Initial Coin Offerings: Investor Protection and Disclosure*

Jiafu An, Wenxuan Hou† and Xianda Liu

University of Edinburgh Business School, University of Edinburgh, 29 Buccleuch Place, Edinburgh, UK, EH8 9JS

Abstract

As a newly emerged financing facility for entrepreneurs, initial coin offerings (ICOs) has experienced explosive growth since 2016. This paper provides one of the first empirical studies on ICOs from 37 countries. While it's not always the case that ICO investors are classified as shareholders, we find that the anti-director rights and anti-self-dealing index are positively associated with the country-level raised fund of ICOs after controlling for economic and culture factors. The disclosure quality and investor rights as specified in the Whitepapers are generally poor and they are found to be important to raise more funds in ICOs. We argue that the lack of (self-) discipline poses a threat to investor protections. Around 60% Whitepaper do not disclose information on the use of proceeds or management team. Around 80% ICOs do not entitle investors the rights for dividend or vote. Our findings suggest the needs of regulating ICOs.

Keywords: Initial coin offerings, ICOs, investor protection, Bitcoin, disclosure, Whitepaper

JEL Code: G21; G23

---

1. Introduction

"Initial coin offerings" (ICOs) is a form of crowdfunding in which firms issue digital tokens in return for a payment. The amount of money raised by start-ups in ICOs has reached $3.2 billion (Economist, Nov 9th 2017[1]) and surpassed early stage venture capital (VC) funding for internet companies (CNBC, 9 Aug 2017). Meanwhile, many governments expressed concerns on the lack of monitoring of ICOs. China and South Korea even banned ICOs in September 2017. The U.S. Securities and Exchange Commission impose its first enforcement actions against an ICO on 4 December 2017. While the studies show that the legal institutions are important for the development of crowdfunding (Rau, 2017; Dushnitsky, Guerini, Piva and Rossi-Lamastra, 2016), the investor protection aspects of ICOs remain under-researched. This paper intend to provide one of the first empirical studies to shed light on the debate.

In November 2008 Nakamoto posted a new design of digital currency "Bitcoin" based on blockchain technology (Yermack, 2015). As a new application of blockchain technology, ICOs has gone beyond the digital currency. Blockchains' nature of storage transactions also reform the traditional financial asset such as stocks, bonds and other real properties. In ICOs, developers sell blockchain-based tokens to investors and early adopters for raising fund for projects (Catalini and Tucker 2017). The blockchain-based ICOs have a number of benefits. First, it makes people impossible to change the information on blocks and thus provides security for users. Once the transaction is validated, such information are added in the blockchain, and irreversible and verifiable. Second, it provides transparency for the user. Historical data can be found in the blockchain. Third, it allows the developer adding "smart contract". In summary, the blockchain

---

[1] https://www.economist.com/news/leaders/21731161-there-ico-bubble-it-holds-out-promise-something-important-meaning

structure provides the users a decentralized, secured and low cost solution for financial transactions in ICOs (Catalini and Gans, 2016; Larios-Hernández, 2017; Rohr and Wright, 2017).

The blockchain technology does not make ICOs immune to fraud. In fact, many including Wikipedia Founder Jimmy Wales called ICOs an "absolute scam". The CEO of JP Morgan Jamie Dimon stated that "the currency isn't going to work" and that "it is worse than tulip bulbs". The SEC created its cyber unit to investigate and file charges against ICO. Albeit the concerns, the total market capitalization of all ICO projects has reached $3.8 billion in November 2017 since the first ICO project is Mastercoin in July 2013.

We first explore the development of ICO markets in the world. King and Levine (1993) shows that better financial systems improve the probability of successful innovation and thereby accelerate economic growth. ICOs serve as an additional channel for entrepreneurs to access to finance. La Porta, Lopez-de-Silances, Shleifer and Vishny (1997) argue that the legal institutions, investor protection in particular, determines the development of the capital market. We argue that better investor protection can lead to a larger ICO market as indicated by the total amount of raised fund in ICOs. To perform the analyses, we collect the data from the raised fund from Token Data (tokendata.io) and find that ICOs exist in 38 countries. We find that the Anti-director index and Ani-self-dealing index are positively related to the size of the ICO market, confirming our conjectures.

We next examine micro-level data. We noticed that only 17% of ICOs entitle investors cash flow right and voting right. While ICO papers can regard investors as consumers in a corporate loyalty scheme and therefore should not enjoy any of such rights, we find that cash flow right can significantly increase the raised fund in ICOs. The disclosure of Whitepapers is poor in general. Only 37% ICOs disclose the information about the management team. 12% ICOs even conceal the location of the project. 31% of ICOs discuss potential risks and 40% discuss the use

of proceeds. We find that better disclosure quality increases the amount of raised fund, presumably because of lower discount rate due to mitigated information asymmetry.

This study makes two important contributions. First, to our best knowledge, this is the first paper that examine the country-level development of ICO markets and its determinants. It adds to the growing literature on crowdfunding (Dushnitsky, 2016; Rau, 2017) and related to the law and finance literature (La Porta et al., 1997, 1998) by presenting the original evidence on the importance of country-level legal institutions for developing ICOs. Second, it contribute to the literature on the governance and fraud issues of crowdfunding (Cumming et al., 2016). We suggest important rights and disclosure items that help to increase the raised fund in ICOs. Finally, our study has important practical contributions by suggesting the ways to gauge the investor protection of ICO projects.

The reminder of the paper proceeds as follows. Section 2 introduces the background of ICOs and our sample. Section 3 examine the link between country-level legal institutions and the development of ICO markets. Section 4 and 5 examine how the investor rights and disclosure quality determine the raised fund in ICOs. Section 6 concludes.

2. Background and Data

2.1. ICOs

Based on the application of the tokens, research suggests a new classification, "currency type" and "token" (Chen, 2017). A currency is usually native to a blockchain (Nakamoto, 2008). Such application of blockchain-based token are usually known as "digital currency" or "cryptocurrency", because it is based on cryptography. Such currency type ICO project often aims to build up an economy system. And the token is the usually its product rather than a representation of shares of company. The value of the token comes from the use of this product. For example, Bitcoin and Ether, they both designed to achieve the goal of storage transaction on

a peer-to-peer basis. While in the ICO procedure of Ether, the developers aim to build up an ecosystem and the investors purchase the company products rather than the shares of company.

The token type or equity type, however, are depends on the value of underlying assets and services. It may not native to be a blockchain but such technology do a great job on improving transparency and liquidity of transaction. Yermack (2017) suggests the blockchain-based ownership token provides great transparency on ownership which shape the corporate governance. Here in order to show better economic meanings of tokens in ICO, we suggest two type of tokens, currency type and equity type rather than "token type" in blockchain literature.

In an initial coin offering (also known as token sale), the developer team first disclosure a "whitepaper" that contains the ICO information such the aims of the project and the implication of blockchain technology. ICO issuers often use an internet-based marketing strategy by promoting their ICO documents through Reddit, Twitter, online media and official websites. A whitepaper typically include a number of the following sections.

A) Token description. It describes the design, purchase and use of the token in the project as well as the right of token holder, such as whether token holders have the claim on project assets, whether token holders receive dividends, and whether they have voting rights. In equity-type ICOs, tokens are issued for investors to finance projects; while in currency-type ICOs, tokens are the product for costumers. B) ICO plan. It gives detail information on the project including the time, price and distribution of the tokens. The price of ICOs more often are set based on other type of cryptocurrencies and only a few accept fiat currency (e.g. US dollars). Early investors and large investors often receive discount in token price. C) Management team. It introduces the managers, developers and often the advisors of the project.

