Political Corruption and Firm Access to Public Capital Market

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Abstract

The study provides new evidence on how political corruption affects firm performance. Using a large sample of IPOs from 1990 to 2015 in the U.S., we uncover strong evidence that the corrupt environment imposes costs for firms to access public capital market. This translates into a $1.3 million potential loss for an average issuer. Our evidence indicates that the effect applies only for small-sized issuers. Moreover, we demonstrate that underwriters play an important role to promote IPOs in the corrupt environment by increasing offer price revisions and reducing underpricing. We further reveal that political corruption does not diminish the likelihood of pre-IPO shareholder's managing positive wealth gains. Our results continue to hold after addressing endogeneity concern and conducting a variety of robustness tests.

JEL classification: G10; G14; G39

Keywords: Political corruption, firm performance, IPO, underpricing

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1. Introduction

Alibaba went public in the US in 2014 as one of the largest technology IPOs. The price of the first trading day surged to 38% from its offer price of $68 per share, which implies that the company suffered a $9.12 billion potential loss from such undervalued shares. The level of underpricing for Alibaba has been relatively higher than the average first-day returns of 15.5% in the US during the same year. The major concern regarding the deal with Alibaba was the corruption issue involved, such as gift giving and interrelationship with public officials which are prevalent in China. Corruption when taking the form of rent-seeking, can set up barriers for corporations carrying out business (Dal Bó and Rossi (2007), Fisman and Svensson (2007) and Paunov (2016)). The potential loss representing "money left on the table" also increases the cost to access the public capital market for Alibaba. It is the World Economy Forum that points out that corruption raises the cost for firms doing business with 10% on average in the world (OECD, 2013).

The US is not a typical country with extensive level of corruption. The Transparency International gave the score of 76 out of 100 and ranked the US at 16th in the world among all countries in terms of corruption severity. Nevertheless, FBI is devoted to eliminate corrupt activities every year in the US. For instance, William J. Jefferson, a Representative of Louisiana's 2nd congressional district since 1991, was convicted for taking advantage of his political position to offer favourable treatment for several American companies. Specifically, during 2000 to 2005, he received bribes of $478,000 and helped his co-conspirators seek billions of dollars additional income. In a sting case named "Tennessee Waltz" conducted by FBI since 2002, several state legislators were arrested due to accepting over $150,000 bribes to help a company introduce a new legislation which is beneficial to the business, thought the law had not been passed.

There are two main streams of research focusing on corruption and firm performance. The first stream of the literature addresses that corruption diverts company's productivity away from its regular operation. Political corruption can reduce investment and R&D expense (Ades and Tella (1997)), make firm inefficiency (Dal Bó and Rossi (2007)), obstruct companies to attain business access and regulation (Nguyen and Van Dijk (2012)), deteriorate management and productivity (Athanasouli and Goujard (2015)) and set up barriers for firm to obtain quality certificates (North (1990) and Paunov (2016)). Another stream of studies relates to firms that can benefit from rent-seeking behaviour. Corruption mentality can help companies to deal with the low efficient government and bad laws from the local (Leff (1964) and Lui

(1985)), and therefore help firm's growth (e.g., Rock and Bonnett (2004), Vial and Hanoteau (2010) and Mironov (2015)). Using bribery in business acts as a bargaining process between corrupt governors and firms (Paunov (2016)). Corporations can benefit from the bargaining by offering bribes and quickly receive government service, such as a municipal contract. However, only small number of enterprises can enjoy and benefit from the bargaining process, because corrupt officials would only accept bribes from certain companies for the risk-free purpose. On the contrary, firms who do not have access to the illicit business activities will experience losses from their corrupt-resorted competitors. The effects of corruption on firm performance raise several interesting questions: Does political corruption has an impact for firms to access public capital market when going public? If so, do prestigious investment banks who act as intermediaries in financial market help? How does corrupt environment affect pre-shareholder's benefit?

Motivated by the empirical evidence on the subject, we address the questions by examining the relationship between political corruption and IPOs first-day returns. We use a large and comprehensive sample of U.S newly listed issues over the period from 1990 to 2015. We obtain corruption convictions data from TRAC on the US public officials in each state and adopt per capital convictions as our most important links to the corrupt business environment. This approach is similar to that of Butler, Fauver and Mortal (2009) and Smith (2016). However, different from these studies, we measure corrupt environment from 1990 to a year before the IPO. This is due to the impact of the period before going public to initial aftermarket returns.

Overall, IPO market is characterised by information asymmetry, which causes uncertainty of firm value for investors, and therefore results in unusual initial returns (e.g., high underpricing) (Rock (1986), Levis (1990), Amihud, Hauser and Kirsh (2003) and Nielsson and Wójcik (2016)). We argue that political corruption raises the local business environment uncertainty for two reasons: first, if firms offer bribes to a corrupt government official, then they are willing to adopt means to prevent the corrupt behaviours from exposing to the public due to the need for secrecy (Shleifer and Vishny (1993)), such as using a concentrated decision-making process within the organization, making the company less transparent. Second, if companies suffer from damages on the productive or managerial outcomes due to unfair competition caused by using illicit business activities from competitors, then those companies are likely to conceal their inferior situations from investors, resulting in increased ex-ante uncertainty. In sum, we argue that political corruption is an important factor influencing first-day returns for firms going public.

We find strong support for our conjectures. Specifically, we reveal that political corruption is associated with higher IPO initial returns in the US stock market. The effect is economically significant: a one standard deviation increase in corrupt environment index (CPI) is linked with a 1.3% increase in initial returns, which translates into a $1.3 million "money left on the table" for a mean-sized issuer. The results indicate that, political corruption causes higher underpricing for small sized firms, but not for large corporations. We argue that this is due to 1) big companies have the ability and more resources to secure themselves on the financial market; 2) they have better connections with politicians and are likely to use bribes for business, therefore will benefit from corruption. The findings are consistent with the resource redistribution model, which suggests that resources are re-allocated from one party to another party due to rent-seeking actives. Indeed, higher underpricing caused by corruption implies that IPO issuers incur opportunity costs and investors receive more returns in short-run.

Importantly, when examining the link between corrupt environment and investment banks, we reveal that there is a positive relationship between corruption and IPOs offer price revision. This implies a higher desire for information production in the corrupt environment during bookbuilding. We attribute this to the underwriter's promotional efforts which they attempt to induce private information from the informed investors and price the share close to its intrinsic value. We also document evidence of the bank's ability to promote issues in rent-seeking environment, reflected by the empirical evidence of the reduced underpricing with prestigious underwriters. Further, we argue that corrupt business environment does not deteriorate pre-shareholder's benefits by demonstrating that corruption increases the likelihood of positive net wealth gains for insiders. This explains that issuers may not worry about losses from initial returns in a corrupt environment as pre-IPO shareholders still benefit from the shares they retain. The evidence is in support of prospect theory (Loughran and Ritter (2002)) and wealth maximizing hypothesis (Ang and Brau (2003)).

We also consider endogeneity that arises from the headquarter selection with certain observed or unobserved corruption characteristics. Firm can choose states as headquarters with different corruption levels and this selection may affect financial and managerial decisions (see, e.g., Smith (2016)). OLS estimates are therefore potentially biased under such self-selection issue. To address this concern, we implement an instrumental variable approach to reveal the pure effect of rent-seeking environment. Specifically, we select education level and racial heterogeneity on the state level which have a causal relationship with political corruption as instruments. All our results continue to hold after controlling for the endogeneity problem. In addition, we use a propensity score matching method to control for observable differences

between corrupt and non-corrupt areas. The evidence confirms that the higher underpricing exists in States when political corruption is stronger.

Finally, we carry out a variety of additional tests as robustness checks. We first measure corrupt environment for firms from the year of incorpration to one year before IPO, which restrict accounts for the rent-seeking surrounding for an IPO issuer. We then use alternative conviction information from "The US Department of Justice (DOJ)" and create additional corrupt environment measures. We only use a number of convictions in each state as an alternative measure of our interest and then exclude IPOs from Washington D.C. due to the fact that corruption in the area is relatively higher than others. In particular, we also conduct the instrumental variable approach for the tests to control for endogeneity issue. Overall, our empirical evidence from robustness checks confirms that political corruption raises costs for firms going public, represented by higher first-day returns in the rent-seeking environment.

Our study makes important and significant contributions to political corruption and IPOs related literature. Prior studies theoretically and empirically demonstrate that political corruption negatively affects firm performance, but limited on managerial and productivity levels, and therefore potentially raises extra costs for companies doing business (e.g. Shleifer and Vishny (1993), Bliss and Tella (1997), Ades and Tella (1997), Mo (2001), Fisman and Svensson (2007), Dal Bó and Rossi (2007), Bloom and Van Reenen (2010) and Athanasouli and Goujard (2015)). To our knowledge, we provide the first study to present empirical evidence that political corruption imposes additional costs on firms to enter the public capital market by revealing that newly listed companies raise less capital than what they potentially were able to elevate. Moreover, some studies point out that corruption is related to a high business uncertainty (e.g., Shleifer and Vishny (1993)), and document the relationship between the uncertainty and M&A in host countries (e.g., Delios and Beamish (1999), Delios and Henisz (2000) and Slangen and Van Tulder (2009)). We provide further empirical evidence on how business environment uncertainty stemmed from corruption interacts with financial market in the local community. Specifically, we show that higher uncertainty due to rent-seeking behaviour obstructs investors to gather information and assess firm value around the IPO, which results in greater underpricing.

The majority of corruption related studies focus on the international arena. Nevertheless, concentrating on the country level is more appropriate, since it controls for institutional and culture factors (Fisman and Gatti (2002)). US is usually treated as a country with low political corruption (e.g., International Country Risk guide). Thus, corruption may have low impact on firm performance in the US due to the complete and well-defined law system. Our study,

therefore, adds new evidence on the level that corruption affects firm performance on the growing literature within country studies (e.g., Amore and Bennedsen (2013) and Smith (2016)). In relation to contribution to IPO-related literature, prior research presents many factors that could determine IPO performance, such as credit rating (An and Chan (2008)), international business activity (Mauer, Wang, Wang and Zhang (2015)), and firm location (Nielsson and Wójcik (2016)). We address a new determinant of IPO short-run returns in the stock market – political corruption, which could be a future guidance for issuers and investors when making decisions.

The rest of the paper is organised as follows. Section 2 discusses the relevant literature. Section 3 presents the hypothesis development. Section 4 explains the sample and methodology we employed in the study. Section 5 presents our preliminary findings and test the robustness of our results. Finally, section 6 summarises the paper.

2. **Literature review**

2.1 **Theoretical Framework**

The relationship between rent-seeking (corruption), production and economy was first modelled in the classical work by Murphy, Shleifer and Vishny (1993). In this study, if rent-seekers, either from public or private sectors, attempt to expropriate values from the society, this will diminish the returns to the production as more resources are allocated to rent-seekers (e.g. corrupt officials). Alternatively, it will result in another party losing the opportunity to share the resources.

In the spirt of their work, suppose that a local government has some procurements opening to all companies to bid. At the same time there is a small number of firms determined to bribe public officials to win the projects. Consequently, the corrupt business activity breaks the fair competitiveness in the market and results with an advantage to only those firms with benefit from the public resources, which are the procurements. As for other companies, who are corruption-free, they may suddenly realize that they are trapped in an unexpectedly difficult situation in the future in which they need to compete with firms who gain interests from using bribes for the business, as the resource has shifted from the public to the bribers. Therefore, corrupt activities can eventually damage the economy and the output of production through the redistribution of resources. On the other hand, the hidden cost will increase for the companies operating in a corrupt business environment. Kaufmann and Wei (1999) present a positive relationship between bribes and the expenditures that the companies occur. They find that the more bribes the company pays, the longer they need to deal with the officials for negotiating

regulations and incur the higher cost of capital. Therefore, the evidence suggests that Murphy, Shleifer and Vishny (1993)'s model is not only for corruption and production, but also is applicable to test the consequences of rent-seeking in financial market.

2.2 Political corruption and firm performance

The extant literature has uncovered the relationship between corruption and firm performance extensively. Corruption can impede the company's growth directly or indirectly. Ades and Tella (1997) document that corruption can reduce investment and R&D expenditures through affecting industry policies. Dal Bó and Rossi (2007) argue that corruption can divert corporations from their primary economic activity. They focus on the electricity utilities and find that companies have to invest additional input to produce the same amount of output in a corrupt environment. Athanasouli and Goujard (2015) report that corruption weakens firm management and aggregate productivity. They find that contract dependent firms in a corrupt region have lower R&D investment and smaller product market. In addition, the authors reveal that those firms are associated with a highly centralized decision-making mechanism. Paunov (2016) provides evidence that corruption reduces the probability for companies to obtain quality certification and cuts down the machinery investment for innovations. But the study fails to prove that corruption has a negative impact on export-oriented and public traded firms to obtain relevant certifications and patents.

