Positive tone and initial coin offering

Positive tone and Initial Coin Offerings

Abstract

An initial coin offering (ICO) has become a popular venue for crowdfunding at an early stage in a blockchain project. In the ICO process, a whitepaper may serve as an effective marketing tool to influence investor perception and investor trading behaviour. In this paper, we investigate whether management sentiment as captured by the disclosure tone of the ICO whitepaper is seen as a credible signal and capable of affecting price behaviour of the ICO on its first trading day. We document a positive association between management's net positive tone in the whitepaper and ICO first-day return, indicating that management sentiment has a significant impact on investor behaviour. Our findings show, however, that such association is contingent on the presence of causal argument, suggesting that disclosure tone needs a significant extent of causal reasoning support to back-up its credibility and make it persuasive. These findings provide incremental evidence on the relationship between management tone and relative asset returns during an ICO process in the cryptocurrency markets. While management may benefit from soft information disclosure in the whitepaper, investors and regulators should be aware of self-serving incentives in whitepaper disclosures.

Key words: Tone, initial coin offering, causal reasoning, market return, narrative disclosure.

Introduction

Cryptocurrencies are based on blockchain technology which allows open software to create cryptocurrencies on the blockchain with little effort. As a new way of crowd funding, an initial coin offering (ICO) allows the management of a cryptocurrency project to raise funds at an early stage. In such a process, a whitepaper is commonly used as a key information piece to promote and highlight the features of the product or service offered. A whitepaper can be very valuable as a marketing tool to promote a project's benefits and convince potential investors to purchase the cryptocurrencies offered.

Perceived doubts on the fundamental value of cryptocurrency ventures and the volatility of cryptocurrency markets[1] (Cheah and Fry, 2015; Yermack, 2015; Corbet et al., 2018; Chaim and Laurini, 2019; Geuder et al., 2019; Enoksen et al., 2020; Shu and Zhu, 2020) leverage the potential benefits of a persuasive narrative to support a cryptocurrency venture, especially when it enters the market. Investor over-optimism may be an important factor to explain relative asset price behaviour (Bordalo et al., 2020; Hong et al., 2006) and allows for self-serving benefits of a good marketing of the launch of a new venture. New ventures may attempt to set an initial price that is significantly higher than the cryptocurrency's intrinsic value, and use the tone and sentiment displayed in the ICO whitepaper to inflate investor optimism during the initial coin offering. Following the intuition of Pástor and Veronesi (2006) and Bordalo

[1] For instance, as one of the leading cryptocurrencies, the price of Bitcoin went up dramatically and peaked at approximately USD 20,000 in December 2017, dropping to below USD 5,000 afterwards. Moreover, most of the cryptocurrencies are quoted largely below their initial coin offering (ICO) price after one or two years.

et al. (2020), good news may lead to excess optimism of investors and boost investor demand of relative assets, thus contributing to a sustained price increase and an asset price bubble.

We investigate the relationship between the tone in the whitepaper and price behaviour of the cryptocurrencies offered during the first day of trading. We expect that the tone (sentiment) in the whitepaper disclosures will significantly affect investor perception and shape investor beliefs by leveraging the investor excess optimism in the cryptocurrency markets. Moreover, we examine whether such relationship is more pronounced when the whitepaper disclosures are perceived as more credible due to supportive argumentation.

ICOs present a particularly interesting context to investigate how sentiment (tone) information produced by management disclosures affects investor decisions. Since ICOs usually occur in the start-up phase of a blockchain project, only very limited information on project fundamentals is available, necessitating investors to trade the cryptocurrencies offered mainly on expectations about the future of the project. Actually, most blockchain projects even do not have a valid product. Before the ICO, a blockchain project usually lacks visibility among retail investors. The process of going public through an ICO is likely to dramatically change its visibility and prominence, especially if the project is launched on one of the main cryptocurrency markets. In a context where information on project fundamentals is lacking, the impact of discretionary management information is likely to be highly leveraged. In fact, the sentiment displayed through management disclosure may be the primary driver of

investor expectations regarding the project's future. Investor responses to the ICO on the first trading day may, thus, be particularly revealing regarding the effectiveness of management's disclosure tone. Moreover, we expect that the presence of causal argument will strengthen the impact of a positive disclosure by adding credibility and making it more persuasive. Backing up sentiment by causal reasoning may considerably enhance investor trust and confidence and strengthen the effect of disclosure sentiment on investor decision-making (Zhang et al., 2019b).

In examining the association between disclosure tone in an ICO whitepaper and the ICO's first trading day return, we find that net positive tone of the whitepaper is positively and significantly related to ICO's first trading day return, suggesting that management tone (sentiment) is indeed influential for investor decision-making in ICOs. In addition, we test whether the association between positive tone and ICO's first trading day return is stronger if disclosure content is augmented by rational argument. We find that the intersection term of causal reasoning dummy and positive tone is positively and significantly associated with ICO's first trading day return, implying investors are more likely to be affected by positive tone if the whitepaper is more persuasive in terms of supportive argument.

We contribute to both the crowdfunding and narrative disclosure literature. Bourveau et al. (2019), Florysiak and Schandlbauer (2018), Zhang et al. (2019a) and Samieifar and Baur (2020) study the association between whitepaper readability, blockchain ICO fundraising and related market performance. According to our knowledge, we are the first to investigate how investors in the cryptocurrency market

respond to the narrative disclosure tone of the ICO whitepaper. Prior research also studies the association between asset returns or volatility and the tone in financial disclosures from public media (Ahmad et al., 2016; Bajo and Raimondo, 2017; Tetlock, 2007; Tetlock et al., 2008), conference calls (Blau et al., 2015; Borochin et al., 2018; Brockman et al., 2017; Chen et al., 2018; Price et al., 2012), and textual disclosures by management (Arslan-Ayaydin et al., 2016; Choi, 2020; Jiang et al., 2019; Yan, 2015). We add to the latter. In addition, our results suggest that the customary financial disclosure dictionaries, such as Loughran and McDonald (2011) are useful in measuring disclosure tone in blockchain-related whitepapers. With regard to the impact of causal information disclosure, prior studies focus on the relation between causal reasoning and firms' accounting performance (Aerts and Zhang, 2014; Asay et al., 2018;) and analyst behaviour (Yan et al., 2019; Zhang et al., 2019b). With regard to the association between asset returns or volatility and causal reasoning, Kong et al. (2020) find that the causal language is positively and significantly associated with future stock price crash risk. In this paper, we find that causal reasoning language is likely to make whitepaper disclosures more persuasive, and strengthen the association between net positive tone and ICO's first trading day return.

The paper proceeds as follows. Section 2 reviews prior literature and develops hypotheses. Section 3 describes our sample data. Section 4 presents the research method and our results, while section 5 concludes the paper.

Literature review and hypothesis development

Research on initial coin offerings and management incentives

An ICO is an original financing channel based on blockchain technology through which management can raise funds by selling the cryptocurrencies of their project at an early stage of development. The project management usually retains a portion of the cryptocurrencies to sustain the further development of the project and to reward the project team, while selling a large percentage of the cryptocurrencies to the public. Moreover, the project team usually retains total ownership of their initiative. Unlike an IPO, investing in a cryptocurrency is not a bet on management's ability to create a profitable business, but rather a bet on how useful and popular the products and services provided by the particular network application will be.

Compared to traditional financing processes, an ICO has a number of advantages for issuers. First, in an ICO, cryptocurrencies are marketed directly to investors, thus increasing the speed of the offering process and allowing to economize on costs. Second, the technology required to initiate an ICO is relatively simple and easily accessible, which lowers barriers of entry. Third, because of the recent crypto-hype, the amount of funding that can be raised through an ICO is relatively high compared to other, more traditional crowdfunding channels. Finally, an ICO enables management to bypass the more rigorous and regulated controls required by venture capitalists and financial institutions in a funds raising process (Fisch, 2019; Kher et al., 2020).

The success of an ICO is associated with the utility feature of cryptocurrencies, management credibility, voluntary project disclosures and promotion through social

media (Howell et al., 2020). ICO ventures supported by a more readable whitepaper tend to achieve a higher first-day ICO return (Zhang et al., 2019a). The limited availability of public information on an ICO may hinder its success, since potential investors may feel deprived of essential information to ground an economic decision on ICO participation. The relative lack of regulated project-specific information may, however, incentivize management to engage in substantial voluntary narrative disclosures in order to attract investor attention, avoid an offer price discount and maximize the proceeds of the ICO. The main disclosures regarding an ICO are usually provided by an ICO whitepaper which contains key information about the cryptocurrency project. As the primary information source, the content of the whitepaper is likely to significantly affect investor perception and shape investor expectations.

