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Regulation, Corruption, and Decentralized Autonomous Organizations: Insights from Bitcoin Trading and Platform Founding Between 2011 and 2023

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Abstract. Decentralized autonomous organizations (DAOs) represent a novel organizational form enabling self-governed coordination based on blockchain technology. This study examines the prototypical Bitcoin DAO from an institutional perspective, focusing on how its core features—decentralization and autonomy—interact with the broader institutional framework in which it operates. Specifically, we study how regulative institutional environments (i.e., (il)legalization) shape the growth and development of DAOs while theorizing about the role of both petty and grand corruption (i.e., by higher-level officials) in influencing the effectiveness of these regulative institutions. Our empirical analysis focuses on the global rise of Bitcoin trading and platform establishment across 49 national contexts from 2011 to 2023. Utilizing a unique data set, we find that, although the number of Bitcoin exchange platforms in a country is positively associated with Bitcoin *legalization*, Bitcoin trading volume is positively associated with Bitcoin *illegalization*. In countries with higher levels of grand corruption, Bitcoin illegalization becomes even more strongly associated with trading. In contrast, grand corruption dampens the positive association between legalization and the number of Bitcoin exchange platforms. Further, the presence of petty corruption reduces the impact of grand corruption. Our study reveals that it is critical to distinguish between petty and grand corruption as an important factor that influences the interplay between the regulative environment and growth and development of the Bitcoin DAO and the related ecosystem of Bitcoin trading and platform founding.

Keywords: decentralized autonomous organizations (DAOs) • regulative institutional environment • institutional theory • bitcoin trading • platform founding • petty and grand corruption

Introduction

Decentralized autonomous organizations (DAOs) are defined as nonhierarchical, blockchain-based entities governed by self-executing rules on a secure public network, enabling stakeholders to coordinate, manage operations, and evolve the organization through voluntary contributions and decision making without central control (Hsieh et al. 2018, Hassan and de Filippi 2021, Jirásek 2023). In this sense, DAOs represent a new form of organizing in the digital landscape (Lumineau et al. 2021, Hsieh and Vergne 2023) as their governance operates in a decentralized manner, relying solely on automated rules that are autonomously stored and executed (Hsieh et al. 2018, Cardoso 2023). Because of these characteristics, DAOs have the potential to transform traditional forms of governance and collective organizations significantly (Lumineau et al. 2021, 2023; Hsieh and Vergne 2023). Although DAOs come in many forms, the cryptocurrency Bitcoin has been named frequently as the first established and prototypical DAO (Hsieh et al. 2018, Santana and Albareda 2022, Hsieh 2024).

To date, only a limited number of studies in organization and management research have explored DAOs in depth. Existing studies approach DAOs from three primary perspectives: first, unique governance structures that eliminate the need for a centralized authority to coordinate actions (Hsieh and Vergne 2023); second,

technology-driven decision making, such as smart contracts and token-based voting rights (Goldberg and Schär 2023); and third, how DAO governance diverges from traditional contractual and relational governance models (Lumineau et al. 2021).

Although these studies provide valuable insights into the internal governance mechanisms of DAOs, they largely overlook how the broader institutional environment influences the emergence and growth of DAOs. We address this gap by adopting an institutional perspective, examining how the Bitcoin DAO has evolved internationally in response to institutional factors, such as the regulative environment and corruption, that is, the degree to which public authority is used for personal benefit (Kaufmann et al. 2010, p. 4), across 49 different national contexts. We theorize about the interplay between the regulative environment and corruption and how this relationship significantly impacts the development of Bitcoin as the most prominent DAO.

Studying DAOs from an institutional perspective is important because, like other emerging industries and new organizational forms, DAOs face significant uncertainty (Aldrich and Fiol 1994, Sine et al. 2005, Lee et al. 2017, Hiatt and Carlos 2019). To mitigate against this uncertainty and better understand when and under what conditions new organizational forms such as DAOs emerge and thrive, institutional theory frequently highlights the role of regulative institutions, that is, laws and regulations that regulate market activities. These institutions influence the development and diffusion of new organizational forms, for instance, by reducing the uncertainty surrounding them (Dobbin and Dowd 1997, Sine et al. 2005, Tolbert et al. 2011, Gurses and Ozcan 2015, Weigelt and Shittu 2016). However, the decentralized and autonomous nature of DAOs may challenge existing institutional frameworks that primarily focus on centralized, conventional organizational forms. First, the decentralization inherent in DAOs calls into question the enforcement power of traditional regulatory institutions. As Bitcoin and other DAOs operate globally and outside the boundaries of state-controlled financial systems, the role of the national regulative institutional environment becomes less clear. Second, autonomy, particularly in combination with anonymity, may result in reduced accountability among DAO participants, potentially facilitating the evasion of regulatory oversight and authority. These factors make the impact of the regulatory environment on the development of DAOs less straightforward. On the one hand, legalization could promote the proliferation of centralized exchange platforms, which play a crucial role in the development of DAOs like Bitcoin as major entry points. As these platforms are conventional legal entities, their founders would benefit from the reduced regulatory uncertainty associated with legalization. On the other hand, it could be the illegalization that drives trading activity due to the "forbidden fruit"[1] effect (Brehm 1966). Individuals participating in DAOs like Bitcoin are furthermore often driven by morally contested motives, nonmainstream political orientations, and/or distrust of financial institutions (Faria 2022, Shapiro 2022, Littrell et al. 2024). With an increased level of anonymity, which reduces the risks of detection associated with engaging in illegal activities, illegality may therefore be associated with higher levels of trading.

In addition, previous work highlights the influence of corruption on the effectiveness of regulative institutional efforts (Klitgaard 1988, Duvanova 2014). Yet, it is still unknown how the regulative institutional environment affects DAOs under varying levels of corruption. This is particularly crucial because decentralization and autonomy may influence how corruption will impact the effectiveness of regulative efforts targeting DAOs, resulting in DAOs being differently affected by corruption. High levels of corruption make it more difficult to enforce regulations due to reduced oversight (Rose-Ackerman 1996, 2010; Mashali 2012). The decentralized nature of DAOs may further complicate the enforcement of regulations by dispersing governance of DAOs across a global network, obstructing regulators' efforts to exert control (Sun et al. 2022). Moreover, the autonomy of DAOs can allow participants to avoid identification, potentially shielding them from corrupt pressures. As a result, decentralization and autonomy may challenge the common perceptions regarding the role of institutional interventions in governing DAOs.

To conceptualize corruption, we follow recent research that highlights that corruption is constituted by two distinct mechanisms: grand and petty corruption (Argandoña 2005, Lambsdorff et al. 2005, Sartor and Beamish 2018). Petty corruption refers to "the everyday, street-level type of corruption that involves small payments, speed money and tips to people low in the hierarchy" (Lambsdorff et al. 2005, p. 5). This type is smaller in scale and has frequently been conceptualized at the individual level. In contrast, grand corruption is "the abuse of power in the political domain and the related fraud in laws and policies" (Lambsdorff et al. 2005, p. 6). This corruption form is related to the state and the extent to which politics and the ruling elite use their power and influence to design policies and activities that favor their interest. Research shows that corruption influences the emergence of organizational forms (Sartor and Beamish 2018), but the differential effects of grand and petty corruption are poorly understood, particularly when considering DAOs.

To test our theoretical assumptions, we investigate the rise and development of the Bitcoin DAO network

in 49 countries with unique national currencies, spanning 13 years from its early beginnings in 2011 through its development up to the end of 2023. To enrich our knowledge of the emergence and development of "the original DAO" (Chaudry 2021), we investigate Bitcoin trading (Aalborg et al. 2019, Jain et al. 2019, Bouraoui 2020) and the Bitcoin exchanges founding in each country that are key components of the Bitcoin network ecosystem (Wörner et al. 2016).

DAOs offer a unique governance model rooted in technological systems to facilitate decentralized decision making and coordination (Cardoso 2023). Examining them in the context of regulation and corruption allows us to contribute to the management literature in the following ways. First, we connect the organizational design literature on new forms of organizing (Puranam et al. 2014, Hinings et al. 2018, Karanović et al. 2021) and the emerging literature stream on DAOs in organizational science and adjacent fields (Cardoso 2023) by examining the impact of the regulative institutions in the context of DAOs. Second, we contribute to the literature on the country-level impacts of corruption (Sommer 2017, Crombach and Smits 2024) by examining how different forms of corruption (i.e., grand and petty) impact the emergence and rise of the Bitcoin DAO. Third, by focusing on the Bitcoin ecosystem from a broader perspective that includes Bitcoin exchange platform founding and Bitcoin trading volume, we shed further light on the development of a new phenomenon that is not well understood thus far but that has recently gained increasing attention in the overall economy (Poteriaieva 2024), as well as in the management literature (Hsieh et al. 2018, Vergne 2020). In studying Bitcoin regulations across countries, our study also provides some policy implications.

Research Context: Bitcoin DAO

DAOs function as decentralized networks that rely on open-source code and distributed nodes to autonomously enforce predefined rules and execute decisions without centralized oversight (Hsieh et al. 2018, Hassan and de Filippi 2021). Although their structures vary, DAOs typically utilize token-based voting mechanisms, enabling stakeholders to propose, deliberate, and implement changes in a peer-to-peer, democratic manner (Singh and Kim 2019). In this way, DAOs represent a new organizational form that allows "organizing the actions of a collectivity, usually of people" (Cardoso 2023, p. 3). Although traditional digital platforms such as open-access communities and open-source software still rely on central management, blockchain technology introduced a new form of decentralized management by using distributed ledgers and machine consensus to validate transactions, as seen in cryptocurrencies and smart contracts (de Filippi 2017).

According to Hsieh (2024), DAOs can be understood in two main categories. Layer 1 (L1) pertains to the core infrastructure forming the organizing principle supporting decentralization and autonomy. L2 and L3 form the second main category and are built on L1, regulating how applications interact with the infrastructure, as well as users to fulfill desired functions. Given the "concept of DAOs as a new form of organizing starts with L1 DAOs as a paradigm with early real-world manifestations" such as "Bitcoin as the first L1 DAO" (Hsieh 2024, pp. 1–2), Bitcoin is often referred to as the first, original, or prototypical DAO (Santana and Albareda 2022, Cardoso 2023).

Bitcoin first appeared in 2008, during the world financial crisis, which inspired "Satoshi Nakamoto" (a pseudonym) to create a new digital currency independent of institutions such as governments or central banks (Nakamoto 2008). It relies on a decentralized network to verify all transactions resulting in a global and immutable public ledger, that is, the blockchain (Weber 2016). Total Bitcoin circulation is limited to 21 million units, which are successively mined by performing complex calculations.[2] The value of Bitcoins and its capitalization has increased dramatically (Popper and Lee 2018) as steadily more people and institutions participate in it. As of October 2024, the market capitalization of Bitcoin (BTC) alone was estimated to be 1.34 trillion USD, which represented a dominant 54.92% of the overall cryptocurrency market with the BTC price resting at $67.69k[3] close to an all-time high. This development is further promoted by several actors that make up the crypto ecosystems, such as (1) specialized exchanges, (2) traders, (3) crypto-focused nonprofit institutions (e.g., lobbying); (4) blockchain start-ups; (5) crypto-asset custodians and wallet-related firms; and more recently, (6) traditional financial institutions and (7) institutional investors.

However, for Bitcoins to get traded, and for more participants to enter the DAO (which is crucial to the premise of decentralization), digital exchange platforms must be established that solve central coordination problems to facilitate a sufficiently stable market order (Beckert 2009). Individuals who intend to participate in such novel transactions often face high uncertainty due to challenges in building mutual trust as a foundation for cooperation and substantial supply and demand fluctuations (Belk 2014, Hartl et al. 2016). Whereas these conditions may inhibit orderly transactions between individuals, successful digital exchange platforms facilitate cryptocurrency trading (e.g., Coindance, Binance, Localbitcoin) and thereby offer a means to mitigate these issues (Ahrne et al. 2015, Kirchner and Schüßler 2019). Establishing such platforms, although difficult due to security and regulatory challenges, has been crucial to support the growth of the Bitcoin DAO (Arslanian 2022, p. 368).

Despite these developments, the Bitcoin DAO is highly contested because of its potential to disrupt entire monetary systems (Böhme et al. 2015). Moreover, because of the novelty of Blockchain technology, central financial institutions have difficulties in trying to regulate Bitcoin. The DAO and its surrounding market require creating a whole new set of financial rules and specific governance regulations. Up to now, varieties of regulative institutional initiatives and perspectives have emerged ranging from no regulation or a complete ban to the complete legalization of Bitcoin trading with various forms in between. For example, in March 2021, India announced plans to make Bitcoin trading illegal[4]—even though transaction volumes are swelling.[5] At the other end of the spectrum, some countries, such as the United States, Canada, Australia, England, Spain, Sweden, Finland, and Norway have formally legalized Bitcoin. In April 2017, the Japanese government was the first to recognize Bitcoin as a legal method of payment.[6] In September 2021, El Salvador became the first country to accept Bitcoin as legal tender, a decision that was undone in February 2025 due to pressures from the International Monetary Fund.[7] Several other countries, such as South Africa, Italy, and Poland, have no explicit rules or regulations on Bitcoin yet. This variance in reception remains and illustrates why Bariviera et al. (2017) concluded that "the legal perspective of Bitcoin is fuzzy" (p. 84).

Theoretical Background

Regulative Institutions and the Emergence of New Organizational Forms

Like the emergence of other novel forms of organizing (e.g., the platform-based sharing economy; Uzunca et al. 2018, Karanović et al. 2021), DAOs are plagued with great uncertainty because their technologies, products, and processes are "untested and incompletely understood" (Tushman and Anderson 1986, p. 444). Institutional research has frequently acknowledged the role of institutions for emergence and development of such novel organizational phenomena (Hannan and Freeman 1986, Aldrich and Fiol 1994, Hsu and Hannan 2005, Navis and Glynn 2010). Next to normative institutions (i.e., the extent to which a new organizational form is in line with the values and norms in the social environment) and cultural-cognitive institutions (i.e., the extent to which a new organizational form is understood by social actors because they fit into existing cognitive and cultural schemas), regulative institutions entail "rule setting, monitoring, and sanctioning activities" (Scott 2008, p. 52) conducted by powerful actors, such as the state or other regulative organizations. Rules and regulations can define what is (not) acceptable in each society. They regularize and constrain behavior and have a strong impact on the emergence of new forms of organizing. For example, work in this area has already shown how regulation impacts organizations in nascent sectors such as satellite radio (Navis and Glynn 2010), electric lightbulbs (Hargadon and Douglas 2001), and personal genomics (Gao and McDonald 2022). As Fligstein (1996, p. 661) notes, "Initial regulatory institutions shape the development of new markets because they produce cultural templates that affect how to organize." However, although DAOs share features of other new organizational forms in that they need regulative support to mitigate uncertainty, the unique features of DAOs, decentralization and autonomy, trigger new challenges from an institutional perspective.

Regulative Institutions, Corruption, and DAOs

Because of the blockchain network, DAOs allow a decentralized form of organization without traditional forms of control: for example, via a hierarchy. Because of the feature of autonomy, a DAO "acts autonomously and separately from its members and their wills and determinations" (Cardoso 2023, p. 4).[8] Both characteristics provide new challenges for regulative institutions. First, the enforcement power of traditional regulatory institutions is challenged by the decentralization inherent in DAOs. This is because most DAOs, such as Bitcoin, operate on a globally distributed infrastructure, comprising thousands of nodes worldwide (Park et al. 2019). This decentralized structure ensures redundancy, meaning that no single node is critical to the network's operation (Motlagh et al. 2020). Thus, even if some nodes are shut down or restricted by local authorities, the network remains functional and beyond the direct control of any single national regulation authority. Second, the autonomy of DAOs may facilitate regulatory evasion and reduce accountability among participants. Unlike conventional organizations, DAOs like Bitcoin lack centralized leadership or legally accountable representatives, and the absence of a clear chain of responsibility allows participants to remain pseudonymous (Nakamoto 2008). Although blockchain transactions are publicly traceable, participants can interact within DAOs while largely avoiding identification by national authorities (Möser 2013, Wang et al. 2017, Azhar and Whitehead 2021). This anonymity, coupled with the decentralized infrastructure, makes DAOs difficult and very costly for traditional regulatory frameworks to manage or control effectively (Reynolds and Irwin 2017).

Corruption has been shown to moderate the effect of regulative efforts (Klitgaard 1988, Duvanova 2014), and we think that DAO decentralization and autonomy will also influence this moderation. In environments with high levels of corruption, regulatory institutions often lack the strength to enforce compliance due to compromised or inconsistent oversight

(Rose-Ackerman 1996, 2010; Mashali 2012). Decentralization in DAOs amplifies this effect by distributing power across a global network, with no single control point for regulators to target (Sun et al. 2022). Without centralized structures, enforcement may become more challenging, and corrupt authorities may be less able to exercise influence or control over participants. At the same time, autonomy can allow participants to avoid identification, which might enable them to sidestep corrupt pressures more easily. Thus, the combined effects of decentralization and autonomy may further influence the impact of regulatory authorities in corrupt environments, ultimately reshaping the ways in which corruption moderates regulatory efforts.

Corruption, as a multifaceted construct, manifests itself in various forms that may influence different economic activities in distinct ways (Cuervo Cazurra 2008, 2016). For the scope of this study, we differentiate between grand and petty corruption (Argandoña 2005, Lambsdorff et al. 2005, Sartor and Beamish 2018). Grand corruption is often related to more infrequent and larger scale payments to political actors in high-level offices for abuse of power (Argandoña 2005, Lambsdorff et al. 2005). On the other hand, petty corruption involves individuals in lower-level offices, happens more frequently, and is smaller in scale (Sartor and Beamish 2018), and is often described as "the grease that makes the wheels of the bureaucratic machine turn more smoothly" (Argandoña 2005, p. 251). Sartor and Beamish (2018, p. 352) name four key characteristics that distinguish petty and grand corruption. First, payments related to grand corruption are more infrequent, involve larger monetary sums and are paid to higher-level government bureaucrats, whereas payments related to petty corruption are more frequent, involve smaller sums, and are paid to lower-level bureaucrats. Second, grand corruption is often restricted by national legislation, whereas petty corruption may not be clearly regulated. Third, and related, the degree of enforcement varies: antigrand corruption measures might be enforced more strongly than the antipetty corruption laws. Fourth, cultural norms and attitudes toward petty and grand corruption can also vary (Truex 2011). Although grand corruption is often perceived as clearly "wrong," petty corruption can be more tolerated—at least in some countries or contexts (Uslaner 2004). The distinction between grand and petty corruption is important for our study, given that we argue that these distinct forms of corruption may interact differently with the decentralization and autonomy characterizing the Bitcoin ecosystem. Consequently, their impact on the relationship between regulatory institutions and activities crucial to Bitcoin's development is also distinct.

Role of Exchange Platforms and Trading in the Development of the Bitcoin DAO

As previously outlined, a key characteristic of a DAO is decentralization. To achieve diffusion and higher levels of decentralization, a growing ownership community is crucial (Takagi 2017, Walden 2020, Santana and Albareda 2022). Participation in the Bitcoin DAO can be achieved in two main ways: First, individuals can obtain tokens by directly engaging in mining or by participating in group-based mining pools. This involves proof-of-work, the use of tremendous computing power (i.e., racks of high-performance graphics cards) to solve complex algorithms to validate transactions taking place on the blockchain in exchange for tokens (and with it, voting rights in the Bitcoin DAO). However, the exponentially increasing costs of acquiring the equipment and energy to engage in mining as well as the limited number of tokens available for mining in the Bitcoin system makes this form of entry into the DAO only available to select actors. Thus, second, the much more convenient option to gain ownership and enter DAOs is via exchange platforms. Exchange platforms offer tokens (cryptocurrency) to individuals in exchange for fiat currency. Trading a fiat currency into Bitcoin is the most convenient way to participate in this DAO and to hold an ownership stake in the Bitcoin network. In fact, trading into Bitcoin via local exchange platforms is crucial to ensure further growth of the global system (Walden 2020). Thus, studying trading volume on these exchange platforms can be considered a key mechanism to assess the emergence and growth of the DAO.