D) Risk factors regarding the uncertainty involved in the business such as the threat of cyber-attacks and uncertainty of the monetary policy for currency-type blockchain-based token. E) The use of proceeds indicating how the raised fund will be spent on various items such as R&D,

marketing, and legal services. Currency-type projects sometimes set up a foundation to receive the fund raised from ICO. F) Development roadmap such as the milestone and developing plan for the projects. G) Disclaimers. Some whitepapers include disclaimers to claim that the purchasing of token is not a form of investment: it do not represent the ownership over company and have no governance rights over the company or project. The investor warning section explain detail that company does not generate the value of token and no dividend type payment for token holders. Token holders are only the users of company products rather than an investment.

In addition to the whitepapers, some ICO projects choose to disclose technical papers that include more technical details such as the product design and blockchain code. The codes could be under peer review of the technical experts within the community, helping to ensure the codes of blockchain application do not involve any errors or bugs. In order to provide incentive for the technical auditors, some projects establish bounties for the compensate developers.

Once the token sale starts, anyone with the access to internet can participate in the ICO procedure around the world, which means small investors are able to be involved in the early stage of a business. Such facts are also known as the worldwide crowdfunding. After ICOs, the fund raising outcome – including fund raised, token price, token distribution, managers' account- are disclosed on the official website. The tokens are normally non-redeemable and sometimes subject to trading restrictions[2].

---

[2] Except for ICOs in China, on September 4, 2017 seven Chinese financial regulators officially banned all ICOs within the People's Republic of China, demanding that the proceeds from all past ICOs be refunded to investors or face being "severely punished according to the law". Thus many ICOs have to return all their fund back to their investors (Sep 4 The Wall Street Journal) Retrieved from https://www.wsj.com/articles/some-digital-coins-are-up-2-800-what-could-go-wrong-1504522801

2.2. Data and Sample

The list of ICOs and the raised fund are collected from Token Data (tokendata.io). The database provides the raised fund in US dollars, the month of the ICOs, token sale price and a link to the Whitepapers. We identify the country origin of ICOs from Token Market (tokenmarket.net). When such information is not available, we compliment the data from the official webpage of ICOs, the Whitepapers, Twitter, Facebook and the Linkedin page of founders and executives. We have noticed that certain ICOs deliberately conceal the information on the country origin and management team.

Our sample includes 150 ICOs in 37 countries from August 2014 to August 2017 before any country banned ICOs.[3] We observe a large increase on ICO after April 2017 where new ICO projects raised about 102 million USD and reached 648 million in June 2017 in total as shown in Figure 1. In Figure 2 we present the global volume of ICOs, where we observe United States (460 million USD), Switzerland (195 million USD), Israel (171 million USD), Singapore (126 million USD) and Russia (86 million USD) are the top 5 popular operating country of new ICOs from August 2014 to August 2017.

3. The financial development of ICOs

3.1. Conceptual framework

La Porta et al. (1997) document the link between the quality of law and financial development. On the other hand, common law system leads to a better financial market by giving more protection on investors. It means the higher requirements on disclosure and financial history for firms to seek external financial in traditional channels. In this case, early start-ups may have to turn to alternative channels, namely ICO. For the demand side, we may also observe a positive

---

[3] See note 2 Chinese government officially banned all ICOs on Sep 4, 2017.

relationship between ICO and common law system, while the underlying channel is different with previous investors' view. It should be noticed that the ICO project sometimes would have a fixed operating country, while the investors are from all around the world. In the supply side of the story, it is not only the home-country investors that gain more confidence but also investors from other countries. But for the demand side of firms' view, it is the quality of the law in the operating country affect its ICO performance. In general, both of demand side of entrepreneur's view and supply side of investor's view imply a positive relation between law and ICO performance.

Law may also promote finance via the "adaptability channel". Common law is formed by judges who have to face more specific disputes, and precedents from judicial decisions shape common law. Damaska (1986) describe the common law system – originating in English law – is "dispute resolving", while civil law is "policy implementing". Thus common law is more flexible and able to meet the new needs, while civil law is based on statutes and codes and more "fixed". In a view of "procedural formalism", civil law countries appear greater procedural formalism – higher duration of judicial proceedings, less honesty, less fairness and more corruption – and it eventually end up a low enforcement (Djankov et al., 2003). Furthermore, La Porta et al. (2004) suggest common law country is associated with greater judicial independence which contribute to the security of property rights. Besides, its foundation is build up the idea of protecting property and contract right and limit the government interfere in market (Mahoney, 2001). A better protection on "property right" and better "contract enforcement" will leads to a more developed financial market and thus the long term financial growth (Beck et al., 2003).

In the view of ICO, since common law system is more flexible to meet the new demands, the regulation institutions in common law counties are more likely to introduce that ICO projects is a form of security and subject to their security law. And on a view of "contract enforcement" and "property right protection", investors may have great confidence on common law countries and leads to better ICO results. It should be highlight that such protection is different from pure

shareholder or creditor in the concept of legal origin theory. Token holders in ICOs sometime are only the product users (currency type ICO), and in other cases are equity holders (equity type ICO). It would be no doubt that both of two type holders are subject to the risk of agency conflict. The risk of expropriation by company insider would be a general cost are similar for two type investors, whether the token represents underlying company asset. Thus, common law countries with better contract enforcement and property right protection will give token holders more confidence and they would more willingly to purchase tokens in ICO, which are similar to shareholders and creditors. In short, we hypothesis the ICO as one of financing tools, the investors will care about their right protections. The country with flexible legal system will observe a higher ICO fundraising due to the investors' confidence.

3.2. Empirical approach and results

We assess the relationship between legal protection and ICO development across countries. Our analyses focus on total fund raised through ICO and legal protection measured by anti-director index (La Porta et al., 2002), anti-self-dealing index (Djankov et al., 2008) and creditor right index (Djankov et al., 2007).

We begin with cross-country, ordinary least squares (OLS) regressions to assess the relationship between legal protection and ICO development. Specifically, we use the following regression specification:

$$ICO_c = \alpha + \beta Law_c + \boldsymbol{\Gamma} X_c' + \varepsilon_c \tag{1}$$

where the dependent variable, ICO_c, is the natural logarithm of total fund raised (in US dollars) in a given country. The key explanatory variable is Law_c from country c. Other explanatory variables, X_c', control for an assortment of country characteristics and $\boldsymbol{\Gamma}$ represents the vector of coefficients on these variables. In most specifications, we control for modern economic development measured by the natural logarithm of GDP per capita adjusted by PPP in 2004 (*GDP per capita*)

and the natural logarithm of the number of bureaucratic steps of opening a new business (*Lnsteps*). In several specifications, we add control variables for *Corruption* which is measured using the World Bank's *Worldwide Governance Index*'s corruption score averaged over period 1996 through 2000, *Enforce,* an indicator of contract enforceability constructed by Djankov et al. (2003), *Rule of Law,* a measure of a country's law and order from *International Country Risk Guide* (La Porta et al., 1998), *Individualism*, an index of individualism in a given country, and *Uncertainty Avoidance,* a measure of a country's average risk reference. Our coefficient of interest is β, which measures the relationship between legal protection and ICO development. Robust t-statistics that allow heteroskedasticity are reported in parentheses. We summaries our results in Figure 3.

As reported in Table 2, the ICO development measured by *Ln (Total Amount of Funds Raised in ICO in US Dollars)* is strongly, positively associated with legal protection when either using anti-director index or anti-self-dealing index. The economic magnitude of our estimates are large. For example, consider the estimates in column (4) in Table 2, if a country were to increase its anti-director index by one standard deviation (1.44), the *Ln (Total Amount of Funds Raised in ICO in US Dollars)* would increase by 0.94 (=1.44*0.65). Since we are using the natural logarithm of the amount of funds raised, this would translate into a 256% (=$e^{0.94}$) increase in the total fund raised. Similarly, when using anti-self-dealing index as a proxy for legal protection, the estimated economic magnitudes are substantial. Consider column (8) in Table 2, if we move a country's anti-self-dealing index one standard deviation up (0.25), the dependent variable would raise by 1.135 (=0.25*4.54), which translates into a 311% (=$e^{1.135}$) increase in the total amount of funds raised through ICO. Consistent with our hypothesis, the coefficients on creditor right index are not statistically significant. This is because ICO is seen as a financial channel more related with equity financing. So the creditor protection may be not relevant.

