High Differentiation and Low Standardization: The Role of Venture Capitalists in Transforming the Governance and Management of Family Firms

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Abstract

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Keywords: Venture Capital; Corporate Governance; Standardization; Family Firm

JEL Classification: G24; G34

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Abstract

Using a theoretical framework based on Rajan (2012), we empirically analyze how venture capital (VC) investments "standardize" family firms by transforming their corporate governance and top management. We find that family members are more likely to depart from management positions in VC-backed compared to non-VC-backed firms. Further, family control rights, cash-flow rights, and the separation between them drop more in VC-backed firms. These effects are stronger when VCs have greater bargaining power or board representation. The above effects of VC-backing are causal. We find that the standardization of VC-backed family firms yields higher IPO firm valuation and post-IPO operating performance.

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1. Introduction

In a recent Presidential Address to the American Finance Association, Rajan (2012) develops a theory of the firm and its financing in a setting where the creation of value requires many collaborators with their identities changing over time (rather than a single entrepreneur acting alone). He argues that a private firm undergoes two important transformations over its early life. He refers to the first transformation as "differentiation," whereby an entrepreneur brings together a group of people and the assets they work with to create an organization, leading to the production of distinctive goods and services. Since a differentiated, unique enterprise is hard for outsiders to finance, and finance is critical for an entrepreneur to purchase the assets she needs for enterprise building, Rajan (2012) argues that the firm needs to undergo a second transformation, namely, "standardization," whereby the firm's operations are standardized so as to make the firm's key human capital more replaceable and liquid, even while it continues to produce differentiated products or services.[1] Rajan (2012) further argues that equity (rather than debt) is the appropriate security to finance such a transformation and that equity markets play an important role in this second transformation (e.g., through an initial public offering (IPO)) by rewarding the entrepreneur for standardizing the firm. Finally, Rajan (2012) argues that, in a venture capital (VC) backed firm, the VC can help the standardization process by advising the entrepreneur and by motivating her to implement this transformation.

Motivated by the above theoretical framework, in this paper we study the role of VCs in helping private family firms undergo the second transformation above, namely, standardization, before an IPO. We study family firms pre-IPO, since, as Rajan (2012) points out, family firms are likely to be high on differentiation and low on standardization prior to an IPO.[2] As Rajan (2012) further points out, an entrepreneur (founding family) has an incentive to delay standardization; a VC, on the other hand, may be able to use the fact that some key standardization milestones are contractible (e.g., hiring of professional managers)

[1] See Section II of Rajan (2012) for a formal model of standardization, where standardization is modeled as a means for the entrepreneur to appropriate the "going concern" value of the firm. Rajan (2012) credits Myers, Rajan, and Zingales (2005) for an early attempt at formalizing the notion of standardization. See also Zingales (2000) who highlights the growing importance of a firm's human capital relative to its physical assets.

[2] See Figure 3 of Rajan (2012) and the related discussion of the array of possibilities for firms and financing when one considers both differentiation and standardization.

to accelerate standardization. We, therefore, compare the transformation of corporate governance and management in VC-backed versus non-VC-backed family firms to isolate the incremental effects of VC-backing in accomplishing the standardization process. Further, since an IPO is the first large infusion of external financing into the firm from the financial markets, the benefits of standardization will accrue to the firm to the greatest extent at this time. We therefore focus our empirical analysis of the standardization of family firms at the time of IPO and the years around the IPO. Finally, it has been well-documented that the corporate governance of family firms in China and other East-Asian countries is particularly weak (e.g., pyramidal ownership structures used to expropriate minority shareholders), so that the role of VC-backing in standardizing family firms is likely to be particularly strong in this context. Hence we make use of a large sample of Chinese private family firms that went public during 2004-2012 for our empirical analysis. To the best of our knowledge, there has been no study so far in the literature that analyzes the effects of VC-backing in transforming the corporate governance and management of family firms.

We analyze three research questions in this paper. First, the family firm literature has suggested that the involvement of multiple family members in owning or managing a firm may be harmful to its performance.[3] Therefore, the first set of research questions we analyze is related to the ability of VCs to help reduce the number of family firm members holding top management positions in the firm. In particular, we study whether VCs are able to force some family members to depart from their management positions in the firm and whether the likelihood of VCs being able to induce such departures increases with the relative power of VC versus the founding family (as proxied by VCs' equity ownership) and with VC board representation. Further, we analyze the original positions from which these family members depart: top executives, directors, or supervisors. Finally, we analyze the types of family members, namely, blood-based or marriage-based relatives of the founders, or the firm founders themselves, that are more likely to depart from firm management.

Second, most of the family firms around the world are controlled by large (family)

[3] See, e.g., Bertrand, Johnson, Samphantharak, and Schoar (2008), who, using a sample of Thai family firms, show that the involvement of more of the founders' sons in the management of family firms is associated with lower firm performance. See also Miller, Le Breton-Miller, Lester, and Cannella (2007), who, using a sample of U.S. family firms, show that Fortune 1,000 family firms that include relatives of the founder as owners or managers never outperform in terms of market valuation, even during the first generation.

shareholders, and their control rights usually exceed their cash-flow rights. It has been argued by the theoretical literature that such an ownership and control structure is suboptimal for shareholder value maximization and facilitates the controlling shareholders' expropriation of minority investors: see, e.g., Grossman and Hart (1988) or Harris and Raviv (1988). Therefore the second set of research questions we analyze relate to the ability of VCs to reduce the family's control rights, cash-flow rights, and the separation between control and cash-flow rights. Further, if VCs are indeed able to help achieve such ownership and control right reductions, we analyze whether the VCs' ability to achieve such reductions increases with their relative power with respect to the founding family and also with their board representation. Finally, we analyze the reductions in equity ownership, if any, of different types of family members, namely, those of blood-based or marriage-based relatives of the founder, and of the firm founders themselves.

Third, improvements in the corporate governance of family firms are valuable to shareholders (including to VCs) only if they result in corresponding increases in firm performance and in firm valuation. Therefore, the third set of research questions we ask deal with the effect of possible departures of family members from management positions and reductions in family members' control and cash flow rights associated with VC-backing on the subsequent performance and valuation of these firms. In particular, we analyze whether the above departures of family members from management positions in VC-backed family firms and the reductions in their control and cash flow rights in the immediate pre-IPO period (i.e., while these firms are still private) translate into improvements in their post-IPO operating performance and immediate post-IPO secondary market valuation. We also analyze whether such performance and valuation improvements associated with changes in the corporate governance and in the top management of VC-backed family firms are greater than the corresponding improvements in non-VC-backed family firms.

We address the above research questions using hand-collected data on a sample of 499 Chinese private firms (210 VC-backed and 289 non-VC-backed firms) that went public during 2004-2012. China's security regulator requires firms going public to disclose in their IPO prospectuses information regarding their management team (top executives, directors, and supervisors) and management turnover, as well as every change in equity ownership structure

(including detailed information regarding equity transfers and VC investments) since firm inception: we hand-collect this data from IPO prospectuses for our analysis. We also hand-collect from IPO prospectuses information regarding family members who are involved in owning and managing the firm, including their titles, shareholdings, relationships to the founder, political connections, business connections, gender, and educational background.[4] In summary, our data provides us with a complete picture of the changes in the management teams and ownership and control structures of family firms during the pre-IPO period, as well as regarding other important variables related to the above changes.

China presents us with an appropriate economic setting for our analysis for two reasons. First, the governance of family firms in China and other East-Asian countries has been documented to be weak, with pyramidal ownership structures often used to expropriate minority shareholders (see, e.g., Claessens, Djankov, and Lang (2000); Claessens, Djankov, Fan, and Lang (2002)). There is also direct evidence of the expropriation of small shareholders by controlling shareholders in China: see, e.g., Jiang, Lee, and Yue (2010). Given this, there is significant room for improvement in the corporate governance of family firms in China. Second, after about fifteen years of development, China's venture capital market has become one of the largest in the world (surpassing the UK and second only to that in the U.S.), providing us with a large enough sample of VC-backed family firms with comprehensive data on these firms suitable for our analysis.[5] In summary, the severity of the minority shareholder expropriation problem in China combined with the large number of VC-backed family firms there provide us with the ideal economic setting to study the role of VCs in improving the corporate governance of family firms as well as the resulting effects on firm performance and valuation.

The empirical strategy we adopt to isolate the effects of VC-backing on changes in the corporate governance of family firms is to compare these changes to those occurring in

[4] Since we conduct our analysis not only at the firm-level but also at the family-member level, we also collect a family-member sample which includes 1,378 founding family members who hold top executive, director, and supervisor positions, as well as a sample of 1,341 family members who hold ownership stakes in the firm.

[5] The size of the VC investments in China relative to other countries is based on data provided by Dow Jones VentureSource (http://www.dowjones.com/pressroom/releases/ 2012/02022012-Q4CHVC-0010.asp).

non-VC-backed family firms.[6] At the same time, we recognize that VCs' choice of family firms to invest in may not be completely exogenous. This choice may in fact depend on various firm characteristics such as firm size, industry, geographical location, and also the difficulty VCs perceive in changing firm corporate governance. Such firm characteristics may also affect the changes in these firms' corporate governance after VC financing, potentially confounding our analysis. To address this potential endogeneity, we adopt two empirical strategies. First, to address the selection of VCs of firms to invest in based on observables, we conduct our empirical analysis of corporate governance changes in VC-backed versus non-VC-backed family firms using a propensity score matched sample of these two groups of firms matched on the firm characteristics mentioned above. Second, since VCs' decision to invest in a family firm may also be based on some unobservable characteristics of family firms, we conduct an instrumental variable analysis to deal with this potential endogeneity problem (arising from the possible selection of firms to invest in by VCs based on unobservable firm characteristics).

The results of our empirical analysis addressing our first set of research questions are as follows. First, both our ordinary least squares (OLS) regressions and propensity score matching analyses show that family members are significantly more likely to leave management positions in VC-backed firms than in non-VC-backed firms.[7] When we use the equity ownership of VCs as a proxy for their power to make changes in the firm, we find that the larger VC shareholdings, the more likely family members are to leave from top management positions. We also find that family members are more likely to leave from top management positions when VCs are represented on the board of directors, consistent with the notion that board representation is helpful for VCs to be able to exert sufficient pressure on the founding family to achieve the departure of family members from important management positions. Second, from our family-member level analysis, we find that family members serving on the firm's board of supervisors are more likely to depart due to

[6] The idea here is to disentangle the changes in the management positions of family members and their control and cash flow rights occurring due to the VC-backing of family firms from those occurring purely as a result of these firms maturing over time.

[7] These results are also economically significant. The turnover probability of family members in VC-backed firms is 8.4 percent higher than that in non-VC-backed firms.

VC-backing rather than those serving as executives or on the firm's board of directors.[8] However, in firms where VCs have greater power to make changes relative to the founding family (as proxied by their share ownership), both executives and members of the board of supervisors are more likely to depart. Third, we find (again from our family member level analysis) that while marriage-based relatives of the founder are in general more likely to leave than blood-based relatives or founders themselves, both blood-based and marriage-based relatives are more likely to leave their management positions in firms where VCs have greater equity holding.[9]

The results of our empirical analysis addressing our second set of research questions are as follows. First, both our OLS regressions and propensity score matching analyses show that family control rights, cash-flow rights, and the separation between control and cash-flow rights drop to a significantly greater extent in VC-backed firms compared to that in non-VC-baked firms.[10] Using the equity ownership of VCs as a proxy for their power to make changes in the firm, we find that family firms where VCs have greater equity ownership experience greater reductions in family control rights, cash-flow rights, and the separation between control and cash flow rights. We also find greater reductions in family control rights, cash-flow rights, and the separation between control and cash flow rights in firms where VCs are represented on the board of directors, suggesting that board representation is helpful for VCs to be able to exert sufficient pressure on the founding family to reduce their control and cash-flow rights in the firm. Second, both our OLS regressions and propensity score matching analyses show that the family is more likely to lose voting

[8] In our analysis of the changes in family members' management positions, we classify original positions of family members into top executives, members of the firm's board of directors, and members of the firm's board of supervisors. According to China's company law, executives and directors are in charge of making and executing the company's major decisions. However, companies are also required to set up a board of supervisors to monitor top executives and members of the board of directors to ensure that they exercise their job functions properly.

[9] This may reflect the greater importance placed on blood-based relationships relative to marriage-based relationships in Chinese culture.

[10] These results are also economically significant. Thus, the decrease in family control rights is around 8% larger for VC-backed firms than that for non-VC-backed firms. The decline in family cash-flow rights is around 6.5% larger in VC-backed firms than in non-VC-backed firms. The decrease in the separation between family control and cash-flow rights is around 0.8% larger for VC-backed firms than that for non-VC-backed firms.

control of the firm in a VC-backed family firm rather than in a non-VC-backed family firm.[11] Third, our family-member level analysis shows that the shareholdings of the founders and their blood-based relatives experience a larger decline in VC-backed firms compared to their declines in non-VC-backed firms, and that the reductions in the equity ownership of all three kinds of family members (blood-based relatives, marriage-based relatives, or founder) are increasing with the VCs' equity ownership in the firm.

The results of our empirical analysis addressing our third set of research questions are as follows. First, we find that, in VC-backed family firms, the decline in family firm control rights and in the separation between family control rights and cash flow rights result in significant improvements not only in post-IPO operating performance, but also in firm valuation immediately after IPO.[12] Second, the departure of family members from top management positions has no statistically significant impact on the post-IPO operating performance or the valuation of VC-backed firms.[13] These two results together indicate that, while the corporate governance reforms associated with the VC-backing of family firms indeed translate into better subsequent firm performance and valuation, reductions in the family's control rights are a more effective corporate governance reform than the departures of family members from management positions. Third, neither the decline in family firm control rights (and in the separation between family control rights and cash flow rights) nor the departure of family members from top management positions, have any statistically significant effect on the post-IPO operating performance or the valuation of non-VC-backed firms. This suggests that VCs are not only able to help reduce the control rights of the family and secure the departure of family members from management positions, but are also able to help family firms they back in other ways, so that these firms are able to translate corporate

[11] This result is also economically significant. The probability of the founding family losing voting control in VC-backed firms is around 10 percent higher than that in non-VC-backed firms.

[12] The effect of reductions in family cash flow rights is mixed. While this has a positive effect on operating performance, it has no significant effect on firm valuation. This is not too surprising, since, while reducing the equity ownership of the family reduces their entrenchment within the firm, this also reduces family members' incentives to exert effort toward maximizing shareholder value (along the lines argued by Jensen and Meckling (1976)).

[13] However, while this is true in general, in untabulated results, we find that, for larger magnitudes of the departure of family members from management positions, there is indeed a statistically significant improvement in firm post-IPO operating performance.

governance and management changes more effectively into better operating performance and valuation.[14]

The rest of the paper is organized as follows. Section 2 discusses how our paper is related to the existing literature and the contribution it makes relative to this literature. Section 3 develops testable hypotheses. Section 4 describes our data and sample selection procedures and defines the relevant variables. Section 5 presents our empirical tests and results. Section 6 concludes. An Internet Appendix presents supplemental tables.

2. Relation to the Existing Literature and Contribution

Our paper is related to two strands in the existing literature. The first strand is the literature on venture capital financing, and in particular, the literature documenting that venture capitalists may add value to the firms they invest in beyond simply providing external financing. A few papers in this literature have studied the role of venture capitalists in intensively monitoring firm managers (Gompers (1995) and Lerner (1995)), and the effects of VC-backing on corporate board structure (Baker and Gompers (2003) and Hochberg (2012)) and on earnings management by entrepreneurial firms (Hochberg (2012)).[15] None of the above papers study the effects of VC-backing in transforming the management of entrepreneurial firms or their corporate governance (beyond board structure). Kaplan, Sensoy, and Stromberg (2009) study 50 VC-backed companies, and analyze how their firm characteristics (financial performance, line of business, points of differentiation, nonhuman capital assets, growth strategy, top management, and ownership structure) evolve from business plan to IPO. While, unlike our paper, their focus is on informing the debate on the relative importance of the business ("horse") versus the management team ("jockey") in contributing to the success of a firm, their paper can be viewed as related to ours to the extent that they also study human capital turnover in some VC-backed firms.