However, exchange platforms not only play an essential role in trading, but they also offer crucial infrastructure for monetization and economization (Caliskan 2020). Entrepreneurs found Bitcoin exchanges and provide the trading infrastructure in exchange for commissions on trades. Yet, it is important to keep in mind that the foundation of an exchange platform is in many ways a "classical" entrepreneurial act that involves entrepreneurs and the formation of a legal entity. Thus, most Bitcoin exchange platforms are established using conventional legal structures in their respective countries and are centrally governed by individual entrepreneurs or entrepreneurial teams.[9] Taken together, the development of Bitcoin builds, on the one hand, on the decentralized forms of management and governance that characterize blockchain technology and the related Bitcoin trading activity, but on the other hand, on the founding of platforms that is an entrepreneurial act that typically requires a traditional centralized governance mechanism. This implies that progressive decentralization and autonomy of DAOs such as Bitcoin have a (seemingly paradoxical) dependence on these rather centralized forms of organizations (Caliskan 2020), as well as on traditional forms of incorporation and the

related embeddedness in a particular regulative institutional environment. Further, although both these activities are crucial to the development of Bitcoin as a DAO, the regulations and institutions would likely influence them differently. This, in turn, justifies a careful analysis of their relationship with legalization/illegalization and corruption.

Hypotheses Development

Legalization and Platform Founding

Founding Bitcoin exchange platforms can be regarded as a potentially lucrative entrepreneurial activity as platform founders earn a fee on every transaction that takes place on their exchange (e.g., Coinbase in the United States takes around 0.1% of Bitcoin transaction volume[10]). However, as in most emerging markets, access to essential resources, such as financial and human capital, is crucial for the establishment and growth of new ventures (Honoré and Ganco 2023). Securing these resources in these markets is particularly complicated by regulatory uncertainty that is aggravated by the rules and regulations that do not exist or are highly underdeveloped (Hsu and Hannan 2005, Lee et al. 2017, Grandy and Hiatt 2020, Gao and McDonald 2022, Birkinshaw 2024).

Regulatory uncertainty has other negative consequences as well. Among others, it can discourage investors from entering new markets. For instance, Petkova et al. (2014) show that regulative uncertainty leads to hesitation among venture capital investors to invest in the emerging clean tech industry sector. Regulatory uncertainty may also hinder innovation, as companies might be reluctant to invest in research and development if they are uncertain about the future regulatory landscape (Kwon et al. 2024). It also implies low or unclear institutional legitimacy. Finally, companies operating under regulative uncertainty face a greater risk of inadvertently violating laws, leading to potential legal sanctions and liability. This argument applies to the emerging organizational form of DAOs, such as Bitcoin, where regulatory definitions and compliance requirements are either absent or still developing with significant variations across countries (Bariviera et al. 2017). Thus, if DAOs remain unregulated for a long time, this uncertainty may discourage entrepreneurs from founding an exchange platform.

Regulatory uncertainty permeating new organizational forms and industries can be resolved if governments classify an activity as illegal, conclusively discouraging platform founding or even making it impossible. Conversely, legalization could reduce regulatory uncertainty, lower barriers to entry, and decrease transaction costs (Park et al. 2024) including compliance costs. In fact, scholars have noted that regulations that constrain business practices limit entrepreneurship (Bartelsman et al. 2005, Klapper et al. 2006), whereas supportive institutions encourage it (Young et al. 2018). Legalization, often the result of a lengthy multistakeholder engagement and deliberation process (Zimmerman and Zeitz 2002), shows government support of a new industry and the associated organizational form creates clear accountability and makes compliance and taxation costs calculable.

Legalization would also aid in predicting technology trajectories (Parayil 2003) and facilitate access to capital, as investors may be less cautious and face reduced information asymmetry, given that entrepreneurs' actions are bound by the legal system. Acts of regulatory approval, such as financial incentives and certifications from legal authorities (Deeds et al. 2004, Sine et al. 2007), would signal commitment to the development of an emerging sector (Aldrich and Fiol 1994). Thus, we posit the following.

Hypothesis 1a. *Legalization is positively associated with platform founding.*

Legalization and Platform Founding: Moderating Role of Corruption

We argue that the impact of regulations may be affected by varying levels of corruption. In this context, we distinguish between grand and petty corruption, which may impact the effect of regulation on economic activities differently. Grand corruption, also described as wholesale corruption (Bussell 2015), involves the highest-level officers in a government organization or considerable scale. In settings where such corruption activity is possible, powerful actors such as large corporations, wealthy individuals, or people with high levels of political influence are capable of bending the rules for their benefit (Bailey and Thomas 2017, Blind et al. 2017, Stigler 2021). Because the rationale of regulatory action in grand corruption centers around creating benefits for a select group of society but not maximizing societal welfare, regulations under these circumstances may appear arbitrary to the observers (Rodriguez et al. 2005, Petrou 2015). This may decrease the reliability of regulatory acts such as legalization, and thereby aggravate regulatory uncertainty (Park et al. 2024). Particularly for entrepreneurs who are generally endowed with lower levels of resources and lack the influence to be active in these circles (Zhou and Peng 2012), the uncertainty associated with such erratic regulations would deter entrepreneurial action.

Moreover, grand corruption weakens societal accountability and may also have a direct impact on the legitimacy of legal systems (Larsson and Grimes 2023). Not only does grand corruption weaken the legal fiber of the system, but high-level officials are setting a bad example, promoting a rule-breaking culture that disregards societal welfare. In this case, other members of society including entrepreneurs

would become less likely to take the rules seriously and follow them if those at the top break them in serious ways and remain unpunished (Rose-Ackerman 2010). Therefore, we expect that the presence of grand corruption in each country will negatively moderate the effect of legalization on the founding of new Bitcoin trading platforms.

Hypothesis 1b. *Grand corruption negatively moderates the relationship between legalization on platform founding.*

Grand corruption may obscure the meaning and impact of Bitcoin legalization and thereby decrease the tendencies of entrepreneurs to found exchange platforms. However, although entrepreneurs are unlikely to possess the means to affect decisions by higher-level government officials (Zhou and Peng 2012), their influence and agency are likely to be much higher with lower-level officers. Also termed "retail corruption," petty corruption describes the degree to which such lower-level government agents deviate from the rules and regulations for their personal gain (Bussell 2015). The relational capital that entrepreneurs build with lower-level officials due to the enhanced network similarity and local embeddedness may help them to engage in "greasing the wheels" of their entrepreneurial activity (Krammer 2019, Nur-tegin and Jakee 2020, Istipliler et al. 2023). The existing literature highlights that bribes and payments to local officials can facilitate not only looking at the other way, but the provision of required permissions (Mashali 2012), which may be particularly important for organizations in contested markets, such as business licenses to operate an exchange.

Research also shows that pervasive corruption (e.g., high levels of corruption) may decrease the uncertainty of market actors, given that in this setting corruption is considered to be normal and an established means of "boundary spanning activities" (Cook et al. 1983, Rodriguez et al. 2005, Petrou and Thanos 2014). Hence, platform founders will be less concerned by the reputational risks of being associated with grand corruption. Similarly, bribery has been shown as a potential facilitator of new product introductions in emerging markets suffering from corruption and institutional voids (Krammer 2019). This implies that entrepreneurs know that petty corruption may facilitate the introduction of controversial innovations to such markets. For example, Uber faced widespread bribery allegations in Asia for good reason: The company forced itself into new markets through lawsuits, bribes, and influence tactics (Collier et al. 2018), putting the livelihoods of taxi drivers at risk and lobbying city officials for favorable regulation. Similar tactics were pursued by Airbnb that raised the costs of rent in major cities (Santolli 2016).

The reasoning above implies that petty corruption may result in an increased level of agency perceived by platform entrepreneurs when navigating through the obscure and arbitrary regulatory environment emerging from grand corruption. Therefore, we expect that petty corruption will weaken the negative effect of grand corruption on the relationship between legalization and exchange platform founding. Thus, we state the following.

Hypothesis 1c. *The negative moderating effect of grand corruption on the relationship between legalization and platform founding will be weakened by the presence of petty corruption.*

Illegalization and Bitcoin Trading

It has been frequently shown that when governments declare a market activity to be illegal, this results in a decrease in the respective activities in that market (Klapper et al. 2006). For instance, in the case of banned products or services (e.g., illegally watching movies, sharing of copyrighted material, etc.), consumers would decrease or halt their consumption due to their fear of potential sanctions (e.g., expropriation of coins, monetary fines or even jail time). These sanctions increase the transaction fees for the banned activity, decreasing its economic attractiveness. Yet, this view is based on the assumptions that the market is already established; that is, it is not atypical or contested and filled with actors aligned around prevalent social norms and economic rationale, and institutions are well developed with governments enforcing regulations through sanctions.

Yet, the Bitcoin DAO is neither established nor typical. From the onset, Bitcoin trading and the ecosystem of trading platforms that facilitate its trade have been highly controversial and contested (Dodd 2018). It is known that Bitcoin has been used to finance illegal or socially sanctioned activities such as drug dealing, weapons trade, or tax evasion (Foley et al. 2019). Further, there have been several notable scandals involving the downfall of trading platforms such as MtGox, which was once considered to be a legitimate and highly established market actor (Feder et al. 2017). By design, Bitcoin also grew into a heavily decentralized global system that took on an idiosyncratic self-organizing structure, making it highly difficult to control due to the absence of a central authority, its global nature, and the degree of anonymity it offers (i.e., a form of starfish organization; Brafman and Beckstrom 2006). Although only a handful of actors have permission to commit code changes to the Bitcoin DAO, their power and influence are minimal because change requests stem from globally dispersed members of the community who must vote on them; nobody can force the adoption of changes to the protocol.[11] This complex nature of the Bitcoin market has made regulation difficult, time-consuming, and costly even for governments

of wealthy industrialized countries (for a discussion, see Magnuson (2018)). The not only highly decentralized but anonymous nature of Bitcoin makes enforcement very challenging and, in some cases, almost impossible (Greenberg 2024). Technologies such as Bitcoin Fog have allowed criminals to even further reduce their traceability for illicit purposes (Möser 2013, Wang et al. 2017, Azhar and Whitehead 2021).

Moreover, the belief system motivating participation in Bitcoin also aligns less with prevalent societal norms. For example, when asked what motivates Bitcoin traders on the platform Localbitcoins, the cofounder replied "For sure the profit motive is one … (also) ideological motivations. Some people want to make cryptocurrencies more common and help people to get them." (I1, lines 9–10). He further stated that "a majority of them might be Bitcoin investors that might be doing a little bit of Bitcoin trading on the side. This situation is kind of common." (I1, lines 14–16). Regarding country-level differences in motivations he remarked that "One thing that was interesting in Tokio Meetups in Japan. Those people were quite Bitcoin fascinated (…) To me it is a totally original thing." (I1, lines 136–138)

Research also acknowledges that the belief system of individuals owning Bitcoins is shaped by a combination of ideologies, technological optimism, and sometimes distrust in financial institutions, as well as in traditional fiat currencies (Littrell et al. 2024). Many Bitcoin supporters are skeptical of central banks and fiat currencies due to concerns about inflation and the perceived mismanagement of monetary policy. In this sense, investing in Bitcoin is seen by some as a form of expropriation of the ruling class in favor of the ruled class and therefore ideologically driven (Golumbia 2015, Ferguson et al. 2024). This line of reasoning has also been enriched with ideas rooted in a need for chaos (i.e., anarchy) and nonmainstream political orientations (Dallyn 2017, Littrell et al. 2024). Such cynicism toward the established order implies that people holding such views will be likely to engage in behaviors outside of the bounds of the system or that undermine it (Vigna and Casey 2015). This can also be explained via the "forbidden fruit" effect, which refers to the psychological phenomenon where people are more attracted to things that are restricted, banned, or deemed off-limits by a greater authority (Brehm 1966). Researchers have found support for the forbidden fruit effect in various contexts including alcohol intake (Hankin et al. 1993), smoking (Sussman et al. 2010), and eating behaviors (Jansen et al. 2008). Research also highlights that aside from the human natural resistance to control or authority, curiosity acts as one of the drivers of desire toward what is forbidden (Loewenstein 1994). It is well known that a high drinking age of 21 encourages binge drinking among high school and college students below this age limit (Blocker 2006). Similarly, a prostitution ban has been shown to increase human trafficking (Lee and Persson 2022), and in many markets, the allure of a "high" through drugs is likely only strengthened if these products or services are banned, with the added effect of forcing proponents underground.

Furthermore, declaring a market activity to be illegal may have another unintended consequence. By taking an official stance on Bitcoin and declaring trading to be illegal, governments may signal that they take it seriously and not only draw attention but lend a degree of legitimacy to it. In case of Bitcoin, such an illegalization may reinforce the beliefs held by many market participants regarding its disruptive nature. Interpreting this as an indication of the traction of the decentralized and autonomous Bitcoin as an alternative to the existing financial order, they will be more likely to trade Bitcoin. Further, the low level of institutional development in the market for cryptocurrencies would also limit the likely degree of enforcement of illegalization. It has been speculated that some governments such as China ban Bitcoin trading for their local populations while holding considerable Bitcoin reserves themselves,[12] casting a shadow on the legitimacy of such regulations. Considering these arguments, we posit the following.

Hypothesis 2a. *Illegalization is positively associated with trading volume.*

Illegalization and Bitcoin Trading: Moderating Role of Corruption

Grand corruption has broad impact and scale, as its influence on higher-level government officials can lead to far-reaching policy implications that serve the interests of certain groups at the expense of others (Rose-Ackerman 2010). High grand corruption sends a signal that those at the top are not following the rules, reducing the trust in institutions, as well as the legitimacy of laws and regulations imposed by them (Uslaner 2004). This, in turn, may lead to an increase in antiestablishment and antielitist reactions often rooted in an "us versus them" divide (Hanley and Sikk 2016, Bazurli and Portos 2021). Under these conditions, not only the above-noted cynicism but also the desire toward Bitcoin as the forbidden fruit would drive further engagement in trading. Corruption would provide people with a justification not to follow the prohibitions in the first place and to show more reactance toward those who make the rules to restrain their freedom (Varava and Quick 2015). Research also shows that as a ban is interpreted more as a threat to freedom, resistance is intensified (Brehm 1966), which would likely be the case if such a ban is imposed by corrupt politicians. In line with these arguments, people who considered governments to be "not transparent, set

arbitrary rules that benefit themselves, and are corrupt and can't be trusted with an individual's money" were the early adopters of Bitcoin (Ferguson et al. 2024, p. 292). Even today some studies show that people who believe in theories about the state controlling everyone's lives or view federal reserves as corrupt mechanisms are more likely to hold Bitcoin in the United States (Golumbia 2015, Ferguson et al. 2024). Data from the Federal Reserve's Survey of Household Economic Decision Making in the United States (2023)[13] also shows that a lack of trust in banks was among the main reasons why people in the United States use cryptocurrencies.

Further, corruption at high levels can also be associated with questionable and intransparent practices of countries when it comes to following their own Bitcoin regulations. For instance, it has been reported that China (with at least tolerance of the government) is second only to the United States in the Bitcoin mining industry, representing about 21% of the market,[14] wheres this has been banned for the local population.[15] Such intransparent and arbitrary practices at the higher levels of the state organization may reverse the effects of a regulative activity and reinforce the beliefs that governments use regulations to control average citizens. Under these conditions, these individuals may rethink why they are not permitted to trade Bitcoins to earn additional rents (or combat inflation) if government officials are doing so, particularly if transactions are very difficult and costly to trace, when at all possible (Greenberg 2024). Therefore, we argue that grand corruption will positively impact the effect of illegalization on trading volume in a given country.

Hypothesis 2b. *Grand corruption positively moderates the relationship between illegalization and trading volume.*

Yet, although grand corruption would shape the impact of Bitcoin illegalization, we argue that petty corruption would also play an important moderating role. This is the case because petty corruption may influence traders' perceptions of regulations, as it may further decrease the likelihood of facing the consequences of their actions. In settings with high levels of petty corruption, officers and civil personnel responsible for enforcing regulations in key sectors, such as law enforcement, are more likely to seek personal gains at the expense of enforcing laws (Mashali 2012). This effect is especially aggravated in contexts of high grand corruption, where superiors in higher offices act in self-interest, reinforcing a culture of corruption also in lower offices (Rose-Ackerman 2010). This can amplify the perception of grand corruption, as high levels of corruption at both lower and higher levels of government may foster a pervasiveness and a perception of its omnipresence.

Research also shows that trust in the fairness of personnel involved in enforcing laws becomes far more critical when the legitimacy of the laws and regulations along with the people making them is questionable (Murphy et al. 2009, Jackson et al. 2014, Akinlabi and Murphy 2018). As articulated by a civil servant from Brazil—a country struggling with high levels of both forms of corruption— "impunity is a great incentive for those who in theory think that in fact, there will never be a consequence for an unlawful act" (Fernandes and Meyer 2018, p. 129). This lack of punishment and oversight would facilitate the establishment of grey, informal markets and peer-to-peer markets such as in China.[16] Accordingly, under conditions of high grand and petty corruption, the deterrent effect of illegalization of Bitcoin will be reduced for traders, increasing their likelihood to trade. Thus, we posit the following.

Hypothesis 2c. *The positive moderating effect of grand corruption on the relationship between illegalization and trading volume will be strengthened by the presence of petty corruption.*

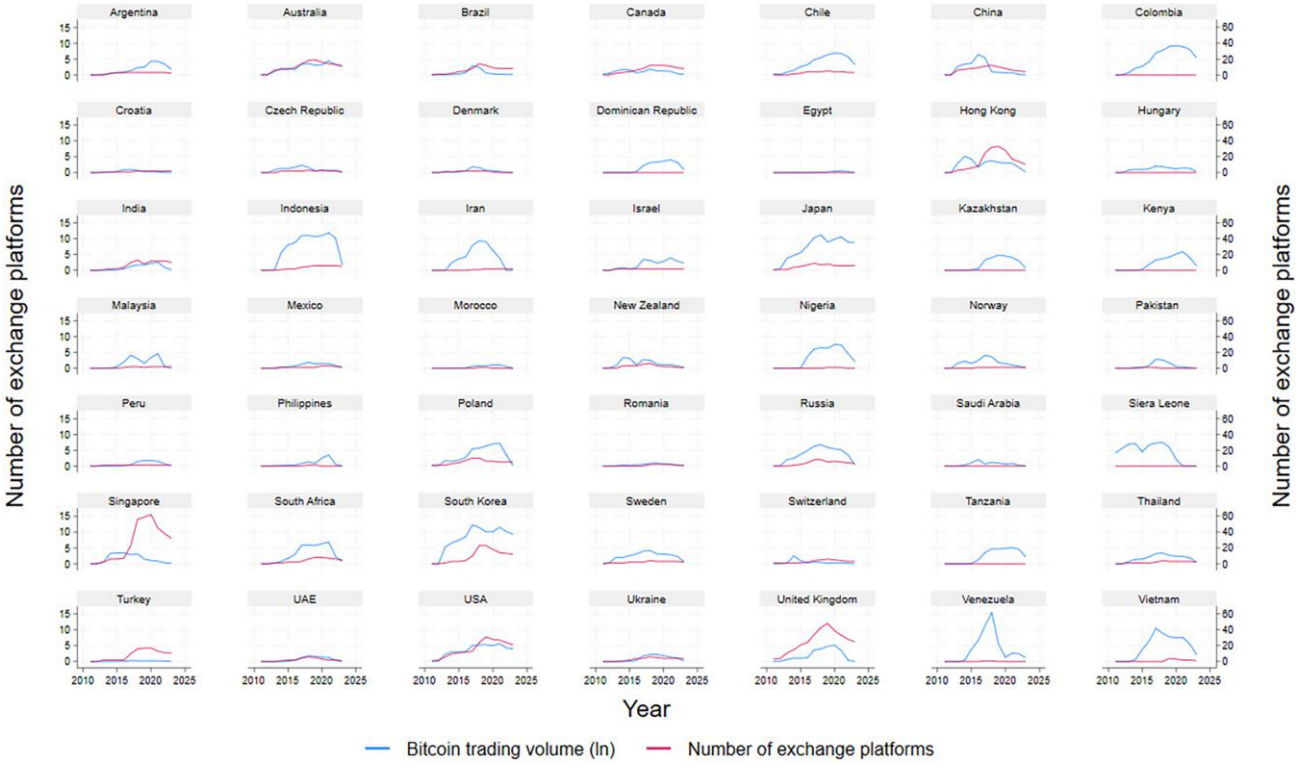
Sample, Data, and Methods

Data Collection and Sample

To test our hypotheses, we collected and compiled data from several sources. First, we collected yearly data on Bitcoin trading volume on the most popular Bitcoin trading platforms using the Bitcoincharts[17] archive, coin.dance, and bitcoinity.org.[18] These data were drawn for all the countries that have unique currencies and that are listed in this archive that covers 49[19] countries and covers the years 2011–2023 (see Figure 1 for the distribution of countries by regions). The most common way to trade Bitcoin is on an exchange platform that trades them against fiat currencies. In our study, the trading data come from the Bitcoin exchange trading platforms (e.g., Localbitcoins, MtGox,[20] or Ruxum), covering both developed and (often harder to observe) emerging countries.[21] All the listed platforms we obtained the data for adhere to know-your-customer (KYC) criteria, increasing the likelihood of the traders' country of residence matching the respective country where the exchange platform operates.[22] Second, we collected data on several Bitcoin exchange platforms based on the websites coinmarketcap.com and cryptowisser.de (as an additional comprehensive list and for cross-validation).