We next examine the channels through which legal protection is associated with ICO financing. Specifically, we test three inter-related, but by no means exhaustive, mechanisms: a)

since better legal institutions promote finance by facilitating contract enforcement, protecting property rights and adapting to changing economic conditions, in places with better legal institutions, investors are more confident in newly emerged financing channels due to better adaptability of the law; b) good legal traditions form a culture of general trust in the society, and this general trust may spill over to the financial market, including the newly-emerged ones; c) in places with good financial and legal institutions, people are generally confident in finance and thus more acceptable to new financing vehicles. The third channel is distinct from the second one since the second channel emphasizes a culture of trust in general whereas the third focuses on confidence specifically applied to the financial market. We test these channels using the following OLS regressions:

$$ICO_c = \alpha + \beta Law_c + Y M'_c + \Gamma X'_c + \varepsilon_c \tag{2}$$

where the dependent variable, ICO_c, is the natural logarithm of total fund raised (in US dollars) in a given country. The key explanatory variable is Law_c from country c. Other explanatory variables, X'_c, control for an assortment of country characteristics discussed above and Γ represents the vector of coefficients on these variables. M'_c represents one of the mechanism variables: *Market Cap, Private Credit,* and *Trust*, where *Market Cap* is the ratio of market capitalization to GDP averaged from 1999 through 2003*, Private Credit* is the ratio of private credit to GDP averaged from 1999 through 2003, *Trust* is the percentage of people in a country who agree that strangers can generally be trusted and is from the *World Value Survey*. Y is the vector of coefficients on these variables.

As shown in Table 3, we find evidence strong evidence that in places with better legal institutions, investors are more confident in newly emerged financing channels due to better adaptability of the law. This is manifested by the strong and positive association between the legal proxies and the natural logarithm of the amount raised through ICO, even after controlling for all the mechanism measures (see column (4) in Table 3). We find limited evidence on the channel

where we hypothesize that in places with good financial and legal institutions, people are generally confident in finance and thus more acceptable to new financing vehicles. In three out six regressions, the measure of financial market enters with strong, positive sign. The economic magnitude of our estimates is non-trivial. For example, take the coefficient from column (4) in Table 3. A one standard deviation increase in the ratio of market capitalization to GDP would raise the total amount of capital funded through ICO by 165% ($=e^{0.58*0.86}$). We find no evidence on the general trust channel. Consistent with our hypothesis again, the creditor right measure is still not significantly correlated with the ICO development, with or without controls for *Market Cap, Private Credit,* and *Trust.*

A major concern to our estimation is omitted variables. There might be factors both influencing the ICO outcome and the quality of legal institutions that are not included in our estimation. Such factors could be related with geo-climate of a country, such as the disease environment and the quality of soil. Since these country-traits are found to be associated with geography-specific culture (for example, see Alesina et al., 2011), they may bias our results. In this section, we use an instrumental variable strategy to validate our estimation. Specifically, we use the English legal tradition as an instrument variable to isolate a plausibly exogenous variation across country's legal systems. We note that La Porta, et al. (1998) and Acemoglu and Johnson (2005), among others, have validated its use both qualitatively and quantitatively. Specifically, for a given country, its legal origin is either exogenously imposed by its colonizers or acquired through imitation of European countries. Therefore, it is arguably unrelated to a country's modern development, but should closely associated with the quality of the legal system now. Acemoglu and Johnson (2005) provide convincing validity tests on this instrument.

As reported in Table 4, the estimates are quantitatively similar to our baseline results. The coefficients of anti-director index and anti-self-dealing index enter strongly, positively in the regressions. The economic magnitude of our estimates are slightly stronger than our baseline

results. For example, consider [column (3)](#) in [Table 4](#), if a country were to increase its anti-director index by one standard deviation (1.44), the dependent variable would rise by 1.12 (1.44*0.78), slightly larger than the baseline estimate of 0.94. From [column (6)](#) in [Table 4](#), if we were to increase a country's anti-self-dealing index by a standard deviation of 0.25, the amount of total funds raised through ICO would increase 341% ($=e^{0.25*4.91}$), which is comparable to our baseline estimate of 311%. In sum, the instrumental estimate further add validity to our estimations.

4. The investor rights in ICOs

A basic right for investors is to enjoy future cash flows, where equity holders receive dividends and debt holders have a stream of fixed interest payments (Modigliani and Miller, 1958). Voting right is a precondition for investors to exert influence on managers (Shleifer and Vishny, 1997). The "anti-director index" in La Porta et al. (1997), for example, largely focuses on it. In the case of ICOs, these two rights are often not granted for investors. There are two possible explanations. Because the ICO plan were not subject to regulations, the contract are flexible. If token holders regarded as customers as oppose to investors in currency-type ICOs, whether the company should provide dividend is under debate. Secondly, this may be attributed to the agency problem. Boards typically do not exist in ICO firms. We argue that the cash flow and voting rights help to increase the raised fund in ICOs. Some ICO whitepapers even include a disclaimer clause by claiming that purchasing tokens do not represent an investment, and token does not imply any right in company. The purpose of the disclaimers is to reduce the litigation risks and the accountability of the mangers. These three type of rights – voting, dividend, and disclaimers – may influence the investor's decision making process and impact ICO performance.

To perform the analysis, we carefully go through all whitepapers of all 150 ICO projects, and investigate the rights that company offers its token holder. In general we identify three types of rights for investors ($Rights_k$). Following previous literature, we focus on the voting right and dividend right from traditional finance view. Voting right is defined that whether investor could

participate in decision making process in company. $Right_{Voting}$ is a dummy variable that equals 1 if company enables token holders influence firm policy through voting. Then dividend right is consider to be the value of the equity in traditional finance, and it represents the future cashflow of the shareholder. Thus, we investigate whether ICO project provides its investors dividend type payment. If company consider dividend payment plan, we code $Right_{Dividend}$ as 1 and zero otherwise. Finally, we find ICO whitepaper often includes a section of "Disclaimer Clause" or "Investor Warning". For example, it claims that token sale or ICO is not same with tradition investment. Tokens are not represent any rights over company. Purchasing tokens do not represent any investment and the company will not guarantee any future income. If so, we code $Right_{Disclaimer\ Clause}$ equals 1 and zero otherwise. We adopt OLS regressions to investigate token holder rights offered by company and ICO fundraising. Specifically we use following specification:

$$ICO_{i,c} = \alpha + \beta_k Rights_{k,i} + \Gamma X'_c + \varepsilon_i \tag{3}$$

where the dependent variable $ICO_{i,c}$ is the natural logarithm of total fund raised (in US dollars) of firm i in country c. Our key interest variable here is $Rights_{k,i}$ provided by ICO project i. Other factors X'_c is the country level control same with previous country level analysis and Γ represents the vector of coefficients on these variables. Then we include the control for cryptocurrency (X'_f) and country fixed effect μ_c as robustness for our result. The reason that we do not apply similar country level controls from model (2) is that the missing values in country level control, such as *GDP per capita*, *Lnsteps*, *Corruption*, *Rule of Law*, *Individualism*, and *Uncertainty Avoidance*.

We first control for the ICO type for 149 ICO projects which are equity type or currency type. We argue that ICO cannot simply be seen as Initial Public Offering (IPO), since some of project aims to build up an ecosystem. The tokens they issued are more likely to be a currency rather than the shares in IPO. *ICO Type* is a dummy variable that equals 1 if the token issued is a currency rather than the shares of the company. Then we includes the concern on cryptocurrency

13

price, since most ICO project is a cryptocurrency based financing tool. Most ICOs only accept cryptocurrency rather than fiat currency as payment method, such as Bitcoin, Dash, and Eth etc. As a result, we investigate the top 10 cryptocurrency[4] based on their market capitalization, namely Bitcoin, NEO, Ripple, ETH, Dash, Monero, NEM, ETH classic, Litecoin and Lisk. *Cryptocurrency Price Index* is calculated by weighted average of top 10 cryptocurrency price within that month of ICO issuing. The price of Bitcoin, for example, has increased from zero before 2013 to more than $10,000 in December 2017.

