Governance, Ownership Structure and Performance of IPO Firms: The Impact of Different Types of Private Equity Investors and Institutional Environments

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ABSTRACT

This paper examines performance effects of ownership concentration and two types of private equity investors (venture capitalists and business angels) in firms that have recently undergone an initial public offering (IPO) in the United Kingdom and France. We expand and contextualize nascent understanding of multiple agency theory by examining heterogeneity of private equity investors and by suggesting that multiple agency relationships are affected by different institutional contexts. We employ a unique, hand-collected dataset of 224 matched IPOs (112 in each country). Controlling for the endogeneity of private equity investors' retained share ownership, we find support for the agency theory argument that concentrated ownership improves IPO's performance. The research also shows that the two types of private equity investors have a differential impact on performance, and the legal institutions in a given country moderate this impact.

A growing body of corporate governance research has examined the relationships between stock ownership patterns, managerial behavior, and corporate performance. Despite theoretical attractions, research on the relationship between ownership concentration and performance is, at best, mixed (Dalton *et al.,* 2003). In part, this research is limited by its focus on the effects of large-block share ownership in large mature firms with relatively little attention to entrepreneurial firms that underwent an initial public offering (IPO). Additionally, prior research is limited as it has not differentiated among types of investors. Recent studies on "conflicting voices" in strategic management have acknowledged that owner identity has important organizational implications as different owners may have different objectives and decision-making horizons (Hoskisson *et al.,* 2002), but these studies are focused on public rather than private equity investors. In private firms undergoing an IPO the major different private equity investors will have different agency relationships that will generate a multiple agency setting that has yet to be recognized widely (Arthurs *et al.,* 2008). Finally, previous studies on the impact of ownership patterns have focused almost solely on a single institutional setting, North America. But the institutional setting in which research is conducted may impact the nature and extent of agency conflicts and the governance roles of ownership patterns. This research will seek to overcome these shortcomings by examining the impact of ownership concentration and the presence of different block holders on IPO firm performance outside North America in different institutional settings.

Examination of IPO firms offers potential for more insightful analysis of corporate governance effects since corporate governance of the firm at listing is likely clearer than at any point in the firm's history (Filatotchev and Wright, 2005). Recognition of this fact has led Betty and Zajac (1994:315) to argue that "studying IPO firms may provide a particularly clear test of the agency-based contingency perspectives." IPO firms are characterized by different large-block holders of retained equity after listing. For example, while original founders are

often the largest shareholders in an IPO, there is also typically a heterogeneous set of outside private equity investors who specialize in high growth high potential ventures. Specifically, two distinct types of private equity investors are present in an IPO, "formal" (venture capitalists or VCs) and "informal" (business angels or BAs) early-stage investors, with different investment objectives and time-horizons (Mason and Stark, 2004). However, prior research on governance has ignored potential differences between VCs and BAs. As Gompers and Lerner (2001: 146) indicate: "our understanding of … 'angel' investing is highly incomplete."

Prior research on VC-backed IPOs had focused almost totally on the US market. One cannot assume, however, that theories developed in the US, and associated empirical evidence, apply universally in other institutional settings. Prior studies that combine agency research with institutional theory have shown that differences in national institutions can impact the effectiveness of corporate governance on the firm level (Aguilera and Jackson, 2003; La Porta *et al*. 2000). For example, in common law societies, investors are willing to take more risks and use "arms-length" control mechanisms since they have legal remedies like the ability to sue in the courts if board members and managers do not act in their best interest and maximize firm profitability. In civil law countries investors rely more heavily on network-based, "relationship" governance (Hoskisson, *et al*., 2004). Thus, the impact of various types of investors may be different in civil law environments, where fewer legal remedies are available compared to common law countries (Fiss and Zajac, 2004).

This study, therefore, provides theoretical and empirical insights into the impact of concentrated ownership, types of block-holders, and their effects on IPO performance in two mature markets outside North America with different institutional settings. Specifically, we examine the contrasting contexts of the United Kingdom (UK), as a common law country, and France as a civil law country. The two countries differ in important ways that lead us to

expect differences in the performance of private-equity-backed firms following IPO. Ownership concentration in France is generally greater than in the UK. UK BA and VC markets are significantly more developed and larger than French markets (EVCA, 2008). The value of VC investments in the UK in 2007 was equivalent to 1.69% of GDP compared with only 0.66% in France. VCs in France are less likely both to be independent and to monitor investees than their UK counterparts (Sapienza, Manigart, and Vermeir, 1996). BAs in the UK are more likely to form networks, with BA networks in the UK representing 36% of all European BA networks (Aernoudt, *et al*. 2007). Contrasting these two European IPO and venture capital markets offers the potential to control for many other extraneous variables that may confound findings while examining the moderating effects of the legal institutions on inter-relationships between ownership concentration, types of private equity block-holders, and resulting firm performance.

This examination allows us to expand and contextualize nascent understanding of the multiple agency perspective (e.g., Arthurs *et al*., 2008) which moves away from a simplistic principal-agent dichotomy and considers multiple governance roles of the same participants in the firm's governance mechanism. First, we develop theoretical insight on this perspective by differentiating between formal and informal "pressure resistant" private equity investors in IPOs. Prior research has typically focused only on VCs and has provided mixed results on the relationship between the role of VCs and IPO stock market performance (cf. Megginson and Weiss, 1991; Barry *et al*., 1990; Gompers, 1996; Lee and Wahal, 2004). Examination of both VCs and BAs is important since the different objectives, funding sources, and time-horizons of BAs give rise to different agency problems and involvement with their investees than VCs, which may result in different performance consequences for IPO firms during and after flotation.

Second, we develop multiple agency theory by suggesting and showing that these multiple agency relationships are affected by different institutional contexts. Specifically, performance outcomes of ownership concentration and retained ownership by the two types of private equity investors may differ depending on the legal system and institutional characteristics of the private equity industry in a specific country. This is an important contribution as multiple agency theory research has so far tended to imply that it is a universal theory that applies in the same way in different institutional settings. As such, we contribute to emerging attempts to integrate institutional and corporate governance research (e.g., Aguilera and Jackson, 2003) by combining institutional and multiple agency theories as we examine factors affecting performance of IPO firms.

The paper employs a unique, hand-collected sample of 224 matched IPOs in the two countries during the period of 1996-2002 and controls for possible endogeneity of private equity firms' ownership. Prior research has too often not controlled for such endogeneity and thus this research method may serve as a model to others in the future. The empirical results refer primarily to market performance, but we also used an operating performance variable (return on assets, RoA) as a robustness test of the findings of the main study.

THEORETICAL FRAMEWORK & HYPOTHESES

An IPO often represents the first "liquidity event" in the life-cycle of a fast-growing firm when its founders and initial investors begin the process of realizing the value of their ownership stake in the firm (Brav and Gompers, 2003). However, the IPO process presents a number of potential agency conflicts for the various parties. For example, a potential adverse selection problem exists since managers may not accurately reveal all they know about a firm. Since many firms at IPO have little operating history, investors cannot rely upon an extensive track record of performance to judge a firm's health and potential for growth (Brav and

Gompers, 2003; Mason and Stark, 2004). By making overly optimistic estimates of the firm's revenues the managers may try to inflate the expected value of the firm, which in turn increases their rewards from the IPO.

