Legal Institutions and Capital Raising Activities of Newly Public Firms [*]

Aziz Alimov
IESEG School of Management
aaalimov@cityu.edu.hkm.

Michael G. Hertzel
Arizona State University
Michael.Hertzel@asu.edu.

PRELIMINARY AND INCOMPLETE.

Abstract

We investigate the prevalence of staged financing at the time of IPOs and the role of country-level legal institutions in explaining newly public firms' access to staged financing in 45 countries. Our approach builds on recent evidence in Hertzel, Huson, and Parrino (2012) showing that staging of capital infusions, similar to that observed in the venture capital market, can explain the financing of newly public firms in the U.S. We find evidence of staged financing in both U.S. and non-U.S. firms. Firms with higher levels of intangibles and with greater R&D intensity raise less money at their IPO and return more quickly for post-IPO capital infusions. Firms that raise less money at the IPO come are more likely to return for follow-on financing. Preliminarily results suggest that IPO firms from countries with weaker legal institutions are less likely to be candidates for public market staging and provide some evidence of public market staging in weak governance countries.
.

Legal Institutions and Capital Raising Activities of Newly Public Firms

1. Introduction

The purpose of this paper is to investigate capital raising activity of newly public firms in 45 countries with an aim of improving our understanding of the channel through which legal institutions affect firm growth and economic development. A well-functioning Initial Public Offering ("IPO") market is important for innovation, growth, and creation of jobs and firm value. The literature has established that for many firms around the world an IPO provides an immediate infusion of cash to finance current and future valuable investment opportunities (Pagano et al. 1998; Doidge, Karolyi, Stulz 2007). Therefore, the benefits from raising an appropriate amount of capital during the IPO are potentially quite high. However, many IPOs firms are young growth firms and tend to be characterized by severe asymmetric information and agency problems. Therefore, investors are expected to discount the value, and therefore the amount, of the equity sold in the IPO. As these problems increase, investors could limit or even deny funds to the IPO firm. Such investor concerns are well-founded as agency theory suggests that managers can use corporate cash in ways that destroy shareholder value (e.g., Jensen,1986). The ability of equity investors to manage their exposure to the potential misuse of IPO proceeds is therefore critical for the efficient functioning of the IPO market.

One way to mitigate agency costs of wasteful spending by IPO firms is by staging capital infusions: investors would limit the initial amount of capital that a firm can raise in the IPO and periodically disburse remaining funds depending on performance. Infusing capital in stages addresses the costs related to information asymmetry by limiting the amount of capital a newly public firm might waste if anticipated valuable growth prospects do not materialize. A key feature of such financing arrangement is that when staged IPO firms subsequently have

sufficient performance to warrant a second round of financing, there is a reasonable expectation of being able to receive that financing.

Staged financing is common to nearly all venture capital investments (Gompers 1995). However, the evidence on whether such financing mechanism is employed by IPO investors is limited. Hertzel, Huson, and Parrino (2012) find evidence consistent with the view that many issuers in their sample of U.S. IPOs between 1990 and 2007 appear to consider their initial offering as the first stage in a dynamic capital raising strategy. Such dynamic post-IPO financing strategy appears to be related to proxies for post-IPO information revelation about the issuer and the severity of information and agency problems at the issuer. Iliev and Lowry (2020) find that about 15% of newly public firms continue receiving periodic capital infusions from their venture capitalists after the IPO. These findings suggest that to the extent that the practice of equity staging enhances capital formation by increasing the number and types of U.S. firms that can go public, it adds to the vibrancy of the IPO market thereby promoting innovation and economic development in the U.S..

However, little is known about capital raising activities of newly public firms outside the U.S. as well as those of the U.S. IPOs since 2007. It is a crucial gap in the literature because of the increasing globalization of the IPO markets and the changes in U.S. IPO market since the 2008 financial crisis (Stulz et al. 2007; Ritter) .

In this paper, we investigate the prevalence of follow-on (staged) equity financing at the time of IPOs and the potential factors explaining the ability of firms to have access to such financing arrangements in 45 countries over the period 1990-2018. The advantage of using international setting is that it allows us to study the impact of significant cross-country differences in property rights and minority investor protection, and therefore, the extent of expected agency and information problems on equity market staging. The goal of that part of the analysis is to provide evidence on whether the ability to effectively stage firms at the time

of their IPO is one channel through which cross-country differences in the quality of legal institutions affect economic development.

We analyze the effect of legal institutions on the capital raising activity of newly public firms in the context of the tradeoff theory of cash holdings which posits that firms tradeoff the costs and benefits of holding cash to arrive at optimal cash balances. Holding adequate amounts of cash can benefit firms by protecting against underinvestment that can arise due to asymmetric information, adverse cash flow shocks, and/or capital market conditions that make it difficult to raise capital. However, holding excess cash can be detrimental to shareholders if it leads to wasteful value-destroying overinvestment, perquisite consumption, or outright theft by entrenched managers.

Although the vast majority of empirical research has focused on U.S. firms, our study is more closely related to a growing literature that examines the determinants of cash holdings and the value of cash to outside investors using international data. One line of inquiry investigates the importance of financial market development and the protection offered to outside investors in determining cash levels and the value of cash balances. When investor protection is weak, agency concerns are magnified since managers can more easily appropriate the private benefits of cash. However, if firms in weak protection countries are riskier and/or if it is harder to raise external capital in weak protection countries, there are also increased benefits of holding precautionary cash balances. Thus, while increased agency concerns suggest a greater role for staging at the IPO in weak protection countries, the increased need for precautionary balances when access to capital markets is limited suggests a benefit to larger IPO sizes. We note that the preponderance of existing evidence suggests cash holdings of firms in weak protection countries are due to agency problems and are not reflective of precautionary motives. We seek to add to this evidence by examining the effect of legal institutions on how much cash firms raise at the time of their IPO, which is a crucial

4

event in the life of a firm and one where outside investors have significant control over resulting cash balances.

To study the capital raising activities of newly public firms around the world using a sample of more than 9,000 firms that went public from 1990 to 2018. In the first part of our analysis we relate the post-IPO financing activities of newly public firms to proxies for information and agency problems as used in Hertzel et al. (2012).

Our main measures of country-level property rights are three World Governance Indicators (WGI) published by the World Bank and developed by Kaufman, Kraay and Mastruzzi (2009). These indexes capture the following dimnstion of the quality of legal environment: rule of law, control of corruption, and voice and accountability. We use two widely used measures of investor protection: the anti-self-dealing index and anti- director rights index from Djankov et al. (2008). The correlation between these two investor protection indexes and the property rights measures is around 0.2, indicating substantial disparity between the degree of property rights and minority investor protection in countries.

We find that firms with more intangible assets and firms that invest more heavily in research and development (R&D) raise less money at their IPO and are more likely to return for financing subsequent to their IPO. This evidence is consistent with the public market staging hypothesis, which posits that the public equity market places greater limits on the availability of cash to managers of firms that are more subject to agency problems associated with excess cash.

Our univariate findings suggest that IPO firms from weak governance countries appear less likely to be candidates for staging at the time of their IPO. They are less R&D intensive, have lower levels of intangible assets, have higher operating income, are burning through less cash, and are larger. Consistent with the univariate findings, our multivariate

tests find strong evidence of staging in strong governance countries, but not in weak governance countries.

The remainder of the paper is organized as follows. Section 2 discusses related literature and develops our hypotheses and analytical framework. Section 3 describes our sample. Section 4 presents our findings for non-U.S. IPO firms and Section 5 presents preliminary findings on the effect of country-level governance on IPO market staging. Section 6 concludes.

2. Literature review and hypothesis development

Our investigation of the effects of investor protection on the capital raising activities of newly public firms follows closely the approach of HHP who investigate the financing activities of newly public firms in the U.S. We begin our literature review by discussing the HHP findings, analytical framework, and public market staging hypothesis. Next, we discuss the literature that considers the effect of investor protection on the tradeoff theory of cash balances. This discussion provides the basis for our analytical framework, which includes a focus on the need for precautionary cash balances as well as agency concerns when considering the amount of cash that firms raise at the time of their IPO. We next develop the hypothesis of a "public market staging channel" through which weak legal institutions lead to less innovation and economic development via its effect the financing activity of newly public firms. Finally, we discuss other alternative explanations of the timing of post-IPO capital infusions.

2.1. Staging and timing of capital infusions: The public market staging hypothesis

The staging of capital infusions is a hallmark of venture capital investing where start-up firms are typically characterized by severe information asymmetries and uncertainties. Providing funding in stages helps to mitigate the costs associated with these information

asymmetries and uncertainties by limiting the amount of capital that start-up managers (entrepreneurs) might use for overinvestment if anticipated growth opportunities do not materialize.

Gompers (1995) develops and tests predictions from agency theory that shed light on factors that affect the staging of venture capital investments. Agency theory predicts that round sizes and duration (time between rounds) should both decline with firm characteristics associated with information asymmetry and uncertainty about future investment prospects. Consistent with the agency predictions, Gompers (1995) finds that round sizes and duration both decline with (i) increases in the industry ratio of intangible assets to total assets, (ii) increases in the industry market-to-book ratio and, (iii) greater industry R&D intensity.

HHP provide evidence that factors that explain the round staging of venture capital investments also explain the staging of capital infusions in newly public firms. They find that the size of an IPO and the time between an IPO and a firm's next capital infusion both decrease with increases in R&D intensity, asset intangibility, and growth opportunities. We follow HHP and refer to the idea that there is round staging in the public equity market as the *public market staging hypothesis*.

2.2. Investor protection and the tradeoff theory of cash balances

We study the effect of investor protection on the capital raising activities of newly public firms in the context of the tradeoff theory of cash holdings, which posits that firms trade off the costs and benefits of holding cash to arrive at optimal cash balances. Precautionary cash balances can benefit firms by protecting against underinvestment that can arise due to asymmetric information, adverse cash flow shocks, and/or capital market conditions that make it difficult to raise capital. Alternatively, cash can be detrimental if it leads to wasteful overinvestment, perquisite consumption, or outright theft by entrenched

managers. A large empirical literature documents evidence suggesting that both precautionary motives and agency concerns affect the level and value of cash holdings at firms.[1]

One way to think about the effect of investor protection on capital raising activity is to consider how it affects both sides of the cash balance tradeoff. On the precautionary balance side, La Porta et al. (2006, 2007) argue, and provide evidence, that weak country-level investor protection is associated with fewer opportunities for external finance. Thus, cash can be valuable in such an environment since it limits underinvestment in profitable investment opportunities for financing constrained firms. Based on estimates of a structural model of investment, Love (2003) reports evidence consistent with the idea that cash holdings benefit firms in countries with weak financial development by helping them overcome financial constraints.