[14] One possible example of such additional help may be in replacing family shareholders with new shareholders who are able to provide value-added monitoring services to the firm.

[15] The large literature analyzing the effects of VC-backing on other aspects of entrepreneurial firm performance is also distantly related to this paper: see, e.g., Chemmanur, Krishnan, and Nandy (2011), who show that VC-backing increases firm efficiency as measured by total factor productivity, and Chemmanur, Simonyan, and Tehranian (2013), who argue that venture capitalists help to improve the quality of the top management of entrepreneurial firms.

Hellmann and Puri (2002) study a sample of 170 young high-technology firms in Silicon Valley and show that VC-backing is positively related to measures of professionalization of firm management such as the adoption of human resource policies and of stock option plans and the hiring of a vice-president of sales and marketing. They also find that VC-backed firms are more likely and faster to replace the founder with an outside CEO. While the above is related to our paper, ours is the first paper in the literature to study the standardization of the top management of family firms; further, rather than focusing only on the CEO, we study the effects of VC-backing in transforming the entire management team of family firms. Ours is also the first paper to study the effect of VC-backing on the cash flow rights, control rights, and the wedge between control and cash flow rights of the founding family in family firms. Finally, ours is also the first paper to analyze how the standardization of top management and corporate governance of family firms is rewarded by the financial markets through higher stock market valuation upon IPO.

The second strand is the literature on family firms. Several papers in this literature have documented that, while family ownership has some advantages in terms of maximizing shareholder value, for example, due to better monitoring of CEOs (see, e.g., Anderson and Reeb (2003)), family ownership also suffers from significant disadvantages arising from conflicts of interest between family shareholders and other shareholders (see, e.g., Shleifer and Vishny (1997), Anderson and Reeb (2004), and Villalonga and Amit (2009)). A large literature has documented that, unlike in the case of firms in the U.S. and Japan (where equity ownership is diffuse), in a typical Asian or European family firm equity ownership is concentrated, with one or more members of a family tightly holding shares. A number of papers in this literature have also documented the agency conflicts existing between controlling (family) shareholders and minority shareholders: see, e.g., La Porta, Lopez-de-Silanes, and Shleifer (1999), Claessens, Djankov, and Lang (2000), Claessens, Djankov, Fan, and Lang (2002), Faccio and Lang (2002), Faccio, Lang, and Young (2001), and Johnson, Boone, Breach, and Friedman (2000). A number of other papers document that, when a larger number of family members are involved in controlling and operating a family firm, the performance of the firm suffers: see, e.g., Miller, Le Breton-Miller, Lester, and Cannella (2007) and Bertrand, Johnson, Samphantharak, and Schoar (2008).

A few papers in the family firm literature have also studied possible mechanisms to mitigate the minority shareholder expropriation problem existing in family firms. One example is Anderson and Reeb (2004), who show that independent directors may help alleviate conflicts between family shareholders and outside shareholders and thus improve firm performance. Another example is Anderson, Duru, and Reeb (2009), who suggest that financial transparency serves as an additional disciplining mechanism on family shareholders who attempt to extract private benefits from family firms. Unlike the above papers, the focus of our paper is on analyzing a new mechanism for improving the corporate governance of family firms, namely, VC-backing. We show, for the first time in the literature, that VC investments in family firms help to improve corporate governance by securing the departure of some family members from management positions and by reducing the separation between the cash flow and control rights held by the founding family, thereby improving subsequent firm performance and financial market valuation.

3. Theory and Hypothesis Development

The theoretical framework we use to develop our testable hypotheses is based on the two-period, three-date standardization model in Rajan (2012). He argues that a private firm undergoes two important transformations over its early life. The first transformation is differentiation, whereby an entrepreneur brings together a group of people and the assets they work with to create an organization, leading to the production of distinctive goods and services. Since a differentiated, unique enterprise is hard for outsiders to finance, and finance is critical for an entrepreneur to purchase the assets she needs for enterprise building, Rajan (2012) argues that the firm needs to undergo a second transformation, namely, standardization, whereby the firm's operations are standardized so as to make the firm's key human capital more replaceable and liquid, even while it continues to produce differentiated products or services. We adapt the above framework to the specific context of family firms.

We consider a setting where an entrepreneur (a founder and her family) initially handles all the basic functions of a firm (e.g., product development, marketing, personnel, and finance) in its first period. The founding family may fund the firm's operations in its first period either using its own private financing (i.e., it does not raise any VC financing) or may choose to

raise part of the financing required for its first period operations from a venture capitalist.[16] The founder plans to take the firm public in an IPO at the end of the first period. While the IPO may fund part of the firm's second period (future) operations, both the founder and the venture capitalist also plan to sell a substantial fraction of their equity in the IPO. We assume, following Rajan (2012), that, prior to its IPO, the firm will undergo a process of standardization, which may involve hiring professional managers to hand various functional areas such as product development, marketing, personnel, and finance (previously handled by the founder or her family members). Standardization therefore reduces the idiosyncratic and personal aspects of the founder and her family's role in managing the firm, allowing her job to resemble that of a typical CEO, and making it easier for the firm's top management team to be replaced by professional managers.

In the above setting, both the founder and the venture capitalist obtain significant benefits from standardization through a higher equity market valuation for their holdings in the firm.[17] However, there is a "wedge" between the objectives of the founding family and the VC. While the founding family receives private benefits from managing the firm, in addition to the cash flow benefits accruing to their equity stakes in the firm, the VC enjoys only the cash flow benefits accruing to his equity holdings in the firm. Assuming that the private benefits enjoyed by the founding family are reduced due to standardization, it can be shown that the optimal level of standardization preferred by the venture capitalist will be greater than that preferred by the founding family. We assume that the actual level of standardization chosen by the firm prior to its IPO in a VC-backed family firm will be determined as a result of bargaining between the venture capitalist and the founding family. This means that, in a VC-backed family firm where the VC has greater bargaining power with respect to the founder, the level of standardization chosen prior to the firm's IPO will be

[16] As Rajan (2012) points out, a VC "is willing to finance the entrepreneur in the early stages of the enterprise if he knows that the entrepreneur has sufficient incentive to standardize later on, and if the expected market value of the venture capitalist's equity claim compensates for the risk he takes up-front in financing the venture."

[17] To quote Rajan (2012): "The tension between generating NPV, which requires innovation and differentiation of the firm's assets and human capital, and offering financiers credible repayment, which requires reducing the extent to which the firm's employees are irreplaceable, has to be lowered by bringing every task done by the enterprise closer to the mainstream (while ensuring that the tasks, taken together, produce the differentiated product). Finance requires successful start-ups to grow up and standardize what they do well, and the entrepreneur has an incentive to make this happen precisely because the firm will be run by others over time."

greater. By the same logic, the level of standardization chosen by a non-VC-backed firm will be lower than that chosen by a VC-backed firm (since the level of standardization chosen by a non-VC-backed firm will be the same as the founding family's preferred optimal standardization level).

We now make use of the above theoretical framework to develop testable hypotheses on the role of venture capitalists in transforming the governance and management of family firms, and the resulting effects on subsequent firm performance and equity valuation.

3.1 The Effect of Venture Capital Investments on Departures of Family Members from Top Management Positions

We first develop hypotheses related to the departure of family members from management positions in VC-backed family firms. There is considerable prior evidence that nepotism based on family relationships hurts the performance of family firms, for example, by limiting labor market competition for management jobs.[18] This suggests that reducing the involvement of at least the less effective members of the founding family may improve firm performance. In addition, as discussed above, our theoretical framework based on Rajan (2012) implies that the level of standardization chosen by VC-backed family firms before IPO will be greater than that chosen by non-VC-backed family firms. Since standardization involves replacing founding family members with professional managers, the first hypothesis we test here is whether VC-backed family firms are more likely to force family members to depart from top management positions compared to non-VC-backed firms (**H1**).

Further, the theoretical framework above implies that level of standardization chosen by a VC-backed family firm will be greater if the bargaining power of the VC relative to the founding family (as proxied by the VC's equity ownership in the firm) is greater. Therefore, we hypothesize that the larger the VC's shareholdings in the firm, the more likely family members are to depart from top management positions **(H2)**.

[18] For example, Pérez-González (2006) finds that firms where incoming CEOs are related to the departing CEO, to a founder, or to a large shareholder by either blood or marriage, underperform relative to firms that promote unrelated CEOs. Using a sample of Thai family firms, Bertrand, Johnson, Samphantharak, and Schoar (2008) show that the involvement of more of the founders' sons in the management of family firms is associated with lower firm performance. Finally, using a sample of U.S. family firms, Miller, Le Breton-Miller, Lester, and Cannella (2007) show that Fortune 1,000 family firms that include relatives of the founder as owners or managers never outperform in terms of market valuation, even during the first generation.

Another measure of the bargaining power of VCs with respect to the founding family is board representation of VCs, since this gives them access to more information and greater ability to potentially influence other board members. Further, in the spirit of Fama and Jensen (1983) and Williamson (1983), who argue that board composition is shaped by the need for oversight, it is possible that VCs are more likely to be represented on the boards of family firms where the need for monitoring is the greatest.[19] For both of the above reasons, we would expect the departure of family members from management positions to be more likely when VCs are represented on the boards of family firms **(H3)**.

Next, we analyze the original management positions from which family members are more likely to depart. We classify the original position of family members into top executives, directors of the board, and members of the board of supervisors. According to China's company law, executives and members of the board of directors are in charge of making and executing the company's major decisions. However, companies are also required to set up a board of supervisors to monitor top executives and members of the board of directors to ensure that they exercise their job functions properly. The positions from which family members depart may be important for the future performance of the firm: for example, if family members depart from executive positions or from the board of directors, the effect on future firm performance may be greater than if they depart from the board of supervisors. We therefore conjecture that the positions from which family members depart will be related to the relative power of the VC and the founding family in the firm. Thus, if we use the equity ownership of VCs as a proxy for their power to make changes in the firm, we expect that the larger are VC shareholdings, the more likely family members are to depart from executive positions or from the board of directors; however, if VC shareholdings are smaller, we would expect family members to depart only from the board of supervisors (which has primarily a monitoring role) or not to depart at all **(H4)**.

We then explore the effect of VC-backing on the departure of family members with different relationships to the founder. In Chinese culture, greater importance is placed on blood-based relationships relative to marriage-based relationships. Therefore, only VCs who

[19] Lerner (1995) documents that, in a study of CEO turnovers in biotechnology firms, that VCs' representation on the boards of their portfolio firms increases around CEO turnover in these firms.

have greater bargaining power relative to the founding family are likely to be able to accomplish the departure of blood-based relatives of the founder from management positions, while those with lesser power may be able to accomplish the departure of only marriage-based based relatives or accomplish no departures at all. At the same time, founders in family firms are long recognized as valuable for the superior performance of family firms, so that VCs may not encourage founders to leave at all.[20] Given the above, using the equity ownership of VCs as a proxy for their power to make changes in the firm, we hypothesize that in firms where the VCs have the smallest shareholdings, only marriage-based relatives are likely to depart from management positions, while in firms with larger VC shareholdings, both blood-based and marriage-based relatives are likely to depart; with founders expected to depart only rarely **(H5)**.

3.2 The Effect of Venture Capital Investments on Family Control and Cash Flow Rights

Theoretical papers such as Grossman and Hart (1988) and Harris and Raviv (1988) imply that deviations from one share-one vote sub-optimally affect firm performance, with the negative performance effects increasing in the extent of deviation from one share-one vote. However, there is considerable evidence showing that many family firms are controlled by a single family, and that the controlling shareholders typically have power over these firms significantly in excess of their cash flow rights.[21] Further, there is evidence that, while firm value increases with the cash flow rights of the controlling shareholder (consistent with a positive incentive effect), it falls when the control rights of the largest shareholder exceed his cash-flow rights (consistent with an entrenchment effect).[22]

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[20] See, e.g., Villalonga and Amit (2006), who show that family ownership creates value only when the founder serves as the CEO of the firm or as its Chairman with a hired CEO. See also Fahlenbrach (2009), who find that founder-CEO firms have a higher operating performance and a higher firm valuation than successor-CEO firms.

[21] La Porta, Lopez-de-Silanes, and Shleifer (1999) study the firms in 27 wealthy economies and find these firms are typically controlled by families or the State. Further, the controlling shareholders typically have power over these firms significantly in excess of their cash-flow rights, primarily through the use of pyramids. In addition, Claessens, Djankov, and Lang (2000) show that the voting rights of the family frequently exceed their cash-flow rights via pyramid structures and cross-holdings in East Asian countries, and more than two-thirds of these firms are controlled by a single shareholder.

[22] Claessens, Djankov, Fan, and Lang (2002) investigate a large number of family firms in eight East Asian countries and find that firm value increases with the cash-flow ownership of the largest shareholder, consistent

Given the above, another aspect of standardization is to establish a more balanced ownership structure in family firms prior to their IPO, so as to obtain a higher equity valuation upon IPO. To establish such an ownership structure, VCs may encourage founding families in these firms to give up a part of their ownership, and attempt to reduce the excess of family control rights over cash flow rights. We therefore postulate that family control rights and cash-flow rights will drop to a significantly greater extent in VC-backed family firms compared to non-VC-backed family firms during the three-year period pre-IPO (**H6**). Further, since the excess of family owners' control rights over their cash-flow rights has a negative effect on firm performance and value, we also expect that the separation between family control rights and cash-flow rights to be reduced to a significantly greater extent in VC-backed firms compared to non-VC-backed firms during the three-year period pre-IPO (**H7**). We also expect that family owners in VC-backed firms are significantly more likely than family owners in non-VC-backed firms to lose voting control of the firm (**H8**).

It is also likely that the power of VCs relative to that of the founding family affects their ability to make changes in family firms' ownership and control structure. Therefore, if we use the equity ownership of VCs as a proxy for their power to make changes in the firm, we expect family firms where VCs have greater equity ownership to experience greater reductions in the family's control rights and the separation between their control and cash flow rights **(H9)**.[23] Further, as discussed under hypothesis **H3**, since membership on the firm's board gives VCs access to more information and greater ability to potentially influence other board members, we expect the above changes to be more likely in family firms where VCs serve on the board of directors **(H10).**

Finally, we analyze the type of family member, namely, founder, blood-based relatives of the founder, or marriage-based relatives whose shareholdings are most likely to be reduced in

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with a positive incentive effect; however, firm value falls when the control rights of the largest shareholder exceed his cash-flow rights, consistent with an entrenchment effect. The above evidence suggests the importance of minimizing the separation between control rights and cash-flow rights of the controlling shareholder.

[23] Given the possibly ambiguous effect of reductions in family cash flow rights on firm value (recall that family equity ownership may have both incentive and entrenchment effects), we are agnostic about the direction of the relationship between VC equity ownership and the reduction in family cash flow rights in VC-backed versus non-VC-backed family firms.

a VC-backed family firm. Under hypothesis **H5**, we postulated that marriage-based relatives, rather than founders or blood-based relatives, are most likely to be forced to depart from management positions in VC-backed family firms. However, in terms of ownership structure, only reducing the shareholdings of marriage-based relatives is likely to have little effect on family control of firms, since the original shareholdings of marriage-based relatives are low.[24] Therefore, if VCs want to standardize the ownership structure of a family firm to a greater extent by reducing the negative effect of family entrenchment and increase the balancing power of outsider block-holders, they will have to encourage not only marriage-based relatives, but also founders and blood-based relatives to reduce their equity ownership. We therefore expect that the ownership of founders and blood-based relatives, as well as that of marriage-based relatives, will drop to a greater extent in VC-backed than in non-VC-backed family firms, and that the extent of their ownership reduction will be increasing in the bargaining power of the VC relative to that of the founding family, as proxied by the VCs' equity ownership in the firm (**H11**).