Although retrieving corruption related information on the micro level is extremely difficult due to the need of secrecy of corrupt activities, a few studies have previously found ways to overcome this aspect and make use of firm-level data to access the sensitivity of corruption on business performance. Fisman and Svensson (2007) document that corruption hampers firm growth three times more than taxation. Specifically, they used bribery data from surveys on Uganda firms and reveal that a one percentage point increase in bribery payments results in a three percentage points decrease in firm growth. Similarly, Nguyen and Van Dijk (2012) use different firm-level surveys indicating the severity of perceived corruption in Vietnam and conclude that corruption impedes private company's growth; but not harm state-owned firms (SOEs). This might be caused by the special interrelationship with government officials, which benefit SOEs at the cost of private firms in a corrupt environment. They argue that the adverse effects of corruption on businesses can be mitigated by improving the governance quality, lowering business entry cost, offering better land access and regulations in the private sector.

In contrast to the negative effects of corruption on firm performance, some studies address that the malfeasance can benefit the companies to some extent. First, from a macro perspective, some researches focus on the whole economy scale. Leff (1964) and Lui (1985) argue that corrupt activities enable companies to dispose of obstacles caused by the local government, such as low efficient public services or incomplete laws. Rock and Bonnett (2004) reveal that corruption helps new and large industrialising economies growth faster in East Asian. They assert that the high growth in high corrupt environment is from the trade-off deal of using briberies to exchange for quicker and efficient services from governmental officials.

Second, few studies document the beneficial aspects of corruption on a micro level. Vial and Hanoteau (2010) measure corruption as bribes and indirect tax payment to investigate how corruption affects firms in Indonesia. They present a long-term positive effect of corruption on the plant growth and that finding is in support of the "grease the wheels" hypothesis. Finally, Mironov (2015) uses a unique database for driving licenses from Russia and implements the propensity to corruption (PTC) as the objective measure. He documents that companies which employ corrupt CEOs outperform their counterparts. Specifically, the study reports that a one standard deviation increase in PCT of CEOs is associated with an increase of 3.6% on income diversion for the company. Nevertheless, even if some companies can benefit from using bribes for doing business, other firms who do not have access to the illegeal acitivies will suffer from potential losses and eventually leave the market (Bliss and Tella (1997)).

3. Hypothesis development

3.1 Corrupt environment and IPO performance

The firm performance will signal stock price stability and relate to the future dividend distribution. Better firm characteristics can deliver benefits to investors. IPO investors may decide to stay away from risky environment options, as they are usually willing to pay a higher price for the issues with outstanding quality. Chiang, Qian and Sherman (2010) document that institutional investors always consider the value of the issue when investing in an IPO. Similarly, Neupane, Paudyal and Thapa (2014) reveal that institutional investors are sensitive to firm quality when making investment decisions, and retail investors will follow them if they perform well in the market. However, a rent-seeking environment can inherently destroy company performance (e.g., Dal Bó and Rossi (2007), Nguyen and Van Dijk (2012), Athanasouli and Goujard (2015) and Paunov (2016)).

If investors realize that the IPO companies from a corrupt environment do not show prospective financial achievement, they may not require as much demand as the issuer expects. This will bring IPO companies into a financial predicament and securities from the corrupt environment will have difficulty in raising capital from going public. This may motivate issuer to conceal particular information from investors, such as financial or managerial shortages when operating under strong political corruption. For instance, issuers can use ambiguous language for some specific contents in the IPO prospectus to misguide investors. Consequently, the company performance damaged by corrupt environment should be less transparent during going public.

Stulz (2005) and Durnev and Fauver (2011) reveal that firms tend to implement opaque disclosure policies to protect resources when surrounded with risks in a rent-seeking business background. Thus, when operating in a corrupt environment, firms are likely to hide financial information in order to avoid bribe extractions from corrupt officials. Further, Smith (2016) finds that firms tend to decrease liquidity and increase debt obligations to limit expropriation when operating under political corruption uncertainty. On the other hand, for firms who are engaged in corrupt business activities, the need for secrecy also makes the companies be hard to value for investors. For instance, using bribes for business may lead firms to centralize decision making process within the organization to prevent information leakage (Athanasouli and Goujard (2015)), which makes the company less transparent.

Therefore, a political corrupt business environment increases the market uncertainty and risks (Shleifer and Vishny (1993) and Ades and Tella (1997)). Beatty and Ritter (1986) argue that IPO underpricing should become higher along with the ex-ante uncertainty of IPO firm value. Investors are more likely to get involved in a call option for the information production during the IPO process, with the strike price compared to offer price. When the uncertainty aggregates, investors require a lower offer price to increase the value of the call option in exchange for the costly information collection. Therefore, IPOs issued in a corrupt environment and the increased ex-ante uncertainty lead to our first hypothesis:

H_1: IPOs from a strong political corrupt environment are associated with higher first-day returns.

Svensson (2003) argues that the amount of bribes a firm is keen to offer will depend on its "ability to pay". Thus, large corporations may play the role of being long-term partners with corruption-prone governors, and in return benefit more from the bribery they pay. As resource redistribution model predicts, such rent-seeking activity has largely shifted resources from the

public to bribery-resorted companies, resulting in damages to the remaining firms who do not benefit from corruption. Paunov (2016) reveals that corruption negatively affects the likelihood that companies obtain quality certificates, and particularly has an impact on small companies. Thus, big firms do not worry about fighting for corruption as small enterprises do (Dixit (2015)). On the other hand, large corporations usually have more resources and human capital to secure themselves on the market, and therefore avoid adverse effects from corruption. Concentrating on the IPO context, if corruption does not exacerbate firm performance, then the issuer is less likely to conceal disadvantages during going public. Consequently, this will lead to lower uncertainty and information asymmetry for the firm values, which makes investors collect information in IPO at a lower cost. Given this reason, we develop our second hypothesis:

H_2 Corruption level should have an impact on underpricing among small firms, with less or no effect on large corporations.

3.2 Corrupt environment and offer price revision

IPO revision is treated as an effective means for investment banks to collect and induce private information revealed by the informed investors (Benveniste and Spindt (1989) and Hanley (1993)). During the bookbuilding process, the banks have the discretion to distribute shares and make a final decision on the offer price. Benveniste and Spindt (1989) model that a good piece of news from the informed investors lowers IPO offer price and paid as compensation for inducing the private information, known as information acquisition model. In contrast, investors who hide the information deliberately will be allocated with less shares as punishment from investment banks. Offer price revision is sensitive to the uncertainty of the firm value rather than the value per se (Cook, Kieschnick and Van Ness (2006)). Corrupt environment aggregates information asymmetry and market uncertainty. In other words, less informed investors trade in the corrupt oriented environment, and this naturally enlarges information asymmetry problem between investors and investment banks. Therefore, gathering information during road shows becomes more difficult when rent seeking is prevalent. To develop the second hypothesis, we associate offer price revision and corrupt environment:

H_3: The demand of collecting information in the corrupt environment is higher, reflected by higher offer price revisions.

3.3 Underwriter's role in corrupt environment

Habib and Ljungqvist (2001) point out that one of the promotion activities used by issuers is to hire prestigious investment banks. Reputable underwriters are market participants

that have been tested over the years and have a reputation at stake. They have experience in promoting, supporting and certifying IPOs. Their appearance in an IPO from the rent-seeking environment should send a positive signal to the investors who have doubts about the new issues. Furthermore, reputable underwriters usually have established close links with investors (Ljungqvist and Wilhelm (2002), Chen and Wilhelm (2008)). Thus, they can take advantage of their experience and networks to target particular investors in the rent-seeking environment. Investment banks can invite investors that who are experts in the industry regarding the IPO company during the book building process. Such investors can analyse the company accurately and therefore increase their confidence about the issue in the corrupt environment, which reduces their cost of collecting information. This will help underwriters in pricing the issue at its intrinsic value.

Nevertheless, the ability of a reputable investment bank to price the issue close to the intrinsic value does not only depend on the investors. If a corporation is from the rent-seeking environment, its transparency may be lower. This will restrain underwriters to evaluate the issue. Reputable underwriters may pay high salaries to experienced analysts that they hire, such as all-star analysts, to help evaluate the IPO. In turn, experienced analysts can conquer the problem caused by the corrupt environment, for instance, to fairly judge the increased extra expenditure from firms incurred by public rent-seeking. From this point, prestigious investment banks will expose higher bargaining power over issuers in a corrupt environment. Wang and Yung (2011) assert that reputable underwriters can incorporate information into pricing the issue more accurately. Issuers from a corrupt environment will be willing to pay a higher premium in exchange for accurate issue pricing from reputable underwriters (see, e.g., Sherman and Titman (2002)). Thus, the advantages and superior abilities of prestigious investment banks in a corrupt environment lead to our second testable hypothesis:

H_4: Prestigious investment banks can price issues accurately in political corrupt environment.

4. Sample and Data

4.1 Data

The sample includes shares of the US common stock recorded in the Thomson One Banker database from 1 January 1990 to 31 December 2015. We exclude the issues with offer price below $5 due to the restrictions imposed by the Penny Stock Reform Act of 1990 on such IPOs. To avoid further negative impacts from certain types of offerings on our sample, we

follow previous literature and eliminate closed-end funds, unit offerings, real investment trusts (REITs) and American depositary receipts (ADRs). Finally, this leaves the sample with 5963 observations. We also rely on the same database to collect the offering information, including offer price, underwriter's information, the ratio of the shares that insiders retain during the IPO, number of bookrunners and the primary market place where the stock trades. We gather firm age and underwriter's reputation from Jay Ritter's website. To identify the issuer's location, we obtain the headquarter information from Compustat and then merge with the source from Thomson One Banker to ensure the data reliability.

4.2 Political corrupt environment measures

We collect number of the public corruption convictions from Transactional Records Access Clearinghouse (TRAC) database and population for each state from The United State Census Bureau between 1990 and 2015. The main advantage of using TRAC to access the data is that the database uses Freedom of Information Act (FOIA) to request the raw information from different agencies such as FBI. Then all the information will be checked and verified by TRAC to ensure the reliability of the data. TRAC also uses up-to-date lead charge codes to classify different judicial cases.

We follow Glaeser and Saks (2006) and Butler, Fauver and Mortal (2009) to measure corrupt environment as number of corruption cases per million population in the state. However, apart from other related studies, in the case a company has gone public in 2000 and the corrupt environment deteriorates in that state after 2001. To avoid problems related to the year effecting offering and the corruption status, we create our measure of corrupt environment. Namely, we calculate number of public corruption convictions per million people from 1990 to one year before the IPO.

$$CPI = \frac{number\ of\ convictions_{(From\ 1990\ to\ 1\ year\ before\ IPO)}}{Population\ in\ million_{(From\ 1990\ to\ 1\ year\ before\ IPO)}} \quad (1)$$

Where CPI (corruption perception index) represents the measure of public corruption environment. One would argue that an appropriate measure should consider IPO month, because corrupt environment may vary across the whole year. However, both The United State Census Bureau and TRAC do not provide the detailed monthly information. We also create an alternative corrupt environment measure to account for the IPO year; the results indicate that there is no difference between using the two measures.

In addition to the continuous measure, we create a binary variable to estimate corrupt environment in our sample. Specifically, we calculate the corruption index for all 50 states in the US corresponding to different IPOs in our sample from 1990 to a year before going public. The median value of CPI in the 50 states is then identified and used as a comparison indicator: if the offering has CPI equal or above the median value, indicating the IPO is from corrupt areas and takes 1; otherwise is 0. The correlation between *CPI* and *High public corruption* is 0.337.

We noticed that IPOs from Washington D.C. have higher corrupt environment ranging from 11 to 45 convictions per million people; while other issues vary from 0 up to 4. It is not surprising that D.C. has such a high corrupt environment for two reasons: First, D.C. is the political centre in the US and increase the likelihood that public official being corrupt. Second, there are less inhabitants in D.C. and making per capital conviction higher in the area. Thus, we winsorize CPI and High public corruption variables at the 1% and 99% level due to such a large difference from D.C. In robustness test, we exclude IPOs from D.C. and report similar results.