Because we aimed to explain how varieties in regulative legitimacy as well as petty and grand corruption affect Bitcoin activity over time, we also collected country-level data that we describe in detail below. To gain a deeper understanding of the data and mechanisms underlying the Bitcoin market, we also conducted several expert interviews.

Figure 1. (Color online) Bitcoin Trading Volume (ln) and Number of Exchange Platforms over Years by Country



Variables

Dependent Variables

Bitcoin Trading Volume. Our first dependent variable is the yearly Bitcoin *trading volume (ln)* in U.S. dollars. Trading volume reflects the purchases and sales of Bitcoins on a particular exchange platform within a 24-hour timespan (Jain et al. 2019, Bouraoui 2020, Marmora 2022). In line with prior Bitcoin research (Aalborg et al. 2019), the variable Bitcoin trading volume was created by summing the trading volume from the respective exchanges listed on the website bitcoincharts.com and supplemented by data from the webpages coin.dance as well as bitcoinity.org, two widely used community driven Bitcoin statistics providers. To account for variations in population density in different countries (Aparicio et al. 2021) and because a larger population might trigger more trading, we divided the Bitcoin trading volume by population size obtained from the World Bank. Because our dependent variable is nonnormal and skewed, we used the natural logarithm for this distribution.

Number of Exchange Platforms. Our second dependent variable denotes the number of Bitcoin exchange platforms in a particular country and year. Although Bitcoin operates as a DAO, the vast majority of Bitcoin transactions (i.e., 92.3%) still take place on centralized exchanges,[23] making these exchanges crucial for the development of the DAO. These platforms serve as the major entry points for users acquiring and trading Bitcoin, contributing significantly to the development and usage of the cryptocurrency. The proliferation of these platforms also indicates increasing entrepreneurial activity to capitalize on the growing interest and demand of audiences. Along similar lines, prior research also considers founding to be a well-established measure of new market development (e.g., studies on the U.S. brewing (Carroll and Wade 1991, Swaminathan 1998, Wade et al. 1998), newspapers (Delacroix and Carroll 1983), cooperative organizations (Staber 1989), and the global satellite radio market (Navis and Glynn 2010)). Accordingly, we compiled the platform data based on the websites coinmarketcap.com and cryptowisser.de. We then validated the information provided manually and matched it to the countries in our sample.

Independent Variables

Regulative Activity. To measure regulative activities, we collected information on the passage of country-level Bitcoin regulations from various sources and websites such as coin.dance, newspapers, and various press releases (e.g., Cryptocurrencies by Country[24]; Global Cryptoasset Regulatory Landscape Study[25]; Regulation of Cryptocurrency Around the World[26]; The Law Library of Congress, Global Legal Research Center[27]).[28] We used three categories to measure

regulative status. The variable is coded as zero when no clear regulation exists (i.e., *unregulated*), one when Bitcoin trading is legal (i.e., *legal*), and two when Bitcoin trading is *illegal* in a given country (see Appendix B). However, prior studies also show the complexity of the regulatory landscape, a spectrum that beyond the declaration of activities as legal or illegal clearly includes "unregulated" status. In fact, this regulatory pluralism is an important force that can shape markets (Lindley and Techera 2017) and that we also followed. Our approach in building these time variant variables is similar to that used in entrepreneurship research on the effect of bankruptcy laws across countries (Armour and Cumming 2008, Peng et al. 2010, Lee et al. 2011). Three of the authors independently coded the categories and obtained consistent results (with more than 97% agreement). For the remaining cases, the authors discussed the situation and reached consensus, for example, based on the timing of legal changes.

Corruption. Following prior research, we differentiated corruption into grand versus petty corruption (Argandoña 2005, Lambsdorff et al. 2005, Sartor and Beamish 2018). The Transparency International Corruption Perceptions Index (CPI) is one of the most often used databases to measure corruption (Judge et al. 2011, Bello y Villarino 2021). However, the CPI has the disadvantage of covering very different factors that are only partly related to corruption (Mungiu-Pippidi 2016, Bello y Villarino 2021), which makes this database difficult to use while studying grand and petty corruption. Lambsdorff et al. (2005) and Sartor and Beamish (2018) used the data from the World Competitive Report (WCR) to distinguish between grand and petty corruption.[29] However, unfortunately, these data are not available anymore for the years that we covered in our study.[30] In addition, the WCR did not continue to ask the questions (items) that have been used to measure petty and grand corruption in prior research (Sartor and Beamish 2018). Thus, we developed an alternative measure for petty and grand corruption based on data from the World Justice Project (WJP; Rules of Law).[31] The WJP Rule of Law Index calculates scores and rankings for 8 factors[32] and 44 subfactors. We ran a principal components analysis with a varimax rotation to identify different components. We applied the Kaiser criterion that suggests dropping the components with eigenvalues lower than one (Beavers et al. 2019). This procedure provided us with three components. However, the additional variance explanation of the third component was less than 5%, which resulted in a two-component solution. The associated constructs and items are presented in Appendix C. The Cronbach's alpha for petty corruption and grand corruption (0.97 for both) exceeded the recommended 0.7 minimum cutoff (Taber 2018). We reverse-coded the raw data so that greater grand corruption and petty corruption are indicated by higher scores.[33]

Control Variables. We use several country-level control variables. We control for *inflation* (measured by the consumer price index), given it may have a strong impact on financial activities in general and cryptocurrency activities in particular (Blau et al. 2021). We also include *total population* (log transformed to ensure normality) of each country, given that it may correlate with the regulative decisions and levels of corruption in the society (Lecuna 2012). Similarly, we also include *percentage of working population,* given that this reflects the portion of a country's population with higher discretion and agency to engage in trading and platform founding, as well as political activity such as voting. Further, technology affinity may affect the tendency to engage in trading (Müser et al. 2024). Thus, *percentage of Internet users* in each country's population is also included as a control variable. All these variables are obtained from the World Bank.[34]

We also included the variable *press freedom rank* to control for the level of press freedom in a particular country. This variable is operationalized by the world press freedom (WPF) index ranking (i.e., higher the number indicating the ranking, lower the level of press freedom) provided by the organization "Reporters without borders" and that is also available via the World Bank database. The WPF index reflects the amount of freedom available to journalists in 180 countries based on the combination of different data sources (such as a questionnaire devised targeted to journalists, media professionals, lawyers, and sociologists). We also controlled for the quality of democracy by including the *democracy score* provided by the *Economist Democracy Index*.[35] Both the existence of a free press and quality democracy may influence the political landscape and corruption but also affect the trading and founding activities by changing the reliability of market information and risk perceptions of individuals. Nevertheless, it is still important to control for these factors given that the existence of democracy or its instruments such as a free press are not sufficient factors to explain corruption (Rose-Ackerman 1996).

We also include the *number of Bitcoin ATMs* because this may indicate the normative support in a country (Tolbert and Zucker 1983), affecting trading and platform founding, as well as regulation activities. We hand-collected these data from coinradar.com and various press releases. In 2013, the world's first Bitcoin automated teller machine (ATM) was established in Vancouver, British Columbia, Canada, which allowed individuals to sell or purchase Bitcoin currency at a coffee shop. The continued existence or wider implementation of a practice suggests to an audience that it

is appropriate for a given context, thus legitimizing it (Tolbert and Zucker 1983). Similarly, the existence of associations may also indicate such support given industry associations (most often incorporated as nonprofits) are key drivers of new markets (Hiatt and Carlos 2019) and have been used in prior studies to measure normative legitimacy (Hiatt et al. 2009). Thus, we hand-collected data on whether a Bitcoin association was founded in a particular country each year using sources such as bitcoinfoundation.org for the United States or bitcoinassociation.ch for Switzerland.

We also control for *media attention* (Matta et al. 2015). Media attention is frequently used in management literature to assess the adoption of practices in cross-cultural settings (Schmidt et al. 2013, Rathert 2016), as well as within institutional theory to study legitimization processes (Pollock and Rindova 2003, Suddaby and Greenwood 2005, Kennedy 2008). We operationalized *media attention* as the number of Bitcoin articles that appeared per year in each newspaper in the Factiva database. To do so, we checked 49 countries' leading newspaper print media outlets from 2011 through 2023 using the Factiva (Dow Jones Reuters Business Interactive) database. We followed Schmidt et al. (2013) and selected leading print newspapers from each country for the analysis. We identified the leading newspapers based on a combination of three factors: (1) mentoring in prior research on media attention (Schmidt et al. 2013); (2) their relevance based on their circulation and reputation; and (3) their full-article availability in the Dow Jones Factiva database. Print newspapers were selected, rather than online outlets, because print newspaper articles allow a clearer country-level assignment of the articles than online outlets do (Schmidt et al. 2013). We searched for all articles that appeared in the Factiva database in the leading print newspapers that mentioned the keyword "Bitcoin*" in title and article (even when Bitcoin was not the main focus of the article). We counted the number of articles in a given year and a given newspaper (country).

We also controlled for *Google hits* to capture the online attention in Google Trends[36] by country and year as an indicator of public interest in Bitcoins. Google Trends captures the search interest of a particular term or phrase relative to the highest point on the chart for the given region and time (between 2011 and 2023). The values range from 100 to 0 and is relative to the time frame specified in the search query. A value of 100 describes the peak popularity for a particular term, a value of 50 represents that the term is half as popular, and a score of zero means the term was less than 1% as popular as the peak. Prior research acknowledges the importance of media coverage for the emergence of new industries (Sine et al. 2005). In particular, prior finance research, for example, has used Google Trends data to quantify new Internet phenomena (Kristoufek 2013, Cheah and Fry 2015, Marmora 2022). For example, Kristoufek (2013) found a strong positive correlation between Bitcoin prices and corresponding search terms. Moreover, a bidirectional link was found (i.e., not only do search queries influence prices but also vice versa). Following prior research (Kristoufek 2013, 2015), we obtained the search requests for the search term "bitcoin*."

Finally, *year indicators* are included in each model to control for the year specific fixed effects.

Model Specification. To test our hypotheses, we utilize two estimation methods: (1) fixed effects (FE) estimation with two-stage-least-squares (2SLS) and (2) dynamic panel data (DPD) estimation based on a system Generalized Method of Moments (GMM) approach (Arellano and Bover 1995, Blundell and Bond 1998).

FE Estimation with 2SLS. FE estimation is commonly used with panel data because it enables the elimination of time-invariant unobserved heterogeneity with the help of demeaning. Unlike other estimation methods, such as first differencing, which results in the loss of the initial time period, the demeaned estimator allows for the utilization of the entire sample period. However, although demeaning may tackle omitted variable bias concerns by neutralizing the effects of *time-invariant* heterogeneity, other *time-variant* factors can remain unaccounted for in the regressions. In our setting, these factors may affect Bitcoin trading and platform founding, as well as regulative activities in a country. This would indicate an endogenous relationship between our dependent variables (i.e., trading and platform founding) and the regulative activities, biasing our regression coefficients. Furthermore, reverse causality may also endanger our inferences. Namely, it might be the case that governments decide to regulate bitcoin based on increased trading or platform founding. Thus, to address the issues of omitted variable bias (due to time-variant heterogeneity) and reverse causality that may result in endogeneity, we utilized instrumentation through 2SLS estimation.

To apply the 2SLS estimation, instruments, that is, variables that are correlated with the variables of interest (i.e., relevant), yet not correlated with the regression error term (i.e., exogenous), are required. In our study, we relied on two variables to form such instruments. The first of these variables is the age of the finance minister of a given country. Finance ministers play a crucial role in shaping economic policies, including the regulation of emerging financial technologies like cryptocurrencies (Reiners 2020). The age of finance ministers may significantly influence their approach toward regulating cryptocurrencies, as younger ministers might be more open to innovation

and the integration of new technologies. Conversely, older finance ministers, who may have less familiarity with digital technologies, might approach regulation with greater caution, focusing on potential risks and preferring stricter controls to mitigate uncertainties. This generational gap can shape the policies they advocate, impacting future cryptocurrency regulation. Accordingly, countries with older finance ministers would be more likely to engage in regulation in general. Further, when there is a regulatory action taken by these actors, it is more likely to be illegalization. In line with these assumptions, we find a positive significant coefficient when we regress the age of the finance minister on the likelihood of regulatory activity ($\beta = 0.034$, $p < 0.001$). Furthermore, in these countries with a regulation, the likelihood of illegalization (legalization) seems to increase (decrease) with the age of the finance minister ($\beta = 0.028$, $p = 0.061$).

The second variable is formed as the mean levels of illegal and legal regulative activities per year in one of seven geographic regions following the World Bank taxonomy: East Asia Pacific, Europe and Central Asia, Latin America and Caribbean, Middle East and North Africa, North America, South Asia and sub-Saharan Africa (see Appendix A). We argue that the regional tendencies to regulate Bitcoin may affect the focal country governments, driving their decisions regarding this issue. In other words, if more countries in a given region and year regulate Bitcoin, the rest of the countries not regulating the cryptocurrency will likely feel more obliged to do so. Prior research shows the isomorphic tendencies demonstrated by countries when it comes to committing to or complying with certain monetary or fiscal regulations (Simmons 2000, Jones and Zeitz 2019) including the regulation of Bitcoin (Borri and Shakhnov 2020). On the other hand, prior studies also show (Lischke and Fabian 2016) that Bitcoin trading and adoption may be less bounded by regional proximity but rather correlated with institutional similarity, as well as other socio-economic factors. Unlike physical commodities, Bitcoin's borderless and digital nature enables global transactions, making financial and technological openness, along with infrastructure, stronger determinants of adoption than geographical proximity. Thus, differences in factors such as economic policies, Internet penetration, or cultural attitudes toward innovation may create varied trading patterns, even among neighboring countries (Lischke and Fabian 2016). These arguments further justify the use of the variable as an exogenous instrument for our instrumentation.

In addition to these variables, their interactions with other controls in our regressions are included in our models as instruments. Beyond increasing the number of instruments without any extra data, this approach also enables the instrumentation of our interaction variables under suspicion of endogeneity (Wooldridge 2015, Bun and Harrison 2019, Ebbes et al. 2022). To "economize on the number of instruments" (Bun and Harrison 2019, p. 822) and optimize the *F*-statistics for all eight endogenous variables we are willing to instrument, only certain interaction terms (as well as lower-order polynomials such as squared forms) were selected for the first-stage regressions (Sharma et al. 2020, Chevalier et al. 2013, Chung et al. 2023, Adomako et al. 2024). Finally, to make sure that our estimations are robust to potential weak instrumentation which can be an issue in smaller samples, we utilize the limited information maximum likelihood (LIML) estimator (Staiger and Stock 1997, Blomquist and Dahlberg 1999).

System GMM Estimation. In empirical investigations where the focus is on market development, dependent variables may depend on past realizations of themselves (Dang et al. 2015), and lagged values of the dependent variables should be included in the models to prevent omitted variable bias (Bond 2002). However, when lagged dependent variables are included in regressions, ordinary least squares estimators become biased because the lagged dependent variables are inherently correlated with the error term. To address this endogeneity issue, the lagged dependent variables should be instrumented. However, given the difficulty of finding strong instruments that are correlated with the lagged dependent variables, but not the dependent variable itself, special estimators for DPD modeling are required.

One of the most pervasive approaches to estimating DPD models is the *difference GMM* approach also known as Arellano-Bond estimation (Arellano and Bond 1991). In this method, the *lagged levels* of the exogenous regressors are used to instrument the lagged dependent variables. The difference GMM also handles unobserved heterogeneity via *first differencing* to ensure that the lagged values of exogenous regressors fulfil the orthogonality conditions so that they can be used in the instrumentation of the lagged dependent variables. This is relevant in the case of a "low T, high N" setting (i.e., data sets with few periods and many individuals) given in such settings *demeaning* (i.e., fixed effects estimator) may generate inconsistent estimates (Nickell 1981, Holtz-Eakin et al. 1988). Coined as "Nickell bias," this issue makes FE estimation and demeaning not suitable for DPD modelling (even when T is 10; Nickell 1981) despite its benefit of including all periods in the analysis.

In addition to the instrumentation of the lagged dependent variable, the difference GMM method also makes it possible to use the lagged values of exogenous regressors to instrument other endogenous variables (i.e., beyond the lagged dependent variable) in the equation. Furthermore, inclusion of excluded

(or external) instruments to improve the exogenous identification of such variables is also allowed. Later, Arellano and Bover (1995) and Blundell and Bond (1998) showed that the difference GMM approach can be improved if the *lagged differences* are also included in the vector of instruments (Baum 2013). This improved DPD estimation approach including not only the *lagged levels*, but also the *lagged differences* to instrument the differenced equation is commonly referred to as the *system GMM* approach or Blundell-Bover estimation and pose the second estimation method to test our hypotheses.

Results

Descriptive Results

Regarding Bitcoin trading volume, we observed great variation across countries. The highest trading on average occurred in Venezuela, Indonesia, Korea, Japan, and Vietnam. Countries with the lowest average trading volume include Denmark, Switzerland, Turkey, and Croatia. The number of exchange platforms similarly vary among countries. Singapore, United Kingdom, United States, and Hong Kong have more than 10 exchange platforms on average, whereas 20 countries report having 1 or less than 1 exchange platform on average over the 13 years. Figure 1 also illustrates the mean yearly Bitcoin trading volume and exchange platforms for all 49 countries over the sampling period. The figure shows that the trading volume increases overall but a slight decrease in recent years is evident. Further, the graphs also show that, although trading volume and number of exchange platforms seem to be correlated for some countries (e.g., the United States, United Kingdom, Australia), there is a strong discrepancy between trading and exchange platform founding activities in many countries (e.g., Vietnam, Venezuela, Nigeria).

Regarding the legal status of Bitcoin, 73 year-country observations (12%) in our sample have the status illegal and 249 observations (39%) have the status legal, whereas 315 observations (49%) are categorized as unregulated. Figure 2 shows the legal status of Bitcoin across countries over time. As depicted, Bitcoin was unregulated in all countries in our sample until 2013. After that, many developed countries, including Australia, Singapore, and Switzerland, moved early to legalize Bitcoin in 2013 and maintained this throughout the period considered. Yet, China moved in the opposite direction by illegalizing it and maintaining this status. Another trend can be observed in countries like the Czech Republic, Thailand, and Russia, which initially illegalized Bitcoin for several years before legalizing it. In contrast, a few countries, such as Morocco, Pakistan, and Nigeria, chose to ban Bitcoin later in 2017 and have remained firm in their decision. Finally, in a few countries such as Chile, Kazakhstan, and Saudi Arabia, Bitcoin became unregulated following some years of legalization, whereas only in Nigeria was such an unregulated status preceded by an illegal status.

Table 1 presents the descriptive statistics for the variables used in this study. The correlation matrix shows that in line with our expectations, press freedom rank and democracy score are strongly correlated with grand corruption ($r = 0.86$ and $r = -0.91$, respectively). However, the inclusion and exclusion of these variables leads to similar results for the remaining variables (see robustness tests). Given an investigation of variance inflation factors remains below the recommended threshold of 10, which indicates no serious concerns for multicollinearity (Neter et al. 1996), we decided to keep these variables.

Hypothesis Testing

Regression Estimation Results. Table 2 shows the results of the FE estimation with 2SLS instrumentation. In line with Papies et al. (2017), we went through *a three-step approach* to establish the appropriateness of 2SLS in our setting. All 2SLS diagnostics used through these steps along with the first-stage *F*-statistics are also summarized in Table 2.

