From Opaque to Accountable Governance: Investor Activism for Transparency in Social Media Amid Disruption in Cryptocurrency

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Abstract

Cryptocurrencies have experienced rapid growth, but the absence of regulatory supervision has given rise to concerns regarding transparency. Unlike traditional financial systems, cryptocurrencies lack a central authority, resulting in unclear governance and potential issues. This is exemplified by the problems associated with Initial Coin Offerings (ICOs). The recent crisis at FTX underscores the importance of transparency. While some exchanges are beginning to list assets governed by ethical principles, the path towards establishing accountable governance remains uncertain. Our research delves into how the lack of transparency in cryptocurrency exchanges prompts investors to advocate for accountable governance. We employ an event study approach to examine the impact of the FTX bankruptcy, with a particular focus on activism on Twitter. Our findings indicate that investor demands for transparency encourage exchanges to adopt measures aimed at ensuring accountability, such as conducting Proof of Reserves audits. This shift has the potential to foster a more stable and reliable cryptocurrency ecosystem, ultimately benefiting both investors and the industry as a whole.

Keywords: Opaque governance, accountable governance, investor activism, mediation path

Introduction

In recent years, cryptocurrencies have undergone a notable transformation, transitioning from innovative digital concepts to powerful technologies that have the potential to revolutionize the global financial system. However, despite the significant progress that has been made, investors are faced with uncertainties surrounding this emerging asset class (Kowsmann and Ostroff 2022). Unlike the Financial Accounting Standards Board (FASB), which acts as an independent nonprofit body that establishes accounting and financing reporting standards, the cryptocurrency industry lacks such an oversight agency. While cryptocurrencies offer various benefits, including capital raising and financial inclusion, they also present certain drawbacks, such as lack of transparency that stems from the lack of oversight and regulation due to its decentralized governance systems (Hua and Huang 2021). Transparency concerns are currently being

debated among policymakers, investor communities, and financial institutions, with investors calling for greater transparency within the industry.

An opaque governance can be characterized as one in which the public lacks information to fully understand how the system operates and makes decisions due to lack of disclosure of key information (Healy and Palepu, 2001). Hiding, withholding, manipulating, or misrepresenting information that investors can access to make informed decisions is common in opaque governance structures (Bushman et al., 2004). An opaque governance is marked by a lack of openness, clarity, and accountability (Bebchuk and Weisbach, 2010), which can make it challenging for investors to assess the effectiveness, credibility, and fairness of the system (Bushman and Smith, 2001). This, in turn, can raise suspicions of corruption, abuse of power, favoritism, and erosion of trust and confidence in the governance structure (Hermalin and Weisbach, 2012). Reason for the increased interest in cryptocurrencies is related to the emergence of a new fundraising method called initial coin offerings (ICOs). This method is highly unregulated funding method allows companies to raise capital through unregulated process with no legal penalties for misleading information during an ICO. Our study conceptualizes the phenomenon of unregulated fundraising in the form of self-issued tokens on exchanges. In response to mounting customer demands, exchanges have taken proactive steps to ensure the security of customer funds. One of the key measures they employ is the implementation of Proof of Reserves practices, which involve thorough verification of customer fund safety through independent audits. Our study describes the act of reducing the information gap between investors and exchanges by transparently disclosing investors' assets held by exchanges that are hidden in obscurity as an accountable governance structure. An accountable governance structure is a form of governance that allows investors to make their own investment decisions based on publicly available information, and in this study we refer to the Proof of Reserves service.

The recent collapse of the FTX, a prominent exchange in the cryptocurrency ecosystem, not only illustrates the dire need for greater transparency in the governance of the crypto industry but also underscores the imperative for thorough investigations on what can be done to transform opaque governance into accountable governance.

In response to this growing demand for transparency, some exchanges have begun to list ethical governance-compliant assets, signaling a shift towards responsible practices in the industry (Bodhanwhla and Bodhanwala 2019). However, the process of transforming opaque governance into responsible governance remains unclear. To this end, we ask the following research questions: (a) when does opaque governance lead to greater investor activism for transparency?, (b) does investor activism for transparency influence accountable governance?, and (c) what is the underlying mechanism that can explain how opaque governance can be transformed into accountable governance?

Our study employs an event study approach to investigate the impact of the FTX bankruptcy incident on the cryptocurrency ecosystem, with a focus on how opaque governance structures in cryptocurrency exchanges provoke heightened investor activism on Twitter (Vidal-Tomás et al. 2023; Lu et al. 2022). We assess the degree of non-compliance with transparency principles among exchanges by examining their listing practices, particularly the listing of high-risk cryptocurrency assets that they themselves have issued (e.g., self-issued tokens), which is widely recognized as promoting opaque governance (Kowsmann et al. 2022). In the aftermath of the FTX governance failure, we collect and analyze investors' tweets calling for increased transparency to measure investor activism.

Our findings suggest that this investor-driven demand for transparency fosters a transition towards more accountable governance among exchanges. Exchanges respond to this growing pressure by adopting measures such as Proof of Reserves practices , where they verify the safety of customer funds through third-party audits. This shift towards transparency has the potential to create a more stable and reliable cryptocurrency ecosystem, which ultimately benefits investors and the industry as a whole. Finally, we discuss the policy and managerial implications of our findings, offering insights and recommendations for regulators and exchange operators to ensure a more transparent and accountable cryptocurrency ecosystem, paving the way for increased investor confidence and responsible growth.

Related Work

Our research aims to address the gap in the current literature regarding the transparency and accountable governance in the crypto-asset market. A trend has emerged in which companies are adopting decentralized governance, shifting away from traditional centralized approaches, mainly due to the development of blockchain technology. Decentralized governance systems, as seen in crypto-asset exchanges, disclose the

movement of virtual assets and participants both inside and outside the exchange. However, research on accountable governance for companies operating under decentralized governance remains limited.