4.3 Sample Statistics

Panel A of Table 1 provides descriptive statistics for the variables of interest and control in our sample. The average (median) firm age is 14.9 years (8 years), with 34.9% firms from the high technology industry. The average IPO offer price in our sample is $12.89 with a mean IPO first day returns of 18.92%. The IPOs in our sample face an average of 1.33 bookrunners with rank 6.57(the highest is 9), indicating that majority issuers hire reputable underwriters. VC-backed IPOs occupy 39.3% in our sample, with the average ratio of shares that insiders retain (Overhang) of 3.37%. The average IPO offer price revision is 44.3% with 66.7% upward revisions. Majority IPOs went public during the hot market period (71%) and listed on Nasdaq (68.4%). Over half (53.4%) IPO insider's benefit from wealth gains (Insider's wealth dummy). All variables are winsorized at 1% and 99% level and definitions are provided in the Appendix A.

[Please Insert Table 1 about Here]

Panel B displays descriptive statistics categorized by corrupt environment level. The results imply that the difference in IPO first-day return and offer price revision is large and significant. IPO firms with headquarter located in corrupt areas have an average first-day returns that are 4.85% greater than issuers from non-corrupt areas. The difference for offer

price revision is even larger, with 83.2% more in high rent-seeking environment. Other control variables also exhibit statistical differences in means, except number of bookrunners and hot market condition. In order to provide in depth analysis of individual cases, we provide a list of fifteen IPOs that were ranked in top with the level of political corrupt environment based on the headquarter locations. For comparison purpose, we also present the average first-day returns and money left on the table in the IPO year. Specifically Panel A of table 2 reports the top-fifteen IPOs operating in the highly corrupt environment of Washington D.C.; Panel B excludes both the IPOs from Washington D.C. and the IPOs who share the same CPI in the same state. We observe that, in the majority of the cases, the IPOs locate in a relatively high corrupt environment, show excessive first-day returns and leave more money on the table in comparison to the average level in the issuing year.

[Please Insert Table 2 about Here]

The unilateral comparison results are consistent with our primary hypothesis that corrupt environment leads to higher underpricing and offer price revisions. Nevertheless, the analysis does not take into account other influential factors. Thus, we control additional explanatory variables and conduct multivariate regression analysis to investigate the association between corrupt environment and IPO performance in the following sections.

5. Empirical Findings

5.1 The associate between corrupt environment and IPO first-day returns

We now examine the relationship between corrupt environment and IPO first day returns in multivariate OLS regression analysis. We cluster the standard errors by both year and industry to avoid unspecified correlations and ensure robustness of our results. We also control for year and industry effects for most models. In particular, as Butler, Fauver and Mortal (2009) argue that political corruption could be characterised by general demographics feature of a geographic region in the US. Following the U.S. Census Bureau, we classify our sample into West, Midwest, South, and Northeast, based on the IPO issuers headquarter states. Thus, we also include the region control in most of the models. Panel A of Table 3 reports the results of the analysis.

[Please Insert Table 3 about Here]

In all of those regressions, the *IPO first-day returns* variable appears to be positively and significantly related to corrupt environment, corroborating the results of the univariate

comparisons. This provides evidence that political corruption is associated with higher underpricing, which makes IPO issuers suffer from potential losses on the public capital market. The adjusted R-square soars from 0.0005 in model 1 to 0.236 in the baseline model where we include rich sets of explanatory regressors (model 4), implying that the magnitude of additional control variables. In specification 5, we do not account for region effect, the coefficient of CPI weakens in terms of magnitude and statistical significance, confirming that regional diversification has an impact on the US political corruption. We use *High public corruption* variable as alternative measure to indicate whether IPO firm is from the corrupt area in the last specification. The coefficient estimate is positive and significant at 1% level, exhibiting that IPOs experience 2.56% more underpricing in the high rent-seeking environment. Regarding the economic magnitude of impacts in the baseline model 4: a one stand deviation increase in corrupt environment index (CPI) surrounded IPO issuer implies 1.31 % increase of initial returns on average.

The control variables are significant at conventional level and show expected signs. Firm age appears to be negatively related to the underpricing, as the older firm generates lower information uncertainty, and investors can receive more knowledge about the business (Cliff and Denis (2004)). The coefficients on Venture capital are positive and significant, meaning that VC-backed IPOs generate higher initial returns, which is in line with the finding of Loughran and McDonald (2013). The relationship between underwriter's reputation and initial returns are negative and all significant at 1%, supporting the certification hypothesis that top-tier banks have a reputation at stake and can price the issue close to the intrinsic value (e.g., Michaely and Shaw (1994)). A number of bookrunners is related to lower underpricing, as more bookrunners make more efforts in IPO and result in fewer gaps between the offer price and firm value (Nielsson and Wójcik (2016)). Issues listed on Nasdaq experience higher underpricing (Leone, Rock and Willenborg (2007)) and firms from high-tech industry also exhibit excessive initial returns (Loughran and Ritter (2004)). Finally, signs on share overhang and hot market dummy are also positive and significant at 1% level, confirming to previous related studies (e.g., Lowry and Murphy (2007) and Loughran and McDonald (2013)).

Next, we investigate the effect of corruption on underpricing among different firm dimensions. We keep all covariates included in panel A and divide the sample based on the firm size. We classify large corporations are those with pre-IPO total assets in top quartile in our sample. The results are presented in panel B. The estimations show positive and significant signs on *CPI* and *High public corruption* for small sized firms; on the contrary, display positive estimates but with no statistical significance for large corporations. The evidence, as expected,

suggests that corruption does have an impact on small firms, but has no effect on mature ones. This is consistent with our conjecture: stock performances of large corporations are less likely to be influenced by corruption due to the benefits they may receive from using illegal business means, or their ability to keep safe from corruption, thus leading to less uncertainty around IPO and reduced costs of information collection for investors.

5.2 IPO offer price revision and corrupt environment

In this section, we test the association between IPO offer price revision and firms operating in a corrupt environment. We measure offer price revision as the percentage change from the midpoint of the initial price range to the offer price (Corwin and Schultz (2005)). In addition, we use Revision UP dummy to indicate upward revisions. Namely, offer price exceeds the midpoint of the initial price range. If corrupt environment indeed results in more frequent offer price revise due to the need of information from investors, then should also generate more positive revisions.

Table 4 displays the results from using OLS and logistic regressions. We first use IPO offer price revision as the dependent variable. The signs of *CPI* and High public corruption are positive and significant at 10% and 5%, respectively. A one standard deviation increase in CPI results in 0.337% more offer price revisions on average. Next, we run logistic estimations for using *Revision UP dummy* as the outcome variable, and the estimates of interests are 0.11 and 0.14, and significant at 1% and 5% level, respectively. The coefficient of *High public corruption* suggests that the odds of a positive revision increase by 1.15% when IPO is from the high political corrupt environment. Given that underwriters frequently revise offer price is due to the need of information production (Benveniste and Spindt (1989)), our evidence in return implies that higher market uncertainty and severer information asymmetry exist on the market. The results support our second hypothesis that there is a high demand for underwriters to induce private information in corrupt environment, resulting in greater IPO offer price revisions.

[Please Insert Table 4 about Here]

Most of the included control variables display expected signs. Specifically, High-tech IPOs, offer price, and trading on Nasdaq are positively related to offer price revision, while firm age, number of bookrunners and reputable underwriters are negatively associated with the revision. The results are similar in logistic estimations, except listing no Nasdaq does not result in more upward offer price revisions. The results are generally aligned with previous literature.

5.3 Underwriter's role in corrupt environment

As we conjectured that prestigious banks have superior abilities to help firms operating in rent seeking environment mitigate the level of IPO underpricing, this section provides empirical evidence to support it further. We use two indicators to measure underwriter's reputation: underwriter's rank and a binary variable indicating whether underwriter is reputable, by limiting the rank equal or over 7. Table 5 presents the results of the interaction effect between prestigious investment banks and IPOs from corrupt environment.

[Please Insert Table 5 about Here]

To illustrate results, the coefficient estimate on interaction term *CPI*Underwriter rank* is negative and significant at 5%, suggesting that better ranked investment banks can reduce IPO underpricing when working in the severe corrupt environment. Similarly, the result on *CPI*Rank above 7* remains negatively correlated with first-day returns and significant at 5%. Comparing to the sign in specification 1, testing only reputable underwriters confirms that top-tier banks reduce underpricing efficiently, as the magnitude is larger. In both models, the coefficient estimates on CPI remain positive and significant at 1%. Other control variables display expected signs as showed in baseline regression and all significant at conventional level. The results are consistent with our last hypothesis.

5.4 Endogeneity control

5.4.1 Instrumental variable approach

We should emphasize that the above analysis is based on the assumption that the selection of IPO issuers headquarter is exogenously determined. However, as Panel A of Table 1 illustrates, the differences of IPO initial returns and offer price revisions tend to be large in high and low corrupt areas. Additionally, there are over half (68%) of issuers located in high rent-seeking environment. Thus, the choice of headquarter location for IPO firms could be an endogenous problem.

Hold other conditions equal (e.g., market targets), if a company has the intention to use bribery in business or to commit financial fraud for private gains, then manager may want to choose a State for their headquarters where corrupt activity is prevalent. This potentially challenges our results where selection bias issue exists. Thus, following Faulkender and Petersen (2006), An and Chan (2008) and Lin and Su (2008), we use a two-stage Instrumental

Variable model to address this self-selection concern.[2] The model requires the use of proper exogenous variables that can affect the dependent variable through a main explanatory variable but do not have a direct impact on the outcome (Wooldridge (2015)). Ideally, the variable should have an influence on the choice of firm headquarter location regarding the local corrupt environment but not on IPO returns or revisions. In the spirit of Mauro (1995), Alesina, Baqir and Easterly (2000), Glaeser and Saks (2006) and Lochner (2007), we select *education level* and *racial heterogeneity* variables on the state level to serve as such identification restrictions. Prior studies demonstrate that racial heterogeneity can affect corruption, as it may drive politicians to use money transactions in exchange for political support from their ethnic group (e.g., Glaeser and Saks (2006)). To construct the instrumental variables, we collect the data from the US Census Bureau and match our sample by IPO year from t+1 to t+9 to a single value strictly after each census year.

Table 6 reports the results from the second step of using two-stage least squares (2SLS) regressions to control for endogeneity. We cluster standard errors by year and industry to access robustness results. As seen in the table, instrumented *CPI* and *High public corruption* are positively related to underpricing and revision at conventional level. The reported p-values of Durbin-Wu-Hausman test reject that *CPI* and *High public corruption* are exogenous, confirming the endogeneity issue in our sample. The included control variables retain expected signs. The results are consistent with previous findings from baseline regressions.

[Please Insert Table 6 about Here]

5.4.2 Matching estimation

The results from Panel B of Table 1 show that most of our control variables are significantly different between the levels of the corruption. The statistical differences appear in High-tech, offer price, share overhang, trading on Nasdaq and venture capital. Thus, the differences in IPO characteristics in corrupt and non-corrupt areas could be caused directly or indirectly by the local political corrupt environment, or by unobserved heterogeneity between IPO issuers. In this section, we use propensity score matching (PSM) to control for such observable differences. Using a propensity score matching analysis, we can statistically compare the outcome of a treated observation (IPO firm) with an effect (corrupt environment)

[2] For binary variable, we apply a special two stage least square method. Methodology is provided in the Appendix D.

to the same observation but not treated based on a number of covariates. We define our treatment observations as those IPOs from corrupt areas and include rich sets of covariates from the previous analysis. We extend our testing by controlling for year, industry, and region effects.

We follow Smith and Todd (2005) and Smith (2016) to estimate the propensity score matching and tabulate the results in Table 7. We use three methods for the average treatment effect of the treated for IPO initial returns. Initially, we use the four nearest neighbors matching with common support, and adopt Abadie and Imbens (2006) standard errors. We then estimate radius matching and use a caliper of 0.05 to avoid bad matches. Finally, we use local linear matching with a bandwidth of 0.5 to access the differences between the two group of IPO returns. We observe that the differences between matched and unmatched samples are positive and all significant at 1%. The results, are economically significant, showing differences ranging from 3.06% to 4.273% for first day returns, suggesting that IPOs from corrupt oriented areas experience higher underpricing. The estimates are greater than the ones reported from our baseline regressions in magnitude and consistent with our primary hypothesis.