3.3 The Effect of Corporate Governance Changes Induced by VC Investments on the Post-IPO Operating Performance and Valuation of Family Firms

The benefits arising from standardization in our theoretical framework developed above is the higher operating performance equity market valuation that will accrue to the firm upon IPO, and consequently higher cash flow benefits to both the VC and the founding family, who hold equity stakes in the firm. We therefore hypothesize that the corporate governance reforms (such as the departure of family members from top management positions, as well as the reduction of the founding family's excess control rights over their cash-flow rights) occurring in the years prior to IPO will translate into improved post-IPO operating performance for family firms. Further, since, under symmetric information, the stock market value of a firm is simply the present value of its future cash flow stream, we expect that such corporate governance reforms accomplished in VC-backed family firms will also translate

[24] In our sample, the shareholdings of founders, blood-based relatives, and marriage-based relatives at the beginning of the three-year period prior to IPO are 51%, 12%, and 12%, respectively.

into higher immediate (post-IPO) secondary market valuations **(H12).**[25]

A related interesting question is whether, if the corporate governance reforms undertaken by VC-backed family firms indeed translate into better post-IPO operating performance and firm valuation, these performance and valuation effects are greater in VC-backed firms than in non-VC-backed firms (**H13**), i.e., for a given extent of changes in corporate governance, are the performance and valuation effects greater in VC-backed family firms than in non-VC-backed family firms? This may indeed be the case if, along with corporate governance improvements they help firms make, VCs help family firms they invest in make other changes which make these corporate governance reforms translate more effectively into better operating performance and valuation. One example of such possible improvements made by family firms with the help of VCs may be to not only secure the departure of family members from top management positons, but also to replace these departing family members with higher quality management team members.[26] Further, in terms of changing ownership structure, VCs may not only be able to help family firms reduce the founding family's ownership, but also to secure equity investments from new high value-added shareholders who may be able to intensively monitor the founding family and top executives, or to bring in additional business resources helpful to the firm.

4. Data, Sample Selection, and Variables

4.1 Data and Sample

Our original sample contains all family firms listed on China's SME (Small and Medium-sized Enterprise) board and GEM (Growth Enterprise Market) from 2004 to 2012.[27] We define family firms as firms where founding family members are the largest shareholders

[25] Consistent with this, prior literature has shown that firms underperform when multiple family members are involved in owning or managing the business (see, e.g., Miller, Le Breton-Miller, Lester, and Cannella (2007)), or when control rights of the founding family are significantly in excess of their cash-flow rights (see, e.g., La Porta, Lopez-De-Silanes, Shleifer, and Vishny (2002), Claessens, Djankov, Fan, and Lang, (2002), Barontini and Caprio (2006), and Villalonga and Amit (2006)).

[26] See, e.g., Hellmann and Puri (2002), or Chemmanur, Simonyan, and Tehranian (2013), who show that VCs may help firms they invest in improve their management quality.

[27] China's SME (Small and Medium-sized Enterprise) board is set up in 2004, and GEM (Growth Enterprise Market) is set up in 2009. There are very few family firms listed on China's main board because the main purpose of setting up China's main board is for State-owned enterprises to go public.

and more than one member of the founding family continue to hold positions as top executives, directors, supervisors, or block-holders (ownership being 5% or higher) of the company.[28] After excluding ST (Specially Treated) companies,[29] we obtain a final sample of 499 family firms. For each family firm, we hand-collect relevant information on family members involved in the family business, and we arrive at a sample of 1,378 family members who hold positions as top executives, directors, or supervisors, as well as a sample of 1,341 family members who hold equity ownership of the family firms.

The main advantage of using data from China for this study compared to data from the U.S. and other countries is that the China Securities Regulatory Commission (CSRC – the "Chinese SEC") requires companies going public to disclose, in their IPO prospectuses, information including their management teams (top executives, directors, and supervisors) and all management turnovers, as well as every change of ownership structure (including changes of shareholders and their shareholdings), from firm inception to IPO. We hand-collect management positions and management turnover of family members from the section of "Directors, Supervisors, and Top Executives" in IPO prospectuses. The data for calculating family ownership structure change is hand-collected from the "Historical Change of Ownership Structure and Major Assets Restructuring since Inception" section of IPO prospectuses. We also search the resumes of founders and other family members contained in IPO prospectuses for information on their political connections, business connections, gender, age, education background, and their family relationships to firm founders. Accounting data in the three-year period pre-IPO and in the post-IPO period are obtained from IPO prospectuses and the CSMAR database, respectively. Stock price data come from the CSMAR database as well.

[28] There is a wide-ranging literature on family business, and it is somewhat difficult to find consensus on the exact definition of family firms. The typical family business has been characterized as an organization controlled and usually managed by multiple family members (see, e.g., Shanker and Astrachan (1996) and Lansberg (1999)), often from multiple generations (see, e.g., Anderson and Reeb (2003), and Gomez-Mejia, Haynes, Nunez-Nickel, Jacobson, and Moyano-Fuentes (2007)). Since most of the family firms in China are established after Deng Xiaoping's economic reform in 1978, only a few of them have been succeeded by their second generations.

[29] ST (Specially Treated) companies are those companies with two consecutive annual losses. The range of daily stock price fluctuations is limited within ±5%. Since their financial and trading characteristics are different from most other listed companies, we exclude these companies.

We hand-collect information on each round of VC financing from the section of "Historical Change of Ownership Structure and Major Assets Restructuring since Inception" in IPO prospectuses, which provides detailed information on each round of equity financing from VCs and other shareholders.[30] We identify VC financings, i.e., equity financings in which VCs are new shareholders, if the new shareholder is included in the lists of VCs in the "2003-2012 China Venture Capital Development Reports (CVCD Reports)" (Wang and Wang, 2003-2012), which are compiled by the Chinese Academy of Science and Technology for Development (CASTED). In addition to using CVCD Reports, we also use VC lists provided by the WIND VC database to double-check whether a shareholder is indeed a VC. We identify 210 family firms as VC-backed among a total of 499 family firms in our sample (42%). We also hand-collect data on VC shareholdings immediately after the first-round of VC financing, as well as VC representations on boards (i.e., VCs serving as directors), from IPO prospectuses.

4.2 Measures of Corporate Governance Changes

In this subsection, we describe the construction and measurement of corporate governance changes of family firms in the pre-IPO period. We investigate two aspects of corporate governance changes in sample family firms: departures of family members from management positions, and changes of family control rights and cash-flow rights.

We measure departures of family members from top management positions at both firm-level (*Turnover1*) and family-member-level (*Turnover2*). For VC-backed firms, *Turnover1* equals one if at least one of the family members depart from the positions of top executive, director, or supervisor during the period from the first-round of VC investment to IPO or in the three-year period prior to IPO, and zero otherwise.[31] For non-VC-backed firms,

[30] The information we collect include the date of financing, the identity of new shareholders, the amount of equity financing, and the ownership structure (i.e., a list of shareholders and their shareholdings) after the financing.

[31] In particular, if a VC-backed firm receives the first-round VC investment in the pre-IPO three-year period, we measure departures of family members from management positions during the period from first-round VC investment to immediately before IPO. If a VC-backed firm receives the first-round VC investment before the three-year period pre-IPO, we measure departures of family members from management positions during the three-year period pre-IPO. The same principle is also similarly applied while constructing several other variables, including *△Control rights*, *△Cash-flow rights*, *△Separation*, *Control loss*, and *△Shareholding*.

Turnover1 equals one if at least one of the family members depart from the positions of top executives, directors, or supervisors in the three-year period prior to IPO, and zero otherwise. We focus on management turnover and other corporate governance changes in the three-year period pre-IPO because 82.5% of VC-backed family firms in our sample received their first-round VC investments in the three-year period pre-IPO. Following Lehn and Zhao (2006), we classify a turnover as a forced turnover, if the departing family member is under the age of 65 and there are no announcements or reports showing that the reason for the departure is related to death, poor health, or acceptance of another position. The family-member-level measure of departures of family members from management positions (*Turnover2*), equals one if the family member departs after the first-round VC investment and in the three-year period pre-IPO (for VC-backed firms), or in the three-year period pre-IPO (for non-VC-backed firms), and zero otherwise.

We also construct the following five variables to measure the change in ownership structure of family firms. First, the percentage change of control rights (△*Control rights*). △*Control rights* equals the founding family's control rights immediately before IPO divided by the founding family's control rights immediately before the first-round VC investment or at the beginning of the pre-IPO three-year period, and then minus one (for VC-backed firms), or the founding family's control rights immediately before IPO divided by the founding family's control rights at the beginning of pre-IPO three-year period, and then minus one (for non-VC-backed firms). Control rights measure the controlling shareholder's ability to affect firm decisions, such as, elections of directors to the board and appointments of supervisors. Following Claessens, Djankov, and Lang (2000), when there are multiple control chains; we take control rights to be the sum of the voting rights along the chain with the weakest link of all the holding layers. For example, family A owns 30% of company B, which in turn owns 20% of company C. In addition, family A owns 20% of company D directly, which in turn owns 10% of company C (this share ownership structure constitutes the second control chain of family A over company C). As a result, Family A's voting rights over company C are determined as Min(30%, 20%) + Min(20%, 10%) = 30%. We then aggregate direct and indirect voting rights to obtain total control rights.

Second, the percentage change of cash-flow rights (△*Cash-flow rights*), equals the

founding family's cash-flow rights immediately before IPO divided by the founding family's cash-flow rights immediately before the first-round VC investment or at the beginning of the pre-IPO three-year period, and then minus one (for VC-backed firms), or the founding family's cash-flow rights immediately before IPO divided by the founding family's cash-flow rights at the beginning of the pre-IPO three-year period, and then minus one (for non-VC-backed firms). We measure "cash-flow rights" as the controlling shareholder's percentage ownership of profits/losses and dividends of a firm. A high percentage of ownership by the controlling shareholder provides strong incentives to maximize firm value and minimize agency misconduct. If there are multiple chains of ownership, then cash-flow rights along each chain are the product of all ownership rights of intermediate companies within that chain. The total cash-flow rights are the sum of all cash-flow rights from all ownership chains, as similarly defined in Claessens, Djankov, and Lang (2000). Using the example above, the cash-flow rights of family A over company C would be calculated as 30% $\times$20% + 20%$\times$10% = 8%.

Third, the change of the separation between control rights and cash-flow rights ($\triangle$ *Separation*), is measured as the separation between founding family's control rights and cash-flow rights immediately before IPO, minus the separation immediately before the first-round VC investment or at the beginning of the pre-IPO three-year period (for VC-backed firms), or minus the separation at the beginning of the pre-IPO three-year period (for non-VC-backed firms). Separation between control rights and cash-flow rights of the controlling shareholder measures the degree of divergence from the one share-one vote ownership structure, which can be viewed as the controlling shareholder's motive to extract wealth from the firm. Under such a governance structure, the controlling shareholder receives the entire benefit of wealth expropriation, but bears only a fraction of the cost.

Fourth, losing voting control (*Control loss*), is an indicator variable which equals one if (and zero otherwise) the total shareholdings of founding family members declines from above 50% to below 50% during the period from the first-round of VC investment to IPO or during the three-year period prior to IPO (for VC-backed firms), or during the three-year period prior to IPO (for non-VC-backed firms). If the founding family does not have voting control of the firm before the first-round VC investment or at the beginning of the pre-IPO three-year

period, we set the *Control loss* variable as missing value.

Fifth, the change of shareholdings of a specific family member (△*Shareholding*) is defined as the shareholdings of a certain family member immediately before IPO divided by his/her shareholdings immediately before the first-round VC investment or at the beginning of the pre-IPO three-year period, and then minus one (for VC-backed firms), or the shareholdings of a certain family member immediately before IPO divided by his/her shareholdings at the beginning of the pre-IPO three-year period, and then minus one (for non-VC-backed firms).

4.3 Measurements of Post-IPO Operating Performance and Firm Valuation Immediately after IPO

To examine the economic outcome of corporate governance changes due to VC-backing, we construct proxies for post-IPO operating performance and firm valuation immediately after IPO.

Post-IPO operating performance, △*Adjusted OROA*, is measured as the change of industry- and performance-adjusted operating return on assets (OROA) by subtracting the industry- and performance-adjusted OROA in the year prior to the issue (year -1) from the industry- and performance-adjusted OROA in subsequent years (years 0 through 3). OROA is the ratio of operating income over the book value of assets. Industry-adjusted OROA equals OROA minus the median OROA of the relevant industry. The industry classification (22 groups) here and after is based on the CSRC industry classifications, with two digits for manufacturing industries and one digit for other industries[32]. Industry and performance adjusted OROA is calculated as industry-adjusted OROA minus the median OROA of a control group of firms with similar performance. Performance controls are created by dividing all of the firms listed on China's SME and GEM boards into deciles sorted by industry-adjusted OROA in the year prior to IPO.

We construct proxies for IPO firm valuation, following the method used in Chemmanur, Simonyan, and Tehranian (2013). First, we calculate the Tobin's Q of a specific firm, which

[32] We use two digits for manufacturing industries because 60% of listed companies in China belong to manufacturing industries.

is the ratio of the market value of assets over the book value of assets, where the market value of assets is equal to the book value of assets minus the book value of equity plus the product of the number of shares outstanding and share price. We measure IPO firm valuation in the secondary market by using either the first trading day closing price as the share price in the above definition (*QFTD*) or the share price at the end of the IPO issue month (*QIM*). Second, we construct industry-adjusted Q ratios (*QFTDADJ* and *QIMADJ*) by subtracting industry median Q ratios from the above proxies based on CSRC industry classifications. The book value of assets and the book value of equity for both IPO firms and industry peers are taken from the first available post-IPO quarter. The number of shares outstanding for IPO firms and industry peers is taken from the first available post-IPO quarter as well, and the share prices of industry peers are the IPO month closing prices.

4.4 Other Variables

In order to separate the effect of VC investments from that of other aspects of firm quality and family characteristics, we include the following variables as controls in our multivariate tests. First, given that political connections of family members, business connections and education background of the founder, and the age of the family firm may affect family control and management, we construct the following variables: *Political connection* is a dummy variable that equals one if one of the family members, who serve as top executives, directors, supervisors, or block-holders, was a former government official, military officer, deputy of the National People's Congress (NPC), or a member of the Chinese People's Political Consultative Conference (CPPCC), and zero otherwise. *Business connection* is a dummy variable that equals one if the founder is serving or used to serve as the leader of the industry association, and zero otherwise.[33] *Education* takes the value of one if the founder has received a bachelor's degree or above, and zero otherwise. *Firm age* is the natural logarithm of the number of years from firm inception to IPO.[34] In addition, the

[33] If there are more than one founders, we select the main founder who has the larger shareholdings than the other founder(s), or hold the higher position (e.g., chairman of board of directors) when his/her shareholdings is the same as the other founder(s).

[34] These factors could have positive or negative effects. On the one hand, if family members have stronger political connections, or if the founder has a wider range of business connections, or better education

changes in corporate governance are likely to be affected by firms' financial status. For example, the poorer the firm performance, perhaps the stronger the incentive of the firm to improve corporate governance. Thus, we add three financial variables as controls. *Size* is the natural logarithm of total assets three years pre-IPO. *Leverage* is defined as total debt divided by total assets three years pre-IPO. *Prior ROA* is defined as net income divided by total assets three years pre-IPO. In instrumental variable regression analysis, we use two instruments for VC-backing dummy, namely, *Number of local VCs* which is the number of VC companies in the family firm's headquarter province in the year of firm founding or incorporation, and *Government Research grant/GDP* which is the amount of research grants from the provincial government divided by GDP of the family firm's headquarter province in the year of firm founding or incorporation.

4.5 Summary Statistics

Panels A, B, and C of Table 1 present summary statistics of dependent variables, independent variables, and control variables, respectively. Panel A shows that the mean of *Turnover1* is 32.3%, suggesting that 32.3% of family firms have at least one family member departing from top management positions during the three-year period prior to IPO. The mean of family-member-level measure of family members departing from management positions (*Turnover2*) is 12.8%, which means that 176 out of 1,378 sample family members depart from their management positions. During the three-year period prior to IPO, on average, family control rights drop by 5.7%, family cash-flow rights drop by 6.6%, the separation of family control rights and cash-flow rights slightly increase by 0.3%, 7.3% of founding families lose voting control (i.e., family ownership declines from above 50% to below 50%), and the shareholdings of family members decrease by 4.7%. The changes of industry- and performance-adjusted operating return on assets (OROA) from the year prior to IPO (year -1) to IPO year (year 0), and the three years after IPO (years 1 through 3) are -5.7%,

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background, or the family has operated the firm for a longer time, the founding family may have stronger negotiation power relative to VCs, and thus VCs could find it more difficult to force family members to depart from management positions, or to reduce family control rights and cash-flow rights. On the other hand, if the founder has a wider range of business connections, or better education background, he/she may rely less on the other family members in managing the family firm, and may provide more support for VCs to change the corporate governance of the family firm.

