1.0394*** (0.0829) | 0.0638 (0.1781) | 0.1333 (0.0829) | 0.4679* (0.0902) | 0.2725 (0.2447) | 1.7368*** (0.1672) | -0.1434 (0.2415) | 2.3940*** (0.1583) | 3.0063*** (0.3232) | -0.4845*** (0.4714) | -0.2736** (0.1761) | 0.1645 (0.1232) |
| Brent | -0.0480 (0.0573) | 0.2188*** (0.0593) | 0.4774*** (0.0739) | -0.0544** (0.0244) | -0.0483 (0.0356) | 0.2358*** (0.0849) | 0.0279 (0.0580) | 0.8376*** (0.1317) | 0.0107 (0.0741) | 0.7623*** (0.1364) | 1.1996*** (0.1364) | -0.1047* (0.0610) | 0.0309 (0.0390) | 0.1225** (0.0582) |
| Obs. | 1424 | 1424 | 1198 | 1155 | 1231 | 1049 | 550 | 1029 | 808 | 611 | 553 | 1083 | 1128 | 1200 |
| McFadden | 0.2490 | 0.6150 | 0.4340 | 0.5610 | 0.6510 | 0.1630 | 0.7450 | 0.3460 | 0.4640 | 0.1850 | 0.3760 | 0.6510 | 0.6960 | 0.6770 |

The table reports the average marginal effects with their corresponding standard errors in brackets. *, **, and *** represents significance at the 10%, 5%, and 1% level, respectively.

Table S6: Tobit Regression Results

| | Dependent variable: Truncated [0, 1] p-value | | | | | | | | | | | | | |
|----------|--|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|
| | BTC | ETH | LINK | MKR | ZRX | REN | LUNA | SNX | FTM | RSR | RUNE | THETA | ENJ | MANA |
| Volume | 0.0225*** (0.0055) | 0.0274*** (0.0066) | 0.0358*** (0.0032) | 0.0209*** (0.0033) | 0.0526*** (0.0034) | 0.0114*** (0.0029) | 0.0605*** (0.0031) | 0.0130*** (0.0024) | 0.0321*** (0.0023) | -0.0274*** (0.0055) | -0.4428*** (0.0461) | 0.0466*** (0.0022) | 0.0246*** (0.0016) | 0.0389*** (0.0021) |
| TVL | - (0.0014) | -0.0036*** (0.0029) | -0.0033 (0.0037) | -0.0204*** (0.0037) | -0.0105*** (0.0021) | -0.0267*** (0.0048) | 0.0195** (0.0087) | 0.0076 (0.0069) | -0.0046 (0.0061) | -0.0102 (0.0157) | -0.8744*** (0.1444) | 0.0572*** (0.0034) | 0.0159*** (0.0022) | 0.0054*** (0.0017) |
| Covid-19 | 0.1182*** (0.0214) | 0.1781*** (0.0196) | 0.0589*** (0.0158) | - (0.0142) | -0.0781*** (0.0132) | 0.0438*** (0.0142) | - (0.0209) | -0.1111*** (0.0209) | 0.0375*** (0.0120) | - (0.2636) | 0.2122 (0.0133) | 0.0367*** (0.0133) | 0.0464*** (0.0098) | 0.0484*** (0.0095) |