[Please Insert Table 7 about Here]

5.5 Insider's wealth in corrupt environment

One of the principal objectives for firms going public is to take pre-IPO shareholder's net wealth gains into account. Loughran and Ritter (2002) argue that insiders are better off from retaining the shares when the stock price is high (wealth effect) and lose from selling the shares with high first day returns which will result in the substantial amount of money left on the table (dilution effect). Such wealth gains, however, are affected by the offer price revisions and initial returns. Pre-IPO shareholders benefit from a higher market price which results from a higher revision and underpricing, depending how much shares they retain. On the other hand, pre-IPO shareholders suffer a loss from a low offer price which does not reach its intrinsic value (dilution effect). Therefore, the overall effect of offer price revisions and initial returns on insider's wealth depends on the portion of shares they retain and sell in during the IPO. Thus, net wealth gains using the dilution effect abstracted from the insider's wealth effect can appropriately capture the prosperity of the pre-IPO shareholders. Therefore, we are particularly interested in investigating how the corrupt environment affects insider's wealth.

We use *insider wealth gains* variable as the dependent variable indicating whether pre-IPO shareholders benefit from wealth gains, measuring as wealth effect minus dilution effect[3]. In addition to variables of our interest, we also incorporate three control variables: Initial returns residual, the logarithm of IPO proceeds and IPO float ratio. The initial returns residual variable is obtained from regressing IPO first-day returns on rent-seeking measures and worked as a proxy for the separate effect of underpricing on insider's wealth (Cook, Kieschnick and Van Ness (2006) and Cooney, Madureira, Singh and Yang (2015)). We include float ratio as Cook, Kieschnick and Van Ness (2006) document that it influences underpricing and has an impact on insider's gains. In spirit of Ljungqvist, Nanda and Singh (2006), we control for IPO proceeds, given that underwriters are likely to increase offer size to entice sentiment investors who determine the marginal valuation of the issue in the market. We perform a logistic regression to investigate the association between insider's wealth and corrupt environment. The results are tabulated in Table 8.

[Please Insert Table 8 about Here]

The results from control variables are in line with Cook, Kieschnick and Van Ness (2006) and Cooney, Madureira, Singh and Yang (2015). Specifically, we find that increasing the amount of proceeds during the IPO and decreasing float ratio can improve the likelihood of net positive gains for pre-IPO shareholders. The initial return residuals also exhibit a positive relationship with insider's wealth and significant at 1%. Importantly, we observe that corrupt environment does not lower insider's wealth, as the signs of CPI and High public corruption are positive and significant at conventional level. This is consistent with wealth o hypothesis proposed by Ang and Brau (2003), that insiders use strategies to conceal the number of shares they sell in the aftermarket. In addition, Loughran and Ritter (2002) argue that issuers do not feel upset about the "money left on the table" due to the perceived wealth gains exceed the losses from first-day returns. Our results are in support of their finding and particularly indicate that corrupt business environment may not be a concern for insiders since they still benefit from the shares they retain before the IPO.

[3] Following Bradley and Jordan (2002),Cook et al.(2006) and Cooney et al.(2015), we define the wealth effect of the insiders as (closing price of the first trading day - midpoint filling range) *number of shares retained by pre - IPO shareholders; the dilution effect is calculated as (closing price of the first trading day - offer price) *number of shares issued in the offering. We measure the number of shares retained by pre-IPO shareholders as (number of shares outstanding after offering - number of shares issued in the offering).

5.6 Robustness tests

Table 9 presents further regressions using alternative measures of the corrupt environment and additional tests as robust checks to explore the sensitivity of IPO underpricing in rent seeking surroundings. We use both OLS and 2SLS regressions to challenge the results. We also draw full sets of control variables from our baseline regressions.

[Please Insert Table 9 about Here]

In earlier analyses, we measure corrupt environment from 1990 to one year before IPO. In this section, we use an alternative measure which only considers the rent-seeking business environment since the IPO firms are established. In other words, the new measure is defined as number of convictions per million population from the company founded year to one year prior to the IPO. Thus, available observations drop to 2904 IPOs due to many firms started businesses before 1990 and the detailed information regarding convictions is not provided. As seen in the table 9, the resulting coefficients on *CPI (excl. Prior est.)* variable remain positive and significant, providing alternative evidence that corrupt environment results in higher IPO initial returns. A Hausman test (p-value: 0.0528) in 2SLS estimation rejects that our interest in specification 1 is exogenous.

Other related studies use conviction data from The US Department of Justice Public Integrity Section (PIN) report (e.g., Glaeser and Saks (2006) and Butler, Fauver and Mortal (2009)). To underpin our results, we apply DOJ data in this section. First, we duplicate corrupt environment measure from table 3 using convictions information provided by DOJ in specification 2. The estimations show that using alternative data does not affect our results: IPO first-day returns are still positively significantly related to the corrupt environment. In model 3, we repeat our new measure of the rent-seeking surrounding from specification 1, but adopting DOJ data. The results, however, display the expected sign in OLS estimation but not statistically significant; then turn to be positive and significant at 10% when using IV approach. The overall evidence confirms that corrupt environment has a positive impact on IPO initial returns, regardless of using conviction sources.

In specification 4, we use raw convictions from TRAC database as our interest, namely, number of convictions from 1990 to one year before IPO. The coefficients are again of expected signs and are all significant but generate less economic magnitudes than in baseline models. Next, we exclude IPOs from Washington D.C. as the corrupt environment in the Capital City is severer than others. The estimates have the expected signs and remain significant. The

magnitudes of relations are similar than those in baseline regressions, implying that IPOs from D.C (e.g., with extremely high corruption) does not drive our results. In terms of economic significance, a one standard deviation increase in CPI results in 1.34% increase in initial returns on average under OLS estimation.

5.7 Beyond the first day returns

In the spirit of Nielsson and Wójcik (2016), if IPOs from corrupt areas outperform IPOs from non-corrupt areas, then the higher first-day return is just a reflection of the outperformance. On the other hand, in the case the difference does not appear when examining returns after the first trading day, which indicates that there is no disparity in ability between IPOs from different level of corrupt environment. Alternatively, it shows that there is a specific impact from political corruption pertaining on the first day of trading, which is consistent with our main hypothesis that the differences of initial returns emerge from the uncertainty of firm value across various levels of corrupt environment in states (e.g., pre-IPO corrupt environment aggregates market uncertainty and information asymmetry), and is fully revealed on the initial returns. To further underpin our hypothesis, we examine the relationship between corrupt environment and IPO long-run returns.

[Please Insert Table 10 about Here]

We use equally and value weighted firm portfolios to access cumulative buy-and-hold returns and explore the sensitivity in corrupt environment by separately examining: (1) the first calendar week return (excl. first trading day); (2) the returns from week 2 to week4; (3) the returns from month 2 to month 3; (4) the returns from month4 to month 6; (5) the returns from month 1 to month 6(excl. first trading day). To illustrate results, Panel A shows there is no significant differences in IPO long-run performance between corrupt areas and non-corrupt areas. We use a propensity score matching of the four nearest neighbors with common support in Panel B and the result appears to be significant in Week 2-4, meaning that IPOs from corrupt areas even underperforms the issues from non-corrupt environment. Finally, we run multivariate regression in Panel C. The coefficient estimates are only significant for week 2-4 but display negative signs, suggesting that a political corrupt environment does not make IPOs perform better during a specific period in the long-run. In untabulated results, we also report similar results for using *High public corruption* variable as a link to corrupt environment. Overall, our evidence confirms to the underlying hypothesis that the impact of corrupt environment in pre-IPO period is mainly concentrated on the first day of trading.

5.8 White collar crime

Prior studies consider white collar crime as another rent-seeking behaviour taking in private section (e.g., Murphy, Shleifer and Vishny (1993)), which could be a plausible factor influencing our results, as such convictions impose a more direct impact on firm performance (see, e.g., Dechow, Sloan and Sweeney (1996), Baucus and Baucus (1997) and Marciukaityte, Szewczyk, Uzun and Varma (2006)). Arguably, one would suspect that white collar crime, other than political corruption, causes high IPO first-day returns. Given this concern, we collect white collar crime conviction data from TRAC and duplicate the measures for political corruption. Table 11 present the results of running regressions to investigate the association between white collar crime and IPO performance. In the empirical evidence, we find that there is no significant relationship between white collar crime and IPO underpricing. In fact, unlike government behaviours, which draws more public eyes, white collar crime is implicit. The firm and investor will not notice the crime until the offender is arrested. Thus, under this circumstance, IPO issuers have no intensive to conceal the information, and the investor will not pay attention to such a crime. White collar crime, therefore, should not be a factor driving our results.

[Please Insert Table 11 about Here]

6. Discussion

Why. Pre-IPO shareholders manage positive returns in a corrupt environment?

A debate that arises from our study would be why pre-IPO shareholders can manage positive returns from the shares they retain in a corrupt environment, though political corruption imposes costs for firms to access IPO market by aggregating first-day returns. We argue that underwriter's promotional efforts during the IPO play an important role in the corrupt environment.

As discussed, a positive pre-shareholder's wealth gain depends on the higher IPO offer price revision and lower underpricing, relative to the portion of shares they retain. However, our evidence indicates that political corruption increases first-day returns, meaning insiders continue to suffer from loses in a corrupt environment. Thus, the results from section 5.2 portray the impression that a positive insider's wealth benefit may mainly derive from higher offer price revisions, which is attributed to the promotional efforts by underwriters (Cook, Kieschnick and Van Ness (2006)). As our hypothesis postulates, corrupt environment results in higher revisions due to the demand on information production. On the one hand,

underwriters can incorporate information into the offer price (Corwin and Schultz (2005)) and higher revisions bring benefits to issuers (e.g., raise more capital) (Cooney, Madureira, Singh and Yang (2015)). On the other hand, investment banks need to balance the level of underpricing (Beatty and Ritter (1986)), especially when corruption is stronger. Because underwriters may lose participation by other investors, in the case aftermarket returns are low (i.e., collecting information in a corrupt environment is costly and investors do not receive sufficient compensation); when the IPO is undervalued, other potential customers (i.e., IPO issuers) may attempt to free-ride on this problem and decide not to hire the same banks in the future. This forces underwriters to make the best efforts to support the IPO in the corrupt environment.

Further, in unreported results (available upon request), by using the gross spread proxied as total fees and the selling concession represented for the reward for selling the issue to separately examine the relationship with corruption levels we reveal that both compensation measures are positively associated with the corrupt environment. This suggest that issuers pay more for underwriters when political corruption becomes stronger. There is evidence that investment banks deem their prestige in the market as an important symbol for the future business. Thus, higher fees provides underwriters with incentives to secure their reputation stake and raise offer price revisions for IPO firms from a corrupt environment. Insiders in turn benefit from price revisions. The success of conducting an IPO in a corrupt environment can serve as a promotion for the banks, which will attract more issuers whom are surrounded with corruption. Therefore, such reciprocal relationship between IPO firms and investment banks increases the likelihood of having positive wealth gains for pre-IPO shareholders in a corrupt environment.

7. Conclusions

Consistent with the argument that political corruption increases business environment uncertainty, and has a negative impact on firm performance, this study provides initial evidence between corrupt environment and IPO short-run performance in the US. Specifically, we reveal that corruption is associated with higher underpricing, but only for small sized firms. This translates into a $1.3 million loss for a mean-sized issuer in the form of excessive first-day returns. The finding is consistent with information asymmetry causing higher underpricing, which is due to market uncertainty surrounds IPOs in a corrupt environment. In addition, we uncover that corruption mainly affects small firms, and has no impact on large corporations. We also address the role of underwriters in the risk-adverse market. We document that better

ranked investment banks reduce underpricing for issuers, which is in agreement of their certification roles in the IPO. Further, being consistent with information-acquisition model, underwriters have to revise offer price frequently in a corrupt environment, as there is a higher demand to gather information from the informed investors. Finally, examining pre-shareholder's wealth gains explains that issuers may not worry about "money left on the table" since they still benefit from the shares they retain in the rent-seeking environment.

In the analysis, we consider endogeneity issue when IPO firm headquarters is not randomly selected in our sample. We perform an instrumental variables approach and use education level and racial heterogeneity as instruments for political corruption. In addition, we use a propensity score matching estimation to challenge endogeneity problem. In robustness tests, we implement alternative measures for the corrupt environment, use the database for corruption convictions from DOJ and exclude factors that may drive our analysis (e.g. exclude IPOs from D.C). All the analyses strengthen our prediction and suggest that political corruption in the US raises costs for firms going public, by leaving millions of dollars "on the table".