In addition, IPO firms have a number of early stage investors that retain their ownership after the flotation whose objectives and incentives may not align with public market investors. The multiple agency framework suggests a complex picture of the governance roles of these early stage investors. For example, although VCs are principals to a focal IPO firm, they are also agents to those who provide their investment funds (Arthurs *et al*., 2008). Founder-managers may hold significant equity stakes in the IPO firm, and there is the potential for these individuals to abuse public market investors (Sanders and Boivie, 2004). These dual roles can result in the traditional principal-agent problems in IPO firms being supplanted by multiple agency problems arising from principal-principal goal incongruence which occurs when a dominant owner disregards the interests of minority public market owners (Dharwadkar, George, and Brandes, 2000; Douma, George, and Kabir, 2006; Young, *et. al*., 2008).

Being aware of the risks of these agency conflicts, public market investors will price-protect themselves, leading to lower IPO valuations. A significant body of research in finance and management has developed various proxies for the "IPO discount," including a reduction in the IPO's offer price, an increase in "underpricing", i.e. the difference between the offer and after-market prices among others (Chahine and Filatotchev, 2008). As a result, scholars have sought to understand the means to control such IPO discounts. Following a pioneering paper by Leland and Pyle (1977), a growing body of research has examined potential signals that could be used by IPO firms to convey their value to investors and which are costly to imitate for low-quality firms with acute agency problems (Certo, 2003). We focus on the retained ownership patterns of IPO firms since "one of the key decisions private firm owners

and managers control at IPO is the percentage of the firm to sell" (Nelson, 2003: 714). We argue that ownership concentration and retained ownership by private equity investors represent important factors that can reduce or amplify risks outlined above and as a consequence can affect the performance of the IPO firm.

Moreover, we argue that the direct effects of these agency risks on performance are contingent on the nature of the private equity investor and on the institutional environment in a particular country. First, the heterogeneity of private equity investors, specifically whether they are a formal VC or an informal BA, may impact the inter-relationship between ownership and performance. These different types of investors may have different implications in terms of certification of investee quality and their ability to deal with potential agency problems. Second, the extent to which a specific national context protects minority investors and legally enforces contracts will moderate the effects of ownership patterns. The following sections extend these arguments and develop appropriate hypotheses.

Institutional environment, ownership concentration and IPO performance

Agency theorists have long considered ownership concentration and types of block-holders as governance factors that may reduce agency costs associated with diffuse ownership patterns (Barry *et al*., 1990; Shleifer and Vishny, 1997). Prior research argues that greater concentration of cash flow rights constrains the consumption of perquisites and thus produces a positive effect on corporate valuation as managers and directors operate in the interests of shareholders (Jensen and Meckling 1976).

In the context of IPOs, the multiple agency framework suggests that high concentration of retained ownership may be a particularly important governance mechanism that mitigates the various types of agency conflicts identified earlier. First, large blocks of retained shares by early-stage investors may be a signal that reduces the risk of public market investors suffering from adverse selection (Leland and Pyle, 1977). The IPO is characterized

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by lock-up arrangements that make retained ownership by original investors relatively illiquid after the IPO and as a result their retained concentrated ownership imposes a cost on those investors. Thus, their retained ownership signals their belief in the value of the firm to minority investors (Field and Hanka, 2001; Brav and Gompers, 2003). Second, concentrated ownership leads to a reduction of coordination costs related to multiple types of private and public equity investors in the IPO firm. Dharwadkar *et al*. (2000:658) argue that high ownership concentration allows lower coordination costs, "because there are fewer owners with whom to coordinate". Third, ownership concentration creates incentive alignment between public market and early stage investors that perform multiple principal-agent roles by shifting their preferences towards shareholder objectives, in line with arguments suggested by Jensen and Meckling (1976). Therefore, ownership concentration may be a particularly important governance parameter that enhances IPO firm performance and reduces the negative effects of the "IPO discount" arising from agency conflicts identified above. Hence:

> *Hypothesis 1a. IPO firm performance is positively associated with concentration of*
> *retained ownership.*

However, building on pioneering work within the law and economics field, management researchers increasingly argue that the effectiveness of corporate governance mechanisms may differ from country to country and are moderated by institutional characteristics of a particular economic system (Dharwakar *et al*., 2000; Douma *et al*., 2006; Hoskisson *et al*., 2004). Therefore, the traditional agency framework may present only a partial view of the world and organization research would benefit from merging agency and institutional theories (Douma *et al*., 2006: 638). It follows, therefore, that the salience of agency problems discussed above and the effectiveness of corporate governance factors depends on national institutional environments.

Two principal strains of institutional theory shape research today, one from political science and economics (e.g., North, 1990), while another major branch of institutional theory comes primarily from sociology and organization theory (e.g., Scott, 2002). The political science and economics approach assumes that the strategic actions taken by managers and organizations are the result of a strategic "calculus" to foster gains from exchange. Thus, the theory focuses on the rules associated with political and economic institutions that create incentives for managers—given their preferences and cognitive abilities—and how these shape collective organizational outcomes (North, 1990). The sociology/organization theory branch of institutional theory, alternatively, emphasizes how organizations adjust to pressures for legitimacy in the institutional environment.

Our concern here is with those legal institutions that help form "the rules of the game in a society" (North, 1990). Legal institutions can vary significantly even in different nations sharing similar cultural traits and even being close physically to each other (Wright *et al*., 2005). The roots of the differences in legal institutions emanate from the distinction between two major families of legal systems, common law and civil law. Common law systems build on the legal precedent established by judges as they resolve individual cases; those case opinions have the force of law and strongly influence future decisions.[1] We extend these arguments by suggesting that the institutional context in which corporate governance factors operate may affect their impact as a signal to potential investors. Research examining the impacts of common and civil law on business has shown significant differences in voting rights attached to shares, protection of shareholder voting mechanisms against abuse by management, and remedial rights of minority shareholders in different nations.

Common-law countries have the strongest legal protection of minority shareholders, while investor protection is weakest in French civil-law countries (Hoskisson *et al*., 2004;

Lerner and Schoar, 2005). For example, the composite investors' protection index developed by La Porta *et al*. (2000) scores the UK at 5 but only 3 for France. Using a different methodology, the World Bank has developed a number of corporate governance indices, including an Ease of Shareholder Suits Index, which measures shareholders' ability to sue officers and directors for misconduct and a Strength of Investor Protection Index (World Bank, 2008). According to these estimates, the Ease of Shareholder Suits and Strength of Investor protection indices are 7.0 and 8.0 in the UK, yet only 5.0 and 5.3 in France.