While the use of blockchain technology offers a relatively high degree of transparency and increased governance participation, incidents such as the FTX bankruptcy indicate that transparency can still be inadequate without ethical business practices. The FTX incident demonstrates that decentralized governance does not guarantee transparency and accountability. Despite the growing practical demand for responsible and transparent governance in cryptocurrency exchanges (Table 1), previous research has been slow to investigate the transformation from opaque governance to accountable governance and the role of investor activism on social media in promoting transparency.

Prior studies on accountable governance in decentralized governance systems have predominantly viewed the adoption of blockchain system itself as an independent variable, concluding that blockchain adoption leads to increased transparency and accountability (Atzori 2015; Swan 2015). These studies assume that the inherent characteristics of blockchain technology, such as its decentralized and transparent nature, automatically lead to improved governance and accountability within organizations adopting the technology. However, recent cases of transparency issues and unethical practices in decentralized governance companies highlight the need for further research into the mechanisms to drive greater accountability of blockchain economy. Further, although in traditional corporate structures (e.g., Kim et al. 2022, Hwang et al. 2022, Grewal et al. 2018, Eccles et al. 2014) prior studies on accountable governance i have demonstrated that government regulations can enhance accountability, in the emerging blockchain economy where government regulations are relatively limited, the drivers of accountability in decentralized governance companies remain unclear. This study aims to address this gap in knowledge.

Previous studies have focused on shareholder activism as a driver of corporate change, mainly considering its impact on financial performance (Brauer et al. 2022, Barros et al. 2022) or information transparency (Hafeez, B. et al. 2022, Michelon etl al. 2020). Extant literature also demonstrates that shareholder activism on social media can induce changes in companies and even improve accountability through increased information disclosure to shareholders. Notwithstanding, these studies have mostly been conducted in traditional centralized settings and are limited in measuring shareholder activism through proxies such as open letters or aggregated Google search trends.

Existing studies in the field of decentralized governance systems have investigated the sentiments expressed by investors on social media about blockchain companies and their digital assets (Gurdgiev, C. et al. 2020, Zhang et al. 2022, Anamika et al. 2022). However, these studies have primarily focused on investors' reactions to changes in asset prices rather than movements aimed at promoting accountable governance. Therefore, although these studies analyze new digital assets, their findings are similar to previous research that have examined investors' reactions on social media in the stock market. In contrast, our research focuses on the role of investor activism in promoting transparency and accountable governance in the context of decentralized governance systems.

To the best of our knowledge, our study is the first to measure the impact of shareholder activism on social media on accountability in companies with a decentralized governance system. Our research makes three distinctive and novel contributions to the literature: (a) we show that opaque governance triggers more investor activism on social media (Twitter) for transparency after (vs. before) a disruptive governance failure is reported (i.e., FTX bankruptcy), (b) we demonstrate that investor activism for transparency on social media leads to accountable governance, and (c) we establish that investor activism for transparency mediates the transformation process from opaque to accountable governance. By analyzing the relationship between investor activism on social media, transparent governance, and the adoption of Proof-of-Reserve (PoR) practice in the cryptocurrency ecosystem, our study provides valuable insights for regulators and exchange operators to ensure a more transparent and accountable cryptocurrency economy. Taking the above collectively, this positions our work uniquely within the existing body of research, as illustrated in Table 1.

Study	Decentralized Governance System	Shareholder Activism on Social Media	Accountable Governance
Gurdgiev et al. (2020)	o	o	
Zhang et al. (2022)	o	o	
Anamika et al. (2022)	o	o	

Chod et al. (2022)	o		o
Seyedsayamdost et al (2020)	o		o
Kim et al. (2022)			o
Hwang et al. (2022)			o
Grewal et al. (2018)			o
Eccles et al. (2014)			o
Brauer et al. (2022)		o	
Barros et al. (2022)		o	
Hafeez et al. (2022)		o	o
Michelon et al. (2020)		o	o
Our Research	o	o	o

Table 1. Positioning of our study relative to the literature

Theoretical Background

Our conceptual model and hypotheses are grounded in uncertainty reduction theory (URT) (Berger and Calabrese 1975). URT has its roots in the communications literature where people seek information to reduce anxiety and uncertainty when interacting with others (Berger and Calabrese 1975; Berger 1986). Although originally developed as a communications theory, it has been applied in various settings including but not limited to e-government service use (Venkatesh et al. 2016), computer-mediated communication environment (e.g., social network site) (Antheunis et al. 2010), organizational fairness (Lind and Van den Bos 2002), and consumer assessment of services (Siehl et al. 1992).

At the core of URT is that uncertainty adds opaqueness and unpredictability in understanding the other party, which increases frustration and adds fuel to the desire for transparent information. In the cryptocurrency context, uncertainty reduction pertains to reducing the gap in knowledge about governance structure between investors and the exchange. A response to the demand for uncertainty reduction from the market (i.e., investors) is request for greater transparency (Venkatesh et al. 2016). Transparency can be achieved when more and accurate information is provided that can reduce risk and increase confidence in decision-making.

We define investor activism for transparency as the demand from investors for exchanges to provide more accurate and comprehensive information on transactional and operational activities. According to URT, four strategies are used to seek more information to increase transparency: passive, active, interactive, and extractive information seeking. Passive refers to obtaining information through unobtrusive indirect observation; active refers to asking a third party to obtain information; interactive refers to directly asking the party from which you lack information; and extractive information seeking refers to using computer-mediated communication devices to obtain information that is available online.

In the crypto industry, the extractive information-seeking strategy is particularly relevant due to the decentralized and digitally native nature of the ecosystem. This strategy enables investors to harness the power of online platforms, social media, and various data sources to access information, which is often not readily available through traditional channels. Furthermore, the rapidly evolving landscape of the crypto industry and the emergence of new projects and technologies necessitate that investors constantly seek up-to-date information, making the extractive strategy even more crucial in reducing uncertainty and fostering informed decision-making.