In response to the questions raised in the introduction, the findings of this paper imply that: (1) political corruption aggregates business environment uncertainty, and sets barriers for companies to enter public capital market by incurring higher first-day returns; (2) underwriters play an important role on eliminating market information asymmetry and can reduce underpricing for issuers in corrupt environment; (3) corruption has a positive impact on pre-IPO shareholder's wealth due to investment bank's promotion efforts. Overall, our study uncovers the significance of political corruption on IPO performance, which may guide investors to make further decisions.

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Table 1 Summary Statistics

The table provides descriptive statistics for our sample. Panel A illustrates basic summary statistics for the main variables of control and interest in our sample; panel B reports t-test results for the mean values of our primary and control variables divided into high and low corrupt environment groups. The data contains IPO characteristics collected from Thomson One Banker, including IPO initial returns, calculated as the percentage change from the offer price to the first day closing price. IPO revision is defined as changes from offer price to the midpoint of the initial price range over offer price. The missing values from database trim the sample size on IPO revision, Revision UP dummy and insider's wealth dummy. We calculate the corrupt environment measures for each state in the US from 1990 to 1-year prior to the IPO date, corresponding to the IPO sample; if the IPO has corrupt surrounding measure above the median value, representing it is from the high corrupt environment and noted as 1, otherwise is 0. One, two and three asterisks denote statistical significance at the 10%, 5% and 1% level. All variables are defined in the appendix.

Panel A Summary statistics

Variable	N	Mean	Median	Std. Dev.	Min	Max
IPO initial returns	5,963	18.92	8	33.67	-23.91	186.61
High public corruption	5,963	0.68	1	0.47	0	1
Firm age	5,963	14.9	8	20.7	0	165
High-tech	5,963	0.35	0	0.48	0	1
Offer price	5,963	12.89	12	5.13	5	29
No. of Bookrunners	5,963	1.33	1	0.85	1	6
Overhang	5,963	3.37	2.69	2.89	0	17.51
Underwriter rank	5,963	6.57	8	3.86	0	9
Nasdaq	5,963	0.68	1	0.47	0	1
Hot market	5,963	0.71	1	0.45	0	1
Venture capital	5,963	0.39	0	0.49	0	1
Revision	5,766	0.44	0	12.65	-36.36	33.33
Revision UP dummy	5,766	0.67	1	0.47	0	1
Insider's wealth dummy	5,667	0.53	1	0.5	0	1

Panel B Summary Statistics by Corrupt and Non-Corrupt areas

Variable	Non-corrupt areas	Corrupt areas	t-statistic difference in means
IPO initial returns	15.62	20.47	-5.19***
Firm age	16.88	13.96	5.09*
High-tech	0.28	0.38	-7.46***
Offer price	13.41	12.64	5.36***
No. of Bookrunners	1.36	1.31	2.31
Overhang	3.23	3.43	-2.44***
Underwriter rank	6.67	6.52	1.40*
Nasdaq	0.66	0.69	-2.34***
Hot market	0.71	0.71	0.42
Venture capital	0.32	0.43	-7.00***
Revision	-0.13	0.71	-2.33***
Revision UP dummy	0.64	0.68	-2.68***
Insider's wealth dummy	0.52	0.54	-1.31*

Table 2 Top-fifteen IPOs Based on the Level of Political Corrupt Environment

The table reports fifteen IPOs in the top level of political corrupt environment in the US, based on the headquarter locations. The sample consists of initial public offerings from 1990 to 2015 in the US stock market. IPO first-day returns are calculated as the percentage changes from first day closing price to offer price. We measure corrupt environment (CPI) as the number of corruption convictions from 1990 to 1-year before the IPO date divided by the population in millions in the same period. Panel A only presents the samples in the D.C.; and Panel B excludes the D.C., and also rules out the IPOs who share the same CPI in the same state. The average first-day returns, average money left on the table in the IPO year and IPO age are obtained from Jay Ritter's website.

Panel A

IPO date	Issuer	Age at IPO	Headquarter State	CPI	First-day returns for the issuer	Average First-day returns for the IPO year	Money left on the table for issuer ($, million)	Average money left on the table in the IPO year ($, million)
06/17/2004	Blackboard Inc	6	District of Columbia	43.90	43.50%	12.30%	33.50	3.86
11/16/2004	InPhonic Inc	7	District of Columbia	43.90	33.58%	12.30%	47.85	3.86
06/28/2005	Columbia Equity Trust Inc	1	District of Columbia	43.68	2.33%	10.30%	4.19	2.64
04/12/2006	Vanda Pharmaceuticals Inc	3	District of Columbia	43.16	-3%	12.10%	-1.73	3.95
02/15/2000	VarsityBooks.com Inc	3	District of Columbia	42.43	-2.50%	56.30%	-1.02	29.83
10/18/2007	DuPont Fabros Tech Inc	10	District of Columbia	41.98	6.29%	14%	40.29	4.95
05/20/1999	CAIS Internet Inc	1	District of Columbia	37.35	0%	71.10%	0.00	37.11
10/04/1999	XM Satellite Radio Hldgs Inc	7	District of Columbia	37.35	14.58%	71.10%	17.50	37.11
02/05/1998	ACSYS Inc	1	District of Columbia	34.40	33.09%	21.90%	7.74	5.25
07/31/1998	Global Vacation Group Inc	39	District of Columbia	34.40	4.46%	21.90%	1.87	5.25
11/25/1997	Consolidation Capital Corp	0	District of Columbia	32.12	4.07%	14%	19.54	4.56
05/27/1997	Carey International Inc	18	District of Columbia	32.12	33.93%	14%	10.33	4.56
08/20/1996	CapStar Hotel Co	8	District of Columbia	28.86	0%	17.2%	0	6.76
02/14/1995	US Office Products Co	1	District of Columbia	24.43	5%	21.20%	1.63	4.90
10/30/1991	BET Holding Inc	12	District of Columbia	21.48	38.97%	11.90%	28.16	1.50

Panel B

IPO date	Issuer	Age at IPO	Headquarter State	CPI	First-day returns for the issuer	Average First-day returns for the IPO year	Money left on the table for issuer ($, million)	Average money left on the table in the IPO year ($, million)
11/05/1990	Northrim Bank	0	Alaska	16.27	-3.13%	10.80%	-0.27	0.34
03/23/2010	First Interstate BancSystem In	42	Montana	6.79	10.76%	9.40%	15.60	1.84
08/05/2004	RightNow Technologies Inc	9	Montana	6.22	0.71%	12.30%	0.31	3.86
11/26/1997	Brass Eagle Inc	2	Alaska	6.06	13.64%	14%	3.41	4.56
11/17/1999	Alaska Commun Sys Grp Inc	5	Alaska	5.22	0.45%	71.10%	0.43	37.11
07/13/1995	BNCCORP Inc,Bismarck,ND	8	North Dakota	5.00	2.50%	21.20%	0.25	4.90
05/14/1990	Integrated Waste Services Inc	4	New York	4.94	40%	10.80%	4.50	0.34
10/23/1992	Casino Magic Corp	2	Mississippi	4.64	105.00%	10.30%	19.43	1.82
09/23/1999	Jore Corp	12	Montana	4.55	20.00%	71.10%	8.00	37.11
06/27/2002	Montana Mills Bread Co Inc	6	New York	4.49	34.00%	9.10%	3.40	1.13
05/17/2001	Instinet Group Inc	32	New York	4.48	31.17%	14.20%	144.63	2.97
09/04/1991	Mutual Assurance Inc	15	Alabama	4.44	27%	11.90%	3.15	1.50
10/04/2000	Coach Inc	59	New York	4.39	15%	56.30%	15.16	29.83
08/26/1993	River Oaks Furniture Inc	6	Mississippi	4.36	33.33%	12.70%	6.40	3.50
09/30/1993	Tri-County Bancorp Inc	13	Wyoming	4.35	24%	12.70%	0.08	3.50

Table 3 Impact of Political Corruption on IPO First-day Returns

The table displays the effects of corrupt environment on IPO first-day returns using ordinary least square (OLS) regressions. The sample consists of initial public offerings from 1990 to 2015 in the US stock market. The dependent variables are IPO first-day returns, calculated as the percentage changes from first day closing price to offer price. Panel A includes all samples, while panel B divide the sample into two group based the firm size. We define large corporations are those with pre-IPO total assets in the top quantile. We measure corrupt environment (CPI) as the number of corruption convictions from 1990 to 1-year before the IPO date divided by the population in millions in the same period. As for the binary feature of corrupt surroundings (High Public Corruption), we calculate the corrupt environment measures for each state in the US from 1990 to 1-year prior to the IPO, corresponding to the sample; if the IPO has corrupt surrounding value above the median among all the states, representing it is from high corrupt environment and noted as 1, otherwise is 0. In Panel A, Model (2) (3) (4) and (6) include year, industry, and region control. Model (5) only include the year and industry control. One, two and three asterisks denote statistical significance at the 10%, 5% and 1% level. T-statistics are included in the parentheses and are reported for heteroskedasticity robust standard errors clustered by both year and industry. All variables are defined in the appendix.

Panel A

	(1)	(2)	(3)	(4)	(5)	(6)
CPI	0.938**	1.170**	1.297***	1.402***	0.832**	
	(2.08)	(2.56)	(2.85)	(3.14)	(2.27)	
High public corruption						2.563***
						(3.71)
Ln (1+age)		-1.796***	-3.117***	-2.930***	-3.000***	-2.935***
		(-3.89)	(-5.30)	(-5.42)	(-5.37)	(-5.42)
High-tech		9.014***	7.468***	6.302***	6.712***	6.223***
		(5.23)	(4.89)	(4.53)	(4.69)	(4.51)
Offer price			1.473***	1.490***	1.471***	1.492***
			(4.70)	(4.80)	(4.79)	(4.79)
No. of bookrunners			-3.030***	-2.337***	-2.323***	-2.314***
			(-4.05)	(-3.30)	(-3.28)	(-3.26)
Overhang			1.387***	1.325***	1.366***	1.325***
			(5.86)	(5.88)	(5.97)	(5.92)
Underwriter rank			-0.469***	-0.535***	-0.544***	-0.541***
			(-3.18)	(-3.54)	(-3.62)	(-3.55)
Nasdaq				2.623***	2.714***	2.569***
				(2.90)	(3.02)	(2.82)
Hot market				19.168***	19.134***	19.332***
				(3.34)	(3.84)	(3.96)
Venture capital				4.384**	4.875***	4.282**
				(2.46)	(2.61)	(2.41)
Intercept	16.968***	10.722***	1.785	-1.140	0.432	0.149
	(17.16)	(2.83)	(0.41)	(-0.24)	(0.09)	(0.03)
Year control	Y	Y	Y	Y	Y	Y
Industry control	Y	Y	Y	Y	Y	Y
Region control	Y	Y	Y	Y	N	Y
Adjusted R2	0.0005	0.1733	0.2317	0.2360	0.2337	0.2361
Number of observations	5963	5963	5963	5963	5963	5963

Panel B: Small vs Large Corporations				
	Small firms		Large corporations	
CPI	1.697***		0.586	
	(2.8)		(0.79)	
High public corruption		3.163***		0.292
		(3.18)		(0.24)
Ln (1+age)	-3.907***	-3.919***	-0.770*	-0.774*
	(-7.36)	(-7.38)	(-1.69)	(-1.70)
High-tech	5.372***	5.332***	6.013**	5.994**
	(4.14)	(4.11)	(2.56)	(2.54)
Offer price	2.332***	2.335***	0.663***	0.662***
	(16.11)	(16.15)	(4.7)	(4.67)
No. of bookrunners	-1.009	-1.067	-1.282*	-1.261*
	(-0.64)	(-0.68)	(-1.90)	(-1.87)
Overhang	1.891***	1.885***	0.685***	0.686***
	(6.33)	(6.32)	(3.52)	(3.53)
Underwriter rank	-0.865***	-0.875***	-0.135	-0.137
	(-5.69)	(-5.75)	(-1.18)	(-1.20)
Nasdaq	-0.37	-0.434	2.723**	2.707**
	(-0.33)	(-0.38)	(2.24)	(2.23)
Hot market	10.473***	13.153***	32.457***	32.079***
	(2.62)	(3.3)	(7.15)	(6.97)
Venture capital	1.77	1.653	8.563***	8.564***
	(1.64)	(1.54)	(4.1)	(4.11)
Intercept	-2.605	-0.857	-6.957	-6.186
	(-0.52)	(-0.17)	(-1.43)	(-1.28)
Year control	Y	Y	Y	Y
Industry control	Y	Y	Y	Y
Region control	Y	Y	Y	Y
Adjusted R2	0.2708	0.2709	0.1572	0.157
Number of observations	4162	4162	1801	1801

Table 4 IPO Offer Price Revision in Corrupt Environment

The table provides the results from OLS regression estimating the relationship between IPO revision and corrupt environment. The dependent variable is IPO revision and revision UP dummy. IPO revision is the percentage change from offer price to the midpoint of the initial price range; the revision UP dummy is a binary variable indicating whether offer price exceeds the midpoint of the initial price range. Model (1) and (2) are OLS regressions using IPO revision as the dependent variable; model (3) and (4) use logistic regressions taking Revision UP dummy as the dependent variable. We measure corrupt environment (CPI) as the number of corruption convictions from 1990 to 1-year before the IPO date divided by the population in millions in the same period. As for the binary feature of corrupt surroundings (High Public Corruption), we calculate the corrupt environment measures for each state in the US from 1990 to 1-year prior to the IPO, corresponding to the sample; if the IPO has corrupt surrounding value above the median among all the states, representing it is from high corrupt environment and noted as 1, otherwise is 0. All regressions include year and industry controls, and region control. One, two and three asterisks denote statistical significance at the 10%, 5% and 1% level. T-statistics are included in the parentheses and are reported for heteroskedasticity robust standard errors. All variables are defined in the appendix.

