Formal institutions, culture, and initial coin offerings: A cross-country analysis

Özgür Arslan-Ayaydin[a,2], Prabal Shrestha[b,1], James Thewissen[b,4], Wouter Torsin[b,1]

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ABSTRACT

ICOs (Initial Coin offerings) allow entrepreneurs to raise capital from investors internationally without relying on an intermediary. Through ICO, entrepreneurs offer blockchain-based tokens with multitude of features in exchange for the investors' contribution. However, given the distant online nature of the transactions, and the limitations of regulatory oversight, these ICOs are still perceived risky by general investors. Considering these context specificities, we pose that investors infer trustworthiness of these ICOs through their country of origin. Using the institutional strength as a proxy for the investors' perception of the ICO's legitimacy, we find that ICOs originating from countries with stronger institutional background have a greater likelihood of meeting their goal of being traded on a secondary market, raising more funding during their offerings, and experiencing lower price volatility on the secondary market. We observe that this relationship is particularly relevant when regulations concerning ICOs are absent. Furthermore, we observe that the positive relationship between instituional background and investors decision to contribute to an ICO project is moderated by cultural dimensions of uncertainty avoidance and collectivism. In this manner, this study provides a broadbased evidence for the role of institutions and culture on motivating investors trust in an ICO setting.

KEYWORDS: Initial coin offerings, trust, institutional strength, price volatility.

AUTHORS INFO

[a] *Department of Finance, University of Illinois at Chicago, United States*
[b] *Financial Management, Katholieke Universiteit Leuven, Belgium*

[1] prabal.shrestha@kuleuven.be
[2] orslan@uic.edu
[3] james.thewissen@kuleuven.be
[4] wouter.torsin@kuleuven.be

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1 Introduction

With the continuous increase in the popularity of cryptocurrencies, a new opportunity to use them as a way to raise funds and finance new projects has risen through initial coin offerings (ICOs). We define an ICO as a decentralized method of financing, whereby a firm calls for funding by issuing coins to online investors. Coins (or tokens) are digital medium of value exchange based on the blockchain, which can operate independently and can be traded between investors. Blockchain technologies provide accurate record-keeping and ownership transparency, which improves information flows, and accurate tracking of asset ownership [Yermack, 2017]. At least 235 ICOs were launched in 2017, including numerous offerings that raised in excess of $100 million. In 2016, an entity called The DAO raised $160 million by selling crypto-tokens to over 15,000 individual purchasers around the globe. This massive fund raise would give rise to an entirely new capital ecosystem. In 2017, initial coin offerings exploded, raising a collective $5.1 billion.

Despite its acknowledged role in promoting new ventures, our data shows that the level of ICOs and their success in attracting capital varies considerably across countries. While the U.S. has the most active cryptocurrency market in the world, many countries have little, if any, ICO activity. Such variations in cryptocurrency markets across countries reflect their stage of economic development, which is often tied to the development of formal institutions and informal cultural constraints. To our knowledge, there exists no empirical research on the effect of these institutions on differences in national levels of ICO activity.

Institutional strength is expected to be a major factor in the development of ICOs given that strin-

gent and well-understood regulations have yet to be effectively implemented in this industry at an optimal level. Right now, both project founders and investors are acting with a high degree of uncertainty concerning legal structures. The high risks are borne by the market participants themselves. In fact, ICOs are offered and traded without a single registration statement being filed with the SEC, and largely without private placement memoranda or other common securities disclosures. Because of these problems, while some successful ICOs do exist, existing regulatory gaps have, in part, enabled fraudulent or criminal activities that resulted in investor losses [Baum, 2018]. From a global perspective, regulatory responses have varied drastically. Some governments attempt to target individual cases of failure by approaching them as either traditional financial security issuances or criminal organizations with malicious intent, while other governments from countries such as China have imposed outright bans on ICOs, in fear of both chaotic market conditions and the formation of a decentralized economy which escapes government oversight (Reuters, 2017). In the absence of a meaningful regulation, the current ICO marketplace continues to be rife with pump-and-dump schemes and is increasingly tagged as the new Digital Wild West [Robinson, 2017].

In this lightly regulated context, we seek to understand the influence of the institutional strength on the development of ICOs. In particular, this paper tests whether the strength of the formal institution of the country of origin of the ICO substitutes for the lack of regulation surrounding ICOs by infering trustworthiness to investors. Institutions are usually defined as the humanly devised constraints that structure political, economic and social interaction of people. As noted by North [1991], "institutions exist to reduce uncertainty in the world" and in doing so provide incentives and disincentives for engaging in certain behavior and activities. We argue that well-developed formal institutions can promote ICO activity by providing the proper incentives for investors to offer risk capital to ICO initiatives. Having an appropriate incentive structure is critical because ICO activity is fraught with information asymmetry/opportunism and uncertainty. ICO investors will therefore incur significant transaction and other opportunity costs if proper institutional frameworks are not in place.

A successful formal institutional framework involves interaction with informal institutions. Informal institutions are conventions, codes of conduct, and norms of behavior that come from socially transmitted information and as such are part of a country's cultural heritage [North, 1991]. We therefore also suggest that variations in ICO activity because of the level of formal institutional development depend on informal cultural constraints such as uncertainty avoidance and collectivism. The formal institutional effects on ICO activity will be weaker when a society is uncertainty-avoiding. Individuals in such societes will be reluctant to participate in economic activities whose outcomes are uncertain and thus will be less responsive to the incentive offered by formal institutions. We also expect the formal institutional effects to be weaker in a collectivist society. Collectivist societies rely more on informal relationships and connections as a means of safeguarding against potential opportunistic behavior [Gould, 1993], preserving order, enforcing contracts and reducing transaction costs [Perkins, 2000]. Conformity and harmony are the norm, and behavior that might be perceived as opportunistic is likely to bring shame [Steensma, Marino, Weaver, and Dickson, 2000]. As a result, relationships in collectivist societies help build trust and pressure people to act cooperatively [Triandis, 1993]. Such reliance on relationship-based transactions can limit the full potential of formal institutions in stimulating ICO activity.

Our analysis is based on 2,000 ICO initiatives for 68 countries during the 2015 and 2018 period and supports the positive effect of formal institutions on ICO activity. We derive investors' perceptions of the legitimacy of a country from where the ICO originates, through World Bank Governance Indicators. Our measure incorporates six distinctive aspects of institutional development, namely (i) Control of Corruption, (ii) Rule Of Law, (iii) Government Effectiveness, (iv) Regulatory Quality, (v) Political Stability, and (vi) Voice and Accountability. Our results show that ICOs from countries with higher institutional strength are (i) more frequent, (ii) more successful (e.g., they have a higher probability of being traded on a secondary exchange and raise more funding during the initial coin offerings) and (iii) less volatile.

Our results hold for a battery of methodological tests and alternative definitions of formal institu-

tions; but more importantly, we find that the impact of institutions on ICO activity mostly holds for countries with no regulation concerning cryptocurrencies. We use Pinsent Masons [2017]'s classification of regulatory regimes relating to Bitcoins and cryptocurrencies to categorize the regulation background of ICOs into three types: (i) unregulated: such as, Brazil, Sweden and United Kingdom, (ii) regulated: such as, United States, Switzerland and Singapore (iii) strictly banned: such as, Iceland and Bolivia. We split the sample based on their regulatory regime and find that the relationship between ICO and institutions is positively significant only for countries with unregulated cryptocurrencies, suggesting that institutional background is particularly relevant for investors when evaluating ICOs based in countries without specific regulatory support.

We also find evidence on the contingent effects of uncertainty avoidance and collectivism on ICO activity. We find that although the level of ICO activity increases with the level of formal institutional development, ICO activity is less sensitive to formal institutions when a society is highly uncertainty-avoiding. We also show that collectivist orientation weakens the positive impact of formal institutional development on the level of ICO activity. This result suggests that the collectivist orientation limits the development of formal institutions, confine capital flows to those connected to their existing network, and exclude potential investors from joining the network and investing in ICOs.

The bottomline of our results is that the strength of the formal institution of the country of origin of an ICO substitutes for the lack of regulation surrounding ICOs by infering trustworthiness to investors. We significantly contribute to a better understanding of this new ICO phenomenon in three ways. First, our study represents the first attempt to address the relationship between formal institutions and ICO activity. We show that the institutional framework can be used to explain significant differences existing between ICO activities throughout the world. In addition, our study analyzes the contingency effects of informal cultural constraints on the relationship between formal constraints and ICO characteristics. These results complement prior literature on how formal institutions and informal cultural constraints influence various economic activities and outcomes, including electric utility investment [Bergara, Henisz, and Spiller, 1998]; multinational market entry [Henisz, 2000]; innovation [Shane, 1993]; technology alliances [Steensma et al., 2000] or the development of venture capital markets [Gompers and Lerner, 1999].

Second, in spite of their potential game-changing role in entrepreneurial finance, very few papers examined the emergence of ICOs. Most studies discuss the legal or managerial aspects of this phenomenon, without an empirical analysis. Few exceptions are the papers by Fisch [2019], Adhami, Giudici, and Martinazzi [2018], Amsden and Schweizer [2018], Momtaz [2018] and Zhang, Aerts, Lu, and Pan [2019]. In particular, Fisch [2019] investigates the signals that increase the chances of success of ICOs completed between March 2016 and March 2017. He finds that, while patents are insignificant, technical white papers are an effective signal in ICOs. Additionally, ICOs with a high quality code can raise more capital. Zhang et al. [2019] document that the readability of the white paper significantly increases the ICO first-day return. We contribute to this research by showing that the level of institutions constitute an important determinant of the activity, success and riskiness of ICOs.

Third, our results inform policy-makers by enriching discussions of appropriate policy frameworks that could stimulate the development and regulation of ICOs. Our results also reinforce the proposition that the same formal institutional rules applied in different societies can produce different economic outcomes [North, 1991]. The results also imply that it is necessary for policymakers to factor in cultural values and norms when crafting formal institutional rules to promote ICO activities [Sen, 2014].

This paper is organized as follows: Section 2 provides a literature review, whereas Section 3 summarizes the data and the methodology. Section 4 provides the regression results and Section 5 concludes.

2 ICO definition, regulatory uncertainty and international heterogeneity

2.1 What is an Initial Coin Offering?

In 2012, software developer J.R. Willett proposed a mechanism to raise funds using blockchain technology in his now famous article, "The Second Bitcoin Whitepaper" [Willet, 2014]. The mechanism is today popularly referred to as Initial Coin Offering (ICO), and also Initial Token Offerings, Initial Crypto-asset Offerings or Token Generation Event. In one of the first studies on its financing outcomes, Amsden and Schweizer [2018] define ICOs as an 'unregulated form of crowdsale to raise funds through a blockchain by selling venture-related tokens or coins in exchange for legal tender or cryptocurrencies'. As such, in an ICO, ventures raise capital by selling tokens to a crowd of investors dispersed around the world. Unlike traditional securities, tokens are a digital medium of exchange (cryptocurrency) which are intended to become functional future units of the venture's project, serving multitude of purposes (e.g. utility exchange, right to ownership, royalties). The three main premises of ICOs are as follows: (1) the company creates a digital coin, which can be then offered for sale to the public through an initial offering and (2) these coins can be exchanged among investors or converted into other currencies and (3) most tokens can be traded in a secondary market after the conclusion of the ICO [Benedetti and Kostovetsky, 2018]. As such, ICOs share, on the one hand, characteristics of the secondary market created with traditional initial public offerings (IPOs), where firms sell a fraction of their equity to the public in a stock market and, on the other hand, of the primary market of crowdfunding, where proponents raise money from a heterogeneous set of investors through online platforms.

The particularity of ICOs mainly stem from three perspectives. First, ICOs are based on decentralized networks with diffused contributors. The underlying blockchain technology provides accurate record-keeping and ownership transparency without a central authority, [Yermack, 2017]. ICOs allow digital entrepreneurs to raise funds directly from the dispersed crowd of investors while avoiding costs of compliance and intermediaries. There is no platform upon which ICOs must occur and there is no compulsory registration for ICOs. Second, the use of blockchain technology enables smart contracts, which allows the specificities of the issued tokens to vary in innumerable ways, introducing new dimensions to funder-entrepreneur relationship . ICOs could be based on diverse variations of blockchain that dictates governance structure, such as, decentralized and hierarchical. The underlying tokens could incorporate variety terms and conditions and resemble any form of established financing. Third, the provision of a secondary market for issued tokens allows rapid liquidity for investors upon successful listing, unlike in conventional entrepreneurial financing where the contracts are essentially illiquid [Benedetti and Kostovetsky, 2018].