Then we includes the media coverage of ICO, which is the searching heat index from Google Trends. We construct the index by searching keywords "Initial Coin Offering". The more media exposure may lead to better understandings of more small investors and thus may generate an effect on ICO performance. Thus, *Media Coverage* is the logarithm form of the ICO Google searching index in the month of the ICO issuing.

Table 5 presents the results on the relationship between token holders' rights and total ICO fund raise on firm level. In general, our results suggest a positive link between token holders' voting right and ICO fundraising, but surprisingly insignificant relationship between other type of right and ICO fundraising, namely dividend and disclaimer clause. In column (1) and (2), we test the relationship between voting and fundraising, which is positive and significant both statistically and economically. If the company providing voting rights to its token holder, the *Ln (Total Amount of Funds Raising in ICO in USD)* would increase by 1.263). Considering we are using natural logarithm form of the fundraising, it would be a 353.60% ($=e^{1.263}$) increase in total fund raised through ICO. In other words, token buyers in ICO cares about the voting right offered by ICO

---

[4] Data comes from "Cryptocurrency Market Capitalizations", https://coinmarketcap.com/coins/ last access 10 Dec 2017. Since the price of cryptocurrency is highly volatile, we only use the ranking on 22 Nov 2017. In robustness we also use the index of top 5 and other random combination of 5 cryptocurrency to conduct the index. The results do not change when we try different cryptocurrency price index.

Company, and they are more willingly to invest in tokens with voting power to discipline management team.

While, other rights of dividend and disclaimers are insignificant with fundraising. Especially the dividend right, which is a surprise from the view of tradition finance. We assume investors are expected to receive dividend, since the value is comes from the future cashflow which is dividend payment. One possible conjecture is that token holders in ICO do not care about dividend payment, since they value the capital gain from their investment. Considering the high return of tokens in ICO, dividend payment may not be the first priority from the investors' view. On the other hand, it is reasonable to assume the insignificant relationship is due to the investor may not believe in the whitepaper from the ICO company, since it is a new type of global based financing tool. Besides, there is no three party to review on company's promise in whitepaper, such as exchange, regulator, auditor and underwriter like IPO. Self-discipline is unable to convince investors. Thus in the untabulated table we further test whether such relationship remains in the country with better investor protection which is measured by anti-director index. Such measurement captures whether investors could discipline and monitor company through voting right. We introduce a sub-sample where the anti-director index[5] is above the mean of the total sample. In this case we could assume investor could vote out the manager who does not keep the promise or does not pay dividend in the future. While the results still show an insignificant relationship of dividend rights and ICO fundraising in a country with better investor protection. Thus we may interpret such result that investor may more care about the capital grain from ICO rather than the dividend type payment in the future.

---

[5] We also conduct the sub-sample by using "anti-self-dealing index", which provides the similar results.

5. The disclosure quality of Whitepapers

Besides investors' right, one of the main vehicle of legal origin – financial development relationship is company disclosure in the firm level. Legal protection facilitates private contracting and it is not through better regulation or government interference that promote financial market development. In general common law system instead of civil law system, encourages better market discipline and private ligation which leads to better performance (La Porta et al., 2006). Most cases, law mandates the disclosure on company, and such disclosure makes investor is able to value companies more easily and less information asymmetry. Thus investor is more willingly to invest which leads to a better external financial performance for the firm and better financial market in country level. Without such standardization on disclosure, litigation is governed by contract and tort law which increase the uncertainty and potential cost for investors.

On the other hand, the importance of disclosure is highlight by research on "promoter's problem" in security issuing (Mahoney, 1995). It suggests a potential concerns of investors that issuer may deliberately sell bad securities to the public, and will eventually damage the financial market. Firm disclosure provides a signal to investors that company is solid, profitable and easier for them to evaluate the company. For those company does not disclosure enough information, the investors may assume the worst cases (Grossman, 1981; Grossman and Hart, 1980). Investors would rely on those information when it is under condition of reputational, legal or contractual penalties for misreporting. Under the case of high information asymmetry, issuers may have to seek additional channels to signal their equity are good (Ross, 1979). In IPO process, auditors and underwriters provide extra credibility for the company by their reputation and liability (Chemmanur and Fulghieri, 1994). Stock exchanges also have regulations over the disclosure and provide signal to the investors of "good" equity (Miller, 1991).

However, ICO as a new financing tool is firstly under a grey area of regulation. It is a global based financing tool, which is hard for a government to provide sufficient monitoring over ICO.

Company sometimes can change its web site to avoid regulation from the government and some company even does not report its operating country. Even in the country which publishes regulations over ICO, the legal liability of ICO and tokens issued in ICO is unclear. Whether token is a kind of security, whether it represents underlying company assets and the right of token holders are undefined both in the industry and regulation institution. Secondly, ICO as an online based financing tool can go public without any auditors, underwriters or exchange. This means there may be no three part can provide extra reputation, credibility and liability for the ICO company. Thus the main signal that investor has to rely on is the disclosure on company whitepaper before it public. Here, we identify five dimension of disclosure in ICO whitepaper, risk, use of proceeds, management team, roadmap, and operating country. These disclosures items provide signals to investors. Thirdly, ICO is a financing platform focus on small investors rather than large institutional investors. There are indeed, some project save a large proportion of tokens for institutional investor, while the main contributor is small investors within online community.

Those small investors are often unable to access to extensively research and assess potential investment, which are similar to the cases in equity crowdfunding (Ahlers et al., 2015). Thus, the issuer have to find ways to clearly demonstrate their project and provide clear signals for investors. Previous literature suggest different type of signals on management team, founders involvement led to different investor behaviours. Thus, we assume disclosure on the five items indicate different quality and investor will react based on such signals. In general, better disclosure quality will lead to a positive signal to investors since their only knowledge on this ICO projects come from whitepaper.

We measure whitepaper disclosure of ICO projects ($Disclosure_k$) in five dimension, risk factor, use of proceeds, management team, roadmap and operating country. We investigate the relationship between disclosure items and ICO performance under the country level control in model (4) and cryptocurrency control and then country fixed effect. $Disclosure_{Risk\ Factor}$ is a

dummy variable equals 1 that whitepaper includes any risk section, including the potential risk of business, or other technical risk such as cyber-attacks. For some currency type of ICO project, the potential risk regarding to monetary policy is also coded as 1. And if ICO whitepaper does not include any potential risk, $Disclosure_{Risk\ Factor}$ is coded as zero. $Disclosure_{Use\ of\ Proceeds}$ is a dummy variable equals to 1 if the whitepaper discloses how company would use the money raised from ICO and zero otherwise. $Disclosure_{Management\ Team}$ is a dummy variable is 1 if ICO whitepaper discloses the information of its management team and zero otherwise. $Disclosure_{Roadmap}$ equals to 1 if the whitepaper includes a roadmap and discloses the future development plan of the company. And the last dummy variable is $Disclosure_{Country\ Unknown}$, which is 1 if whitepaper did not disclose the operating country of the project and zero otherwise.

$$ICO_{i,c} = \alpha + \beta_k Disclosure_{k,i} + \Gamma X'_c + \varepsilon_i \tag{4}$$

It should be noticed that for model (4), if there is no information regarding to the operating country of ICO projects, the country-level controlling variables would be zero. Thus we have to omit the country level controls for $Disclosure_{Country\ Unknown}$ analysis.