In the first step, we rejected the null hypothesis of the Kleinbergen-Paap statistics for all our models, implying high support for the *relevance* of our instruments (Anderson 1951, Bascle 2008, Hayashi 2011). In addition, all first-stage *F*-statistics indicate the high predictive power of our instruments and exceed the critical values of Stock-Yogo *F*-tests for LIML estimation (Stock and Yogo 2005). In the second step, we investigated the *exogeneity* of our instruments. If more instruments are available than the variables instrumented in the models (as in our case), instrument exogeneity can be assessed using the Hansen *J* statistic (nonrejection implies exogeneity) (Bascle 2008). The Hansen *J* statistics failed to reject the null hypothesis in all our models, indicating no exogeneity concerns regarding our instruments.

Therefore, we continued with the third step that involves checking if the variables under the suspicion of endogeneity (i.e., illegal and legal regulation, as well as their interactions) are indeed endogenous justifying a 2SLS estimation. For this purpose, we utilized the GMM distance test in each of our models (Baum et al. 2007, Baum 2008). Rejection of this statistic would indicate that the suspected variables are indeed likely to be endogenous. In all of our models (except Model 4), GMM distance test results supported our endogeneity suspicions and therefore the use of 2SLS in the analyses. In four of the five models, the null hypotheses are clearly rejected at 95% confidence interval, whereas in one of the models (Model 5), it was only marginally not rejected ($p = 0.056$).

Figure 2. Legal Status of Bitcoin in Countries Through the Years

Note. Black indicates illegal status, dark gray indicates unregulated status, and light gray indicates legal status.

Hypothesis 1a posits that the legalization of Bitcoin in a country will be positively associated with the number of platforms in that country. The positively significant coefficient of legal (Table 2, Model 1, $\beta = 7.541$, $p = 0.003$) offers support for this hypothesis. This result suggests that the legalization of Bitcoin in a country is associated with about seven more platforms in that country on average. Model 2 tests Hypothesis 1b

Table 1. Descriptive Statistics and Correlation Table

No.	Variable	Mean	Standard deviation	Minimum	Maximum	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	*Number of exchange platforms*	3.826	7.635	0.000	62.000	1.000															
2	*Bitcoin trading volume (ln)*	2.175	2.737	0.000	15.552	0.187*	1.000														
3	*Illegal*	0.115	0.319	0.000	1.000	−0.068	0.120*	1.000													
4	*Legal*	0.391	0.488	0.000	1.000	0.430*	0.185*	−0.288*	1.000												
5	*Grand corruption*	39.988	17.435	5.800	83.008	−0.184*	−0.004	0.347*	−0.241*	1.000											
6	*Petty corruption*	44.603	17.643	9.649	80.803	−0.346*	0.006	0.148*	−0.335*	0.557*	1.000										
7	*Inflation (cr)*	1.602	1.159	−1.279	10.589	−0.111*	0.049	0.042	−0.017	0.384*	0.464*	1.000									
8	*Total population (in million)*	117.000	268.000	3.850	1,430.000	0.102*	0.000	0.286*	−0.094*	0.208*	0.149*	0.018	1.000								
9	*Working population rate*	66.013	5.434	51.984	85.678	0.184*	−0.057	0.032	0.089*	0.096*	−0.345*	−0.179*	0.048	1.000							
10	*Internet usage rate*	66.902	25.615	0.900	100.000	0.327*	0.100*	−0.081*	0.495*	−0.369*	−0.658*	−0.205*	−0.265*	0.432*	1.000						
11	*Press freedom rank*	92.240	54.761	1.000	179.000	−0.097*	0.002	0.316*	−0.246*	0.858*	0.518*	0.257*	0.316*	0.160*	−0.408*	1.000					
12	*Democracy score*	6.229	2.119	1.710	9.930	0.177*	0.008	−0.378*	0.267*	−0.907*	−0.486*	−0.336*	−0.157*	−0.108*	0.361*	−0.822*	1.000				
13	*Number of Bitcoin ATMs (ln)*	1.181	1.815	0.000	10.449	0.452*	0.174*	−0.124*	0.515*	−0.244*	−0.207*	−0.051	−0.060	0.051	0.435*	−0.237*	0.250*	1.000			
14	*Bitcoin association*	0.513	0.500	0.000	1.000	0.356*	0.274*	−0.064	0.516*	−0.225*	−0.127*	0.050	−0.035	−0.016	0.422*	−0.181*	0.269*	0.450*	1.000		
15	*Media attention (ln)*	1.444	1.675	0.000	6.950	0.521*	0.235*	0.100*	0.336*	−0.076	−0.184*	−0.137*	0.227*	0.132*	0.274*	0.010	0.114*	0.335*	0.347*	1.000	
16	*Google hits (ln)*	4.441	1.537	0.000	6.775	0.259*	0.329*	0.202*	0.413*	0.070	−0.004	0.124*	0.058	−0.006	0.386*	0.027	−0.023	0.376*	0.547*	0.424*	1.000

$^*p < 0.05$.

positing that grand corruption negatively moderates the relationship between legalization and platform founding. Here, the interaction term *legal* × *grand corruption* has a negatively significant coefficient ($\beta = -0.383$, $p < 0.001$). This implies that each 2.5-point increase in grand corruption decreases the positive effect of the legalization on the platform founding by approximately one platform. This finding also suggests that when grand corruption is approximately above 20 (which is the case for almost 80% of our year-country observations), the positive effect of legalization on the platform founding is offset. Hypothesis 1c posits that the grand corruption's negative moderation of the relationship between legalization and the number of platforms founded (i.e., Hypothesis 1b) will be negatively moderated by petty corruption so that as petty corruption increases, this effect will be weakened (i.e., become less negative). The positive and significant three-term interaction *legal* × *grand corruption* × *petty corruption* (Model 3, $\beta = 0.024$, $p = 0.004$) offers initial support for this conjecture. This effect implies that in a country where Bitcoin is legalized and the grand corruption score is average (i.e., ~40), each point of increase in petty corruption would weaken the negative effect of grand corruption by one exchange platform.

Hypothesis 2a posits that the illegalization of Bitcoin in a country is positively associated with trading volume in that country. The significantly negative coefficient of *illegal* (Model 4, $\beta = 1.383$, $p = 0.029$) offers support for our hypothesis. Given that our dependent variable is log-transformed, these results suggest that, in comparison with the unregulated case, the illegalization of Bitcoin is associated with a more than twofold (i.e., 130%) increase in trading volume per capita in a country. In other words, when all else is held equal, if only $100 is traded by an average person in a country where Bitcoin is unregulated, this amount increases to $230 under illegalization.

Hypothesis 2b suggests that this positive effect of illegalization on trading volume will become stronger as grand corruption in the country increases. Model 5 that tests and supports this conjecture includes the interaction term *illegal* × *grand*, which is significantly positive ($\beta = 0.303$, $p = 0.016$). Accordingly, in a country where Bitcoin is legalized, each point increase of the grand corruption score is associated with 30% more trading conducted by an average person, compared with the case where Bitcoin is unregulated. Finally, Hypothesis 2c posits that grand corruption's positive moderation of the relationship between illegalization and trading volume (i.e., Hypothesis 2b) will be positively moderated by petty corruption. The three-term interaction *illegal* × *grand* × *petty* is positively significant in Model 6 ($\beta = 0.008$, $p = 0.026$), offering support for our hypothesis. This effect implies that an average individual of a country where grand corruption

Table 2. Regression Models with Fixed Effects 2SLS Estimations

	Number of exchange platforms			Bitcoin trading volume (ln)		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Legal	7.541**	13.267**	37.836***	0.873	0.448	1.442*
	(2.550)	(4.271)	(10.240)	(0.771)	(0.921)	(0.646)
Illegal	−1.185	−4.217**	−3.454	1.383*	−16.371*	22.359*
	(1.530)	(1.435)	(2.550)	(0.634)	(7.450)	(9.859)
Grand corruption	−0.033	0.094	0.561	−0.027	−0.093*	0.107^{+}
	(0.060)	(0.070)	(0.348)	(0.021)	(0.037)	(0.062)
Petty corruption	0.069	0.066	0.638*	0.044	−0.012	0.199**
	(0.068)	(0.074)	(0.254)	(0.036)	(0.049)	(0.062)
Legal × grand corruption		−0.383***	−0.029			
		(0.096)	(0.408)			
Legal × petty corruption			−1.886***			
			(0.500)			
Grand × petty corruption			−0.013*			−0.003*
			(0.006)			(0.001)
Legal × grand corruption × petty corruption			0.024**			
			(0.008)			
Illegal × grand corruption					0.303*	−0.439**
					(0.126)	(0.168)
Illegal × petty corruption						−0.388^{+}
						(0.217)
Illegal × grand corruption x petty corruption						0.008*
						(0.004)
Number of exchange platforms				−0.011	−0.003	−0.019
				(0.013)	(0.015)	(0.013)
Bitcoin trading volume (ln)	−0.021	−0.170	0.433*			
	(0.110)	(0.138)	(0.211)			
Inflation (cr)	−0.704^{+}	0.083	−0.714	0.128	−0.041	0.120
	(0.379)	(0.356)	(0.690)	(0.121)	(0.157)	(0.121)
Total population (in millions)	0.000***	0.000***	0.000***	−0.000	−0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Working population rate	−0.585*	−1.184***	0.441	0.102	0.217*	0.111
	(0.238)	(0.263)	(0.639)	(0.077)	(0.101)	(0.080)
Internet usage rate	−0.062**	0.087*	0.020	0.023^{+}	−0.001	0.029*
	(0.024)	(0.043)	(0.063)	(0.012)	(0.016)	(0.013)
Press freedom rank	−0.011	0.004	−0.139**	0.012*	0.014^{+}	0.012*
	(0.016)	(0.019)	(0.044)	(0.006)	(0.007)	(0.006)
Democracy score	0.117	−1.152*	−0.643	0.536*	0.247	0.506*
	(0.557)	(0.561)	(1.142)	(0.237)	(0.268)	(0.233)
Number of Bitcoin ATMs (ln)	0.532*	0.504*	1.296***	0.135*	0.172*	0.102
	(0.219)	(0.224)	(0.372)	(0.064)	(0.078)	(0.066)
Bitcoin association	−0.758	0.329	−1.063	0.067	0.413	−0.139
	(0.677)	(0.604)	(1.030)	(0.239)	(0.283)	(0.256)
Media attention (ln)	0.715***	0.964***	0.289	0.089	0.106	0.100
	(0.217)	(0.241)	(0.396)	(0.072)	(0.086)	(0.072)
Google hits (ln)	0.251	0.142	−1.163^{+}	−0.187	−0.177	−0.154
	(0.290)	(0.291)	(0.622)	(0.134)	(0.153)	(0.145)
Year dummies	✓	✓	✓	✓	✓	✓
2SLS diagnostics						
Kleinbergen-Paap statistic *p*-value (rej. supports instrument relevance)	0.000	0.000	0.005	0.000	0.006	0.000
Hansen J statistic *p*-value (non-rej. supports instrument exogeneity)	0.290	0.414	0.802	0.721	0.601	0.402
GMM distance test *p*-value (rej. indicates endogeneity of suspected variables)	0.005	0.000	0.000	0.401	0.056	0.002
First-stage *F*-statistic						
Legal	20.022	23.021	25.125	22.624	20.428	18.352
Illegal	10.545	14.978	10.556	12.961	11.903	10.962
Legal × grand corruption		12.616	10.327			
Legal × petty corruption			12.487			
Legal × grand corruption × petty corruption			13.809			

Table 2. (Continued)

	Number of exchange platforms			Bitcoin trading volume (ln)		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Illegal × grand corruption					22.022	19.669
Illegal × petty corruption						16.009
Illegal × grand corruption × petty corruption						16.745
S-Y *F* test critical values (10% maximum LIML size)	3.31	4.18	3.42	4.18	3.97	3.31
F-test	9.668	10.478	3.913	17.541	13.575	15.070
Prob *F*	0.000	0.000	0.000	0.000	0.000	0.000
Observations	637	637	637	637	637	637
Number of countries	49	49	49	49	49	49

Note. Robust standard errors in parentheses.
$^{***}p < 0.001$; $^{**}p < 0.01$; $^{*}p < 0.05$; $^{+}p < 0.10$.

score is average (i.e., ~40) and Bitcoin is illegalized, each point of increase in petty corruption is associated with another 30% increase in the trading amount.

In addition to the FE and 2SLS models, we also used system GMM estimation to test our hypotheses. We used the *xtabond2* command in STATA 18 to run our models (Roodman 2009), and results of these estimations are reported in Table 3 along with relevant diagnostics. In line with suggestions (Roodman 2009, Baum 2013, Kripfganz 2019), we ensured that the Arellano-Bond AR(1) test for autocorrelation is rejected in every model, whereas the AR(2) test is not

Table 3. Regression Models with System GMM Estimations

	Number of exchange platforms			Bitcoin trading volume (ln)		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Legal	1.484*	8.714***	31.203*	0.521	−0.190	0.069
	(0.728)	(2.183)	(12.199)	(0.356)	(0.315)	(0.216)
Illegal	−0.446	−3.905*	−1.566	1.075*	−2.529*	27.042^{+}
	(0.832)	(1.965)	(2.311)	(0.525)	(1.191)	(15.028)
Grand corruption	−0.027	−0.028	0.162	−0.006	−0.010	0.069
	(0.055)	(0.063)	(0.296)	(0.027)	(0.027)	(0.096)
Petty corruption	−0.058	−0.157*	0.192	0.034	0.031	0.115*
	(0.054)	(0.078)	(0.216)	(0.036)	(0.040)	(0.054)
Legal × grand corruption		−0.200**	−0.917^{+}			
		(0.069)	(0.494)			
Legal × petty corruption			−1.046*			
			(0.433)			
Grand × petty corruption			−0.004			−0.002
			(0.005)			(0.002)
Legal × grand corruption × petty corruption			0.027*			
			(0.013)			
Illegal × grand corruption					0.062*	−0.474^{+}
					(0.028)	(0.247)
Illegal × petty corruption						−0.636*
						(0.323)
Illegal × grand corruption × petty corruption						0.011*
						(0.005)
Bitcoin trading volume (ln)	−0.117	−0.350	1.066*			
	(0.170)	(0.313)	(0.444)			
Bitcoin trading volume (ln) (L1)				0.870***	0.900***	0.907**
				(0.229)	(0.199)	(0.303)
Bitcoin trading volume (ln) (L2)				−0.426***	−0.413***	−0.390***
				(0.063)	(0.070)	(0.068)
Number of exchange platforms				0.025	−0.025	−0.024
				(0.017)	(0.026)	(0.022)
Number of exchange platforms (L1)	0.878***	0.686***	0.839***			
	(0.048)	(0.058)	(0.078)			

Table 3. (Continued)

	Number of exchange platforms			Bitcoin trading volume (ln)		
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Inflation (cr)	0.025	0.152	−0.036	0.113	0.103	0.083
	(0.111)	(0.200)	(0.215)	(0.094)	(0.101)	(0.107)
Total population (in millions)	−0.000^{+}	−0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Working population rate	0.573*	0.589*	0.306	0.145	0.108	0.100
	(0.273)	(0.274)	(0.335)	(0.113)	(0.096)	(0.132)
Internet usage rate	0.073**	0.077*	0.054	−0.023	−0.018	−0.025
	(0.024)	(0.033)	(0.037)	(0.015)	(0.015)	(0.021)
Press freedom rank	0.014	0.001	0.012	−0.013^{+}	−0.016^{+}	−0.017*
	(0.016)	(0.017)	(0.019)	(0.008)	(0.008)	(0.008)
Democracy score	0.089	0.108	1.460^{+}	−0.174	−0.121	0.156
	(0.319)	(0.459)	(0.792)	(0.281)	(0.262)	(0.381)
Number of Bitcoin ATMs (ln)	0.043	0.502^{+}	0.073	0.003	0.049	0.010
	(0.131)	(0.267)	(0.224)	(0.073)	(0.069)	(0.075)
Bitcoin association	0.125	−0.227	0.183	−0.085	−0.032	0.164
	(0.308)	(0.356)	(0.488)	(0.244)	(0.218)	(0.233)
Media attention (ln)	0.155^{+}	0.356**	0.158	−0.009	0.012	0.027
	(0.088)	(0.122)	(0.150)	(0.065)	(0.061)	(0.064)
Google hits (ln)	0.239	0.202	0.044	0.055	−0.060	−0.037
	(0.204)	(0.262)	(0.282)	(0.277)	(0.242)	(0.241)
Year dummies	✓	✓	✓	✓	✓	✓
System GMM diagnostics						
Arellano-Bond AR(1) test *p*-value	0.036	0.048	0.047	0.001	0.004	0.001
Arellano-Bond AR(2) test *p*-value	0.449	0.753	0.737	0.670	0.324	0.530
Hansen test	0.312	0.819	0.896	0.360	0.983	0.984
Number of instruments	58	62	63	59	63	58
Wald chi-squared statistic	3,544.42	2,962.78	1,167.92	1,191.91	1,595.98	1,658.82
p-value of chi-square	0.000	0.000	0.000	0.000	0.000	0.000
Observations	588	588	588	539	539	539
Number of countries	49	49	49	49	49	49

Note. Robust standard errors in parentheses.
***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; $^{+}p < 0.10$.

rejected, ensuring the feasibility of using second and higher lagged levels and differences of endogenous variables as instruments. This criterion also guided our modeling choice to include only the first lag of our first dependent variable (*number of exchange platforms*) as a control while including also the second lag of our second dependent variable (*bitcoin trading volume*). Finally, in all models, Hansen *J* statistics are clearly rejected, implying no concerns regarding the endogeneity of the instrument set used in our models. Given that the inferences remain the same throughout all models (see Appendix D), we do not go over all models in this table to save space for further analyses.

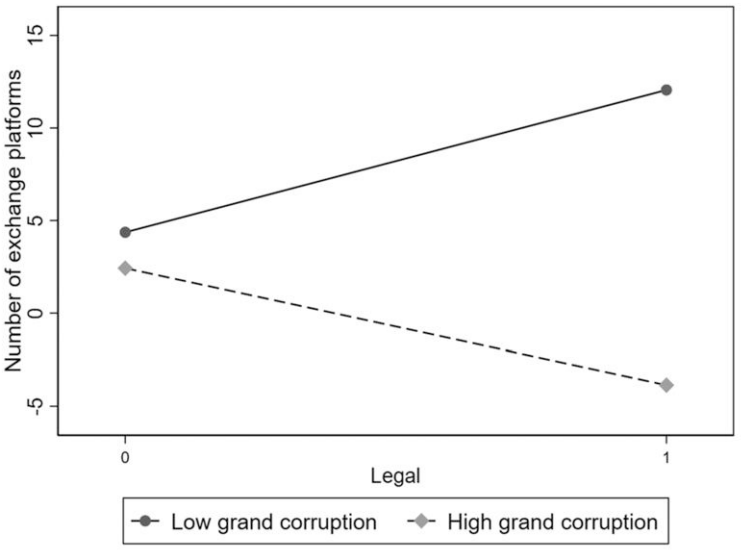
Interaction Plots, Simple Slope Tests, and Slope Difference Tests. An investigation of interaction plots, simple slopes, and slope differences is essential to fully understand and interpret a moderation effect (Dawson 2014). Particularly for three-way interactions, slope differences that result in a significant coefficient three-term coefficient may not be in line with hypothesized differences (Dawson and Richter 2006). Therefore, we present these analyses to further explain our results and corroborate our hypotheses (see Figures 3–6 along with the explanations presented as notes). In all our plots and analyses, all other covariates apart from the ones reported in the figures are treated at their means. Overall, we can conclude that the results of our slope and slope difference tests offer support for our arguments.

Robustness Checks

We conducted several robustness checks and additional analyses. First, we checked the robustness of our findings using alternative measures. Instead of using the Bitcoin trading volume (ln) in U.S. dollars adjusted for population size as the dependent variable, we used Bitcoin trading volume per country without any adjustments. Further, we checked if the transformations of other control variables significantly impacted our results and inferences. Moreover, we also ran our models by mean-centering the variables entering our interactions. Our findings remain robust for these alternations.