Research on tone of narrative disclosures and market return

Prior research documents that the tone of narrative disclosures may affect investor trading behaviour and relative asset returns (Sadique et al., 2008; Arslan-Ayaydin et al., 2015). For example, Bajo and Raimondo (2017) show that positive sentiment embedded in a company's media coverage is likely to drive individual investors' demand for the company's stock and positively affects the IPO stock return on its first trading day. Huang et al. (2014), Brockman et al. (2017) and Jiang et al. (2019) find that the positive tone in both earnings announcements and related press coverage is significantly associated with increased stock returns. Price et al. (2012) find that the tone of quarterly earnings conference calls is a significant predictor of abnormal returns

and transaction volume when an earnings announcement is released. Similarly, unfavorable media content appears to induce downward pressure on stock market prices (Tetlock, 2007, Teclock et al., 2008). The relationship between tone and relative asset returns may also be affected by time horizon and macro-economic factors (Veronessi, 1999; Ahmad et al., 2016)[2].

Moreover, we expect that the impact of disclosure tone on investor decision making will be exacerbated in highly speculative markets characterized by excessive investor optimism (Bordalo et al., 2020). Hong et al. (2006) argue that in such markets, investors tend to pay prices that exceed their own valuation of a relative asset, as they anticipate finding a buyer who is willing to pay even more in the future. Such an overconfident resale option is likely to impart a bubble component in asset prices. Cryptocurrency exchanges are new markets, with mostly young and inexperienced investors which tend to hold overconfident expectations about asset prices (Greenwood and Nagel, 2009; Greenwood et. al., 2019; Haruvy et. al., 2007; Vissing-Jorgensen, 2003). In such an environment and considering the circumstance that sentiment displayed in the whitepaper disclosures may be the primary driver of investor expectations regarding the project's future, investors may be especially susceptible to tone-based impression

[2] Ahmad et al. (2016) find that the relation between firm-specific media tone and firm-level returns tends to be time-varying, with firms undergoing long periods during which the impact of media-expressed tone on returns is insignificant, and occasional episodes when the impact is significant. Veronesi (1999) shows that the effect of announcement tone on a stock's implied volatility depends on macroeconomic factors, as the market tends to underreact to positive news in downturn periods and to overreact to negative news in booming periods.

management in the ICO whitepaper. Focusing on one aspect of market return, ICO first trading day return, we expect a more positive tone of an ICO whitepaper to lead to a higher ICO first trading day return. We anticipate that investors react to the positive tone by increasing their demand for the cryptocurrency on offer. An overall positive tenor when describing the blockchain project in a whitepaper, is likely to positively affect and strengthen investor expectations of the future value of the cryptocurrency, their willingness to invest and the demand for the cryptocurrency on the ICO's first trading day. This leads us to propose the following hypothesis regarding the tone-return relationship in the ICO market:

Hypothesis 1: Ceteris paribus, a stronger positive tone in the ICO whitepaper is associated with a higher ICO first-day return.

Research on causal reasoning as narrative disclosure

Next to tone, prior research also documents a significant association between causal reasoning content in narrative disclosures and market participant responses (Zhang et al., 2019b; Kong et al., 2020). Management may use causal reasoning in an ICO whitepaper to shape investors' opinion about the blockchain project and add credibility to how it portrays the project's benefits. Causal language (e.g. "therefore", "as a result of") is instrumental to establish logico-semantic relations between propositional content and, thus, appeals to the reader's sense of rationality and understanding (Hyland, 1998). Causal reasoning may be used to elaborate on different issues, including vision, strategy, moral, legal and practical conduct by referring to agency, goals and plans, responsibilities, opportunities, blame and external constraints. Prior research

documents that causation markers and causal connectors are strategically used by companies in their external communication to support their claims, to guide readers' inferences and perception (Hyland, 2005) and enhance the persuasiveness of the message (Zhang and Aerts, 2015). Financial disclosure research shows that causal reasoning is quite common in corporate narrative disclosures to explain past performance or frame future prospects (Baginski et al., 2004; Koonce et al., 2011; Aerts and Zhang, 2014; Zhang et al., 2019b). By linking ideas and arguments, causal reasoning content presents the message in an inferential frame and tends to guide the reader's interpretation of content in a direction preferred by the communicator (Palmieri et al., 2015). Investors may be more easily affected by the positive tone of narrative disclosures when presented with convincing inferences and argument. Both informational and self-presentational motives may underlie the use of causal language. Kong et al. (2020) find that the causal reasoning is positively associated with future stock price crash risk, suggesting that managers may manipulate causal language in order to make information more complex and deceivingly hide adverse information. But even with such manipulative motives, causal information needs to be convincing to be effective.

Given the current state of regulation of the ICO market, the general lack of objective information on project fundamentals and the risk appetite of market participants in current ICO markets, we assume that causal reasoning in an ICO whitepaper may offer a minimum convenience threshold for investors to assess the project's potential and future development prospects and build reassurance and confidence to invest in the

project. Causal reasoning may add credibility to the empathic appeal embedded in the narrative tone of the whitepaper messages, thereby strengthening the positive association between the positive disclosure tone and ICO first-day return. The hypotheses are as followed:

Hypothesis 2a: Ceteris paribus, stronger causal reasoning in the ICO whitepaper is associated with a higher ICO first-day return.

Hypothesis 2b: Ceteris paribus, the relationship between positive tone in the ICO whitepaper and ICO first-day return is more pronounced when causal reasoning in the ICO whitepaper is higher.

Sample description

Our sample comprises ICO data of listed blockchain projects from the four largest cryptocurrency exchanges in Asia: Bitfinex, Binance, Huobi Global and OKEx, covering the period ranging from August 24, 2017 to October 30, 2019[3]. We focus on Asia because Makarov and Schoar (2020) show that Asia accounts for more than 95% of total Bitcoin trading volume from Asia, Europe and US in 2016, indicating that Asia represents the largest cryptocurrency market share in the blockchain industry. As the cryptocurrency markets operate as a 24-hour trading market, we use the official China national standard time, Beijing Time (UTC+08:00), to measure the first-day (week/month) return of the ICO, since most ICOs in our sample occur on Chinese

[3] There was a significant regulatory change on September 4, 2017. On that day, ICOs were declared illegal in China and, as a consequence, cryptocurrency prices dropped significantly. Three observations within our sample relate to the period before September 4, 2017. Our main results remain largely unchanged when eliminating these observations from our sample.

cryptocurrency exchanges[4]. ICO whitepapers are manually collected from the website of the ventures and from the Binance website[5]. Appendix A provides an overview of the typical item components of a whitepaper. Initially, we have 323 whitepapers in pdf format. We drop the documents which cannot be successfully converted to text format through Java programming. We also drop fiat cryptocurrencies[6], such as USDT. Finally, we retain 293 whitepapers in our sample. The ICO market data are obtained from the aforementioned four cryptocurrency exchanges. Circulating supply and total supply of cryptocurrencies are collected from two professional cryptocurrency websites[7]. Data regarding institutional back-up, lock-up period and proportions retained by the management team are collected from the ICO whitepapers and venture websites.

Methodology and empirical results

We apply the following model to estimate the association between positive tone and ICO's first trading day return.

[4] According to interviews of the authors with members of the management team of Huobi Global and OKEX, most investors in these cryptocurrency exchanges are Chinese, while also the founders of Huobi global, OKEX, and of Binance are Chinese residents.

[5] https://info.binance.com.

[6] A fiat cryptocurrency, also called fiat-pegged cryptocurrency, is backed one-to-one by a corresponding fiat legal currency, such as dollar, or renminbi (RMB, CNY). For example, tether (USDT) proposes a method to maintain a one-to-one reserve ratio between USDT and US dollar, and they also use audit methods to prove that issued cryptocurrencies are fully backed and reserved at all times. See details on: https://tether.to/wp-content/uploads/2016/06/TetherWhitePaper.pdf.

[7] https://coinmarketcap.com; https://info.binance.com.

$$ICO\ first\ day\ return_{i,t}$$

$$= \alpha + \beta_1 Positive\ Tone_{i,t} + \beta_2 Causal\ Reasoning_{i,t}$$

$$+ \beta_3 Intersection_{i,t} + \beta_4 Ln(CEPU)_{i,t} + \beta_5 Gold\ Return_{i,t-1}$$

$$+ \beta_6 Bitcoin\ Return_{i,t-1} + \beta_7 Liquidity_{i,t} + \beta_8 Ln(mkt)_{i,t}$$

$$+ \beta_9 Bull_{i,t} + \beta_{10} Venture\ Capital_{i,t} + \sum \beta_j Exchange\ Dummy$$

$$+ \sum \beta_k Year\ Dummy$$

The ICO first-day return is defined as (close price on the first listed day at Beijing time – open price on the first listed day at Beijing time) / open price on the first listed day at Beijing time. We use the first deal price on the ICO first-day as our open price.