	Dependent variable： IPO revision		Dependent variable： Revision UP dummy	
	(1)	(2)	(3)	(4)
CPI	0.362*		0.110***	
	(1.92)		(2.67)	
High public corruption		0.688**		0.140**
		(2.10)		(1.99)
Ln (1+age)	-1.087***	-1.088***	-0.252***	-0.252***
	(-7.41)	(-7.42)	(-7.32)	(-7.34)
High-tech	2.468***	2.449***	0.309***	0.306***
	(5.81)	(5.77)	(3.61)	(3.58)
Offer price	1.184***	1.184***	0.199***	0.199***
	(35.26)	(35.25)	(21.28)	(21.28)
No. of Bookrunners	-1.275***	-1.269***	-0.306***	-0.304***
	(-5.02)	(-5.00)	(-5.29)	(-5.26)
Overhang	0.046	0.046	-0.015	-0.015
	(0.85)	(0.84)	(-1.26)	(-1.27)
Underwriter rank	-0.309***	-0.310***	-0.082***	-0.083***
	(-7.11)	(-7.13)	(-6.77)	(-6.79)
Nasdaq	0.752**	0.737**	0.024	0.020
	(2.31)	(2.26)	(0.34)	(0.27)
Hot market	10.999	11.039	0.714	0.737
	(1.63)	(1.56)	(0.57)	(0.56)
Venture capital	0.389	0.359	0.014	0.007
	(1.05)	(0.97)	(0.19)	(0.10)
Intercept	-9.661***	-9.338***	-0.484	-0.355
	(-4.96)	(-4.84)	(-1.27)	(-0.94)
Year control	Y	Y	Y	Y
Industry control	Y	Y	Y	Y
Region control	Y	Y	Y	Y
Adjusted R2	0.2443	0.2444		
Pseudo R2			0.1273	0.1268
Number of observations	5766	5766	5766	5766

Table 5 Analysis of Underwriter's Role on IPO Underpricing in Corrupt Environment

The table presents the results of the interaction term between IPO first-day returns and underwriter's reputation. The sample consists of initial public offerings from 1990 to 2015 in the US stock market. The dependent variable is IPO first-day returns, calculated as the percentage changes from the first day closing price to offer price. We measure corrupt environment (CPI) as the number of corruption convictions from 1990 to 1-year before the IPO date divided by the population in millions during the same period. Underwriter rank ranges from the lowest score 0 to the highest score 9 and is obtained from Jay Ritter's website; Rank above 7 is a dummy variable indicating whether the IPO is supported by underwriter with rank 7 or above. All regressions include year and industry controls, and region control. One, two and three asterisks denote statistical significance at the 10%, 5% and 1% level. T-statistics are included in the parentheses and are reported for heteroskedasticity robust standard errors. All variables are defined in the appendix.

Dependent variable: IPO first-day returns	(1)	(2)
CPI	3.056***	2.731***
	(3.15)	(3.26)
CPI*Underwriter rank	-0.250**	
	(-2.06)	
CPI*Rank above 7		-1.933**
		(-2.08)
Ln (1+age)	-2.898***	-2.832***
	(-8.20)	(-8.00)
High-tech	6.279***	6.427***
	(5.56)	(5.70)
Offer price	1.505***	1.608***
	(15.39)	(15.54)
No. of Bookrunners	-2.376***	-2.338***
	(-3.77)	(-3.75)
Overhang	1.319***	1.345***
	(7.27)	(7.38)
Underwriter Rank	-0.024	
	(-0.09)	
Rank above 7		-1.621
		(-0.80)
Nasdaq	2.664***	2.880***
	(3.29)	(3.56)
Hot market	19.413***	19.589***
	(3.10)	(2.98)
Venture capital	4.468***	4.870***
	(4.78)	(5.17)
Intercept	-4.957	-6.071
	(-1.23)	(-1.56)
Year control	Y	Y
Industry control	Y	Y
Region control	Y	Y
Adjusted R2	0.2365	0.2377
Number of observations	5963	5963

Table 6 Instrumental Variable Approach

The table reports the results from the second step of using two-stage instrumental variable (2SLS) method, controlling for endogeneity issue of firm headquarter selection, to explore the relationship between IPO first-day returns and corrupt environment. The sample consists of initial public offerings from 1990 to 2015 in the US stock market. The dependent variable in the model (1) and (2) is IPO first-day returns, calculated as the percentage changes from the first day closing price to offer price; in the model (3) is IPO revision, defined as offer price minus the midpoint of the initial price range divided by the offer price. We measure corrupt environment (CPI) as the number of corruption convictions from 1990 to 1-year before the IPO date divided by the population in millions in the same period. As for the binary feature of corrupt surroundings (High Public Corruption), we calculate the corrupt environment measures for each state in the US from 1990 to 1-year prior to the IPO, corresponding to the sample; if the IPO has corrupt surrounding value above the median among all the states, representing it is from high corrupt environment and noted as 1, otherwise is 0. We use two instrumental variables to control the endogeneity issue of firm headquarter selection in the corrupt environment: Racial heterogeneity and Education level. We collect the data from the US Census Bureau for each census year and match our sample by every IPO year from t+1 to t+10 to a single value. The exogeneity test is a Durbin-Wu-Hausman test and p-values are reported. All regressions include the year and industry controls. One, two and three asterisks denote statistical significance at the 10%, 5% and 1% level. T-statistics are included in the parentheses and reported for heteroskedasticity robust standard errors clustered by both year and industry. All variables are defined in the appendix.

	Dependent variable: IPO first-day returns		Dependent variable: IPO revision
	(1)	(2)	(3)
CPI	2.735***		0.867**
	(3.05)		(2.07)
High public corruption		2.507***	
		(3.27)	
Ln (1+age)	-2.956***	-3.059***	-1.135***
	(-5.38)	(-5.31)	(-7.04)
High-tech	6.745***	6.846***	2.625***
	(4.68)	(4.68)	(4.20)
Offer price	1.480***	1.550***	1.177***
	(4.87)	(4.52)	(24.53)
No. of Bookrunners	-2.338***	-2.264***	-1.272***
	(-3.33)	(-2.98)	(-4.47)
Overhang	1.377***	1.423***	0.074
	(6.04)	(5.34)	(1.29)
Underwriter rank	-0.541***	-0.568***	-0.311***
	(-3.63)	(-3.49)	(-4.86)
Nasdaq	2.965***	2.750***	0.914**
	(3.30)	(2.95)	(2.12)
Hot market	18.862***	18.491***	10.918
	(3.88)	(3.63)	(1.46)
Venture capital	4.932***	4.815**	0.620
	(2.66)	(2.40)	(1.37)
Intercept	-3.960	-3.338	-9.667***
	(-0.84)	(-0.66)	(-5.40)
Year control	Y	Y	Y
Industry control	Y	Y	Y
Region control	N	N	N
Exogeneity test (p-value)	0.0174	0.065	0.0385
Adjusted R2	0.2310	0.2261	0.2383
Number of observations	5963	5963	5766

Table 7 Propensity Score Matching Analysis

The table displays the average treatment effect of the treated for IPO first-day returns in high and low corrupt environment. The sample consists of initial public offerings from 1990 to 2015 in the US stock market. As for the binary feature of corrupt surroundings (High Public Corruption), we calculate the corrupt environment measures for each state in the US from 1990 to 1-year prior to the IPO, corresponding to the sample; if the IPO has corrupt surrounding value above the median among all the states, representing it is from high corrupt environment and noted as 1, otherwise is 0. The outcome variable is IPO first-day returns, calculated as the percentage changes from the first day closing price to offer price. Model (1) uses four nearest neighbors and Mahalanobis distance covariate matching with common support. Model (2) adopts radius matching with a caliper of 0.05. Model (3) applies local linear matching in a bandwidth equal to 0.5. We include all control variables used in Table 3. All matchings include year and industry controls, and region control. One, two and three asterisks denote statistical significance at the 10%, 5% and 1% level. T-statistics are included in the parentheses. Model (1) uses Abadie and Imbens (2006) standard errors. All variables are defined in the appendix.

	Four nearest neighbors with common support (1)	Radius matching (caliper=0.05) (2)	Local linear regression (bandwidth=0.5) (3)
Outcome variable: IPO first-day return			
Average treat effect of the treated	3.288***	4.273***	3.060***
	(3.71)	(2.86)	(2.05)
Year control	Y	Y	Y
Industry control	Y	Y	Y
Region control	Y	Y	Y

Table 8 Analysis of Insider Wealth Gains in Corrupt Environment

The table shows the results of using logistic regressions to analyse IPO insider wealth gains in a corrupt environment. The dependent variable is insider wealth gains dummy, taking 1 if insider's wealth effects are greater than the dilution effects. Following Cook et al. (2006), the wealth effect is defined as (closing price of the first trading day-midpoint filling range) *number of shares retained by pre-IPO shareholders; dilution effect is defined as (closing price of the first trading day-offer price) *number of shares issued in the offering. We measure the number of shares retained by pre-IPO shareholder as (number of shares outstanding after offering - number of shares issued in the offering. Initial return residual is the residual of regressing initial returns on CPI and High Public Corruption. Float ratio is the ratio of number of shares issued in the offering over the number of shares issued and outstanding after the offering. We measure corrupt environment (CPI) as the number of corruption convictions from 1990 to 1-year before the IPO date divided by the population in millions in the same period. As for the binary feature of corrupt surroundings (High Public Corruption), we calculate the corrupt environment measures for each state in the US from 1990 to 1-year prior to the IPO, corresponding to the sample; if the IPO has corrupt surrounding value above the median among all the states, representing it is from high corrupt environment and noted as 1, otherwise is 0. All regressions include year and industry controls, and also region control. One, two and three asterisks denote statistical significance at the 10%, 5% and 1% level. T-statistics are included in the parentheses and are reported for heteroskedasticity robust standard errors clustered by year and industry. All variables are defined in the appendix.

Dependent variable: Insider's wealth dummy	(1)	(2)
CPI	0.072*	
	(1.80)	
Initial return residuals	0.062***	
	(10.04)	
High public corruption		0.159**
		(2.19)
Initial return residuals		0.062***
		(10.04)
Ln (Proceeds)	0.336***	0.336***
	(7.93)	(7.93)
Float ratio	-6.345***	-6.346***
	(-11.72)	(-11.76)
Intercept	-0.066	-0.010
	(-0.17)	(-0.03)
Year control	Y	Y
Industry control	Y	Y
Region control	Y	Y
Pseudo R2	0.2753	0.2753
Number of observations	5667	5667

Table 9 Alternative Corrupt Environment Measures and Robustness Tests

The table displays the results from ordinary least square (OLS) and the second step of two-stage least square (2SLS) regressions using alternative measures of the corrupt environment and additional tests. The sample consists of initial public offerings from 1990 to 2015 in the US stock market. We use two instrumental variables to control the endogeneity issue of the corrupt environment: Racial heterogeneity and Education level. We collect the data from the US Census Bureau for each census year and match our sample by each IPO year from t+1 to t+9 to a single value. Model (1) measures corrupt environment from the firm's year of incorporation to 1-year prior the IPO. Model (2) and model (3) use corruption convictions from the U.S. Department of Justice, and repeat the corrupt environment measure method from table 3 and model (2) in this table. Model (4) uses raw number of convictions from 1990 to the date of 1-year prior the IPO. Model (5) drops off firm headquarters in D.C. Corrupt environment measures are winsorized at 1% level in the model (1) (2) (3) and (5). The exogeneity test is a Durbin-Wu-Hausman test and p-values are reported. All regressions include the year and industry controls, and only OLS regressions include region controls. One, two and three asterisks denote statistical significance at the 10%, 5% and 1% level. T-statistics are included in the parentheses and reported for heteroskedasticity robust standard errors clustered by both year and industry. All variables are defined in the appendix.