2.2 Regulatory uncertainty

Despite the innovations and novelty of ICOs expanding the scope of financing new ideas, the financing mechanism is marred with technical obscurity, and heightened risks and uncertainties. For this reason, ICOs are often referred to as the 'Digital Wild West' [Robinson, 2017], where investors are expected to perform their own due diligence. Robinson [2017] states that at least 235 ICOs were launched in 2017, including numerous offerings that raised in excess of $100 million. Many of these offerings were based not on established business models or proven products, but on little more than a white paper expressing an idea and a few lines of sample code. All of this was done without a single registration statement being filed with the SEC, and largely without private placement memoranda or other common securities disclosures. Therefore, it is not surprising that many fraudulent ICOs have arisen, with many government institutions issuing warnings to investors [European Securities and Markets Authority, 2017; US Securities and Exchange Commission, 2019].

Today, the most prominent limitation of ICOs lies in the regulatory uncertainty and arbitrage exploited by some issuers. Unlike traditional securities, which are generally regulated by government

institutions (e.g. SEC in U.S.), there exists no governing body controlling ICOs. The lack of disclosure requirements in ICOs exacerbates information asymmetries already present in early stage SME financing. There is also a lack of a financial consumer and investor protection in ICOs that would allow investors to obtain redress and compensation, and the risk of fraud is high. The ability of ICOs to circumvent intermediaries makes all these tasks necessary to protect investors especially challenging for ICOs. The readily liquid market of tokens has led to speculative behavior and exceptional price volatility, which is frequently highlighted in the media [Adkisson, 2018]. Furthermore, as regulators seek to enforce suitable rules, the diverse functionality of issued tokens makes its legal status unclear. It is difficult to ascertain whether the issued tokens should be treated as money, commodity or security, which would trigger different disclosure, liability and compliance requirements [Enyi and Le, 2017].

However, this is not dissuading investors from leaping into the arena. The early token sales of ICOs occurred as recently as July, 2013 (Mastercoin), with Ethereum (3700B = $2.3m) and Karmacoin in 2014. In May 2017, the web browser Brave's ICO generated $35 million in less than 30 seconds. Another example is the more "mainstream" ICO launched by Kik (a messaging app developer), which emitted $50 million in tokens ("Kin") to institutional investors in September 2017. However, concurrently, related to this ICO, an unknown third-party conducted a phishing scam by circulating a false URL for the Kik offering via social media. The volume ICO activity is growing at breakneck speed, and to monitor these ICO emissions, there are more than 20 websites that offer tracking ICO data. A cumulative analysis shows that ICO value in October 2017 year-to-date (YTD) was $2.3 billion, ten times greater than calendar year 2016.

2.3 Heterogenous regulation around the world

Coinciding with the recent growth in fundraising via ICOs is the increasing interest of regulators in this new form of entrepreneurial financing [Condos, Sorrell, and Donegan, 2016; Dell'Erba, 2018]. Despite the potential to expand financing for entrepreneurial ventures, regulators are concerned with protecting investors' interest amidst the potential for duplicity and scams in the high information asymmetry environment [Zetzsche, Buckley, Arner, and Föhr, 2017]. Below, we describe the attitude taken by financial regulators in the United States, Asia-Pacific region and Europe.

United States

The U.S. adopts a "do no harm" approach when regulating cryptocurrencies. The U.S. uses a centralized system in which all tokens offered by ICOs are traded as securities. The US Securities and Exchange Commission (SEC) has issued explicit warnings to investors to be highly cautious against scammers using ICOs, particularly in the colloquially termed "pump and dump" schemes, where capital is fleetingly raised and then immediately dumped in exchange for other instruments at a profit, all within a very brief interval. In July 2017, the SEC indicated that it could have the authority to apply federal securities law to ICOs, and while it does not state that all blockchain tokens (ICOs) would necessarily be considered securities, its determinations would be made on a case-by-case basis. The SEC action may encourage more institutionalized investors to invest in ICOs, but it should be noted that ICOs typically prevent U.S. investor participation to remain out of the jurisdiction of the United States government.

Asia-Pacific region

A more cautious attitude has been taken by financial regulators in the Asia-Pacific region. For instance, China, where seven regulatory agencies officially banned all ICOs within the People's Republic, and they demanded that the proceeds from all past ICOs be refunded to investors or face being "severely punished according to the law". A similarly strong line has been taken by regulators in South Korea, where the Financial Services Commission prohibited ICOs in September 2017 and promised "stern penalties" for violations. The Chinese context is important because ICOs has raised nearly $400 million from about 100,000 investors prior to the ban. However, more recent statements from Chinese

regulators have stated that the ICO ban is intermittent, pending a more systematic regulatory framework. On the contrary, in Hong Kong, the Securities and Futures Commission released a statement (September 2017) explaining that tokens may constitute securities for purposes of the legal framework (Securities and Futures Ordinance), in which case dealing in such tokens would be a regulated activity under Hong Kong law. Australia's regulator (ASIC) has issued guidance (September, 2017) stating that the legality of an ICO is dependent on the specific circumstances, on a case-by-case basis. In New Zealand, the Financial Markets Authority (FMA) released guidelines on the current regulatory environment in regards to ICOs (October 2017).

European Union & Switzerland

In Europe, on the other hand, a differentiated regulation prevails. Switzerland in particular benefits from the tag of 'Crypto Valley' with its consistent focus on blockchain and fintech startups. FINMA, the Swiss Financial Market Supervisory Authority, classifies tokens into three sub-types: asset, payment and utility tokens, which do not constitute an actual investment but allow the buyer direct access to the product or service of the ICO. Smaller countries and city states such as Gibraltar, Malta or Liechtenstein have seen some success, having copied the crypto-friendly models of Switzerland.[1]

The European Union approaches Blockchain technology and the growth of the cryptocurrency markets with cautious optimism to better cultivate the technologies before taking action. The European Securities and Market Authority (ESMA) issued a statement warning investors to consider the risks associated with cryptocurrency, including price volatility and the potential for fraud warning ICO issuers to consider whether they are violating any existing regulations ICOs. For instance, in 2018, the Belgian Financial Supervisory and Market Authority (FSMA) released a website warning citizens about common cryptocurrency frauds. Under the title "If it's too good to be true, it's not true", the government started the campaign to raise awareness of threats posed by cryptocurrencies. The government informs citizens on how they can protect their money and make intelligent investment decisions. Additionally, the website links to a list of fraudulent cryptocurrency platforms and offers the possibility to check if websites or companies are on the authorities' blacklist. Many EU regulators are also cautioning against cryptocurrency's potential for fraud and other misconduct.

These conflicting takes by authorities on ICOs around the world is emblematic of the challenges in monitoring and regulating ICOs. Despite the efforts, the disintermediated and decentralized nature of ICOs make implementation of regulations a challenge in itself. ICOs particularly cater to open-source projects and decentralized business, attracting stakeholders and funders beyond the project's national boundary. As the issued tokens are supported by a distributed ledger, attribution to a specific regulatory jurisdiction is not mandatory, and therefore, regulatory compliance is essentially voluntary. There is no platform upon which ICOs must occur and, in most countries, there is no compulsory registration. Furthermore, the blockchain-based online transactions offers the prospect for market participants to maintain their anonymity. Consequently, enforcement of regulations becomes subject to entrepreneurs' discretion. As such, despite the fledgling efforts of various authorities to tame ICOs, efficacy of such regulations is still a matter of empirical investigation, and considering its limitations, it is important to identify the factors that compensate for such limitations. In the next section, we establish our hypotheses and describe how institutions relate to ICO activity.

3 Hypothesis development – Institutions, culture and ICOs

3.1 The role of formal institutions in developing the ICO market

Amidst the constrained regulatory support, investors are tasked with the challenge of identifying quality and authentic projects by themselves. ICOs are fraught with information asymmetry and potential

[1] In Gibraltar, the government published regulation establishing a framework for regulated DLT (Distributed Ledger Technology) companies, which would encompass ICOs and subject them to financial controls and standards; to enter into effect on January 1, 2018. In the UAE, the Abu Dhabi Global Market issued official guidance on ICOs in October 2017.

for opportunism, and under such circumstances, it is difficult and costly for investors to evaluate entrepreneurial companies. ICOs currently operate in a highly technical environment, where investors with limited technological expertise may find it difficult to navigate through. In addition, as ventures are typically in the early stage and with little proven record, there naturally is a great degree of information asymmetry. Moreover, due to the lack of verifiable information, there is a heightened potential for fraud [Kaal and Dell'Erba, 2017; Shifflett and Jones, 2018]. Thus, the challenge for investors is to identify trustworthy ICOs which would forego the temptations to renege on their commitments once the amount is raised.

To identify trustworthy projects, investors look for attributes such as authenticity, ability and social-inclination. Recent studies on ICOs look at disparate determinants of ICO success, such as display of technological capability and voluntary disclosure, among others [Adhami et al., 2018; Amsden and Schweizer, 2018; Fisch, 2019; Howell, Niessner, and Yermack, 2018; Momtaz, 2018; Zhang et al., 2019]. ICOs are mostly accompanied with a 'white paper', which acts as an unofficial prospectus that includes information that the project founder deems to be important to investors. Whitepapers do not follow a strict structure, and could vary in the level of technicality and the types of information it includes [Cohney, Hoffman, Sklaroff, and Wishnick, 2018]. Considering the flexible nature of content and the ease of replication of positve signals in online settings, the efficacy of such information is largely undermined [Riegelsberger, Sasse, and McCarthy, 2003]. In fact, the study by Adhami et al. [2018] do not observe any significant relationship between the inclusion of whitepaper and ICO success. Ideally, in such a scenario, regulatory safeguards are meant to protect investors from fraudulent behavior. However, as discussed before, the capacity of such regulations is greatly diminished in the ICO setting.

Therefore, in this dynamic and lightly regulated context and inadequate reliable signals, the quality of institutions is expected to be an important factor in the development of ICO activity. Recent studies relating to organizational literature call attention to the role of institution-based trust building process in explaining business behaviors [Bachmann and Inkpen, 2011; Welter, 2012; Zucker, 1986]. Institutional trust is argued to be crucial paticularly in early stages of a business relationship and in cases where existing relation-building avenues are not available, such as in an ICO environment. Therefore, in this study, we seek to explain variations in ICO activity across countries by taking an institutional economics perspective. Institutes define what is legitimate in the market, and therefore, provide incentives for firms and individuals to act in a certain way [North, 1991; Shane, 1993]. They reduce the ambiguity surrounding the safety and security of investors' funding contribution, and consequently, provide a basis for trust among investors.

In fact, several studies report funding discrimination based on institutional context of the firm's country location in various financing settings, including foreign investment [Leuz, Lins, and Warnock, 2008], IPO performance [Bell, Moore, and Al-Shammari, 2008], and venture capital investment [Bruton, Fried, and Manigart, 2005; Meuleman, Jääskeläinen, Maula, and Wright, 2017]. Furthermore, formal institutions are also associated with other economic activities and outcomes, such as multinational market entry [Henisz, 2000]; innovation [Shane, 1993] and technology alliances [Steensma et al., 2000]. In relation to entrepreneurial financing, several studies show that the level of venture capital activity is linked with the quality of regulatory policies, such as, taxation rules [Da Rin, Nicodano, and Sembenelli, 2006], government-sponsored programs [Armour and Cumming, 2006], and bankruptcy laws [Armour and Cumming, 2006]. However, little empirical research has documented the effect of formal institutions on ICO activity across countries.

We propose in this paper that the strength of insitutions in the ICO's country of origin subsitutes for the lack of regulation and supervisory framework in the context of ICOs. Formal institutions are vital for economic exchange because they help mitigate the costs of transacting by reducing the complexity of the external environment [North, 1991]. Through institutions, governments can formulate and implement policies and regulations that promote private sector and reward risk-taking investment activities [Baygan and Freudenberg, 2000]. An early study by Nelson [1993] argues that unique country-level institutional structure guide firms' strategic activities and help determine the nature and

amount of innovation. Conseqeuntly, several studies highlight that institutional environment influences the extent and types of entrepreneurial activity that occur within a country [Aldrich and Fiol, 1994; Baumol and Strom, 2007; Busenitz, Gomez, and Spencer, 2000; Stenholm, Acs, and Wuebker, 2013]. Therefore, given the association between formal institutions and the extent of entrepreneurial activity, country-specific institutional background is likely to subsitute for the lack of reliable external signals in influencing investors' ICO investment decision. As investors associate the project's institutional context with its quality and reliability, it consequently impacts its probability of ICO success, the extent of amount raised and reduce related uncertainties.

Hypothesis 1a: Favorable institutional background of ICO projects has a significantly positive impact on ICO success, amount raised and token price volatility.

Hypothesis 1b: The impact of favorable institutional background of ICO projects on funding outcome is diminished among projects based in locations with ICO-related regulations.