Loughran and McDonald (2011) study disclosure tone in a financial context and find that a lot of the words listed as negative words in the General Inquirer software are words that are not typically negative in a financial disclosure context. Relatedly, Heston and Sinha (2014) show that sentiment measures extracted using the more generic Harvard IV dictionaries and those using the domain-specific word lists of Loughran and McDonald's (2011) are in fact negatively correlated. Moreover, Price et. al. (2012) find that a context-specific linguistic dictionary (such as Loughran and McDonald's (2011)) is more powerful than a more widely used general dictionary, such as Harvard IV-4 Psychosocial. Therefore, we use the Loughran and McDonald (2011) dictionary specifications to measure management tone, since it better fits the financial disclosures that we investigate. Henry (2008) measures the tone as the spread between the percentage of positive and negative words, expressed in terms of the sum of the number of positive and negative words. Arslan-Ayaydin et al. (2016) measures tone as the

spread between the percentage of positive and negative words, relatively to the total number of words. In order to assure the robustness of our findings, we apply both measures in our study.

$$Positive\ Tone[1] = \frac{(number\ of\ positive\ tone\ words - number\ of\ negative\ tone\ words)}{(number\ of\ positive\ tone\ words + number\ of\ negative\ tone\ words)}$$

$$Positive\ Tone[2] = \frac{(number\ of\ positive\ tone\ words - number\ of\ negative\ tone\ words)}{Total\ number\ of\ words\ in\ the\ white\ paper}$$

We measure causal reasoning as a dummy variable equals to 1 if causal reasoning word intensity is larger than its median value, otherwise 0. We capture causal reasoning intensity by counting the relative frequency of causal reasoning words in the whitepaper. The identification of the causal reasoning words is based on a list of causal words used by Linguistic Inquiry and Word Count (LIWC), a widely-used text analysis programme. Causal reasoning word intensity is measured as the number of causal reasoning words scaled by total number of words in the whitepaper (Zhang and Aerts, 2015; Zhang et. al., 2019b). The intersection term is measured as positive tone multiplied by the causal reasoning dummy. Prior research documents high similarity between gold and Bitcoin in risk management (Baur et. al., 2018; Dyhrberg, 2016; Shahzad et. al., 2019; Wu et. al., 2019) and market efficiency (Al-Yahyaee et. al., 2018, Urquhart, 2016). Therefore, we add gold return one month before the ICO's first trading date as a control. As

Panagiotidis et al. (2018) find that Chinese economic policy uncertainty is negatively related to Bitcoin return, we include the measure of China economic policy uncertainty (CEPU) one month before the ICO as provided by the Economic Policy Uncertainty website[8]. In addition, we follow Zhang et. al. (2019a) and control for Bitcoin return and liquidity. Liquidity is measured as the number of cryptocurrencies released in the ICO scaled by total amount of cryptocurrencies issued[9]. The natural logarithm of total market value when issuing (ln(mkt)), controls for ICO size and is measured as the opening price on the first day of the ICO multiplied by the number of cryptocurrencies released in the ICO. To control for market timing, we include a bull market dummy based on the Bitcoin and the Ethereum price movement. The bull market dummy is set at 1 for the period ranging from April 2017 to December 2017 and for the period from March 2019 to July 2019, when the Bitcoin return amounts to 618.90% and 234.42% respectively, and the Ethereum return to 304.28% and 163.74% respectively. To control for venture capital involvement (Venture Capital), we construct a dummy set at 1 if at least one venture capital firm invested in the new venture before the ICO (Fisch and Momtaz, 2020).

<Insert Table 1>

The mean of positive tone for both alternative tone measures is negative (-0.336, -0.016), indicating that, on average, a whitepaper contains more negative words compared to positive words. The causal reasoning measure is an indicator variable

[8] https://www.policyuncertainty.com/china_epu.html (Baker et. al., 2016).
[9] According to ERC20 in ethereum, the amount of issued cryptocurrency cannot be changed as the coding is done and the coding is open source to gain the trust of interested parties.

derived from causal reasoning word intensity (calculated as the number of causal reasoning words scaled by total number of words in the ICO whitepaper). The, causal reasoning dummy equals 1, if causal reasoning word intensity is larger than its median value. The mean of the causal reasoning indicator is 0.417. The mean of ICO liquidity in our sample is 64.1%, suggesting that about 64% of the cryptocurrencies generated are available for trading on a cryptocurrency exchange.

<Insert Table 2>

Table 2 shows that both tone measures and the causal reasoning measure are positively and significantly correlated with ICO first-day return (0.123, 0.129, 0.133). Moreover, the correlation between liquidity and ICO first-day return is negative and significant at the 90% level. Positive tone 1 is highly correlated with Positive tone 2 (0.782).

<Insert Table 3>

Table 3 shows the regression tests of Hypothesis 1 using the positive tone measures and other controls. Model 1 and Model 2 regress ICO first-day return on positive tone without controls. Model 3 and Model 4 include China economic policy uncertainty (CEPU), gold return, Bitcoin return, and liquidity as controls. Model 5 and Model 6 add cryptocurrency exchange dummies as additional controls, while Model 7 and Model 8 also take into account year dummies. Results are consistent with our expectations. The association between ICO first-day return and positive tone is positive and significant for both tone measures. Gold return is positively and significantly related to ICO first-day return. Moreover, the association between Bitcoin return and ICO first-day return is also positive and significant.

Table 3 also reports regression results for Hypothesis 2a (the causal reasoning variable). Consistent with our expectations, the association between ICO first-day return and the causal reasoning dummy is positive and significant, suggesting that a whitepaper supported with more rational argument is likely to lead to a higher ICO first-day return.

<Insert Table 4>

Table 4 reports test results for Hypothesis 2b by adding the intersection term of positive tone and causal reasoning to the models. The coefficients of the intersection term are positive and significant, which is also consistent with our expectation and suggests that the association between positive tone and ICO first-day return is more pronounced if the ICO whitepaper is more persuasive in terms of argumentative back-up.

Supplementary tests

Robustness tests with additional controls

As the first-day return of the ICO may be significantly affected by the amount of cryptocurrencies reserved for the management team and by the lock-up period for venture capital[10], we perform additional tests to control for these variables. However, data availability for these variables reduced our data set to 50.85% of the original sample. Table 5 presents our results for this subsample and shows that the main results are largely unchanged.

<Insert Table 5>

Positive tone and ICO first-day return in different industries

In order to investigate the association between positive tone and ICO first trading day return in different industries, we first assign the cryptocurrencies in our sample to 5 industries, namely 'information technology application', 'business and media', 'smart contract platform', 'finance', and 'wallets'[11]. The industry of information technology application applies to platforms providing underlying technique services for artificial intelligence, data storage and computation, internet of things and others, such as entertainment, game developers, music, culture, art and PE, by using blockchain techniques. Moreover, it also includes those creating payment and transaction protocols, administration protocols and others improving activity efficiency. The industry of business and media comprises 2 parts. The business part refers to blockchain applications which provide customers with advertising, e-commerce and other business and leasing services supported by blockchain techniques, benefiting merchants with efficiency improvement. Moreover, different from traditional media, the media part in blockchain applications includes functions of socialization, content creation and sharing, enabling users to break the traditional barriers and establishing a brand-new peer-to-peer socialization model. The industry of smart contract platform provides developers with the development, deployment, and operation of the smart contracts[12].

[11] The industry classification is based on cryptocurrency insight classification (https://tokeninsight.com/industry).

[12] A smart contract is a computer program which is intended for executing, controlling or documenting relevant events and actions according to the terms of a contract or an agreement. The objectives of smart contracts are the reduction of need in trusted intermediators, arbitrations and enforcement costs, fraud losses, as well as the malicious and accidental exceptions, by using peer-to-peer blockchain techniques.

The industry of finance provides users with finance-related services based on blockchain techniques, including transaction and payment, loan, financial data service, asset management, securitization and others. The industry of wallets refers to the software wallets designed by computer programs and installed on the computer, smartphone, or the physical hardware wallets equipping a vehicle with special encryption chips. Moreover, we also incorporate exchanges providing customers with cryptocurrencies trading into the industry of wallets.

<Insert Table 6>

Table 6 shows the association between positive tone and ICO first-day return in different industries. Indus I stands for information technology application, Indus II is business and media, Indus III is finance, Indus IV is smart contract platform, and Indus V is wallets. Within our sample, the association between positive tone and ICO first day return is positive and significant for information technology application and finance industry. However, such relationship does not hold for other industries.

Positive management tone and ICO first-week/month return

As Ahmad et al. (2016) document that the effect of media-expressed tone on the stock return may be time-varying, we further test whether the association between positive tone and initial ICO return also holds for the ICO's first trading week/month, by replacing the first-day return proxy with first-week/month return.

<Insert Figure 1>

Figure 1 shows the distribution of ICO first-week (Panel A) / first-month (Panel B) return under two circumstances: whether the ICO first-day return is smaller than its 25th

percentile (left, -0.201) or larger than its' 75th percentile (right, 0.384) respectively. In general, the ICO first-week/month return tends to be lower (higher) when the ICO first-day return is relatively lower (higher), suggesting that investors tend to stick to their investment decisions over a longer period (week/month).

<Insert Table 7>

Table 7 presents the regression results for the association between positive tone in the whitepaper and ICO's first week/month return. The results are consistent with Table 3 and Hypothesis 1. The association between positive tone and ICO first-week return is positive and significant. Moreover, the positive tone is positively and significantly related to ICO first-month return at a 90% significance level. Overall, the results suggest that the tone-return relationship is still effective if we extend the investor decision-making period to one week or one month, instead of one day.