-5.1%, -4.8%, and -2.7%, respectively. It confirms the phenomenon of long-run post-IPO underperformance of China's listed companies. The mean (median) value of the two measures of industry-adjusted Tobin's Q (*QFTDADJ* and *QIMADJ*) are 0.495 (0.196) and 0.343 (0.070), respectively, suggesting that the Tobin's Q of IPO firms in the secondary market immediately after the IPO is higher than the Tobin's Q of their industry peers.

Panel B shows that 42.1% of family firms are VC-backed. The average of VC shareholdings is 5.1% in the whole sample and 12.2% in VC-backed firms. In 26.9% of family firms, or 63.9% of VC-backed family firms, at least one venture capitalist serves on the board of directors. Panel C shows family and firm characteristics of family firms. We find 54.3% of founding families have political connections, 56.3% of them have built a wide range of business connections in the industry, 58.1% of founders have bachelor's degrees or above. The average firm age is around 10 years, and the average firm size is around 455 million Chinese RMB. The average leverage ratio and prior ROA (return on assets) are 55.1% and 12.6%, respectively. The average number of VC companies in the family firm's headquarter province in the year of founding or incorporation is 68.6. The average ratio of provincial government research grants to GDP in the family firm's headquarter province in the year of founding or incorporation is 0.4%.

5. Empirical Tests and Results

5.1 The Effect of VC Investments on Departures of Family Members from Top Management Positions

5.1.1 Logit Analysis of the Effect of VC Investments on Departures of Family Members from Top Management Positions

To examine the effect of VC investments on departures of family members from top management positions, we develop the following logit regression models:

$$logit(Turnover1) = \beta_0 + \beta_1 VC\ dummy + \beta_2 Political\ connection + \beta_3 Business\ connection + \beta_4 Education + \beta_5 Firm\ age + \beta_6 Size + \beta_7 Leverage + \beta_8 Prior\ ROA + Industry\ dummy + \varepsilon_{i,t} \quad (1)$$

$$logit(Turnover2) = \beta_0 + \beta_1 VC\ dummy + \beta_2 Political\ connection + \beta_3 Business\ connection + \beta_4 Education + \beta_5 Firm\ age + \beta_6 Size + \beta_7 Leverage + \beta_8 Prior\ ROA + Industry\ dummy + \varepsilon_{i,t} \quad (2)$$

Model (1) is a firm-level regression using a sample of 499 publicly listed family firms. We regress the firm-level indicator of family members departing from management positions (*Turnover1*) on a dummy variable which equals one for VC-backed firms and zero for non-VC-backed firms (*VC dummy*), and a set of control variables including political connections of family members (*Political connection*), business connections of the founder (*Business connection*), education background of the founder (*Education*), logarithm of firm age (*Firm age*), natural logarithm of total assets (*Size*), leverage ratio (*Leverage*), prior return on assets (*prior ROA*), and industry fixed effects based on the CSRC industry classifications. Model (2) is a family-member-level regression using a sample of 1,378 individual family members who hold positions as top executives, directors, or supervisors in family firms. The dependent variable of Model (2) is the family-member-level indicator of family members departing from management positions (*Turnover2*). Definitions of all independent variables in Model (2) are the same as those in Model (1).

We report estimated results of Model (1) in Columns 1 to 4 of Table 2. Column 1 is the baseline regression without any control variables. We find that the coefficient of the VC dummy is positive and statistically significant. In Column 2, this result still holds, after adding control variables. These results suggest that family members are more likely to depart from top management positions in VC-backed firms than in non-VC-backed firms. The coefficients reported in Table 2 are logit estimates of the effect of a marginal change in the corresponding factor on the probability of family members departing from management positions. Thus, based on the coefficient estimate in Column 2, the probability of family members departing from management positions in VC-backed firms is 8.9% higher than that in non-VC-backed firms. As for control variables, only *Business connection* is statistically significant. The positive coefficient estimate might suggest that family firms with wide business networks rely less on other family members, and thus other family members are more likely to depart from family businesses.

In Column 3, we further investigate whether the relative power of VCs versus the founding family affects VCs' ability to force family members to depart from top management positions. To examine this, we use a logit regression model similar to Model (1), but the main independent variable is total shareholdings of VCs immediately after the first-round of VC

investment (*VC shareholdings*), which is a proxy for VCs' power to make changes in the firms. The coefficient estimate of *VC shareholdings* is positive and statistically significant at 1% level, suggesting that the probability of family members departing from top management positions increases with *VC shareholdings*.

In Column 4, we further analyze whether VC board representation affect VCs' ability to force family members to depart from top management positions. We use a logit regression model similar to Model (1), but interacting *VC dummy* with *VC director* (an indicator variable taking the value of one if VCs have board representation, and zero otherwise) and with *No-VC director* (an indicator variable taking the value of one if VCs do not have board representation, and zero otherwise), respectively. The regression coefficient of *VC dummy×VC director* estimates the effect of VC-backing on the departure of family members from management position among VC-backed firms where VCs have board representation; while the estimated coefficient of *VC dummy×No-VC director* estimates such an effect among VC-backed firms where VCs do not have board representation. The results in Column 4 show that the coefficient estimate of *VC dummy×VC director* is positive and significant at 1% level; while the coefficient estimate of *VC dummy×no-VC director* is negative and not significant. The results suggest that VCs are able to force some family members to depart from top management positions only when VCs serve on the board of directors.

In Columns 5 to 8, we report results for Model (2), which is a family-member-level analysis. We show that our findings from firm-level analysis still hold. The economic significance is also not negligible. For example, in Column 6, we find that the turnover probability of family members in VC-backed firms is 3.7% higher than those in non-VC-backed firms.

Overall, our results based on both firm-level and family-member-level analyses suggest that VC-backed family firms are more likely to force family members to depart from top management positions compared to non-VC-backed family firms, providing support for hypothesis **H1**. Our results also suggest that that the larger *VC shareholdings*, the more likely family members are to depart from top management positions, providing support for hypothesis **H2**. Finally, the results show that family members are more likely to leave top management positions when VCs are represented on the board of directors, providing support

for hypothesis **H3**.

5.1.2 Propensity Score Matching Analysis of the Effect of VC Investments on Departures of Family Members from Management Positions

We recognize that the decision of VCs to invest in family firms is not entirely exogenous and may depend on characteristics of these firms, such as, their industry, size, the proximity to VC firms, and the difficulty perceived by VCs in changing firm corporate governance. Ideally, to study the effect of VC-backing on the probability of family members departing from management positions, we need to measure the probability of family members departing from management positions of the same firm with versus without VC-backing. However, we observe each firm only once. After a firm has received VC financing, we will not be able to observe it without VC financing. Since the decision to receive VC financing is endogenous, it may introduce bias into our analysis when comparing the probability of family members departing from management positions in VC-backed firms with that in non-VC-backed firms.

Several papers (see, e.g., Rubin (1974, 1977) and Rosenbaum and Rubin (1983)) have shown that in such situations comparing firms matched on their propensity of being treated (in our case, the propensity of receiving VC financing) tends to eliminate the potential bias. Following the methodology described in Lee and Wahal (2004) and Chemmanur, Simonyan, and Tehranian (2013), we match each VC-backed firm in our sample with one or several non-VC-backed firms using the one-to-one "nearest neighborhood" propensity score, Gaussian kernel, and regression-adjusted local linear matching approaches. This methodology involves two stages. In the first stage, we run probit regressions with an indicator variable as the dependent variable, which equals one for VC-backed firms and zero for non-VC-backed firms, on a set of independent (matching) variables. The set of independent (matching) variables includes CSRC industry code dummy variables, the dummy variables indicating the province in which a family firm's headquarter is located, the natural logarithm of total assets three years prior to IPO, the natural logarithm of firm age three years prior to IPO, the number of family members who are co-founders of the family firm, the total ownership of founding family members when the family firm was first set up, the education background of founders (a dummy variable which equals one if the founder has

received a bachelor degree or above, and zero otherwise). The last three variables are used to capture the difficulty VCs perceive in changing firm corporate governance. All matching is conducted with replacement and common support.[35]

Using each matching estimator, we calculate the mean difference between the probability of family members departing from management positions in VC-backed firms and matched non-VC-backed firms, and then compute bootstrapped standard errors (with 50 replications) of these mean differences to conduct our statistical tests. Panel A of Table 3 reports these mean differences along with their test statistics. Based on the matching methods, we find non-VC-backed matching firms for 206 VC-backed firms. The pseudo-R^2 of the first-stage regression is 0.13, suggesting that our matching variables are good predictors of VC-backing. For brevity, we do not report results for the first-stage regressions.

Panel A of Table 3 shows that with the propensity score method, the average difference in the probability of family members departing from management positions is 10.7%. The standard error of this estimate is 4.9%, and the 95% confidence interval is between 1.1% and 20.3%. The average estimates using the Gaussian kernel and regression-adjusted local linear matching approach are 8.9% and 9.3%, respectively, and these estimates are statistically significant.

Further, we use our one-to-one propensity score matched sub-sample (206 VC-backed firms and 126 non-VC-backed firms) to run regressions with the indicator variable of family members departing from management positions (*Turnover1*) as the independent variable, on *VC dummy* and a set of control variables as described in Model (1). Since in this sub-sample some non-VC-backed firms are used as a match for several VC-backed firms, we make use of weighted least squares (WLS) regressions where the weight for each VC-backed firm is equal to one, whereas the weight for each non-VC-backed firm is equal to the number of times it is used as a match for VC-backed firms in this sub-sample. The results of the regression are reported in Panel B of Table 3. We find that *VC dummy* is positive and statistically significant, implying that VC-backing increases the probability of family members departing from top management positions, even after controlling for the potential endogeneity of VC-backing

[35] We run probit regressions with the option of "common support," which drops treatment observations (VC-backed firms) whose propensity scores are higher than the maximum or less than the minimum propensity score of the controls (non-VC-backed firms).

and other firm characteristics variables. In summary, the results of the propensity score matching analysis provide further support for Hypothesis **H1**.

5.1.3 The Effect of VC Investments on Departures of Different Types of Family Members from Management Positions

We start by analyzing the original management positions from which family members are more likely to depart from due to VC investment. We classify the 1,378 sample family members into three sub-samples based their management positions: board directors (1,059), top executives (659), and members of board of supervisors (166). The total number of firm management positions, 1,920 (1,059 + 695 + 166), exceeds the total number of family members who hold management positions (1,378), because a family member may hold multiple positions. We estimate the logit model which regresses *Turnover2* on *VC dummy* (an indicator of VC-backed firms) or *VC shareholdings* (total shareholdings of VCs after the first round of VC investments), for the above three subsamples, respectively. We also control for a set of variables as described in Model (2). Table 4 reports the regression results.

We find that the effect of VC-backing on the probability of family members departing from top executive positions is not significant (Columns 1 and 2). However, the relative power of VCs versus the founding family, as proxied by *VC shareholdings*, has a positive and statistically significant effect on the probability of family members departing from top executive positions (Column 3). These results indicate that VCs are able to achieve departures of family members from important positions, such as top executive positions, only when they have greater power relative to the founding family.

The results in Columns 4, 5, and 6 show that both VC-backing and VC shareholdings do not have statistically significant effects on the probability of family members departing from board directors. By contrast, the effect of VC-backing and VC shareholdings on the probability of family members departing from the board of supervisors is positive and statistically significant (Columns 7, 8, and 9). These results suggest that it is easier for VCs to force family members who serve on the board of supervisors to leave, as the job function of supervisors is mainly monitoring and advising, and supervisors have less power than top executives and board directors.

Further, we analyze the effect of the relative power of VCs versus the founding family on the importance of positions from which family members depart, by utilizing an ordered logit regression model. The dependent variable is the order of importance of departed positions: 3 if family members depart from top executives, 2 if they depart from directors of board, 1 if they depart from board of supervisors, and 0 if they do not depart from any positions. Our results show that *VC shareholdings* (proxy for VCs' power) have a positive and statistically significant effect on the order of importance of the positions from which family members depart (Column 10 in Table 4). In particular, when *VC shareholdings* are larger, family members are more likely to depart from top executive positions, while when *VC shareholdings* are smaller, family members only depart from the board of supervisors or do not depart at all. Overall, results in Table 4 provide support for hypothesis **H4**.

Next, we analyze the effect of VC investments on departures of family members with different relationships to the founder. We divide sample family members into three subsamples: blood-based family members (480), marriage-based family members (403), and founders (495). We estimate Model (2) in these three subsamples, respectively.

The results are presented in Table 5. We find that the effect of VC-backing on the probability of blood-based relatives departing from management positions is positive but not statistically significant (Columns 1 and 2). However, *VC shareholdings* have positive and significant effect on the probability of blood-based relatives departing from management positions (Column 3), suggesting that VCs could achieve departures of blood-based relatives from family firms only when VCs have greater power relative to the founding family. We further show that the effects of VC-backing and *VC shareholdings* on the probability of marriage-based relatives departing from management positions are positive and statistically significant (Columns 4, 5, and 6). However, VC-backing and *VC shareholdings* have no significant effect on the probability of founders departing from management positions (Columns 7, 8, and 9). In summary, these results together suggest that when VCs have less power relative to the founding family, they could only force marriage-based relatives to leave, while when VCs have stronger power, they could even force both marriage-based and blood-based relatives to leave. The insignificant effect of VC investments on the probability of founders departing from management positions may suggest that even if VCs have

stronger power (i.e., larger shareholdings), it is still difficult for them to force founders to leave, as VCs' shareholdings are usually lower than the founding family. It could also suggest that VCs may not attempt to force founders to leave, because founders are recognized as valuable for the outperformance of family firms (see e.g., Villalonga and Amit (2006) and Fahlenbrach (2009)).

Further, we analyze the effect of the relative power of VCs versus the founding family on the order of departures of family members with different levels of importance in relation to the founder, by utilizing an ordered logit regression model. The dependent variable is the order of importance in relation to founders: 3 if founders depart, 2 if blood-based family members depart, 1 if marriage-based family members depart, and 0 if family members do not depart from management positions. We find that the coefficient estimate of *VC shareholdings* is positive and highly significant, suggesting that the larger the *VC shareholdings*, the more likely founders or blood-based family members are to depart from top management positions.[36] On the other hand, if VCs' shareholdings are smaller, only marriage-based family members are to depart from management positions, or none of the family members depart. Overall, results in Table 5 provide support for hypothesis **H5**.[37]

5.2 The Effect of VC Investments on Family Control Rights and Cash-flow Rights

5.2.1 Ordinary Least Squares (OLS) Regression Analysis of the Effect of VC Investments on Family Control Rights and Cash-flow Rights

In this subsection, we examine the effect of VC investments on the change of the founding family's control rights, cash-flow rights, and the separation between control rights and cash-flow rights. We estimate an ordinary least squares (OLS) regression model specified as follows:

[36] Based on results from Columns 1-3 and Columns 7-9 in Table 5, the findings here are driven primarily by departures of blood-based family members, as opposed to founders, from top management positions.

[37] For brevity, in untabulated results of this paper (Table A1 in the Internet Appendix), we compute numbers and percentages of different types of departing family members. We find that differences in frequencies of family members departing from management positions between VC-backed and non-VC-backed firms are mainly driven by family members serving on boards of supervisors, and marriage-based family members are more likely to depart in VC-backed firms than in non-VC-backed firms. These findings are consistent with the results reported in Tables 4 and 5.

$$Dependent\ variable = \beta_0 + \beta_1 VC\ dummy/VC\ shareholding + \beta_2 Political\ connection + \beta_3 Business\ connection + \beta_4 Education + \beta_5 Firm\ age + \beta_6 Size + \beta_7 Leverage + \beta_8 Prior\ ROA + Industry\ dummy + \varepsilon_{i,t} \quad (3)$$

where the dependent variables in different specifications are various proxies for the change of family control rights and cash-flow rights: the percentage change of family control rights (△*Control rights*), the percentage change of family cash-flow rights (△*Cash-flow rights*), the change of the separation between family control rights and cash-flow rights (△*Separation*), and an indicator variable of whether the founding family loses voting control (*Control loss*). The main independent variables in different specifications are different measures of VC investments, which include *VC dummy* (an indicator variable of whether a family firm is VC-backed) and *VC shareholdings* (total shareholdings of VCs after first round of VC investments in the family firm).