3.2 Culture, formal institutions and ICOs

Here we extend the initial hypothesis by revisiting the proposition that investors respond in an equivalent manner to the assurances provided by formal institutions [Wright, Pruthi, and Lockett, 2005]. Formal institutions are embedded in different stable cultural contexts, which influences how institutional effects play out in a society [Fukuyama, 1995; Hofstede, Hofstede, and Minkov, 2010]. Prior studies have associated national culture with the level of entrepreneurial activity and entrepreneurial characteristics of individuals [Baum, Olian, Erez, Schnell, Smith, Sims, Scully, and Smith, 1993; Davidsson, 1995]. Cultures that value risk-taking and independent thinking have a greater propensity to develop radical innovation, whereas cultures that enforce conformity, group interests, and control over the future are not likely to show entrepreneurial behavior [Herbig, 1994]. Therefore, some key cultural attributes are likely to dampen the influence of institutional quality in determining the investors' perception of entrepreneurial quality, and therefore, the ICO project's reliability. Culture is deeply embedded set of shared values and beliefs, which could manifest both unconsciously and irrationally [Herbig, 1994]. As such, amidst the numerous dimensions of culture influencing various socio-economic outcomes, we are concerned with cultural attributes associated with risk taking behavior and the tendency to favor group interests, namely uncertainty avoidance and collectivism, as they are prominently linked with innovation and entrepreneurial behavior [Hayton, George, and Zahra, 2002; Mueller and Thomas, 2001; Shane, 1993].

3.2.1 Uncertainty avoidance, formal institutions and ICOs

Uncertainty avoidance is defined as the "extent to which the members of a culture feel threatened by uncertain or unknown situations" [Hofstede et al., 2010]. Societies vary significantly in their tolerance for uncertainty and ambiguous situations. People from some countries are more likely to be wary of lack of information and the inability to predict future events than others. As a result, people who are culturally apprehensive to uncertainty are likely to require a higher risk premium on risky activities compared to others, as they perceive risk-taking to be more costly. Therefore, entrepreneurial activities that are considered to be an important source of technological innovation [Schumpeter, 1934] and economic growth [Birley, 1987] are particularly wanting in societies that are reluctant to take upon activities involving high degree of uncertainty. Similarly, the high degree of uncertainty surrounding ICOs is likely to undermine the potential for ICO activity in a given country. The ICO setting, where new ventures face distant investors with distinct cultural and institutional backgrounds, is filled with uncertainty. The entrepreneurs targeting investors beyond their national boundaries are vulnerable to 'liability of foreignness' [Hymer, 1960]. Furthermore, these firms are generally new ventures, and therefore, suffer from the 'liabilities of newness' and face high failure rates [Audretsch and Mahmood, 1994]. As the transactions are conducted over the Internet, devoid of personal contact, investors are challenged to accurately assess the value of ICOs, making the returns from ICO investments highly

uncertain. Considering these specificities, there is likely to be much restrain around ICO activity in countries with high degree of uncertainty avoidance. In this manner, this apprehension to uncertainty rooted in prevailing societal culture blunts the impact of institutions in motivating confidence among the investors. Even when institutional quality are improved, the rigid cultural inclinations inhibits the effectiveness of such institutions.

Hypothesis 2a: The higher the level of uncertainty avoidance, the weaker the positive relationship between the level of formal institutional development and the level of ICO activity.

3.2.2 Collectivism, formal institutions and ICOs

Social connectedness is a prominent cultural attribute that distinguishes between societies where ties between individuals are generally loose, and those where the individuals or the members of the society are strongly connected with shared set of values and norms [Earley and Gibson, 1998; Hofstede et al., 2010]. Individualistic societies are more inclined to rely on formal contracts [Steensma et al., 2000], whereas, collectivist societies typically depend on informal connections to safeguard against opportunistic behavior [Gould, 1993; Triandis, 1993]. As such, in places with strong collectivist characteristics, despite the lack of institutional support, informal cultures may serve as solutions to exchange problems [North, 1991]. As such, individualistic and collectivist societies depend on institutional and relational mechanisms in varying degrees. Therefore, greater collectivism can mitigate individuals' reliance on formal institutions, leading to its diminished role in economic outcomes.

Furthermore, individualism–the antethesis of collectivism, is linked with the extent of entrepreneurial activity. Davidsson and Wiklund [1997] argue that cultures that promote autonomy and individual achievement have higher firm-formation rates. It is also argued that individualistic values are more favorable to strong work ethic and risk taking. As people are motivated by personal achievement rather than compliance with societal rules, in these societies innovation and entrepreneurship are more prevelant [Shane, 1993]. Furthermore, in individualistic societies, formal institutions, in the form of political, economic and contractual rules, play a central role in providing incentive structure for economic transactions. In contrast, in collectivist societies, personal goals of individuals are relegated below collective interests [Earley, 1989]. Conformity and harmony are the norm, and behavior that might be perceived as opportunistic is likely to bring shame [Steensma et al., 2000]. Thus, motivations for entrepreneurial endeavors are largely restrained in societies that are near the collectivist end of the spectrum. Therefore, in societies with greater collectivist cultural orientation, in addition to the substitution of the role of formal institutions with informal safeguards, entrepreneurial activities are relatively sparse despite the presence of supporting instituional setup. Therefore, we hypothesise as follows:

Hypothesis 2b: The higher the level of collectivism, the weaker the positive relationship between the level of formal institutional development and the level of ICO activity.

4 Data and Methodology

4.1 Sample Construction

As ICOs can circumvent centralized institutions, gathering data and conducting empirical studies on ICOs is particularly challenging. ICOs relieve ventures of the need to rely on a central authority, and therefore, ventures may directly and exclusively provide all the relevant ICO information on their websites. In addition, after the ICOs have culminated, ventures may choose to remove most of the ICO-related information from their websites to adjust to the shift in focus, which makes identifying and collecting the complete population of ICOs practically unfeasible. However, due to the emergence of third-party ICO-tracking websites, which archive information on ICOs, we are still able to gather detailed information on a large pool of ICOs. Thus, using one of the prominent ICO-listing websites, ICOBench.com, we compile the largest dataset of ICOs, consisting of over 2,000 ICOs launched

between April, 2015 and September, 2018. In support of the reliability of the website, [Amsden and Schweizer, 2018] in their empirical study on ICOs observe that ICOBench.com provides the most accurate and detailed information for the largest number of ICOs. We supplement this dataset with additional information from the website coinmarketcap.com to obtain the data on post-ICO prices of the issued tokens [Amsden and Schweizer, 2018; Howell et al., 2018].

4.2 Variable Description

4.2.1 Dependent Variables

This study focuses on two effects of the ICOs' country of origin: (i) its impact on ICO success, and (ii) its impact on the price volatility of the issued tokens, given that the ICO is successful and its token is traded in a secondary market. As discussed by Amsden and Schweizer [2018], defining ICO success is not a trivial task. Specifications of ICOs are not rigid and consistent. Therefore, popular measures of success of other types of venture capital (e.g. crowdfunding), such as successfully raising the 'goal amount' or the delivery of the promised 'reward', are not feasible in an ICO setting. For example, we find that only about 43.7% of the ICOs in our sample specify a soft-cap, i.e. a pre-set funding target.[2] Due to this lack of common measure of success based on the traditional literature, Amsden and Schweizer [2018] suggest identifying ICO success by looking at whether its tokens are subsequently traded on a secondary exchange. As all ICOs look to issue tradeable tokens, irrespective of the nature of the token, the firm or other ICO-specificities, it serves as the most suited measure of success. Therefore, we use a binary variable indicating whether the issued ICO token is eventually traded on an exchange as our main measure of success ($SUCCESS$). We follow [Adhami et al., 2018; Amsden and Schweizer, 2018; Felix, 2018; Fisch, 2019; Howell et al., 2018] and identify the successful ICOs by inspecting whether the issued tokens were listed on the coinmarketcap.com. In addition, in order to distinguish the magnitude of success, we also use the logarithm of the amount raised as a dependent variable ($AMOUNT$) [see e.g. Adhami et al., 2018; Fisch, 2019].

We also look at the impact of institutional background on the ex-post performance of the issued tokens, specifically, we examine the impact on the price volatility of the issued tokens. We use the optimal Generalized Autoregressive Conditional Heteroskedastic (GARCH) model to estimate volatility [Engle, 2001]. Previous studies on bitcoin and other prominent crypto currencies have shown the presence of long memory, leverage effect and Student t-distributions, which justifies the application of GARCH-type models [Bariviera, Basgall, Hasperué, and Naiouf, 2017; Phillip, Chan, and Peiris, 2018]. Studies have previously used different versions of GARCH models to estimate the time-varying volatility in bitcoin and other cryptocurrency data [Chu, Chan, Nadarajah, and Osterrieder, 2017; Katsiampa, 2017; Klein, Thu, and Walther, 2018]. In this paper, we take the standard GARCH model of order 1 specifying skewed Student-t distribution ($GARCH\_VOL$). Furthermore, in order to mitigate estimation bias, we only include tokens with more than 90 days of daily price data.

4.2.2 Independent Variable

Institutions

The institutional background of the ICOs (i.e. the level of institutional development in the country in which the project is based) are measured based on the World Bank Governance Indicators [Kaufmann, Kraay, and Mastruzzi, 2010].[3] It includes six distinctive aspects of institutional development, namely

[2] If the target is not met by the end of the ICO, the contributors will be automatically be reimbursed, which equivalent to the goal amount in an all-or-nothing crowdfunding.

[3] Due to the decentralized nature of blockchain, ICOs can opt out from attribution to any jurisdiction. In fact, Adhami et al. [2018] find that many ICO projects cannot be attributed to a specific country, and a significant portion (12.2% of their sample) adopt a 'decentralized governance' mechanism, i.e. project promoters cooperate online from multiple locations throughout the world without incorporating the business. Our sample excludes ICOs without specified country location.

Control of Corruption[4], Rule Of Law[5], Government Effectiveness[6], Regulatory Quality[7], Polical Stability[8], and Voice and Accountability[9]. The measure is widely used in studies relating to country-level institutional quality in a broad spectrum of areas of study (see, Chortareas, Girardone, and Ventouri [2013]; Elbahnasawy [2014]; Li and Zahra [2012]; Stephan, Uhlaner, and Stride [2015]). This measure is preferred over other measures of institutional development, as it covers a greater number of countries and is updated on a yearly basis. Furthermore, the potential for source bias is particularly low, as the index is prepared with inputs from 30 different data sources, which includes surveys of households and firms, commercial business information providers, non-governmental organizations and public sector organizations [Kaufmann et al., 2010].

We construct a unified measure of country-level institutional development in order to evaluate the impact of broader institutional development, instead of the specific institutional dimensions captured by each indicator. Given the six institutional dimensions are highly correlated, we use principal components analysis to develop the composite index [Li and Zahra, 2012]. The first principal component accounts for 82.46% of the total variance, and is calculated as follows:

$$\begin{aligned} INSTITUTION = {} & RuleOfLaw * 0.4430 + GovernmentEffectiveness * 0.4306 \\ & + ControlOfCorruption * 0.4397 + RegulatoryQuality * 0.4382 \\ & + PoliticalStability * 0.3698 + VoiceAndAccountability * 0.3102. \end{aligned} \tag{4.1}$$

Our results are consistent even when we take simple averages of the governance scores as the aggregate institution measure.

ICO-related Regulations

In relation to Hypothesis 1b, we incorporate a variable indicating the regulator status of each country in relation to ICOs. We construct a factor variable based on Pinsent Masons [2017] which groups countries based on the regulatory approach towards Bitcoins and other cryptocurrencies. The variable indicates three different regulatory statuses: i) the country has acted or is acting to regulate bitcoin (15 countries), ii) the country is does not regulate or is undecided in respect of digital currencies (45 countries), and iii) the country has introduced an outright ban on digital token sales (5 countries). The geographic distribution of these three categories of regulatory statuses is provided in figure 1.

The list offers classification for 65 jurisdictions, therefore, some of the locations in our data are not covered. The primary limitation of this variable is that it is not time-specific, such that there could be cases where regulations in consideration were introduced after the conclusion of the respective ICOs. For example, we have several ICOs which took place in countries where there now exists a ban on coin offerings. In addition, considering the novelty and rapidly evolving regulatory approach to ICOs, some of the locations' ICO regulations could have changed since their issuance.

< Insert Figure 1 about here. >

Culture

In order to operationalize cultural attributes of uncertainty avoidance and collectivism, we use GLOBE (Global Leadership & Organizational Behavior Effectiveness) Culture measures of Uncertainty Avoidance and Instituional Collectivism Values. The GLOBE is a research program founded by Robert

[4]Cost of Corruption represents perceptions of exercise of public power for private gain.

[5]Rule of Law captures perceptions of confidence and obedience of the rules of society, such as contract enforcement, property rights, etc.

[6]Government Effectiveness represents quality of policy formulation and implementation, and the quality and independence of public and civil services.

[7]Regulatory Quality represents government's ability to formulate sound policies and regulations that promote private sector development.

[8]Political Stability represents the likelihood of government destabilization by unconstitutional or violent means.

[9]The Voice and Accountability includes freedom of expression, freedom of association, and a free media.