ICO long-term performance excluding the first-day return

In order to test whether long-term performance would be poorer when the ICO first-day return is higher, we split our sample in two subsamples based on the median value of ICO first-day return. Next, we generate a new variable for the ICO first-week (month) return excluding the first day. The ICO first-week (month) return excluding the first day is defined as (close price on the first listed week (month) at Beijing time – close price on the first listed day at Beijing time) / close price on the first listed day at Beijing time. We use the first deal price on the ICO first-day as our open price.

<Insert Table 8>

Table 8 (Panel A) shows that the mean value of the ICO first-week return excluding the first day is negative in the high ICO first-day return group (group 1), while being positive in the low ICO first-day return group (group 0). However, the difference between these two mean values are not significant. According to Table 8 (Panel B), the mean value of ICO first-month return excluding the first day in the high ICO first-day return group (group 1) is negative, while the mean value of ICO first-month excluding the first day in low ICO first-day return group (group 0) is positive. In this case, the difference between these two mean values is significant. These results indicate that the long-term performance of the ICO tends to be poorer when the first day return is higher. In addition, we also test the association between ICO first-week/month return excluding the first day and positive tone, such association is still positive, but not significant.

Conclusion

As a principal information source produced by the management in blockchain project initial coin offerings, the ICO whitepaper and its project-specific disclosures are expected to play a key role in affecting investors' financial decisions and the price behaviour in ICO's first trading day. We investigate whether the management tone in the ICO whitepaper affects ICO performance on its first trading day and find that a more positive management tone contributes to a higher ICO first-day return. The presence of causal argument in the whitepaper is also significant in explaining the price behaviour on the ICO's first trading day. Moreover, by adding the intersection term of positive tone and the causal reasoning dummy, our results show that the aforementioned

management tone-return relationship also needs a significant extent of causal reasoning to back-up the credibility of management and the persuasiveness of the ICO whitepaper.

Our findings have several noteworthy implications for the relationship between management tone information and relative asset returns in the cryptocurrencies market during the ICO process. First, our findings indicate that ICO investors tend to closely monitor the content and tenor of the whitepaper disclosures, are capable of capturing the sentiment signals in the ICO whitepaper and promptly impound it into ICO pricing. Second, project management seems to definitely benefit from using the tone of voluntary disclosures in the ICO whitepaper in a self-serving way. Thirdly, it seems that management benefits from establishing the credibility of its disclosures in the whitepaper by using causal argument, as it is likely to promote investors' trust in the positive sentiment information contained in the ICO whitepaper. Finally, our results also imply that management could misuse the soft information in the ICO whitepaper in a manipulative self-serving manner in order to maximize ICO proceeds. This may hold a need for a more stringent regulation of ICO disclosures.

Table 1 Descriptive statistics

ICO first-day return is the closing price of a cryptocurrency scaled by opening price on the first trading day minus 1. Positive tone [1] is the difference between the number of positive words and the number of negative words, divided by the total number of positive words and negative words. Positive tone [2] is the difference between the number of positive words and the number of negative words, divided by the total number of words in the ICO whitepaper. Causal reasoning as a dummy variable equals to 1 if causal reasoning word intensity is larger than its median value, otherwise 0. Causal reasoning word intensity is measured as the number of causal reasoning words scaled by total number of words in the ICO whitepaper. CEPU stands China economic policy uncertainty index. Gold return is measured one month before the ICO's first trading day. Bitcoin return is measured one day before the ICO's first trading day. Liquidity is the amount of cryptocurrencies released in the ICO scaled by total amount of cryptocurrencies issued. Bull as a dummy variable equals to 1 if the date is between April 2017 and December 2017 or between March 2019 and July 2019, otherwise 0. Venture capital as a dummy variable equals to 1 if there is at least one venture capital invested in cryptocurrency new venture before ICO, otherwise 0. Ln(mkt) is the natural logarithm of total market value which is defined as the open price in the first day of ICO times number of cryptocurrencies released in the ICO.

	Mean	**Std. dev.**	**P1**	**P25**	**P50**	**P75**	**P99**
ICO first day return	0.186	0.744	-0.877	-0.201	0.000	0.384	2.143
Positive tone [1]	-0.336	0.150	-0.662	-0.431	-0.349	-0.254	0.042
Positive tone [2]	-0.016	0.012	-0.067	-0.02	-0.014	-0.01	0.002
Causal reasoning	0.417	0.494	0.000	0.000	0.000	1.000	1.000
CEPU	5.420	0.370	4.959	5.122	5.33	5.597	6.476
Gold return	0.013	0.041	-0.098	-0.01	0.009	0.051	0.143
Bitcoin return	0.002	0.053	-0.133	-0.022	0.005	0.029	0.126
Liquidity	0.641	0.298	0.03	0.406	0.667	0.954	1.000
Bull	0.417	0.494	0.000	0.000	0.000	1.000	1.000
Venture capital	0.764	0.425	0.000	1.000	1.000	1.000	1.000
Ln(mkt)	25.687	0.389	24.836	25.446	25.670	25.950	26.420

Table 2 Correlation

ICO first-day return is the closing price of a cryptocurrency scaled by opening price on the first trading day minus 1. Positive tone[1] is the difference between the number of positive words and the number of negative words, divided by the total number of positive words and negative words. Positive tone[2] is the difference between the number of positive words and the number of negative words, divided by the total number of words in the ICO whitepaper. Causal reasoning as a dummy variable equals to 1 if causal reasoning word intensity is larger than its median value, otherwise 0. Causal reasoning word intensity is measured as the number of causal reasoning words scaled by total number of words in the ICO whitepaper. CEPU stands China economic policy uncertainty index. Gold return is measured one month before the ICO's first trading day. Bitcoin return is measured one day before the ICO's first trading day. Liquidity is the amount of cryptocurrencies released in the ICO scaled by total amount of cryptocurrencies issued. Bull as a dummy variable equals to 1 if the date is between April 2017 and December 2017 or between March 2019 and July 2019, otherwise 0. Venture capital as a dummy variable equals to 1 if there is at least one venture capital invested in cryptocurrency new venture before ICO, otherwise 0. Ln(mkt) is the natural logarithm of total market value which is defined as the open price in the first day of ICO times number of cryptocurrencies released in the ICO. ***p < 0.01, **p<0.05, *p<0.1.

	ICOFDR	PT1	PT2	CR	CEPU	GR	BR	L	B	VC	MKT
ICO First day return, ICOFDR	1.000										
Positive tone[1], PT1	0.123**	1.000									
	(0.030)										
Positive tone[2], PT2	0.129 **	0.782***	1.000								
	(0.022)	(0.000)									
Causal reasoning[3], CR	0.133**	0.015	-0.089	1.000							
	(0.019)	(0.787)	(0.116)								
CEPU	0.052	0.063	0.054	-0.124**	1.000						
	(0.368)	(0.273)	(0.353)	(0.031)							
Gold return, GR	0.156***	0.019	0.044	0.039	-0.039	1.000					
	(0.006)	(0.736)	(0.436)	(0.491)	(0.500)						
Bitcoin return, BR	0.123**	0.007	0.072	0.062	-0.060	0.102*	1.000				
	(0.029)	(0.906)	(0.203)	(0.278)	(0.299)	(0.071)					

Liquidity, L	-0.098*	-0.033	-0.061	0.000	-0.285***	0.056	-0.026	1.000			
	(0.094)	(0.576)	(0.306)	(0.997)	(0.000)	(0.338)	(0.653)				
Bull, B	-0.074	-0.051	-0.066	-0.048	0.016	0.076	0.005	0.049	1.000		
	(0.191)	(0.373)	(0.247)	(0.398)	(0.776)	(0.179)	(0.935)	(0.401)			
Venture Capital, VC	-0.008	-0.024	0.058	0.044	-0.218***	-0.015	-0.014	-0.084	0.044	1.000	
	(0.893)	(0.673)	(0.305)	(0.440)	(0.000)	(0.789)	(0.806)	(0.154)	(0.440)		
Ln(mkt), MKT	0.159***	-0.025	-0.019	0.108*	-0.138**	0.427***	0.095*	0.034	-0.129**	0.049	1.000
	(0.005)	(0.662)	(0.745)	(0.056)	(0.016)	(0.000)	(0.094)	(0.566)	(0.023)	(0.383)	

Table 3 Regression results for association between positive tone (causal reasoning) in whitepaper and ICO's first trading day return.

ICO first-day return is the closing price of a cryptocurrency scaled by opening price on the first trading day minus 1. Positive tone[1] is the difference between the number of positive words and the number of negative words, divided by the total number of positive words and negative words. Positive tone[2] is the difference between the number of positive words and the number of negative words, divided by the total number of words in the ICO whitepaper. Causal reasoning as a dummy variable equals to 1 if causal reasoning word intensity is larger than its median value, otherwise 0. Causal reasoning word intensity is measured as the number of causal reasoning words scaled by total number of words in the ICO whitepaper. CEPU stands China economic policy uncertainty index. Gold return is measured one month before the ICO's first trading day. Bitcoin return is measured one day before the ICO's first trading day. Liquidity is the amount of cryptocurrencies released in the ICO scaled by total amount of cryptocurrencies issued. Bull as a dummy variable equals to 1 if the date is between April 2017 and December 2017 or between March 2019 and July 2019, otherwise 0. Venture capital as a dummy variable equals to 1 if there is at least one venture capital invested in cryptocurrency new venture before ICO, otherwise 0. Ln(mkt) is the natural logarithm of total market value which is defined as the open price in the first day of ICO times number of cryptocurrencies released in the ICO. Model 1 and Model 2 represent regression between ICO's first-day return and positive tone in the whitepaper without any controls. Model 3 and 4 include China economic policy uncertainty (CEPU), gold return, Bitcoin return, liquidity, bull, venture capital, and ln(mkt) as controls. Model 5 and 6 add cryptocurrency exchange dummies as additional controls. In Model 7 and 8, year dummies are additionally included. ***p < 0.01, **p<0.05, *p<0.1.