Building on this research, we expect that, other things being equal, block-holders in common law nations such as the UK will need a relatively lower level of ownership concentration to signal their ability to deal with agency conflicts in firms going public since IPO investors have the ability to defer to legal protection of minority shareholders or to develop contractual arrangements if necessary to mitigate principal-agent and principal-principal conflicts (Dharwadkar *et al*., 2000). In contrast, in settings with weak legal protection of minority shareholders, ownership concentration may be even more important as a governance mechanism. Bearing in mind that ownership concentration may affect after-market liquidity, better protected public market investors in UK IPOs would prefer less concentrated ownership compared to investors in France. These arguments suggest that, other things being equal, one can expect opposite signaling effects of ownership concentration in the two institutional environments. Hence:

Hypothesis 1b: Compared to French IPOs, UK IPOs will show a negative relationship between performance and the concentration of retained ownership

Private equity investors in IPO firms

Ownership concentration may represent a necessary but not sufficient condition for mitigating agency conflicts arising within the IPO firm. For example, IPO signaling may

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[1] Common law originated in medieval England and spread to its colonies such as the United States, Hong Kong,

require the support of reputational considerations (Megginson and Weiss, 1991). Insiders with highly concentrated ownership have everything to gain and very little to lose from signaling falsely at the time of IPO. Therefore, investors are more likely to be convinced that accurate information disclosure has occurred only when concentrated investors with reputational capital at stake are present to "certify" the quality of the IPO firm. Private equity investors, such as VCs, are large-block shareholders that have the reputational capital to mitigate underpricing (Barry, *et. al.*, 1990). In addition, VCs' monitoring abilities are able to mitigate the potential agency problems discussed above (Florin, and Simsek, 2007). These factors have led to the belief that VC presence will diminish IPO underpricing (Barry *et al*., 1990; Brav and Gompers, 2003; Megginson and Weiss, 1991). However, "grandstanding" research (Gompers, 1996; Gompers and Lerner, 1997; 2001; Lee and Wahal, 2004) contradicts these results and suggests that VCs accept greater underpricing as their main focus is to improve their profile and raise more funds from investors. These contradictory studies consider only formal VCs and do not theorize or control for other types of private equity investors. An explicit consideration of different types of private equity investors may contribute towards explaining these different findings.

Two major types of private equity investors are typically involved in the governance of high growth high potential ventures which typify IPOs – VCs and BAs. Jensen (1993) has held up such private equity investors as models for governance in the modern corporation since their ownership stakes and self interest ensure that they make the tough decisions to maximize profitability. Traditional agency theory has under-theorized the complexity of the role of such private equity block holders in the context of both multiple principals and multiple agents in the firm (Arthurs *et al*., 2008) and in different institutional environments (Wright, Filatotchev, Hoskisson, and Peng, 2005). While VCs and BAs are both private

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Singapore, Australia, New Zealand, and India.

equity investors, there are substantial differences in their nature that, in turn, may differentiate their impact on agency problems (Osnabrugge, 2000). These differential impacts are partly a consequence of differences in their perception of agency risk (Fiet, 1995), which, in turn, leads to differences in the mechanisms adopted by VCs and BAs to address agency issues (Osnabrugge, 2000; Prowse, 1998). VCs are more concerned with market risk whereas BAs are more concerned with agency risks (Fiet, 1995; Mason and Stark, 2004). VCs rely on more formal contractual mechanisms of monitoring and control (Lerner, 1994) while BAs are more reliant on relational governance (Ehrlich, *et al.*, 1994), and they invest on the basis of trust of the entrepreneur (Fiet, 1995).

In addition, VCs have conflicting objectives due to their dual identity as both principals and agents (Arthurs *et al.*, 2008). As agents to their own investors, the VCs have both short-term pressures to obtain results with a timely exit from their investment while also facing long-term pressures for reputation building in order to raise future funds (Arthurs, *et al.*, 2008). In contrast, BAs are patient investors (Madill et al., 2005; Sohl, 1999; Wetzel, 1983); using their own money, they are not constrained to exit within a limited, pre-defined period unlike VCs. Thus, BAs are their own principals. These differences between VCs and BAs point to their potential differential impact on the various agency conflicts outlined above. Facing pressure from funds providers, VCs likely place more emphasis on signaling to investors that they are controlling agency costs *ex ante* through appropriate screening procedures and contracts. BAs more likely emphasize *ex post* control of agency costs through closer active relationships and monitoring (Osnabrugge, 2000). We examine these differences, impact of institutional settings, and resulting IPO performance below.

VCs, institutions and IPO performance

VCs are more widely recognized and researched than are BAs. VCs typically are either the general partners of a limited partnership or employees of a bank or other financial

institution whose specialty is in directing the respective group's investments in new ventures. There have been limited efforts to understand the post-IPO impact of VC ownership on the IPO firm. Barry *et al*. (1990) show the effects of retained VC ownership and board presence following an IPO but do not consider the relationship with post-IPO performance. Similarly, Jain and Kini (1995) argue that VC backing may provide effective monitoring after an IPO, but their research does not discuss in detail the governance impact of the retained VC ownership or consider the institutional setting outside the US. Theorizing on post IPO monitoring by the VC, it is problematic to believe that the VC would be extensively involved in such monitoring of the firm. While lock-up arrangements associated with the VC ensure they remain involved in the firm after its IPO, the lock-up period has a clear short and finite time horizon (Arthurs *et al*., 2009). In our sample, the mean lock-up period was a little over one year (12.26 months, see Table 1 below). The VC has strong motivations to exit the investment in order to redeploy its assets elsewhere, to distribute assets to the limited partner investors, and to establish an exit track record in order to raise further funds (Gompers 1996; Brav and Gompers, 2003). Active monitoring by VCs may increase their opportunity costs after flotation of their portfolio firms, which can limit VCs' efforts to redeploy their assets to new investments. Thus, active monitoring by the VC of their post IPO firm would seem to be limited, which in turn would indicate VC ownership will not lead to greater post-IPO performance. The multiple agency perspective would argue that the impact of VCs' retained ownership on IPO performance should be negative since VCs' greater agency role towards their institutional investors reduces their willingness to put pressure on underwriters or protect the longer-term interests of the IPO firm by monitoring it on behalf of the more diffuse body of shareholders introduced during the IPO (Arthurs *et al*., 2008).

In addition, Arthurs *et al*. (2008) argue that, to maintain their reputation with underwriters VCs need to signal that they are not walking away from poor or uncertain

performers. Underwriters may require the retention of larger equity stakes with associated lock-ups by VCs in businesses where poor performance by the venture exists (Lee and Wahal, 2004). However, retained ownership by VCs may not mitigate the potential of agency problems since they do not focus on monitoring the firm after the IPO which can lead to a negative impact of their retained ownership on performance. Hence:

> *Hypothesis 2a. IPO firm performance is negatively associated with retained ownership of venture capitalists.*

An institutional perspective, however, suggests a more complex story on the governance roles of VCs in different institutional settings (Bruton and Ahlstrom, 2003; Bruton, Fried, and Manigart, 2005). Comparative studies have documented that VCs in countries with a common law tradition more likely use convertible preferred stock that shifts control rights to investors depending on the performance of the venture (Mayer, Schoors, Yafeh, 2005; Lerner and Schoar, 2005; Cummings, 2006), and other contractual arrangements such as liquidation preferences, anti-dilution protections, vesting provisions, and redemption rights (Kaplan, Martel, and Stromberg, 2007). These contractual arrangements enhance the governance roles of VCs in common law countries compared to civil law countries. Evidence also shows significantly greater VC monitoring of investments in the UK than in France (Sapienza, *et al.*, 1996).