House in 1991 to examine the interrelationships between societal culture, societal effectiveness and organizational leadership. The cultural scores are based on the responses of over 17,000 middle managers in 62 countries around the world to questions relating cultural values and practices in each country. The measure of $UNCERTAINTY\_AVAOIDANCE$ indicates 'the extent to which a society, organization, or group relies on social norms, rules, and procedures to alleviate unpredictability of future events.' Similarly, the Institutional Collectivism ($COLLECTIVISM$) indicates the extent to which 'organizational and societal institutional practices encourage and reward (and should encourage and reward) collective distribution of resources and collective action.'[10]

4.2.3 Control Variables

We include most variables commonly included in similar empirical analyses on ICOs in the literature. The control variables are selected based on the information available on ICOBench.com, coinmarketcap.com, and LinkedIn pages of the CEOs. We distinguish the controls into two categories: (i) Location Attributes, and (ii) ICO and Market Attributes.

a. Location Attributes

Tax Haven Status

The location of the venture is directly related to the taxation laws that could be applied. Besides the potential liability arising from future operations, ventures may even incur tax liabilities on the amount raised during the ICO. Due to the varied functionality of issued tokens, the legal status of issued tokens is unclear. It is difficult to ascertain whether the tokens should be treated as money, commodity or security, which consequently triggers different tax liabilities (see Enyi and Le [2017], for detailed discussion). One way for ventures to avoid these potential tax liabilities and the surrounding uncertainties is to base their ICOs in a known tax haven. Due to the diminished potential for tax liability, investors could favor ICOs based in these countries. Perhaps for this reason, we observe a notable number of ICOs that specify their locations in known tax havens, such as the Cayman Islands and Gibraltar (see Figure 1). We introduce a variable (TAX_HAVEN) indicating whether the specified location of the ICO is a tax haven based on a list of 52 tax havens prepared by Hines Jr [2010]. Amsden and Schweizer [2018] did not find any significant relationship between tax haven status of the ICO location and its outcome, however, they rely on a different list prepared by the OECD. We opt to use Hines 2010 list, as it appears to be less affected by internal biases that the OECD has been criticized for [Palan, 2009].

< Insert Figure 2 about here. >

b. ICO and Market Attributes

ICOBench Rating

Besides tracking and compiling ICO information, ICOBench.com also provides ratings for the listed ICOs. The scores are prepared using a combination of a standardized profile rating algorithm and the evaluations provided by independent experts. The algorithm uses more than 20 different criteria, and provides evaluation in terms of four different ICO attributes, namely team, ICO information, product presentation, and marketing and social media presence. Similarly, the experts evaluate the projects in terms of the strength and trustworthiness of the team, the quality of the product, a short legal review, and the vision and business strategy that the entrepreneurs provide. We incorporate the aggregate score issued by ICOBench in our analysis ($RATING$). A note of caution is that these ratings are not permanent, and are frequently re-evaluated, therefore, some of the scores obtained during our data collection, may no longer correspond with the current scores on the website.

Pre-ICO Sale

Some ICOs opt to conduct a pre-sale of tokens before the actual ICO, primarily to cover various ICO-related expenses, such as marketing and setup costs. These sales are normally coupled with bonuses

[10] see https://globeproject.com/data/GLOBE-Dimensions-Definitions-and-Scale-Items.pdf for further description

(discounted rates), and are typically targeted at large and known investors, such as hedge funds and venture capital funds. The theoretical arguments on the impact of such sales are however inconsistent. On one hand, a successful pre-ICO could lead to price discovery, help generate momentum and signal endorsement. On the other, the need for a pre-ICO to cover expenses may signal the venture's lack of financial capacity, and even introduce the risk of token dump when they are issued [Adhami et al., 2018; Amsden and Schweizer, 2018]. The recent studies on ICOs provide contradicting evidence in terms of the impact of having a pre-ICO on the subsequent ICO's success [Adhami et al., 2018; Amsden and Schweizer, 2018]. Nonetheless, we control for having a pre-ICO sale in our models through an indicator variable (PRE_ICO).

Bonus

In order to attract early-birds, token sales in both pre-sale and the main ICO could include bonuses, which are token offers at discounted prices. We include a dummy variable indicating whether such bonuses were offered in either phase of the ICO. Again, it is difficult to anticipate the impact of including such bonuses. It could be that the offer of tokens with bonuses helps generate market interest and help raise greater amounts. However, it could also incentivizes buyers to dump tokens at a premium when the bonuses are no longer applicable, thereby risking the loss of value of the issued tokens. Nonetheless, recent studies do not find any significant relationship between bonuses in ICOs and the amount raised or probability of being traded on coinmarketcap.com [Adhami et al., 2018; Amsden and Schweizer, 2018; Felix, 2018]. We thus include for the presence of a bonus ($BONUS$).

Caps Present

ICOs can specify two key thresholds in order to protect funders interest. The first is a soft cap, which indicates the minimum amount that is targeted to be raised. If the threshold is not reached before a specified deadline, the existing contributions are automatically returned to the investors. Studies by Amsden and Schweizer [2018]; Howell et al. [2018] do show that indeed having a stated goal amount does favorably influence ICO's success. Similarly, ICOs can specify a hard cap, which is the maximum amount the firm intends to raise. These upper limits are put in place to maintain scarcity, in order preserve the value of the issued tokens. Furthermore, the presence of a hard cap also helps buyers gauge the success of the ICO. We control for the impact of specifying these thresholds ($CAPS\_PRESENT$).

Ethereum Platform

Entrepreneurs can choose to develop their own blockchain, which requires greater resources and technical ability, or choose to build on an existing blockchain, such as Ethereum, NEO and Waves. Ethereum is the most popular platform, as most ICOs are managed through smart contracts, or tokens, based on ERC20 and ERC223 Token Standard Contract that run on Ethereum blockchain. In addition to the ease of implementation, adopting popular protocols such as ERC20 helps firms exhibit transparency and signal reliability. When tokens are issued on Ethereum, investors can use standard wallets, streamlining investments. Furthermore, if investors foresee Ethereum as a benchmark for ICOs in the future, tokens based on Ethereum protocol may appear more attractive to investors. Studies have found that indeed ICOs based on Ethereum platform are more likely to be successful and raise more funds [Amsden and Schweizer, 2018; Fenu, Marchesi, Marchesi, and Tonelli, 2018; Fisch, 2019]. We control for this potential favorability of tokens on Ethereum blockchain with a dummy variable ($ETHEREUM$).

Whitelist+KYC

Implementing a Whitelist and Know Your Customer (KYC) in the ICO process is an indication of regulatory compliance. As dealing with cryptocurrencies essentially allows anonymity to buyers, these compliances help ensure the identity of the buyers and mitigate the potential for illicit activities. However, there is little evidence on whether these compliances affect ICO success. In the study by Amsden and Schweizer [2018], they find no significant relationship between adherence to these

compliances and ICO's success. Nonetheless, we control for the impact of implementing at least one of these protocols ($WHITELIST\_KYC$).

Currencies Accepting

Offering investors the option to use different currencies reduces the number of steps needed to complete the investment, thereby easing the transaction process. Furthermore, it requires significant blockchain expertise for ICOs to accept numerous currencies, which may be viewed as a signal of greater technical capacity [Howell et al., 2018]. Still, exchanging capital between currencies is relatively simple and cheap, and therefore accepting more currencies may not have any significant role in the ICOs' success. In our model, we include a variable indicating the number of currencies that the ICO accepts (NUM_OF_CURR).

Fiat Accepting

We include a control variable indicating whether the ICO accepts direct fiat contributions ($FIAT$). Accepting fiat could expand the pool of investors beyond those owning cryptocurrencies. However, this could also be perceived as a lack of confidence, since it may appear as the venture does not believe in its capacity to complete the ICO with just the cryptocurrency investors [Amsden and Schweizer, 2018]. Furthermore, smart contracts cannot ensure that fiat contributions are returned if the soft cap is not reached.

Team Count

We control for the number of team members and advisors listed by the ICOs. Human capital is an crucial aspect that determines the quality of the venture and consequently the funders decision to contribute [Baum and Silverman, 2004; Zacharakis and Meyer, 2000]. The variable does not look at the individual quality, but the aggregate capacity measured by the total number of team members involved. A simple headcount ($TEAM\_COUNT$) of the team could indicate the scope of the project and its capacity to handle the ICO process and the various tasks to successfully materialize the project. Previously, studies by Amsden and Schweizer [2018] and Cerchiello, Toma, and Others [2018] indeed find significant positive relationship between the success of the ICO and the number of team members.

Average Ether Price

Ether is the second most popular cryptocurrency and has the second highest market capitalization (as of February 2019). Furthermore, considering that most ICOs are based on Ethereum blockchain, payments for tokens in ICOs are predominantly made with ether (along with bitcoin) instead of fiat currencies [Fisch, 2019][11]. Therefore, the price of the ether is likely to be influential in funders decision to contribute to ICOs. Firstly, an appreciating ether could directly affect the amount raised by ICO in terms of US dollars. Secondly, an increase in ether prices may indicate positive sentiment in the market regarding cryptocurrencies, and thereby encouraging investments on ICOs. Alternatively, increase in the price of ether could also mean an increase in opportunity cost for funders. After investing in an ICO, the funders' funds are locked in until the issued tokens are traded, or returned if the soft cap is not reached. During this period, funders forsake the potential profits from simply holding their funds in ether. We control for the average of daily ether closing prices during the days in which the ICO was active. Taking the price at the start date of the ICO, Amsden and Schweizer [2018] find a negative relationship between ether prices and the probability of the tokens being traded, we adopt a similar variable ($PRICE\_ETH$).

4.3 Descriptive Analysis

< Insert Tables 1, 2 and 3 about here. >

< Insert Figure 1, 2 annd 3 here. >

[11] Bitcoin price is not included since we observe substantial correlation between Ether and Bitcoin prices (0.76).

Table 3 provides the list of top 50 locations in terms of success rate, average amount raised and average token return volatility. We provide the summary statistics of our sample variables in Table 2. After excluding the outliers (ICOs with amount raised and volatility greater than the 99th percentile), we observe that 23.9% of ICOs eventually issue tokens which are traded in coinmarketcap.com. Furthermore, we observe that on average an ICO raises around 8 million USD. The minimum and maximum amount raised in our trimmed sample is 0 and 86.2 million USD, respectively.[12]

In our trimmed sample of 2,469 observations, we observe that 79 (3.18%) projects did not specify a location or instead indicated that the ICO was 'worldwide'. The institution variables are assigned to only those ICOs that have attributed to a specific location. Furthermore, it should be noted that the World Bank Governance Indicator scores are not available for four jurisdictions in our sample (Curaçao, Gibraltar, Isle of Man, and New Caledonia), which constitute 54 observations.[13] The aggregate institution scores range between -3.881 and 4.586, with a mean score of 2.280, which indicates that most ICOs are based in countries with higher institutional development. This can also be observed in Figure 1, which shows that ICOs are predominantly located in high income countries.

In Figure 1a, we observe that there are disproportionately high number of ICOs (28%) launched in jurisdictions that are widely known as tax havens (based on the list by Hines, 2010). Furthermore, we find that most ICOs take place in jurisdictions that are regulated (Figure 1b and 3a), primarily because the United States hosts most ICOs despite tight regulatory scrutiny on ICOs [Chohan, 2017; Kaal, 2018].[14] We also observe that ICOs are predominantly launched in high income countries, and in jurisdictions situated in Europe and Central Asia, East Asia and Pacific, and North America (Figure 2c).[15]

Furthermore, as shown in Table 2, we find that nearly half (45%) of the ICOs launched a pre-ICO sale and 43% of the ICOs offered some kind of bonus in the pre-sale or in the main ICO. Similar proportions were observed by Amsden and Schweizer [2018] and Adhami et al. [2018]. Furthermore, two-thirds (67%) of the ICOs specified either a soft or a hard cap. Strikingly, 87% of the ICOs were based on the Ethereum Blockchain. This prominence of Ethereum-based ICOs is consistent with other empirical studies ICOs [Amsden and Schweizer, 2018; Fenu et al., 2018]. Similarly, we find one-third of the observations have complied with either or both Whitelist and KYC. On average, an ICO offers almost two (1.86) currency alternatives for investors to execute the token purchase, and less than 2% of the ICOs offer purchase with fiat currency as an option. Furthermore, we find that ICOs on average have approximately twelve team members and advisors onboard. The ether prices fluctuated remarkably during our sample period, ranging from the lowest point of 1.07 USD to highest value of 1,366.77 USD. The mean of average ether price was 545.50 USD.

4.4 Multivariate Analysis

We use generalized linear models (GLM) to estimate our models. In the case of models relating to the success of ICOs, which is a dichotomous variable, we specify a binomial distribution. With regard to the models looking at the impact on the amount raised and the volatility, we specify Gamma distribution with a log-link. The latter is particularly suitable for data that are continous, non-negative, right-skewed and where variance is near-constant on the log-scale (Jong & Heller, 2008). The measures of amount pledged and volatility share these attributes. GLM models have been used in recent crowdfunding and ICO studies to assess the amount of funding raised (Anglin et al., 2018; Fisch, 2019).