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Positive tone[1]	0.593**		0.552**		0.609**		0.641**	
	(2.157)		(1.993)		(2.229)		(2.257)	
Positive tone[2]		9.399***		8.115***		7.884**		8.119**
		(3.207)		(2.732)		(2.527)		(2.528)
Causal reasoning	0.241***	0.262***	0.223**	0.243***	0.185**	0.206**	0.186**	0.208**
	(2.813)	(2.983)	(2.546)	(2.696)	(2.201)	(2.345)	(2.222)	(2.370)
CEPU			-0.034	-0.035	-0.068	-0.069	0.035	0.026
			(-0.283)	(-0.299)	(-0.524)	(-0.541)	(0.216)	(0.161)
Gold return			2.523**	2.498**	2.476**	2.419**	2.619**	2.517**

			(2.011)	(1.999)	(2.146)	(2.105)	(2.404)	(2.311)
Bitcoin return			1.810**	1.669*	2.014**	1.868**	2.010**	1.855**
			(2.086)	(1.907)	(2.519)	(2.298)	(2.489)	(2.261)
Liquidity			-0.297*	-0.295*	-0.217	-0.217	-0.251	-0.248
			(-1.875)	(-1.859)	(-1.385)	(-1.378)	(-1.629)	(-1.600)
Bull			-0.141*	-0.135*	-0.014	-0.007	0.109	0.096
			(-1.727)	(-1.663)	(-0.172)	(-0.086)	(0.490)	(0.433)
Venture Capital			0.029	0.006	0.001	-0.021	-0.002	-0.024
			(0.270)	(0.059)	(0.004)	(-0.191)	(-0.017)	(-0.226)
Ln(mkt)			0.042	0.044	-0.007	-0.002	0.014	0.024
			(0.650)	(0.674)	(-0.122)	(-0.040)	(0.150)	(0.253)
Exchange Dummy	NO	NO	NO	NO	YES	YES	YES	YES
Year Dummy	NO	NO	NO	NO	NO	NO	YES	YES
Constants	0.272***	0.215***	-0.431	-0.505	0.858	0.676	0.078	-0.145
	(2.728)	(3.480)	(-0.248)	(-0.294)	(0.541)	(0.428)	(0.034)	(-0.064)
N	*293*	*293*	*293*	*293*	*293*	*293*	*293*	*293*
Adjusted R^2	*3.57%*	*4.17%*	*8.04%*	*8.31%*	*16.52%*	*16.42%*	*15.74%*	*15.57%*

Table 4 Intersection term of positive tone and causal reasoning in whitepaper regress with ICO's first trading day return.

ICO first-day return is the closing price of a cryptocurrency scaled by opening price on the first trading day minus 1. Positive tone [1] is the difference between the number of positive words and the number of negative words, divided by the total number of positive words and negative words. Positive tone [2] is the difference between the number of positive words and the number of negative words, divided by the total number of words in the ICO whitepaper. Causal reasoning as a dummy variable equals to 1 if causal reasoning word intensity is larger than its median value, otherwise 0. Causal reasoning word intensity is measured as the number of causal reasoning words scaled by total number of words in the ICO whitepaper. Positive tone × Causal reasoning is the intersection term defined as positive tone multiplied by causal reasoning dummy. CEPU stands China economic policy uncertainty index. Gold return is measured one month before the ICO's first trading day. Bitcoin return is measured one day before the ICO's first trading day. Liquidity is the amount of cryptocurrencies released in the ICO scaled by total amount of cryptocurrencies issued. Bull as a dummy variable equals to 1 if the date is between April 2017 and December 2017 or between March 2019 and July 2019, otherwise 0. Venture capital as a dummy variable equals to 1 if there is at least one venture capital invested in cryptocurrency new venture before ICO, otherwise 0. Ln(mkt) is the natural logarithm of total market value which is defined as the open price in the first day of ICO times number of cryptocurrencies released in the ICO. Model 1 and Model 2 represent regression between ICO's first-day return and positive tone in the whitepaper without any controls. Model 3 and 4 include China economic policy uncertainty (CEPU), gold return, Bitcoin return, liquidity, bull, venture capital, and ln(mkt) as controls. Model 5 and 6 add cryptocurrency exchange dummies as additional controls. In Model 7 and 8, year dummies are additionally included. ***p < 0.01, **p<0.05, *p<0.1.

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Positive tone [1]	-0.033		-0.036		0.072		0.105	
	(-0.11)		(-0.117)		(0.239)		(0.334)	
Positive tone [2]		-3.149		-3.098		-1.577		-1.112
		(-0.497)		(-0.496)		(-0.264)		(-0.182)
Causal reasoning	0.719***	0.558***	0.674***	0.512***	0.591***	0.430***	0.589***	0.426***
	(3.457)	(3.710)	(3.219)	(3.334)	(2.775)	(2.864)	(2.771)	(2.830)
Positive tone×Causal reasoning	1.402***	18.437**	1.320**	16.658**	1.185**	13.909*	1.179**	13.543*
	(2.598)	(2.510)	(2.497)	(2.272)	(2.190)	(1.921)	(2.173)	(1.866)

CEPU			-0.038	-0.035	-0.064	-0.062	0.033	0.025
			(-0.329)	(-0.298)	(-0.501)	(-0.493)	(0.204)	(0.158)
Gold return			2.679**	2.558**	2.610**	2.462**	2.794**	2.548**
			(2.081)	(2.024)	(2.207)	(2.120)	(2.495)	(2.303)
Bitcoin return			1.690*	1.465*	1.912**	1.702**	1.914**	1.694**
			(1.956)	(1.679)	(2.394)	(2.104)	(2.376)	(2.074)
Liquidity			-0.260*	-0.264*	-0.183	-0.189	-0.215	-0.219
			(-1.661)	(-1.701)	(-1.170)	(-1.222)	(-1.409)	(-1.439)
Bull			-0.135*	-0.127	-0.014	-0.004	0.121	0.089
			(-1.667)	(-1.568)	(-0.181)	(-0.055)	(0.524)	(0.391)
Venture Capital			0.017	-0.003	-0.016	-0.031	-0.016	-0.034
			(0.158)	(-0.024)	(-0.146)	(-0.291)	(-0.152)	(-0.322)
Ln(mkt)			0.043	0.056	-0.013	0.002	-0.002	0.028
			(0.638)	(0.828)	(-0.215)	(0.038)	(-0.017)	(0.283)
Exchange Dummy	NO	NO	NO	NO	YES	YES	YES	YES
Year Dummy	NO	NO	NO	NO	NO	NO	YES	YES
Constants	0.059	0.022	-0.63	-0.999	0.773	0.343	0.218	-0.412
	(0.574)	(0.223)	(-0.355)	(-0.556)	(0.477)	(0.208)	(0.094)	(-0.176)
N	*293*	*293*	*293*	*293*	*293*	*293*	*293*	*293*
Adjusted R²	*5.33%*	*5.61%*	*9.57%*	*9.42%*	*17.71%*	*17.11%*	*16.92%*	*16.22%*

Table 5 Robustness Test: Regression results for association between positive tone (causal reasoning) in whitepaper and ICO's first trading day return.

ICO first-day return is the closing price of a cryptocurrency scaled by opening price on the first trading day minus 1. Positive tone [1] is the difference between the number of positive words and the number of negative words, divided by the total number of positive words and negative words. Positive tone [2] is the difference between the number of positive words and the number of negative words, divided by the total number of words in the ICO whitepaper. Gold return is measured one month before the ICO's first trading day. Bitcoin return is measured one day before the ICO's first trading day. Liquidity is the amount of cryptocurrencies released in the ICO scaled by total amount of cryptocurrencies issued. Bull as a dummy variable equals to 1 if the date is between April 2017 and December 2017 or between March 2019 and July 2019, otherwise 0. Venture capital as a dummy variable equals to 1 if there is at least one venture capital invested in cryptocurrency new venture before ICO, otherwise 0. Ln(mkt) is the natural logarithm of total market value which is defined as the open price in the first day of ICO times number of cryptocurrencies released in the ICO. Model 1 and Model 2 represent regression between ICO's first-day return and positive tone in the whitepaper without any controls. Model 3 and 4 include China economic policy uncertainty (CEPU), gold return, Bitcoin return, liquidity, bull, venture capital, ln(mkt), team reserve, lock-up period as controls. Model 5 and 6 add cryptocurrency exchange dummies as additional controls. In Model 7 and 8, year dummies are additionally included. ***p < 0.01, **p<0.05, *p<0.1.