Hypothesis Development

The Impact of a Focal Exchange's Opaque Governance on Investor Activism for Transparency in Social Media under Disruptive Governance Failure

From the public (Cucciniello et al. 2017) to the private sector (Jiang et al. 2022), people demand more transparency when a disruptive event (e.g., scandal, coup, or any other political or financial fiasco) transpires and shifts publics' attention or lack thereof to the dark side of obscured governance. After a disruptive event, people actively search for information to make sense of the situation, resulting in more vigilant information processing (Walls et al. 1992). This phenomenon has also been observed in the organizational behavior literature, where crises and scandals lead to increased scrutiny and demands for accountability from stakeholders (Pfarrer et al. 2008; Mena et al. 2016). In a system that has historically operated under a veil, investors may have become accustomed to the entrenched way of business operation over time. Nonetheless, the dormant demand for transparency can erupt dramatically when an event disturbs the system's equilibrium.

Drawing from the public management literature, research in the e-government context shows that lack of information quality characteristics such as accuracy and completeness trigger greater demand for transparency (Venkatesh et al. 2016). Complementing this, the crisis communication literature posits that in times of uncertainty, stakeholders actively seek information to reduce ambiguity and regain control over the situation (Coombs 2007). The rise of social media has provided a powerful platform for the public to voice their demands for transparency and engage in collective action (Castelló et al. 2016). For example, after the 2010 Deepwater Horizon oil spill, stakeholders turned to social media platforms such as Twitter and Facebook to demand greater transparency from BP, the company responsible for the spill (Liu et al. 2018). Similarly, the 2017 United Airlines incident led to massive public outrage on social media, with users demanding transparency, accountability, and policy changes from the airline.

We take this one step further and argue that a disruptive event that signals a catastrophic governance failure will urge the public for greater desire to reduce information uncertainty and trigger investor activism for transparency directed at the focal exchange. By investor activism for transparency directed at the focal exchange, we specifically refer to the *target* of transparency demand as the exchange associated with the opaque governance. Therefore, we advance a positive interaction between opaque governance and disruptive governance failure on investors' activism for transparency directed at the focal exchange such that (see Figure 1):

Hypothesis 1: After a disruptive governance failure, opaque governance leads to more investor activism for transparency directed at the focal exchange.

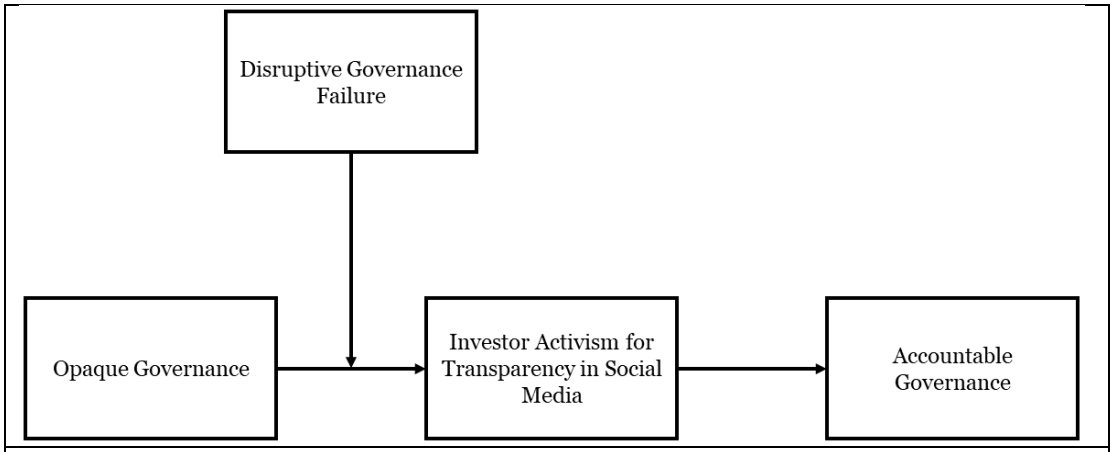

Figure 1. Conceptual Model (From a Focal Exchange's Perspective)

The Impact of Investor Activism for Transparency Directed at the Focal Exchange on Promoting Accountable Governance

Using an investment game between an investor and a manager over 6 growth periods, Lunawat et al. (2021) reveal that financial reporting (a signaling of transparency) increased manager's behavior that was more accountable and moral in the form of greater payout to the investor, despite not being required to do so. Transparency has the effect of enforcing "corrective actions" by exerting pressure on institutions to do the "right thing" that looks after the well-being of investors. For example, shareholder activism for greater transparency in firms' exposure to climate change risk elicited more voluntary disclosure of climate change related risks (Flammer et al. 2021). The power of transparency shifts the focus from maximizing "self-interest" to balancing "mutual interest." In line with this argument, research on corporate governance has found that increased investor activism can lead to improvements in corporate accountability and performance (Gillan and Starks 2000; Brav et al. 2008).

In the cryptocurrency context, this suggests that greater investor activism for transparency directed at the focal exchange will lead to disclosing information about their financial status (e.g., reserves), which can be rewarded with greater investor trust, confidence, and credibility. Disclosing "proof of reserves" can signal to investors that there is nothing to hide and is a responsible effort in response to transparency requests. Having more reserves signals to the market that if and when a crisis occurs, the exchanges will have the funds to weather the storm. The recent Silicon Valley Bank (SVB) collapse is a case in point where investors believed that the bank did not have enough reserves and panickily withdrew cash, accelerating the demise of the bank (Cohan 2023).

Additionally, studies in the context of corporate social responsibility (CSR) have demonstrated that increased transparency and disclosure lead to better CSR performance and improved stakeholder relations (Dhaliwal et al. 2012; Michelon et al. 2015). Therefore, dispelling false beliefs about lack of reserves by disclosing key information (e.g., proof of reserves) can be an effective way to respond to calls for greater transparency. Thus, we propose the following:

Hypothesis 2a: Investor activism for transparency directed at the focal exchange leads to more accountable governance.