[12] The data is exclusive of large ICOs, such as EOS, which raised 4.1 billion USD in June, 2018, making it the largest ICO by amount raised till date.

[13] Considering the close proximity, we assign both British and US Virgin Islands the same institution scores, as the governance scores are only available for US Virgin Islands.

[14] In July 2017, the US Securities and Exchange Commission(SEC) indicated the application of federal securities law to ICOs, given that the ICO token is deemed to be a security. Consequently, most ICOs implement restrictions preventing U.S. investor to participate to remain out of the jurisdiction of the United States government.

[15] The classifications are based on World Bank Income Group and Geographic Region classifications.

Models 1 and 2 in Table 4 provide the results for regression with dependent variables ($SUCCESS$) and ($AMOUNT$), respectively. The first logistic regression (Model 1) is performed with 2,167 observations, i.e. the number of observations with complete information for all the variables. As the data on amount raised is not available for nearly half the ICOs, the Model 2 includes only 1,106 observations. Lastly, we look at the impact on token price volatility in Model 3 based on a sample of ICOs that successfully issued its token and had price data for more than 90 days.

With respect to the control variables, we find some evidence that ICOs based in locations considered to be tax havens to be significantly more likely to be successful. However, this relationship is not robust in terms of its impact on the amount raised. In addition, our results mostly corroborate with other recent empirical studies on ICOs. The most robust results we observe are those for ICOBench rating and the average ether price. With regard to ICO success, similar to Fenu et al. [2018], we find that ICOBench rating has a highly significant positive relationship, indicating that these ratings do influence funders decision (also, that these ratings are devised with parameters that are highly relevant in funders decision making).

We obtain significant but negative coefficients for pre-ICO, bonus and caps present dummy variables, suggesting that having a pre-ICO sale, offering bonuses and specifying either soft or hard caps are rather detrimental to the ICO's outcome. Similar to the findings ofAmsden and Schweizer [2018] and Cerchiello et al. [2018], we also observe a positive relationship between team size and ICO success. In addition, the results suggest that there is a negative relationship between the number of currency choices offered to investors and its success. We find that the dollar amount raised is positively associated with the contemporaneous ether prices. However, with respect to volatility, we find that only average ether prices during the ICO has a significantly negative impact on the price volatility. The most of the estimates for various control variables are consistent between Model 1 and 2, but in relation to volatility, most variables seem to be insignificant.

< Insert Table 4 about here. >

Hypothesis 1 suggests that better institutional conditions in the home country of ICO project is positively related to ICO performance and lesser uncertainty reflected in the token price. The regression results in Table 4 show that there is indeed a strong and significant relationship between institutional background of the ICO's country of origin ($INSTITUTION$) and their outcome, in terms of both the probability of being traded in a secondary market ($SUCCESS$) and the amount raised ($AMOUNT$) [p-value: <0.01]. In order to interpret the results, we calculate the increase in the outcome variable due to a marginal increase of 1 unit of institution measure from the mean institution score of 2.28, while holding the continuous control variables constant at mean, and the dummy variables at 1. From model 1, we observe that an increase of aggregate institution score by 1 unit is associated with an increase in the probability of ICO success increases by 0.8% [Model 1: b = 0.1]. Similarly, we find that an increase of aggregate institution score by one unit from the mean institution score appreciates the amount raised by approximately 700,000 USD [Model 2: b = 0.068]. Furthemore, our results suggest that an increase of institution score by one unit from the mean reduces the volatility -0.045 [Model 3: b = -0.125, p-value = < 0.05]. The results indicate that there is indeed a negative relationship between the institutional background of the jurisdiction in which the ICO is launched and the consequent volatility in the price of issued token, given the tokens are traded in a secondary market.

< Insert Table 5 about here. >

With relation to hypothesis 1b, we conduct a split-sample analysis, investigating the difference in the relationship between institutional background and ICO outcome between ICOs launched in countries with and without specific ICO-related regulation. Table 5 provides the two sets of results in Panels A and B. In Panel A, we observe that among ICOs launched by projects based in countries without related regulations, institutional background still appears to have a role on the ICO's success

and token price volatility. We find significant positive relationship between institutional quality and the probablity of ICO success [p-value: <0.1], and furthermore, observe a negative relationship in relation to the price volatility of the token issued [p-value: <0.05] Moreover, as per the hypothesis, we observe that this relationship is insignificant among ICOs in regulated markets, suggesting that there is a disparity in how institional background is perceived based on the status of the ico-related regulations.

< Insert Table 6 about here. >

Similarly, with respect to hypotheses 2a and 2b relating to the moderating roles of cultural dimensions of uncertainty avoidance and collectivism, we find some supporting evidence. We observe significant negative coefficients [p-value: <0.01] for both variables in relation to the amount raised in the ICOs, indicating that high degree of uncertainty avoidance or collectivism in a society attenuates the effect of institutions in shaping ICO investors' perception. However, we do not observe such interactions with relation to the probability of ICO success and token price volatility.

4.5 Robustness checks

We further incorporate additional robustness checks to validate our findings, as shown in Tables 7, 8, 9 and 10. Here, we use alternative measures of institutional development and price volatility, and investigate whether the impact of institution holds even if we remove the US-based ICOs, which accounts for 17% of the observations, from our sample.

< Insert Table 7 and 8 about here. >

In Tables 7 and 8, we use alternative measures of instituional development based on Corruption Perception Index (CPI) (2018) and composite measure of institutional dimensions from La Porta et al. (1998). CPI scores represent the perceived levels of public sector corruption according to experts and businesspeople in a scale from 0 to 100, 0 being the most corrupt. Secondly, we employ the dimensions identified by La Porta et al. (1998): (i) an anti-director rights index, (ii) an index for the rule of law, (ii) an index for the level of corruption, and (iv) an index of the legal system's efficiency, and take the first principal component to create a unified measure. As shown in Tables 7 and 8. Our results are still signficant in almost all the models, consistently highlighting a positive relationship between institutional background and the success of the ICO and amount raised, and a negative realtionship with regards to the token price volatility.

< Insert Table 9 about here. >

We also investigate if our results hold for alternative measures of token price volatility. The literature provides various alternative measures of volatility based on the nature of data, therefore, we look at two alternative measures of volatility. First, we simply take the standard deviation of the daily returns (STD_RET), which is measured by taking the log differences in daily token price series, a method commonly used in measuring volatility of commodity prices [Fleming and Ostdiek, 1999; Regnier, 2007; Slade, 1991]. Second, we use realized volatility, ($REAL\_VOL$), which is computed as the sum of squared returns. It was introduced by Andersen and Bollerslev [1998], arguing that under appropriate conditions it is an unbiased and highly efficient estimator of volatility [Andersen, Bollerslev, Diebold, and Labys, 2003; Barndorff-Nielsen and Shephard, 2002]. As shown in Table 19, our results with regards to the relationship between institutional background and price volatility is consistently and significantly negative, providing further support for our main findings. The estimated coefficients for both the measures are significant at 5% level.

< Insert Table 10 about here. >

Furthermore, as 17% of the ICOs in our sample were launched in the United States, in order to mitigate the bias that might have on our results, we conduct our analyses with a sample excluding ICOs based in the United States. Our findings are still significant and the signs remain consistent even after these observations are removed. However, we observe that the significance level of the results decrease to 5% and 10% for models 1 and 2.

5 Conclusion

Using a sample of about 2000 ICOs, we provide evidence of a heterogeneity in ICO success and performance across countries. More specifically, building on the generally weak regulations concerning cryptocurrencies and ICOs, our findings indicate that ICOs located in countries with a stronger institutional framework raise more capital during their coin offerings, have a higher likelihood of becoming a traded token, and enjoy substantially lower token price volatility. We interpret these results as being consistent with formal institutions reducing investors' mistrust, and confirm our reasoning by showing that this effect is especially prevalent for countries where ICOs are completely unregulated activities. We find that this importance of institutions remains robust for alternative dimension and specifications.

Although formal institutions engender trust with investors, we further show that this relationship is contingent on the national culture of the home country. More specifically, our results suggest that the institutions provide lower explanatory power in terms of ICO success as cultures become more trustworthy. These findings not only confirm that formal and informal institution play a direct role in shaping investors' perceptions of trust, but they also are likely to behave as substitutes, that is strong institutions have a lower impact in building trust with investors for ICOs in countries with national cultures that furnish trustworthiness.

Altogether, the bottomline of our results suggest that the heterogeneity in ICO success across the world can be explained by investors relying on alternative cues to infer trust and assess the riskiness associated with initial coin offerings.

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Table 1: Variable Definition

Dependent Variables	
$SUCCESS$	Success is a binary variable indicating if the token is eventually traded on a currency exchange.
$AMOUNT(ln)$	The natural logarithm of the amount raised during the coin offering period. We take the log of the pledged amount to account for the exponential path that amount pledged to campaigns have been observed to take.
$GARCH\_VOL$	The ex-post performance of the issued coin measured with return volatility based on GARCH model of order 1 specifying skewed Student-t distribution.
Independent Variables	
$INSTITUTION$	The institutional strength of the ICO project's location country. The variable is a principal component-based aggregated measure that uses six World Bank Governance Indicators.
$ICO\_REG(Regulated)$	Dummy variable indicating whether an ICO-related regulation is present in the ICO project's location.
$UNCERTAINTY\_AVOIDANCE$	The measure of cultural dimension of uncertainty avoidance based on Global Leadership & Organizational Behavior Effectiveness $GLOBE$ culture scores 2004. The score indicates the extent to which the people from a country rely on social norms, rules, and procedures to alleviate unpredictability of future events.
$INSTITUTIONAL\_COLLECTIVISM$	The measure of cultural dimension of institutional collectivism based on Global Leadership & Organizational Behavior Effectiveness $GLOBE$ culture scores, which indicates the predilection towards collective distribution of resources and collective action in organizational settings.
Control Variables	
TAX_HAVEN	Dummy variable indicating whether or not the country is located in a tax haven (as per Hines (2010)).
$RATING$	Aggregated score assigned to the ICO by experts from icobench.com.
PRE_ICO	Dummy variable indicating whether a pre-ICO sale is conducted.
$BONUS$	Dummy variable indicating whether bonuses are offered during the ICO.
$CAPS\_PRESENT$	Dummy variable indicating whether the a soft and/or a hard cap is specified.
$ETHEREUM$	Dummy variable indicating whether the underlying blockchain of the project is built on the Ethereum platform.
$WHITELIST\_KYC$	Dummy variable indicating whether the ICO implements Whitelisting and Know Your Customer (KYC) processes.
NUM_OF_CURR	The number of types of fiat and crypto currencies that the ICO accepts.
$FIAT$	Dummy variable indicating whether the ICO accepts fiat currencies.
$TEAM\_COUNT$	The number of members in the team behind the ICO.
$PRICE\_ETH$	The average price of Ether during the ICO.