The estimated results of Model (3) are presented in Table 6. Columns 1 to 4 report the estimated results with the change of family control rights (△*Control right*) as the dependent variable. We find that VC-backing has a negative and statistically significant effect on the change of family control rights (Columns 1 and 2). The economic significance is also substantial. The decrease of family control rights in VC-backed family firms is 8% larger than that in non-VC-backed family firms. We further investigate whether the relative power of VCs versus the founding family, as proxied by *VC shareholdings*, affect VCs' ability to make changes in family control rights. We find that *VC shareholdings* have a negative and statistically significant effect on the change of family control rights (Column 3). A 1% increase in *VC shareholdings* is associated with a 0.5% decrease in family control rights.

Next, we investigate whether the effect of VC-backing on family control rights is stronger if VCs serve on the board of directors. We interact *VC dummy* with *VC director* (an indicator variable of whether VCs have board representation) and with *no-VC director* (an indicator variable of whether VCs do not have board representation), respectively. The results presented in Column 4 show that the coefficient estimate of *VC dummy*×*VC director* is negative and statistically significant; while the coefficient estimate of *VC dummy*×*no-VC director* is negative but not significant. These results indicate that the effect of VC-backing on the reduction of family control rights is statistically significant only when VCs serve on

the board of directors.

In terms of control variables, the coefficient of firm size is significantly positive, suggesting that the founding family loses less control rights when they have stronger negotiation power arising from larger size. Interestingly, we find that founders with better education background experience smaller decline of family control rights, than those with lower education background. This result may suggest that a founder with lower education background may not be able to satisfy the demand of firm growth and development, and therefore, the reduction of founding family control rights is optimal for shareholder value maximization.

In Columns 5 to 8, we use the same specifications to estimate the effect of VC investment on the change of family cash-flow rights (*⊿Cash-flow rights*). We find that both VC-backing and *VC shareholdings* are negatively associated with the extent of reduction of family cash-flow rights (Columns 5, 6, and 7). The extent of reduction of family cash-flow rights in VC-backed family firms is 6.5% to 6.8% larger than that in non-VC-backed family firms (based on the coefficient estimates of *VC dummy* in Columns 5 and 6). We also show that the effect of VC-backing on the reduction of family cash-flow rights is statistically significant only when VCs serve on the board of directors (Column 8).

Columns 9 to 12 report estimated results with the change of the separation between family control rights and cash-flow rights (*⊿Separation*) as the dependent variable. We show that both VC-backing and *VC shareholdings* are negatively associated with the extent of reduction of the separation between family control rights and cash-flow rights (Columns 9, 10, and 11). The decrease in the separation between family control rights and cash-flow rights is around 0.7-0.8% larger for VC-backed firms than that for non-VC-backed firms (based on coefficient estimates of *VC dummy* in Columns 9 and 10). Also, the effect of VC-backing on the reduction of the separation between family control and cash-flow rights is statistically significant only when VCs serve on the board of directors (Column 12).

Columns 13 to 16 present results with *Control loss*, an indicator variable of whether the founding family loses voting control (family shareholdings decline from above 50% to below 50%), as the dependent variable. The reported coefficients are logit estimates of the effect of a marginal change in the corresponding independent variable on the probability of the

founding family losing voting control, computed at the sample mean of the independent variable. We find that the effects of VC-backing and *VC shareholdings* on the probability of the founding family losing voting control are all positive and highly significant (Columns 13, 14, and 15). The effects are also economically meaningful. The probability of the founding family losing voting control in VC-backed family firms is 9.9% higher than that in non-VC-backed family firms (based on coefficient estimates of *VC dummy* in Columns 13 and 14). The results in Column 16 show that VC-backing has a positive effect on the probability of the founding family losing voting control, regardless of whether VCs serve on the board or not.

The control variables in Columns 13 to 16 have expected signs. Firm age is positive and significant, suggesting that older family firms are more likely to lose voting control. This is not surprising, as the concentration of ownership usually trends down over time. It may also reflect that, due to the larger contribution of the founding family in the longer run, the founding family could have large influence on company decisions even without voting control. Firm size has significantly negative coefficients, suggesting that founding families of larger firms have stronger negotiation power with VCs, and they therefore are less likely to lose voting control.

Overall, the results in Table 6 suggest that after receiving VC financing, family control rights and cash-flow rights experience significant changes in two aspects. First, the founding family withdraws part of control rights and cash-flow rights, which could reduce the negative effect of dominated ownership and lead to the balance of power between the founding family and outside shareholders. Second, the separation between the founding family's control rights and cash-flow rights drops significantly, which could reduce the probability that the founding family uses control-enhancing mechanisms such as pyramid structures to engage in tunneling behaviors. These results provide support for our hypotheses **H6**, **H7**, and **H8**. We also show that family firms where VCs have greater equity ownership (proxied by *VC shareholdings*) experience greater reductions in founding families' control rights, cash-flow rights, and the separation between their control rights and cash flow rights, providing support for hypothesis **H9**. Finally, the above changes in family control rights and cash-flow rights are greater in family firms where VCs are represented on the board of directors, suggesting that board

representation is helpful for VCs to exert sufficient influence and pressure on the founding family to reduce its control rights and cash-flow rights in the family firm. These results provide support for hypothesis **H10**.

5.2.2 Propensity Score Matching Analysis of the Effect of VC Investments on Family Control Rights and Cash-flow Rights

As discussed in Section 5.1.2, the decision of VCs to invest in family firms may not be entirely exogenous. To control for the potential endogeneity of VC-backing, we employ propensity score matching methods to examine the difference of the change of the founding family's control rights, cash-flow rights, the separation between control rights and cash-flow rights, as well as the probability of the founding family losing voting control between VC-backed and matched non-VC-backed firms. We match each VC-backed firm with a non-VC-backed firm using propensity score matching methods. In the first stage, we run probit regressions with the same specifications as those in Section 5.1.2 and Table 3. We then use the one-to-one propensity score matched sub-sample to run regressions of various proxies for the change of family ownership on *VC dummy*, and a set of controls as described in the previous section. We employ weighted least squares (WLS) regressions where the weight for each VC-backed firm is equal to one, whereas the weight for each non-VC-backed firm is equal to the number of times it is used as a match for VC-backed firms in this sub-sample.

The results are reported in Table 7. In Column 1, the change of family control rights (⊿ *Control rights*) is the dependent variable. The sample here consists of 202 VC-backed firms and 119 unique non-VC-backed firms. We show that the VC dummy is still negative and statistically significant, indicating that family control rights drop to a greater extent in VC-backed firms than in non-VC-backed firms, even after controlling for the potential endogeneity of VC-backing. In Columns 2, 3, and 4, the dependent variables are the change of family cash-flow rights (⊿*Cash-flow rights*), the change of the separation between family control rights and cash-flow rights (⊿*Separation*), and an indicator variable of whether the founding family loses voting control (*Control loss*), respectively. The samples consist of 202 VC-backed firms and 119 non-VC-backed firms in Column 2, 203 VC-backed firms and 128 non-VC-backed firms in Column 3, and 171 VC-backed firms and 91 non-VC-backed firms

in Column 4. In Columns 2 and 3, the coefficient estimates of VC dummies are both negative and highly significant, suggesting that even after controlling for the potential endogeneity of VC-backing and firm characteristics, family cash-flow rights and the separation between family control rights and cash-flow rights both drop to a greater extent in VC-backing firms than in non-VC-backed firms. In Column 4, the coefficient estimate of the VC dummy is positive and significant, suggesting that even after controlling for the potential endogeneity of VC-backing and firm characteristics, the probability of the founding family losing voting control increases to a greater extent in VC-backing firms than in non-VC-backed firms.[38]

Overall, our findings in this section suggest that after controlling for the endogeneity of VC-backing, VC-backing still has significant effect on the change of family control rights, cash-flow rights, the separation between the two, and the probability of the family losing voting control, which provide further support for hypotheses **H6, H7,** and **H8**.

5.2.3 The Effect of VC Investments on Shareholdings of Family Members with Different Relationships to the Founder

We conduct family-member level analysis in this subsection, examining the effect of VC investment on the change of shareholdings of family members with different relationship to the founder. We regress the change of shareholdings of a certain family member during the pre-IPO period (*△Shareholding*) on *VC dummy* or *VC shareholdings*, as well as a set of controls as described before. The results of ordinary least square (OLS) regressions are reported in Table 8.

Columns 1 to 3 report results for the whole sample (1,341 family members who hold ownership stakes). We find coefficient estimates of *VC dummy* and *VC shareholdings* are significantly negative. The economic significance is non-negligible. In VC-backed firms, the decline of family members' shareholdings is about 7% larger than that in non-VC-backed

[38] We also conduct univariate tests for propensity score matching analysis. We match each VC-backed firm with one or several non-VC-backed firms using three matching methods: propensity score, Gaussian kernel, and regression-adjusted local linear. These results are not tabulated in this paper, for brevity (Table A2 in the Internet Appendix). Our univariate results show that mean differences of changes of family control rights, cash-flow rights, separation between the two, and the probability of the founding family losing voting control between VC-backed firms and matched non-VC-backed firms are statistically significant, regardless which matching method is employed. Univariate results are consistent with multivariate results of propensity score matching reported in Table 7.

firms (Columns 1 and 2). A 1% increase in *VC shareholdings* is associated with a 0.6% decrease in family members' shareholdings (Column 3).

In Columns 4 to 12, we further divide the whole sample into three sub-samples: blood-based family members subsample (Columns 4, 5, and 6), marriage-based family members subsample (Columns 7, 8, and 9), and founders subsample (Columns 10, 11, and 12). The coefficients on *VC dummy* are negative and statistically significant only in the subsample of blood-based family members and the subsample of founders, but not statistically significant in the subsample of marriage-based family members. These results suggest that the declines of shareholdings of founders and blood-based family members are larger in VC-backed firms than in non-VC-backed firms. The negative but insignificant effect of VC-backing on shareholdings of marriage-based relatives may be due to the fact that original shareholdings of marriage-based relatives are low.[39] Further, we find that the coefficients of *VC shareholdings* are negative and statistically significant in all three subsamples, suggesting that greater power of VCs relative to the founding family (proxied by *VC shareholdings*) is associated with larger declines in shareholdings of founders, blood-based relatives, and marriage-based relatives.

The results of family-member level analysis in Table 8 suggest that VCs could encourage founders, and both blood-based and marriage-based family members to give up parts of their shareholdings, for the sake of establishing a more balanced ownership structure in family firms. These results, therefore, provide support for hypothesis **H11**.

5.3 Instrumental Variable Regression Analysis of the Effect of VC Investments on Corporate Governance Changes of Family Firms

Our results so far have shown that VC-backing has a significant effect on corporate governance changes of family firms, and we also use propensity score matching analysis to correct for potential endogeneity of receiving VC financing based on observable characteristics of family firms. However, it is possible that VCs' decision to invest in a family firm is based on unobservable characteristics of the family firm. If this is the case,

[39] In our sample, the shareholdings of founders, blood-based relatives, and marriage-based relatives at the beginning of the three-year period pre-IPO are 51%, 12%, and 12%, respectively.

then our logit and OLS analysis could suffer from a further endogeneity problem, as the VC-backing dummy could potentially be correlated with the residual term, causing logit and OLS coefficient estimates to be biased.

We utilize instrumental variable regressions to deal with potential endogeneity problems. A valid instrument needs to satisfy two conditions: it should be correlated with the VC-backing dummy (the validity requirement), but it should not be correlated with the residual term in the regression of corporate governance changes (the exclusion restriction). Following Chemmanur, Krishnan, Nandy (2011), we choose two instruments that are correlated with the demand and supply of venture funds in the economy, but are independent of future changes of corporate governance in VC-backed family firms, namely, the number of VC companies in the family firm's headquarter province in the year of firm founding or incorporation, and the amount of research grants from the provincial government divided by GDP of the family firm's headquarter province in the year of firm founding or incorporation. In particular, we expect that family firms located in provinces with greater numbers of VC companies are more likely to receive VC funding. We also expect that the greater supply of research grants from the local government to entrepreneurial firms leads to less demand for VC funds. Since the number of local VC companies and research grants from local governments capture exogenous variations in terms of both the supply of, and the demand for, VC funds, we do not expect these two IVs to directly affect future changes of corporate governance in family firms.

We obtain data on inception date and headquarter location of VC companies from the WIND VC database which covers over 4,299 VC companies. We then calculate the number of VC companies headquartered in each province each year. We also obtain data on the amount of research grants supplied by provincial governments and GDP of each province during our sample period from the National Bureau of Statistics of China.

The results of our instrumental variable analysis are presented in Table 9. Column 1 presents first stage regressions of the VC-backing dummy on the two instruments and other control variables. The two instruments are confirmed to be significant determinants of whether family firms receive VC investments. The reported partial F-test statistics in the first stage confirm that *Number of local VCs* and *Government research grant/GDP* are strong

instruments, with an F-statistic of 14.04, exceeding the cutoff of 11.59.[40]

We report the second stage results of IV regressions of the probit model in Columns 2 and 6, where the dependent variables are dummy variables (*Turnover1* and *Control loss*, respectively), and the second stage results of IV regressions with two-stage least squares (2SLS) estimator in Columns 3, 4, and 5, where the dependent variables are continuous variables (*△Control rights*, *△Cash-flow rights*, and *△Separation*, respectively). Consistent with our previous findings, our second stage regressions here indicate that, even after controlling for potential endogeneity of VC-backing, it still has a significantly positive effect on the probability of family members departing from top management positions, and the probability of the founding family losing voting control, and a significantly negative effect on the change of family control rights, cash-flow rights, and the separation between the two.

Although we cannot directly test whether the instruments are uncorrelated with the error terms in regression models in Columns 2 to 6, we can conduct the over-identification test since the number of instruments is greater than the number of endogenous regressors. The joint null hypothesis of the over-identification test is that the excluded instruments are valid instruments, i.e., uncorrelated with the error term and correctly excluded from the estimated equation. A rejection would cast doubt on the validity of the instruments (see, e.g., Wooldridge (2002)). The reported Amemiya-Lee-Newey minimum chi-square statistic (for IV-Probit) and Hansen-J statistics (for IV-2SLS) in Columns 2 to 6 cannot reject the null hypothesis. Therefore, we could not reject the hypothesis that our two instruments are uncorrelated with the error term.

Since *VC shareholdings* can be potentially endogenous as well, we also employ instrumental variable regressions similar to those in Table 9 to deal with potential endogeneity of *VC shareholdings*. The two instruments for *VC shareholdings* are the same as those for the VC-backing dummy. We find that even after controlling for potential

[40] Larcker and Rusticus (2010) demonstrate that when the instrument is only weakly correlated with the endogenous variable, IV methods can produce highly biased estimates even when the variable is only slightly endogenous. This is the so-called weak-instrument problem. In their survey of the weak-instrument literature, Stock, Wright, and Yogo (2002) develop benchmarks for the F-statistic: when the number of instruments is 1, 2, 3, 5, and 10, the suggested critical F-values are 8.96, 11.59, 12.83, 15.09, and 20.88, respectively. If the first-stage partial F-statistic falls below these critical values, the instruments are considered to be weak and the validity of inference is potentially compromised.

endogeneity, *VC shareholdings* still have a significantly positive effect on the probability of family members departing from top management positions, and the probability of the founding family losing voting control, and a significantly negative effect on the change of family control rights, cash-flowing rights, and the separation between the two. These results are omitted for brevity. Overall, our instrumental variable regression analysis provides further support for hypotheses **H1**, **H2**, **H6**, **H7**, **H8**, and **H9**.