We propose a competing hypothesis to H2a, which suggests that investor activism for transparency can have two distinct targets. The first, as previously mentioned, is investor activism for transparency directed at the focal exchange. This type of activism is highly specific, as it involves investors demanding transparency concerning the exchange in question or the exchange associated with the opaque governance. That is, while investors could call for industry-wide transparency, this particular demand is narrower in scope as it is focused on a specific exchange (Frooman 1999; Dorobantu et al. 2017).

The second target is investor activism for transparency concerning exchanges other than the focal exchange. This form of activism casts a wider and more inclusive net, encompassing all exchanges except for the focal exchange. As this type of activism includes all other exchanges, it can be considered a form of competitive pressure (Marquis and Lounsbury 2007; Eesley and Lenox 2006). When calls for transparency reverberate across the industry, including competitors, this pressure can encourage conformity to accountable governance. Although the impact of investor activism for transparency directed at the focal exchange may be felt more directly, the impact of investor activism for transparency on exchanges other than the focal exchange is expected to be more indirect, as the spotlight is not necessarily on the focal exchange in question. Therefore, we posit that two alternative forces can lead to accountable governance: investor activism for transparency directed at the focal exchange (H2a) and investor activism for transparency on exchanges other than the focal exchange (H2b). Hence, we propose the following alternative hypothesis:

Hypothesis 2b: Investor activism for transparency directed at exchanges other than the focal exchange leads to more accountable governance of the focal exchange.

Mediation Effect of Investor Activism for Transparency Directed at the Focal Exchange

We draw on the Input–Process–Output (IPO) framework to develop the mediating role of investor activism for transparency directed at the focal exchange (Hackman 1987; McGrath 1984). In its simplest form, this

framework indicates that process plays a transformational role in converting inputs into outputs. The process in our conceptual model is investor activism for transparency directed at the focal exchange. A key role of transparency is its ability to function as an uncertainty reduction mechanism, by providing more accurate and complete information to the public (Coombs 2007; Weick et al. 2005). Since one of the critical missing links between opaque and accountable governance is the disclosure of unbiased and comprehensive information, transparency can fill this void. That is, through transparency, "darkness sees light" and the subject in question (opaque governance) can be transformed (Suddaby et al., 2017). In our model, corrective action needs to be undertaken on the input (opaque governance) to transform an undesirable state into accountable governance, a desirable output, via the process of exposure to transparency. The prior arguments lead to the following:

Hypothesis 3: The interactive influence of opaque governance and disruptive governance failure on accountable governance is mediated by stakeholder activism for transparency targeted at the fundraising exchange.

Empirical Analysis

Empirical Context

The context for this study is the cryptocurrency economy, focusing on the FTX bankruptcy event (Grewal and Serafeim 2019; Eccles et al. 2014). The critique of opaque governance practices, exemplified by the use of self-issued tokens by cryptocurrency exchanges, has gained increased attention following the bankruptcy of FTX, a prominent exchange within the cryptocurrency ecosystem. Given the highly active and vocal nature of investors in the cryptocurrency market, it is imperative to examine the role of investor activism by considering the FTX bankruptcy incident. In this regard, our investigation focuses on the role of investor activism for transparency in explaining the relationship between opaque and accountable governance in the wake of a disruptive governance failure as exemplified by the fallout of FTX.

In our research, we consider proof-of-reserve (PoR) as a key aspect of accountable governance. PoR involves the disclosure of reserves held by exchanges, providing transparency on the safety of investor funds (Wade 2023). This transparency measure can be achieved through methods such as audits by independent third-party firms, public disclosure of cold wallet addresses, or verifiable proof of reserves using cryptographic techniques. PoR serves as a means for cryptocurrency exchanges to reassure their investors that they have sufficient reserves to cover all deposits, reducing the risk of bankruptcy. It is considered an important aspect of accountable governance, enhancing trust and accountability in exchange operations. Investors can verify the safety of their funds, which is particularly crucial in the volatile and often unregulated cryptocurrency economy.

Data and Variables

To test our hypotheses, we constructed a dataset that included 38 crypto exchanges, with data organized on a daily and exchange level. We gathered data from various sources for each of the 38 exchanges. First, we examined the issuance of self-issued tokens to determine the opacity of corporate governance. This information was found on platforms such as the exchange's official website, news media, cryptocurrency information sites like CoinGecko, or social media channels like Twitter or Reddit. We assigned a code of 1 or 0 to each exchange based on whether they had confirmed the issuance of self-issued tokens or not, by examining their announcements and public news for several days after establishment, as well as Coingecko. Thus, self-issued tokens are utilized as an indicator of opaque governance of exchange i ($Opaque_i$). The decision on whether to issue self-issued tokens is made by exchanges at the beginning of their business operations or shortly thereafter, and this decision remains unchanged over time. Hence, it is deemed a time-invariant factor established before August 2022, the beginning of the analysis period, and is provided at the exchange level.

Second, to operationalize the notion of "disruptive governance failure," the study employed the bankruptcy of FTX ($Failure_t$) on November 11th, 2022, which took place during the research period. $Failure_t$ is a binary variable that takes on a value of 1 after the occurrence of the FTX shock and 0 otherwise. Therefore, the disruptive governance failure shock is an event that occurred uniformly across all exchanges. Taken

together, we operationalize the interactive effect of opaque governance and disruptive governance failure that exchange *i* faces at day *t* as the interaction variable ($Opaque_i * Failure_t$).

Third, we gathered tweets from Twitter to assess stakeholders' calls for transparency on social media at the exchange-day level. For example, the tweet by Brad Garlinghouse, CEO of Ripple., who tweeted, "the crypto industry at large in the US needs to rebuild trust through both utility and transparency (due to FTX, Terra, and more)," can be considered a potential indicator of call for transparency. Another example is the tweet by Bruce Fenton, a managing director at Watchdog Capital, where he wrote, "Let's talk SBF/ FTX, DC politics & transparency," discussing the need for transparency in relation to SBF/FTX, DC politics, and other related matters. These tweets emphasize the importance of transparency and shed light on concerns within the crypto industry.