Second, we changed the specifications of our models by controlling for additional country-level factors that may potentially influence Bitcoin trading as well

Figure 3. Interaction Plot for *Legal* × *Grand* (Hypothesis 1b)

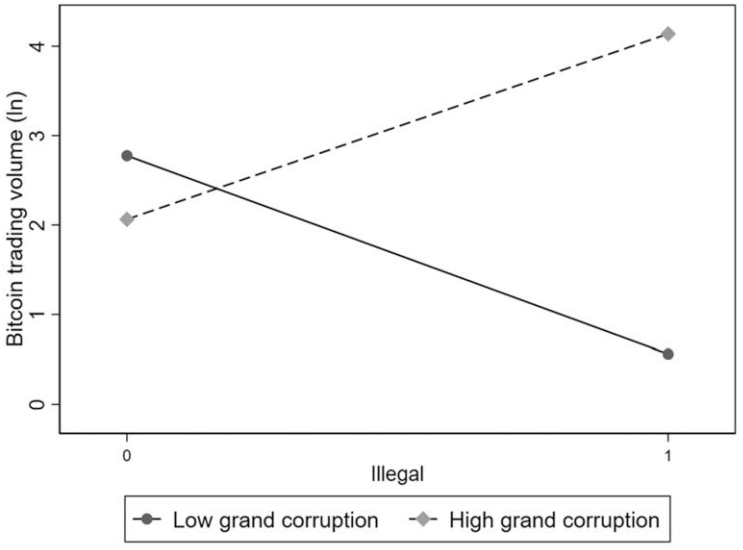


Simple slope tests

No	(at)	Slope	p-val.
I	Low grand corruption	7.688	0.000
II	High grand corruption	-6.290	0.064

Notes. Interaction plot for legal × grand (i.e., Hypothesis 1b) is presented. For low levels (i.e., mean minus two standard deviations) of grand corruption, the slope of the line depicting the relationship between legalization and number of exchange platforms is significantly positive ($p < 0.001$). This means that for low levels of grand corruption, the effect of legalization is indeed significant. For high levels of grand corruption (i.e., mean plus two standard deviations), however, the slope is negative in line with our expectations, although this finding is tentative ($p = 0.064$).

Figure 4. Interaction Plot for *Illegal* × *Grand* (Hypothesis 2b)

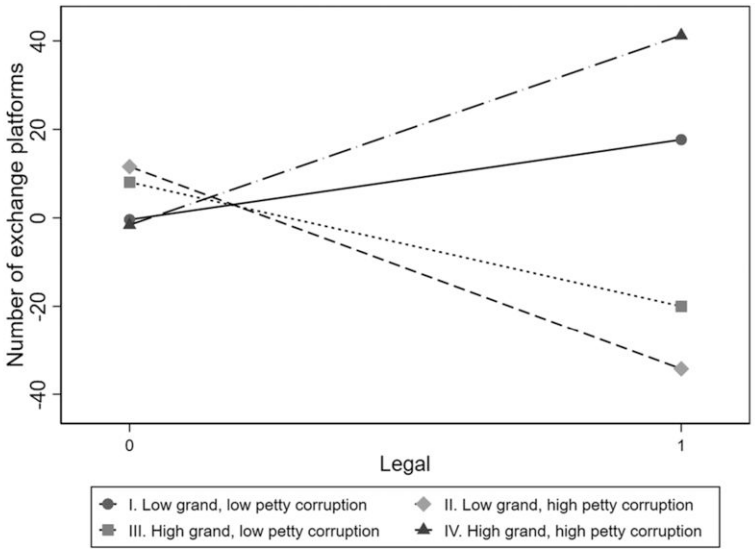


Simple slope tests

No	(at)	Slope	p-val.
I	Low grand corruption	2.075	0.069
II	High grand corruption	-2.214	0.038

Notes. Interaction plot for illegal × grand corruption (i.e., Hypothesis 2b). As the simple slope tests indicate, for high levels of grand corruption, the slope of the line depicting the relationship between illegalization and Bitcoin trading volume is positive ($p = 0.038$). For lower levels of grand corruption, it is negative ($p = 0.069$). This offers tentative support for our conjectures regarding the increased trading activity when illegalization is combined with corruption.

Figure 5. Interaction Plot for *Legal* × *Grand Corruption* × *Petty Corruption* (Hypothesis 1c)



Simple slope tests

No	(at)	Slope	p-val.
I	Low grand, low petty corruption	18.075	0.011
II	Low grand, high petty corruption	-45.826	0.025
III	High grand, low petty corruption	-28.066	0.219
IV	High grand, high petty corruption	42.834	0.090

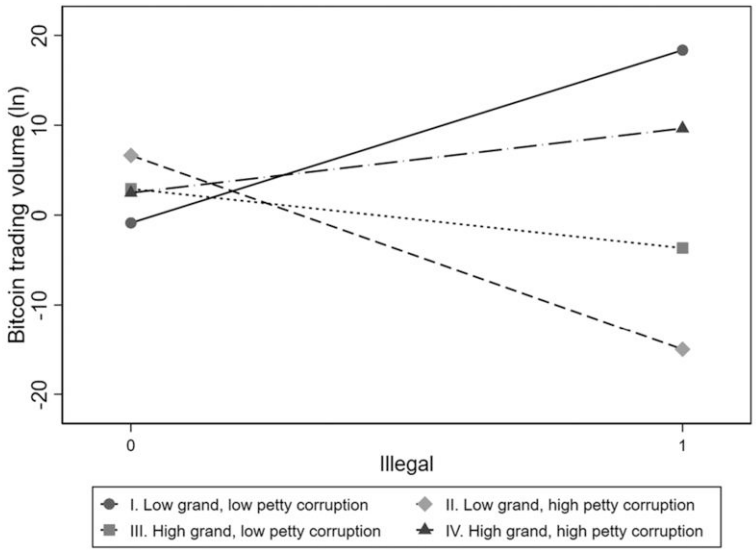
Slope difference Tests

No	(at)	Slope difference	p-val.
I - II	(low grand, low petty) - (low grand, high petty)	63.901	0.017
I - III	(low grand, low petty) - (high grand, low petty)	46.141	0.081
I - IV	(low grand, low petty) - (high grand, high petty)	-24.759	0.262
II - III	(low grand, high petty) - (high grand, low petty)	-17.759	0.484
II - IV	(low grand, high petty) - (high grand, high petty)	-88.660	0.033
III - IV	(high grand, low petty) - (high grand, high petty)	-70.901	0.129

Notes. Interaction plot for *legal* × *grand* × *petty* (i.e., Hypothesis 1c). The line depicting the case when both petty and grand corruption is low (i.e., line I) has a significantly ($p = 0.011$) positive slope as we expect. This implies that lack of corruption overall supports business activity. On the other hand, when petty corruption is low but grand corruption is high (i.e., line III), we register a negative but nonsignificant ($p = 0.219$) coefficient. The results of our slope difference test between lines I and III offer tentative support ($p = 0.081$) that these slopes are different from each other. This implies that when grand corruption is not accompanied by petty corruption, it is indeed less likely there will be more exchange platforms founded. This is in line with our arguments suggesting a "wheel greasing" role of petty corruption when grand corruption is high. The slope of the line depicting the low grand, high petty corruption case (i.e., line II) is significantly negative ($p = 0.025$). This highlights how the detrimental effect of petty corruption surfaces at the absence of grand corruption, when it is not offset by the "wheel greasing" role. On the other hand, the slope of high grand, high petty corruption case (i.e., line IV) is tentatively positive ($p = 0.090$). More importantly, the difference between lines II and IV is significant ($p = 0.033$), offering further support that petty corruption may be enabling in case of high grand corruption. Interestingly, the positive effect of legalization on number of platforms is not significantly different when both petty and grand corruption are low as well as when both are high ($p = 0.262$). This suggests that platform founders and operators may indeed benefit strongly from petty corruption when alleviating problems associated with grand corruption.

as by reducing our control vector. Because cryptocurrencies can be categorized either as currencies or as commodities (Wang and Vergne 2017), we also controlled this categorization on a country level. Regarding currency, this variable takes the value of one if a country declared Bitcoins as a currency and zero if otherwise. The commodity variable follows the same logic. In line with prior studies (Kwok and Tadesse 2006, Weber et al. 2009), we also controlled for the logged gross domestic product (GDP) per capita (at current international prices) as a measure of a country's wealth and availability of capital to control for the overall institutional quality of a country. Further, we also included the primary education enrolment in our models to control for the level of education which may affect the technological affinity. In addition, we ran our models as we excluded two variables (*press freedom and democracy score*) that show a high correlation with our variables of interest. We also ran our models with all our control variables lagged by one year. Results remain stable under all these conditions.

Figure 6. Interaction Plot for *Illegal* × *Grand Corruption* × *Petty Corruption* (Hypothesis 2c)



Simple slope tests

No	(at)	Slope	p-val.
I	Low grand, low petty corruption	19.225	0.083
II	Low grand, high petty corruption	-21.632	0.040
III	High grand, low petty corruption	-6.594	0.061
IV	High grand, high petty corruption	7.171	0.001

Slope difference Tests

No	(at)	Slope difference	p-val.
I - II	(low grand, low petty) - (low grand, high petty)	40.857	0.051
I - III	(low grand, low petty) - (high grand, low petty)	25.819	0.065
I - IV	(low grand, low petty) - (high grand, high petty)	12.054	0.206
II - III	(low grand, high petty) - (high grand, low petty)	-15.038	0.107
II - IV	(low grand, high petty) - (high grand, high petty)	-28.803	0.020
III - IV	(high grand, low petty) - (high grand, high petty)	-13.765	0.008

Notes. The second three-way interaction, *illegal* × *grand* × *petty* (i.e., Hypothesis 2c), is shown in Figure 6. Tentatively ($p = 0.083$) positive slope of line I suggests that the relationship between illegalization and bitcoin trading is strongest when both petty and grand corruption is low. This may imply that when corruption is absent, individuals engage in trading freely, resulting in an increase of the trading amount. However, in line with our expectations, when both types of corruption is high (i.e., line IV), illegalization is also significantly positively associated with trading ($p = 0.040$). Interestingly, the slope difference test between line I and line IV shows that strength of this relationship does not differ from each other. More interestingly, in case only grand corruption is high (i.e., line III) or only petty corruption is high (i.e., line II), illegalization seems to be negatively associated with trading ($p = 0.040$ and $p = 0.061$). In the former (i.e., high grand and low petty corruption), an increased likelihood of higher power to enforce regulations may scare away traders. In the latter case (i.e., low grand and high petty corruption), one may argue that politically driven Bitcoin traders may be less likely to engage in deviant behavior by trading. In addition, we also see that slope difference test for both lines depicting cases where the grand corruption is low (i.e., lines I and II) is positive and marginally significant ($p = 0.051$). This implies that petty corruption changes the illegalization-trading volume relationship at the low levels of grand corruption. This is similar when we look at the effect of petty corruption on illegalization-trading volume relationship at the high levels of grand corruption. Namely, slopes III and IV are significantly different from each other ($p = 0.008$).

Discussion

This study aimed to investigate the Bitcoin DAO from an institutional perspective with a particular focus on the regulative institutional environments (i.e., (il)legalization). We further explored the impact of both grand and petty corruption on the effectiveness of these regulations across 49 national contexts from 2011 to 2023. We argue that corruption is a crucial factor in this context, as it interacts with decentralization and autonomy—the distinctive features of DAOs like Bitcoin—and thereby influences the impact of regulations on both Bitcoin holders and exchange platform founders. In fact, the regulative institutional environment is a key component to explain the growth and development of new markets and organizational forms. To quote the cofounder of Localbitcoins (the only platform for Bitcoin trading in developing countries for many years) that we interviewed on July 4, 2018: "In this kind of businesses or industry (…) it is always about the regulation." (I1 transcript, line 41).

Our study offers three main contributions. First, we contribute to the organizational design literature on new forms of organizing (Puranam et al. 2014, Hinings et al. 2018, Karanović et al. 2021) with a particular focus on DAOs (Hsieh et al. 2018, Santana and Albareda 2022, Hsieh and Vergne 2023). By connecting to the work in organizational design research that questions the merits of regulation to limit participation in decentralized organizations (Dostov and Shust 2014, Seele 2018), our results provide new insights into how the key features of a DAO, autonomy and decentralization, result in differential outcomes when considering the role of regulations. Our results are in line with prior literature that highlights entrepreneurs' susceptibility toward regulatory uncertainty (Gao and McDonald 2022). We show that legalization is positively associated with the entrepreneurial act of establishment of exchange platforms because it reduces the uncertainty associated with founding businesses instrumental to the decentralization and growth of Bitcoin. However, our results also indicate that it is the illegalization of Bitcoin that is associated with an increase in trading activity. Besides the forbidden fruit effect and the divergent meaning that illegalization may bear for ideologically driven Bitcoin traders (Faria 2022, Shapiro 2022, Littrell et al. 2024), autonomy associated with the DAO may increase anonymity and reduce the risks of sanctions resulting from engaging in an illegal activity. This implies that the distinctive nature of decentralized networks as hybrid organizations at the intersection of markets and hierarchies (Takagi 2017) results in a bifurcation of the effects of regulation on the development of these unique entities. In this sense, our work builds on and expands the institutional literature on regulations and new market emergence (Navis and Glynn 2010, Gao and McDonald 2022), as well as the literature highlighting the conductive role of regulations (i.e., restrictions) for innovation and growth (Park et al. 2024) in the unique context of DAOs. Considered together, our findings highlight that regulative environment may animate different mechanisms (i.e., trading versus platform founding) in distinctive ways and thereby influence the development of the Bitcoin network and ecosystem.

Our second contribution relates to our theorization about the impact of corruption on the development of DAOs as novel forms of organizations. By considering two forms of corruption (petty and grand) also in interaction, we depart from existing management research that frequently considers corruption as a one-dimensional construct (Galang 2012). Instead, we theorize how these two forms of corruption jointly impact the relationship between regulation and the development of the Bitcoin DAO. Research frequently points to a strong consensus that corruption has negative consequences on business and economic growth (Shleifer and Vishny 1993, Mauro 1995). However, recent international business research indicates that markets and firms can prosper despite, or perhaps because of, corruption (Cuervo-Cazurra and Genc 2008, Peng et al. 2008). We explore this heterogeneous impact of the underlying mechanisms of corruption in greater detail by considering the regulative institutional environment. A common assumption in regulatory studies is that "regulators differ from market actors in that they are driven not by profit or efficiency logics but by concerns unique to their public-oriented mission" (Gao and McDonald 2022, p. 919). However, regulations can also be used by a limited group of actors in society to advance their own agendas (Bailey and Thomas 2017, Blind et al. 2017, Stigler 2021). Our investigation of grand corruption as an important factor that moderates the relationship between illegalization and Bitcoin trading supports this view, providing insights into how anonymous traders may perceive and interpret regulations under the presence of grand corruption. This is an important contribution for policy makers. In particular, DAOs anonymity may incline traders to trade Bitcoins although it is illegal to do so. In addition, our finding that grand corruption can reduce the uncertainty-relieving effect of Bitcoin legalization, particularly when it comes to establishing new exchange platforms, is also noteworthy. In such cases, grand corruption may signal a high level of arbitrariness in regulatory actions (Rodriguez et al. 2005), discouraging entrepreneurs from engaging in rent-seeking activities. Thus, although grand corruption may strengthen the role of regulations in fostering Bitcoin trading among anonymous participants, it may simultaneously weaken the positive effects of regulations on platform creation by entrepreneurs. This dual role of grand corruption—both facilitating and hindering Bitcoin's development indirectly—highlights a critical area of contribution.

Yet, both in the case of platform founding and trading, we observe that petty corruption plays a crucial indirect role as an enabler when it comes to its effects on the moderation of grand corruption. In the case of platform founding, we argued that petty corruption should alleviate the negative consequences of grand corruption faced by entrepreneurs. This is the case because petty corruption may be associated with less decisive regulatory enforcement or offer entrepreneurs new means to circumvent the challenges they face due to regulations. This is in fact in line with the literature stream focusing on how corruption may "grease the wheels of commerce," especially when institutional voids, that is, the absence or inadequacy of formal institutions, are present (Krammer 2019, Istipliler et al. 2023). Research also points out that the effect of grand corruption can be different than petty and encourages empirical investigations in different contexts because corruption "just may be the lesser of

two evils, the second being excessive government regulations" (Nur-tegin and Jakee 2020, p. 29). Our work investigating the Bitcoin network as the prototypical DAO at the nexus of corruption and regulation expands our knowledge of how these coherences may manifest themselves under the conditions of decentralization and anonymity.

Finally, our work also highlights the rather unconventional dynamics underlying the development of the Bitcoin phenomenon. Although prior research has frequently confirmed that reliable and stable market conditions facilitate the diffusion and adoption of innovations (Damanpour and Gopalakrishnan 1998), the results from our Bitcoin setting show that crises may lead to processes that ultimately strengthen the system beyond simple resilience. In fact, it has been already shown that cryptocurrency-related system-level shocks like the MtGox scandal led to significant short-term drops in Bitcoin trading volume (Feder et al. 2017). Yet, these events have also ultimately led to improved security practices (e.g., multisignature wallets), further decentralization, and ultimately to iterations of Bitcoin Core code. The more recent collapse of the Futures Exchange (FTX) exchange, for instance, had reputational spillover effects on other newer and less established cryptocurrencies (Yousaf and Goodell 2023). However, this has paradoxically renewed interest in the more established "tried and true" Bitcoin that has experienced yet another trading resurgence. The collapse of even major exchanges seems not to stop the system but leads to organizational adaptations that increase stability and security, much like antibiotics that can lead bacteria to evolve and become stronger. Our results concerning the conducive effect of illegalization and corruption on the trading volume also highlight this not only resilient but also antifragile (i.e., one that is not merely shock resistant but benefits from disorder; Taleb 2014) nature of Bitcoin as a DAO. This could present an interesting area to extend research on success factors in the design of decentralized organizations, particularly concerning radical decentralization and self-managing organizations (Lee and Edmondson 2017, Reitzig 2022).

Further, our work highlights another interesting relationship crucial to the development of Bitcoin as the prototypical DAO: its dependence on the centralized organizational forms for its establishment and widespread diffusion. Growing community ownership was crucial to achieving sufficient decentralization of Bitcoin (Walden 2020), fulfilling its promise of decentralized and autonomous governance of economic activities (Takagi 2017, Santana and Albareda 2022). Given that exchange platforms offer crucial infrastructure for monetization and economization, they have played an essential role in the growth and traction of Bitcoin (Caliskan 2020). Yet, interestingly, the vast majority of exchange platforms contributing to the development of the most prominent decentralized and autonomous organization are still centralized and owned by known individuals, functioning as conventional legal entities prevalent in their respective countries.[37] Although decentralized exchange platforms do exist and their prevalence is slowly increasing, the trading volumes on these are still very small and have been negligible over the last decade (Han et al. 2023, Shah et al. 2023). This implies that, paradoxically, the progressive decentralization of Bitcoin was dependent on these rather centralized forms of organization. Hence, our investigation of the development of Bitcoin by focusing on the decentralized activity of trading and the centralized infrastructure enabling this form of participation paves a path forward to understanding the centralization-decentralization tensions and discussions permeating the DAO landscape (Hsieh et al. 2018, Dylan-Ennis and Kavanagh 2024). Further, although exchange platforms have been crucial for the emergence and growth of Bitcoin, the dominantly centralized nature of these organizations may also undermine its *raison d'être*. This may also explain the increasing tendency of participants toward shifting their trading activities to decentralized exchange platforms (Hägele 2024).