International comparisons indicate that reputational incentives of VCs are relatively higher in common law countries. In common law countries, venture capital firms as a rule are independent institutions, and their main sources of finance include pension funds, insurance companies, and other institutional investors (Kaplan *et al.*, 2007). In civil law countries with bank-centered governance systems, such as France, VCs tend to be subsidiaries of banks and other financial institutions (so-called captives) who provide them with both equity and debt finance to make investments (Mayer *et al.*, 2005).

Focusing on the rationale of Arthurs *et al.* (2008), we argue that the extent of the multiple agency associated with the VCs at the time of IPO could be different in the UK compared to France. VCs in France are, as a rule, captive firms, so the salience of the multiple agency conflict in this country is likely to be higher than in the UK. Remuneration in independent VCs usually aligns more closely with interests of fund investors than does remuneration for captive VCs. Captive VCs may also have shorter monitoring horizons since parent firms more likely assess them on annual return on capital while independent VCs are more likely to be assessed on the internal rate of return over the funds' life (Robbie, Wright and Chiplin, 1997). These factors combined may further limit the certification and monitoring abilities of VCs in France compared to the UK. Thus, while VCs' retained ownership generally has a negative effect on IPO performance, their impact may be relatively different in common law countries compared to civil law countries. Hence:

Hypothesis 2b: Compared to French IPOs, UK IPOs will show a positive relationship between performance and VC retained ownership

Business angels, institutions and IPO performance

Although BAs represent another important type of block-holders in an IPO firm, considerably less is known about their governance roles compared to VCs (Lerner, 1998; Sohl, 1999). BAs are wealthy, successful individuals who, in contrast to VCs, are longer-term investors and are their own principals. As such, BAs face less need to sell their shares, are likely to be more committed over the long term to the venture, and more likely engage in *ex post* monitoring activities (Osnabrugge, 2000). While in general the BA market may lack transparency and BAs may be less concerned about their reputation than VCs, IPO reputation of the BA becomes increasingly important. As successful business people, BAs indicate to other investors the presence of a substantial investment and are often actively pursued by entrepreneurs (Aernoudt, San Jose, and Roure, 2007). BAs will want to maintain and build

their reputation and networks so that they will be approached to make investments in other ventures as serial angels. As a result, they will need to actively monitor the firm and help ensure its success. Thus, one can expect BAs to utilize their longer-term commitment and trust relationship to influence management and ensure the performance of the venture (Politis, 2008). Higher retained ownership by BAs signals they believe that maintaining their investment is worthwhile since they will be incurring monitoring costs. Thus, BA retained ownership should more actively mitigate the extent of agency problems and it positively affects IPO performance. Hence:

> *Hypothesis 3a. IPO firm performance is positively associated with retained*
> *ownership of business angels*

The above arguments, however, do not take into account potential institutional influences on the effectiveness of BA governance. BAs' flexibility and longer time horizon are well suited to countries with a less formal institutional framework and less legal protection of minority shareholders. The BA also works with the investee more closely and over a longer term seeks to solve problems that arise, which is consistent with the civil law setting in France. If there is a problem to solve, the parties may be able to work it out over a longer time, whereas, with a shorter time horizon, the VC must often rely on legal means to reach a solution. Moreover, the preference for BAs to invest in closer geographic areas than do VCs makes relational monitoring easier (Sohl, 1999) and fits well in a geographically diverse country such as France in contrast to a geographically homogeneous UK (Chantelot, 2004).[2]

In addition, other significant institutional differences between the UK and France lead to potential differences in angels' effects on the IPO value in the two countries. In the UK,

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[2] Chantelot (2004) examines the innovative industries in France and shows that French regions have developed some industrial clustering such as micro-electronic components in Bouches du Rhône, petrochemical in Haute Normandie, nuclear energy in Basse Normandie, chemical and nanotechnology in Rhone-Alpes, etc. Chantelot (2004: 10) also argues that public policy choices have contributed to the cluster of French industries such as the aeronautic industry in Toulouse.

BAs organize through the development of BA networks that have gradually evolved into knowledge-based intermediaries (Aernoudt *et al.*, 2007). The government often supports these networks through tax concessions (e.g., the UK's Enterprise Investment Scheme) and full or partial guarantees against risks, when the loss burden is shared with a public authority. This process of networking and government financial guarantees introduces potential multiple agency problems that likely reduce the extent of alignment of interests of BAs and minority public market investors (Arthurs *et al.*, 2008).

In contrast, the BA industry in France remains highly individualized and it is more likely to rely on the direct principal-agent relationship between angels and entrepreneurs (France Angels, 2004). This direct relationship may better enable BAs, in a country with weaker legal protection of minority shareholders, to monitor the behavior of management. Since these institutional differences between BA communities in the two countries will likely have relatively different importance in terms of mitigating post-IPO agency conflicts, we suggest:

Hypothesis 3b: Compared to French IPOs, UK IPOs will show a negative relationship between performance and BA retained ownership

METHODS

Sample

We followed a multi-stage data collection procedure as suggested by Nelson (2003). We include all IPOs that are floated on the main and secondary tier markets in each country. Our primary list of IPOs came from the London Stock Exchange New Issues files in UK and the Parisbourse S.A. in France. Further information was provided by the AIM Market Statistics publications for UK IPOs and the Autorités de Marchés Financiers (AMF) publications for French IPOs. The population of IPO firms over a specific period normally includes in addition to the flotation of entrepreneurial firms a wide diversity of organizations,

such as corporate spin-offs, equity carve-outs, reverse take-over vehicles, special purpose vehicles (SPVs), etc. Pooling all IPOs together creates a problem with comparability of these different organizational forms. For example, equity carve-outs and SPVs normally do not have private equity backing; plus, their promoters own a small fraction of the equity, which makes their comparison to other IPOs difficult. Following Nelson (2003), we focus on entrepreneurial IPOs to avoid this problem and obtain diverse patterns of block-holdings in an otherwise homogeneous sample of firms. From the original list of 966 IPOs over the period of 1996-2002, we excluded re-admissions and transfers from AIM to the main market. We also excluded IPOs of unit and investment trusts, since they have very specific governance characteristics. Also excluded were IPOs from de-mergers, equity carve-outs, reverse takeovers, and equity reorganizations. The sample excluded investment and acquisition vehicles as their governance systems are extremely simplified, and their boards resemble investment committees of private equity firms. In addition we required that original founders retain equity stakes and board positions in the post-IPO firm in order to ensure that the firms' governance was comparable. After these selection steps, we obtained a sample of 444 IPOs for which we were able to identify the original founders. The variables of interest came from information provided in the IPO listing prospectuses, which contain detailed information on the pre- and post-IPO ownership of insiders and early stage investors.

Lastly, since IPO firms' characteristics usually help determine their performance, we attempted to capture risk differences between French and UK IPOs by matching firms based on their size, age, book-to-market ratio, and industry membership. This method helps to ensure that as far as possible, the sample consists of firms that match in almost all major details except for the legal institutions that they face. First, we used a matched pairs methodology where both French and UK IPO samples are matched as closely as possible by size and age, criteria usually used as control variables in the IPO literature (Chahine and

Filatotchev, 2008). Since continental VCs usually invest in larger and older ventures compared to their UK counterparts (Sapienza *et al*., 1996), the sample matching helps us avoid a possible selection bias in our sample. Ritter (1984) also shows that VC activity tends to be clustered by industry. We therefore matched our companies based on the hi-tech versus non hi-tech sector membership.[3] However, different macroeconomic factors and business environments might shape IPO firms differently between the UK and France even when they are the same in terms of size, age, and industry membership. As a result we used the book-to-market ratio to match our studied IPOs and control for growth opportunities (Fama and French, 1995). The result is a final sample of 224 IPOs (matched sample of 112 from each country).