To operationalize the variable of *Investor activism for transparency directed at the focal exchange*, we collected tweets that mentioned the name of each exchange and referred to the keyword "crypto". We then removed tweets that merely praised the exchange's customer service or mentioned its stock price. To identify tweets related to transparency, we conducted topic modeling on the remaining collected tweets and selected 8 representative keywords, including "Transparency, Proof, Reserve, Merkle, Credib(ility/ible), Respons(ibility/e), Truth, Trust". We labeled tweets that contained at least one of these keywords as "transparency request tweet" for the targeted exchange. Then, to measure the number of transparency-related tweets for an exchange, we calculated the total number of "transparency request tweet" tagged with relevant keywords for exchange *i* at day *t*. As the final step, we captured "the exposure" to investor activism targeting the focal exchange *i* on social media by incorporating total number of tweets tagged with keywords related to exchange *i*'s transparency, multiplied by the number of followers for each poster ($Investor\ activism\ focal_{it-1}$). This variable $Investor\ activism\ focal_{it-1}$ is used to test H1 and H2a.

In contrast, for investor demand for exchanges other than the focal exchange, we incorporated the total number of tweets tagged with transparency-related keywords for all other exchanges, except for the focal exchange, multiplied by the number of followers for each poster ($Investor\ activism\ other\ than\ focal_{-it-1}$). This variable $Investor\ activism\ other\ than\ focal_{-it-1}$ is used to test H2b. We employed a lagged variable (t-1) to address the possibilities of reverse and simultaneous causality.

We assess the accountable governance of an exchange by examining whether they voluntarily implemented PoR during our sample period (*Accountability*). Among the 38 exchanges examined, we found that 13 implemented PoR. The publication dates of PoR across different exchanges exhibit a broad distribution, ranging from October to December 2022, as depicted in Figure 2.

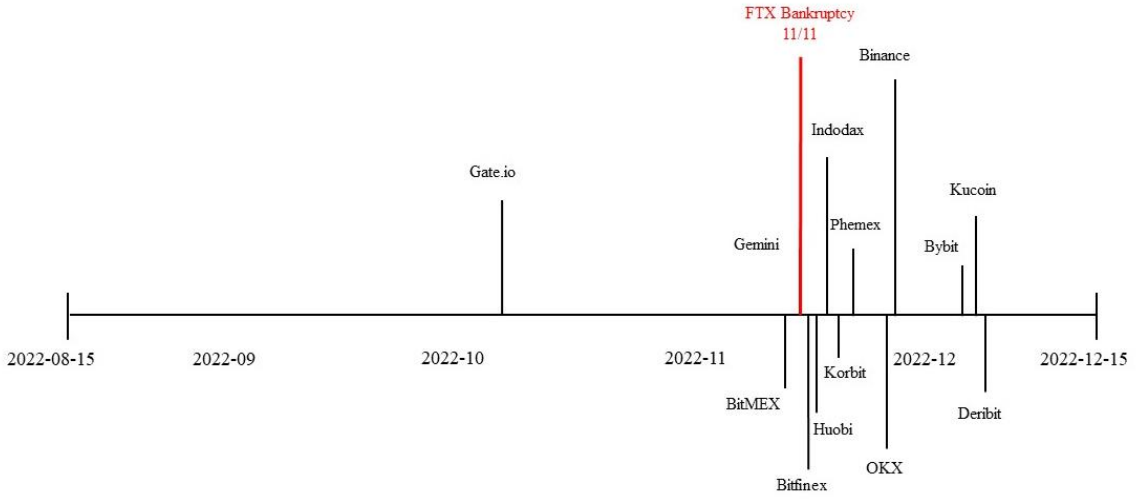

Figure 2. Timeline of Proof-of-Reserves (PoR) by Exchange

Last, we consider time-varying exchange characteristics as controls, such as the total number of transactions sent in/out of the exchange (*In/Outside Transactions*) and total Bitcoin flow within exchange (*Exchange within Flow*). For example, on average, a crypto exchange receives 1,633 transactions per day from external Bitcoin wallets to its internal Bitcoin wallet, while outgoing transactions to external wallets occur around 225 times per day. By controlling the number of transactions at the exchange-day level, the

operational activity and fee revenue of each exchange can be indirectly controlled over time, and firm size, firm resources, and customer base that can affect PoR can also be controlled. For these control variables, we gathered exchange-specific daily panel data of number of transactions from CryptoQuant.com, a platform that provides on-chain and market data obtained from blockchain networks, banks, exchanges, and miners in the cryptocurrency industry. Table 2 presents the summary statistics of the data.

Variables	Obs.	Mean	Std. Dev.	Min	Max
Investor activism focal	4674	207,736.8	1,499,581	0	37,243,645
Investor activism other than focal	4674	7,686,260	10,503,451	28,221	58,780,638
Accountability	4674	0.003	0.053	0	1
Opaque	4674	0.500	0.500	0	1
Failure	4674	0.285	0.451	0	1
Inside transaction (Bitcoin)	4674	1,633.960	5,393.028	0	33,171
Outside transaction (Bitcoin)	4674	225.121	749.756	0	6,097
Exchange within Flow (Bitcoin)	4674	9,173.836	49,556.94	0	1,739,567

Table 2. Summary Statistics

Before moving on to the econometric analysis, we first examined model-free evidence as shown in Figure 3. A significant spike in tweet volume demanding transparency, particularly for exchanges with self-issued tokens, is observed following the FTX bankruptcy shock.