5.4 The Effect of Corporate Governance Changes due to VC-backing on Firm Valuation and Performance

In this section, we test our hypothesis regarding the effect of corporate governance changes due to VC-backing on IPO firm valuation and post-IPO operating performance. The OLS regression takes the following form:

$$\begin{aligned} \textit{Post-IPO operating performance (or Valuation)} = {} & \beta_0 + \beta_1 Y' + \beta_2 \textit{Political connection} + \beta_3 \textit{Business connection} \\ & + \beta_4 \textit{Education} + \beta_5 \textit{Firm age} + \beta_6 \textit{Size} + \beta_7 \textit{Leverage} + \beta_{10} \textit{Prior ROA} + \textit{Industry dummy} + \varepsilon_{i,t} \end{aligned} \quad (4)$$

The dependent variables in different specifications are: firm valuation in the secondary market immediately after IPO (industry-adjusted Tobin's Q, denoted as *QFTDADJ* and *QIMADJ*), and post-IPO operating performance. The key independent variable, *Y'*, is changes of corporate governance in family firms, which in different specifications are: $\triangle$*Control rights* (the change of family control rights), $\triangle$*Cash-flow rights* (the change of family cash-flow rights), $\triangle$*Separation* (the change of the separation between family control rights and cash-flow rights), *Control loss* (an indicator variable of the family losing voting control), and *Turnove1* (departures of family members from top management positions). Control variables include political connections of family members (*Political connection*), business connections of the founder (*Business connection*), education background of the founder (*Education*), natural logarithm of firm age (*Firm age*), natural logarithm of total assets (*Size*), leverage ratio (*Leverage*), return on assets (*prior ROA*), and industry fixed effects based on CSRC industry classifications.

We analyze the effect of corporate governance changes on IPO firm valuation in the secondary market immediately after IPO in the subsample of VC-backed firms and the

subsample of non-VC-backed firms separately. The estimated results are reported in Table 10. Panel A of Table 10 shows that a decrease of family control rights leads to a significant increase in the valuation of VC-backed firms (Columns 1 and 2). However, this effect is not significant among non-VC-backed firms (Columns 3 and 4). The differences between the coefficient estimates of $\triangle$*Control rights* among VC-backed firms versus non-VC-backed firms are significantly different from zero for Column 1 versus Column 3, with industry-adjusted Tobin's Q on the first trading day (*QFTDADJ*) as dependent variables. This suggests that the effect of the reduction of family control rights on the improvement of firm valuation on the IPO day is stronger among VC-backed firms than that among non-VC-backed firms. Table 10 Panel B shows that the reduction of family cash-flow rights has no significant effect on IPO firm valuation both among VC-backed and among non-VC-backed firms.

Panel C of Table 10 shows that the change of the separation between family control rights and cash-flow rights has a significantly positive effect on IPO firm valuation in the secondary market in the subsample of VC-backed firms. However, this effect becomes insignificant in the subsample of non-VC-backed firms. In Panel D of Table 10, we show that founding family losing voting control of the firm pre-IPO has a significantly positive effect on firm valuation among VC-backed firms, while this effect is again insignificant among non-VC-backed firms. We also find that the effect of family losing voting control on the improvement of firm valuation on the first trading day is stronger among VC-backed firms than that among non-VC-backed firms. In Panel E of Table 10, we find that departures of family members from top management positions have no statistically significant impact on IPO firm valuation both among VC-backed and among non-VC-backed firms.

Finally, we explore whether the effect of corporate governance changes due to VC on the improvement of firm valuation would increase with the relative power of VCs versus the founding family (as proxied by VCs' equity ownership) and with VC board representation. We use the same specification but add interactions of corporate governance changes (*Y'*) with *VC shareholdings* (or *VC director*), as well as *VC shareholdings* (or *VC director*) into the model. We find that none of the coefficient estimates of the interaction terms (*Y'*$\times$*VC*

shareholdings or *Y'*×*VC director*) are statistically significant (not tabulated).[41]

Our findings in Table 10 can be summarized as follows. First, the decrease of family control rights, and the separation between family control rights and cash flow rights significantly increase firm valuation immediately after IPO. However, these effects only exist among VC-backed family firms, or are stronger among VC-backed firms versus those among non-VC-backed firms. These results may suggest that, along with changes of family firms' ownership and control structure they help family firms make, VCs help family firms make other changes, which in turn make such changes translate more effectively into higher firm valuation. For example, VCs may not only be able to help family firms reduce the founding family's ownership, but may also be able to secure equity investments from new high value-added shareholders who may be able to intensively monitor the founding family and top executives, or bring in business resources helpful to the firm.[42]

Second, contrasting the insignificant effect of departures of family members from top management positions on firm valuation with the significant effect of reductions in family control rights and the separation between family control rights and cash-flow rights on firm valuation, one may conclude that reductions in family control rights are a more effective corporate governance reform than departures of family members from top management positions. Overall, the results in Table 10 support our hypotheses **H12** and **H13**.

Our empirical results on the effect of corporate governance changes due to VC-backing on post-IPO operating performance of firms are similar to our results above on equity valuation post-IPO. While, due to space constraints, we do not tabulate and discuss them here, these results on post-IPO operating performance also support our hypotheses **H12** and **H13**.[43]

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[41] The results may be driven by two offsetting effects of VC-backing on firm valuation. First, as we have found, the reduction of family control rights, and the separation between family control rights and cash flow rights due to VC-backing translate more effectively into higher firm valuation immediately after IPO. Second, the investors in the secondary market have concerns that VCs will exit after the IPO, which will result in the ending of VCs' value-added monitoring, and VCs often resign from the board after they exit.

[42] We also could not rule out the possibility that the insignificant effect of corporate governance changes on firm valuation is driven by the effect that family control rights, cash-flow rights, and the separation between the two experiences less change during the pre-IPO 3-year period in non-VC-backed firms compared to VC-backed firms.

[43] These results are presented in Table A3 of the Internet Appendix, and discussed in detail there.

6. Conclusions

Using a theoretical framework based on Rajan (2012), we have empirically analyzed how venture capital investments help to standardize family firms by transforming their corporate governance and top management. We find that family members are more likely to depart from management positions in VC-backed compared to non-VC-backed firms. Further, family control rights, cash-flow rights, and the separation between them drop more in VC-backed firms in the three years pre-IPO. These effects are stronger when VCs have greater bargaining power or board representation. Using Propensity-Score matching and Instrumental Variable analyses, we show that the above effects of VC-backing are causal. Finally, we find that the standardization of VC-backed family firms yields higher IPO firm valuation and post-IPO operating performance.

References

Anderson, R., Duru, A., Reeb, D., 2009. Founders, heirs, and corporate opacity in the United States. *Journal of Financial Economics* 92, 205-222.

Anderson, R., Reeb, D., 2003. Founding-family ownership and firm performance: Evidence from the S&P 500. *Journal of Finance* 58, 1301-1327.

Anderson, R., Reeb, D., 2004. Board composition: balancing family influence in S&P 500 firms. *Administrative Sciences Quarterly* 49, 209-237.

Baker, M., Gompers, P., 2003. The determinants of board structure at the initial public offering. *Journal of Law and Economics* 46, 569-598.

Barontini, R., Caprio, L., 2006. The effect of family control on firm value and performance: evidence from continental Europe. *European Financial Management* 12, 689-723.

Bertrand, M., Johnson, S., Samphantharak, K., Schoar, A., 2008. Mixing family with business: A study of Thai business groups and the families behind them. *Journal of Financial Economics* 88, 466-498.

Chemmanur, T. J., Krishnan, K., Nandy, D., 2011. How does venture capital financing improve efficiency in private firms? A look beneath the surface. *Review of Financial Studies* 24, 4037-4090.

Chemmanur, T. J., Simonyan, K., Tehranian, H., 2013. The role of management quality in the IPOs of venture-backed entrepreneurial firms. Available at SSRN: http://ssrn.com/abstract=2245374 or http://dx.doi.org/10.2139/ssrn.2245374.

Claessens, S., Djankov, S., Fan, J., Lang, L., 2002. Disentangling the incentive and entrenchment effects of large shareholdings. *Journal of Finance* 57, 2741-2771.

Claessens, S., Djankov, S., Lang, L., 2000. The separation of ownership and control in east Asian corporations. *Journal of Financial Economics* 58, 81-112.

Faccio, M., Lang, L., 2002. The ultimate ownership of Western European corporations. *Journal of Financial Economics* 65, 365-395.

Faccio, M., Lang, L., Young, L., 2001. Dividends and expropriation. *American Economic Review* 91, 54-78.

Fahlenbrach, R. 2009. Founder-CEOs, investment decisions, and stock market performance. *Journal of Financial and Quantitative Analysis* 44, 439-466.

Fama, E. F., Jensen, M. C., 1983. Separation of ownership and control. *Journal of Law and Economics* 26, 301-325.

Gomez-Mejia, L., Haynes, K., Nunez-Nickel, M., Jacobson, K., Moyano-Fuentes, J., 2007. Family owned firms: risk loving or risk averse? *Administrative Science Quarterly* 52, 206-137.

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

Grossman, S. J., Hart, O. D., 1988. One share-one vote and the market for corporate control. *Journal of Financial Economics* 20, 175-202.

Harris, M., Raviv, A., 1988. Corporate governance: voting rights and majority rules, *Journal of Financial Economics* 20, 203-235.

Hellmann, T., Puri, M., 2002. Venture capital and the professionalization of start-up firms: empirical evidence. *Journal of Finance* 57, 169-197.

Hochberg, Y. V., 2012. Venture capital and corporate governance in the newly public firm. *Review of Finance* 16, 429-480.

Jensen, M. C. and Meckling, W. H., 1976, Theory of the firm: managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics* 3, 305-360.

Jiang, G., Lee, C., Yue, H., 2010. Tunneling through inter-corporate loans: the China experience. *Journal of Financial Economics* 98, 1-20.

Johnson, S., Boone, P., Breach, A., Friedman, E., 2000. Corporate governance in the Asian financial crisis. *Journal of Financial Economic*s 58, 141-186.

Kaplan, S., Sensoy, B., Stromberg, P., 2009. Should investors bet on the jockey or the horse? Evidence from the evolution of firms from early business plans to public companies. *Journal of Finance* 64, 75-114.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., 1999. Corporate ownership around the world. *Journal of Finance* 54, 471-517.

La Porta, R., Lopez-De-Silanes, F., Shleifer, A., and Vishny, R., 2002. Investor protection and corporate valuation. *Journal of Finance* 57, 1147-1170.Lansberg, I., 1999. Succeeding generations. *Harvard Business School Press*, Boston, MA.

Larcker, D., Rusticus, T., 2010. On the use of instrumental variables in accounting research. *Journal of Accounting and Economics* 49, 186–205.

Lee, P. M., Wahal, S., 2004. Grandstanding, certification and the underpricing of venture capital backed IPOs. *Journal of Financial Economics 73*, 375–407.

Lehn, K., Zhao, M., 2006. CEO turnovers after acquisitions: Are bad bidders fired? *Journal of Finance* 61, 1759-1811.

Lerner, J., 1995. Venture capitalists and the oversight of private firms. *Journal of Finance* 50, 301-318.

Miller, D., Le Breton-Miller, I., Lester, R., Cannella, Jr. A., 2007. Are family firms really superior performers? *Journal of Corporate Finance* 13, 829-858.

Myers, S., Rajan, R., and Zingales, L., 2005. Financing organizations 1: Start-up. *Working paper*, University of Chicago.

Pérez-González, F., 2006. Inherited control and firm performance. *American Economic Review* 96, 1559-1588.

Rajan, R. G., 2012. Presidential Address: The corporation in finance. Journal of Finance 67, 1173-1217.

Rosenbaum, P., Rubin, D., 1983. The central role of propensity score in observational studies for causal effects. *Biometrica* 70, 41-55.

Rubin, D, 1974. Estimating causal effects of treatments in randomized and nonrandomized studies. *Journal of Educational Psychology* 66, 688-701.

Rubin, D, 1977. Assignment to treatment group on the basis of a covariate. *Journal of Educational Statistics* 2, 1-26.

Shanker, M., Astrachan, J., 1996. Myths and realities: family businesses' contribution to US economy—A framework for assessing family business statistics. *Family Business Review* 9, 107-123.

Shleifer, A., Vishny, R., 1997. A survey of corporate governance. *Journal of Finance* 52, 737-783.

Stock, J., Wright, J., Yogo, M., 2002. A survey of weak instruments and weak identification in generalized method of moments. *Journal of Business & Economics Statistics*, 20, 518–529.

Villalonga, B., Amit, R., 2006. How do family ownership, control and management affect firm value? *Journal of Financial Economics* 80, 385-417.

Villalonga, B., Amit, R., 2009. How are U.S. family firms controlled? *Review of Financial Studies* 22, 3047-3091.

Wang, S., Wang, Y., 2003-2012. Venture capital development in China (2003-2012). *Economy and Management Press*, Beijing, China.

Williamson, O. E., 1983. Organization form, residual claimants, and corporate control. *Journal of Law and Economics 26*, 351-366.

Wooldridge, J. M., 2002. Econometric analysis of cross section and panel data. *The MIT Press*, Cambridge.

Zingales, L., 2000. In search of new foundations. *Journal of Finance* 60, 1623-1653.

Table 1. Summary Statistics

Panels A, B, and C provide summary statistics. The data set is made up of the 499 family firms publicly listed during the period from 2004 to 2012, and 1,378 family members who hold the positions of top executives, members of board of directors, or members of board of supervisors in family firms. *Turnover1* is the firm-level measure of management turnover, which equals one if at least one of the family members are forced to depart in the pre-IPO period, zero otherwise. *Turnover2* is the family-member-level measure of management turnover, which equals one if the family member departs in the pre-IPO period. *△Control rights* is the percentage change of family control rights during the pre-IPO period. *△Cash-flow rights* is the percentage change of family cash-flow rights during the pre-IPO period. *△Separation* is the change of the separation between family control rights and cash-flow rights during the pre-IPO period. *Control loss* is an indicator of the total shareholdings of founding family members declining from above 50% to below 50% during the pre-IPO period. *△Shareholding* is the percentage change of shareholdings of family members during the pre-IPO period. *△Adjusted OROA*, is the change of industry- and performance-adjusted operating return on assets (*OROA*) by subtracting the industry- and performance-adjusted OROA in the year prior to the issue (year -1) from the industry- and performance-adjusted OROA in subsequent years (years 0 through 3). *QFTDADJ*, and *QIMADJ* are two definitions of industry-adjusted Tobin's Q. Tobin's Q is the ratio of the market value of assets to the book value of assets, where the market value of assets is equal to the book value of assets minus the book value of common equity plus the number of shares outstanding times the market price (either IPO first trading day closing price (for *QFTDADJ*), or the closing price at the end of the issue month (for *QIMADJ*)), or times the share price at the end of the issue month (for industry peers). Industry-adjusted Tobin's Q is the difference between IPO firm's Tobin's Q and the median Tobin's Q of its industry peers based on CSRC industry classification. *VC dummy* is an indicator variable which equals one if the family firm is VC-backed, and zero otherwise. *VC shareholdings* is the total shareholding of VCs after the first-round of VC investment in the family firm. *VC director* is a dummy which equals one if the family firm is VC-backed and at least one venture capitalist serve on the board of directors, and zero otherwise. *No-VC director* is a dummy which equals one if the family firm is VC-backed but none of the venture capitalists serve on the board of directors, and zero otherwise. *Political connection* is a dummy variable that equals one if at least one of the family members, who serve as top executives, directors, supervisors or block-holders, was a former government official, military officer, deputy of the NPC (National People's Congress), or member of the CPPCC (Chinese People's Political Consultative Conference), and zero otherwise. *Business connection* is a dummy variable that equals one if the founder is serving or has previously served as the leader of the industry association, and zero otherwise. *Education* takes the value of one if the founder has received a bachelor's degree or above, and zero otherwise. *Firm age* is the number of years from the firm's inception to IPO. *Size* is total assets in millions of RMB. *Leverage* is defined as total debt divided by total assets. *Prior ROA* is net income divided by total assets in the prior year. *Number of local VCs* is the number of VC companies in the family firm's headquarter province in the year of founding or incorporation. *Government Research grant/GDP* is the amount of research grants from provincial government divided by the GDP of the family firm's headquarter province in the year of founding or incorporation.