Measures

Dependent Variables

We used a combination of stock-market and operating performance of IPO firms. In line with Nelson (2003), the first measure was the percent price premium [(offer price – book value per share)/offer price], which assesses investor optimism about the future value of IPO firms. Nelson (2003: 715) argues that the percent price premium demonstrates the difference between the accounting and the market value and could measure "intangible assets, monopoly control, and investor enthusiasm, or some other factor that would dislocate stock price from accounting-based figures."[4] To examine operating performance, we used the return on assets (RoA), measured at the end of the IPO year. This measure takes into account the size of the firm and ensures that the relative asset intensity of various firms does not drive the results.

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[3] Although prior research uses SIC classifications, our results using hi-tech sector membership are consistent with Megginson and Weiss (1991) who use the three-digit SIC classification, and show concentration of VC-backed IPOs in the high technology area. Using SIC classifications does not significantly affect our main conclusions but reduces the size of the sample to 43 IPOs in each country.

[4] To test whether our results are in line with findings by Arthurs et al. (2008) we also approximated the stock-market performance of IPO firms by Underpricing or the percentage difference between the offer price and the price at the end of the first day of trading (i.e. [(end of the 1ˢᵗ day price)/(offer price) -1]. Although not presented here, the results are very similar to those obtained using Nelson's measurement. Therefore, our findings are robust with regard to different specifications of IPO performance.

Independent Variables

Ownership concentration (hypothesis 1a) was calculated as a Herfindhal-Hirschman index. This index for each firm was based on the retained ownership of listed block-holders in the prospectus, which, apart from VCs and BAs also included founders, industry partners, non-founding directors, etc. The index is equal to the sum of the block-holders' squared ownership as a percentage of the total post-IPO block-holding.

We employed a variety of resources to identify the VC and BAs investors (hypotheses 2a and 3a). UK venture capital firms were identified from the *British Venture Capital Association 2000/2001 Directory*, *2000 Pratt's Guide to Venture Capital Sources*, and 2000/2001 *Venture Capital Report Guide to Venture Capital in the UK*. We also included Venture Capital Trusts (VCTs) managed by established venture capital firms. VCTs are smaller, specialist funds normally set up for tax purposes by the larger players in the UK venture industry. We identified French Venture Capital firms from the *Association Française des Investisseurs en Capital (AFIC) Directory*. Unfortunately, similar information on members of BA networks in the UK and France is not available. BAs were identified through the prospectus as individuals that had invested in the venture as private individuals who are not associated with founders, other board members, senior managers, and venture capital investors. Both VC and BA ownership were calculated as percentages of the total number of shares outstanding after the IPO date.

To address the possibility of the effects of institutional differences between the UK and French corporations in the sample, we use a dummy variable equal to 1 for the UK and zero otherwise. To test our counry-specific hypotheses 1b, 2b and 3b we adopted a methodology suggested by Kim, Hoskisson and Wan (2004) and used interactions between the UK dummy and three ownership variables (e.g., ownership concentration, VC retained ownership and BA retained ownership).

Controls

We controlled for the IPO's size (LogSize), measured as the logarithm of the firm's capitalization at the offer price in pounds, and age, measured by the number of years between the firm's founding date and its IPO date. To control for the risk level of the IPO firm, we used a hi-tech dummy variable equal to 1 if the firm was from the information technology and software sectors. In addition, we included the sum of all risk factors mentioned in the IPO prospectus to control for the effect of risk on both market and operating performance; these risks factors included specific firm activities such as technology, competition, legal aspects, and exchange rate changes. If the prospectus mentioned the risk it was assigned a 1, if not a zero with the total risk factors for the firm then totaled.

IPO firms usually use diverse information to signal their value. Since governance parameters can serve as useful screening and sorting criteria that affect investors' valuation of IPO firm (Filatotchev and Bishop, 2002; Sanders and Boivie, 2004), we included board independence, i.e. the percentage of independent (external) directors on the IPO's board. Signaling research also suggests that founders' retained share ownership signals their private information on the higher quality of IPO firm and positively affects IPO value (Prasad, Vozikis, Bruton, and Merikas, 1995; Sanders and Boivie, 2004; Espenlaub and Tonks, 1998). Following these studies, we control for the effect of founder ownership on IPO firm performance. In addition, debt may limit managerial discretion and mitigates potential agency conflicts. To control for possible effects of debt on IPO valuations, we used the debt-to-asset ratio. Previous studies also control for effects of VC experience on IPO firm performance (Shepherd, Zacharakis, and Baron, 2002). We use two VC characteristics as proxies for experience: fraction of global VCs in an IPO firm's VC syndicate, and average age of VCs involved in the IPO firm.

Brav and Gompers (2003) and Megginson and Weiss (1991) suggest that high-quality IPO firms may signal quality by agreeing to longer lock-ups. Restricting the sale of stock for a longer period imposes costs on initial investors representing a credible signal of the firm's quality. We included length of lock-up (in months) as a control variable.

Previous empirical studies also control for the role of underwriter reputation. Using the cumulative market share over a five-year period prior to the IPO date as a proxy for underwriter reputation, we verify whether more prestigious underwriters have a third-party certifying role (Beatty and Ritter, 1986) or are more likely to seek their own advantage by charging lower fees and leaving more money on the table (Cooney *et al.,* 2001). Gompers and Lerner (2000) show periods of high funds inflow can affect valuations. Accordingly, we also controlled for the bubble period of rapid growth through a dummy variable equal to 1 if the IPO occurred during the period 1999-2000, zero otherwise. Finally, as the period between IPO date and end of the IPO's fiscal year varies across companies and may be important given the initial sensitivity of IPO firms to external environments (Certo, 2003), in the regression for operating performance we included a lag calculated as number of days between IPO date and end of fiscal year.

Analysis

Scholars modeling the relationships between risk financiers' ownership and performance have generally employed standard OLS regression. However, involvement of different financiers in entrepreneurial firms is contingent on the risk characteristics of the venture (Gorman and Sahlman, 1989), such as founders' ownership, experience, and board involvement (Filatotchev, Wright, and Arberk, 2006). Therefore, we have the potential risk of endogeneity as we analyze the private equity firms' retained ownership. For example, VCs' investments might be driven by venture characteristics and their experience. Hence, performance is a function of endogenously related ownership variables, and a simple ordinary

least square regression may overestimate their explanatory roles (Hamilton and Nickerson, 2003).

Since both performance and ownership variables are continuous, a two-stage least squares (2SLS) regression analysis was used to overcome the endogeneity problem. Within a 2SLS regression predicted values for endogenous variables are generated at the first stage. At the second stage, these predicted variables were used as instrumental variables in OLS regressions to verify the hypothesized relationships. As the explanation of firm performance reflects a path model with multiple endogenous variables, we first implemented one regression for each endogenous variable (i.e., BA Ownership and VC Ownership), and then used their instruments to explain performance.