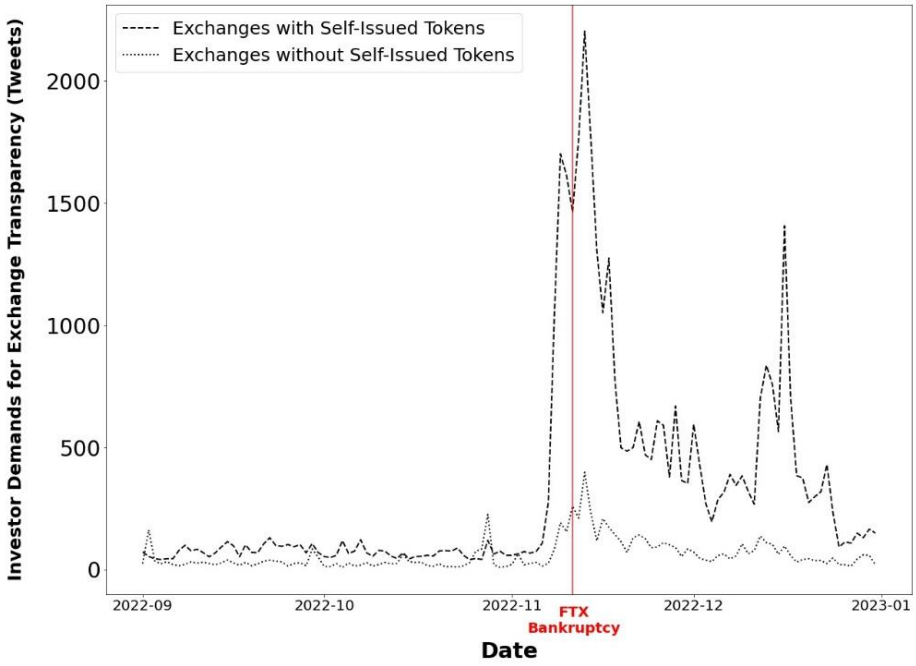

Figure 3. Elevated Transparency Demand in Exchanges with Opaque Governance

Regarding the impact of opaque governance and investor activism on the accountable governance of exchanges, Figure 4 also provides interesting model-free evidence. We classify exchanges into four categories based on the presence of a self-issued token and the volume of tweets during the month prior to PoR disclosure. For the exchanges that had a self-issued token and faced a high volume of tweets requesting

transparency, a PoR disclosure was made earlier compared to the other three groups. These observations reflect the potential influence of investor activism on Twitter to adopt transparent and accountable governance through PoR disclosures, which we aim to test in the following section.

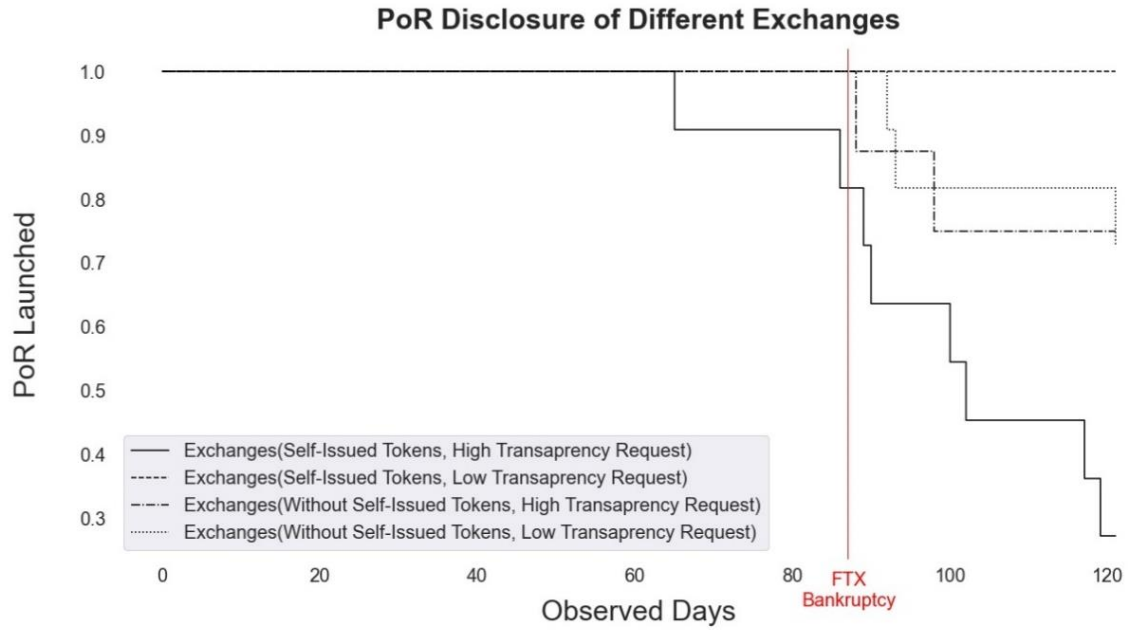

Figure 4. PoR Disclosure Timings of Exchanges

Econometric Specification

To examine the relationship between opaque governance, disruptive governance failure, and the role of investor activism in promoting accountable governance, we used several econometric methods, including OLS regression, survival analysis, and mediation analysis with bootstrapping. To test H1 that examines how opaque governance and governance failure interact to affect investor activisms to request for transparency for a focal exchange, we utilized OLS regression to estimate eq (1):

$$log(Investor\ activism\ focal_{it}) = v_t + \beta_1 Opaque_i * Failure_t + \gamma X_{it} + u_i + \varepsilon_{it} \qquad \text{Eq. (1),}$$

where $Investor\ activism\ focal_{it}$ refers to the level of exposure to investor activism directed towards a specific exchange *i* at time *t* by incorporating the total number of tweets related to exchange *i*'s transparency, multiplied by the number of followers for each poster, $Opaque_i$ is a binary variable that equals 1 if the exchange i has confirmed the issuance of self-issued tokens, and 0 otherwise, and $Failure_t$ is a binary variable that equals 1 for on or after the date of the FTX bankruptcy, and 0 for before the bankruptcy failure. X_{it} is a vector of exchange-specific time-varying controls, i.e., *Inside transaction (Bitcoin), Outside transaction (Bitcoin),* and *Exchange within Flow (Bitcoin),* that capture the operational activity and fee revenue of each exchange i at time t. In equation (1), we include time fixed effect v_t and exchange fixed effect u_i to control for unobserved exchange-invariant and time invariant effects. Lastly, ε_{it} denotes the idiosyncratic error term for exchange *i* at day *t*.