Table 2: Descriptive Statistics

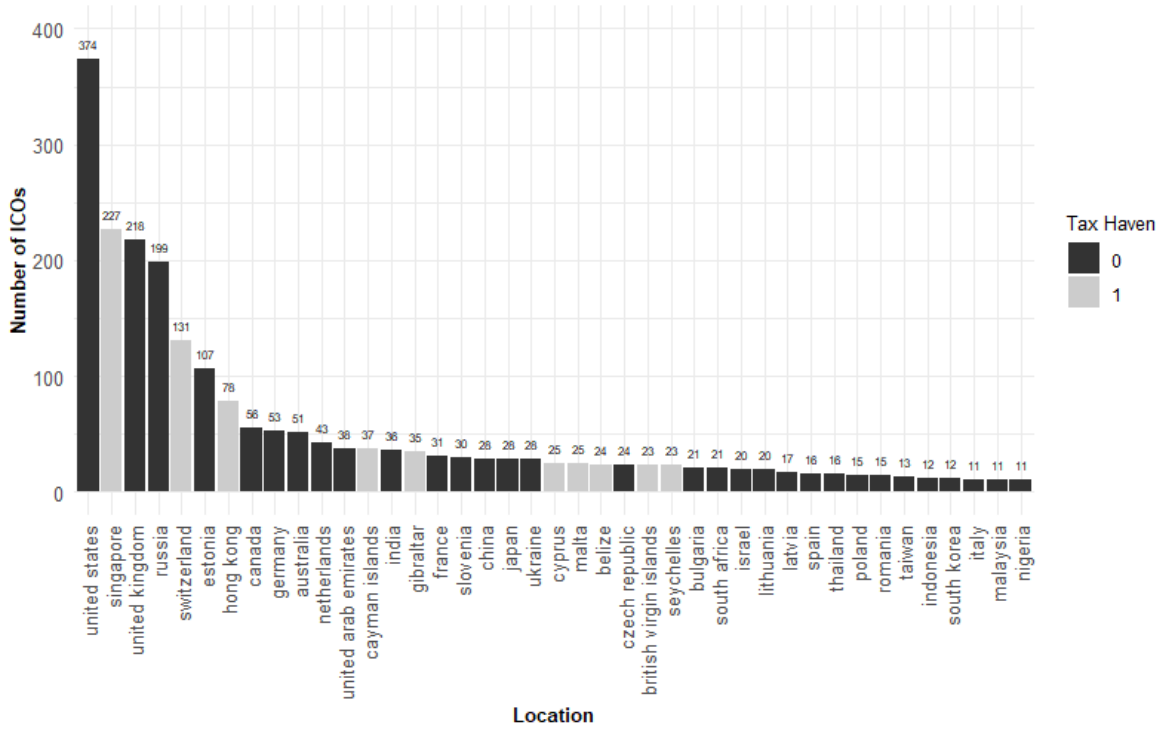
	N	Mean	Med	Std	Min	Max
Dependent Variables						
$SUCCESS$	2,469	0.24	0	0.42	0	1
$AMOUNT$	2,469	4,868,033.000	0	9,855,626.000	0	71,600,000
$SD\_RETURNS$	580	0.142	0.116	0.069	0.067	0.442
Independent Variables						
$INSTITUTIONS$	2,336	2.280	3.153	1.948	-3.881	4.586
$UNCERTAINTY\_AVOIDANCE$	1,830	4.368	4.320	0.717	2.880	5.370
$COLLECTIVISM$	1,830	4.340	4.270	0.336	3.250	5.220
Control Variables						
TAX_HAVEN	2,469	0.28	0	0.45	0	1
$RATING$	2,469	2.949	2.900	0.766	0.700	4.800
PRE_ICO	2,469	0.45	0	0.50	0	1
$BONUS$	2,469	0.43	0	0.50	0	1
$CAPS\_PRESENT$	2,469	0.67	1	0.47	0	1
$ETHEREUM$	2,469	0.87	1	0.33	0	1
$WHITELIST\_KYC$	2,469	0.36	0	0.48	0	1
NUM_OF_CURR	2,469	1.86	1	1.48	1	13
$FIAT$	2,509	0.02	0	0.13	0	1
$TEAM\_COUNT$	2,260	12.20	11.00	7.52	1.00	67.00
$PRICE\_ETH$	2,469	545.50	548.28	227.30	1.07	1,366.77

Table 3: ICO locations based on Success Rate, Average Volatility and Amount Raised

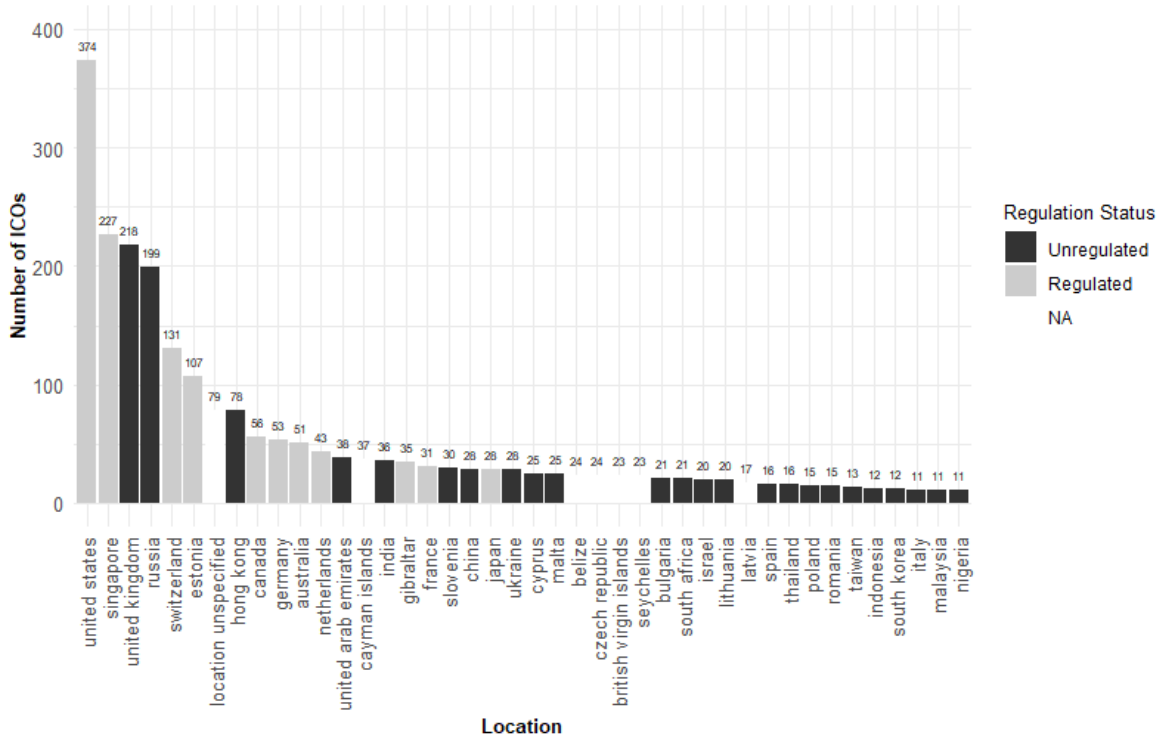
Panel A		Panel B		Panel C	
Location	% Successful	Location	$\overline{AmountRaised}$	Location	$\overline{Volatility}$
Armenia	1.00	Slovakia	37,378,158.00	St. Vincent and the Grenadines	0.65
St. Vincent and the Grenadines	1.00	British Virgin Islands	26,005,433.66	Latvia	0.50
Costa Rica	0.57	Cayman Islands	24,125,877.14	Nigeria	0.36
Argentina	0.50	United States	19,146,090.22	Armenia	0.34
China	0.50	New Zealand	18,884,693.80	Turkey	0.25
Finland	0.50	Samoa	16,456,000.00	India	0.25
Lithuania	0.50	Lithuania	15,978,704.98	Panama	0.24
St. Kitts and Nevis	0.43	Malaysia	15,306,791.82	Mexico	0.24
Liechtenstein	0.40	Colombia	13,483,880.00	Czech Republic	0.23
New Zealand	0.40	China	12,215,572.28	Belarus	0.23
Singapore	0.37	Switzerland	12,171,794.48	United Arab Emirates	0.22
Slovenia	0.37	Bahamas	11,118,144.50	Finland	0.20
Malaysia	0.36	Israel	10,857,872.78	Luxembourg	0.20
Switzerland	0.36	Gibraltar	10,571,673.46	Ukraine	0.19
Cayman Islands	0.35	Argentina	10,050,000.00	Spain	0.19
British Virgin Islands	0.35	Isle of Man	9,306,070.71	Colombia	0.19
Gibraltar	0.34	Japan	8,888,519.86	Romania	0.18
Colombia	0.33	Singapore	7,904,969.86	Bulgaria	0.17
South Korea	0.33	Romania	7,677,122.80	Australia	0.17
Romania	0.33	Afghanistan	7,000,000.00	Belize	0.17
France	0.32	Hong Kong	6,991,182.90	Netherlands	0.17
Japan	0.32	Cyprus	6,758,977.20	Location Unspecified	0.17
Malta	0.32	Canada	6,748,227.10	Seychelles	0.17
Spain	0.31	Mexico	6,334,018.38	Japan	0.17
Austria	0.30	Spain	6,236,628.03	Liechtenstein	0.16
United States	0.28	Thailand	5,951,454.31	Hong Kong	0.16
Hong Kong	0.27	Estonia	5,553,611.76	Mauritius	0.15
Bahamas	0.25	Liechtenstein	5,540,000.00	Canada	0.15
Cambodia	0.25	Malta	5,495,384.13	Malaysia	0.15
Marshall Islands	0.25	Germany	5,427,800.77	Malta	0.15
Mauritius	0.25	United Kingdom	5,129,789.15	United Kingdom	0.15
Mexico	0.25	Austria	5,085,212.30	Switzerland	0.15
Cyprus	0.24	France	4,992,190.97	Cayman Islands	0.14
Seychelles	0.22	Luxembourg	4,782,439.64	Russia	0.14
United Kingdom	0.22	Slovenia	4,775,909.74	United States	0.14
Belize	0.21	Laos	4,769,155.00	Singapore	0.14
Czech Republic	0.21	Belize	4,368,499.29	Lithuania	0.14
Belarus	0.20	Seychelles	4,275,147.87	China	0.13
Israel	0.20	Tanzania	4,274,582.00	Gibraltar	0.13
Panama	0.20	Poland	4,167,916.98	Italy	0.13
Sweden	0.20	South Africa	4,139,077.25	Taiwan	0.13
Canada	0.20	India	3,842,579.49	New Zealand	0.13
Australia	0.20	St. Kitts and Nevis	3,840,714.29	Marshall Islands	0.13
Bulgaria	0.19	Australia	3,341,439.48	Cambodia	0.13
Location Unspecified	0.19	South Korea	3,242,691.83	Germany	0.13
Germany	0.19	Marshall Islands	3,203,387.75	Austria	0.12
Netherlands	0.19	Costa Rica	3,197,668.86	Cyprus	0.12
Russia	0.18	Russia	3,024,603.70	St. Kitts and Nevis	0.12
Indonesia	0.17	Finland	3,000,000.00	South Africa	0.12
Estonia	0.16	United Arab Emirates	2,791,416.63	Argentina	0.12

Note: Panels A, B and C present three lists of top 50 locations in terms of ICO Success Rate, Average Amount Raised and Average Token Price Volatility measured in terms of standard deviation of the daily returns.

Figure 1: Country-specific ICO destribution



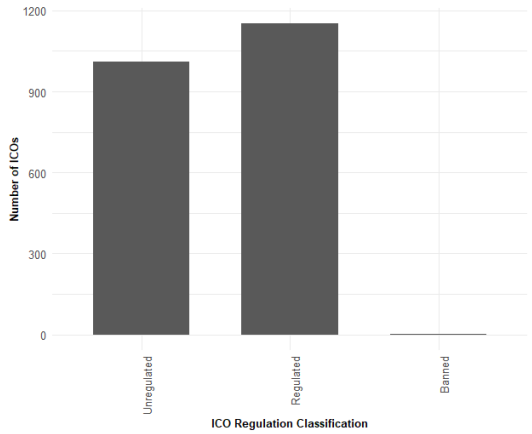
(a) Number of ICOs per location and Tax Haven status



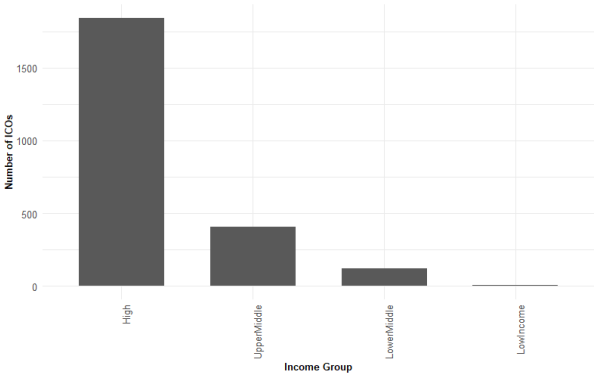
(b) Number of ICOs per location and Regulation status

Note: The tax havens are identified based on a list prepared by Hines (2010). The regulation classification is based on Pinsent Masons (2015).