Limitations and Future Research

Our study is not free of limitations, which provide areas for future research. For instance, our sample considers only those 49 countries with unique currencies, because this allows us to separate trading activity by country with our compiled data set that makes use of publicly available data. It is also possible to apply alternative empirical approaches to access Bitcoin data. For example, an alternative approach could be to disentangle all transactions directly on the blockchain by IP address range, yet this would be a highly costly and complex endeavor and out-of-scope for most researchers, at least with the current technologies available. Such an approach would also enable us to observe and investigate the different levels of concentration in different countries across time. Although statistics show that the total number of users registered on exchange platforms constantly increases,[38] our current approach does not allow investigating if trading activities in countries are concentrated with fewer larger players or reflect many transactions conducted by smaller players. Similarly, because of our current approach, we also cannot entirely rule out the possibility that some users might access exchange platforms from foreign countries to engage in trading, via using solutions such as virtual private networks (VPNs). Yet, engaging in trading this way would entail

significant difficulties and inconveniences. For instance, trading in a nonlocal currency would result in unnecessary transaction costs (e.g., currency conversion) that traders seek to avoid. Further, secure and reliable VPN services are premium services, increasing the costs associated with trading. Moreover, these solutions may simply not be reliably available because some countries (such as Russia, China, or Turkey) heavily restrict VPN usage for their citizens.[39] Even where these services are available to users, it is known that, because of KYC (know-your-customer) and AML (antimoney laundering laws) requirements, exchanges are incentivized to implement geo-blocking to prevent using exchanges via VPN to avoid the legal consequences. Although it is not uncommon that certain users breach these, platforms are reported to respond with even stronger measures and prevention mechanisms such as "stricter KYC checks and IP restrictions, to ensure their services comply with local regulations."[40] Although we think that these factors suggest that our results would not be significantly affected by this limitation, we still acknowledge that the lack of reliable data to assess the use of VPN services in Bitcoin trading limits our ability to strictly rule out the effect of these services on our results.

Further, our study does not directly capture country-level differences in the enforcement of Bitcoin bans, despite our models including various factors that may predict a portion of this variance. Therefore, we encourage future researchers to investigate not only the existence of these laws but also the level of commitment by nations to enforce them, as this could further enhance our understanding. Moreover, we also acknowledge that regulations can differ in their scope and effect on Bitcoin trading. For example, regulations and prohibitions concerning initial coin offerings (ICOs) have become more prominent recently (see South Korea[41] or France[42]). Although ICO regulations remain outside of the purview of this study as these do not directly regulate Bitcoin trading, studying these regulations and their less immediate impacts can also yield interesting insights (Okorie and Lin 2020).

Our data acquisition approach is also agnostic toward the over-the-counter (OTC) trading volume. The Bitcoin OTC market refers to high-net-worth individuals or institutions willing to buy or sell BTC directly without intermediation by any exchange. Because of the private nature of these transactions, "the OTC trading that happens around the world represents hidden data and factors."[43] Yet, although it is not possible to quantify or directly account for them in our analysis, surges in OTC activities similar to the one observed in early 2025 may still impact the pricing and the transactions taking place in exchanges. However, OTC balances remain comparably small, as reports indicate that such surges result in exhaustion of these balances and are followed by "a shift toward exchange-based trading, potentially driving long-term growth" of the platforms.[44]

Another limitation is related to our research design. Despite our efforts to alleviate endogeneity concerns using instrumentation and lagged controls, we still cannot completely rule these out given that our research design does not enable exogenous manipulations of our variables of interest to investigate causal effects. Particularly, although we provide theoretical arguments and empirical support through diagnostics, we cannot entirely rule out the endogeneity issues about our instruments. For instance, in some countries, geographical proximity to nations with high trading volumes may create short-term spillover effects. It is also worth noting that corrupt politicians may legalize industries to benefit themselves or their networks, or vice-versa: Legalization of a contested industry can lead to further corruption, as a recent case of cannabis legalization in California shows.[45] Further, our assumption concerning the age of finance ministers and their tendency to be progressive toward new instruments and technologies may be questionable in various contexts. Therefore, we advise the readers to carefully interpret our results, particularly regarding the potential causal mechanisms. Future research may utilize multifactor experimental designs where the corruption and regulation variables are randomly manipulated. The use of vignettes to explain what trading and platform founding decisions may entail for individuals could be helpful in eliciting desired behavior in a laboratory setting.

Although our focus on the trading volume and exchange platforms is well justified by their implications for studying the impact of the institutional landscape on the development of DAOs, it still poses a limitation given that there may be other metrics which may be relevant to such an analysis. In this relation, we acknowledge that despite the past and current dominance of centralized exchange platforms, the prevalence of decentralized exchanges is gradually increasing. Along with the constant decentralization impetus, security risks associated with centralized structures (as these may constitute a single-point of failure) seem to be the driving force behind this development. Therefore, we advise future researchers to carefully track developments in this landscape and consider including these exchange platforms in their analyses. In addition, mining may also be an important factor to investigate to better understand the development of Bitcoin. However, studying miners could be complex and entail potential pitfalls. First, to our knowledge, there is no reliable data on bitcoin mining at the country level for our time period; data from the

Cambridge Centre for Alternative Finance on mining costs thus far only span October 2019 through January 2022.[46] Second, mining activities are highly dependent on other factors such as electricity prices in the respective countries. In fact, an investigation conducted in March 2022 shows that "with skyrocketing energy requirements, the cost to mine 1 Bitcoin can differ by $200,000 depending on where you are in the world": It may be as high as 245,000 USD in Venezuela, compared with only 16,000 USD in Russia.[47] Studies also showed that the development in the price of Bitcoin made mining Bitcoins as commodities a loss-generating economic activity, which "explains why many Western miners have dropped out of the circuit, further increasing the centralization of mining activity in China" (Delgado-Mohatar et al. 2019, p. 1). Third, one of our key informants stated that "the mining part of the [crypto] economy is very small" (I1, lines 77–81). We also think that recent discussions revolving around the carbon footprint generated by Bitcoin (Foteinis 2018, Stoll et al. 2019, Sarkodie et al. 2023) offer a crucial area of investigation to assess the externalities associated with the development of these novel forms of organizing.

Another limitation of our study pertains to the unique context it focuses on. Being the first working prototype for the blockchain-based "Level 1" DAOs (Hsieh 2024) makes Bitcoin a highly special phenomenon rich with idiosyncrasies. Thus, it is possible that mechanisms and implications of our arguments in this study may not fully apply to other L1 DAOs, particularly those introduced more recently. For instance, holding more recent L1 DAOs such as Ethereum may be driven by other less ideological motives given that the Ethereum network developed to be the one of the major platforms L2 and L3 DAOs utilize to offer services with the help of smart contracts. Further, the DAO landscape and technology are now more established with higher legitimacy and reduced uncertainty. The relationships we demonstrate for Bitcoin in the past may not be representative of its future development, as well as what will happen to other L1 DAOs that follow it.

Conclusion

In conclusion, this study underscores the intricate relationship between the institutional environment and the development of DAOs, exemplified by Bitcoin. Our findings suggest that regulatory activities, such as legalization or illegalization, significantly influence Bitcoin's expansion—through trading volume and the number of exchange platforms—depending on national contexts. Importantly, we demonstrate that both grand and petty corruption play a moderating role, amplifying or dampening the effects of these regulatory environments. Together, these insights highlight how the nuanced interplay of regulative frameworks and corruption shapes the trajectory of DAOs, offering essential considerations for policymakers, particularly as blockchain-based organizations continue to develop within diverse and dynamic institutional landscapes.

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Appendix A. Distribution of Countries Across Regions

Region	Countries included	Frequency	Percent	Cumulative
East Asia and Pacific	Australia, China, Hong Kong, Indonesia, Japan, South Korea, Malaysia, New Zealand, Philippines, Singapore, Thailand, Vietnam	156	24.49	24.49
Europe and Central Asia	Switzerland, Czech Republic, Denmark, United Kingdom, Croatia, Hungary, Kazakhstan, Norway, Poland, Romania, Russia, Sweden, Turkey, Ukraine	182	28.57	53.06
Latin American and Caribbean	Argentina, Brazil, Chile, Colombia, Dominican Republic, Mexico, Peru, Venezuela	104	16.33	69.39
Middle East and North Africa	United Arab Emirates, Egypt, Iran, Israel, Morocco, Saudi Arabia	78	12.24	81.63
North America	Canada, United States	26	4.08	85.71
South Asia	India, Pakistan	26	4.08	89.8
Sub-Saharan Africa	Kenya, Nigeria, Sierra Leone, Tanzania, South Africa	65	10.20	100
Total		637	100	

Note. Regions reflect World Bank classification.

Appendix B. Examples of Coded Regulations

Country	Illustrative quote, description, or explanation	Date	Category	Source
Argentina	Bitcoins are not legal currency, strictly speaking since they are not issued by the government monetary authority and are not legal tender.	10/2017	Unregulated	https://blogs.thomsonreuters.com/answerson/world-cryptocurrencies-country/
Australia	In December 2013, the governor of the Reserve Bank of Australia (RBA) say in an interview about Bitcoin legality, "There would be nothing to stop people in this country deciding to transact in some other currency in a shop if they wanted to."	12/2013	Legal	http://www.austrac.gov.au/media/media-releases/new-australian-laws-regulate-cryptocurrency-providers
Chile	Chile is home to a growing number of cryptocurrency exchanges that are currently not regulated.	01/2018	Unregulated	https://cointelegraph.com/news/chilean-government-introduces-new-cryptocurrency-and-fintech-regulation-bill-to-congress
China	In late 2013, China's Central Bank (the People's Bank of China) bars financial institutions from partaking in digital currency and Bitcoin transactions, but individuals are free to trade as they wish.	11/2013	Illegal	https://blogs.thomsonreuters.com/answerson/world-cryptocurrencies-country/
Denmark	The Danish government is taking a hands-off approach to regulation, although several government bodies are outspokenly against cryptocurrencies.	05/2018	Unregulated	https://www.finder.com/global-cryptocurrency-regulations
Egypt	"Bitcoin trading is illegitimate in Egypt, Head of the Egyptian Financial Supervisory Authority (EFSA) Mohamed Omran said on Sunday during his meeting with the Parliament's Economic Affairs Committee". He added that Egypt's Capital Market Law, stipulates that any impermissible activity is illegal and imposes a penalty on anyone practicing it."	12/2017	Illegal	http://www.egypttoday.com/Article/3/37254/Bitcoin-is-illegitimate-in-Egypt-EFSA
India	In April 2018 the Reserve Bank of India (RBI) bans banks and any regulated financial institutions from "dealing with or settling virtual currencies." The sweeping regulation prohibits trade of cryptocurrencies on domestic exchanges, and gives existing exchanges until July 6th, 2018, to wind down.	04/2018	Illegal	https://complyadvantage.com/knowledgebase/crypto-regulations/cryptocurrency-regulations-india/
India	India lifts two-year cryptocurrency ban. Supreme Court ruling is an "historic day, not just for the crypto community, but for the entire country."	03/2020	Legal	https://www.independent.co.uk/life-style/gadgets-and-tech/news/bitcoin-price-latest-exchange-crash-india-cryptocurrency-ban-a9378201.html
Iran	The Iranian Central Bank adopts a "wait-and-see" policy toward cryptocurrencies. While trading cryptocurrencies is illegal, the police have no legal mandate to stop it.	05/2013	Illegal	https://blogs.thomsonreuters.com/answerson/world-cryptocurrencies-country/
Iran	The Iranian government amends its cryptocurrency regulation to enable the country's central bank to fund imports with Bitcoin that is legally mined in the country, the government-controlled IRNA news agency reported on Saturday.	10/2020	Legal	https://news.bitcoin.com/iran-crypto-law-miners-bitcoin-central-bank/
Morocco	"The Office des Changes wishes to inform the general public that the transactions via virtual currencies constitute an infringement of the exchange regulations, liable to penalties and fines provided for by [existing laws] in force."	11/2017	Illegal	https://www.loc.gov/law/help/cryptocurrency/cryptocurrency-world-survey.pdf

Appendix B. (Continued)

Country	Illustrative quote, description, or explanation	Date	Category	Source
Nigeria	While a 2017 note prohibits banks from doing crypto deals, it allows them to have exchanges as customers, provided they meet certain requirements. Language in the latest guidance appears to make dealing on any exchanges illegal.	12/2020	Illegal	https://qz.com/africa/1970446/nigerias-central-bank-takes-aim-at-cryptocurrency-again/
Thailand	The *Foreign Exchange Administration and Policy Department* states that due to lack of existing applicable laws, capital controls, and the fact that Bitcoin straddles multiple financial facets, the following Bitcoin activities are illegal in Thailand: buying Bitcoins, selling Bitcoins, buying any goods or services in exchange for Bitcoins, selling any goods or services for Bitcoins, sending Bitcoins to anyone located outside of Thailand, receiving Bitcoins from anyone located outside of Thailand.	07/2013	Illegal	https://bitcoin.co.th/trading-suspended-due-to-bank-of-thailand-advisement/
South Korea	South Korea's Supreme Court rules that Bitcoin is a legally recognizable asset. The landmark ruling occurred on May 30, 2018, and it overturns a decision made by one of the country's lower courts in a case dating back to 2017.	05/2018	Legal	https://bitcoinmagazine.com/articles/south-korean-supreme-court-rules-bitcoin-asset/
Vietnam	The State Bank of Vietnam issues a decree on cryptocurrency on October 30, 2017. According to news reports, the Bank effectively determines that Bitcoin and other virtual currencies are not legal.	10/2017	Illegal	https://www.loc.gov/law/help/cryptocurrency/cryptocurrency-world-survey.pdf

Appendix C. Factor Analysis

Constructs and associated items	Loading
Petty corruption (Cronbach's alpha: 0.972)	
Government officials in the executive branch do not use public office for private gain	0.943
Government officials in the police and the military do not use public office for private gain	0.923
Government officials in the legislative branch do not use public office for private gain	0.881
Crime is effectively controlled	0.789
People do not resort to violence to redress personal grievances	0.892
Civil justice is not subject to unreasonable delays	0.770
Civil justice is effectively enforced	0.859
Criminal investigation system is effective	0.841
Criminal adjudication system is timely and effective	0.932
Correctional system is effective in reducing criminal behavior	0.919
Criminal system is free of corruption	0.951
Grand corruption (Cronbach's alpha: 0.972)	
Government powers are effectively limited by the legislature	0.856
Government powers are subject to non-governmental checks	0.977
Transition of power is subject to the law	0.919
Right to information	0.793
Civic participation	0.941
Complaint mechanisms	0.813
Freedom of opinion and expression is effectively guaranteed	0.976
Freedom of belief and religion is effectively guaranteed	0.813
Freedom from arbitrary interference with privacy is effectively guaranteed	0.870
Freedom of assembly and association is effectively guaranteed	0.941

Appendix D. Summary of Hypothesis Tests

Hypothesis no.	Hypothesis	Supported?	Coefficient (model)
H1a	Legal regulation is positively associated with platform founding.	Yes	7.541** (Table 2, Model 1) 1.484* (Table 3, Model 1)
H1b	Grand corruption negatively moderates the effect of legal classification on platform founding.	Yes	−0.383*** (Table 2 Model 2) −0.200** (Table 3 Model 2)
H1c	The negative moderating effect of grand corruption on the relationship between legalization and platform founding will be weakened by the presence of petty corruption.	Yes	0.024** (Table 2, Model 3) 0.027* (Table 3, Model 3)
H2a	Illegal regulation is positively associated with trading volume.	Yes	1.383* (Table 2, Model 3) 1.075* (Table 3, Model 3)
H2b	Grand corruption positively moderates the effect of illegal classification on trading volume.	Yes	0.303* (Table 2, Model 3) 0.062* (Table 3, Model 3)
H2c	The positive moderating effect of grand corruption on the relationship between illegalization and trading volume will be strengthened by the presence of petty corruption.	Yes	0.008* (Table 2, Model 3) 0.011* (Table 3, Model 3)

***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; $^{+}p < 0.10$.

Endnotes

[1] We want to thank our editor for this helpful suggestion.

[2] Note that not all Bitcoins are actually in circulation, further reducing supply. Also, according to a recent study, the complex calculations required to conduct one Bitcoin transaction equal the monthly energy demand for a one-person household (ING Bank, 2017), accessed September 24, 2024, https://think.ing.com/downloads/pdf/opinion/why-bitcoin-transactions-are-more-expensive-than-you-think.

[3] Accessed October 18, 2024, https://www.forbes.com/digital-assets/crypto-prices/.

[4] Accessed May 18, 2024, https://www.reuters.com/article/uk-india-cryptocurrency-ban-idUSKBN2B60QP.

[5] Accessed October 18, 2024, https://www.triple-a.io/cryptocurrency-ownership-data.

[6] Accessed July 29, 2024, https://www.newsbtc.com/2017/04/02/japan-officially-recognises-bitcoin-currency-starting-april-2017.

[7] Accessed February 20, 2025, https://www.bbc.com/news/technology-58473260; https://dig.watch/updates/bitcoin-is-no-longer-legal-tender-in-el-salvador#:~:text=El%20Salvador%20has%20reversed%20its,merchants%20struggled%20to%20adopt%20it.

[8] It is important to note that the degree of autonomy varies among the different types of DAOs depending on algorithmic functioning of the DAO.

[9] Although decentralized exchange platforms exist and their prevalence is slowly increasing, the trading volumes on these are still very small and have been negligeable over the last decade compared to the heavily dominant centralized exchanges (Han et al. 2023, Shah et al. 2023).

[10] Accessed October 19, 2024, https://help.coinbase.com/en/coinbase/trading-and-funding/pricing-and-fees/fees.

[11] Accessed October 19, 2024, https://nydig.com/learn/who-controls-bitcoin.

[12] Accessed November 11, 2024, https://www.forbes.com/sites/billybambrough/2022/11/05/china-could-secretly-hold-6-billion-of-bitcoin-ethereum-and-other-crypto-triggering-a-serious-price-crash-warning/.

[13] Accessed February 18, 2025, https://www.federalreserve.gov/publications/files/2023-report-economic-well-being-us-households-202405.pdf.

[14] Accessed February 17, 2025, https://chainbulletin.com/bitcoin-mining-map/.

[15] Accessed, September 24, 2024, https://www.cointribune.com/en/bitcoin-55-of-global-mining-under-the-secret-control-of-china/; https://www.reuters.com/technology/bruised-by-stock-market-chinese-rush-into-banned-bitcoin-2024-01-25/.

[16] Accessed September 29, 2024, https://www.reuters.com/technology/bruised-by-stock-market-chinese-rush-into-banned-bitcoin-2024-01-25/.

[17] Bitcoin charts is one of the most commonly used data platforms. In order to integrate with Bitcoin charts, exchange platforms are required to provide both their complete trading history as well as the full orderbook. Bitcoin charts was founded in 2010 by early Bitcoin core developers and authorities Nils Schneider and Tim Best, Bitcoin charts refers to itself as the "world's leading provider for financial and technical data related to the Bitcoin network."

[18] Accessed October 3, 2024, https://bitcoincharts.com; https://coin.dance/; https://bitcoinity.org/.

[19] A cross-national study sample size of 40–50 countries can be found in several international business studies (Ioannou and Serafeim 2012, Young et al. 2018).

[20] For example, MtGox, one of the earliest Bitcoin exchanges, began trading in July 2010 and handled more than 70% of all Bitcoin transactions worldwide in 2013 as the world's leading Bitcoin exchange.

[21] For example, the included LocalBitcoins platform was the only trading platform available in emerging markets for years.

[22] Although it is possible to use a costly VPN service, online services such as Netflix easily recognize and often block such traffic. Crypto exchanges are known to use geofencing to reduce compliance risk. Further, it is generally in traders' interest to use their local currency to trade. Thus, we believe trading volume by currency to be a good overall representation of country-level differences in trading volume. https://variant.fund/articles/practical-guide-to-geofencing/ (accessed November 26, 2024).

[23] Accessed February 18, 2025, https://www.coingecko.com/en/exchanges/decentralized#:~:text=We%20track%20920%20decentralized%20crypto,)%2C%20Meteora%2C%20and%20Orca.

[24] Accessed May 1, 2024, https://blogs.thomsonreuters.com/answerson/world-cryptocurrencies-country/.

[25] Accessed May 1, 2023, https://www.jbs.cam.ac.uk/wp-content/uploads/2020/08/2019-04-ccaf-global-cryptoasset-regulatory-landscape-study.pdf.

[26] Accessed March 3, 2024, https://www.bitcoinmarketjournal.com/bitcoin-regulation-by-country/.

[27] Accessed March 3, 2024, https://www.loc.gov/law/help/cryptocurrency/cryptocurrency-world-survey.pdf.

[28] We also used the following sources: Accessed March 3, 2024, http://www.law.gov. Accessed March 3, 2024, https://www.loc.gov/law/help/cryptocurrency/map1.pdf. Accessed March 3, 2024, https://www.loc.gov/law/help/cryptocurrency/world-survey.php. Accessed March 3, 2024, https://www.visualcapitalist.com/mapped-cryptocurrency-regulations-around-the-world/. Accessed March 3, 2024, https://www.bitcoinmarketjournal.com/bitcoin-regulation-by-country/. Accessed March 3, 2024, https://www.finder.com/global-cryptocurrency-regulations.