For H2a, which predicts that investor activism for transparency targeting the focal exchange will lead to more accountable governance, we employed survival analysis with the Cox hazard model to estimate eq (2). While OLS regression is easily interpretable, it is not immune to the data censoring issue inherent in PoR decisions, and our observation of exchanges' time-to-PoR may be right censored, especially towards the end of the study period. Moreover, given our focus on the time-to-event outcome of exchange PoR

implementation, we employed survival analysis using the Cox hazard model. Specifically, we used the Cox proportional hazard model to examine the effects of time-varying covariates (Zhang et al. 2018), such as Twitter counts that change over time. To empirically test H2a, we formulated the following eq (2):

$$\log harzard(accountability)_i(t) = \beta_{2a} \log (Investor\ activism\ focal_{it-1}) + \gamma X_{it} + \varepsilon_{it} \quad \text{Eq. (2),}$$

where $Investor\ activism\ focal_{it-1}$ refers to the level of exposure to activism directed towards a specific exchange i at time *t-1* by incorporating the total number of tweets related to exchange i's transparency, multiplied by the number of followers for each poster. In eq (2), we employed a lagged variable (t-1) for Twitter counts to address the possibilities of reverse and simultaneous causality. This Cox model was specified using the hazard of a PoR event occurring. Specifically, given that $harzard(accountability)_i(t)$ is the hazard ratio of exchange i at time t, $h_1(t)$ is the hazard rate for exchanges that adopted PoR, and $h_0(t)$ is the hazard rate for exchanges that did not adopt PoR at time t, the Cox model was used to estimate the hazard ratio, $HR = harzard(accountability)_i(t) = \frac{h_1(t)}{h_0(t)}$. The X_{it} vector represents exchange-specific time-varying controls, as previously defined. Lastly, ε_{it} denotes the idiosyncratic error term for exchange i at day t. Thus, β_{2a} in eq (2) is to test H2a, which shows the estimate for the treatment effect of exposure to investor activism directed at the focal exchange i on PoR decision of exchange i.

For H2b which predicts that investor activism for transparency targeting exchanges other than the focal exchange will lead to more accountable governance of the focal exchange, we also employed the Cox hazard model to estimate eq (3):

$$\log harzard(accountability)_i(t) = \beta_{2b} \log (Investor\ activism\ other\ than\ focal_{-it-1}) + \gamma X_{it} + \varepsilon_{it} \quad \text{Eq. (3)}$$

where $Inverstor\ activism\ other\ than\ focal_{-it-1}$ refers to the level of exposure to activism directed towards exchanges other than the focal exchange i at time *t-1*. In eq (3), the Cox model was also specified using the hazard of a PoR event occurring, but the independent variable is the exposure to investor activism on exchanges other than the focal exchange. Thus, β_{2b} in eq (3) is to test H2b, which shows the estimate for the treatment effect of exposure to investor activism for exchanges other than the focal exchange on PoR decision of the focal exchange.

Finally, in our mediation analysis, we estimate eq (4) to examine the mediating effect of investor activism. We also used the estimated coefficient β_1 in eq (1) to estimate the mediation effect.

$$\log harzard(accountability)_i(t) = \beta_0 Opaque_i * Failure_t + \beta_3 \log (Investor\ activism\ focal_{it-1}) + \gamma X_{it} + \varepsilon_{it} \quad \text{Eq. (4)}$$

To formally test the mediation hypothesis which examines the indirect path through investor activism for transparency(H3), we used a bootstrapping approach based on Preacher and Hayes (2008). To test it, we merged the datasets used for eq (1) and eq (2) and conducted panel OLS and time varying Cox model on the merged datasets to obtain the coefficient β_3. The coefficients of interest for mediation analysis are β_1 in eq (1) and β_3 in eq (4), and $\beta_1 \times \beta_3$ captures the mediation effect (or indirect effect) of $Investor\ activism\ focal$. We multiplied the two coefficients to obtain the final coefficient for the mediation path. To obtain a reliable estimate, we repeated this process 1,500 times to create bootstrap samples. We then calculated the standard errors of the resulting 1,500 coefficients to form a 95% confidence interval.

Results

Our empirical results are presented in Table 3. We can observe that the estimated coefficient of β_1 is 0.6297 ($p < 0.01$), indicating a positive interactive effect of opaque governance and disruptive governance failure on the exposure to investor activism for transparency directed at the focal exchange, supporting H1. Following the governance failure event, particularly the FTX bankruptcy, the effect of opaque exchange

governance on activism for transparency on Twitter became more pronounced, exhibiting an approximate daily increase of 62.97 % for exposure to activism tweets.

Regarding the impact of transparency demand tweets on accountability, while Models 1 (Eq. (2)) and 2 (Eq. (3)) include only the exposure to activism directed at the focal exchange and exposure to investor activism directed at exchanges other than the focal exchange, respectively as the independent variables Model 3 includes both variables. The estimated coefficient of β_{2a} is 0.1352 in Model 1 ($p < 0.05$) and 0.1241 in Model 3 ($p < 0.05$) indicating a positive effect of the exposure to transparency demand tweets directed at the focal exchange on PoR decision, supporting H2a. In economic terms, a 1 unit of log(tweets) increase, that is e(2.71)-fold increase in tweets, from the prior day resulted in about 1.144 fold increase ($e^{0.1352} \approx 1.144$) in the odds for PoR disclosure. However, since, the coefficients on exposure to investor activism for transparency directed at exchanges other than the focal exchange was insignificant in both models (-1.647 ($p > 0.1$) in Model 2 and -1.321 ($p > 0.1$) in Model 3), H2b was not supported.