On the other side of the tradeoff, there is evidence suggesting that in countries where investor protection is weaker, corporate governance is poorer and it is thereby easier for managers and controlling shareholders to appropriate the private benefits of cash. For example, Ditmar, Mahrt-Smith, and Servaes (2003) show that firms in countries with weak investor protection hold more cash and suggest that this may reflect the ability of investors in strong protection countries, but not in weak protection countries, to force managers to payout excess cash. There is also more direct evidence that managerial access to excess cash in weak protection countries can be detrimental to shareholders. For example, Pinkowitz, Stulz, and Williamson (2006) show that a dollar of liquid assets is worth a dollar to minority

---

[1] The empirical literature on the relation between excess cash and firm value finds evidence that both precautionary motives and agency concerns affect the level of cash holdings at firms For evidence on the detrimental effects of providing managers access to excess cash see, for example, Faulkender and Wang (2006), Dittmar and Mahrt-Smith (2007), Harford, Mansi, and Maxwell (2008) and DeAngelo, DeAngelo, and Wruck (2002). For evidence that cash holdings can benefit stockholders see, for example, Opler, Pinkowitz, Stulz, and Williamson (1999), Han and Qiu, (2007) Haushalter, Klasa, and Maxwell (2007) and Duchin (2009).

shareholders in high investor protection countries but worth much less to minority shareholders in countries with weak investor protection.

Although the majority of research aimed at the tradeoff theory focuses on cross-sectional determinants of the *level* and value of firms' cash holdings, our study of the capital raising activity of newly public firms fits more naturally within the growing literature that considers how firms *manage* (build up or draw down) cash balances through capital raising activities or through dividend and capital structure policies that affect cash payouts. Of particular relevance to our investigation are studies that consider how firms build up cash positions. One way that firms increase cash holdings is by saving cash from cash flow. Khurana, Martin, and Periera (2006) find that the sensitivity of cash holdings to cash flow decreases with financial development. They interpret this evidence in the context of the model in Almeida, Campello, and Weisbach (2006) where firms facing financing constraints save cash out of current cash flow potentially trading off current investment to fund future investment opportunities.

In addition to accumulating cash positions by saving out of current cash flow, cash positions can also be built up by raising funds in the capital market. Examining U.S. data, McLean (2011) reports evidence suggesting that U.S. firms have increasingly turned to share issuance as a method of building up cash reserves. In particular, he finds that firms with high precautionary motives lacking insufficient internally generated cash, issue shares when market conditions are favorable and save the cash for future investment.

In addition to actions that firms can take to build up cash positions, firms can reduce cash balances through capital structure and dividend policies. Several papers consider the relation between investor protection, dividend policy, and firm value. For example, Kalcheva and Lins (2007) report that although firm values decrease when controlling managers in weak protection countries hold more cash, firm values are higher when controlling managers in

weak investor protection countries pay dividends.[2] This evidence suggests that management of cash levels through disbursements is valuable and thus consistent with the Easterbrook (1984) agency cost argument for higher dividend payout. In Easterbrook (1984), high dividend payouts reduce expected agency costs not only because they reduce managerial access to cash, but also because of the increased capital market scrutiny that results from having to more frequently fund future investment externally. To the extent that capital market monitoring is an important force in driving values higher for dividend paying firms, we expect that agency concerns with managerial access to excess cash should similarly be important in understanding the size of IPOs in weak investor protection countries.

2.3. Law, financing activity of newly public firms, and economic development

A broad literature in law and economics considers the extent to which a country's legal environment contributes to its economic development. A theoretical view underlying one line of inquiry is that legal institutions contribute to economic growth by facilitating the creation of well-functioning capital markets that allow firms access to lower cost external financing. Although there is a significant amount of evidence consistent with this view, the precise mechanism(s) by which this occurs is less well-understood. Our investigation of the capital raising activities of newly public firms aims to help improve our understanding of the channel through which legal institutions affect economic development.

Our study is motivated, in part, by recent evidence suggesting that venture capital investment may be restricted in countries with weak legal institutions due to investor concerns about contract enforceability. Kaplan and Stromberg (2003, 2004) show that U.S.-style venture capital contracts separate cash flow and control rights in a manner that contract

---

[2] These finding are consistent with evidence in La Porta et al. (2000) and Faccio, Lang, and Young (2001) that investors in countries with strong investor protection are able to get managers to be pay out free cash flow as dividends

theory suggests is an optimal way for venture capital investors to deal with the severe uncertainty and information asymmetry associated with startup firms. Lerner and Schoar (2005) show that in countries with weak legal institutions, where courts are less likely to understand the concept of separation of cash flow and control rights, venture capitalists are forced to take larger ownership stakes to enhance the likelihood of contract enforceability. Based on this observed deviation from optimal contracting, Lerner and Schoar (2005) hypothesize a "contractual channel" through which poor legal enforcement inhibits economic development.

As discussed earlier, HHP provide evidence that factors which explain the staging of capital infusions in the venture capital market also explain how much firms in the U.S. raise at the time of their IPO and how quickly they return for follow on financing. To the extent that the practice of public market staging enhances capital formation by increasing the number and *types* of firms that are able to go public, it adds to the vibrancy of the market for IPOs and promotes innovation and economic development. Our goal, in future iterations of this paper, is to provide some insight on how country-level legal environment variables affect this aspect of IPO markets.

2.4. Alternative explanations for the timing of capital infusions

HHP control for evidence from earlier studies that consider alternative explanations for the length of time before newly public firms return to the capital market for additional funding. These explanations (which include signaling, market-discovery, market-feedback, and market-timing motives) suggest that the time to first post-IPO financing is related to post-

IPO stock returns and market conditions. [3] We similarly control for these alternative explanations, but are also currently considering how country-level investor protection might affect these alternative stories. For example, to what extent can underpricing be used to signal undervaluation (and predict follow-on financing) in countries with weak legal institutions where opportunities for external finance are limited? [4]

3. Sample selection and data description

Our analysis of public market staging and the size of IPOs focuses on firms completing IPOs in 43 countries that have data on legal institutions. Our initial sample comprises all firms in these countries that completed an IPO of common stock between January 1990 and December 2019 as reported in the Thomson Financial Securities Data Corporation (SDC) Global New Issues Database. From the SDC database we collect data on the offer date, offer price, issue description, industry classification, total number of shares sold, the number of primary and secondary shares, amount of proceeds, marketplace of issue, underwriter name(s), and whether the issue was backed by a venture capitalist. We have tried to correct all data errors in the SDC database by cross verifying our sample with the IPO data from Bloomberg. In particular, we note substantial data errors in the SDC identification of the offering date and price.

We exclude rights offerings, private placements, spinoffs, unit offers, reverse leveraged buyouts as well as offerings by utility firms (SIC codes 4900-4999), financial firms (SIC codes 6000-6999), limited partnerships, trusts, REITs, and governments or quasi-public firms. We consolidate concurrent issues in the domestic market and the foreign market as

---

[3] See Allen and Faulhaber (1989), Grinblatt and Hwang (1989), and Welch (1989) on signaling explanations, Allen and Faulhaber (1989) and Welch (1989) on market-discovery pooling explanations, Jegadeesh, Weinstein, and Welch (1993) on the market-feedback hypothesis and Bayless and Chaplinsky (1996) on market-timing.
[4] Shi, Pukthuanthong, and Walker (2012) report that the stringency of country-level disclosure requirements for IPO prospectuses is negatively related to IPO underpricing. Although this evidence is consistent with reduced pre-IPO asymmetric information, the effect on signaling strategy is not clear.

well as multiple issues within three calendar days into a single offering and aggregate the total proceeds. Finally, we drop offerings in which the issuer does not issue primary shares and thus does not receive cash. This results in an initial sample of 23,421 IPOs.

Our analysis requires firm-level accounting and stock price data as well as country-level data on legal environment, investor protection, and economic development. We obtain the firm-level accounting data from the Thomson Financial Worldscope and Standard and Poor's Compustat Global and Compustat North America databases. Stock return and firm trading status data come from Datastream and the Center for Research in Security Prices (CRSP). We match each non-U.S. issuer with Worldscope and Datastream using company identifiers and firm names. We drop firms that that do not have stock price data within 90 days of the issue date. Our final sample includes 12,440 firms with valid data on assets and sales in the fiscal year of the IPO. In each of our tests, we use as many valid observations as possible, so the sample is not necessarily the same across regressions. In order to reduce the effect of outliers, we winsorize each accounting variable at the 1% level. We describe the accounting and stock price variables in the Section 4.1.

For each of our IPO firms we identify all capital infusions in the two-year period following the IPO.[5] We collect data on public equity and debt issues from the SDC New Issues Database. Bank loan data are obtained from DealScan. Following HHP, we refer to all firms that raise new capital within two years of their IPOs, regardless of the type of capital, as *issuers* and refer to the time from the IPO to the first post-IPO capital infusion as the *spell length* or *duration*.

Our primary measure of the quality of a country' legal institution is the Worldwide

---

[5] Our choice of a two-year period follows HHP. However, we also plan to perform the subsequent empirical analysis using cut-off periods of three years, four years, and five years. HHP find their empirical evidence is qualitatively the same, regardless of the length of the cut-off period. We also note that the measure of funds raised in an IPO includes the amount of funds raised at the time of the IPO as well as all funds raised over the following 30 days.

Governance Indicators developed by the World Bank since 1996 and described in Kaufmann, Kraay, and Mastruzzi (2009). More specifically, our country governance index is the average of the following three governance dimensions:

1. *Voice and Accountability* – measures the extent to which a country's citizens are able to participate in political process, as well as enjoy personal freedom.

2. *Rule of Law*– measures the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

3. *Control of Corruption*– measures the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

For the observations prior to 1996, we use the governance index level in 1996. One useful quality of this measure is that it captures both the strength of the law *and* its enforcement. A higher level of the governance measure is associated with better quality of a country's legal institutions. In the robustness tests, we plan to also employ alternative political and institutional quality indexes such as the investor protection indices developed by the World Bank and La Porta et al. (2006). The La Porta et al. index, however, is not available for many emerging markets such as China and Russia.