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**
Positive tone[1]	0.984***		0.996**		1.091***		1.087***	
	(-2.661)		(-2.571)		(-2.741)		(-2.710)	
Positive tone[2]		16.280***		15.586***		16.046***		15.647***
		-3.218		-2.963		-2.803		-2.663
Causal reasoning	0.142	0.167	0.085	0.114	0.081	0.114	0.083	0.114
	(-1.199)	(-1.384)	(-0.728)	(-0.951)	(-0.721)	(-0.964)	(-0.732)	(-0.955)
CEPU			0.073	0.089	0.054	0.073	0.166	0.184
			(-0.386)	(-0.479)	(-0.289)	(-0.392)	(0.710)	(0.785)
Gold return			2.175	2.054	2.956	2.785	3.232*	3.043*
			(-1.157)	(-1.108)	(-1.623)	(-1.547)	(1.883)	(1.808)
Bitcoin return			3.588***	3.569***	3.665***	3.621***	3.752***	3.733***

			(-2.653)	(-2.639)	(-2.949)	(-2.89)	(2.955)	(2.904)
Liquidity			0.191	0.184	0.160	0.153	0.105	0.090
			(-0.986)	(-0.962)	(-0.829)	(-0.796)	(0.524)	(0.445)
Bull			-0.159	-0.155	-0.088	-0.079	0.062	0.040
			(-1.314)	(-1.288)	(-0.766)	(-0.690)	(0.252)	(0.165)
Venture Capital			-0.017	-0.042	-0.056	-0.072	-0.049	-0.067
			(-0.115)	(-0.289)	(-0.345)	(-0.449)	(-0.314)	(-0.433)
Ln(mkt)			0.085	0.074	0.005	0.004	0.021	0.014
			(-0.731)	(-0.638)	(-0.047)	(-0.034)	(0.153)	(0.102)
Team reserve			0.151	0.178	0.126	0.163	0.110	0.141
			(-0.581)	(-0.689)	(-0.524)	(-0.671)	(0.447)	(0.570)
Lock-up period			0.123**	0.118**	0.063	0.061	0.066	0.065
			(-2.31)	(-2.239)	(-1.21)	(-1.193)	(1.285)	(1.285)
Exchange dummy	NO	NO	NO	NO	YES	YES	YES	YES
Year dummy	NO	NO	NO	NO	NO	NO	YES	YES
Constants	0.481***	0.392***	-2.357	-2.244	-0.258	-0.422	-1.347	-1.339
	(-3.176)	(-3.294)	(-0.705)	(-0.681)	(-0.083)	(-0.139)	(-0.347)	(-0.339)
N	149	149	149	149	149	149	149	149
Adjusted R^2	3.25%	3.15%	11.05%	10.64%	16.29%	15.31%	15.35%	14.13%

Table 6 Regression results for association between positive tone and ICO's first trading day return in different industries.

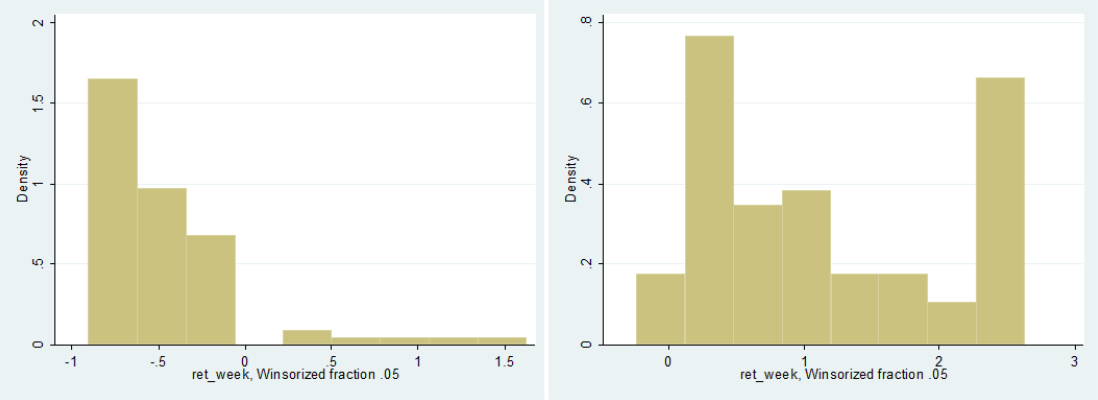
ICO first-day return is the closing price of a cryptocurrency scaled by opening price on the first trading day minus 1. Positive tone [1] is the difference between the number of positive words and the number of negative words, divided by the total number of positive words and negative words. Positive tone [2] is the difference between the number of positive words and the number of negative words, divided by the total number of words in the ICO whitepaper. Causal reasoning as a dummy variable equals to 1 if causal reasoning word intensity is larger than its median value, otherwise 0. Causal reasoning word intensity is measured as the number of causal reasoning words scaled by total number of words in the ICO whitepaper. CEPU stands China economic policy uncertainty index. Gold return is measured one month before the ICO's first trading day. Bitcoin return is measured one day before the ICO's first trading day. Liquidity is the amount of cryptocurrencies released in the ICO scaled by total amount of cryptocurrencies issued. Bull as a dummy variable equals to 1 if the date is between April 2017 and December 2017 or between March 2019 and July 2019, otherwise 0. Venture capital as a dummy variable equals to 1 if there is at least one venture capital invested in cryptocurrency new venture before ICO, otherwise 0. Ln(mkt) is the natural logarithm of total market value which is defined as the open price in the first day of ICO times number of cryptocurrencies released in the ICO. Industry I to V are as followed: information technology application, business and media, smart contract platform, finance, and wallets. ***p < 0.01, **p<0.05, *p<0.1.

	Model 1	**Model 2**	**Model 3**	**Model 4**	**Model 5**	**Model 6**	**Model 7**	**Model 8**	**Model 9**	**Model 10**
	Indus I	**Indus II**	**Indus III**	**Indus IV**	**Indus V**	**Indus I**	**Indus II**	**Indus III**	**Indus IV**	**Indus V**
Positive tone[1]	1.268***	0.214	3.103**	-0.152	0.831					
	(2.783)	(0.228)	(2.735)	(-0.207)	(0.974)					
Positive tone[2]						11.610**	4.032	41.720**	10.290	7.898
						(2.017)	(0.589)	(2.121)	(0.639)	(0.739)
CEPU	-0.043	0.348	-0.525	-0.056	0.516	0.047	0.297	-0.412	-0.084	0.397
	(-0.126)	(0.416)	(-1.239)	(-0.163)	(1.183)	(0.147)	(0.368)	(-1.138)	(-0.240)	(0.891)
Gold return	1.308	-0.202	2.061	9.327***	7.797	1.606	-0.106	-0.185	8.724**	8.530*
	(0.534)	(-0.021)	(0.554)	(2.753)	(1.612)	(0.647)	(-0.011)	(-0.047)	(2.603)	(1.785)
Bitcoin return	2.609*	3.352	5.481**	-0.445	5.181*	2.888**	3.791	5.500**	-0.413	5.020*
	(1.963)	(1.011)	(2.059)	(-0.176)	(1.969)	(2.298)	(1.162)	(2.107)	(-0.164)	(1.943)

Liquidity	-0.279	-0.446	-0.402	-0.210	-0.017	-0.294	-0.477	-0.513	-0.232	-0.033
	(-0.874)	(-0.487)	(-0.726)	(-0.582)	(-0.053)	(-0.930)	(-0.521)	(-1.036)	(-0.642)	(-0.109)
Bull	0.543	1.315	-0.908	0.224	0.240	0.600*	1.324*	-0.943*	0.142	0.110
	(1.544)	(1.625)	(-1.544)	(0.601)	(0.395)	(1.708)	(1.658)	(-1.838)	(0.366)	(0.179)
Venture Capital	0.224	0.330	0.191	-1.420*	0.272	0.280	0.349	0.297	-1.432*	0.299
	(0.897)	(0.784)	(0.560)	(-1.784)	(0.934)	(1.111)	(0.799)	(0.980)	(-1.811)	(1.029)
Ln(mkt)	-0.198	0.371	-0.208	-0.089	0.205	-0.214	0.335	-0.209	-0.101	0.175
	(-0.759)	(0.591)	(-1.188)	(-0.455)	(0.587)	(-0.821)	(0.547)	(-1.309)	(-0.502)	(0.499)
Exchange dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constants	5.010	-13.030	9.770	3.998	-7.647	5.055	-11.826	9.604*	4.148	-5.995
	(0.780)	(-0.712)	(1.698)	(0.763)	(-0.869)	(0.782)	(-0.669)	(1.955)	(0.775)	(-0.655)
N	92	32	42	56	43	92	32	42	56	43
Adjusted R^2	11.28%	-9.49%	15.23%	23.92%	32.30%	14.95%	-10.58%	22.60%	23.18%	34.10%