[29] Sartor and Beamish (2018, p. 358) use three items from the WCR to construct petty corruption, namely (1) irregular payments in public utilities; (2) irregular payments in loan applications; and (3) irregular payments in tax collection. They further use two items from the WCR to construct grand corruption (although they dropped the last one due to high cross loadings in the principal component analysis) namely the (1) prevalence of illegal political donations and (2) irregular payments in government policymaking.

[30] In the study by Sartor and Beamish (2018), the time horizon was 2004–2007; our time horizon is 2011–2022.

[31] Accessed July 28, 2024 (https://worldjusticeproject.org/rule-of-law-index/).

[32] Factors of the WJP Rule of Law Index include 1. Constraints on Government Powers; 2. Absence of Corruption; 3. Open Government; 4. Fundamental Rights; 5. Order and Security; 6. Regulatory Enforcement; 7. Civil Justice; 8. Criminal Justice.

[33] Unfortunately, the WJP does not provide data for the countries Israel, Switzerland, and United Arab Emirates. However, because of the relevance of these markets for the cryptocurrency context (Aalborg et al. 2019) we imputed the data via using the CPI score (which covers these three countries). High R^2 values of the imputation regressions (77.90 and 84.11, respectively, for grand and petty corruption) indicate high predictive power of CPI for this purpose. In addition, we also checked based on the CPI which countries were closest to those were missing and integrated these scores into our regression models. Based on the data of the CPI and covering the years 2012–2022, we found that Israel had an average CPI score of 61, which is like Poland with an average score for the same time period of 59. Switzerland had an average CPI score from 2012 to 2022 of 85, which is like Norway with an average score for the same time period of 85.09. Finally, Saudi Arabia had an average CPI score from 2012 to 2022 of 49.54, which is like Malaysia with an average score for the same time period of 49.36. Thus, we replaced the missing WJP data for Israel with the scores of Poland, Switzerland was filled with the data form Norway, and Saudi Arabia was filled with the scores of Malaysia. We rerun our models with this form of imputation and found consistent results. Further, our results remain unchanged when these countries are excluded from the analyses. Moreover, in addition to these three countries with no WJP values through the entire period, a further five countries (Denmark, Egypt, Hungary, Sierra Leone, Tanzania) do not have any WJP values reported in 2011. Given prior research reveals that corruption values are relatively stable over time (Mungiu-Pippidi 2016, Bello y Villarino 2021) and as our investigations show that best predictions of the prior year corruption are the corruption in the following year, we use extrapolation to impute these values. Our results remain robust also to this imputation.

[34] Fifty-seven missing observations (i.e., 9% of the whole sample) of the *working population rate* as well as *internet usage rate* variables are imputed via interpolation. Our results remain robust to the exclusion of the interpolated values.

[35] Accessed November 15, 2024, https://ourworldindata.org/grapher/democracy-index-eiu.

[36] Accessed May 5, 2024, https://trends.google.com/trends/explore?q=bitcoin.

[37] Accessed October 18, 2024, https://www.coingecko.com/en/exchanges/decentralized#:~:text=We%20track%20816%20decentralized%20crypto,Ethereum)%2C%20and%20Aerodrome%20SlipStream.

[38] Accessed February 18, 2025, https://www.statista.com/statistics/1202503/global-cryptocurrency-user-base/.

[39] Accessed February 18, 2025, https://nordvpn.com/de/blog/are-vpns-legal/.

[40] Accessed February 18, 2025, https://icoholder.com/en/news/u-s-users-bypass-crypto-exchange-restrictions-with-vpns.

[41] Accessed February 18, 2025, https://cryptoforinnovation.org/why-crypto-has-become-an-election-issue-for-south-korea/#:~:text=Domestic%20Initial%20Coin%20Offerings%20(ICO,cryptocurrency%20mining%20activities%20are%20limited.

[42] Accessed February 20, 2025, https://www.amf-france.org/en/news-publications/news/towards-new-regime-crypto-assets-france.

[43] Accessed February 18, 2025, https://icoholder.com/en/news/u-s-users-bypass-crypto-exchange-restrictions-with-vpns.

[44] Accessed February 18, 2025, https://ambcrypto.com/bitcoin-otc-supply-drops-70-since-2021-a-sign-of-looming-supply-shock/.

[45] Accessed February 15, 2025, https://www.latimes.com/california/story/2022-09-15/cannabis-corruption-threats-secret-financial-deals-politicians.

[46] Accessed November 21, 2024, https://ccaf.io/about_ccaf.

[47] Accessed February 18, 2025, https://www.visualcapitalist.com/wp-content/uploads/2022/07/cost-of-mining-bitcoin.html.

References

Aalborg HA, Molnár P, de Vries JE (2019) What can explain the price, volatility and trading volume of Bitcoin? *Finance Res. Lett.* 29:255–265.

Adomako S, Zhu F, Hsu DK, Istipliler B, Wiklund J (2024) Navigating environmental threats to new ventures: A regulatory fit approach to bricolage. *J. Management Stud.*, 1–45.

Ahrne G, Aspers P, Brunsson N (2015) The organization of markets. *Organ. Stud.* 36(1):7–27.

Akinlabi OM, Murphy K (2018) Dull compulsion or perceived legitimacy? Assessing why people comply with the law in Nigeria. *Police Practice Res.* 19(2):186–201.

Aldrich HE, Fiol CM (1994) Fools rush in? The institutional context of industry creation. *Acad. Management Rev.* 19(4):645–670.

Anderson TW (1951) Estimating linear restrictions on regression coefficients for multivariate normal distributions. *Ann. Math. Statist.* 22(3):327–351.

Aparicio S, Audretsch D, Urbano D (2021) Why is export-oriented entrepreneurship more prevalent in some countries than others? Contextual antecedents and economic consequences. *J. World Bus.* 56(3):1–23.

Arellano M, Bond S (1991) Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *Rev. Econom. Stud.* 58(2):277–297.

Arellano M, Bover O (1995) Another look at the instrumental variable estimation of error-components models. *J. Econometrics* 68(1):29–51.

Argandoña A (2005) Corruption and companies: The use of facilitating payments. *J. Bus. Ethics* 60:251–264.

Armour J, Cumming D (2008) Bankruptcy law and entrepreneurship. *Amer. Law Econom. Rev.* 10(2):303–350.

Arslanian HE (2022) *The Book of Crypto* (Springer Nature, Berlin, Heidelberg).

Azhar MHB, Whitehead RV (2021) A study of user experiences and network analysis on anonymity and traceability of bitcoin transactions. *EAI Endorsed Trans. Security Safety* 7(25):1–8.

Bailey JB, Thomas DW (2017) Regulating away competition: The effect of regulation on entrepreneurship and employment. *J. Regulatory Econom.* 52:237–254.

Bariviera AF, Basgall MJ, Hasperué W, Naiouf M (2017) Some stylized facts of the Bitcoin market. *Phys. A Statist. Mech. Appl.* 484:82–90.

Bartelsman E, Scarpetta S, Schivardi F (2005) Comparative analysis of firm demographics and survival: Evidence from micro-level sources in OECD countries. *Indust. Corporate Change* 14(3):365–391.

Bascle G (2008) Controlling for endogeneity with instrumental variables in strategic management research. *Strategic Organ.* 6(3):285–327.

Baum CF (2008) Using instrumental variables techniques in economics and finance. Paper presentation, Stata Users Group, Berlin, Germany. Accessed February 15, 2025, https://www.stata.com/meeting/germany08/Baum.DESUG8621.beamer.pdf.

Baum CF (2013) Dynamic panel data estimators. Paper Presentation EC 823: Applied Econometrics, Boston College, Boston. Accessed February 15, 2025, http://fmwww.bc.edu/EC-C/S2013/823/EC823. S2013.nn05.slides.pdf.

Baum CF, Schaffer ME, Stillman S (2007) Enhanced routines for instrumental variables/generalized method of moments estimation and testing. *Stata J.* 7(4):465–506.

Bazurli R, Portos M (2021) Crook!: The impact of perceived corruption on non-electoral forms of political behaviour. *Internat. Political Sci. Rev.* 42(2):245–260.

Beavers AS, Lounsbury JW, Richards JK, Huck SW, Skolits GJ, Esquivel SL (2019) Practical considerations for using exploratory factor analysis in educational research. *Practical Assessment Res. Evaluation* 18(1):6.

Beckert J (2009) The social order of markets. *Theoret. Soc.* 38:245–269.

Belk R (2014) You are what you can access: Sharing and collaborative consumption online. *J. Bus. Res.* 67(8):1595–1600.

Bello y Villarino JM (2021) Measuring corruption: A critical analysis of the existing datasets and their suitability for diachronic transnational research. *Soc. Indicators Res.* 157:709–747.

Birkinshaw J (2024) Too little, too late? How policymakers and regulators respond to the business model innovations of digital firms. *Acad. Management Perspect.* 38(3):269–285.

Blau BM, Griffith TG, Whitby RJ (2021) Inflation and Bitcoin: A descriptive time-series analysis. *Econom. Lett.* 203:109848.

Blind K, Petersen SS, Riillo C. A (2017) The impact of standards and regulation on innovation in uncertain markets. *Res. Policy* 46(1):249–264.

Blocker Jr JS (2006) Did prohibition really work? Alcohol prohibition as a public health innovation. *Amer. J. Public Health* 96(2):233–243.

Blomquist S, Dahlberg M (1999) Small sample properties of LIML and jackknife IV estimators: Experiments with weak instruments. *J. Appl. Econom.* 14(1):69–88.

Blundell R, Bond S (1998) Initial conditions and moment restrictions in dynamic panel data models. *J. Econometrics* 87(1):115–143.

Böhme R, Christin N, Edelman B, Moore T (2015) Bitcoin: Economics, technology, and governance. *J. Econom. Perspect.* 29(2):213–238.

Bond S (2002) Dynamic panel data models: A guide to micro data methods and practice. *Portuguese Econom. J.* 1:141–162.

Borri N, Shakhnov K (2020) Regulation spillovers across cryptocurrency markets. *Finance Res. Lett.* 36:101333.

Bouraoui T (2020) The drivers of Bitcoin trading volume in selected emerging countries. *Quart. Rev. Econom. Finance* 76(May):218–229.

Brafman O, Beckstrom R (2006) *The Starfish and the Spider: The Unstoppable Power of Leaderless Organizations* (Penguin, London).

Brehm JW (1966) *A Theory of Psychological Reactance* (Academic Press, New York).

Bun MJG, Harrison TD (2019) OLS and IV estimation of regression models including endogenous interaction terms. *Econometric Rev.* 38(7):814–827.

Bussell J (2015) Typologies of corruption: A pragmatic approach. Rose-Ackerman S, Lagunes P, eds. *Greed, Corruption, and the Modern State: Essays in Political Economy* (Edward Elgar Publishing, Northampton, MA), 21–45.

Caliskan K (2020) Platform works as stack economization: Cryptocurrency markets and exchanges in perspective. *Sociologica: Internat. J. Sociol. Debate* 14(3):115–142.

Cardoso AG (2023) Decentralized autonomous organizations–DAOs: The convergence of technology, law, governance, and behavioral economics. MIT Computational Law Report, Massachusetts Institute of Technology, Boston.

Carroll GR, Wade J (1991) Density dependence in the organizational evolution of the American brewing industry across different levels of analysis. *Soc. Sci. Res.* 20(3):271–302.

Chaudry A (2021) Why the Bitcoin network is the original DAO. Accessed February 15, 2025, https://bitcoinmagazine.com/culture/why-bitcoin-network-is-original-dao.

Cheah ET, Fry J (2015) Speculative bubbles in Bitcoin markets? An empirical investigation into the fundamental value of Bitcoin. *Econom. Lett.* 130:32–36.

Chevalier A, Harmon C, O'Sullivan V, Walker I (2013) The impact of parental income and education on the schooling of their children. *IZA J. Labor Econom.* 2(1):22.

Chung M, Sharma L, Malhotra MK (2023) Impact of modularity design on mobile app launch success. *Manufacturing Services Oper. Management* 25(2):756–774.

Collier RB, Dubal VB, Carter CL (2018) Disrupting regulation, regulating disruption: The politics of Uber in the United States. *Perspect. Politics* 16(4):919–937.

Cook K, Shortell SM, Conrad DA, Morrisey MA (1983) A theory of organizational response to regulation: The case of hospitals. *Acad. Management Rev.* 8(2):193–205.

Crombach L, Smits J (2024) The subnational corruption database: Grand and petty corruption in 1,473 regions of 178 countries, 1995–2022. *Sci. Data* 11(1):686.

Cuervo-Cazurra A (2016) Corruption in international business. *J. World Bus.* 51(1):35–49.

Cuervo-Cazurra A (2008) Better the devil you don't know: Types of corruption and FDI in transition economies. *J. Internat. Management* 14(1):12–27.

Cuervo-Cazurra A, Genc M (2008) Transforming disadvantages into advantages: Developing-country MNEs in the least developed countries. *J. Internat. Bus. Stud.* 39:957–979.

Dallyn S (2017) Cryptocurrencies as market singularities: The strange case of Bitcoin. *J. Cultural Econom.* 10(5):462–473.

Damanpour F, Gopalakrishnan S (1998) Theories of organizational structure and innovation adoption: The role of environmental change. *J. Engrg. Tech. Management* 15(1):1–24.

Dang VA, Kim M, Shin Y (2015) In search of robust methods for dynamic panel data models in empirical corporate finance. *J. Banking Finance* 53:84–98.

Dawson JF (2014) Moderation in management research: What, why, when, and how. *J. Bus. Psych.* 29(1):1–19.

Dawson JF, Richter AW (2006) Probing three-way interactions in moderated multiple regression: Development and application of a slope difference test. *J. Appl. Psych.* 91(4):917.

Deeds DL, Mang PY, Frandsen ML (2004) The influence of firms' and industries' legitimacy on the flow of capital into high-technology ventures. *Strategic Organ.* 2(1):9–34.

de Filippi P (2017) What blockchain means for the sharing economy. *Harvard Bus. Rev.* (March 15), https://hbr.org/2017/03/what-blockchain-means-for-the-sharing-economy.

Delacroix J, Carroll GR (1983) Organizational foundings: An ecological study of the newspaper industries of Argentina and Ireland. *Admin. Sci. Quart.* 28(2):274–291.

Delgado-Mohatar O, Felis-Rota M, Fernández-Herraiz C (2019) The Bitcoin mining breakdown: Is mining still profitable? *Econom. Lett.* 184:108492.

Dobbin F, Dowd TJ (1997) How policy shapes competition: Early railroad foundings in Massachusetts. *Admin. Sci. Quart.* 42(3):501–529.

Dodd N (2018) The social life of Bitcoin. *Theory Culture Soc.* 35(3): 35–56.

Dostov V, Shust P (2014) Cryptocurrencies: An unconventional challenge to the AML/CFT regulators? *J. Financial Crime* 21(3):249–263.

Duvanova D (2014) Economic regulations, red tape, and bureaucratic corruption in post-communist economies. *World Development* 59:298–312.

Dylan-Ennis P, Kavanagh D (2024) Hash, bash, cash: Decentralized autonomous organizations (DAOs) as a new form of democratic organizing. *Decentralized Autonomous Organizations* (Routledge), 23–40.

Ebbes P, Papies D, van Heerde HJ (2022) Dealing with endogeneity: A nontechnical guide for marketing researchers. Homburg C, Klarmann M, Vomberg A, eds. *Handbook of Market Research* (Springer International Publishing, Cham, Switzerland), 181–217.

Faria I (2022) When tales of money fail: The importance of price, trust, and sociality for cryptocurrency users. *J. Cultural Econom.* 15(1):81–92.

Feder A, Gandal N, Hamrick JT, Moore T (2017) The impact of DDoS and other security shocks on Bitcoin currency exchanges: Evidence from Mt. Gox. *J. Cybersecurity* 3(2):137–144.

Ferguson G, Haglin K, Jordan S (2024) The personality and politics of cryptocurrency investors. *Amer. Politics Res.* 52(3):290–305.

Fernandes C, Meyer B (2018) Corruption in Brazilian Public administration: A study on the perception of law enforcement agents. *J. Public Administration Governance* 8(2):119–136.

Fligstein N (1996) Markets as politics: A political-cultural approach to market institutions. *Amer. Sociol. Rev.* 61(4):656–673.

Foley S, Karlsen JR, Putniņš TJ (2019) Sex, drugs, and bitcoin: How much illegal activity is financed through cryptocurrencies? *Rev. Financial Stud.* 32(5):1798–1853.

Foteinis S (2018) Bitcoin's alarming carbon footprint. *Nature* 554(7690): 169–170.

Galang RMN (2012) Victim or victimizer: Firm responses to government corruption. *J. Management Stud.* 49(2):429–462.

Gao C, McDonald R (2022) Shaping nascent industries: Innovation strategy and regulatory uncertainty in personal genomics. *Admin. Sci. Quart.* 67(4):915–967.

Goldberg M, Schär F (2023) Metaverse governance: An empirical analysis of voting within decentralized autonomous organizations. *J. Bus. Res.* 160:113764.

Golumbia D (2015) Bitcoin as politics: Distributed right-wing extremism. Lovink G, Tkacz N, de Vries P, eds. *MoneyLab Reader: An Intervention in Digital Economy* (Institute of Network Cultures, Amsterdam), 5–8.

Grandy JB, Hiatt SR (2020) State agency discretion and entrepreneurship in regulated markets. *Admin. Sci. Quart.* 65(4):1092–1131.

Greenberg A (2024) *Tracers in the Dark: The Global Hunt for the Crime Lords of Cryptocurrency* (Vintage, New York).

Gurses K, Ozcan P (2015) Entrepreneurship in regulated markets: Framing contests and collective action to introduce pay TV in the US. *Amer. Management J.* 58(6):1709–1739.

Hägele S (2024) Centralized exchanges vs. decentralized exchanges in cryptocurrency markets: A systematic literature review. *Electronic Markets* 34(1):33.

Han J, Huang S, Zhong Z (2023) Trust in defi: An empirical study of the decentralized exchange. *Proc. Allied Soc. Sci. Associations (ASSA) Annual Meeting*. Accessed February 15, 2025, https://afajof.org/management/viewp.php?n=53732.

Hankin JR, Firestone IJ, Sloan JJ, Ager JW, Goodman AC, Sokol RJ, Martier SS (1993) The impact of the alcohol warning label on drinking during pregnancy. *J. Public Policy Marketing* 12(1):10–18.

Hanley S, Sikk A (2016) Economy, corruption or floating voters? Explaining the breakthroughs of anti-establishment reform parties in eastern Europe. *Party Politics* 22(4):522–533.

Hannan MT, Freeman J (1986) Where do organizational forms come from? *Sociol. Forum* 1:50–72.

Hargadon AB, Douglas Y (2001) When innovations meet institutions: Edison and the design of the electric light. *Admin. Sci. Quart.* 46(3):476–501.

Hartl B, Hofmann E, Kirchler E (2016) Do we need rules for "what's mine is yours"? Governance in collaborative consumption communities. *J. Bus. Res.* 69(8):2756–2763.

Hassan S, de Filippi P (2021) Decentralized autonomous organization. *Internet Policy Rev.* 10(2).

Hayashi F (2011) *Econometrics* (Princeton University Press, Princeton, NJ).

Hiatt SR, Carlos WC (2019) From farms to fuel tanks: Stakeholder framing contests and entrepreneurship in the emergent US biodiesel market. *Strategic Management J.* 40(6):865–893.

Hiatt SR, Sine WD, Tolbert PS (2009) From Pabst to Pepsi: The deinstitutionalization of social practices and the creation of entrepreneurial opportunities. *Admin. Sci. Quart.* 54(4):635–667.

Hinings B, Gegenhuber T, Greenwood R (2018) Digital innovation and transformation: An institutional perspective. *Inform. Organ.* 28(1):52–61.

Holtz-Eakin D, Newey W, Rosen HS (1988) Estimating vector autoregressions with panel data. *Econometrica* 56(6):1371–1395.

Honoré F, Ganco M (2023) Entrepreneurial teams' acquisition of talent: Evidence from technology manufacturing industries using a two-sided approach. *Strategic Management J.* 44(1):141–170.