Variable	Mean	Median	Max	Min	Std. Dev.	N
Panel A: Dependent variables						
Turnover1	0.323	0	1	0	0.468	499
Turnover2	0.128	0	1	0	0.335	1,378
⊿Control rights	-0.057	-0.037	5.449	-0.670	0.318	482
⊿Cash-flow rights	-0.066	-0.054	2.787	-0.670	0.235	482
⊿Separation	0.003	0	0.313	-0.228	0.041	482
Control loss	0.073	0	1	0	0.260	411
⊿Shareholding	-0.047	-0.020	2.710	-1.000	0.457	1,341
⊿Adjusted OROA (IPO -1 to IPO)	-0.057	-0.041	0.121	-0.381	0.064	498
⊿Adjusted OROA (IPO -1 to IPO +1)	-0.051	-0.040	0.240	-0.499	0.067	498
⊿Adjusted OROA (IPO -1 to IPO +2)	-0.048	-0.041	0.270	-0.496	0.068	498
⊿Adjusted OROA (IPO -1 to IPO +3)	-0.027	-0.015	0.317	-0.500	0.073	365
QFTDADJ	0.495	0.196	9.125	-2.119	1.366	499
QIMADJ	0.343	0.070	9.456	-2.367	1.258	499
Panel B: Independent variables						
VC dummy	0.421	0	1	0	0.494	499
VC shareholdings	0.051	0	0.447	0	0.081	499
VC director	0.269	0	1	0	0.444	499
No-VC director	0.152	0	1	0	0.360	499
Panel C: Control variables						
Political connection	0.543	1	1	0	0.499	499
Business connection	0.563	1	1	0	0.496	499
Education	0.581	1	1	0	0.494	499
Firm age	10.816	9	56	2	7.891	499
Size (million RMB)	455.316	249.800	32,530.02	31.790	1,518.159	499
Leverage	0.551	0.566	0.934	0.073	0.159	499
Prior ROA	0.126	0.108	0.520	0.000	0.078	499
Number of local VCs	68.565	42	333	0	67.358	499
Government research grant/GDP	0.004	0.004	0.014	0.001	0.002	499

Table 2. The Effect of VC Investments on Departures of Family Members from Management Positions

Columns 1 to 4 are firm-level regressions, where the dependent variable is *Turnover1*, the firm-level measure of management turnover. Columns 5 to 8 are family-member-level regressions, where the dependent variable is *Turnover2*, the family-member-level measure of management turnover. The reported coefficients are logit regression estimates of the effect of a marginal change in the corresponding regressor on the probability of family management turnover, computed at the sample mean of the independent variables. Coefficients of industry dummies are omitted for brevity. Z-statistics based on robust standard errors are reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Sample	Firm level	Firm level	Firm level	Firm level	Family-member level	Family-member level	Family-member level	Family-member level
Dependent Variable	*Turnover1*	*Turnover1*	*Turnover1*	*Turnover1*	*Turnover2*	*Turnover2*	*Turnover2*	*Turnover2*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VC dummy	0.084**	0.089**			0.037**	0.037**		
	(1.972)	(2.037)			(1.987)	(1.998)		
VC shareholdings			0.733***				0.231**	
			(2.957)				(2.323)	
VC dummy×VC director				0.151***				0.054**
				(2.907)				(2.343)
VC dummy×No-VC director				-0.021				0.008
				(-0.335)				(0.292)
Political connection		-0.039	-0.044	-0.035		-0.026	-0.027	-0.025
		(-0.827)	(-0.922)	(-0.731)		(-1.264)	(-1.311)	(-1.217)
Business connection		0.102**	0.110**	0.107**		0.034*	0.037*	0.035*
		(2.228)	(2.377)	(2.321)		(1.805)	(1.929)	(1.857)
Education		0.020	0.015	0.023		0.009	0.007	0.009
		(0.462)	(0.332)	(0.525)		(0.486)	(0.380)	(0.488)
Firm age		0.033	0.034	0.034		0.009	0.008	0.008
		(0.919)	(0.945)	(0.955)		(0.596)	(0.544)	(0.554)
Size		-0.031	-0.025	-0.031		-0.011	-0.008	-0.011
		(-1.044)	(-0.868)	(-1.061)		(-0.893)	(-0.712)	(-0.898)
Leverage		-0.114	-0.126	-0.111		-0.012	-0.020	-0.012
		(-0.617)	(-0.679)	(-0.600)		(-0.160)	(-0.269)	(-0.158)
Prior ROA		0.465	0.507	0.456		0.142	0.155	0.133
		(1.338)	(1.462)	(1.289)		(1.001)	(1.079)	(0.917)
Industry Dummy		Yes	Yes	Yes		Yes	Yes	Yes
Observations	499	499	499	499	1,378	1,378	1,378	1,378
pseudo R-squared	0.006	0.036	0.043	0.046	0.004	0.017	0.018	0.019

Table 3. Propensity Score Matching Analysis of the Effect of VC Investments on Departures of Family Members from Management Positions

Panel A reports mean differences in probabilities of family members departing from management positions between VC-backed and matched non-VC-backed IPO firms. Each VC-backed family firm is matched with one or more non-VC-backed firms using propensity score, Gaussian kernel, or regression-adjusted local linear matching approaches, respectively. Matching is conducted with replacement. Standard errors are bootstrapped standard errors with 50 replications. Confidence intervals are 95% selection bias adjusted confidence intervals. Panel B presents multivariate weighted least squares (WLS) regressions of the firm-level family management turnover (*Turnover1*) on *VC dummy* and other control variables. The weight for each VC-backed firm is equal to one, whereas the weight for each non-VC-backed firm is equal to the number of times it is used as a match for VC-backed firms. Propensity score matching is implemented using the one-to-one "nearest neighbors" methodology with common support. Matching variables used in both Panels A and B include CSRC industry code dummies, family firm headquarter province dummies, *ln*(total assets) at the end of IPO -3 year, *ln*(firm age) at the end of IPO -3 year, number of family members (co-)founding the firm, total ownership of founding family members at firm startup, and education background of founders. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Panel A:Univariate tests			
	Propensity Score	Gaussian Kernel	Regression-Adjust Local Linear
Difference in means	0.107	0.089	0.093
Standard error	0.049	0.041	0.045
z-statistics	2.18**	2.16**	2.04**
Confidence interval	[0.011, 0.203]	[0.083, 0.170]	[0.004, 0.182]
Panel B: Multivariate analysis			
Dependent Variable		*Turnover1*	
VC dummy		0.098**	
		(2.120)	
Political connection		-0.034	
		(-0.613)	
Business connection		0.148***	
		(2.784)	
Education		-0.028	
		(-0.544)	
Firm age		0.050	
		(1.248)	
Size		-0.073**	
		(-2.073)	
Leverage		0.068	
		(0.354)	
Prior ROA		0.340	
		(0.915)	
Industry Dummy		Yes	
Observations		412	
pseudo R-squared		0.046	

Table 4. **The Effect of VC Investments on Departures of Family Members from Different Types of Management Positions**

Columns 1 to 9 present results of logit regression analysis of the effect of VC investments on departures of family members from different types of management positions using three subsamples, namely, top executive subsample (Columns 1 to 3), member of board of directors subsample (Columns 4 to 6), and member of board of supervisors (Columns 7 to 9). The dependent variable in Columns 1 to 9 is *Turnover2*, the family-member-level measure of management turnover. The reported coefficients are logit regression estimates of the effect of a marginal change in the corresponding regressor on the probability of family members departing from management positions, computed at the sample mean of the independent variables. Column 10 reports results of ordered logit regression analysis on the effect of the relative power of VCs versus the founding family on the type (or importance) of positions from which family members depart. The dependent variable in Column 10 is the order of importance of departed positions, which equals 3 if departing from top executives, 2 if departing from members of board of directors, 1 if departing from members of board of supervisors, and 0 if no departures. Coefficients of industry dummies are omitted for brevity. Z-statistics based on robust standard errors are reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Sample	Top Executive			Director			Supervisor			Ordered Logit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VC dummy	0.015	0.012		-0.003	-0.002		0.160**	0.170**		
	(0.966)	(0.824)		(-0.178)	(-0.122)		(2.075)	(2.089)		
VC shareholdings			0.143**			0.005			0.861*	2.199***
			(2.323)			(0.041)			(1.698)	(3.010)
Political connection		0.000	0.000		-0.001	-0.001		-0.101	-0.119	-0.234
		(0.022)	(0.011)		(-0.039)	(-0.031)		(-1.107)	(-1.419)	(-1.347)
Business connection		-0.009	-0.005		0.007	0.006		0.159*	0.145	0.317*
		(-0.635)	(-0.324)		(0.430)	(0.328)		(1.727)	(1.607)	(1.827)
Education		0.015	0.013		0.001	-0.000		0.115	0.107	0.064
		(0.923)	(0.751)		(0.031)	(-0.010)		(1.352)	(1.357)	(0.407)
Firm age		-0.009	-0.007		-0.001	-0.001		0.090	0.061	0.062
		(-0.681)	(-0.505)		(-0.058)	(-0.079)		(1.019)	(0.736)	(0.433)
Size		0.011	0.012		0.005	0.005		-0.020	-0.000	-0.061
		(1.285)	(1.398)		(0.491)	(0.436)		(-0.333)	(-0.008)	(-0.585)
Leverage		-0.066	-0.072*		-0.052	-0.051		0.184	0.121	-0.255
		(-1.482)	(-1.669)		(-0.750)	(-0.684)		(0.482)	(0.331)	(-0.399)
Prior ROA		-0.155	-0.138		0.135	0.123		0.452	0.409	1.219
		(-1.407)	(-1.360)		(1.090)	(1.048)		(0.623)	(0.602)	(1.152)
Industry Dummy		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Observations	695	695	695	1,059	1,059	1,059	166	166	166	1,378
pseudo R-squared	0.004	0.032	0.047	0.000	0.009	0.007	0.019	0.062	0.047	0.012

Table 5. The Effect of VC Investments on Departures of Family Members with Different Relationships to the Founder

Columns 1 to 9 present results of logit regression analysis of the effect of VC investments on departures of three types of family members: blood-based family members (Columns 1 to 3), marriage-based family members (Columns 4 to 6), and founders (Columns 7 to 9). The dependent variable in Columns 1 to 9 is *Turnover2*, the family-member-level measure of management turnover. The reported coefficients are logit regression estimates of the effect of a marginal change in the corresponding regressor on the probability of family members departing from management positions, computed at the sample mean of the independent variables. Column 10 reports results of ordered logit regression analysis on the effect of the relative power of VCs versus the founding family on the order of departure of family members with different levels of importance of their relationships with founders. The dependent variable in Column 10 is the level of importance of their relationships with founders: which equals 3 if founders themselves depart, 2 if blood-based family members depart, 1 if marriage-based family members depart, and 0 if none of the family members depart. Coefficients of industry dummies are omitted for brevity. Z-statistics based on robust standard errors are reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Sample	Blood-based			Marriage-based			Founders			Ordered Logit
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
VC dummy	0.040	0.040		0.082**	0.086**		0.000	0.001		
	(1.086)	(1.081)		(1.997)	(2.041)		(0.045)	(0.192)		
VC shareholdings			0.423**			0.302**			0.009	2.117***
			(2.419)			(2.309)			(0.227)	(3.092)
Political connection		-0.090**	-0.095**		-0.000	-0.004		0.005	0.005	-0.243
		(-2.142)	(-2.402)		(-0.003)	(-0.108)		(0.797)	(0.818)	(-1.415)
Business connection		0.034	0.041		0.052	0.052*		0.007	0.006	0.344**
		(0.910)	(1.146)		(1.187)	(1.871)		(1.437)	(1.136)	(2.018)
Education		0.019	0.017		0.041	0.041		-0.010	-0.010	0.040
		(0.518)	(0.474)		(0.989)	(1.123)		(-1.520)	(-1.374)	(0.251)
Firm age		0.029	0.033		0.017	0.010		-0.008*	-0.008*	0.080
		(0.892)	(1.030)		(0.468)	(0.561)		(-1.731)	(-1.857)	(0.571)
Size		-0.015	-0.010		-0.026	-0.023		-0.001	-0.001	-0.076
		(-0.662)	(-0.435)		(-0.947)	(-0.659)		(-0.185)	(-0.227)	(-0.716)
Leverage		-0.027	-0.033		0.057	0.054		0.022	0.027*	-0.250
		(-0.181)	(-0.238)		(0.322)	(0.218)		(1.537)	(1.894)	(-0.391)
Prior ROA		0.023	0.048		0.486	0.491		0.012	0.011	1.301
		(0.076)	(0.188)		(1.400)	(1.439)		(0.435)	(0.359)	(1.206)
Industry Dummy		Yes	Yes		Yes	Yes		Yes	Yes	Yes
Observations	480	480	480	403	403	403	495	495	495	574
pseudo R-squared	0.003	0.029	0.031	0.010	0.030	0.024	0.024	0.166	0.139	0.012

Table 6. The Effect of VC Investments on Family Control Rights, Cash-Flow Rights, and the Separation between the Two

The dependent variables in Columns 1 to 4, 5 to 8, 9 to 12, and 13 to 16, are *△Control rights*, *△Cash-flow rights*, *△Separation*, and *Control loss*, respectively. Columns 1 to 12 report OLS regression coefficients, while Columns 13 to 16 report logit regression coefficients. Coefficients of industry dummies are omitted for brevity. Z-statistics (t-statistics) based on robust standard errors are reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
Dependent variable	*△Control rights*				*△Cash-flow rights*				*△Separation*				*Control loss*			
VC dummy	-0.080***	-0.081***			-0.065***	-0.068***			-0.007*	-0.008**			0.099***	0.099***		
	(-2.943)	(-3.688)			(-3.010)	(-3.575)			(-1.938)	(-1.993)			(3.600)	(3.720)		
VC shareholdings			-0.469***				-0.417***				-0.032*				0.371***	
			(-3.999)				(-3.809)				(-1.953)				(3.832)	
VC dummy×VC director				-0.099***				-0.082***				-0.008*				0.111***
				(-4.337)				(-4.001)				(-1.804)				(2.664)
VC dummy×No-VC director				-0.048				-0.042				-0.007				0.184***
				(-1.308)				(-1.245)				(-1.348)				(2.762)
Political connection		0.013	0.017	0.012		0.007	0.011	0.006		-0.002	-0.001	-0.002		0.018	0.013	0.018
		(0.594)	(0.811)	(0.559)		(0.369)	(0.587)	(0.337)		(-0.500)	(-0.453)	(-0.503)		(0.916)	(0.568)	(0.927)
Business connection		0.034	0.029	0.032		0.020	0.016	0.019		0.004	0.004*	0.004		-0.010	-0.007	-0.011
		(1.423)	(1.244)	(1.374)		(1.040)	(0.837)	(0.997)		(1.141)	(2.085)	(1.118)		(-0.509)	(-0.318)	(-0.554)
Education		0.085**	0.086**	0.084**		0.069***	0.070***	0.068***		0.004	0.004*	0.004		-0.030	-0.037	-0.030
		(2.205)	(2.234)	(2.180)		(2.792)	(2.828)	(2.769)		(0.958)	(2.245)	(0.950)		(-1.211)	(-1.422)	(-1.240)
Firm age		0.017	0.019	0.016		-0.003	-0.001	-0.003		0.002	0.003	0.002		0.039*	0.042*	0.039*
		(0.365)	(0.417)	(0.355)		(-0.097)	(-0.027)	(-0.107)		(0.579)	(0.630)	(0.576)		(1.892)	(1.797)	(1.872)
Size		0.066*	0.063*	0.065*		0.052**	0.050**	0.052**		0.001	0.001	0.001		-0.027*	-0.029	-0.027*
		(1.890)	(1.830)	(1.884)		(2.448)	(2.359)	(2.436)		(0.399)	(0.440)	(0.399)		(-1.801)	(-1.514)	(-1.853)
Leverage		-0.215	-0.216	-0.214		-0.156	-0.157	-0.156		0.006	0.006	0.007		-0.012	-0.007	-0.012
		(-1.074)	(-1.073)	(-1.067)		(-1.336)	(-1.328)	(-1.324)		(0.392)	(0.390)	(0.393)		(-0.186)	(-0.088)	(-0.188)
Prior ROA		0.333	0.315	0.340		0.211	0.195	0.216		0.028	0.027	0.028		-0.061	-0.036	-0.057
		(1.524)	(1.427)	(1.546)		(1.359)	(1.234)	(1.376)		(0.981)	(1.355)	(0.986)		(-0.393)	(-0.186)	(-0.380)
Constant	-0.023	-1.399**	-1.360**	-1.392**	-0.039***	-1.103***	-1.066***	-1.098***	0.006**	-0.051	-0.049	-0.051				
	(-1.064)	(-2.062)	(-2.011)	(-2.051)	(-2.834)	(-2.706)	(-2.631)	(-2.689)	(2.355)	(-0.821)	(-1.233)	(-0.819)				
Industry Dummy		Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes
Observations	482	482	482	482	482	482	482	482	482	482	482	482	411	411	411	411
Pseudo R-squared/R-squared	0.016	0.070	0.069	0.073	0.019	0.076	0.076	0.079	0.008	0.026	0.022	0.026	0.070	0.139	0.114	0.142