Dependent variable: IPO first-day returns	Alternative measure (1)		Corrupt environment measure (DOJ cases) (2)		Alternative measure (DOJ cases) (3)		Raw convictions (4)		Excl. D.C (5)	
	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS	OLS	2SLS
CPI (exl.prior est.)	0.998*	3.569**								
	(1.77)	(2.33)								
CPI(DOJ)			0.245**	1.216***						
			(2.38)	(2.86)						
CPI (excl. prior est. DOJ)					0.608	3.228*				
					(1.62)	(1.71)				
Raw convictions							0.004**	0.008***		
							(2.03)	(2.67)		
CPI										
									1.409***	3.692***
									(3.05)	(3.29)
Ln (1+age)	-0.153	-1.039	-2.921***	-2.856***	-0.950	-0.863	-2.831***	-2.817***	-2.878***	-2.886***
	(-0.17)	(-0.99)	(-5.37)	(-5.32)	(-0.93)	(-0.85)	(-4.98)	(-4.91)	(-4.96)	(-4.88)
High-tech	7.087***	6.606***	6.388***	7.176***	4.103**	6.918***	7.236***	7.448***	7.296***	7.820***
	(2.77)	(4.21)	(4.53)	(4.61)	(2.25)	(3.99)	(4.79)	(4.83)	(4.82)	(4.91)
Offer price	1.760***	1.875***	1.482***	1.461***	1.960***	1.845***	1.368***	1.365***	1.371***	1.371***
	(3.74)	(4.05)	(4.77)	(4.80)	(4.74)	(3.86)	(4.35)	(4.43)	(4.34)	(4.42)
No. of bookrunners	-3.033***	-2.806***	-2.346***	-2.387***	-3.185***	-2.719**	-1.828***	-1.843***	-1.810***	-1.827***
	(-2.64)	(-2.74)	(-3.31)	(-3.38)	(-3.11)	(-2.49)	(-3.01)	(-3.05)	(-2.96)	(-3.02)
Overhang	1.969***	1.947***	1.333***	1.399***	1.766***	1.953***	0.466***	0.469***	0.464***	0.477***
	(4.84)	(5.76)	(5.91)	(5.99)	(5.43)	(5.70)	(2.74)	(2.73)	(2.71)	(2.63)
Underwriter rank	-0.461***	-0.457***	-0.534***	-0.525***	-0.444***	-0.459***	-0.453***	-0.457***	-0.451***	-0.452***
	(-2.90)	(-2.84)	(-3.55)	(-3.56)	(-3.21)	(-2.86)	(-3.08)	(-3.11)	(-3.07)	(-3.13)
Nasdaq	2.118	1.896	2.584***	3.021***	1.682	1.856	2.650***	2.850***	2.598***	3.090***
	(1.56)	(1.19)	(2.88)	(3.41)	(1.20)	(1.12)	(2.86)	(3.11)	(2.79)	(3.27)
Hot Market	18.519***	18.927***	19.627***	19.592***	23.627***	20.466***	22.604***	23.076***	21.599***	21.375***
	(3.96)	(3.00)	(3.60)	(4.27)	(3.25)	(3.54)	(2.90)	(2.84)	(2.89)	(3.43)

Continued

Venture Capital	6.142***	5.846**	4.455**	5.497***	5.685***	6.443**	5.131**	5.370**	5.174***	5.838***
	(3.15)	(2.14)	(2.53)	(3.04)	(2.93)	(2.28)	(2.57)	(2.57)	(2.61)	(2.79)
Intercept	-8.040	-28.620***	0.127	-4.253	-17.335*	-16.178***	2.455	2.354	-0.169	-5.396
	(-0.91)	(-3.64)	(0.03)	(-0.92)	(-1.91)	(-3.31)	(0.48)	(0.49)	(-0.03)	(-0.96)
Year control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Region control	Y	N	Y	N	Y	N	Y	N	Y	N
Exogeneity test (p-value)		0.0528		0.0129		0.1169		0.3095		0.0033
Adjusted R2	0.2755	0.2699	0.2357	0.2207	0.2855	0.2605	0.2141	0.2129	0.2153	0.2070
Number of observations	2904	2904	5963	5963	2899	2899	5963	5963	5941	5941

Table 10 Returns beyond the first trading day

The table explores the relationship between corrupt environment and IPO returns after first trading day. We use equally-weighted and value-weighted buy-and-hold returns and report separately based on: (1) the first week returns; (2) the returns from week 2 to week4; (3) returns from month 2 to month 3; (4) returns from month 4 to month 6; (5) returns after first trading day to month 6. We exclude the return for first trading day in case (1) and (5). We measure corrupt environment (CPI) as number of corruption convictions from 1990 to 1-year before the IPO date divided by the population in millions in the same period. Panel A reports the t-test for the differences in means between corrupt and non-corrupt areas; Panel B presents the results from propensity score matching using four nearest neighbors and Mahalanobis distance covariate matching with common support, reported with Abadie and Imbens (2006) standard errors; panel C performs multivariate regression analysis using corrupt environment measure CPI for IPO long-run performance. One, two and three asterisks denote statistical significance at the 10%, 5% and 1% level. T-statistics are included in the parentheses. The standard errors are clustered by year and industry in Panel C. All variables are defined in the appendix.

Panel A: T-test in means

	Equally -weighted	Value-weighted	Obs.
Week1			
Corrupt area	-0.57%	-0.44%	3975
Non-corrupt area	-0.30%	-0.18%	1857
Differences	-0.27%	-0.26%	
t-stat. difference in means	(1.00)	(0.93)	
Week2-4			
Corrupt area	0.81%	1.61%	3975
Non-corrupt area	1.36%	2.03%	1857
Differences	-0.55%	-0.42%	
t-stat. difference in means	(1.19)	(0.89)	
Month2-3			
Corrupt area	-1.20%	0.32%	3975
Non-corrupt area	-2.25%	-0.03%	1857
Differences	1.05%	0.35%	
t-stat. difference in means	(-0.38)	(-0.45)	
Month 4-6			
Corrupt area	-6.84%	-3.40%	3975
Non-corrupt area	-6.24%	-3.20%	1857
Differences	-0.60%	-0.20%	
t-stat. difference in means	(0.71)	(0.90)	
Month 0-6			
Corrupt area	-8.24%	-1.84%	3975
Non-corrupt area	-7.01%	-0.68%	1857
Differences	-1.23%	-1.16%	
t-stat. difference in means	(0.89)	(0.83)	

Panel B: Propensity Score Matching (Four nearest neighbors with common support)

	Week1	**Week 2-4**	**Month 2-3**	**Month 4-6**	**Month 0-6**
Outcome variable:					
BHAR(Equally-weighted)					
Average treat effect of the treated	-0.03	-2.25***	0.16	-0.05	-1.95
	(-0.09)	(-3.45)	(0.14)	(-0.04)	(-1.15)
Outcome variable:					
BHAR(Value-weighted)					
Average treat effect of the treated	-0.01	-2.16***	0.12	-0.41	-2.23
	(-0.02)	(-3.21)	(-0.11)	(-0.33)	(-1.29)
Year control	Y	Y	Y	Y	Y
Industry control	Y	Y	Y	Y	Y
Region control	Y	Y	Y	Y	Y

Panel C: Multivariate regression analysis

	Equally-weighted					Value-weighted				
	Week1	**Week 2-4**	**Month 2-3**	**Month 4-6**	**Month 0-6**	**Week1**	**Week 2-4**	**Month 2-3**	**Month 4-6**	**Month 0-6**
CPI	-0.139	-0.767*	0.385	0.019	-0.555	-0.113	-0.755*	0.470	-0.153	-0.579
	(-1.11)	(-1.75)	(0.96)	(0.04)	(-0.68)	(-0.89)	(-1.76)	(1.12)	(-0.29)	(-0.70)
Ln (1+age)	0.121	0.133	0.150	0.441	0.414	0.103	0.144	0.053	0.539	0.422
	(0.92)	(0.70)	(0.38)	(1.20)	(0.51)	(0.77)	(0.72)	(0.13)	(1.45)	(0.51)
High-tech	-0.124	0.402	0.397	-1.611	-1.279	-0.090	0.460	0.436	-1.441	-0.911
	(-0.42)	(0.47)	(0.22)	(-0.86)	(-0.36)	(-0.31)	(0.51)	(0.24)	(-0.74)	(-0.25)
Offer price	-0.007	-0.115	-0.098	0.207**	-0.033	-0.003	-0.113	-0.118	0.152	-0.105
	(-0.24)	(-1.26)	(-1.04)	(2.30)	(-0.17)	(-0.10)	(-1.24)	(-1.24)	(1.62)	(-0.54)
No. of bookrunners	0.040	0.462	1.237**	-0.849	0.987	0.028	0.458	1.340**	-0.772	1.204
	(0.22)	(1.40)	(2.15)	(-1.56)	(1.02)	(0.15)	(1.39)	(2.38)	(-1.42)	(1.24)
Overhang	0.068	0.252***	0.231*	0.241	0.787**	0.069	0.255***	0.225*	0.276*	0.822**
	(1.14)	(2.99)	(1.80)	(1.55)	(2.33)	(1.13)	(2.88)	(1.69)	(1.69)	(2.46)
Underwriter rank	0.069**	0.280***	0.326***	0.213**	0.803***	0.067**	0.266***	0.331***	0.228**	0.800***
	(2.16)	(4.08)	(2.73)	(2.02)	(4.01)	(2.13)	(3.90)	(2.69)	(2.11)	(3.86)
Nasdaq	0.303	1.064***	1.396**	2.345***	4.993***	0.328	1.085***	1.389**	2.181**	4.823***
	(1.07)	(2.60)	(2.05)	(2.64)	(3.29)	(1.16)	(2.61)	(1.98)	(2.44)	(3.16)
Hot Market	1.436	5.246***	3.218	2.380	12.265**	1.302	4.383***	2.263	-2.462	5.222
	(1.25)	(3.32)	(1.11)	(0.62)	(2.30)	(1.11)	(2.84)	(0.75)	(-0.62)	(0.96)
Venture Capital	-0.311	1.419*	0.119	-3.614***	-1.847	-0.331	1.417*	0.150	-3.470***	-1.714
	(-1.01)	(1.80)	(0.11)	(-3.32)	(-0.90)	(-1.11)	(1.75)	(0.14)	(-3.04)	(-0.82)
Intercept	-1.169	-6.714***	-17.839***	-16.456***	-38.733***	-1.479	-6.592***	-17.480***	-13.648***	-35.633***
	(-0.92)	(-2.89)	(-6.92)	(-3.97)	(-6.80)	(-1.15)	(-2.75)	(-6.26)	(-3.26)	(-6.28)
Year control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Industry control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Region control	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Adjusted R2	0.0007	0.0360	0.0109	0.0430	0.0352	0.0002	0.0363	0.0155	0.0389	0.0382
Number of observations	5832	5832	5832	5832	5832	5832	5832	5832	5832	5832

Table 11 Examine White Collar Crime and IPO Short-run Performance

The table displays the effects of white collar crime on IPO first-day returns. The sample consists of initial public offerings from 1990 to 2015 in the US stock market. We duplicate corruption environment measures for white collar crime. The dependent variable is IPO first-day returns, calculated as the percentage changes from the first day closing price to offer price. All regressions include year and industry controls, and region control. One, two and three asterisks denote statistical significance at the 10%, 5% and 1% level. T-statistics are included in the parentheses and are reported for heteroskedasticity robust standard errors. All variables are defined in the appendix.