RESULTS

Descriptive Statistics

Table 1 provides correlations and descriptive statistics. The average price premium of 72% suggests investors pay a significantly higher offer price than the book-value of equity, and are therefore optimistic about the prospects of newly listed firms. The average adjusted RoA is equal to 0.5%, suggesting that performance of IPO firms is not substantively different from its industry average. On average, BAs and VCs owned 4.3% and 8.3% of total equity in the IPO firm, respectively. This is significantly below founder ownership which is 39%.

- Table 1 near here -

Although not reported in Table 1, Variance Inflation Factors (VIFs) for all studied variables are all below 1.65, which rejects serious multicollinearity concerns (O'Brien, 2007).

Hypothesis Testing

To address our concern related to the simultaneous determination of both BA and VC ownership variables, the empirical analysis begins by first determining the predicted values of VC and BA ownership variables, which are then used to verify our hypotheses in the

performance regressions. The analysis in Table 2 presents the first stage OLS regressions for both BA and VC ownership using the "Number of BAs" and the "Number of VCs" as instrument variables. Since BA ownership (VC ownership) naturally increases with the number of BAs (VCs), we believe both variables satisfy the necessary conditions for valid instruments (Staiger and Stock, 1997; Murray, 2006). The correlation matrix (Table 1) indicates that correlations between the instruments and the dependent variables are not statistically significant, whereas the correlations between the instruments and the potentially endogenous explanatory variables (i.e. BA Ownership and VC Ownership) are strongly significant (Hamilton and Nickerson, 2003). To test the strength of our instruments, we calculated the partial R-square and the partial F-statistics. Our results indicate significantly high R-square for both the Number of BAs and the Number of VCs in Models (1) and (2), 0.279 and 0.248 respectively. The F-statistics for the Number of BAs and the Number of VCs are equal to 15.85 and 13.84 respectively, which is greater than the required F-statistic of 10 in Staiger and Stock (1997). This result confirms the strength of both variables as valid instruments for BA Ownership and VC Ownership.[5] Both OLS regressions also controlled for the ownership concentration, firm-level demography factors, and for the lockup period following the IPO date. In addition, the VC ownership regression in Model (2) controls for the effects of the VC characteristics, i.e. the fraction of Global VCs, and average Age of VCs involved in the IPO firm.

OLS regression results in Model (1) show that involvement of BAs in UK IPOs is significantly higher than in French IPOs ($p \leq 0.001$). These findings may be the result of the recent development of UK BAs' networks which might have facilitated access by wealthy individual investors to young firms (Aernoudt *et al*, 2007). There is a positive association

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[5] Our results are also consistent with our test for the over-identifying restrictions which shows an insignificant Chi-square, thus confirming the instrumental variables to be well-identified. The C-Statistic test was also calculated for both instrumental variables, and the results confirm the orthogonality of both the Number of BAs and the Number of VCs.

between BA ownership and the ownership concentration variable ($p \leq 0.10$). Also, BA ownership is higher in hi-tech IPOs ($p \leq 0.10$), whereas it is negatively related to founder ownership ($p \leq 0.10$). In line with our expectations, BA ownership has a positive and significant relation to our selected instrument variable, i.e. the Number of BAs ($p \leq 0.001$).

- Table 2 near here -

Model (2) provides the results of the determinants of VC ownership. In contrast to the results in the BA regression, there is a higher VC ownership in French IPOs ($p \leq 0.10$). The negative association between VC ownership and ownership concentration ($p \leq 0.05$) suggests that VCs are less likely to participate in IPO firms with concentrated ownership, and that they are less likely to influence the management usually dominated by the founding team. This ownership pattern is also consistent with the negative association between VC ownership and Founder ownership ($p \leq 0.001$). As predicted, there is a significant association between VC ownership and the number of VCs ($p \leq 0.001$). Also, VC retained ownership increases in the percentage of Global VCs among the IPO owners ($p \leq 0.05$) as well as the average age of VC firms involved with the IPO firm ($p \leq 0.001$). This result suggests that more experienced VCs tend to retain a larger stake at IPOs.

Table 3 provides results of the hypotheses tests. Models (3) and (4) present the OLS regression results, whereas Models (5),(6), and (7) include the 2SLS regression results controlling for potential endogeneity between VC and BA ownership by using the OLS regression results in Table 2 as a first stage.

While Models (3) and (5) focus on the linear associations between price premium and ownership variables, Models (4) and (6) verify the moderating country effects on the interrelationships between ownership variables and IPO performance and analyze interactions between the UK dummy variable and the concentration, VC and BA ownership variables.

Consistent with hypothesis 1a, both Models (3) and (5) show a positive association between concentration and the price premium (at the $p{\leq}0.05$ and 0.01 levels, respectively). Moreover, both the OLS and 2SLS regressions results in Models (4) and (6) show a negative interaction term between concentration index and the UK dummy ($p{\leq}0.10$). Consistent with hypothesis 1b, this suggests that compared to French IPOs, there is a negative relationship between performance and ownership concentration in UK IPOs.

The OLS regression in Model (3) shows that the relationship between the price premium and VC retained ownership is insignificant. Controlling for potential endogeneity between VC and BA ownership variables, the 2SLS regression in Model (5) provides negative association between price premium and VC ownership ($p{\leq}0.10$), in line with hypothesis 2a. Models (4) and (6) show a positive association between the price premium and the interaction of VC ownership and the UK dummy ($p{\leq}0.001$). This finding is in line with hypothesis 1b and suggests that compared to French IPOs, price premium is positively related to venture capitalists' retained ownership in UK IPOs.

While the OLS regression in Model (3) does not show any significant association between price premium and BA ownership, the 2SLS regression in Model (5) indicates that price premium is positively related to BA ownership ($p{\leq}0.10$). This finding is consistent with hypothesis 3a. Furthermore, both Models (4) and (6) show a negative association between price premium and the interaction term between BA ownership and the UK dummy ($p{\leq}0.001$). This indicates that compared to French IPOs, price premium is negatively related to business angels' retained ownership in UK IPOs, which is consistent with hypothesis 3b.

- Table 3 near here -

In terms of other controls, Table 3 indicates a higher price premium in UK IPOs. Price premium is also higher in larger IPOs but lower in older firms and in those with more independent boards. Price premium also increases in more levered IPOs and those managed

by more prestigious underwriters. As expected, IPOs in the bubble period have a higher price premium, whereas VC firms' characteristics do not seem to affect price premium.

Finally, Model (7) provides the 2SLS regression results for tests of effects of ownership structure on IPO performance using the adjusted return-on-asset (RoA) as a dependent variable. The regression results are generally consistent with the results in other models in Table 3, which suggests that the findings of the main study are supported by the use of a different dependent variable (operating performance). Concentration positively impacts the adjusted RoA, but compared to French IPOs, the adjusted RoA is negatively related to ownership concentration in UK IPOs. The adjusted RoA is negatively related to VC ownership, and this relationship is positively moderated by the UK dummy variable. Moreover, there is evidence of a country effect on the association between the adjusted RoA and BA ownership. Specifically, adjusted RoA is positively related to BA ownership, but compared to French IPOs, there is a negative association between adjusted RoA and BA ownership in UK IPOs ($p{\leq}0.10$).