Figure 1 Distribution of ICO first-week/month return

Panel A ICO first-week return



Panel B ICO first month-return

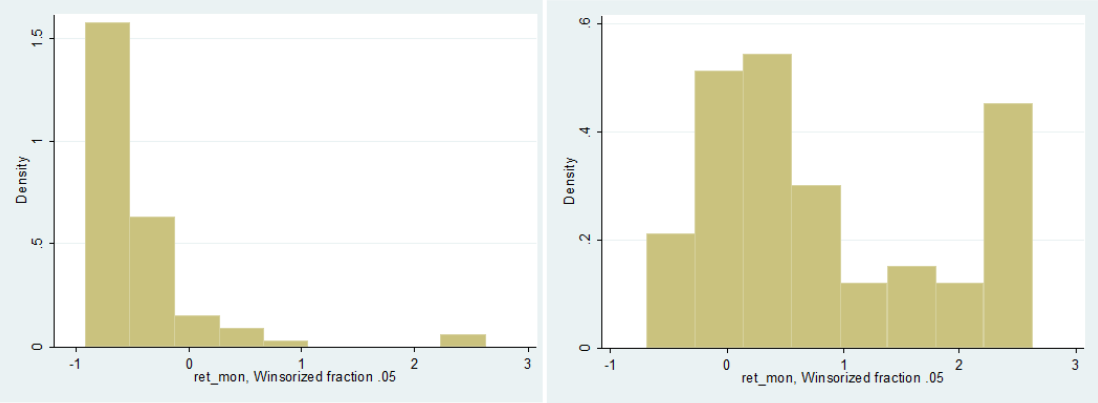


Figure 1 reports the distribution of ICO first-week/month return. The ICO first-week/month return is calculated in the same way as the aforementioned ICO first-day return, which is the closing price of a cryptocurrency scaled by opening price on the first trading week/month minus 1. Panel A reports the distribution of ICO first-week return. The left figure presents the distribution of ICO first-week return of which the cryptocurrency's ICO first-day return is smaller than its' 25th percentile, while the right figure presents the distribution of ICO first-week return of which the cryptocurrency's ICO first-day return is larger than its' 75th percentile. Similarly, Panel B reports the distribution of ICO first-month return. The left figure presents the distribution of ICO first-month return of which the cryptocurrency's ICO first-day return is smaller than its' 25th percentile, while the right figure presents the distribution of ICO first-month return of which the cryptocurrency's ICO first-day return is larger than its' 75th percentile.

Table 7 Regression results for association between positive tone in whitepaper and ICO's first week/month return.

ICO first-week/month return is the closing price of a cryptocurrency on the end of the first week/month scaled by closing price on the first trading day minus 1. Positive tone [1] is the difference between the number of positive words and the number of negative words, divided by the total number of positive words and negative words. Positive tone [2] is the difference between the number of positive words and the number of negative words, divided by the total number of words in the ICO whitepaper. CEPU stands China economic policy uncertainty index. Gold return is measured one month before the ICO's first trading day. Bitcoin return is measured one day before the ICO's first trading day. Liquidity is the amount of cryptocurrencies released in the ICO scaled by total amount of cryptocurrencies issued. Bull as a dummy variable equals to 1 if the date is between April 2017 and December 2017 or between March 2019 and July 2019, otherwise 0. Venture capital as a dummy variable equals to 1 if there is at least one venture capital invested in cryptocurrency new venture before ICO, otherwise 0. Ln(mkt) is the natural logarithm of total market value which is defined as the open price in the first day of ICO times number of cryptocurrencies released in the ICO. Column 1 and 2 apply the ICO first week return as the explained variables and Column 3 and 4 apply the ICO first month return. ***p < 0.01, **p<0.05, *p<0.1.

	ICO First Week Return	ICO First Week Return	ICO First Month Return	ICO First Month Return
Positive tone[1]	0.769**		0.613*	
	(2.183)		(1.783)	
Positive tone[2]		7.648**		7.134*
		(2.139)		(1.782)
CEPU	0.240	0.225	0.154	0.052
	(1.163)	(1.089)	(0.769)	(0.255)
Gold return	2.405*	2.247*	-0.368	-0.473
	(1.876)	(1.772)	(-0.254)	(-0.323)
Bitcoin return	2.139**	1.995**	1.632*	1.330
	(2.147)	(1.978)	(1.656)	(1.307)
Liquidity	-0.316*	-0.313*	-0.242	-0.276
	(-1.680)	(-1.650)	(-1.426)	(-1.612)
Bull	0.042	0.029	-0.101	-0.101
	(0.196)	(0.142)	(-0.334)	(-0.335)
Venture Capital	0.224*	0.200*	0.328***	0.369***
	(1.941)	(1.772)	(2.935)	(3.506)
Ln(mkt)	0.018	0.032	0.395**	0.475***
	(0.145)	(0.253)	(2.416)	(2.868)
Exchange dummy	YES	YES	YES	YES
Year dummy	YES	YES	YES	YES
Constants	-1.208	-1.544	-9.194**	-10.483***
	(-0.412)	(-0.527)	(-2.486)	(-2.794)

N	293	293	293	293
Adjusted R^2	9.99%	9.22%	11.63%	9.75%

Table 8 ICO first-week (month) performance excluding the first-day

Low first-day ICO return group and high first-day ICO return group are split by our sample based on the median value of ICO first-day return. Panel A reports the observations, mean values and differences of the ICO first-week return excluding the first day in two groups. Panel B reports the observations, mean values and differences of the ICO first-month return excluding the first day in two groups. ***p < 0.01, **p<0.05, *p<0.1.

	Panel A		**Panel B**	
	N	**Mean**	**N**	**Mean**
Low first-day ICO return group	147	0.021 (0.028)	147	0.026 (0.050)
High first-day ICO return group	146	-0.021 (0.043)	146	-0.205 (0.064)
Difference	293	0.042 (0.051)	293	0.230*** (0.081)

Appendix A: Typical content items of a whitepaper

Overview: Introduce the industry, market status, competitors and finances of the project.

Risk Factors: This section concerns the various legal, industry and internal risks of your project and how it impacts the success of the project and the ICO.

Solution: This section explains in detail how the project is going to solve the problem. The solution is usually the main focus for investors when reviewing a whitepaper.

Cryptocurrency Valuation: It provides information about how the cryptocurrency is going to be used in the project, and whether the team has plan or timeline to buyback the cryptocurrency in the future.

Cryptocurrency Distribution: It provides details regarding the distribution schedule, cryptocurrency allocation, overall fees and costs of the project.

Team Members: This part focuses on providing details about the project team members and their capabilities. It is essential that at least one team member has a strong understanding or background of blockchain technology.

Milestones: This portion focuses on the use of cryptocurrencies and the journey of the project through a series of timelines. This gives the reader a bird's eye view of the project and provides a deeper understanding on how the project will proceed in the future.

Reference: This section contains all the references and resources from which the external data has been compiled. It may help the project to gain credibility as authentic sources are provided for the readers to study further.

Reference

Aerts, W., & Zhang, S. (2014). Management's causal reasoning on performance and earnings management. European Management Journal, 32, 770–783.

Ahmad, K., Han, J., Hutson, E., Kearney, C., & Liu, S. (2016). Media-expressed negative tone and firm-level stock returns. Journal of Corporate Finance, 37, 152-172.

Arslan-Ayaydin, Ö., Boudt, K., & Thewissen, J. (2015). Managers set the tone: Equity incentives and the tone of earnings press releases. Journal of Banking & Finance, 72, S132-S147.

Al-Yahyaee, K. H., Mensi, W., & Yoon, S. M. (2018). Efficiency, multifractality, and the long-memory property of the Bitcoin market: A comparative analysis with stock, currency, and gold markets. Finance Research Letters, 27, 228-234.

Asay, H.S., Libby, R., & Rennekamp, K. (2018). Firm performance, reporting goals, and language choices in narrative disclosures. Journal of Accounting and Economics, 65(2-3), 380–398.

Baginski, S. P., Hassell, J. M., & Kimbrough, M. D. (2004). Why do managers explain their earnings forecasts? Journal of Accounting Research, 42, 1–29.

Bajo, E., & Raimondo, C. (2017). Media sentiment and IPO underpricing. Journal of Corporate Finance, 46, 139-153.

Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. The Quarterly Journal of Economics, 131(4), 1593-1636.

Baur, D. G., Dimpfl, T., & Kuck, K. (2018). Bitcoin, gold and the US dollar–A replication and extension. Finance Research Letters, 25, 103-110.

Blau, B. M., DeLisle, J. R., & Price, S. M. (2015). Do sophisticated investors interpret earnings conference call tone differently than investors at large? Evidence from short sales. Journal of Corporate Finance, 31, 203-219.

Bordalo, P., Gennaioli, N., Kwon, S. Y., & Shleifer, A. (2020). Diagnostic bubbles. Journal of Financial Economics, https://doi.org/10.1016/j.jfineco.2020.06.019.

Borochin, P. A., Cicon, J. E., DeLisle, R. J., & Price, S. M. (2018). The effects of conference call tones on market perceptions of value uncertainty. Journal of Financial Markets, 40, 75-91.