We investigate the relationship between whitepaper disclosure and ICO fundraising in Table 6. We observe a positive relationship between the disclosure on potential risk of the ICO project and fundraising. If the company discloses its potential risk in their business, the coefficient of 0.871 in column (2) suggests an increase of 238.93% ($=e^{0.871}$) in total ICO funds raised. It could be interpreted as the positive signal for the investors that company fully acknowledged the risk and dared to admit such risk within the project. Investors capture such signal and interpret it as better project, leading to better investment in such project. Management team is another important item in ICO whitepaper disclosure, in column (5) and (6). Start-ups at early stage may lack of credibility and reputation, where manager team would be a great signal to investor. ICOs without any information on manager team, may lead the investor to assume the worst (Grossman, 1981). As it shown in column (6), If the company discloses its management team, the total ICO

fundraising would increase 0.831. Since it is under the natural logarithm, it would be a 229.56% ($=e^{0.831}$) increase in ICO funds raised, which is positive and economically significant. This result on manager team disclosure is also similar on disclosure on operating country. If the manager choose to conceal the country, the ICO will suffer a significant punishment of 928.13% decrease in total fundraising as shown in column (10). Both of the results suggest the investors may consider better disclosure a positive signal and assume the worst if firm does not disclose.

6. Conclusion

As an unregulated and controversial means of crowdfunding via use of cryptocurrency, ICO attract great public attention. By October 2017, ICOs has raised $2.3 billion during the year, representing a ten times increase of the amount in 2016. ICOs and token sales are now extremely popular. Meanwhile, regulators in various countries warned the risks associated with ICOs. The Financial Conduct Authority in the UK warned that ICOs are mostly unregulated and potentially fraudulent. China's governments declared ICOs a form of unapproved illegal public financing behavior".

Given the controversy of ICOs, very little is understood on their development. As one of the first empirical study on this issue, this paper reveals the insights on the investor protection perspective of ICOs. We find that more than 37 countries have ICOs and these with stronger legal institutions in investor protection tend to have a more developed ICO markets. We also provide micro-level evidence. Investor rights and disclosure quality are poor in general. ICOs that grant investors voting rights and have higher disclosure quality tend to raise more funds. The evidence highlights the importance of investor protection in the development of ICOs.

Reference

Acemoglu, D., & Johnson, S. (2005). Unbundling institutions. *Journal of political Economy*, *113*(5), 949-995.

Ahlers, G. K., Cumming, D., Günther, C., & Schweizer, D. (2015). Signaling in equity crowdfunding. *Entrepreneurship Theory and Practice*, *39*(4), 955-980.

Alesina, A., Giuliano, P., & Nunn, N. (2013). On the origins of gender roles: Women and the plough. *The Quarterly Journal of Economics*, *128*(2), 469-530.

Beck, T., Demirgüç-Kunt, A., & Levine, R. (2003). Law, endowments, and finance. *Journal of Financial Economics*, *70*(2), 137-181.

Catalini, C., & Tucker, C. (2017). When early adopters don9t adopt. *Science*, *357*(6347), 135-136.

Chemmanur, T. J., & Fulghieri, P. (1994). Investment bank reputation, information production, and financial intermediation. *The Journal of Finance*, *49*(1), 57-79.

Chen, Y. (2017). Blockchain Tokens and the Potential Democratization of Entrepreneurship and Innovation.

Cumming, D. J., Hornuf, L., Karami, M., & Schweizer, D. (2016). Disentangling crowdfunding from fraudfunding.

Damaska, M. R. (1986). *The faces of justice and state authority: a comparative approach to the legal process*. Yale University Press.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2008). The law and economics of self-dealing. *Journal of financial economics*, *88*(3), 430-465.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2003). Courts. *The Quarterly Journal of Economics*, *118*(2), 453-517.

Djankov, S., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). The regulation of entry. *The quarterly Journal of economics*, *117*(1), 1-37.

Djankov, S., McLiesh, C., & Ramalho, R. M. (2006). Regulation and growth. *Economics Letters*, *92*(3), 395-401.

Djankov, S., McLiesh, C., & Shleifer, A. (2007). Private credit in 129 countries. *Journal of financial Economics*, *84*(2), 299-329.

Grossman, S. J. (1981). The informational role of warranties and private disclosure about product quality. *The Journal of Law and Economics*, *24*(3), 461-483.

Grossman, S. J., & Hart, O. D. (1980). Disclosure laws and takeover bids. *The Journal of Finance*, *35*(2), 323-334.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics*, *3*(4), 305-360.

La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2002). Government ownership of banks. *The Journal of Finance*, *57*(1), 265-301.

La Porta, R., Lopez-de-Silanes, F., Pop-Eleches, C., & Shleifer, A. (2004). Judicial checks and balances. *Journal of Political Economy*, *112*(2), 445-470.

Larios-Hernández, G. J. (2017). Blockchain entrepreneurship opportunity in the practices of the unbanked. *Business Horizons*, *60*(6), 865-874.

Mahoney, P. G. (2001). The common law and economic growth: Hayek might be right. *The Journal of Legal Studies*, *30*(2), 503-525.

Merton, M. (1991). Financial Innovations and Markets Volatility. *Blackwell, Cambridge MA & Oxford Uk*, *199*, l.

Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2006). What works in securities laws?. *The Journal of Finance*, *61*(1), 1-32.

Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1997). Legal determinants of external finance. *The journal of finance*, *52*(3), 1131-1150.

Rohr, J., & Wright, A. (2017). Blockchain-Based Token Sales, Initial Coin Offerings, and the Democratization of Public Capital Markets.

Ross, S. A. (1979). Disclosure regulation in financial markets: Implications of modern finance theory and signaling theory. *Issues in financial regulation*, *5*(1979), 177-202.

Shleifer, A., & Vishny, R. W. (1997). A survey of corporate governance. *The journal of finance*, *52*(2), 737-783.

Yermack, D. (2013). *Is Bitcoin a real currency? An economic appraisal* (No. w19747). National Bureau of Economic Research.

Yermack, D. (2017). Corporate governance and blockchains. *Review of Finance*, *21*(1), 7-31.

Figure 1: Monthly New ICO Fundraising

Figure 2: The Global Volume of Initial Coin Offering in USD from Aug 2014-Aug 2017