To control for differences in economic development we use the Gross Domestic Product (DGP) and GDP per capita which we obtain from the World Bank's database. The size and development of financial markets are captured using the ratio of market capitalization of listed companies to GDP. We also calculate and variously employ the log of GDP and annual growth rate in GDP as controls variables in our analysis.

4. Empirical evidence on staging in public markets[6]

The public market staging hypothesis predicts that firms that are more prone to agency costs of overinvestment are provided less capital at the time of their IPO and return more quickly to the market for follow-on financing. In this section we present evidence on the relations between firm characteristics that are suggestive of the need for staging and the (i) size of the IPO and (ii) how quickly an IPO firm returns to the capital market. In our analysis, we use an inverse scaled measure of IPO size calculated as the difference between the funds used for investment by a firm and the funds it generates from operations in the year prior to the IPO, scaled by the total dollars raised in the IPO. This measure, which we also refer to as the *cash burn rate*, is the inverse of the number of years of funding provided by the IPO assuming that the firm continues to burn capital at the same rate it did in the year before its IPO.[7]

4.1. Test and Control Variables

We begin by discussing the test and control variables that we use in our analysis.

4.1.1 Test Variables

Our two key test variables are the ratio of intangible assets to total assets and the ratio of R&D expenditures to sales, both estimated using data from the fiscal year just prior to the year of the IPO. According to the staging hypothesis, R&D intensive firms and firms with greater intangible assets are more prone to suffer agency costs of overinvestment due to asymmetric information and uncertainty about the profitability of future growth opportunities. Thus, staging theory predicts these firms should be "kept on a short leash" (provided less

---

[6] For ease of exposition, we acknowledge at the outset that the approach, discussion, and terminology used in this section closely follow that of Hertzel, Huson, and Parrino (2012). Please see their paper for more detailed discussion of the underlying analytical framework. We discuss modifications to their procedures that are necessitated by our consideration of non-U.S. firms.

[7] We do not divide the IPO proceeds by the difference between investment and funds from operations (i.e., compute the number of years of funding directly) to avoid the potential for division by zero and the discontinuity that occurs when the difference between investment and funds from operations is negative.

money) and should return (if future growth prospects turn out to be profitable) more quickly for follow-on financing. We expect that the amount of capital raised at the IPO and the time to the first post-IPO capital infusion are negatively related to both R&D intensity and the ratio of intangible to total assets.

4.1.2. Control variables

We include control variables for firm, deal, and market characteristics in our analysis.

Firm and deal characteristics: Our control variables for firm and deal characteristics include sales, total primary capital raised in the IPO, the cash burn rate, capital expenditures, the percentage of total IPO proceeds attributable to secondary sales, and whether the firm received venture capital prior to the IPO.

We use sales as a proxy for firm age, since we do not have firm age for most of our international sample. The cash burn rate, the dependent variable in the IPO size regressions, is included as a firm-specific control variable in our analysis of the timing of a subsequent capital infusion since the *public market staging hypothesis* suggests that the amount of capital raised at the time of the IPO should be a good indicator of the length time before a firm will need new capital. The ratio of capital expenditures to assets in the year prior to the IPO is included as an additional measure of the level of a firm's pre-IPO capital outlays.

We include the percentage of total IPO proceeds attributable to secondary sales (*percent secondary*) and whether the firm received venture backing (*venture-backed*) as additional control variables. We include *percent secondary* since the public market staging hypothesis is focused on the amount of (primary) capital provided to the firm at the time of its IPO. This variable also captures any effects associated with insider selling and/or ownership structure changes. We include *venture-backed* to control for certification provided by the venture capitalists (suggesting less need for staging). Alternatively, to the extent that more mature firms do not use venture capitalists, venture backing could be associated with

16

less mature firms and thereby a greater need for staging.

Market Characteristics: In their study of public market staging in the U.S., HHP control for IPO underpricing, and post-IPO return and trading volume over the first 20 days following the IPO. These controls are motivated by earlier studies that offer alternative explanations (e.g., market-feedback, -discovery and –timing) for observed cross-sectional variation in the time between a firm's IPO and its next capital infusion. While studies of U.S. IPOs usually measure underpricing as the first day return, studies of international IPOs typically measure underpricing as the initial IPO return measured over *several weeks* (see, for example, Loughran et al., 1994; Ljungqvist et al., 2003; Ritter, 2003; Shi et al., 2012.) A longer return window is used since in some countries trading does not begin immediately following the IPO date. In addition, price movements during the initial trading period are sometimes limited by regulatory constraints that limit price fluctuations within a preset limit. Following this literature, we define underpricing as the 20-trading-day post-IPO return (which includes the first day return.)

The post-IPO trading practices in international markets also raise the question of how to measure post-IPO trading volume and post-IPO returns that are not due to underpricing. More specifically, the post-IPO return and trading volume over the first 20 days following the IPO that HHP use are intended to capture effects that are unrelated to underpricing. In this draft, we assume that the 20-day post-IPO return captures both underpricing and post-IPO stock price performance. We will consider further refinements in future iterations of this study.

HHP control for the volume of aggregate U.S. IPO activity over the 31-day period surrounding the IPO. Each of the IPOs in their sample are classified as having occurred during periods of high, medium, or low activity based on the surrounding aggregate IPO

17

volume.   In this study, we measure aggregate IPO volume as the three-month centered moving average of the number of all IPOs for each month.

We include country and year dummy variables to control for other country and macroeconomic factors that could affect firm financing activities.

4.2. Univariate comparisons: Non-U.S. IPOs

Table 1 provides univariate comparisons of the time to first post-IPO capital infusion, and firm, IPO, and market characteristics for subsamples of firms partitioned by whether or not they return for financing within two years of their IPO. The first column reports statistics for firms that raised capital within two years of their IPOs. The second column reports results for firms that did not raise funds within two years of their IPO, but that are still trading. Columns (3) and (4) show results for firms that delisted, and firms that merged, respectively.

As shown in the first row of Table 1, the sub-sample of 2,311 firms that raised additional capital within two years of their IPO have an average (median) duration of 1.06 (1.02) years. The 5,971 firms that did not complete a post-IPO financing and were still trading after two years have a mean (median) duration of 2.00 (2.00) years.   In the comparisons below, we focus our discussion on differences between firms that return for financing within two years and firms that do not return but that are still trading.

Comparisons for our two key test variables provide evidence consistent with public market staging at the time of the IPO. Intangible assets comprise an average of 7.7 percent of total assets for firms that returned for financing within two years as compared to only 5.8 percent for firms that did not raise additional capital within two years. Similarly, the average ratio of R&D to sales is 0.087 for firms that raised additional financing and 0.32 (1.20) for firms that did not. Both differences are statistically significant.

A comparison of the cash burn rates across the two groups is also consistent with staging at the time of the IPO. The average cash burn rate for firms that return for financing is

0.095. This indicates that these firms, on average, spent an amount equal to 9.5 percent of the IPO proceeds in the year prior to the IPO. Continued spending at this rate implies that the proceeds will last 10.5 years. In contrast, firms that did not raise additional capital had a *negative* and significantly lower mean cash burn rate of -12.5 percent. Cash burn rates are negative when pre-IPO investment spending is less than operating income, i.e., when the firm does not have a financing deficit in the year prior to its IPO. Thus, in principle, if such firms were able to continue funding investment in such a manner, they would not need to return to the capital market for follow-on financing.

Table 1 also shows that the cumulative stock return over the twenty trading days immediately following the IPO (inclusive of the first day return) is not significantly different between the two groups. For U.S. data, HHP find underpricing (measured as the first day return) is similar across subsamples. However, consistent with market-feedback and market discovery explanations of post-IPO financing they find that post-IPO returns are higher for those firms that return for financing. Our preliminary evidence is not supportive of these alternative explanations of post-IPO financing activity.

4.3. Multivariate analysis

The univariate analysis in the previous section provides evidence consistent with staging taking place in non-U.S. IPO markets. In this section, we report evidence from multivariate tests that consider how much firms raise at their IPO (Section 4.3.1.) and how quickly they return for post-IPO financing (Sections 4.3.2. and 4.3.3.)

4.3.1. IPO size analysis: The amount of capital raised in non-U.S. IPO

Table 2 presents coefficient estimates from ordinary least squares regressions that explain the amount of funding raised at the time of the IPO. The dependent variable in this analysis is the cash burn rate which, as described earlier, is equivalent to the inverse of the

length of time that the IPO proceeds would meet the firm's needs if the dollar burn rate continued at the level observed in the year before the IPO.

Consistent with results for U.S. IPOs we find that whether included separately (Models (1) and (2)) or together (Model (3) and (4)) the coefficients on intangible assets and R&D/sales are both positive and significant. These results indicate that firms with more intangible assets and firms with greater R&D intensity are associated with a higher cash burn rate, which implies that they receive less funding at their IPO relative to their pre-IPO dollar burn rate. To measure economic significance a one standard deviation increase in the intangible asset ratio increases the cash burn rate by almost 83 percent, which implies 19 fewer years of funding provided at the IPO. A one standard deviation increase in the ratio of R&D to sales increases the cash burn rate by 14 percent. To the extent that these firms receive lower funding due to staging motives, we should also observe (in our subsequent analysis) these firms raising additional capital sooner than firms with fewer intangible assets and lower R&D intensity.

The coefficient estimates for *percentage secondary* are negative and significant in all four specifications indicating that firms with a larger proportion of secondary sales in their IPOs tend to receive more funding This is consistent with the idea that the proportion of secondary sales is negatively related to uncertainty about the firm's prospects. Coefficient estimates for the *venture-backed* are positive and significant in three of four specifications suggesting that that venture-backed firms are more likely to be staged. This finding suggests that the effect of any certification provided by venture capitalists on the likelihood of staging is more than offset by the tendency for venture capitalists to back less mature firms. Both of these findings are consistent with results for U.S. firms.

4.3.2. Hazard analysis of the time to post-IPO capital infusions

Table 3 reports the results of a hazard analysis of the time to first post-IPO capital infusion. In the methodology we employ (see the appendix) negative coefficient estimates imply shorter durations (quicker time to first post-IPO issue) whereas positive coefficients imply longer durations (slower time to first post-IPO issue).