Bourveau, T., De George, E. T., Ellahie, A., & Macciocchi, D. (2019). Information Intermediaries in the Crypto-Tokens Market. Available at SSRN: https://ssrn.com/abstract=3193392.

Brockman, P., Li, X., & Price, S. M. (2017). Conference call tone and stock returns: Evidence from the Stock Exchange of Hong Kong. Asia-Pacific Financial Studies, 46, 667-685.

Brunnermeier, M. K., & Nagel, S. (2004). Hedge funds and the technology bubble. Journal of Finance, 59, 2013-2040.

Campello, M., & Graham, J. R. (2013). Do stock prices influence corporate decisions? Evidence from the technology bubble. Journal of Financial Economics, 107, 89-110.

Chaim, P., & Laurini, M. P. (2019). Is Bitcoin a bubble? Physica A, 517, 222-232.

Cheah, E., & Fry, J. (2015). Speculative bubbles in Bitcoin markets? An empirical investigation into the fundamental value of Bitcoin. Economics Letters, 130, 32-36.

Chen, J., Demers, E. A., & Lev, B. (2018). Oh what a beautiful morning! Diurnal influences on executives and analysts: Evidence from conference calls. Management Science, 64(12), 5899-5924.

Choi, W. (2020). Disclosure tone of the spin-off prospectus and insider trading. Journal of Accounting and Public Policy, 39(1), 1-26.

Corbet, S., Lucey, B., & Yarovaya, L. (2018). Datestamping the Bitcoin and Ethereum bubbles. Finance Research Letters, 26, 81-88.

Dyhrberg, A. H. (2016). Bitcoin, gold and the dollar–A GARCH volatility analysis. Finance Research Letters, 16, 85-92.

Enoksen, F. A., Landsnes, Ch. J., Lučivjanská, K., & Molnár, P. (2020). Understanding risk of bubbles in cryptocurrencies. Journal of Economic Behavior and Organization, 176, 129-144.

Fisch, C. (2019). Initial coin offerings (ICOs) to finance new ventures. Journal of Business Venturing, 34(1), 1-22.

Fisch, C., & Momtaz, P. P. (2020). Institutional Investors and Post-ICO Performance: An Empirical Analysis of Investor Returns in Initial Coin Offerings (ICOs). Journal of Corporate Finance, https://doi.org/10.1016/j.jcorpfin.2020.101679.

Florysiak, D., & Schandlbauer, A. (2018). The information content of ICO white papers. Available at https://ssrn.com/abstract=3265007.

Geuder, J., Kinateder, H., & Wagner, N. F. (2019). Cryptocurrencies as financial bubbles: The case of Bitcoin. Finance Research Letters, 31, 179-184.

Greenwood, R., & Nagel, S. (2009). Inexperienced investors and bubbles. Journal of Financial Economics, 93, 239-258.

Greenwood, R., Shleifer, A., & You, Y. (2019). Bubbles for Fama. Journal of Financial Economics, 130, 20–43.

Haruvy, E., Lahav, Y., & Noussair, C. (2007). Traders' expectations in asset markets: Experimental evidence. American Economic Review, 97, 1901–1920.

Henry, E. (2008). Are investors influenced by how earnings press releases are written? Journal of Business Communications 45(4), 363–407.

Heston, S. L., & Sinha, N. R. (2014). News versus sentiment: Comparing textual processing approaches for predicting stock returns. Robert H. Smith School Research Paper.

Hong, H., Scheinkman, J., & Xiong, W. (2006). Asset float and speculative bubbles. Journal of Finance, 61, 1073-1117.

Huang, X., Teoh, S. H., & Zhang, Y. (2014). Tone management. The Accounting Review, 89(3), 1083-1113.

Howell, S. T., Niessner, M., & Yermack, D. (2020). Initial coin offerings: Financing growth with cryptocurrency token sales. Review of Financial Studies, 33(9), 3925-3974.

Hyland, K. (1998). Exploring corporate rhetoric meta disclosure in the CEO's letter, Journal of Business Communication, 35(2), 224-245.

Hyland, K. (2005). Meta-discourse: Exploring interaction in writing. Continuum, Oxford, England.

Jang, J., & Kang, J. (2019). Probability of price crashes, rational speculative bubbles, and the cross-section of stock returns. Journal of Financial Economics, 132, 222-247.

Jiang, F., Lee, J., Martin, X., & Zhou, G. (2019). Manager sentiment and stock returns. Journal of Financial Economics, 132(1), 126-149.

Kher, R., Terjesen, S., & Liu, C. (2020). Blockchain, Bitcoin, and ICOs: A review and research agenda. Small Business Economics, https://doi.org/10.1007/s11187-019-00286-y.

Kong, D., Shi, L., & Zhang, F. (2020). Explain or conceal? Causal language intensity in annual report and stock price crash risk. Economic Modelling, https://doi.org/10.1016/j.econmod.2020.02.013.

Koonce, L., Seybert, N., & Smith, J. (2011). Causal reasoning in financial reporting and voluntary disclosure. Accounting, Organizations and Society, 36(4-5), 209–225.

Li, C. W., & Xue, H. (2009). A Bayesian's bubble. Journal of Finance, 64, 2665-2701.

Ljungqvist, A., & Wilhelm, W. J. (2003). IPO pricing in the dot-com bubble. Journal of Finance, 58, 723-752.

Loughran, T., & McDonald, B. (2011). When is a liability not a liability? Textual analysis, dictionaries, and 10‐Ks. Journal of Finance, 66(1), 35-65.

Makarov, I., & Schoar, A. (2020). Trading and arbitrage in cryptocurrency markets. Journal of Financial Economics, 135(2), 293-319.

Palmieri, R., Rocci, A. and Kudrautsava, N. (2015), Argumentation in earnings conference calls, corporate standpoints and analysts' challenges, Studies in Communication Sciences, 15(1), 120-132.

Panagiotidis, T., Stengos, T., & Vravosinos, O. (2018). On the determinants of bitcoin returns: A LASSO approach. Finance Research Letters, 27, 235-240.

Pástor, L., & Veronesi, P. (2006). Was there a Nasdaq bubble in the late 1990s? Journal of Financial Economics, 81, 61-100.

Price, S. M., Doran, J. S., Peterson, D. R., & Bliss, B. A. (2012). Earnings conference calls and stock returns: The incremental informativeness of textual tone. Journal of Banking & Finance, 36, 992-1011.

Sadique, S., In, F, & Veeraraghavan, M. (2008). The impact of spin and tone on stock returns and volatility: Evidence from firm-issued earnings announcements and the related press coverage. Available at SSRN: https://ssrn.com/abstract=1121231.

Samieifar, S., & Baur, D. G. (2020). Read me if you can! An analysis of ICO white papers. Finance Research Letters, https://doi.org/10.1016/j.frl.2020.101427.

Shahzad, S. J. H., Bouri, E., Roubaud, D., & Kristoufek, L. (2019). Safe haven, hedge and diversification for G7 stock markets: Gold versus bitcoin. Economic Modelling, 87, 212-224.

Shu, M., & Zhu, W. (2020). Real-time prediction of Bitcoin bubble crashes. Physica A, 548, 124477.

Tetlock, P.C. (2007). Giving content to investor sentiment: The role of media in the stock market. Journal of Finance, 62(3), 1139–1168.

Tetlock, P. C., Saar-Tsechansky, M., & Macskassy, S. (2008). More than words: Quantifying language to measure firms' fundamentals. Journal of Finance, 63(3), 1437-1467.

Urquhart, A. (2016). The inefficiency of Bitcoin. Economics Letters, 148, 80-82.

Veronesi, P. (1999). Stock market overreaction to bad news in good times: A rational expectations equilibrium model. Review of Financial Studies, 12, 975–1007.

Vissing-Jorgensen, A. (2003). Perspectives on behavioural finance: does irrationality disappear with wealth? Evidence from expectations and actions. In: Gertler, M., Rogoff, K. (Eds.), NBER Macroeconomics Annual. MIT Press, Cambridge, MA, pp. 139–193.

Wu, S., Tong, M., Yang, Z., & Derbali, A. (2019). Does gold or Bitcoin hedge economic policy uncertainty? Finance Research Letters, 31, 171-178.

Yan, S. (2015). Managerial attitudes and takeover outcomes: Evidence from corporate filings. Journal of International Financial Markets, Institutions & Money, 35,30-44.

Yan, B., Aerts, W., & Thewissen, J. (2019). The informativeness of impression management - Financial analysts and rhetorical style of CEO letters. Pacific Accounting Review, https://doi.org/10.1108/PAR-09-2017-0063.

Zhang, S., & Aerts, W. (2015). Management's performance justification and failure to meet earnings thresholds. Accounting and Business Research, 45(6-7), 841-868.

Zhang, S., Aerts, W., Lu, L., & Pan, H. (2019a). Readability of token whitepaper and ICO first-day return. Economics Letters, 180, 58-61.

Zhang, S., Aerts, W., Pan, H. (2019b). Causal language intensity in performance commentary and financial analyst behaviour. Journal of Business and Finance Accounting, 46, 3–31.