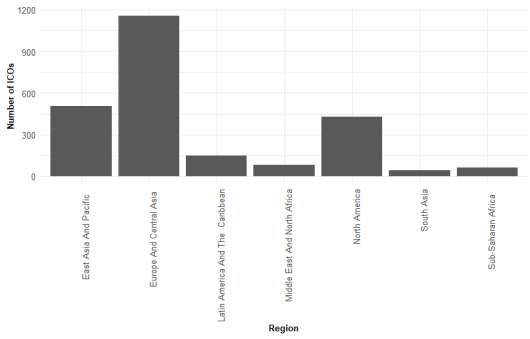
Figure 2: ICO classifications



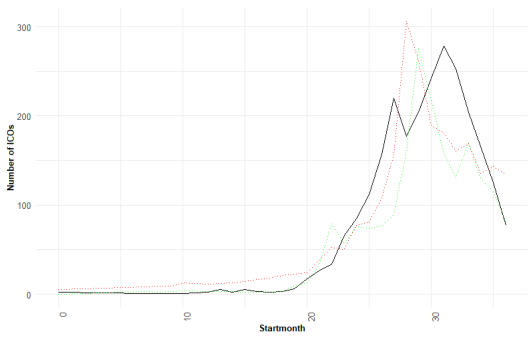
(a) Number of ICOs by ICO Regulation Classification



(b) Number of ICOs by Income Group



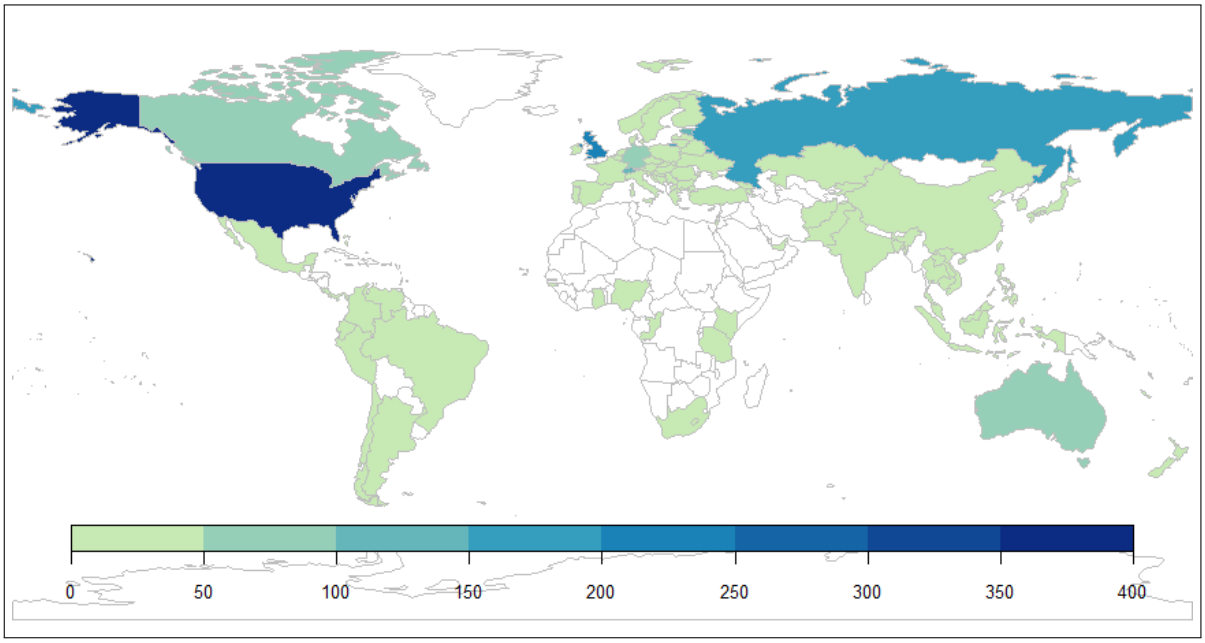
(c) Number of ICOs by Region



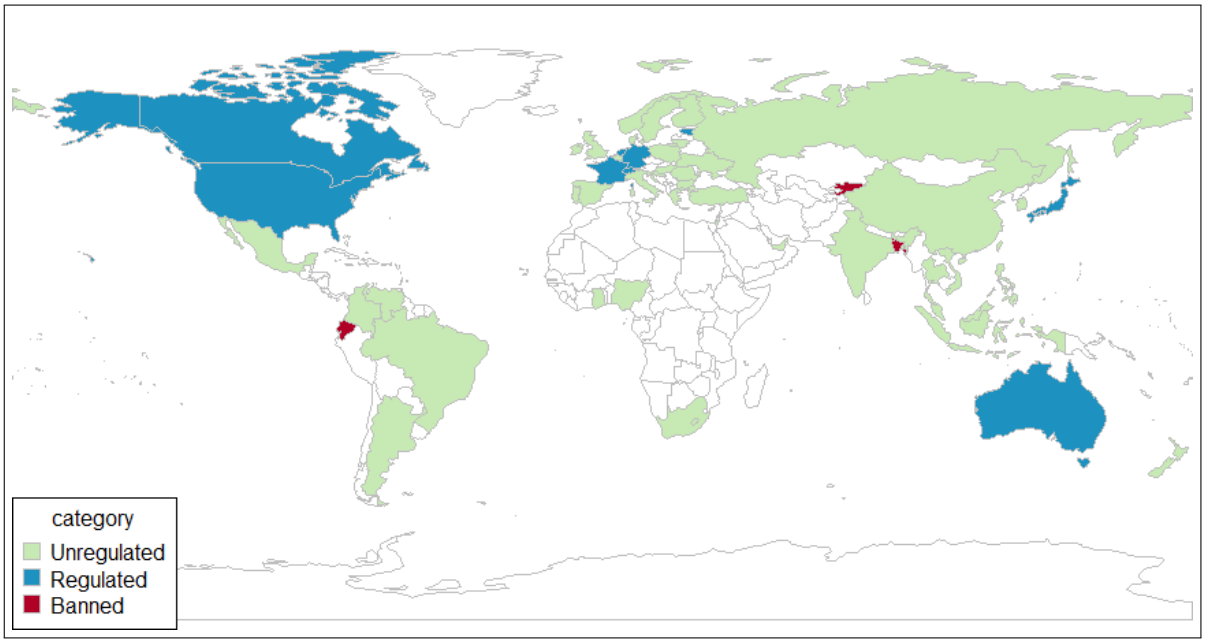
(d) Number of ICOs by launched every month

Note: (a) Based on the classification of 65 countries by Pinsent Masons (2017). n=2,167 (b) Based on World Bank income group classification. n=2,375 (c) Based on World Bank region classification. n=2,430 (d) Number of ICOs launched every month between Aug, 2015 and Aug, 2018, juxtaposed against fluctuations in price of Bitcoin and Ether. n=2,477

Figure 3: Country-specific ICO destribution



(a) Number of ICOs by Country



(b) Regulation Status of ICOs by Country

Table 4: Impact of Institutional Background on ICO Outcome

	Dependent variable:		
	Success (Traded)	*Amount Raised (log)*	*GARCH Vol*
	GLM (Binomial)	GLM (Log Gamma)	GLM (Log Gamma)
	(1)	(2)	(3)
Independent Variables			
$INSTITUTIONS$	$\mathbf{0.100}^{***}$	$\mathbf{0.068}^{***}$	$\mathbf{-0.125}^{**}$
	(0.032)	(0.021)	(0.050)
Control Variable: Location Attribute			
TAX_HAVEN	$\mathbf{0.327}^{***}$	0.024	0.218
	(0.126)	(0.089)	(0.185)
Control Variables: ICO and Market Attributes			
$RATING$	$\mathbf{1.345}^{***}$	$\mathbf{0.261}^{***}$	-0.149
	(0.106)	(0.071)	(0.163)
PRE_ICO	$\mathbf{-0.446}^{***}$	$\mathbf{-0.142}^{*}$	0.117
	(0.118)	(0.083)	(0.181)
$BONUS$	$\mathbf{-0.527}^{***}$	$\mathbf{-0.142}^{*}$	0.215
	(0.118)	(0.081)	(0.179)
$CAPS\_PRESENT$	$\mathbf{-0.307}^{**}$	-0.106	-0.077
	(0.131)	(0.095)	(0.205)
$ETHEREUM$	-0.030	0.133	-0.270
	(0.184)	(0.121)	(0.278)
$WHITELIST$	$\mathbf{-0.986}^{***}$	$\mathbf{-0.174}^{**}$	$\mathbf{0.355}^{*}$
	(0.132)	(0.088)	(0.195)
$NUM\_OF\_CURRENCY$	$\mathbf{-0.110}^{***}$	-0.006	0.045
	(0.042)	(0.025)	(0.059)
$FIAT$	0.208	$\mathbf{0.492}^{*}$	-0.859
	(0.403)	(0.263)	(0.613)
$TEAM\_COUNT$	$\mathbf{0.041}^{***}$	$\mathbf{0.021}^{***}$	0.007
	(0.008)	(0.006)	(0.010)
$PRICE\_ETHER$	0.000	$\mathbf{0.001}^{***}$	$\mathbf{-0.001}^{*}$
	(0.000)	(0.000)	(0.000)
(Intercept)	$\mathbf{-5.069}^{***}$	$\mathbf{14.491}^{***}$	0.184
	(0.366)	(0.228)	(0.546)
Num. obs.	2167	1106	527
Log Likelihood	-1012.678	-18816.479	-35.148

Note: This table presents the results for models investigating the impact of Institutional Background on ICO Success, Amount Raised and Token Price Volatility, in models (1), (2) and (3), respectively. *, ** and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, based on a two-sided t-test.

Table 5: Distinction in Impact of Institutional Background based on ICO Regulation Status

	Dependent variable:					
	Panel A: Unregulated			*Panel B: Regulated*		
	Success (Traded)	*Amount Raised*	*GARCH Vol*	*Success (Traded)*	*Amount Raised*	*GARCH Vol*
	GLM (Binomial)	GLM (Log Gamma)	GLM (Log Gamma)	GLM (Binomial)	GLM (Log Gamma)	GLM (Log Gamma)
	(1)	(2)	(3)	(4)	(5)	(6)
Independent Variables						
INSTITUTIONS	**0.081***	**0.123*****	**−0.144****	−0.024	−0.164	−0.141
	(0.046)	(0.043)	(0.072)	(0.240)	(0.162)	(0.359)
Control Variables: Location Attribute						
TAX_HAVEN	0.204	−0.140	0.302	**0.451***	0.157	0.224
	(0.259)	(0.241)	(0.379)	(0.263)	(0.180)	(0.385)
Control Variables: ICO and Market Attributes						
RATING	**1.402*****	0.189	−0.365	**1.387*****	**0.486*****	−0.189
	(0.176)	(0.152)	(0.257)	(0.152)	(0.097)	(0.224)
PRE_ICO	**−0.375****	−0.105	−0.041	**−0.565*****	−0.115	0.402
	(0.184)	(0.179)	(0.287)	(0.172)	(0.110)	(0.251)
BONUS	−0.256	−0.067	0.312	**−0.750*****	**−0.293*****	0.003
	(0.184)	(0.176)	(0.292)	(0.175)	(0.112)	(0.250)
CAPS_PRESENT	−0.272	−0.124	0.064	**−0.335***	−0.151	−0.125
	(0.211)	(0.204)	(0.335)	(0.188)	(0.128)	(0.268)
ETHEREUM	−0.366	0.171	−0.432	0.309	0.155	0.350
	(0.276)	(0.253)	(0.395)	(0.280)	(0.167)	(0.414)
WHITELIST	**−0.907*****	−0.307	**0.672****	**−0.988*****	**−0.262****	0.176
	(0.219)	(0.194)	(0.329)	(0.184)	(0.118)	(0.256)
NUM_OF_CURRENCY	−0.075	0.035	0.015	**−0.138****	−0.012	0.066
	(0.060)	(0.051)	(0.088)	(0.062)	(0.032)	(0.080)
FIAT	−0.498	0.092	0.408	0.676	**0.791****	**−1.793****
	(0.824)	(0.596)	(1.303)	(0.520)	(0.340)	(0.737)
TEAM_COUNT	**0.037*****	**0.080*****	0.003	**0.040*****	0.008	0.019
	(0.014)	(0.013)	(0.020)	(0.011)	(0.007)	(0.013)
PRICE_ETHER	**−0.001****	**0.001****	−0.000	0.000	**0.001*****	**−0.001****
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)
(Intercept)	**−4.636*****	**12.785*****	0.750	**−5.090*****	**14.878*****	−0.231
	(0.553)	(0.455)	(0.804)	(0.986)	(0.648)	(1.444)
Num. obs.	936	462	194	994	518	281
Log Likelihood	-409.043	-7791.545	-31.199	-488.586	-8886.235	19.768

Note: This table presents the results for models investigating the impact of Institutional Background on ICO Success, Amount Raised and Token Price Volatility in two seperate samples of ICOs based in unregulated jurisdictions and those based in regulated jurisdictions. Models (1), (2) and (3) in Panel A provide the results for the former, and models (4), (5) and (6) in Panel B for the latter. *, ** and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, based on a two-sided t-test.