Consistent with the U.S. evidence, we find that the coefficient on intangible assets is negative and highly significant in all specifications. Consistent with the *public market staging hypothesis*, this result shows that firms with more intangible assets return more quickly for post-IPO capital infusions. However, unlike the U.S. evidence, which shows R&D intensive firms returning more quickly for post-IPO capital infusions, we find that the coefficient on R&D/Sales is insignificant in all specifications. This result is inconsistent with staging at the time of the IPO.[8]

Consistent with public market staging, the coefficient estimate for the cash burn rate is negative and significant in all four specifications reported in Table 3. The negative coefficient implies that firms that raise small amounts of capital relative to their pre-IPO spending return to the market for additional funding more quickly. Furthermore, like firms with high cash burn rates, firms with high levels of pre-IPO capital expenditures return faster (Model (4)). As HHP note, if firms are not staged at the time of their IPO, but instead are provided all the capital they need to fund future investments, we should expect to see no relation between pre-IPO spending and the time to first post-IPO capital infusion.

As discussed earlier, the 20-day post-IPO return captures the effect of underpricing as well as post-IPO information, both of which could be related to firm and/or the market decisions on post-IPO follow-on financing. We find that this variable is negatively related to duration and statistically significant in all four specifications suggesting that firms with

---

[8] Noting that the cash balance literature typically classifies R&D intensive firms as demanders of precautionary balances whereas the staging literature classifies such firms as in need of staging, HHP suggest that the difference may be driven by firm maturity. We plan to explore this possibility in the second half of our study.

favorable stock price performance over the 20-days following the IPO return more quickly for follow-on financing. This evidence is consistent with a variety of alternative explanations of the timing of post-IPO capital infusions that rely on post-IPO (as opposed to pre-IPO) firm and market characteristics. These findings highlight that the staging effects we document for international firms are incremental to the alternative explanations of post-IPO capital infusions.

The results for log of sales are somewhat puzzling. Consistent with staging, the negative and significant coefficient on this variable implies that firms with larger pre-IPO sales come back more quickly for follow-on financing. However, results in Table 4 indicate that these firms have higher proceeds at the time of the IPO.

4.3.3 Probit analysis of whether firms return for post-IPO capital infusions

Table 4 reports estimates of a probit model of the likelihood of a post-IPO capital infusion within two years of the IPO using the same set of explanatory variables as used in the hazard analysis. In the probit analysis, we are, in effect, classifying all firms that return for funding within two years as "staged firms" and examining whether variables that show that firms come back more quickly in the hazard analysis, similarly show increased likelihood that firms return for follow-on financing within two years of the IPO.

A key difference with the hazard evidence is our finding that R&D intensive firms are more likely to come back for follow-on financing; the coefficient on R&D/Sales is positive and significant in all specifications. Thus, unlike the hazard results, the probit findings for R&D intensive firms are consistent with public market staging hypothesis.

Other findings from the probit analysis are largely consistent with the hazard analysis results. IPO firms with more intangible assets, higher cash burn rates, greater pre-IPO capital

expenditures and more positive post-IPO returns are all significantly more likely to return for post-IPO financing.

4.4. Comparisons of U.S. and non-U.S. IPOs

Overall, the results of our analysis suggest that staging of capital infusions similar to that observed for U.S. IPO firms is evident for IPO firms outside of the U.S. However, we note the following differences between U.S. and non-U.S. IPO firms:

- The percentage of firms that return for financing in our sample non-U.S. IPO firms is 27% (2,311 of a total of 8,353 firms) as compared to 47% of U.S. firms that return for financing in the HHP sample. We also note that less than 1% of the firms in our sample either delist or merge, whereas 2.8% of U.S. IPO firms merge and 5% of U.S. IPO firms delist. In the context of the staging framework, these results suggest that there is, on average, less staging of IPOs firm in non-U.S. countries.

- There is a dramatic difference in R&D intensity between U.S. and non-U.S. firms. For example, HHP report that the average ratio of R&D to sales for U.S. IPO firms that do, and do not, return for subsequent financing is 2.3 and 1.2, respectively. This compares with 0.087 and 0.057 as reported in Table 1 for non-U.S. IPO firms. This difference suggests that non-U.S. firms are, on average, less likely to be candidates for staging.

- Also, consistent with the idea that non-U.S. IPO firms are less likely candidates for staging, we observe that they are larger and less likely to be burning through cash than U.S. IPO firms.

Given that our international sample contains IPO firms from countries with weak legal institutions as well as firms from countries with strong legal institutions, the above differences between U.S. and non-U.S. IPO firms may be driven by differences in the

strength of legal institutions. In the next section, we present preliminary findings on the effect of legal institutions on the capital raising activity of newly public firms.

5. The effect of legal institutions on capital raising activities of newly public firms (incomplete)

As an initial look at the effect of legal institutions on the capital raising activity of newly public firms, we repeat the analysis reported in the previous section for subsamples of IPOs formed by whether the IPO firm is in a strong or weak governance country.[9] The strong (weak) governance subsample includes IPO firms that are from countries where the governance index is above (below) the median value for the countries in our sample. The univariate results are reported in Table 5. The IPO size regressions, hazard analysis, and probit analysis (which was reported in Tables 2, 3, and 4 for our sample of non-U.S. firms) is reported in Tables 6, 7, and 8 with results for the weak and strong governance subsample reported in Panels A and B of each table, respectively.

5.1. Univariate comparisons: Strong vs. weak governance

Columns (1) and (2) of Table 5 report comparisons of IPO characteristics for subsamples of IPO firms from countries with low and high governance quality, respectively. The results suggest that IPO firms from weak governance countries appear less likely to be candidates for staging. More specifically, IPO firms from weak governance countries are less R&D intensive, have lower levels of intangible assets, have higher operating income, are burning through less cash, and are larger. Consistent with the idea of less staging in these countries, we also observe that only 16% of weak country governance IPO firms return for

---

[9] Because we are at early stages on this half of the analysis, we chose to focus in this paper on only one measure of legal institution quality.

24

follow-on financing within two years of their IPO as compared to 42% of IPO firms from strong governance countries.

Table 5 also provides comparisons of time to first post-IPO capital infusion, and firm, IPO, and market characteristics for subsamples of firms partitioned by whether or not they return for financing within two years broken out for the subset of firms from weak governance countries (Columns (3) and (4)) and strong governance countries (Columns (5) and (6)). Focusing on our key test variables, the evidence for the strong governance IPO firms is consistent with public market staging; firms that return for financing have significantly higher levels of intangible assets and are significantly more R&D intensive. In contrast, we observe no significant difference in asset intangibility or R&D intensity when comparing firms that return and firms that do not return for financing in weak governance countries. Thus, the univariate evidence is consistent with public market staging in strong governance countries, but not in weak governance countries.

5.2. Multivariate analysis: Strong vs. weak governance

Consistent with the univariate results, the results of multivariate tests performed on the subsample of IPO firms from strong governance countries are consistent with public market staging. Firms with greater asset intangibility and higher R&D intensity receive less funding at their IPO, return more quickly for follow-on funding and are more likely to return for funding within two years of their IPO.

In contrast, evidence from tests using the subsample of low governance IPO firms is less consistent with the public market staging hypothesis. The IPO size regressions (Table 6) show that R&D intensive firms do not receive less funding at the time of their IPO, the hazard analysis (Table 7) shows they do not come back more quickly for follow-on financing, and the probit analysis (Table 8) shows that they are not more likely to return for financing

within two years of their IPO. The results for intangible assets are mixed: The size regressions show that IPO firms with high intangibles receive less funding, but significance is at the 10 percent level, and while the hazard analysis shows that high intangible firms return more quickly, the probit analysis shows that such firms are not more likely to return for follow-on financing. Overall, these results show less evidence of public market staging in countries with weak governance.

In untabulated results, we also ran the same analysis as reported in Tables 5 through 8 using a measure of investor protection from the World Development Indicators database to bifurcate the sample. These results similarly show strong evidence of public market staging in strong protection countries, but not in weak protection countries.

5. Summary, preliminary conclusions, and future work

Previous research has shown that the staging of capital infusions, which is pervasive in the venture capital market, is also evident for newly public firms. Focusing on U.S. data, HHP provide evidence suggesting that factors that explain round sizes and the time between venture capital financing rounds also explain IPO sizes and the time from a firm's IPO to its first post-IPO capital infusion. This study provides similar evidence of public market staging in international markets. We find that firms with higher ratios of intangible to total assets and firms with greater R&D intensity receive less funding at the time of the IPO, relative to pre-IPO capital requirements, and return more quickly for post-IPO capital infusions. Also, consistent with staging at the time of the IPO, we find that firms that raise less money at their IPO raise additional capital more quickly.

When we repeat our analysis separately for subsamples of our data based on a country-level measure of investor protection, we find that preliminary results for high governance quality countries, but not for low governance countries, are consistent with the public market staging hypothesis. That is, unlike in strong protection countries, we find that

26

in weak protection countries IPO sizes and how quickly firms return for their first post-IPO capital infusion are not significantly related to R&D intensity and asset intangibility.

One potential explanation for our findings is that IPO firms in weak governance countries are less likely to be candidates for public market staging. In future iterations of this study, we will explore this explanation and the possible implications for economic development.

References

Allen, F., and G. R. Faulhaber, 1989, Signaling by underpricing in the IPO market, *Journal of Financial Economics* 23, 303-323.

Bae, K., and V. Goyal, 2009, Creditor rights, enforcement, and bank loans, *Journal of Finance* 64, 823-860.

Balcarcel, Ana, Michael Hertzel, and Laura Lindsey, 2012, Contracting frictions and cross border capital flows: Evidence from venture capital, working paper, Arizona State University.

Barclay, M. J., and C. W. Smith, 1995, The maturity structure of corporate debt, *Journal of Finance* 50, 609-631.

Bergman, Nittai, and Daniel Nicolaievsky, 2007, Investor protection and the Coasian view, *Journal of Financial Economics* 84, 738-771.

Bienz, C., and J. Hirsch, 2009, The dynamics of venture capital contracts, working paper, Norwegian School of Economics and Business Administration.

Bottazzi, Laura, Marco Da Rin, and Thomas F. Hellmann, 2009, What is the role of legal systems in financial intermediation? Theory and Evidence, *Journal of Financial Intermediation* 18, 559-598.

Claessens, S., S. Djankov, J. Fan and L. Lang, 2002, Disentangling the incentive and entrenchment effects of large shareholdings, *Journal of Finance* 57, 2379–2408.