DISCUSSION AND FUTURE RESEARCH

Governance research is growing in importance and the role of ownership effects is a central feature of such research. Most studies on the effects of ownership concentration on performance have examined mature companies and have used samples drawn from common law environments, especially North America. However, there is growing appreciation of the heterogeneity of governance mechanisms (Aguilera and Jackson, 2003) and of how appropriate governance mechanisms may differ according to context (Lynall, Golden, and Hillman, 2003; Filatotchev and Wright, 2005). So far, researchers have neglected the implication of different firm and institutional contexts for relationships between ownership and firm performance.

This study extends the nascent theoretical emphasis on multiple agency theory. We consider the heterogeneity of private equity investors looking at the impact of both formal (VC) investors and informal (BA) investors, such investors being cited by Jensen (1993) as the model for corporate governance. We show that their impacts on IPO firm performance are different, with BAs having a significant value-enhancing effect. This analysis allows us to bring into focus the multiple agency perspective and help expand understanding of this theory. Specifically, we highlight that VC and BA both focus on the pre-IPO firm seeking to add value to that firm. However, post-IPO the VC focus shifts to those investors in their funds while the BA's focus remains on the firm. Second, we employ institutional theory to examine two different legal environments, which allow us to contrast corporate governance effects in common and French civil law countries. These two contributions advance our understanding of multiple agency theory and its perspective on corporate governance. Further, we extend prior research by controlling for endogeneity of private equity firm ownership.

In this context, our evidence on the differences in governance roles of different types of private equity investors is particularly important. This finding is in line with previous research on differences in the governance roles of various types of institutional block-holders (Hoskisson *et al*., 2002) and multiple agents (Arthurs *et al*. 2008), which we extend further by considering country effects. Our results show that VCs provide a negative effect on performance, and this finding is consistent with previous studies arguing that VCs may "grandstand," i.e. take firms public in order to raise their profile in the market and attract capital in future rounds. However, VCs in the UK are significantly more likely to implement US-style post-IPO monitoring based on formal contractual terms including liquidation preferences, anti-dilution protections, vesting provisions and redemption rights, etc., as compared to their continental counterparts (Kaplan *et al*., 2007). The positive effect of VCs on performance in the UK compared to France is one outcome of this monitoring. Similarly,

BAs seem to provide a positive effect on performance, but French IPOs drive this result. In France, strong networking and informal links between companies and investors may positively moderate this relationship between BAs and IPO firms.

Future Research

Our findings indicate a rich set of future research possibilities. For example, the findings suggest that agency problems may vary across different national settings and implies that researchers should integrate the agency framework with institutional analysis to generate robust predictions. Future research should expand on this concept and seek to more explicitly examine the nature of agency conflicts and their implications in different institutional settings (Aguilera and Jackson, 2003). While we expect findings to be generalizable to other French civil law contexts like Spain and Italy (Hoskisson *et al*., 2004), would similar results be found in German civil law or the distinctive Scandinavian legal environments (Fiss and Zajac, 2004)? As investor protection in German civil law is less prevalent than in common law but more than in French civil law, the impact of German civil law may lie somewhere between the other two legal environments.

This study also has limitations that suggest areas for further research. For example, we focused on the governance roles of ownership patterns and their impact on performance. However, other governance factors may also have importance that may differ from country to country. In our empirical analysis, we tried to verify country effects on the interrelationships between price premium and various governance parameters such as founder ownership, board independence, and VC firm age. We found that founder ownership in France positively affected price premium, but this association is weaker in the UK. Price premium appears negatively affected by board independence and VC firm age in France, but these effects are positive in the UK. This finding suggests that ownership concentration and the involvement of founders and business angels play more effective governance roles in France, whereas board

independence and VC involvement and experience provide stronger effects in the UK. Although comprehensive analysis of this complex interplay of various governance factors is beyond the scope of this paper, our results suggest that institutional differences between the UK and France significantly affect the roles played by different internal governance mechanisms. Fine-grained future research is needed to understand the interplay of these variables.

Finally, our research highlights that rather than focus on agency as a singular concept there is a need to consider that agency is composed of different types of agency conflicts. Our research employed the theoretical recognition of these different types of agency conflicts and highlights that they can result in different governance impacts by the different private equity investors. Future research should build on this and seek to bring greater empirical support to this theoretical rational. More specifically, multiple agency theory suggests that agency conflicts within the firm may vary according to different governance roles played by the corporate governance participants. A rich understanding of multiple agency theory will come when its component parts and their implications in different institutional settings are better understood.

CONCLUSIONS

Our research has provided a strong indication that ownership concentration and presence of private equity investors can be powerful tools in corporate governance. However, it also demonstrates that ownership concentration is a tool of corporate governance whose impact differs based on the type of private equity investor. These investors' differential impacts depend on the institutional setting in which the relationships occur. Similarly, different types of private equity investors can lead to contrasting performance outcomes, depending on the country of origin of the firm. Future research should build on these findings to better understand those settings and the performance benefit associated with block-holders.

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Table 1: Descriptive statistics and correlations

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13
1. (OP - BV)/OP	0.72	0.14													
2. Adj RoA	0.01	0.10	0.03												
3. UK dummy	0.50	0.50	0.15	-0.38											
4. VC Ownership	0.08	0.14	-0.19	-0.18	-0.35										
5. BA Ownership	0.04	0.09	0.03	-0.12	0.29	-0.06									
6. Concentration Index	3021	1836	0.09	0.30	-0.34	-0.13	-0.22								
7. Size (in Million)	27.87	23.59	0.13	0.02	0.04	0.07	0.07	-0.02							
8. Age	9.31	9.40	-0.19	0.17	-0.05	-0.06	0.12	0.19	-0.06						
9. Hi-tech dummy	0.68	0.47	0.09	-0.08	-0.07	-0.04	0.00	-0.03	0.17	-0.23					
10. Board Independence	0.39	0.21	-0.10	-0.08	0.12	0.21	0.17	-0.14	-0.02	0.03	-0.13				
11. Number of Risk Factors	6.13	5.35	-0.10	-0.04	-0.70	0.29	-0.20	0.20	0.04	0.02	0.13	-0.14			
12. Fin. Debt-to-Tot. Asset	0.12	0.16	0.10	-0.03	-0.09	0.02	-0.11	-0.07	0.02	0.08	-0.22	0.01	0.07		
13. Underwriter Reputation	0.02	0.04	0.15	-0.17	-0.28	0.26	-0.09	0.06	0.15	-0.10	0.12	0.11	0.28	0.05	
14. Lockup period (mths)	12.26	7.90	-0.06	0.04	-0.10	-0.11	-0.01	0.09	-0.15	-0.05	-0.12	0.04	0.03	0.09	-0.11
15. Lag Period	175.1	95.3	0.02	-0.01	-0.04	0.09	0.02	-0.06	-0.04	0.01	0.00	0.06	0.02	-0.13	0.05
16. Bubble period dummy	0.68	0.47	0.11	0.07	0.00	0.03	0.01	-0.16	0.01	-0.22	0.27	-0.02	0.07	-0.15	0.14
17. Founder Ownership	0.39	0.25	0.18	0.21	-0.11	-0.29	-0.18	0.38	-0.02	0.08	0.00	-0.31	0.04	-0.07	-0.06
18. Global VCs (Fraction)	0.48	0.40	-0.02	-0.09	-0.20	0.34	-0.09	-0.13	-0.01	0.01	0.02	0.12	0.21	0.01	0.19
19. VC Firm Age (Average)	13.28	13.86	0.01	-0.08	0.02	0.29	-0.09	-0.18	0.13	-0.03	-0.11	0.08	0.04	0.03	0.08
20. Number of BA	0.95	1.80	0.04	-0.06	0.08	0.00	0.67	-0.27	0.01	-0.01	-0.03	0.13	-0.05	-0.12	0.04
21. Number of VC	1.25	2.46	-0.03	-0.05	-0.20	0.70	-0.04	-0.14	0.00	-0.03	0.05	0.18	0.35	-0.01	0.22

Notes. 2-tailed Pearson correlation coefficients. Correlation coefficients above 0.125 and below -0.125 are significant at 0.05 level and higher.