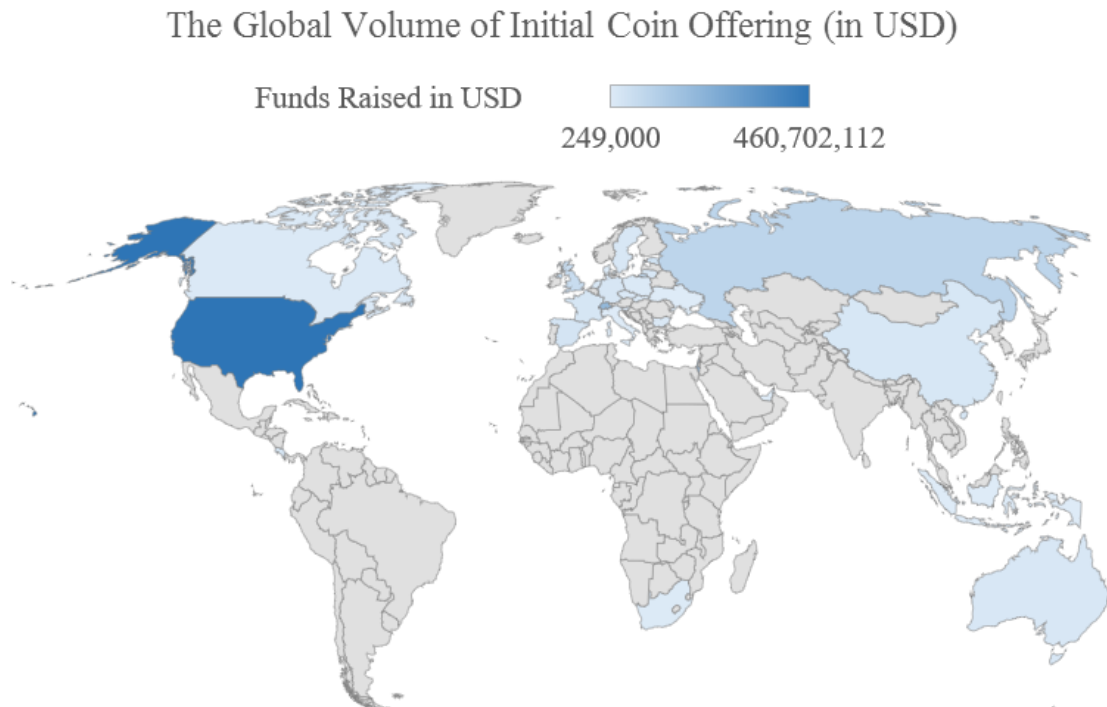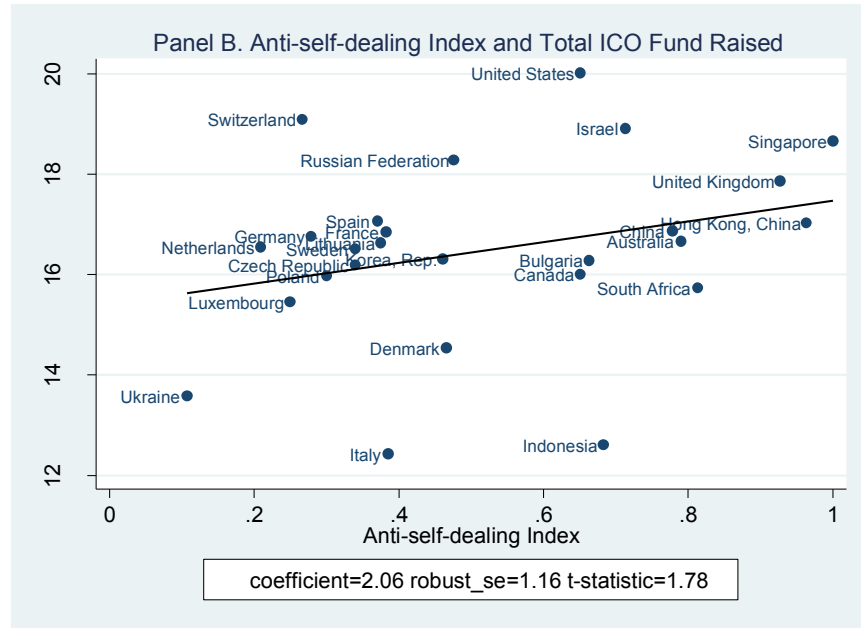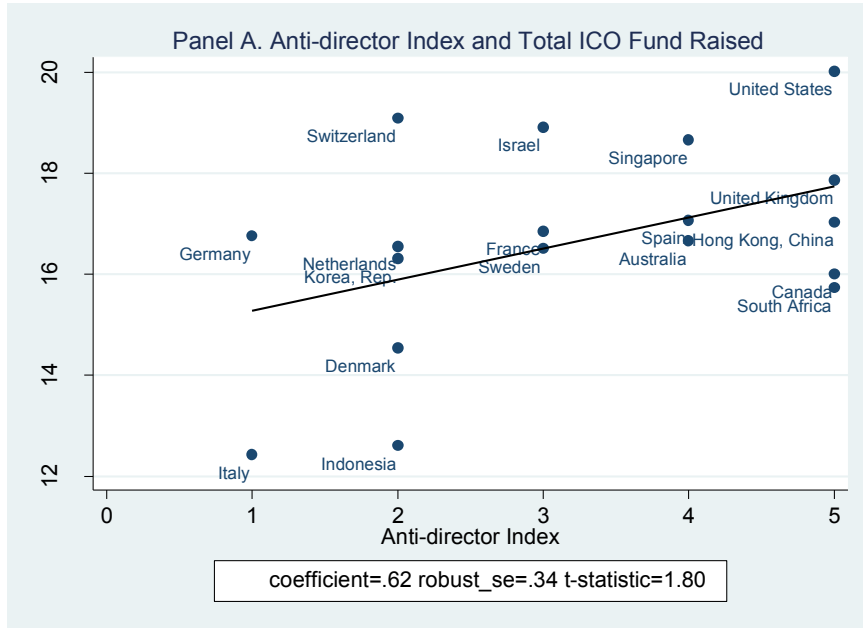**Figure 3: Legal Protection and Total ICO Fund Raised**

Panel A. Anti-director Index and Total ICO Fund Raised

coefficient=.62 robust_se=.34 t-statistic=1.80

Panel B. Anti-self-dealing Index and Total ICO Fund Raised

coefficient=2.06 robust_se=1.16 t-statistic=1.78

Table 1: Summary Statistics

	Obs.	Mean	Std.	Min	Max
Investor Protection Indicators					
English	132	0.49	0.50	0.00	1.00
Anti-director index	91	3.87	1.36	1.00	5.00
Anti-self-dealing index	115	0.59	0.24	0.11	1.00
Creditor right index	120	2.04	1.10	0.00	4.00
Country-Level Controlling Factors					
Enforce	92	7.97	1.17	4.29	8.94
Rule of Law	91	9.00	1.60	3.98	10.00
GDP per capita	123	27280.15	11637.65	3600.92	69932.11
Lnsteps	116	1.75	0.66	0.69	3.00
Corruption	123	1.32	1.04	-0.85	2.35
Individualism	99	68.26	25.82	14.00	91.00
Uncertainty Avoidance	99	49.55	20.05	8.00	93.00
Market Cap	124	1.17	0.82	0.06	3.63
Private Credit	123	1.18	0.65	0.13	2.05
Trust	117	0.33	0.12	0.13	0.67
ICO Whitepaper Dummy Variables					
Token Type	150	0.62	0.49	0.00	1.00
Right – Dividend	150	0.17	0.37	0.00	1.00
Right – Voting	150	0.17	0.38	0.00	1.00
Right – Disclaimer Clause	150	0.11	0.32	0.00	1.00
Disclosure – Risk Factor	150	0.31	0.47	0.00	1.00
Disclosure – Use of Proceeds	150	0.40	0.49	0.00	1.00
Disclosure – Management Team	150	0.37	0.49	0.00	1.00
Disclosure – Roadmap	150	0.55	0.50	0.00	1.00
Disclosure – Country Unknown	150	0.12	0.33	0.00	1.00
Cryptocurrency Controlling Factors					
Ln (Total Amount of ICO funds raised in US Dollars).	149	14.79	1.91	7.31	19.26
Cryptocurrency Price Index	150	6.87	0.41	5.29	7.41
Media Coverage	150	2.68	1.24	0.00	3.91