Dittmar, Amy, Jan Mahrt-Smith, and Henri Servaes, 2003, International corporate governance and corporate cash holdings, *Journal of Financial and Quantitative Analysis* 38, 111-133.

Dittmar, Amy, and Jan Mahrt-Smith, 2007, Corporate governance and the value of cash holdings, *Journal of Financial Economics* 83, 599-634.

Djankov, Simeon, Rafael La Porta, Florencio Lopez-de-Silanes, and Andrei Shleifer, 2008, The law and economics of self-dealing, *Journal of Financial Economics* 88, 430–465.

Doidge, Craig, G., Andrew Karolyi and René Stulz,, 2004, Why are foreign firms that are listed in the U.S. worth more? *Journal of Financial Economics* 71, 205–238.

Doidge, C., G. A. Karolyi, and R.M. Stulz. 2007. Why do countries matter so much for corporate governance? *Journal of Financial Economics* 86:1–39.

Duchin, Ran, 2009, Cash Holdings and Corporate Diversification, *Journal of Finance*, forthcoming.

Dyck, A., and L. Zingales. 2004. Private Benefits of Control: An International Comparison. *Journal of Finance* 59:537–600.

Easterbrook, Frank H., 1984, "Two Agency-Cost Explanations of Dividends," *American Economic Review* 74, 650-659.

Faulkender, M., and R. Wang, 2006, Corporate financial policy and the value of cash, *Journal of Finance* 61, 1957-1990.

Foley, C. Fritz, and Robin Greenwood, 2010, The evolution of corporate ownership after IPO: The impact of investor protection, *Review of Financial Studies* 23, 1231-1260.

Gompers, P., 1995, Optimal investment monitoring and the staging of venture capital, *Journal of Finance* 50, 1461-1490.

Gompers, P., and J. Lerner, 2000, Money chasing deals? The impact of fund inflows on private equity valuation, *Journal of Financial Economics* 55, 281-325.

Grinblatt, Mark, and C. Y. Hwang, 1989, Signaling and the pricing of new issues, *Journal of Finance* 44, 393-420.

Han, S., and J. Qiu, 2007; Corporate precautionary cash holdings, *Journal of Corporate Finance* 13, 43–57

Harford, J., S. Mansi and W. Maxwell, 2008, Corporate governance and firm cash holdings, *Journal of Financial Economics* 87, 535-555.

Hart, O., 1993, Theories of optimal capital structure: a managerial discretion perspective, in M. Blair, ed., The Deal Decade, Washington DC: The Brookings Institution).

Hart, Oliver, 2001, Financial contracting, *Journal of Economic Literature* 39, 1079-1100.

Haushalter, D., S. Klasa and W. F. Maxwell, 2007, The influence of product market dynamics on a firm's cash holdings and hedging behavior, *Journal of Financial Economics* 84, 797-825.

Helwege, J., and N. Liang, 1996, Is there a pecking order? Evidence from a panel of IPO firms, *Journal of Financial Economics* 40, 429-458.

Hertzel, Michael, Mark Huson, and Robert Parrino, 2012, Public market staging: The timing of capital infusions in newly public firms, *Journal of Financial Economics* 106, 72-90.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert Vishny, 1997, Legal determinants of external finance, *Journal of Finance* 52, 1131-1150.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert Vishny, 1998, Law and finance, *Journal of Political Economy* 106, 1113-1155.

La Porta, Rafael, Florencio Lopez-de-Silanes, Andrei Shleifer and Robert Vishny, 2002, Investor protection and corporate valuation, *Journal of Finance* 57, 1147-1170.

Love, Inessa, 2003, Financial development and financial constraints: International evidence from the structural investment model, *Review of Financial Studies* 16, 765-791.

Jegadeesh, N., M. Weinstein, and I. Welch, 1993, An empirical investigation of IPO returns and subsequent equity offerings, *Journal of Financial Economics* 34, 153-175.

Jensen, M. C., 1986, Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323-329.

John, Kose, and Simi Kedia, 2006, Institutions, markets, and growth: A theory of comparative corporate governance, Unpublished working paper, New York University.

Kalcheva, Iva, and Karl Lins, 2007, International evidence on cash holdings and expected managerial agency problems, *Review of Financial Studies* 20, 1087-1112.

Kaplan, S. N., and P. Stromberg, 2003, Financial contracting theory meets the real world: an empirical analysis of venture capital contracts, *Review of Economic Studies* 70, 281-315.

Kaufmann, D., Kraay, A., Mastruzzi, M., 2009, Governance matters v: aggregate and individual governance indicators for 1996–2008, World Bank Policy Research Working Paper No. 4978.

Khanna, N., T. H. Noe, and R. Sonti, 2008, Good IPOs draw in bad: Inelastic banking capacity in hot markets, *Review of Financial Studies* 21, 1873-1906.

Kim, W., and M. S. Weisbach, 2008, Motivations for public equity offers: An international perspective, *Journal of Financial Economics* 87, 281–307.

Mayers, D., 1998, Why firms issue convertible bonds: the matching of financial and real investment options, *Journal of Financial Economics* 47, 83-102.

McLean, R. D., 2011, Share issuance and cash savings, *Journal of Financial Economics* 99, 693-715.

McLean, R. D., and M. Zhao 2012, Share issuance and cash savings: International evidence, working paper, University of Alberta.

McLean, R, D., T. Zhang, M. Zhao, 2012, Why does the law matter? Investor protection and its effects on investment, finance and growth, *Journal of Finance* 67, 313-350.

Megginson, W., and K. Weiss, 1991, Venture capitalist certification in initial public offerings, *Journal of Finance* 46, 879-903.

Opler, T., L. Pinkowitz, R. Stulz, and R. Williamson, 1999, The determinants and implications of corporate cash holdings, *Journal of Financial Economics* 52, 3–46.

Pagano, M., Panetta, F., & Zingales, L. (1998). Why do companies go public? an empirical analysis. *The journal of finance*, *53*(1), 27–64. https ://doi.org/10.1111/0022-1082. 25448

Pinkowitz, L., R. Stulz, R. Williamson, 2006, Does the contribution of corporate cash holdings and dividends to firm value depend on governance? A cross-country analysis, *Journal of Finance* 61, 2725-2751.

Qian, J., and P. Strahan, 2007, How laws and institutions shape financial contracts: the case of bank loans, *Journal of Finance* 42, 2803-2834.

Reese, W., M. Weisbach, 2002, Protection of minority shareholder interests, cross-listings in the United States, and subsequent equity offerings, *Journal of Financial Economics* 66, 65-104.

Schultz, P., 1993, Unit initial public offerings: a form of staged financing, *Journal of Financial Economics* 34, 199-229.

Shi, C., K. Pukthuanthong, and T. Walker, 2012. Does disclosure regulation work? Evidence from international IPO markets, forthcoming in *Contemporary Accounting Research.*

Shleifer, Andrei, and Daniel Wolfenzon, 2002, Investor protection and equity markets, Journal of Financial Economics 66, 3-27.

Stiglitz, J. E., and A. Weiss, 1981, Credit rationing in markets with incomplete information, *American Economic Review* 71, 393-410.

Welch, I., 1989, Seasoned offerings, imitation costs and the underpricing of initial public offerings. *Journal of Finance* 44, 421-449.

Whited, T. M., 2006, External financing constraints and the intertemporal pattern of intermittent investment, *Journal of Financial Economics* 81, 467-502.

Wurgler, Jeffrey, 2000, Financial markets and the allocation of capital, *Journal of Financial Economics* 58, 187-214.

Appendix

A: Variable Descriptions

A.1. Firm-level variables

Our measures of firm-level accounting and stock price variables come from Worldscope and Datastream. We conduct analyses in the paper that relies on measures of the accounting variables in both the year prior to (t=-1) and the year of (t=0) the IPO. The firm-level variables are defined as follows:

Intangible asset ratio This ratio measures intangible assets as a fraction of total assets.

R&D/sales   Research and development expenditures as a fraction of sales.

R&D/assets   Research and development expenditures as a fraction of assets.

Dollar burn rate   Difference between funds used for investment and funds from operations.

Cash burn rate   Annual dollar burn rate as a fraction of total capital raised in the IPO and the following three months.

CapEx   Capital expenditures as a fraction of book assets.

IPO funds   Total capital raised in the IPO and the following thirty days.

Post-IPO return   IPO underpricing measured as the return on shares over the first 20 days following the IPO including the first day return.

A.1. Country-level data

We obtain our country-level variables from the World Development Indicators database maintained by the World Bank.

Log GDP per capita is the natural log of the real GDP per capita, in US dollars.

Country Governance Index is the average of the following governance indicators:

1. *Voice and Accountability* – measures the extent to which a country's citizens are able to participate in political process, as well as enjoy personal freedom.

2. *Rule of Law*– measures the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.

3. *Control of Corruption*– measures the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests.

Appendix B: Hazard analysis methodology

To examine public market staging and the effect of investor protection on the relations between firm characteristics and the length of time to the first post-IPO financing, we perform a multivariate hazard analysis using a semi-parametric hazard model of the form

$$h_i(t) = \left(h_0(t) \exp\left(x_i(t)' \beta \right) \right) \alpha_i \tag{1}$$

where t is the length of time to the first post-IPO capital infusion (or duration), $h_0(t)$ is the baseline hazard function, $x_j(t)$ is a vector of covariates, and β is the corresponding vector of unknown parameters. We estimate the baseline hazard, $h_0(t)$, as a step function in time where the steps are at six-month intervals. The effect of omitted covariates is captured by α_i which models frailty, or the tendency of observations to fail more or less often than predicted by the covariates.

We estimate equation (1) assuming that the hazard rate follows an exponential

distribution using an accelerated failure time form.[10] The results are presented in log expected time parameterization so that the model gives the logarithm of the expected time to the next capital infusion for a given covariate. Thus, negative coefficient estimates imply shorter durations (quicker time to first post-IPO issue) positive coefficients imply longer durations (slower time to first post-IPO issue).

---

[10] We will consider an estimation of a Cox proportional hazard model to check for robustness in future iterations.

Appendix Table A1: IPO and Firm Characteristics

This table reports country-level means on IPO and issuer characteristics by issuer country.