| EPU | -0.0134* (0.0080) | 0.0115 (0.0072) | 0.0254*** (0.0063) | 0.0050 (0.0063) | 0.0102** (0.0050) | 0.0157*** (0.0060) | 0.0143* (0.0086) | 0.0145* (0.0077) | 0.0078 (0.0052) | 0.0064 (0.0129) | 0.2972** (0.1392) | -0.0005 (0.0049) | 0.0076** (0.0039) | -0.0028 (0.0036) |
| VIX | -0.1772*** (0.0150) | -0.0577*** (0.0148) | -0.0522*** (0.0134) | 0.0296** (0.0133) | -0.0491*** (0.0105) | -0.0179 (0.0143) | -0.0833*** (0.0152) | -0.0051 (0.0182) | 0.0422*** (0.0123) | 0.1075*** (0.0243) | 0.5279** (0.2627) | 0.0202* (0.0115) | 0.0219** (0.0090) | -0.0193** (0.0077) |
| GTrend | 0.0099*** (0.0005) | 0.0067*** (0.0003) | 0.0007** (0.0003) | 0.0026*** (0.0003) | 0.0024*** (0.0003) | 0.0020*** (0.0003) | 0.0027*** (0.0003) | 0.0035*** (0.0004) | 0.0023*** (0.0002) | 0.0019*** (0.0005) | 0.0369*** (0.0047) | 0.0009*** (0.0003) | 0.0000 (0.0002) | 0.0012*** (0.0002) |
| Gold | 0.0693 (0.0630) | -0.0558 (0.0663) | -0.1929*** (0.0445) | 0.0331 (0.0445) | -0.0412 (0.0379) | 0.1886*** (0.0658) | -0.5769*** (0.0781) | 0.5395*** (0.0717) | -0.2703*** (0.0478) | 1.0384*** (0.1245) | 2.7863*** (1.3715) | -0.3408*** (0.4040) | -0.2593*** (0.0296) | -0.1406*** (0.0281) |
| Brent | -0.0026 (0.0199) | 0.2162*** (0.0213) | 0.1249*** (0.0434) | 0.0768*** (0.0185) | -0.0857*** (0.0149) | 0.1261*** (0.0197) | -0.0136 (0.0197) | 0.1274*** (0.0236) | 0.0152 (0.0152) | 0.2575*** (0.0303) | 2.7899*** (9.0445) | 0.0635*** (0.0150) | 0.0766*** (0.0113) | 0.0307*** (0.0106) |
| Cons. | -0.3528 (0.4138) | -0.8514** (0.3991) | 0.4342 (0.4512) | -0.5212 (0.3224) | 0.1517 (0.2874) | -1.5928*** (0.4575) | 3.3415*** (0.4881) | -4.6418*** (0.5012) | 1.3626*** (0.3191) | -8.2851*** (0.7883) | -15.0793* (9.0445) | 0.6605** (0.2858) | 0.8962*** (0.2175) | 0.3831* (0.2049) |
| Obs. | 1424 | 1424 | 1198 | 1155 | 1231 | 1049 | 550 | 1029 | 808 | 611 | 553 | 1083 | 1128 | 1200 |