Table 2: Legal Protection and Total ICO Fund Raised

This table presents the results of regressing total funds raised from ICO on proxies of the quality of three different sets of legal rules. The first is anti-director index, which measures the quality of legal protection on minority shareholders in a given country and ranges from 0-6 (LLS, 2002, JF). The second is anti-self-dealing index, which is a measure of legal protection of minority shareholders against expropriation by corporate insiders and also ranges from 0-1 (DLLS, 2006, JFE). The third is the creditor right index which measures the quality of creditor right protection in a given country and taken from Djankov et al. (2007, JFE). The regressions include five sets of control variables. The first set is economic development control and includes GDP per capita adjusted for PPP (*GDP per capita*) for each country in 2004 (World Develop Indicators). The second set is average corruption score over the period 1996 through 2000 (World Bank). The third set is legal controls and includes *rule of law* in a given country (LLSV, 1998, JPE) and the quality of legal enforcement (*Enforcement*) (DLLS, 2003, QJE). The fourth set is business environment and includes the number of steps to open a new business in a certain country (*Lnsteps*) (DLLS, 2002, QJE). And the fifth set is cultural controls and includes measures of individualism (*Individualism*) and tendency to avoid risk (*Uncertainty*) (LLS, 2008, JEL). Robust standard errors are clustered at country level and t statistics are in brackets. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable: Ln (Total Amount of Funds Raised in ICO in US Dollars)												
Anti-director index	0.62* [1.80]	0.66** [2.27]	0.67** [2.32]	0.65*** [3.41]								
Anti-self-dealing index					2.06* [1.78]	2.46** [2.55]	2.46** [2.66]	4.54** [2.40]				
Creditor right index									-0.02 [-0.07]	-0.04 [-0.16]	-0.04 [-0.18]	-0.35 [-1.05]
GDP per capita		0.00*** [3.79]	0.00 [0.78]	0.00** [2.61]		0.00* [1.83]	0.00 [0.51]	0.00 [1.41]		0.00 [1.42]	0.00 [0.34]	0.00* [2.09]
Lnsteps		0.81 [1.17]	1.12 [1.66]	0.84 [0.88]		0.75 [0.81]	0.91 [1.18]	1.03 [1.48]		0.09 [0.10]	0.25 [0.30]	0.28 [0.26]
Corruption			0.87 [0.87]	-0.59 [-1.06]			0.39 [0.34]	-0.72 [-0.69]			0.39 [0.33]	0.09 [0.09]
Enforce				1.62*** [4.57]				1.99** [2.91]				1.46** [2.42]
Rule of Law				-0.35 [-1.08]				-0.03 [-0.09]				-0.91** [-2.49]
Individualism				-0.05*** [-3.75]				-0.05*** [-3.09]				-0.03* [-2.01]
Uncertainty Avoidance				0.03 [1.41]				0.05* [1.79]				0.01 [0.44]
Constant	14.66*** [11.14]	9.15*** [4.18]	9.00*** [3.73]	1.51 [0.43]	15.41*** [21.59]	11.54*** [4.04]	12.69*** [4.86]	-4.45 [-0.61]	16.51*** [21.38]	14.72*** [5.33]	14.74*** [5.30]	9.02* [2.07]
Adj. R-square	0.145	0.345	0.341	0.800	0.045	0.154	0.121	0.740	-0.037	0.059	0.023	0.597
Observations	18	18	18	17	26	25	25	17	29	26	26	17

26

Table 3: Legal Protection, Financial Development and Total ICO Fund Raised

This table presents the results of regressing total funds raised from ICO on proxies of the quality of three different sets of legal rules and two measures of financial development. The first legal measure is anti-director index, which measures the quality of legal protection on minority shareholders in a given country and ranges from 0-6 (LLS, 2002, JF). The second is anti-self-dealing index, which is a measure of legal protection of minority shareholders against expropriation by corporate insiders and also ranges from 0-1 (DLLS, 2006, JFE). The third is the creditor right index which measures the quality of creditor right protection in a given country and taken from Djankov et al. (2007, JFE). The first financial development measure is the ratio of market capitalization to GDP average of 1999 through 2003 (World Development Indicators). The second is the ratio of private credit to GDP average of 1999 through 2003 (World Development Indicators). The regressions include five sets of control variables. The first set is economic development control and includes GDP per capita adjusted for PPP (*GDP per capita*) for each country in 2004 (World Develop Indicators). The second set is average corruption score over the period 1996 through 2000 (World Bank). The third set is legal controls and includes rule of law in a given country (LLSV, 1998, JPE) and the quality of legal enforcement (*Enforcement*) (DLLS, 2003, QJE). The fourth set is business environment and includes the number of steps to open a new business in a certain country (*Lnsteps*) (DLLS, 2002, QJE). And the fifth set is cultural controls and includes measures of individualism (*Individualism*) and tendency to avoid risk (*Uncertainty*) (LLS, 2008, JEL). Trust measures how much a stranger can be trusted in a given country and taken from World Value Surveys. Robust standard errors are clustered at country level and t statistics are in brackets. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Dependent Variable: Ln (Total Amount of Funds Raised in ICO in US Dollars)												
Anti-director index	0.65***	0.55**	0.62**	0.65**								
	[3.41]	[2.64]	[2.55]	[2.36]								
Anti-self-dealing index					4.54**	3.66*	3.66*	9.09*				
					[2.40]	[1.88]	[1.76]	[1.78]				
Creditor right index									-0.35	-0.21	-0.22	-0.21
									[-1.05]	[-0.61]	[-0.52]	[-0.48]
Market Cap		0.57	0.83*	0.86**		0.81	0.88	1.12*		1.15	1.12	0.85
		[1.49]	[2.11]	[2.27]		[1.47]	[1.17]	[1.86]		[1.42]	[0.91]	[0.75]
Private Credit			-1.53	-1.54			-0.32	0.34			0.11	-0.09
			[-1.60]	[-1.48]			[-0.24]	[0.25]			[0.06]	[-0.04]
Trust				0.47				7.38				-2.17
				[0.19]				[1.46]				[-0.83]
Economic control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Business environment control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Political control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Legal control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cultural control	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	1.51	3.43	0.49	0.44	-4.45	-0.66	-1.10	-14.08	9.02*	10.38**	10.58*	10.04*
	[0.43]	[0.85]	[0.09]	[0.21]	[-0.61]	[-0.09]	[-0.15]	[-1.07]	[2.07]	[2.72]	[1.92]	[1.80]
Adj. R-square	0.800	0.794	0.793	0.789	0.740	0.754	0.715	0.766	0.597	0.650	0.591	0.551
Observations	17	17	17	17	17	17	17	17	17	17	17	17

Table 4. Legal Protection and Total ICO Fund Raised-IV Estimation

This table presents the results of IV regressions of total funds raised from ICO on proxies of the quality of three different sets of legal rules. The instrument variable is a dummy variable equal to one if English common law is a given country's legal origin and zero otherwise. The first is anti-director index, which measures the quality of legal protection on minority shareholders in a given country and ranges from 0-6 (LLS, 2002, JF). The second is anti-self-dealing index, which is a measure of legal protection of minority shareholders against expropriation by corporate insiders and also ranges from 0-1 (DLLS, 2006, JFE). The third is the creditor right index which measures the quality of creditor right protection in a given country and taken from Djankov et al. (2007, JFE). The regressions include five sets of control variables. The first set is economic development control and includes GDP per capita adjusted for PPP (*GDP per capita*) for each country in 2004 (World Develop Indicators). The second set is average corruption score over the period 1996 through 2000 (World Bank). The third set is legal controls and includes rule of law in a given country (LLSV, 1998, JPE) and the quality of legal enforcement (*Enforcement*) (DLLS, 2003, QJE). The fourth set is business environment and includes the number of steps to open a new business in a certain country (*Lnsteps*) (DLLS, 2002, QJE). And the fifth set is cultural controls and includes measures of individualism (*Individualism*) and tendency to avoid risk (*Uncertainty*) (LLS, 2008, JEL). Robust standard errors are clustered at country level and t statistics are in brackets. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(5)	(6)	(8)	(9)
Dependent Variable: Ln (Total Amount of Funds Raised in ICO in US Dollars)							
	reduced form	1st stage	2nd stage	1st stage	2nd stage	1st stage	2nd stage
Anti-director index			0.78***				
			[3.59]				
Anti-self-dealing index					4.91***		
					[3.39]		
Creditor right index							-4.92
							[-0.66]
English	2.08**	2.66***		0.42***		-0.42	
	[2.58]	[4.60]		[7.14]		[-0.44]	
Economic control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Business environment control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Political control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Legal control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cultural control	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R-square	0.866	0.677	.	0.939	.	-0.335	.
Observations	17	17	17	17	17	17	17