Country	N	IPO Proceeds	Spell	Book Assets	Intangible /Assets	Cash burn	ROA	Investment	R&D/sale	Capital exp.	Initial return	20-day return	Log od GDP per capita	Governance index
argentina	10	420	1.52	6.56	0.12	0.29	-0.20	0.15	0.01	0.10	2.22	-0.07	8.80	0.00
australia	811	31	1.44	1.98	0.11	0.07	-0.25	0.12	0.09	0.10	0.26	0.01	10.30	1.55
austria	45	112	1.75	4.29	0.06	-0.01	0.08	0.09	0.01	0.07	0.02	0.05	10.25	1.65
belgium	52	119	1.80	3.88	0.16	0.00	-0.03	0.08	0.24	0.08	0.03	0.08	10.27	1.31
brazil	53	269	1.62	5.61	0.04	0.01	0.13	0.14	0.01	0.10	0.14	-0.01	8.65	-0.07
canada	325	62	1.37	2.72	0.05	0.24	-0.13	0.14	0.20	0.12	0.36	0.04	10.32	1.59
chile	11	126	1.64	5.27	0.01	0.00	0.14	0.15	0.00	0.15	-0.27	0.04	8.46	1.09
china	1028	92	1.90	4.26	0.03	-0.07	0.15	0.10	0.01	0.09	1.12	0.00	7.13	-0.51
denmark	52	82	1.71	3.27	0.10	0.14	-0.02	0.12	0.22	0.11	0.06	0.03	10.54	1.82
egypt	5	304	2.00	6.50	0.03	-0.18	0.12	0.05	0.00	0.05	1.82	0.00	7.21	-0.41
finland	50	85	1.65	4.04	0.11	-0.21	0.11	0.10	0.02	0.10	0.33	0.02	10.16	1.89
france	508	79	1.85	3.35	0.13	-0.14	0.10	0.08	0.04	0.07	0.10	0.15	10.16	1.19
germany	397	92	1.82	3.35	0.12	0.04	0.03	0.12	0.04	0.11	0.10	0.29	10.20	1.61
greece	100	82	1.87	4.18	0.03	-0.11	0.14	0.17	0.00	0.20	1.20	0.48	9.50	0.79
hong kong	429	66	1.73	3.72	0.04	-0.28	0.17	0.12	0.01	0.09	0.20	-0.01	10.13	1.19
india	271	42	1.89	3.74	0.03	0.07	0.13	0.15	0.00	0.13	0.42	0.16	6.59	-0.17
indonesia	84	66	1.63	6.22	0.02	0.05	0.12	0.15	0.00	0.14	0.20	0.07	6.87	-0.68
ireland-rep	44	119	1.57	3.26	0.20	0.32	-0.22	0.20	0.22	0.10	0.23	0.14	10.36	1.52
israel	112	47	1.77	3.22	0.03	-0.09	-0.06	0.09	0.24	0.07	0.31	0.08	9.81	0.63
italy	144	111	1.82	4.61	0.14	-0.02	0.07	0.09	0.04	0.05	0.20	0.10	10.07	0.76
japan	1405	40	1.75	4.20	0.02	-0.15	0.08	0.06	0.02	0.05	0.52	-0.03	10.46	1.07
malaysia	374	18	1.93	2.96	0.06	-0.20	0.14	0.09	0.00	0.07	0.31	0.18	8.42	0.41
mexico	39	193	1.48	6.55	0.10	0.21	0.10	0.13	0.00	0.08	0.21	0.03	8.49	-0.23
netherlands	81	190	1.68	4.25	0.11	-0.01	0.10	0.11	0.08	0.08	0.43	0.03	10.24	1.79
new zealand	40	58	1.75	3.95	0.12	0.06	0.04	0.10	0.11	0.10	0.27	0.01	9.99	1.75

norway	90	132	1.70	4.09	0.10	0.40	-0.03	0.14	0.05	0.12	0.16	-0.02	10.81	1.68
pakistan	8	136	1.98	4.88	0.00	0.76	0.15	0.08	0.00	0.08	0.27	0.18	6.24	-0.82
peru	4	314	1.24	5.15	0.15	0.03	0.00	0.18	0.00	0.09	-0.30	0.14	7.99	-0.32
philippines	36	62	1.91	3.61	0.03	0.24	0.17	0.14	0.00	0.11	0.25	-0.02	7.04	-0.23
portugal	13	323	1.67	6.31	0.11	0.16	0.09	0.14	0.00	0.12	0.18	0.05	9.36	1.24
russian fed	36	463	1.47	9.68	0.09	-0.35	0.15	0.18	0.00	0.12	1.44	0.00	8.65	-0.70
singapore	304	29	1.80	3.33	0.02	-0.27	0.19	0.09	0.00	0.08	0.33	-0.06	10.12	1.45
south africa	18	141	1.53	4.09	0.05	-0.34	-0.16	0.11	0.00	0.08	0.33	0.14	8.41	0.40
south korea	272	76	1.74	5.29	0.04	-0.76	0.21	0.15	0.03	0.12	0.93	-0.07	9.67	0.67
spain	37	264	1.75	5.47	0.08	-0.10	0.11	0.08	0.00	0.06	0.11	0.03	9.80	1.14
sri lanka	7	25	2.00	4.13	0.00	-0.48	0.17	0.09	0.00	0.09	0.82	0.06	6.58	-0.33
sweden	75	135	1.60	3.75	0.10	0.02	-0.01	0.09	0.06	0.08	0.29	-0.03	10.34	1.73
switzerland	54	210	1.68	4.84	0.11	0.08	0.03	0.10	0.12	0.08	0.03	0.10	10.62	1.74
taiwan	478	19	1.80	3.84	0.01	-0.36	0.15	0.09	0.04	0.09	0.18	0.10	9.58	0.84
thailand	160	55	1.87	3.44	0.01	-0.02	0.14	0.12	0.00	0.10	0.33	-0.04	6.43	0.09
turkey	11	320	1.99	7.48	0.05	0.73	0.12	0.16	0.02	0.10	1.64	0.03	7.95	-0.18
united kingdom	945	58	1.67	2.45	0.12	0.13	-0.23	0.14	0.13	0.09	0.14	0.13	10.31	1.53

Appendix Table A2: Comparison of IPO and Firm Characteristics between U.S. and non-U.S. firms

The sample is initial public offerings of common stock in the years 1990-2007. All accounting variables are measured at the end of the fiscal year preceding an IPO. Countries with below (above)-median governance index are classified weak (strong) governance. See the Appendix for detailed variable definition. [a, b,] and [c] indicate the mean or median value is statistically different from the mean or median value in the previous column at the 1%,5%, and 10%.

			Raised more capital		DID NOT Raise more capital	
	Non-US	U.S.	Non-US	U.S.	Non-US	U.S.
Spell in years	1.738	1.338	1.055	0.836	1.995	1.918
	(2)	(1.50)	(1.02)	(0.72)	(2)	(2)
	[9028]	[4107]	[2466]	[2202]	[6562]	[1905]
Intangibles/assets	0.0680	0.0778	0.0802	0.0983	0.0632	0.0548
	(0.0056)	(0)	(0.0032)	(0)	(0.0064)	(0)
	[6074]	[3517]	[1730]	[1858]	[4344]	[1659]
R&D/sales	0.505	1.710	0.830	1.735	0.366	1.687
	(0.020)	(0.14)	(0.019)	(0.095)	(0.021)	(0.17)
	[1838]	[2409]	[551]	[1172]	[1287]	[1237]
Cash burn rate	-0.0793	0.143	0.0510	0.153	-0.130	0.130
	(-0.053)	(0.039)	(0.0046)	(0.020)	(-0.072)	(0.060)
	[5416]	[3902]	[1505]	[2095]	[3911]	[1807]
Dollar burn rate	2.590	9.902	9.263	12.38	0.0219	7.030
	(-0.75)	(1.34)	(0.037)	(1.43)	(-1.05)	(1.32)
	[5416]	[3902]	[1505]	[2095]	[3911]	[1807]
Assets ($U.S. millions)	257.7	133.8	455.6	193.4	179.2	64.29
	(32.4)	(21.4)	(32.5)	(33.3)	(32.3)	(13.3)
	[6375]	[4003]	[1810]	[2155]	[4565]	[1848]
Capital exp./assets	0.0872	0.0944	0.100	0.0966	0.0822	0.0918
	(0.051)	(0.059)	(0.053)	(0.058)	(0.050)	(0.059)
	[5450]	[3902]	[1522]	[2095]	[3928]	[1807]
Oper. Cash flow/assets	0.0431	-0.187	-0.0225	-0.109	0.0680	-0.278
	(0.10)	(0.050)	(0.075)	(0.067)	(0.11)	(-0.009)
	[6168]	[3930]	[1695]	[2114]	[4473]	[1816]
IPO proceeds ($U.S. mil)	88.47	366.4	161.9	539.5	60.88	166.4
	(16.3)	(37.5)	(15.6)	(44)	(16.5)	(31.0)
	[9028]	[4107]	[2466]	[2202]	[6562]	[1905]
IPO initial return	0.384	0.245	0.343	0.224	0.400	0.269
	(0.062)	(0.10)	(0.060)	(0.10)	(0.063)	(0.11)
	[8858]	[4102]	[2409]	[2201]	[6449]	[1901]
Post-IPO 20-day return	0.0534	0.0413	0.0836	0.0600	0.0422	0.0197
	(-0.0056)	(0.0040)	(0)	(0.019)	(-0.012)	(-0.012)
	[8693]	[4057]	[2343]	[2172]	[6350]	[1885]

Table 1. Characteristics of the initial public offerings

The sample is initial public offerings of common stock in the years 1990-2007. All accounting variables are measured at the end of the fiscal year preceding an IPO. See the Appendix for detailed variable definition. The mean (median) values and the number of observations (in {} brackets) are reported for each characteristic within each subsample. [a], [b], and [c] indicate the mean or median value is statistically different from the mean or median value in Column "Issued" at the 1%, 5%, and 10% level, respectively.