As only H2a was supported, we test the mediating role of exposure to investor activism for transparency directed at the focal exchange. The mediation effect of exposure to investor activism for transparency directed at the focal exchange, $\beta_1{}^*\beta_3$, 0.0933, is statistically significant and positive ($p < 0.01$) from the bootstrap analysis. Thus, H3 is supported because the transformation of an exchange's governance from opaque to accountable is mediated by the exposure to investor activism for transparency on social media directed at the focal exchange.

To sum up, H1, H2a, and H3 were supported. By utilizing unique exchange-day-level panel data, we show that individual investors demand more transparency on social media for exchanges that have issued self-issued tokens, particularly after a major exchange bankruptcy. The strong social media demand for transparency from investors targeting specific exchanges mediates the path from opaque governance to accountable governance.

Equation 1: X*W → M			
M	**Investor Activism**		
$Opaque * Failure_{it}$	0.6297^{***} (0.1963)		
N	4,636		
Equations 2 and 3: M → Y			
Y	**Accountability**		
	Model 1	**Model 2**	**Model 3**
log ($Investor\ activism\ focal_{it-1}$)	0.1352^{**} (0.054)		0.1241^{**} (0.055)
log ($Investor\ activism\ other\ than\ focal_{-it-1}$)		-1.647 (1.018)	-1.321 (1.006)
Equation 1 and 4: Test for Mediation			
Indirect Effect	0.0933^{***} (0.0014)		
N	4,310		

Table 3. Estimation Results

Note: Point estimates represent the means of estimates across individual observation to replace across 1,500 bootstrap replications. Standard error is summarized as sample standard deviation divided by square root of sample size (1,500). p-value: * < 0.1, ** < 0.05, *** < 0.01

Discussion and Implications

Cryptocurrency and social media have had a love and hate relationship. The cryptocurrency market has relied on social media to gain awareness and to help it launch the digital currency by educating the market. In this regard, Facebook, Twitter, and Reddit have played key roles in bringing awareness to the cryptocurrency industry. However, the double-edged sword role of social media has also forced the industry to become more transparent as evidenced in our study. According to Pew Research Center, "86% of internet users have taken steps online to remove or mask their digital footprints — ranging from clearing cookies to encrypting their email, from avoiding using their name to using virtual networks that mask their internet protocol (IP) address" (Rojas 2018). Using cryptocurrency enables online anonymity and poses challenges accessing consumer online footprints, exacerbating the plague associated with the industry as being opaque. Thus, it is no surprise that the cryptocurrency industry has hidden behind the curtain and has been slow to disclose important information in the eyes of the public and in particular investors. It is under this context that our research provides theoretical and practical contributions to the literature. Theoretically, we shed novel light on the transformation from opaque to accountable governance amid a disruptive governance failure, that is, the FTX bankruptcy incident.

Our findings show that opaque governance of exchanges led to greater investor activism for transparency directed at the focal exchange in the wake of the FTX bankruptcy. This result is consistent with URT in that the disruptive governance failure acted as an inflection point by triggering investors to actively seek transparency on social media. Pouched within social movements in history from East to West, disruptive events are turning points that awaken the silent crowd and elicit voice for change. We also showed that while investor activism for transparency directed at the focal exchange resulted in accountable governance, investor activism for transparency directed at exchanges other than the focal exchange did not. This suggests that transparency needs to be targeted at a specific focal exchange to activate change in course of action and push institutions to stand on responsible ground. Broad brushed demands for transparency targeted at the industry seem to have limited impact on exchanges disclosing PoR. By integrating the two findings and consistent with the IPO framework, we illustrate that the path from opaque governance to accountable governance is mediated by investor activism for transparency targeted at the focal exchange. Therefore, our model explicates the underlying mechanism and the critical role of uncertainty reduction that transparency plays during the transformation process.

It is worth noting that our measure of investor activism for transparency directed at the focal exchange took into account the number of followers for each poster, which allowed us to capture the exposure of transparency of a focal exchange. This goes to show that not all tweets carry the same weight and that some (e.g., influencers) are more impactful than others. From a practical perspective, an industry that lacks a centralized regulatory body is vulnerable to unethical and opaque governance structures. When no single watchdog performs the role of oversight in an industry, our research shows the power of the masses through social media. Thus, our research is one of the first and few to show how targeted external pressure can make a difference in an industry moving towards decentralization and the public's role as a substitute for oversight.

Notwithstanding, this research is not without limitations, which provides opportunities for future research. First, investor activism for transparency was an external factor beyond the confines of a company that mobilized accountable governance. Future research can examine what internal forces can influence movement towards accountable governance, albeit acknowledging the challenge due to being part of a decentralized governance system. Second, the investors in our research were individual investors. Future research can explore what role, if any, institutional investors can play in the transformation process. Last but not least, future research will entail additional analyses beyond our current study, including conducting a qualitative analysis of transparency requests on Twitter through sentiment analysis using NLP. Fourth, in addition to the investor activism we've studied, it's worth thinking about the factors that can affect the accountable governance of exchanges. In order to consider other factors in the aggregate, we plan to add to our analysis in the future by constructing proxies that can capture media or public interest, such as google trend. These endeavors would yield a more nuanced understanding of the interplay between investor activism, governance practices, and transparency in the cryptocurrency industry.

Conclusion

Our study sheds light on the importance of transitioning from opaque to accountable governance within the cryptocurrency industry, particularly during disruptive governance failures and the key mediating role of investor activism for transparency directed at the focal exchange. By examining investor activism in advocating for transparency in social media, we emphasize the need for responsible and ethical governance practices to foster trust and credibility among stakeholders. These findings underscore the significance of promoting accountability and transparency in the rapidly evolving world of cryptocurrencies to ensure sustainable growth and maintain its attractiveness for investors and users. Especially, our research has revealed a self-correcting mechanism in the world of cryptocurrencies that has not been extensively studied before. We have presented initial empirical proof that the FTX bankruptcy event triggered shareholders to take collective action on social media, resulting in more transparent governance for the industry.

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