Table 5: Token Holder Rights and ICO Total Funds Raised

The table presents the results of regression total funds raised from ICO on four types of investors' rights provided by ICO companies. The dependent variable is the *Ln (Total Amount of ICO funds raised in US Dollars)*. Our key interest variables are the token holders' rights offered by ICO firms which are Voting (in column (1-2)), Dividend (in column (3-4)), and Disclaimer Clause (in column (5-6)). $Right_{Voting}$ is a dummy variable that equals 1 if company enables token holders influence firm policy through voting. $Right_{Dividend}$ is coded as 1 if ICO company provides dividend type payment to its token holders and zero otherwise. $Right_{Disclaimer\ Clause}$ equals 1 if ICO company whitepaper includes a warning to investors that it is not a type of investment, and zero otherwise. The regression includes three type of control variable on cryptocurrency. *Cryptocurrency Price Index* is calculated by market-value weighted average of top 10 cryptocurrency price within that month of ICO issuing, including Bitcoin, NEO, Ripple, ETH, Dash, Monero, NEM, ETH classic, Litecoin and Lisk. *Media Coverage* is the natural logarithm of Google Trend index by searching "Initial Coin Offering". *ICO type* is a dummy variable equals 1 if token in ICO is currency type. The regressions also include five sets of country control variables. The first set is economic development control and includes GDP per capita adjusted for PPP (*GDP per capita*) for each country in 2004 (World Develop Indicators). The second set is average corruption score over the period 1996 through 2000 (World Bank). The third set is legal controls and includes *rule of law* in a given country (LLSV, 1998, JPE) and the quality of legal enforcement (*Enforcement*) (DLLS, 2003, QJE). The fourth set is business environment and includes the number of steps to open a new business in a certain country (*Lnsteps*) (DLLS, 2002, QJE). And the fifth set is cultural controls and includes measures of individualism (*Individualism*) and tendency to avoid risk (*Uncertainty*) (LLS, 2008, JEL). Robust standard errors are clustered at country level and t statistics are in brackets. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
	Voting	Voting	Dividend	Dividend	Disclaimer Clause	Disclaimer Clause
Rights	1.904***	1.263**	-0.0671	0.341	0.643	-0.195
	(5.76)	(2.30)	(-0.08)	(0.79)	(0.85)	(-0.35)
Cryptocurrency Price Index		-3.097**		-3.204**		-3.083**
		(-2.09)		(-2.34)		(-2.37)
Media Coverage		1.501***		1.511***		1.478***
		(4.49)		(5.24)		(5.43)
ICO Type		0.286		0.254		0.185
		(0.70)		(0.86)		(0.57)
GDP per capita	0.000111***		0.0000822**		0.0000791**	
	(6.06)		(2.16)		(2.20)	
Lnsteps	0.215		-0.162		-0.189	
	(0.85)		(-0.33)		(-0.39)	
Corruption	0.344*		0.0899		0.187	
	(2.08)		(0.29)		(0.61)	
Enforce	0.406**		0.460**		0.433*	
	(2.48)		(2.12)		(2.07)	
Rule of Law	-0.328***		-0.232*		-0.224*	
	(-5.50)		(-1.88)		(-1.92)	
Individualism	-0.0257***		-0.0301***		-0.0299***	
	(-5.29)		(-4.14)		(-5.25)	
Uncertainty Avoidance	-0.000210		0.00965		0.0117*	
	(-0.05)		(1.23)		(1.76)	
Constant	11.82***	31.49***	12.61***	32.39***	12.55***	31.74***
	(14.95)	(3.47)	(7.77)	(3.87)	(7.97)	(3.97)
Adj. R-square	0.154	0.191	0.002	0.132	0.011	0.129
Observations	87	149	87	149	87	149

Table 6: Whitepaper Disclosure and ICO Total Funds Raised

The table presents the results of regression total funds raised from ICO on five disclosure item in company ICO whitepapers. The dependent variable is the *Ln (Total Amount of ICO funds raised in US Dollars)*. Our key interest variables is the disclosure items in company ICO whitepapers, which are Risk Factor (in column (1-2)), Use of Proceeds (in column (3-4), Management Team (in column (5-6)), Roadmap (in column (7-8)) and whether its Operating Country is unknown (in column (9-10)). $Disclosure_{Risk\ Factor}$ is a dummy variable equals 1 that whitepaper includes any risk, including the potential risk of business, or other technical risk such as cyber-attacks, and zero otherwise. $Disclosure_{Use\ of\ Proceeds}$ is a dummy variable equals to 1 if the whitepaper discloses how company would use the money raised from ICO and zero otherwise. $Disclosure_{Management\ Team}$ is a dummy variable is 1 if ICO whitepaper discloses the information of its management team and zero otherwise. $Disclosure_{Roadmap}$ equals to 1 if the whitepaper includes a roadmap and zero otherwise. $Disclosure_{Country\ Unknown}$, is 1 if whitepaper did not disclose the operating country of the project and zero otherwise. The regression includes three type of control variable on cryptocurrency. *Cryptocurrency Price Index* is calculated by market-value weighted average of top 10 cryptocurrency price within that month of ICO issuing, including Bitcoin, NEO, Ripple, ETH, Dash, Monero, NEM, ETH classic, Litecoin and Lisk. *Media Coverage* is the natural logarithm of Google Trend index by searching "Initial Coin Offering". *ICO type* is a dummy variable equals 1 if token in ICO is currency type. The regressions also include five sets of country control variables. The first set is economic development control and includes GDP per capita adjusted for PPP (*GDP per capita*) for each country in 2004 (World Develop Indicators). The second set is average corruption score over the period 1996 through 2000 (World Bank). The third set is legal controls and includes *rule of law* in a given country (LLSV, 1998, JPE) and the quality of legal enforcement (*Enforcement*) (DLLS, 2003, QJE). The fourth set is business environment and includes the number of steps to open a new business in a certain country (*Lnsteps*) (DLLS, 2002, QJE). And the fifth set is cultural controls and includes measures of individualism (*Individualism*) and tendency to avoid risk (*Uncertainty*) (LLS, 2008, JEL). Robust standard errors are clustered at country level and t statistics are in brackets. ***, **, * denote significance levels at 1%, 5% and 10% respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Risk Factor	Risk Factor	Use of Proceeds	Use of Proceeds	Management Team	Management Team	Roadmap	Roadmap	Country Unknown	Country Unknown
Disclosure	0.729**	0.871**	0.777**	0.327	0.649*	0.831***	1.167***	0.391	-2.292***	-2.228***
	(2.32)	(2.68)	(2.84)	(1.03)	(1.91)	(2.75)	(4.38)	(0.99)	(-17.75)	(-22.24)
Cryptocurrency Price Index		-3.203**		-3.135**		-2.770*		-3.179**		-2.370**
		(-2.45)		(-2.21)		(-1.99)		(-2.38)		(-2.32)
Media Coverage		1.500***		1.470***		1.312***		1.458***		1.239***
		(5.59)		(4.84)		(4.48)		(5.08)		(5.66)
ICO Type		-0.0286		0.116		0.319		0.122		0.294
		(-0.08)		(0.36)		(1.03)		(0.39)		(0.99)
GDP per capita	0.0000734*		0.0000993**		0.0000777*		0.0000971***			
	(2.11)		(2.68)		(2.05)		(2.99)			
Lnsteps	-0.0813		-0.0341		-0.313		0.0132			
	(-0.17)		(-0.07)		(-0.63)		(0.03)			
Corruption	0.222		0.319		0.120		0.324			
	(0.86)		(0.97)		(0.36)		(1.02)			
Enforce	0.412*		0.365		0.418*		0.373*			
	(2.12)		(1.60)		(1.88)		(1.87)			
Rule of Law	-0.227*		-0.313**		-0.268**		-0.287**			
	(-2.02)		(-2.52)		(-2.15)		(-2.68)			
Individualism	-0.0281***		-0.0251***		-0.0293***		-0.0244***			
	(-5.36)		(-3.70)		(-4.76)		(-3.76)			
Uncertainty Avoidance	0.0127*		0.0118*		0.0108		0.00692			
	(2.07)		(1.88)		(1.65)		(1.18)			
Constant	12.33***	32.27***	12.18***	32.02***	13.29***	29.65***	11.76***	32.28***	15.05***	28.20***
	(7.98)	(4.00)	(7.09)	(3.67)	(7.71)	(3.41)	(8.44)	(3.91)	(116.58)	(4.35)
Adj. R-square	0.040	0.177	0.047	0.134	0.031	0.167	0.120	0.138	0.140	0.255
Observations	87	149	87	149	87	149	87	149	149	149