	14	15	16	17	18	19	20
1. (OP - BV)/OP							
2. Adj RoA							
3. UK dummy							
4. VC Ownership							
5. BA Ownership							
6. Concentration Index							
7. Size (in Million)							
8. Age							
9. Hi-tech dummy							
10. Board Independence							
11. Number of Risk Factors							
12. Fin. Debt-to-Tot. Asset							
13. Underwriter Reputation							
14. Lockup period							
15. Lag Period	-0.01						
16. Bubble period dummy	-0.30	0.10					
17. Founder Ownership	0.07	-0.05	-0.10				
18. Global VCs (Fraction)	-0.20	0.11	0.11	-0.22			
19. VC Firm Age (Average)	-0.21	0.14	0.03	-0.22	0.40		
20. Number of BA	-0.03	0.03	0.05	-0.32	0.06	0.04	
21. Number of VC	-0.16	0.09	0.09	-0.29	0.31	0.26	0.01

Table 2: Factors affecting VC and BA retained ownership

	BA Ownership OLS (1)	VC Ownership OLS (2)
Constant	-0.055†	0.045
	(0.032)	(0.045)
UK dummy	0.047***	-0.028†
	(0.014)	(0.015)
Concentration Index	0.119†	-0.009*
	(0.066)	(0.004)
Log Size	0.010	0.022†
	(0.013)	(0.012)
Age	0.001	0.001
	(0.001)	(0.001)
Hi-tech dummy	0.017†	-0.018†
	(0.010)	(0.010)
Board Independence	0.013	0.020
	(0.019)	(0.035)
Risk Factors	0.000	-0.001
	(0.001)	(0.002)
Financial Debt-to-Total Asset	-0.006	-0.009
	(0.015)	(0.025)
Lockup period	0.001	-0.001
	(0.001)	(0.001)
Founder Ownership	-0.050†	-0.202***
	(0.028)	(0.061)
Global VCs		0.091*
		(0.036)
VC Firm Age		0.003***
		(0.001)
Number of BA	0.031***	
	(0.006)	
Number of VC		0.029***
		(0.006)
Partial R-squared	0.279	0.248
Adjusted R-squared	0.523	0.687
F-statistic	23.263	36.012
Prob(F-statistic)	0.000	0.000

Notes: White heteroskedasticity-consistent standard errors & covariance (standard errors are in parentheses).
***, **, *, †: statistically significant at the 0.1%, 1%, 5% and 10% respectively.

Table 3: Factors affecting IPO firm performance

	(Offer Price – Book Value per Share) / Offer price				Adjusted RoA
	OLS	OLS	2SLS	2SLS	2SLS
	(3)	(4)	(5)	(6)	(7)
Constant	0.603***	0.665***	0.582***	0.592***	-0.04
	(0.066)	(0.064)	(0.063)	(0.065)	(0.048)
Concentration Index	0.016*	0.001	0.017**	0.014†	0.043*
	(0.006)	(0.010)	(0.006)	(0.008)	(0.021)
Concentration Index x UK dummy		-0.018†		-0.017†	-0.047†
		(0.010)		(0.010)	(0.027)
VC Ownership	-0.167	-0.275*	-0.172†	-0.231*	-0.26**
	(0.126)	(0.110)	(0.088)	(0.114)	(0.094)
VC Ownership x UK dummy		0.923***		0.809***	0.38**
		(0.190)		(0.238)	(0.148)
BA Ownership	0.157	0.665***	0.109†	0.521***	0.165†
	(0.119)	(0.152)	(0.064)	(0.154)	(0.092)
BA Ownership x UK dummy		-0.614***		-0.674***	-0.149†
		(0.181)		(0.162)	(0.083)
UK dummy	0.051†	-0.032	0.073**	0.055†	-0.05**
	(0.030)	(0.048)	(0.028)	(0.029)	(0.023)
Log Size	0.025†	0.026†	0.026†	0.039*	0.022†
	(0.015)	(0.014)	(0.015)	(0.018)	(0.013)
Age	-0.003**	-0.003***	-0.003**	-0.002**	0.005†
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)
Hi-tech dummy	0.016	0.017	0.020	0.020	0.015
	(0.022)	(0.021)	(0.022)	(0.022)	(0.02)
Board Independence	-0.053†	-0.047†	-0.059†	-0.063†	-0. 005
	(0.031)	(0.028)	(0.035)	(0.037)	(0.037)
Number of Risk Factors	-0.001	-0.001	-0.001	-0.002	-0.003†
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Financial Debt-to-Total Asset	0.148**	0.156***	0.144**	0.143**	0.02†
	(0.046)	(0.044)	(0.047)	(0.048)	(0.011)
Underwriter Reputation	0.634**	0.615**	0.615**	0.633**	-0.499*
	(0.206)	(0.203)	(0.205)	(0.211)	(0.200)
Bubble period dummy	0.023†	0.028†	0.024†	0.022†	0.001
	(0.013)	(0.017)	(0.014)	(0.013)	(0.001)
Lockup period	0.000	0.000	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Founder ownership	0.050	0.052	0.072	0.048	0.06†
	(0.058)	(0.054)	(0.059)	(0.057)	(0.035)
Global VCs (%)	0.026	0.010	0.012	0.010	-0.003
	(0.049)	(0.043)	(0.049)	(0.046)	(0.027)
VC Firm Age	0.001	-0.002	0.000	0.000	0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Lag period					0.012†
					(0.07)
Adjusted R-squared	0.315	0.326	0.301	0.323	0.343
F-statistic	9.221	10.769	9.388	9.424	5.368
Prob(F-statistic)	0.000	0.000	0.000	0.000	0.000

Notes: Table 3 includes the Ordinary Least Squares (OLS) and the Two-Stage Least Squares (2SLS) regressions of the (Offer Price –Book Value per Share)/Offer Price and RoA. Models (3) and (4) present the OLS/2SLS regression results, and Models (5) and (6) present the 2SLS regression results of the factors affecting IPO firm pricing. Model (7) represents 2SLS regressions for RoA. White heteroskedasticity-consistent standard errors & covariance (standard errors are in parentheses).

***, **, *, †: statistically significant at the 0.1%, 1%, 5% and 10% respectively.