The table reports coefficient with their corresponding standard errors in brackets. *, **, and *** represents significance at the 10%, 5%, and 1% level, respectively.

Table S7: Linear Regression Results

| | Dependent variable: <i>PS</i> statistic | | | | | | | | | | | | | |
|----------------------|---|------------------------|------------------------|------------------------|------------------------|-------------------------|------------------------|-------------------------|------------------------|-------------------------|---------------------------|------------------------|------------------------|------------------------|
| | BTC | ETH | LINK | MKR | ZRX | REN | LUNA | SNX | FTM | RSR | RUNE | THETA | ENJ | MANA |
| Volume | 0.1832*** (0.0454) | 0.1962*** (0.0404) | 0.3973*** (0.0358) | 0.1410*** (0.0221) | 0.5641*** (0.0370) | 0.1262*** (0.0323) | 0.8395*** (0.0428) | 0.1613*** (0.0297) | 0.6623*** (0.0474) | -0.2421*** (0.0488) | -0.9699*** (0.1375) | 0.6932*** (0.0328) | 0.5127*** (0.0325) | 0.6908*** (0.0380) |
| TVL | - (0.0258***) | -0.0258*** (0.0363) | -0.0363 (0.0324) | -0.1372*** (0.0251) | -0.1131*** (0.0222) | -0.2963*** (0.0540) | 0.2709** (0.1222) | 0.0948 (0.0858) | -0.0951 (0.1260) | -0.0901 (0.1395) | -2.7780*** (0.3902) | 0.8502*** (0.0511) | 0.3328*** (0.0465) | 0.0954*** (0.0301) |
| Covid-19 | 0.9636*** (0.1747) | 1.2761*** (0.1407) | 0.6541*** (0.1756) | - (0.1422) | -0.8375*** (0.1586) | 0.4864*** (0.1586) | - (0.2608) | -1.3778*** (0.2608) | 0.7750*** (0.2496) | - (0.2496) | -1.6562** (0.7623) | 0.5450*** (0.1989) | 0.9692*** (0.2046) | 0.8583*** (0.1689) |
| EPU | -0.1093* (0.0650) | 0.0821 (0.0516) | 0.2819*** (0.0704) | 0.0336 (0.0428) | 0.1091** (0.0538) | 0.1742*** (0.0671) | 0.1985* (0.1202) | 0.1798* (0.0963) | 0.1612 (0.1089) | 0.0566 (0.1143) | 0.4438 (0.3352) | -0.0076 (0.0735) | 0.1580* (0.0808) | -0.0500 (0.0642) |
| VIX | -1.4450*** (0.1230) | -0.4137*** (0.1063) | -0.5795*** (0.1491) | 0.1989** (0.0899) | -0.5272*** (0.1130) | -0.1988 (0.1592) | -1.1556*** (0.2126) | -0.0636 (0.2268) | 0.8723*** (0.2559) | 0.9489*** (0.2158) | 1.8919** (0.7903) | 0.3001* (0.1716) | 0.4577** (0.1893) | -0.3422** (0.1367) |
| G'Trend | 0.0804*** (0.0038) | 0.0482*** (0.0019) | 0.0077** (0.0037) | 0.0177*** (0.0023) | 0.0258*** (0.0029) | 0.0223*** (0.0034) | 0.0380*** (0.0045) | 0.0432*** (0.0048) | 0.0477*** (0.0049) | 0.0169*** (0.0042) | 0.0196 (0.0144) | 0.0136*** (0.0037) | -0.0008 (0.0042) | 0.0218*** (0.0034) |
| Gold | 0.5654 (0.5154) | -0.3995 (0.4035) | -2.1409*** (0.7386) | 0.2229 (0.3009) | -0.4420 (0.4082) | 2.0930*** (0.7339) | -8.0003*** (1.0917) | 6.6910*** (0.8933) | -5.5831*** (0.9925) | 9.1615*** (1.1056) | 24.0301*** (4.1831) | -5.0662*** (0.5974) | -5.4121*** (0.6201) | -2.4945*** (0.5012) |
| Brent | -0.0212 (0.1625) | 1.5492*** (0.1530) | 1.3858*** (0.2051) | 0.5171*** (0.1247) | -0.9196*** (0.1603) | 1.3998*** (0.2017) | -0.1879 (0.2758) | 1.5800*** (0.2943) | 0.3139 (0.3153) | 2.2722*** (0.2689) | 9.8240*** (1.3112) | 0.9441*** (0.2242) | 1.5981*** (0.2371) | 0.5444*** (0.1882) |
| Const. | -4.6172 (3.3844) | -7.6949*** (2.8688) | 3.2312 (5.0261) | -5.6497*** (2.1781) | -0.7356 (3.0957) | -19.6332*** (5.0998) | 44.6934*** (6.8183) | -59.4345*** (6.2440) | 26.1879*** (6.6288) | -75.5472*** (7.0009) | -167.5892*** (28.6526) | 7.7704* (4.2668) | 16.9662*** (4.5571) | 3.1575 (3.6481) |
| Obs. | 1424 | 1424 | 1198 | 1155 | 1231 | 1049 | 550 | 1029 | 808 | 611 | 553 | 1083 | 1128 | 1200 |
| R² | 0.4084 | 0.5584 | 0.3367 | 0.1851 | 0.2651 | 0.2589 | 0.6762 | 0.4446 | 0.4274 | 0.2969 | 0.3820 | 0.6570 | 0.3097 | 0.4293 |

The dependent variable is the calculated *PS* statistic. The table reports the coefficients with their corresponding standard errors in brackets. *, **, and *** represents significance at the 10%, 5% and 1% level, respectively.

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