| Characteristic | Raised capital within 2 years | Did not raise more capital within 2 years | | |
	Issued	Still trading	Delisted	Merged
	1	2	3	4
Time from IPO to next financing (Spell)	1.05	2.00[a]	1.58	1.51
	(1.02)	(2.00)	(1.66)	(1.58)
	[2465]	[6479]	[43]	[31]
Intangibles/assets	0.08	0.06[a]	0.08	0.13
	(0.00)	(0.01)	(0.01)	(0.01)
	[1730]	[4289]	[33]	[21]
R&D/sales	0.37	0.22[a]	1.33	0.07
	(0.02)	(0.02)	(0.13)	(0.05)
	[551]	[1275]	[4]	[8]
Cash burn rate	0.05	-0.134[a]	-0.251	-0.138
	(0.00)	(-0.072)	(-0.084)	(-0.057)
	[1505]	[3866]	[27]	[17]
Dollar burn rate	8.21	-0.316[a]	-9.875	2.997
	(0.04)	(-1.045)	(-1.576)	(-1.798)
	[1505]	[3866]	[27]	[17]
Book Assets ($U.S. millions)	583.10	211.00[a]	133.30	515.80
	(32.49)	(32.19)	(39.32)	(21.24)
	[1810]	[4508]	[33]	[23]
Capital expenditures/assets	0.10	0.08[a]	0.11	0.05
	(0.05)	(0.05)	(0.06)	(0.02)
	[1522]	[3883]	[27]	[17]
Oper. Cash flow/assets	-0.0137	0.07[a]	0.03	0.13
	(0.08)	(0.11)	(0.09)	(0.13)
	[1695]	[4418]	[32]	[22]
IPO proceeds ($U.S. millions)	106.30	51.59[a]	95.50	76.42
	(15.58)	(16.43)	(17.05)	(17.54)
	[2464]	[6488]	[43]	[30]
IPO initial return	0.38	0.42[c]	0.20	0.10
	(0.06)	(0.06)	(0.02)	(0.00)
	[2407]	[6375]	[43]	[30]
Post-IPO 20-day return	0.09	0.04[a]	0.03	0.01
	(0.00)	(-0.0125)	(-0.03)	(0.02)
	[2341]	[6276]	[43]	[30]

Table 2. Predicting the amount of capital raised in the IPO

Coefficient estimates from ordinary least squares models predicting the cash burn rate for firms that completed an IPO between 1990 and 2007. The dependent variable, the *cash burn rate*, equals the ratio of the difference between funds used for investment and the funds from operations in the year prior to the IPO, divided by the total funds raised in the IPO. See the Appendix for detailed variable definitions. We report p-values in brackets. Standard errors are clustered at the country level. All regressions include year and country fixed effects.

Independent variable	Model		
	1	2	3
Intangible/assets(t=-1)	0.985		0.969
	[0.000]		[0.001]
R&D/Sales(t=-1)		0.032	0.035
		[0.040]	[0.021]
Log of IPO Funds	-0.184	-0.139	-0.136
	[0.028]	[0.211]	[0.215]
Log of assets(t=-1)	0.184	0.135	0.128
	[0.006]	[0.148]	[0.167]
Capex/assets(t=-1)	5.068	6.009	6.098
	[0.000]	[0.000]	[0.000]
Percent secondary	-0.344	-0.375	-0.42
	[0.009]	[0.018]	[0.010]
Venture backed	0.052	0.119	0.13
	[0.285]	[0.074]	[0.034]
Initial return	0.028	0.035	0.038
	[0.268]	[0.261]	[0.213]
Post-IPO 20-day return	0.079	0.053	0.045
	[0.348]	[0.705]	[0.741]
High IPO Activity	0.142	0.142	0.159
	[0.003]	[0.064]	[0.053]
Low IPO Activity	0.123	0.208	0.18
	[0.094]	[0.065]	[0.114]
GDP Per Capita	0.102	0.052	0.041
	[0.133]	[0.608]	[0.689]
Constant	-0.086	0.295	0.132
	[0.549]	[0.174]	[0.520]
Observations	7389	2531	2463
R-squared	0.212	0.204	0.205

Table 3. Predicting the time from IPO to first post-IPO financing

Presented are coefficient estimates from a hazard model of the time to the first post-IPO financing. The model is semi-parametric with a nonparametric baseline hazard and an exponential hazard distribution. The model is in accelerated failure time, that is, a negative coefficient estimate indicates the event (first post-IPO financing) happens more quickly. The coefficient estimates of the baseline hazard, as well as those associated with country and year dummy variables, are not tabulated. See the Appendix for detailed variable definitions. We report p-values in brackets. Standard errors are clustered at the country level. All regressions include year and country fixed effects.

Independent variable	Model		
	1	2	3
Intangible/assets(t=-1)	-0.3839		-1.1196
	[0.042]		[0.002]
R&D/Sales(t=-1)		-0.0504	-0.0477
		[0.133]	[0.152]
Cash burn rate(t=-1)	-0.1281	-0.1199	-0.0879
	[0.000]	[0.014]	[0.080]
Log of IPO Funds	-0.0693	-0.1073	-0.1104
	[0.011]	[0.026]	[0.025]
Log of assets(t=-1)	-0.11	-0.1744	-0.1614
	[0.000]	[0.000]	[0.000]
Capex/assets(t=-1)	-0.6855	-0.3856	-0.7473
	[0.007]	[0.458]	[0.164]
Percent secondary	-0.1162	-0.2921	-0.2848
	[0.447]	[0.273]	[0.302]
Venture backed	-0.199	-0.0902	-0.1168
	[0.025]	[0.496]	[0.383]
Initial return	-0.0773	-0.1092	-0.1112
	[0.001]	[0.005]	[0.005]
Post-IPO 20-day return	-0.5599	-0.582	-0.5585
	[0.000]	[0.000]	[0.000]
High IPO Activity	0.0198	0.1886	0.1426
	[0.889]	[0.450]	[0.579]
Low IPO Activity	-0.0907	-0.0098	0.0055
	[0.217]	[0.939]	[0.966]
GDP Per Capita	0.0107	-0.0054	0.0075
	[0.880]	[0.964]	[0.953]
Constant	16.4728	18.2244	17.2431
	[0.989]	[0.994]	[0.990]
Observations	4791	1573	1491

Table 4. Probit regressions on the likelihood of post-IPO capital infusion

Coefficient estimates from probit models predicting whether a firm that completes an IPO subsequently completes another financing within two years. The models compare firms that raised additional capital within two years of their IPO with firms that were still trading two years after their IPO and that did not obtain post-IPO financing. The dependent variable equals one if the firm completes a subsequent financing and zero otherwise. See the Appendix for detailed variable definitions. We report p-values in brackets. Standard errors are clustered at the country level. All regressions include year and country fixed effects.

Independent variable	Model		
	1	2	3
Intangible/assets(t=-1)	0.124		0.3921
	[0.048]		[0.000]
R&D/Sales(t=-1)		0.0224	0.0218
		[0.000]	[0.000]
Cash burn rate(t=-1)	0.0306	0.0318	0.0232
	[0.000]	[0.005]	[0.027]
Log of IPO Funds	0.015	0.0238	0.0251
	[0.113]	[0.167]	[0.176]
Log of assets(t=-1)	0.0269	0.0453	0.0432
	[0.000]	[0.002]	[0.005]
Capex/assets(t=-1)	0.1405	0.0549	0.174
	[0.061]	[0.725]	[0.329]
Percent secondary	0.0198	0.0704	0.0718
	[0.684]	[0.129]	[0.192]
Venture backed	0.0578	0.021	0.027
	[0.154]	[0.481]	[0.332]
Initial return	0.0163	0.03	0.0304
	[0.144]	[0.040]	[0.042]
Post-IPO 20-day return	0.1231	0.1276	0.1225
	[0.000]	[0.000]	[0.000]
High IPO Activity	-0.0067	-0.041	-0.0294
	[0.818]	[0.590]	[0.700]
Low IPO Activity	0.0097	0.0031	0.0024
	[0.639]	[0.914]	[0.926]
GDP Per Capita	-0.0047	-0.0018	-0.0106
	[0.834]	[0.940]	[0.700]
Observations	4724	1529	1451

Table 5. Characteristics of the initial public offerings: Strong vs weak governance

The sample is initial public offerings of common stock in the years 1990-2007. All accounting variables are measured at the end of the fiscal year preceding an IPO. Countries with below (above)-median governance index are classified weak (strong) governance. See the Appendix for detailed variable definition. The mean (median) values and the number of observations (in {} brackets) are reported for each characteristic within each subsample. [a, b,] and [c] indicate the mean or median value is statistically different from the mean or median value in the previous column at the 1%,5%, and 10% level.

	Country Governance		Country Governance			
			Weak		Strong	
	Country Governance		Raised more capital		Raised more capital	
	Weak	Strong	No	Yes	No	Yes
Spell in years	1.842	1.680 [a]	1.997	1.071 [a]	1.993	1.049 [a]
	(2)	(2)	(2.000)	(1.071)	(2.000)	(1.014)
	[3256]	[5769]	[2708]	[548]	[3853]	[1916]
Intangible/assets	0.0405	0.0821 [a]	0.038	0.053 [b]	0.079	0.088
	(0.0037)	(0.0068)	(0.004)	(0.002)	(0.008)	(0.004)
	[2060]	[4013]	[1663]	[397]	[2680]	[1333]
R&D/sales	0.0677	0.436 [a]	0.070	0.060	0.377	0.541
	(0.0175)	(0.0232)	(0.018)	(0.015)	(0.026)	(0.020)
	[868]	[970]	[667]	[201]	[620]	[350]
Cash burn rate	-0.175	-0.0274 [a]	-0.214	-0.017 [b]	-0.078	0.075 [a]
	(-0.0820)	(-0.0322)	(-0.087)	(-0.034)	(-0.06)	(0.012)
	[2029]	[3386]	[1633]	[396]	[2277]	[1109]
Dollar burn rate	1.103	2.565	-1.333	11.150 [b]	0.325	7.164 [a]
	(-1.635)	(-0.438)	(-1.730)	(-0.670)	(-0.718)	(0.109)
	[2029]	[3386]	[1633]	[396]	[2277]	[1109]
Assets ($U.S. mil)	436.4	254.3 [a]	270.3	1134.8 [a]	174.6	414.3 [a]
	(50.59)	(23.12)	(44.5)	(113.3)	(23.5)	(22.2)
	[2207]	[4167]	[1783]	[424]	[2781]	[1386]
Capital exp./assets	0.0929	0.0839 [b]	0.087	0.116 [a]	0.079	0.094 [a]
	(0.0634)	(0.0453)	(0.061)	(0.075)	(0.045)	(0.046)
	[2051]	[3398]	[1645]	[406]	[2282]	[1116]
Cash flow/assets	0.133	0.0016 [a]	0.134	0.126	0.031	(0.061) [a]
	(0.127)	(0.0822)	(0.128)	(0.123)	(0.092)	(0.056)
	[2212]	[3955]	[1782]	[430]	[2690]	[1265]
IPO proceeds ($U.S. mil)	74.13	62.67 [b]	55.7	165.1 [a]	49.4	89.4 [a]
	(22.86)	(13.34)	(21.1)	(38.7)	(13.7)	(11.7)
	[3256]	[5769]	[2708]	[548]	[3853]	[1916]
IPO initial return	0.644	0.274 [a]	0.659	0.569	0.251	0.321 [b]
	(0.149)	(0.0217)	(0.185)	(0.068)	(0.011)	(0.050)
	[3185]	[5670]	[2654]	[531]	[3794]	[1876]
Post-IPO 20-day return	0.0674	0.0493 [c]	0.052	0.149 [a]	0.039	0.070 [a]
	(-0.0087)	(-0.004)	(-0.015)	(0.014)	(-0.01)	(0.000)
	[3088]	[5602]	[2594]	[494]	[3755]	[1847]

Table 6. Predicting the amount of capital raised in the IPO: Strong vs weak governance

Coefficient estimates from ordinary least squares models predicting the cash burn rate for firms that completed an IPO between 1990 and 2007. The dependent variable, the *cash burn rate*, equals the ratio of the difference between funds used for investment and the funds from operations in the year prior to the IPO, divided by the total funds raised in the IPO. Countries with below (above)-median governance index are classified weak (strong) governance. See the Appendix for detailed variable definitions. We report p-values in brackets. Standard errors are clustered at the country level. All regressions include year and country fixed effects.