Dependent variable: IPO first-day returns		
White Collar Crime	-0.079	
	(-1.30)	
High-White Collar Crime		-0.030
		(-0.04)
Ln (1+age)	-3.025***	-2.956***
	(-5.35)	(-5.41)
High-tech	6.544***	6.317***
	(4.80)	(4.56)
Offer price	1.472***	1.483***
	(4.74)	(4.76)
No. of bookrunners	-2.320***	-2.334***
	(-3.26)	(-3.29)
Overhang	1.361***	1.333***
	(6.00)	(5.93)
Underwriter rank	-0.547***	-0.538***
	(-3.63)	(-3.57)
Nasdaq	2.563***	2.540***
	(2.85)	(2.80)
Hot market	18.967***	19.637***
	(3.65)	(3.65)
Venture capital	4.621***	4.342**
	(2.64)	(2.45)
Intercept	4.295	1.275
	(1.02)	(0.27)
Year control	Y	Y
Industry control	Y	Y
Region control	Y	Y
Adjusted R2	0.2335	0.2351
Number of observations	5963	5963

Appendix A Variable Definitions

Panel A: Corrupt environment measures	
Variable	Description
CPI	Continues variable indicating the corrupt environment for IPO firms. We measure CPI as number of public corruption convictions corresponding per million population from 1990 to one year before the issue year. Conviction data is from TRAC.
High public corruption	Dummy variable indicating whether IPO is from high public corrupt areas. We firstly calculate the corrupt environment measures (CPI) for each state in the US from 1990 to 1-year prior to the IPO, corresponding to the sample; if the IPO has corrupt surrounding value above the median among all the states, representing it is from high corrupt environment and noted as 1, otherwise is 0.
CPI (excl.prior est.)	Continues variable indicating the corrupt environment for IPO firms. We measure this variable as number of public corruption convictions corresponding per million population from the firm founding year to one year before the issue year. Conviction data is from TRAC.
Panel B IPO characteristics	
IPO initial returns	Presented as a percentage and calculated as (first day closing price-offer price)/offer price. (Thomson One Banker)
Ln(1+age)	Natural logarithm of 1 plus company's age before the IPO. Company's age before the IPO is defined as the calendar time of the IPO minus calendar time of the company's founded date. (Jay Ritter's website)
High-tech	Dummy variable taking 1 if the IPO firm is a high technology company, otherwise if 0. High-tech firms are defined as the companies have SIC codes 2833,2834,2835,2836,3517,3572,375,3577,3578,3661,3663,3669,3674,3812,3823,3825,3826,3827,3829,3841,3845,4812,4813,4899,7370,7371,7372,7373,7374,7375,7377,7378,or 7379.(Thomson One Banker)
Offer price	IPO offer price in US dollar. We exclude the offer price below $5.
No. of Bookrunners	The number of bookrunners is the number of managers assuming the responsibility of the bookrunner's role. (Thomson One Banker)
Overhang	The ratio of shares retained by the insider. Calculated as the number of shares retained by the block shareholders over total number of shares in the IPO
Underwriter rank	A continues variable ranges from score 0 to 9 indicating underwriter's reputation, where 0 is the lowest and 9 is the highest. (Jay Ritter's website)
Rank above 7	Dummy variable taking 1 if underwriter's rank is above 7, indicating a good prestige; otherwise is 0. (Jay Ritter's website)
Nasdaq	Dummy variable equal to 1 if IPO is listed on the Nasdaq, otherwise 0.(Thomson One Banker)
Hot market	Dummy variable used to indicate whether the IPO listed during the hot market period. It takes one if the total number of IPO from every quarter exceeds the total number of IPOs in our sample selection criteria, otherwise is 0. (Thomson One Banker)
Venture capital	Dummy variable used to indicate whether the IPO has venture capital support. 1 denotes the IPO is VC-backed, otherwise is 0. (Thomson One Banker)
Revision	Presented as a percentage and calculated as (offer price minus the mid-point of the initial filling price range)/ the mid-point of the initial filling price range. (Thomson One Banker)
Revision UP dummy	Dummy variable taking 1 if the final offer price is larger than the mid-point of the initial filling price range. (Thomson One Banker)
Insider's wealth dummy	Dummy variable taking 1 if insider's wealth effects are greater than the dilution effects. Following Cook et al. (2006), wealth effect is defined as (closing price of the first trading day-midpoint filling range) *number of shares retained by pre-IPO shareholders; dilution effect is defined as (closing price of the first trading day-offer price) *number of shares issued in the offering.
Panel C Instrumental variables	
Education Level	The share of people above 25 years old with more than 4 years collage attended in each state in each census year since 1990. The date is from the US Census.
Racial heterogeneity	The variable is used to measure the ethnic diversity in the US in each census year since 1990. Racial heterogeneity $=1-\sum s_i^2$, where s_i is the share of race group i in each state in the US. The race shares from 1990 are composed of white, black, American Indian, Eskimo or Aleut, Asian, Pacific Islander and others. The race shares from 2000 and 2010 are composed of white, black or African American, American Indian and Alaska native, Asian, native Hawaiian and other Pacific Island, and some other race. The data is from the US Census.

Appendix B Instrumental Variable Approach

As one of the primary explanatory variable has binary feature, in order to control the endogeneity nature of firm's headquarter location choice, we follow Heckman (1978) and Wooldridge (2015) to run a probit regression firstly with our instrumental variables:

$$Probit(High - Public\ corruption) = \alpha_0 + \alpha_1 Racial\ heterogeneity + \alpha_2 Education\ Level + \sum_{1990}^{2015} \beta\ Year + \sum \beta\ Industry + \varepsilon_i \quad (1)$$

Then, we use fitted probabilities $\hat{P}$ from equation (1) and add to the following regression of IPO initial returns on the rent seeking environment as instruments:

$$UP = \alpha_0 + \beta_1 \hat{P} + \beta_2 Ln(age + 1) + \beta_3 High - tech + \beta_4 Offer\ price + \beta_5 No.of\ bookrunners + \beta_6 Overhang + \beta_7 Underwriter\ rank + \beta_8 Nasdaq + \beta_9 Hot\ market + \beta_8 Venture\ capital + \sum_{1990}^{2015} \beta\ Year + \sum \beta\ Industry + \varepsilon_i \quad (2)$$

Regarding the continuous variable of measuring corrupt environment, we adopt a generalized two-stage instrumental variable method for the case where the endogeneity issue exists. In the first step, we create the following model:

$$CPI = \alpha_0 + \beta_1 \hat{P} + \beta_2 Ln(age + 1) + \beta_3 High - tech + \beta_4 Offer\ price + \beta_5 No.of\ bookrunners + \beta_6 Overhang + \beta_7 Underwriter\ rank + \beta_8 Nasdaq + \beta_9 Hot\ market + \beta_8 Venture\ capital + \beta_9 Racial\ heterogeneity + \beta_{10} Education\ Level + \sum_{1990}^{2015} \beta\ Year + \sum \beta\ Industry + \varepsilon_i \quad (3)$$

Where CPI is a continuous variable representing our interest, which is political corruption index. Racial heterogeneity and Educational level are the instrumental variables. All other exogenous variables are defined in the Appendix A. Finally, we obtain fitted values $\hat{V}$ from equation (3) and replace $\hat{P}$ in regression (2) to investigate the association between rent seeking environment and IPO first-day returns.

Appendix C Summary Statistics for Political Corruption Environment Measures by the States

The table provides the summary statistics for the political corruption environment measures for each US state based on the issuer's headquarter location. The sample consists of initial public offerings from 1990 to 2015 in the US stock market. We measure corrupt environment (CPI) as the number of corruption convictions from 1990 to 1-year before the IPO date divided by the population in millions in the same period. The data is organized by the median of CPI.

States	No of IPOs	Median	Mean	Standard deviation	Minimum	Maximum
District of Columbia	22	34.40	33.06	9.82	11.64	43.90
Alaska	3	6.06	9.18	6.15	5.22	16.27
New York	493	4.01	4.03	0.36	3.19	4.94
West Virginia	4	3.74	3.53	0.81	2.37	4.26
Mississippi	15	3.63	3.85	0.50	3.13	4.64
New Jersey	217	3.60	3.56	0.26	3.12	4.05
North Dakota	3	3.56	4.04	0.83	3.56	5.00
Rhode Island	12	3.03	2.81	1.51	0.00	4.11
Wyoming	4	2.94	3.20	0.83	2.55	4.35
Alabama	33	2.84	2.56	0.66	1.72	4.44
Massachusetts	419	2.71	2.50	0.45	1.49	2.96
Hawaii	5	2.55	2.46	0.67	1.76	3.11
Louisiana	26	2.52	2.63	0.68	1.66	3.71
Georgia	162	2.49	2.37	0.43	1.07	2.84
Virginia	136	2.48	2.54	0.29	2.08	3.26
Connecticut	129	2.42	2.32	0.62	0.91	3.23
Florida	304	2.37	2.33	0.19	1.81	2.76
Vermont	7	2.34	1.82	0.67	0.99	2.34
Kentucky	15	2.26	2.20	0.80	0.68	3.30
Tennessee	104	2.16	2.29	0.28	2.00	2.79
Ohio	111	2.07	2.29	0.44	1.76	3.11
South Carolina	29	2.06	2.22	0.41	1.54	2.90
Minnesota	120	2.05	1.98	0.41	1.01	2.60
California	1467	2.04	2.02	0.12	1.71	2.24
Maryland	120	2.00	1.99	0.15	1.71	2.48
Pennsylvania	213	1.93	1.92	0.22	1.50	2.28
Arkansas	10	1.81	1.47	0.75	0.42	2.12
Illinois	221	1.79	1.77	0.26	1.41	2.27
Nebraska	19	1.67	1.83	0.51	1.26	2.81
Arizona	83	1.63	1.78	0.57	1.06	3.53
Maine	6	1.54	1.61	0.56	0.94	2.44
Delaware	9	1.49	1.68	0.74	0.74	3.01
Missouri	56	1.49	1.40	0.31	0.58	1.76
Indiana	63	1.47	1.48	0.19	1.20	2.34
South Dakota	7	1.42	1.26	0.20	1.01	1.42
Oklahoma	44	1.34	1.35	0.12	1.17	1.75
Texas	533	1.24	1.25	0.18	1.00	1.60
New Mexico	9	0.93	0.96	0.15	0.86	1.30
North Carolina	100	0.89	0.89	0.15	0.30	1.04
Kansas	29	0.88	0.87	0.19	0.60	1.21
Iowa	25	0.83	0.82	0.26	0.45	1.25
Colorado	153	0.80	0.88	0.21	0.66	1.51
Wisconsin	48	0.78	0.77	0.10	0.54	0.96
Utah	44	0.69	0.67	0.22	0.34	1.14
Michigan	74	0.66	0.72	0.23	0.51	1.46
Nevada	44	0.60	0.62	0.32	0.00	1.09
Idaho	11	0.47	0.47	0.28	0.00	0.78
Washington	124	0.43	0.45	0.11	0.32	0.68
New Hampshire	17	0.30	0.27	0.17	0.00	0.45
Montana	7	0.24	2.54	3.17	0.00	6.79
Oregon	54	0.20	0.26	0.16	0.00	0.84

Appendix D Summary Statistics for Political Corruption Environment Measures by Year

The table provides the summary statistics for the political corruption environment measures on the year basis. The sample consists of initial public offerings from 1990 to 2015 in the US stock market. We measure corrupt environment (CPI) as the number of corruption convictions from 1990 to 1-year before the IPO date divided by the population in millions in the same period.

Year	No of IPOs	Median	Mean	Standard deviation	Minimum	Maximum
1990	112	1.969	2.03	1.68	0	16.27
1991	279	1.969	2.12	1.99	0	21.48
1992	399	1.936	2.04	0.86	0	4.64
1993	537	2.046	2.12	1.05	0	11.64
1994	438	2.242	2.1	1.11	0	14.59
1995	451	2.134	2.29	1.8	0.2	24.43
1996	651	2.141	2.14	1.41	0.17	28.86
1997	453	2.079	2.29	2.61	0.33	32.12
1998	274	2.033	2.24	2.91	0.12	34.4
1999	427	2.043	2.4	2.62	0.14	37.35
2000	326	2.077	2.17	2.37	0.22	42.43
2001	66	2.061	2.01	0.95	0.2	4.48
2002	62	2.053	2.16	0.98	0.53	4.49
2003	61	1.982	1.91	0.7	0.51	4.35
2004	180	1.932	2.54	4.5	0.5	43.9
2005	153	1.904	2.33	3.49	0.44	43.68
2006	162	1.97	2.64	4.64	0.41	43.16
2007	169	1.951	2.36	3.17	0.45	41.98
2008	24	2.013	2.15	0.9	0.81	3.74
2009	44	2.007	2.21	0.86	0.57	3.67
2010	91	1.868	2.04	0.91	0.58	6.79
2011	78	1.848	1.96	0.69	0.49	3.64
2012	95	1.81	1.89	0.72	0.48	3.66
2013	154	1.772	1.98	0.86	0.39	3.63
2014	173	1.76	2.01	0.78	0.47	3.71
2015	104	1.707	2.29	3.64	0.26	38.43