Hsieh Y-Y (2024) All DAOs are not the same: Distinguishing DAOs across various layers. *J. Organ. Design* 13(2024):1–4.

Hsieh Y-Y, Vergne J-P (2023) The future of the web? The coordination and early-stage growth of decentralized platforms. *Strategic Management J.* 44(3):829–857.

Hsieh Y-Y, Vergne J-P, Anderson P, Lakhani K, Reitzig M (2018) Bitcoin and the rise of decentralized autonomous organizations. *J. Organ. Design* 7(1):1–16.

Hsu G, Hannan MT (2005) Identities, genres, and organizational forms. *Organ. Sci.* 16(5):474–490.

Ioannou I, Serafeim G (2012) What drives corporate social performance? The role of nation-level institutions. *J. Internat. Bus. Stud.* 43(9):834–864.

Istipliler B, Bort S, Woywode M (2023) Flowers of adversity: Institutional constraints and innovative SMEs in transition economies. *J. Bus. Res.* 154:113306.

Jackson J, Asif M, Bradford B, Zakria Zakar M (2014) Corruption and police legitimacy in Lahore, Pakistan. *British J. Criminology* 54(6):1067–1088.

Jain PK, McInish TH, Miller JL (2019) Insights from Bitcoin trading. *Financial Management* 48(4):1031–1048.

Jansen E, Mulkens S, Emond Y, Jansen A (2008) From the Garden of Eden to the land of plenty: Restriction of fruit and sweets intake leads to increased fruit and sweets consumption in children. *Appetite* 51(3):570–575.

Jirásek M (2023) Klima DAO: A crypto answer to carbon markets. *J. Organ. Design* 12(4):271–283.

Jones E, Zeitz AO (2019) Regulatory convergence in the financial periphery: How interdependence shapes regulators' decisions. *Internat. Stud. Quart.* 63(4):908–922.

Judge WQ, Mcnatt DB, Xu W (2011) The antecedents and effects of national corruption: A meta-analysis. *J. World Bus.* 46(1):93–103.

Karanović J, Berends H, Engel Y (2021) Regulated dependence: Platform workers' responses to new forms of organizing. *J. Management Stud.* 58(4):1070–1106.

Kaufmann D, Kraay A, Mastruzzi M (2010) *Worldwide Governance Indicators* (World Bank Group).

Kennedy MT (2008) Getting counted: Markets, media, and reality. *Amer. Sociol. Rev.* 73(2):270–295.

Kirchner S, Schüβler E (2019) The organization of digital marketplaces: Unmasking the role of internet platforms in the sharing economy. Ahrne G, Brunsson N, eds. *Organization Outside Organizations: The Abundance of Partial Organization in Social Life* (Cambridge University Press, Cambridge, UK), 131–154.

Klapper L, Laeven L, Rajan R (2006) Entry regulation as a barrier to entrepreneurship. *J. Financial Econom.* 82(3):591–629.

Klitgaard R (1988) *Controlling Corruption* (University of California Press, Berkeley, CA).

Krammer SMS (2019) Greasing the wheels of change: Bribery, institutions, and new product introductions in emerging markets. *J. Management* 45(5):1889–1926.

Kripfganz S (2019) Generalized method of moments estimation of linear dynamic panel-data models. *London Stata Conf. 2019*, vol. 17 (Stata Users Group, College Station, TX).

Kristoufek L (2013) BitCoin meets Google Trends and Wikipedia: Quantifying the relationship between phenomena of the Internet era. *Sci. Rep.* 3(1):3415.

Kristoufek L (2015) What are the main drivers of the Bitcoin price? Evidence from wavelet coherence analysis. *PLoS One* 10(4): e0123923.

Kwok CCY, Tadesse S (2006) National culture and financial systems. *J. Internat. Bus. Stud.* 37:227–247.

Kwon S, Youtie J, Porter A, Newman N (2024) How does regulatory uncertainty shape the innovation process? Evidence from the case of nanomedicine. *J. Tech. Transfer* 49(1):262–302.

Lambsdorff GJ, Taube M, Schramm M (2005) *The New Institutional Economics of Corruption* (Routledge, New York).

Larsson F, Grimes M (2023) Societal accountability and grand corruption: How institutions shape citizens' efforts to shape institutions. *Political Stud.* 71(4):1321–1346.

Lecuna A (2012) Corruption and size decentralization. *J. Appl. Econom.* 15(1):139–168.

Lee MY, Edmondson AC (2017) Self-managing organizations: Exploring the limits of less-hierarchical organizing. *Res. Organ. Behav.* 37:35–58.

Lee S, Persson P (2022) Human trafficking and regulating prostitution. *Amer. Econom. J.* 14(3):87–127.

Lee BH, Hiatt SR, Lounsbury M (2017) Market mediators and the trade-offs of legitimacy-seeking behaviors in a nascent category. *Organ. Sci.* 28(3):447–470.

Lee S-H, Yamakawa Y, Peng MW, Barney JB (2011) How do bankruptcy laws affect entrepreneurship development around the world? *J. Bus. Venturing* 26(5):505–520.

Lindley J, Techera EJ (2017) Overcoming complexity in illegal, unregulated and unreported fishing to achieve effective regulatory pluralism. *Marine Policy* 81:71–79.

Lischke M, Fabian B (2016) Analyzing the bitcoin network: The first four years. *Future Internet* 8(1):7.

Littrell S, Klofstad C, Uscinski JE (2024) The political, psychological, and social correlates of cryptocurrency ownership. *PloS One* 19(7):e0305178.

Loewenstein G (1994) The psychology of curiosity: A review and reinterpretation. *Psych. Bull.* 116(1):75.

Lumineau F, Schilke O, Wang W (2023) Organizational trust in the age of the fourth industrial revolution: Shifts in the form, production, and targets of trust. *J. Management Inquiry* 32(1):21–34.

Lumineau F, Wang W, Schilke O (2021) Blockchain governance—A new way of organizing collaborations? *Organ. Sci.* 32(2):500–521.

Magnuson W (2018) Financial regulation in the Bitcoin era. *Stanford J. Legal Bus. Finance* 23:159.

Marmora P (2022) Does monetary policy fuel bitcoin demand? Event-study evidence from emerging markets. *J. Internat. Financial Markets, Institutions Money* 77:101489.

Mashali B (2012) Analyzing the relationship between perceived grand corruption and petty corruption in developing countries: Case study of Iran. *Internat. Rev. Admin. Sci.* 78(4):775–787.

Matta M, Lunesu I, Marchesi M (2015) The predictor impact of Web search media on Bitcoin trading volumes. Fred A, Dietz J, Aveiro D, Liu K, Filipe J, eds. *Proc. 7th Internat. Joint Conf. Knowledge Discovery, Knowledge Engrg. Knowledge Management*, vol. 1 (IEEE, Piscataway, NJ), 620–626.

Mauro P (1995) Corruption and growth. *Quart. J. Econom.* 110(3): 681–712.

Möser M (2013) Anonymity of bitcoin transactions. *2013 APWG eCrime Res. Summit* (IEEE, Piscataway, NJ), 1–14.

Motlagh SG, Mišić J, Mišić VB (2020) Impact of node churn in the bitcoin network. *IEEE Trans. Network Sci. Engrg.* 7(3):2104–2113.

Mungiu-Pippidi A (2016) For a new generation of objective indicators in governance and corruption studies. *Eur. J. Criminal Policy Res.* 22:363–367.

Murphy K, Tyler TR, Curtis A (2009) Nurturing regulatory compliance: Is procedural justice effective when people question the legitimacy of the law? *Regulation Governance* 3(1):1–26.

Müser S, Hemmerich M, Schmitz F (2024) Individual differences in Bitcoin investment: The role of personality, attitudes, and knowledge. *J. Behav. Experiment. Econom.* 113:102289.

Nakamoto S (2008) Bitcoin: A peer-to-peer electronic cash system. Accessed February 15, 2025, https://bitcoin.org/bitcoin.pdf.

Navis C, Glynn MA (2010) How new market categories emerge: Temporal dynamics of legitimacy, identity, and entrepreneurship in satellite radio, 1990–2005. *Admin. Sci. Quart.* 55(3):439–471.

Neter J, Kutner MH, Nachtsheim CJ, Wasserman W (1996) *Applied Linear Statistical Models* (Irwin, Chicago).

Nickell S (1981) Biases in dynamic models with fixed effects. *Econometrica* 49(6):1417–1426.

Nur-Tegin K, Jakee K (2020) Does corruption grease or sand the wheels of development? New results based on disaggregated data. *Quart. Rev. Econom. Finance* 75:19–30.

Okorie DI, Lin B (2020) Did China's ICO ban alter the Bitcoin market? *Internat. Rev. Econom. Finance* 69:977–993.

Papies D, Ebbes P, van Heerde HJ (2017) Addressing endogeneity in marketing models. Leeflang PSH, Wieringa JE, Bijmolt TH, Pauwels KH, eds. *Advanced Methods for Modeling Markets* (Springer International Publishing, Cham, Switzerland), 581–627.

Parayil G (2003) Mapping technological trajectories of the Green Revolution and the Gene Revolution from modernization to globalization. *Res. Policy* 32(6):971–990.

Park M, Wu S, Funk RJ (2024) Regulation and innovation revisited: How restrictive environments can promote destabilizing new technologies. *Organ. Sci.* 36(1):240–260.

Park S, Im S, Seol Y, Paek J (2019) Nodes in the bitcoin network: Comparative measurement study and survey. *IEEE Access* 7:57009–57022.

Peng MW, Wang DYL, Jiang Y (2008) An institution-based view of international business strategy: A focus on emerging economies. *J. Internat. Bus. Stud.* 39:920–936.

Peng MW, Yamakawa Y, Lee S-H (2010) Bankruptcy laws and entrepreneur: Friendliness. *Entrepreneurship Theory Practice* 34(3):517–530.

Petkova AP, Wadhwa A, Yao X, Jain S (2014) Reputation and decision making under ambiguity: A study of US venture capital firms' investments in the emerging clean energy sector. *Amer. Management J.* 57(2):422–448.

Petrou AP (2015) Arbitrariness of corruption and foreign affiliate performance: A resource dependence perspective. *J. World Bus.* 50(4):826–837.

Petrou AP, Thanos IC (2014) The "grabbing hand" or the "helping hand" view of corruption: Evidence from bank foreign market entries. *J. World Bus.* 49(3):444–454.

Pollock TG, Rindova VP (2003) Media legitimation effects in the market for initial public offerings. *Acad. Management J.* 46(5): 631–642.

Popper N, Lee S-H (2018) After the Bitcoin boom: Hard lessons for cryptocurrency investors. Accessed February 15, 2025, https://www.nytimes.com/2018/08/20/technology/cryptocurrency-investor-losses.html.

Poteriaieva M (2024) 3 ways Bitcoin could impact the U.S. economy. Accessed February 15, 2025, https://www.forbes.com/sites/mariepoteriaieva/2024/09/17/3-ways-bitcoin-could-impact-the-us-economy/.

Puranam P, Alexy O, Reitzig M (2014) What's "new" about new forms of organizing? *Amer. Management Rev.* 39(2):162–180.

Rathert N (2016) Strategies of legitimation: MNEs and the adoption of CSR in response to host-country institutions. *J. Internat. Bus. Stud.* 47:858–879.

Reiners L (2020) Cryptocurrency and the state: An unholy alliance. *Southern California Interdisciplinary Legal J.* 30:695.

Reitzig M (2022) How to get better at flatter designs: Considerations for shaping and leading organizations with less hierarchy. *J. Organ. Design* 11(1):5–10.

Reynolds P, Irwin ASM (2017) Tracking digital footprints: Anonymity within the bitcoin system. *J. Money Laundering Control* 20(2): 172–189.

Rodriguez P, Uhlenbruck K, Eden L (2005) Government corruption and the entry strategies of multinationals. *Amer. Management Rev.* 30(2):383–396.

Roodman D (2009) How to do xtabond2: An introduction to difference and system GMM in Stata. *Stata J.* 9(1):86–136.

Rose-Ackerman S (2010) Corruption: Greed, culture and the state. *Yale Law J. Online* 120:125–140.

Rose-Ackerman S (1996) Democracy and 'grand' corruption. *Internat. Soc. Sci. J.* 48(149):365–380.

Santana C, Albareda L (2022) Blockchain and the emergence of decentralized autonomous organizations (DAOs): An integrative model and research agenda. *Tech. Forecasting Soc. Change* 182:121806.

Santolli BJ (2016) Winning the battle, losing the war: European cities fight Airbnb. *George Washington Internat. Legal Rev.* 49:673.

Sarkodie SA, Amani MA, Ahmed MY, Owusu PA (2023) Assessment of Bitcoin carbon footprint. *Sustainable Horizons* 7:100060.

Sartor MA, Beamish PW (2018) Host market government corruption and the equity-based foreign entry strategies of multinational enterprises. *J. Internat. Bus. Stud.* 49(3):346–370.

Schmidt A, Ivanova A, Schäfer MS (2013) Media attention for climate change around the world: A comparative analysis of newspaper coverage in 27 countries. *Global Environment. Change* 23(5):1233–1248.

Scott WR (2008) *Institutions and Organizations: Ideas and Interests* (Sage Publications, Thousand Oaks, CA).

Seele P (2018) Let us not forget: Crypto means secret. Cryptocurrencies as enabler of unethical and illegal business and the question of regulation. *Humanist Management J.* 3(1):133–139.

Shah K, Lathiya D, Lukhi N, Parmar K, Sanghvi H (2023) A systematic review of decentralized finance protocols. *Internat. J. Intelligent Networks* 4:171–181.

Shapiro M (2022) Crypto-egalitarian life: Ideational and materialist approaches to bitcoin. *Soc. Anal. (Oxford)* 66(3):62–82.

Sharma L, Chandrasekaran A, Bendoly E (2020) Does the office of patient experience matter in improving delivery of care? *Production Oper. Management* 29(4):833–855.

Shleifer A, Vishny RW (1993) Corruption. *Quart. J. Econom.* 108(3): 599–617.

Simmons BA (2000) International law and state behavior: Commitment and compliance in international monetary affairs. *Amer. Political Sci. Rev.* 94(4):819–835.

Sine WD, David RJ, Mitsuhashi H (2007) From plan to plant: Effects of certification on operational start-up in the emergent independent power sector. *Organ. Sci.* 18(4):578–594.

Sine WD, Haveman HA, Tolbert PS (2005) Risky business? Entrepreneurship in the new independent-power sector. *Admin. Sci. Quart.* 50(2):200–232.

Singh M, Kim S (2019) Blockchain technology for decentralized autonomous organizations. *Adv. Comput.* 115:115–140.

Sommer JM (2017) Grand and petty corruption: A cross-national analysis of forest loss in low-and middle-income nations. *Environment. Sociol.* 3(4):414–426.

Staber U (1989) Organizational foundings in the cooperative sector of Atlantic Canada: An ecological perspective. *Organ. Stud.* 10(3):381–403.

Staiger D, Stock JH (1997) Instrumental variables regression with weak instruments. *Econometrica* 65(3):557–586.

Stigler GJ (2021) The theory of economic regulation. Ferguson T, Rogers J, eds. *The Political Economy: Readings in the Politics and Economics of American Public Policy* (Routledge, New York), 67–81.

Stock J, Yogo M (2005) Asymptotic distributions of instrumental variables statistics with many instruments. Andrews DWK, Stock JH, eds. *Identification and Inference for Econometric Models: Essays in Honor of Thomas Rothenberg* (Cambridge University Press), 109–120.

Stoll C, Klaaβen L, Gallersdörfer U (2019) The carbon footprint of bitcoin. *Joule* 3(7):1647–1661.

Suddaby R, Greenwood R (2005) Rhetorical strategies of legitimacy. *Admin. Sci. Quart.* 50(1):35–67.

Sun W, Jin H, Jin F, Kong L, Peng Y, Dai Z (2022) Spatial analysis of global Bitcoin mining. *Sci. Rep.* 12(1):10694.

Sussman S, Grana R, Pokhrel P, Rohrbach LA, Sun P (2010) Forbidden fruit and the prediction of cigarette smoking. *Substance Use Misuse* 45(10):1683–1693.

Swaminathan A (1998) Entry into new market segments in mature industries: Endogenous and exogenous segmentation in the US brewing industry. *Strategic Management J.* 19(4):389–404.

Taber KS (2018) The use of Cronbach's alpha when developing and reporting research instruments in science education. *Res. Sci. Ed.* 48:1273–1296.

Takagi S (2017) Organizational impact of blockchain through decentralized autonomous organizations. *Internat. J. Econom. Policy Stud.* 12(1):22–41.

Taleb NN (2014) *Antifragile: Things that Gain from Disorder* (Random House, New York).

Tolbert PS, Zucker LG (1983) Institutional sources of change in the formal structure of organizations: The diffusion of civil service reform, 1880-1935. *Admin. Sci. Quart.* 28:22–39.

Tolbert PS, David RJ, Sine WD (2011) Studying choice and change: The intersection of institutional theory and entrepreneurship research. *Organ. Sci.* 22(5):1332–1344.

Truex R (2011) Corruption, attitudes, and education: Survey evidence from Nepal. *World Development* 39(7):1133–1142.

Tushman ML, Anderson P (1986) Technological discontinuities and organizational environments. *Admin. Sci. Quart.* 31(3): 439–465.

Uslaner EM (2004) Trust and corruption. Lambsdorff JG, Taube M, Schramm M, eds. *The New Institutional Economics of Corruption* (Routledge, London), 90–106.

Uzunca B, Rigtering JC, Ozcan P (2018) Sharing and shaping: A cross-country comparison of how sharing economy firms shape their institutional environment to gain legitimacy. *Acad. Management Discoveries* 4(3):248–272.

Varava KA, Quick BL (2015) Adolescents and movie ratings: Is psychological reactance a theoretical explanation for the forbidden fruit effect? *J. Broadcasting Electronic Media* 59(1):149–168.

Vergne J-P (2020) Decentralized vs. distributed organization: Blockchain, machine learning and the future of the digital platform. *Organ. Theory* 1(4):2631787720977052.

Vigna P, Casey MJ (2015) *Cryptocurrency: How Bitcoin and Digital Money Are Challenging the Global Economic Order* (Bodley Head, London).

Wade JB, Swaminathan A, Saxon MS (1998) Normative and resource flow consequences of local regulations in the American brewing industry, 1845-1918. *Admin. Sci. Quart.* 43(4):905–935.

Walden J (2020) Progressive decentralization: A playbook for building crypto applications. Accessed February 15, 2025, https://a16zcrypto.com/posts/article/progressive-decentralization-crypto-product-management/.

Wang S, Vergne J-P (2017) Buzz factor or innovation potential: What explains cryptocurrencies' returns? *PloS One* 12(1):e0169556.

Wang Q, Li X, Yu Y (2017) Anonymity for bitcoin from secure escrow address. *IEEE Access* 6:12336–12341.

Weber B (2016) Bitcoin and the legitimacy crisis of money. *Cambridge J. Econom.* 40(1):17–41.

Weber K, Davis GF, Lounsbury M (2009) Policy as myth and ceremony? The global spread of stock exchanges, 1980–2005. *Acad. Management J.* 52(6):1319–1347.

Weigelt C, Shittu E (2016) Competition, regulatory policy, and firms' resource investments: The case of renewable energy technologies. *Acad. Management J.* 59(2):678–704.

Wooldridge JM (2015) *Introductory Econometrics: A Modern Approach* (Cengage Learning, Boston).

Wörner D, von Bomhard T, Schreier Y-P, Bilgeri D (2016) The bitcoin ecosystem: Disruption beyond financial services? European Conference on Information Systems Research Paper No. 33, AIS, Atlanta.

Young SL, Welter C, Conger M (2018) Stability vs. flexibility: The effect of regulatory institutions on opportunity type. *J. Internat. Bus. Stud.* 49:407–441.

Yousaf I, Goodell JW (2023) Reputational contagion and the fall of FTX: Examining the response of tokens to the delegitimization of FTT. *Finance Res. Lett.* 54:103704.

Zhou JQ, Peng MW (2012) Does bribery help or hurt firm growth around the world? *Asia Pacific J. Management* 29(4):907–921.

Zimmerman MA, Zeitz GJ (2002) Beyond survival: Achieving new venture growth by building legitimacy. *Acad. Management Rev.* 27(3):414–431.

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