Independent variable	Country Governance					
	weak	weak	weak	strong	strong	strong
Intangible/assets(t=-1)	1.241		1.826	0.902		0.681
	[0.018]		[0.025]	[0.000]		[0.015]
R&D/Sales(t=-1)		0.081	0.081		0.022	0.024
		[0.130]	[0.100]		[0.068]	[0.042]
Log of IPO Funds	-0.182	-0.098	-0.122	-0.179	-0.163	-0.143
	[0.052]	[0.417]	[0.362]	[0.118]	[0.345]	[0.391]
Log of assets(t=-1)	0.261	0.191	0.206	0.146	0.098	0.081
	[0.009]	[0.142]	[0.140]	[0.099]	[0.447]	[0.511]
Capex/assets(t=-1)	6.877	8.419	8.461	4.167	3.449	3.49
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.000]
Percent secondary	-0.698	-0.781	-0.828	-0.224	-0.248	-0.322
	[0.014]	[0.188]	[0.174]	[0.076]	[0.043]	[0.011]
Venture backed	0.131	0.147	0.128	-0.003	0.037	0.054
	[0.092]	[0.047]	[0.103]	[0.936]	[0.644]	[0.470]
Initial return	0.005	0.014	0.017	0.037	0.04	0.042
	[0.895]	[0.637]	[0.526]	[0.177]	[0.384]	[0.365]
Post-IPO 20-day return	-0.152	-0.119	-0.104	0.188	0.144	0.124
	[0.143]	[0.572]	[0.613]	[0.039]	[0.181]	[0.264]
High IPO Activity	0.254	0.348	0.399	0.094	0.056	0.062
	[0.001]	[0.030]	[0.026]	[0.051]	[0.493]	[0.433]
Low IPO Activity	0.156	0.337	0.297	0.08	0.12	0.097
	[0.273]	[0.090]	[0.141]	[0.253]	[0.262]	[0.322]
GDP Per Capita	0.16	0.203	0.2	0.089	0.001	-0.021
	[0.132]	[0.335]	[0.361]	[0.321]	[0.995]	[0.879]
Constant	-0.208	0.467	0.19	0.132	0.264	0.169
	[0.118]	[0.317]	[0.660]	[0.562]	[0.392]	[0.569]
Observations	2617	1042	993	4772	1489	1470
R-squared	0.229	0.262	0.261	0.219	0.18	0.182

Table 7. Predicting the time from IPO to first post-IPO financing: Strong vs weak governance

Presented are coefficient estimates from a hazard model of the time to the first post-IPO financing. The model is semi-parametric with a nonparametric baseline hazard and an exponential hazard distribution. The model is in accelerated failure time, that is, a negative coefficient estimate indicates the event (first post-IPO financing) happens more quickly. The coefficient estimates of the baseline hazard, as well as those associated with country and year dummy variables, are not tabulated. Countries with below (above)-median governance index are classified weak (strong) governance. See the Appendix for detailed variable definitions. We report p-values in brackets. Standard errors are clustered at the country level. All regressions include year and country fixed effects.

Independent variable	Country Governance					
	weak	weak	weak	strong	strong	strong
Intangible/assets(t=-1)	-1.3499		-0.7148	-0.2782		-0.9905
	[0.017]		[0.551]	[0.164]		[0.011]
R&D/Sales(t=-1)		-0.1473	-0.1442		-0.0645	-0.0598
		[0.639]	[0.654]		[0.057]	[0.076]
Cash burn rate(t=-1)	-0.1119	-0.1194	-0.1041	-0.139	-0.0536	-0.0067
	[0.021]	[0.065]	[0.114]	[0.002]	[0.525]	[0.938]
Log of IPO Funds	-0.1653	-0.2018	-0.1896	-0.0511	-0.0336	-0.0462
	[0.007]	[0.012]	[0.026]	[0.093]	[0.588]	[0.464]
Log of assets(t=-1)	-0.1687	-0.1523	-0.1468	-0.1007	-0.1891	-0.1752
	[0.002]	[0.039]	[0.051]	[0.000]	[0.000]	[0.001]
Capex/assets(t=-1)	-0.6858	-0.4131	-0.6023	-0.5897	-0.172	-0.6958
	[0.244]	[0.602]	[0.455]	[0.037]	[0.808]	[0.345]
Percent secondary	-0.494	0.0444	0.0195	-0.0496	-0.3619	-0.3566
	[0.173]	[0.952]	[0.979]	[0.770]	[0.218]	[0.242]
Venture backed	-0.5612	-0.611	-0.5662	-0.0395	0.1734	0.116
	[0.001]	[0.006]	[0.013]	[0.706]	[0.293]	[0.485]
Initial return	0.0165	-0.1047	-0.1048	-0.1163	-0.1233	-0.1296
	[0.715]	[0.102]	[0.097]	[0.000]	[0.025]	[0.021]
Post-IPO 20-day return	-0.6535	-0.6819	-0.6807	-0.5103	-0.5172	-0.4842
	[0.000]	[0.003]	[0.003]	[0.000]	[0.006]	[0.011]
High IPO Activity	-0.0526	1.3866	1.1301	0.0132	-0.1833	-0.1965
	[0.889]	[0.007]	[0.048]	[0.931]	[0.524]	[0.503]
Low IPO Activity	0.1592	-0.0904	-0.0439	-0.1748	0.0331	0.0169
	[0.285]	[0.676]	[0.843]	[0.040]	[0.842]	[0.919]
GDP Per Capita	-0.1955	-0.1542	-0.2424	0.0566	0.0537	0.119
	[0.133]	[0.516]	[0.328]	[0.492]	[0.714]	[0.438]
Constant	18.7828	18.924	18.2054	1.4309	1.2714	1.2586
	[0.992]	[0.995]	[0.993]	[0.000]	[0.000]	[0.000]
Observations	1738	743	689	3053	830	802

Table 8. Probit regressions on the likelihood of post-IPO capital infusion: Strong vs weak governance

Coefficient estimates from probit models predicting whether a firm that completes an IPO subsequently completes another financing within two years. The models compare firms that raised additional capital within two years of their IPO with firms that were still trading two years after their IPO and that did not obtain post-IPO financing. The dependent variable equals one if the firm completes a subsequent financing and zero otherwise. Countries with below (above)-median governance index are classified weak (strong) governance. See the Appendix for detailed variable definitions. We report p-values in brackets. Standard errors are clustered at the country level. All regressions include year and country fixed effects.

Independent variable	Country Governance					
	weak	weak	weak	strong	strong	strong
Intangible/assets(t=-1)	0.2655		0.3517	0.102		0.3846
	[0.055]		[0.406]	[0.114]		[0.000]
R&D/Sales(t=-1)		0.0451	0.0441		0.0283	0.0271
		[0.337]	[0.338]		[0.000]	[0.000]
Cash burn rate(t=-1)	0.0175	0.0233	0.0199	0.0403	0.0178	0.0018
	[0.018]	[0.010]	[0.067]	[0.003]	[0.559]	[0.953]
Log of IPO Funds	0.0216	0.0376	0.0328	0.013	0.0054	0.0097
	[0.150]	[0.092]	[0.159]	[0.215]	[0.809]	[0.709]
Log of assets(t=-1)	0.0266	0.0332	0.0337	0.0291	0.0555	0.0529
	[0.044]	[0.133]	[0.146]	[0.001]	[0.004]	[0.016]
Capex/assets(t=-1)	0.1441	0.1046	0.1803	0.1276	-0.0459	0.1214
	[0.296]	[0.678]	[0.532]	[0.140]	[0.763]	[0.379]
Percent secondary	0.1085	0.1038	0.0866	-0.0049	0.0828	0.082
	[0.215]	[0.230]	[0.290]	[0.929]	[0.140]	[0.239]
Venture backed	0.1263	0.1357	0.1289	0.0143	-0.0604	-0.0442
	[0.000]	[0.000]	[0.000]	[0.733]	[0.044]	[0.149]
Initial return	-0.0056	0.0198	0.0189	0.0361	0.0433	0.0461
	[0.702]	[0.164]	[0.203]	[0.004]	[0.073]	[0.072]
Post-IPO 20-day return	0.1058	0.1238	0.1213	0.1245	0.1235	0.1182
	[0.000]	[0.001]	[0.002]	[0.000]	[0.000]	[0.001]
High IPO Activity	0.0415	-0.1912	-0.1904	-0.0111	0.0576	0.0685
	[0.495]	[0.000]	[0.000]	[0.738]	[0.532]	[0.439]
Low IPO Activity	-0.0348	0.0127	0.0026	0.0414	-0.009	0.0021
	[0.230]	[0.660]	[0.925]	[0.033]	[0.843]	[0.958]
GDP Per Capita	0.0384	0.0366	0.0429	-0.0235	-0.0245	-0.0452
	[0.210]	[0.227]	[0.265]	[0.375]	[0.496]	[0.194]
Observations	1718	714	663	3006	815	788