Table 6: Impact of Institutional Background and Culture on ICO Outcome

	Dependent variable:					
	Success (Traded)	*Amount Raised*	*GARCH Vol*	*Success (Traded)*	*Amount Raised*	*GARCH Vol*
	GLM (Binomial)	GLM (Log Gamma)	GLM (Log Gamma)	GLM (Binomial)	GLM (Log Gamma)	GLM (Log Gamma)
	(1)	(2)	(3)	(4)	(5)	(6)
Independent Variables						
$INSTITUTIONS$	$\mathbf{0.376}^{*}$	$\mathbf{0.462}^{***}$	-0.037	0.601	$\mathbf{1.002}^{***}$	0.406
	(0.202)	(0.133)	(0.299)	(0.444)	(0.306)	(0.729)
$UNCERTAINTY\_AVOIDANCE$	0.228	$\mathbf{0.322}^{***}$	0.223			
	(0.179)	(0.112)	(0.250)			
$UNCERTAINTY\_AVOIDANCE : INSTITUTIONS$	-0.081	$\mathbf{-0.110}^{***}$	-0.036			
	(0.051)	(0.033)	(0.074)			
$COLLECTIVISM$				-0.097	$\mathbf{0.342}^{**}$	0.243
				(0.224)	(0.152)	(0.373)
$INSTITUTION : COLLECTIVISM$				-0.120	$\mathbf{-0.220}^{***}$	-0.129
				(0.104)	(0.072)	(0.172)
Control Variables: Location Attribute						
TAX_HAVEN	$\mathbf{0.411}^{**}$	0.140	0.121	$\mathbf{0.440}^{**}$	0.136	0.219
	(0.208)	(0.143)	(0.315)	(0.191)	(0.132)	(0.287)
Control Variables: ICO and Market Attributes						
$RATING$	$\mathbf{1.454}^{***}$	$\mathbf{0.339}^{***}$	-0.292	$\mathbf{1.462}^{***}$	$\mathbf{0.345}^{***}$	-0.289
	(0.122)	(0.078)	(0.183)	(0.122)	(0.079)	(0.184)
PRE_ICO	$\mathbf{-0.457}^{***}$	-0.093	0.329	$\mathbf{-0.455}^{***}$	-0.099	0.336
	(0.134)	(0.092)	(0.205)	(0.134)	(0.093)	(0.204)
$BONUS$	$\mathbf{-0.587}^{***}$	$\mathbf{-0.152}^{*}$	0.238	$\mathbf{-0.581}^{***}$	-0.150	0.232
	(0.136)	(0.092)	(0.203)	(0.136)	(0.092)	(0.203)
$CAPS\_PRESENT$	$\mathbf{-0.280}^{*}$	-0.131	-0.065	$\mathbf{-0.285}^{*}$	-0.125	-0.071
	(0.148)	(0.104)	(0.226)	(0.147)	(0.105)	(0.227)
$ETHEREUM$	-0.093	0.161	-0.202	-0.103	0.138	-0.201
	(0.203)	(0.131)	(0.300)	(0.203)	(0.133)	(0.298)
$WHITELIST$	$\mathbf{-0.977}^{***}$	$\mathbf{-0.268}^{***}$	0.340	$\mathbf{-0.960}^{***}$	$\mathbf{-0.247}^{**}$	0.332
	(0.151)	(0.100)	(0.222)	(0.151)	(0.101)	(0.220)
$NUM\_0F\_CURRENCY$	$\mathbf{-0.131}^{***}$	0.024	0.016	$\mathbf{-0.137}^{***}$	0.015	0.014
	(0.050)	(0.030)	(0.069)	(0.050)	(0.030)	(0.069)
$FIAT$	0.250	$\mathbf{0.673}^{**}$	-0.718	0.254	$\mathbf{0.651}^{**}$	-0.717
	(0.436)	(0.272)	(0.655)	(0.437)	(0.275)	(0.653)
$TEAM$	$\mathbf{0.040}^{***}$	$\mathbf{0.024}^{***}$	0.019	$\mathbf{0.039}^{***}$	$\mathbf{0.023}^{***}$	0.019
	(0.009)	(0.006)	(0.012)	(0.009)	(0.006)	(0.012)
$PRICE\_ETHER$	-0.000	$\mathbf{0.001}^{***}$	-0.001	-0.000	$\mathbf{0.001}^{***}$	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
(Intercept)	$\mathbf{-5.882}^{***}$	$\mathbf{13.147}^{***}$	-0.424	$\mathbf{-4.681}^{***}$	$\mathbf{12.862}^{***}$	-0.656
	(0.769)	(0.480)	(1.134)	(1.040)	(0.705)	(1.712)
Num. obs.	1688	844	431	1688	844	431
Log Likelihood	-793.513	-14370.972	-20.842	-793.891	-14373.673	-20.968

Note: This table presents the results for models investigating the moderating effects of cultural variables, i) uncertainty avoidance and ii) collectivism, on the impact of Institutional Background on ICO Success, Amount Raised and Token Price Volatility. Models (1), (2) and (3) incorporate uncertain avoidance measure in the analyses and models (4), (5) and (6) incorporate collectivism in the analyses. *, ** and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, based on a two-sided t-test.

Table 7: Robustness Test: Using Corruption Perception Index measure of Institutional Background

	Dependent variable:		
	Success (Traded)	*Amount Raised (log)*	*GARCH Vol*
	GLM (Binomial)	GLM (Log Gamma)	GLM (log Gamma)
	(1)	(2)	(3)
Independent Variables			
$INSTITUION(CPIIndex)$	$\mathbf{0.009}^{**}$	$\mathbf{0.007}^{***}$	$\mathbf{-0.015}^{***}$
	(0.003)	(0.002)	(0.005)
Control Variables: Location Attribute			
TAX_HAVEN	$\mathbf{0.342}^{**}$	0.001	0.273
	(0.137)	(0.098)	(0.201)
Control Variables: ICO and Market Attributes			
$RATING$	$\mathbf{1.339}^{***}$	$\mathbf{0.274}^{***}$	-0.156
	(0.109)	(0.073)	(0.168)
PRE_ICO	$\mathbf{-0.444}^{***}$	$\mathbf{-0.163}^{*}$	0.162
	(0.120)	(0.086)	(0.185)
$BONUS$	$\mathbf{-0.558}^{***}$	-0.128	0.242
	(0.121)	(0.084)	(0.184)
$CAPS\_PRESENT$	$\mathbf{-0.342}^{**}$	-0.117	-0.114
	(0.134)	(0.098)	(0.207)
$ETHEREUM$	0.007	0.153	-0.268
	(0.188)	(0.125)	(0.282)
$WHITELIST$	$\mathbf{-0.956}^{***}$	$\mathbf{-0.182}^{**}$	0.274
	(0.136)	(0.092)	(0.201)
$NUM\_OF\_CURRENCY$	$\mathbf{-0.110}^{***}$	-0.007	0.041
	(0.042)	(0.025)	(0.059)
$FIAT$	0.335	$\mathbf{0.510}^{*}$	-0.858
	(0.408)	(0.266)	(0.612)
$TEAM\_COUNT$	$\mathbf{0.041}^{***}$	$\mathbf{0.022}^{***}$	0.008
	(0.008)	(0.006)	(0.011)
$PRICE\_ETHER$	-0.000	$\mathbf{0.001}^{***}$	-0.001
	(0.000)	(0.000)	(0.000)
(Intercept)	$\mathbf{-5.364}^{***}$	$\mathbf{14.180}^{***}$	0.824
	(0.425)	(0.268)	(0.632)
Num. obs.	2078	1050	500
Log Likelihood	-966.882	-17850.702	-38.293

Note: *, ** and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, based on a two-sided t-test.

Table 8: Robustness Test: Using La Porta (2001) measure of Institutional Background

	Dependent variable:		
	Success (Traded)	*Amount Raised (log)*	*GARCH Vol*
	GLM (Binomial)	GLM (Log Gamma)	GLM (log Gamma)
	(1)	(2)	(3)
Independent Variables			
$INSTITUTIONS(LaPorta)$	$\mathbf{0.201}^{**}$	0.038	$\mathbf{-0.296}^{**}$
	(0.080)	(0.053)	(0.126)
Control Variables: Location Attributes			
TAX_HAVEN	$\mathbf{0.359}^{**}$	0.003	0.007
	(0.149)	(0.100)	(0.208)
Control Variables: ICO and Market Attributes			
$RATING$	$\mathbf{1.443}^{***}$	$\mathbf{0.327}^{***}$	-0.234
	(0.131)	(0.083)	(0.195)
PRE_ICO	$\mathbf{-0.485}^{***}$	-0.028	$\mathbf{0.386}^{*}$
	(0.146)	(0.100)	(0.217)
$BONUS$	$\mathbf{-0.502}^{***}$	-0.153	0.300
	(0.148)	(0.101)	(0.216)
$CAPS\_PRESENT$	$\mathbf{-0.335}^{**}$	$\mathbf{-0.192}^{*}$	-0.126
	(0.161)	(0.113)	(0.240)
$ETHEREUM$	-0.053	0.160	-0.004
	(0.224)	(0.143)	(0.327)
$WHITELIST$	$\mathbf{-1.001}^{***}$	$\mathbf{-0.210}^{**}$	0.282
	(0.161)	(0.105)	(0.229)
$NUM\_OF\_CURRENCY$	$\mathbf{-0.132}^{**}$	0.025	-0.022
	(0.056)	(0.034)	(0.077)
$FIAT$	0.243	0.447	$\mathbf{-1.906}^{***}$
	(0.464)	(0.291)	(0.691)
$TEAM\_COUNT$	$\mathbf{0.041}^{***}$	$\mathbf{0.023}^{***}$	0.020
	(0.010)	(0.007)	(0.012)
$PRICE\_ETHER$	0.000	$\mathbf{0.001}^{***}$	-0.001
	(0.000)	(0.000)	(0.000)
(Intercept)	$\mathbf{-5.337}^{***}$	$\mathbf{14.461}^{***}$	0.192
	(0.453)	(0.262)	(0.658)
Num. obs.	1409	692	366
Log Likelihood	-666.062	-11837.672	5.149

Note: *, ** and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, based on a two-sided t-test.

Table 9: Robustness Test: Alternative Volatility Measures

	Dependent variable:	
	SD Daily Returns	*Realized Volatility*
	GLM (Log Gamma)	GLM (Log Gamma)
	(1)	(2)
Independent Variables		
$INSTITUTIONS$	$\mathbf{-0.030}^{**}$	$\mathbf{-0.025}^{**}$
	(0.012)	(0.012)
Control Variables: Location Attribute		
TAX_HAVEN	-0.055	-0.035
	(0.046)	(0.045)
Control Variables:ICO and Market Attributes		
$RATING$	$\mathbf{-0.070}^{*}$	$\mathbf{-0.120}^{***}$
	(0.040)	(0.040)
PRE_ICO	$\mathbf{0.077}^{*}$	-0.007
	(0.045)	(0.044)
$BONUS$	0.023	0.039
	(0.044)	(0.044)
$CAPS\_PRESENT$	-0.047	$\mathbf{-0.083}^{*}$
	(0.051)	(0.050)
$ETHEREUM$	-0.051	-0.111
	(0.068)	(0.068)
$WHITELIST$	$\mathbf{0.168}^{***}$	-0.066
	(0.048)	(0.048)
$NUM\_OF\_CURRENCY$	$\mathbf{0.031}^{**}$	0.006
	(0.014)	(0.014)
$FIAT$	0.064	-0.027
	(0.149)	(0.150)
$TEAM\_COUNT$	-0.003	-0.003
	(0.003)	(0.003)
$PRICE\_ETHER$	$\mathbf{-0.000}^{***}$	$\mathbf{-0.001}^{***}$
	(0.000)	(0.000)
(Intercept)	$\mathbf{-1.531}^{***}$	$\mathbf{1.762}^{***}$
	(0.135)	(0.133)
Num. obs.	462	527
Log Likelihood	744.894	-656.755

Note: *, ** and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, based on a two-sided t-test.

Table 10: Robustness Test: Without US-based ICOs in the sample

	Dependent variable:		
	Success (Traded)	*Amount Raised (log)*	*GARCH Vol*
	GLM (Binomial)	GLM (Log Gamma)	GLM (log Gamma)
	(1)	(2)	(3)
Independent Variables			
$INSTITUTIONS$	$\mathbf{0.076}^{**}$	$\mathbf{0.042}^{*}$	$\mathbf{-0.112}^{**}$
	(0.033)	(0.022)	(0.052)
Control Variables: Location Attribute			
TAX_HAVEN	$\mathbf{0.456}^{***}$	0.152	0.147
	(0.135)	(0.094)	(0.203)
Control Variables: ICO and Market Attributes			
$RATING$	$\mathbf{1.288}^{***}$	$\mathbf{0.210}^{***}$	-0.115
	(0.116)	(0.076)	(0.177)
PRE_ICO	$\mathbf{-0.399}^{***}$	-0.139	0.153
	(0.127)	(0.088)	(0.198)
$BONUS$	$\mathbf{-0.394}^{***}$	-0.030	0.240
	(0.127)	(0.086)	(0.195)
$CAPS\_PRESENT$	$\mathbf{-0.350}^{**}$	-0.100	-0.092
	(0.145)	(0.102)	(0.225)
$ETHEREUM$	-0.128	0.120	-0.327
	(0.205)	(0.129)	(0.305)
$WHITELIST$	$\mathbf{-0.956}^{***}$	-0.118	$\mathbf{0.407}^{*}$
	(0.143)	(0.094)	(0.211)
$NUM\_OF\_CURRENCY$	$\mathbf{-0.129}^{***}$	-0.018	0.037
	(0.045)	(0.026)	(0.064)
$FIAT$	0.417	0.260	-0.773
	(0.435)	(0.278)	(0.645)
$TEAM\_COUNT$	$\mathbf{0.043}^{***}$	$\mathbf{0.023}^{***}$	0.001
	(0.009)	(0.006)	(0.011)
$PRICE\_ETHER$	0.000	$\mathbf{0.001}^{***}$	-0.001
	(0.000)	(0.000)	(0.000)
(Intercept)	$\mathbf{-4.962}^{***}$	$\mathbf{14.557}^{***}$	0.183
	(0.402)	(0.245)	(0.589)
Log Likelihood	-847.324	-16186.770	-54.560
Num. obs.	1839	954	431

Note: *, ** and *** denote statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively, based on a two-sided t-test.