Table 7. Propensity Score Matching Analysis of the Effect of VC Investments on Family Control Rights, Cash-Flow Rights, and the Separation between the Two

This table presents multivariate weighted least squares (WLS) regressions of various proxies of changes of family ownership on *VC dummy* and other control variables. The dependent variables in Columns 1 to 4 are *△Control rights*, *△Cash-flow rights*, *△Separation*, and *Control loss*, respectively. The weight for each VC-backed firm is equal to one, whereas the weight for each non-VC-backed firm is equal to the number of times it is used as a match for VC-backed firms. Propensity score matching is implemented using the one-to-one "nearest neighbors" methodology with common support. Matching is conducted with replacement. Matching variables include CSRC industry code dummies, family firm headquarter province dummies, *ln*(total assets) at the end of IPO -3 year, *ln*(firm age) at the end of IPO -3 year, number of family members (co-)founding the firm, total ownership of founding family members at firm startup, and education background of founders. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

	(1)	(2)	(3)	(4)
Dependent variable	*△Control rights*	*△Cash-flow rights*	*△Separation*	*Control Loss*
VC dummy	-0.056***	-0.059***	-0.010***	0.037*
	(-2.784)	(-2.856)	(-2.803)	(1.910)
Political connection	0.020	0.007	-0.003	0.028
	(0.929)	(0.315)	(-0.812)	(1.534)
Business connection	0.027	0.024	0.004	-0.030
	(1.248)	(1.108)	(0.945)	(-1.614)
Education	0.028	0.031	0.001	-0.061**
	(1.479)	(1.595)	(0.281)	(-2.258)
Firm age	-0.056**	-0.054*	-0.006*	0.045**
	(-1.979)	(-1.926)	(-1.835)	(2.459)
Size	0.042**	0.048***	0.001	-0.042***
	(2.558)	(2.735)	(0.440)	(-3.768)
Leverage	-0.055	-0.070	0.008	0.057
	(-0.654)	(-0.838)	(0.624)	(1.061)
Prior ROA	0.142	0.108	-0.002	0.106
	(1.058)	(0.752)	(-0.066)	(1.017)
Constant	-0.859***	-0.970***	-0.008	
	(-2.898)	(-3.012)	(-0.143)	
Industry Dummy	Yes	Yes	Yes	Yes
Observations	404	404	406	342
Pseudo R-squared/R-squared	0.072	0.075	0.035	0.256

Table 8. The Effect of VC Investments on Shareholdings of Family Members with Different Relationships to the Founder

This table presents OLS regression results of the effect of VC investments on changes of family ownership using the whole sample (Columns 1 to 3) and three subsamples: blood-based family members (Columns 4 to 6), marriage-based family members (Columns 7 to 9), and founders (Columns 10 to 12). The dependent variable is *⊿Shareholding*. Coefficients of industry dummies are omitted for brevity. T-statistics based on robust standard errors are reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

	Whole sample			Blood-based family members			Marriage-based family members			Founders		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
VC dummy	-0.065**	-0.075***		-0.094*	-0.109**		-0.023	-0.042		-0.067**	-0.062**	
	(-2.534)	(-2.948)		(-1.829)	(-2.047)		(-0.432)	(-0.824)		(-2.465)	(-2.471)	
VC shareholdings			-0.579***			-0.821***			-0.505**			-0.375***
			(-4.455)			(-2.862)			(-1.980)			(-2.875)
Political connection		-0.024	-0.019		-0.020	-0.011		-0.104*	-0.101*		0.026	0.030
		(-0.960)	(-0.744)		(-0.408)	(-0.230)		(-1.931)	(-1.883)		(0.962)	(1.095)
Business connection		0.041	0.035		0.033	0.022		0.129**	0.126**		-0.023	-0.027
		(1.511)	(1.293)		(0.606)	(0.403)		(2.465)	(2.401)		(-0.757)	(-0.866)
Education		0.044*	0.046*		0.056	0.057		0.035	0.041		0.037	0.039
		(1.678)	(1.746)		(1.018)	(1.028)		(0.768)	(0.884)		(1.270)	(1.308)
Firm Age		-0.050*	-0.052*		-0.092	-0.094*		-0.093*	-0.096*		0.020	0.022
		(-1.823)	(-1.871)		(-1.627)	(-1.686)		(-1.707)	(-1.764)		(0.667)	(0.719)
Size		0.038**	0.036**		0.039	0.034		0.026	0.025		0.046**	0.044*
		(2.351)	(2.217)		(1.171)	(1.019)		(0.950)	(0.930)		(2.043)	(1.961)
Leverage		-0.133	-0.135		-0.142	-0.144		-0.313*	-0.307*		0.038	0.038
		(-1.238)	(-1.253)		(-0.609)	(-0.617)		(-1.875)	(-1.804)		(0.346)	(0.336)
Prior ROA		-0.370*	-0.393*		-1.065***	-1.093***		-0.726**	-0.760**		0.674**	0.659**
		(-1.671)	(-1.770)		(-2.800)	(-2.854)		(-1.989)	(-2.070)		(2.233)	(2.174)
Constant	-0.021	-0.457	-0.413	0.032	-0.443	-0.330	-0.076***	-0.306	-0.276	-0.033*	-1.177**	-1.143**
	(-1.350)	(-1.407)	(-1.266)	(1.008)	(-0.733)	(-0.544)	(-2.657)	(-0.592)	(-0.531)	(-1.718)	(-2.568)	(-2.505)
Industry Dummy		Yes	Yes		Yes	Yes		Yes	Yes		Yes	Yes
Observations	1,341	1,341	1,341	483	483	483	384	384	384	474	474	474
R-squared	0.005	0.024	0.027	0.007	0.047	0.050	0.001	0.055	0.061	0.012	0.059	0.059

Table 9. Instrumental Variable Regression Analysis of the Effect of VC Investments on Corporate Governance Changes of Family Firms

In the first-stage regression, the dependent variable is *VC dummy*. In second-stage regressions, *VC dummy hat* is the predicted value of *VC dummy* from the first-stage regression. *Number of local VCs* is the number of VC companies in the family firm's headquarter province in the year of founding or incorporation. *Government Research grant/GDP* is the amount of research grants from provincial government divided by the GDP of the family firm's headquarter province in the year of founding or incorporation. Coefficients of industry dummies are omitted for brevity. Z-statistics (t-statistics) based on robust standard errors are reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

First-stage regression		Second-stage regression					
		Estimation method	*IV-Probit*	*IV-2SLS*	*IV-2SLS*	*IV-2SLS*	*IV-Probit*
Dependent variables	*VC dummy*	Dependent variables	*Turnover1*	*△Control right*	*△Cash-flow right*	*△Separation*	*Control loss*
	(1)		(2)	(3)	(4)	(5)	(6)
Number of local VCs	0.002***	*VC dummy hat*	0.886*	-0.356***	-0.207**	-0.056**	1.249*
	(5.248)		(1.714)	(-2.978)	(-1.990)	(-2.131)	(1.768)
Government research grant/GDP	-57.681***	*Political connection*	-0.080	0.003	0.002	-0.003	0.210
	(-4.005)		(-0.614)	(0.133)	(0.113)	(-0.786)	(0.944)
Political connection	0.003	*Business connection*	0.275**	0.039	0.023	0.005	-0.100
	(0.071)		(2.104)	(1.390)	(1.091)	(1.139)	(-0.476)
Business connection	-0.006	*Education*	0.011	0.104**	0.078***	0.007	-0.337
	(-0.129)		(0.082)	(2.296)	(2.793)	(1.438)	(-1.449)
Education	0.068	*Firm age*	0.148	-0.015	-0.019	-0.003	0.510**
	(1.471)		(1.348)	(-0.365)	(-0.618)	(-0.583)	(2.355)
Firm age	-0.089**	*Size*	-0.074	0.066*	0.053**	0.001	-0.280
	(-2.384)		(-0.913)	(1.860)	(2.417)	(0.399)	(-1.555)
Size	-0.019	*Leverage*	-0.412	-0.202	-0.150	0.009	-0.301
	(-0.653)		(-0.833)	(-1.011)	(-1.290)	(0.470)	(-0.387)
Leverage	0.252	*Prior ROA*	1.246	0.295	0.192	0.022	-0.547
	(1.343)		(1.302)	(1.260)	(1.179)	(0.680)	(-0.320)
Prior ROA	-0.005	Constant	1.243	-1.337*	-1.054**	-0.039	2.224
	(-0.014)		(0.756)	(-1.876)	(-2.463)	(-0.577)	(0.612)
Constant	0.807	Industry dummy	Yes	Yes	Yes	Yes	Yes
	(1.392)						
Industry dummy	Yes						
Observations	499						
R^2	0.073	Observations	499	482	482	482	411
Partial-F of IVs	14.02	Over-identification test	2.198	1.405	0.634	1.088	0.739
	(*p*=0.000)		(*p*=0.138)	(*p*=0.236)	(*p*=0.426)	(*p*=0.297)	(*p*=0.390)

Table 10. The Effect of Corporate Governance Changes due to VC-backing on Firm Valuation

This table presents results on the effect of corporate governance changes during the pre-IPO period on firm valuation in the secondary market immediately post-IPO for subsamples of VC-backed firms and non-VC-backed firms, separately. The dependent variables are *QFTDADJ* and *QIMADJ*. The main independent variables in different panels are: *△Control rights* (Panel A), *△Cash-flow rights* (Panel B), *△Separation* (Panel C), *Control loss* (Panel D), and *Turnover1* (Panel E), respectively. In Panels B, C, D, and E, we only report results for the main independent variable and omit results on control variables for brevity. Coefficients of industry dummies are omitted for brevity. Z-statistics (t-statistics) based on robust standard errors are reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Panel A: The effect of the change of family control rights on firm valuation				
	VC-backed firms		Non-VC-backed firms	
	(1)	(2)	(3)	(4)
Dependent variables	*QFTDADJ*	*QIMADJ*	*QFTDADJ*	*QIMADJ*
△Control rights	-0.293*	-0.351*	0.597	0.268
	(-1.686)	(-1.752)	(1.284)	(0.614)
Political connection	0.057	0.033	-0.079	-0.035
	(0.371)	(0.240)	(-0.470)	(-0.231)
Business connection	-0.262	-0.086	0.406**	0.268*
	(-1.830)	(-1.321)	(2.413)	(1.783)
Education	-0.209	-0.190	0.343**	0.207
	(-0.703)	(-0.633)	(2.207)	(1.481)
Firm age	0.009	-0.034	0.081	0.013
	(0.041)	(-0.217)	(0.691)	(0.128)
Size	-0.311**	-0.171	-0.500***	-0.436***
	(-3.268)	(-1.516)	(-5.801)	(-5.543)
Leverage	-0.702	-1.471**	-0.290	-0.415
	(-1.287)	(-3.180)	(-0.461)	(-0.651)
Prior ROA	2.441	1.942	-1.671	-1.567
	(0.933)	(0.823)	(-0.978)	(-0.863)
Constant	6.471**	4.459*	10.513***	9.778***
	(2.936)	(2.194)	(6.126)	(5.918)
Industry Dummy	control	control	control	control
Observations	203	203	279	279
R-squared	0.142	0.117	0.157	0.140
Difference between the coefficient estimates of *△Control rights* in VC-backed and non-VC-backed firms (*Chi-square* in parentheses)				
△Control rights (VC-backed)－	-0.890	-0.619		
△Control rights (non-VC-backed)	(-2.98)*	(-1.56)		

Panel B: The effect of the change of family cash-flow rights on firm valuation				
△Cash-flow rights	0.181	0.169	0.792	0.413
	(0.350)	(0.281)	(1.571)	(0.983)
Other controls	Yes	Yes	Yes	Yes
Observations	203	203	279	279
R-squared	0.141	0.115	0.160	0.141
Difference between the coefficient estimates of *△Cash-flow rights* in VC-backed and non-VC-backed firms (*Chi-square* in parentheses)				
△Cash-flow rights(VC-backed)－	-0.611	-0.244		
△Cash-flow rights (non-VC-backed)	(-0.83)	(-0.12)		

Panel C: The effect of the change of separation between family control and cash-flow rights on firm valuation				
△Separation	-4.719*	-4.861*	-1.219	-1.088
	(-1.861)	(-1.826)	(-0.567)	(-0.574)
Other controls	Yes	Yes	Yes	Yes
Observations	203	203	279	279
R-squared	0.153	0.129	0.153	0.139
Difference between the coefficient estimates of *△Separation* in VC-backed and non-VC-backed firms (*Chi-square* in parentheses)				
△Separation (VC-backed)－	-3.500	-3.773		
△Separation (non-VC-backed)	(-1.17)	(-1.41)		
Panel D: The effect of founding family losing voting controls on firm valuation				
Control loss	0.693**	0.603*	-0.202	-0.141
	(1.981)	(1.819)	(-0.518)	(-0.395)
Other controls	Yes	Yes	Yes	Yes
Observations	178	178	233	233
R-squared	0.157	0.144	0.149	0.132
Difference between the coefficient estimates of *Control loss* in VC-backed and non-VC-backed firms (*Chi-square* in parentheses)				
Control loss (VC-backed)－	0.895	0.744		
Control loss (non-VC-backed)	(3.11)*	(2.49)		
Panel E: The effect of family members departing from management positions on firm valuation				
Turnover1	-0.256	-0.166	0.147	0.108
	(-1.303)	(-0.852)	(0.784)	(0.664)
Other controls	Yes	Yes	Yes	Yes
Observations	210	210	289	289
R-squared	0.156	0.120	0.154	0.140
Difference between the coefficient estimates of *Turnover1* in VC-backed and non-VC-backed firms (*Chi-square* in parentheses)				
Turnover1 (VC-backed)－	-0.403	-0.274		
Turnover1 (non-VC-backed)	(-2.32)	(-1.23)		

High Differentiation and Low Standardization: The Role of Venture Capitalists in Transforming the Governance and Management of Family Firms

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Table A1. Characteristics of Family Members Departing from Management Positions

This table presents numbers and percentages of family members departing from management positions subsamples of VC-backed firms and non-VC-backed firms, separately. We further sort departing family members by their original positions (Panel A), their relationships to founders (Panel B), and their gender (Panel C). The sample consists of 1,378 family members who held management positions in 499 sample family firms.

Panel A: Numbers of family members departing from management positions sorted by original positions

	VC-backed		Non-VC-backed	
	Number	percent	Number	percent
Director	30	5.24%	46	5.71%
Supervisor	40	6.98%	35	4.35%
Top executive	16	2.79%	10	1.24%
Number of departing family members in the subsample	86	15.01%	91	11.30%
Total number family members in the subsamples	573		805	

Panel B: Numbers of family members departing from management positions sorted by relationships to founders

	VC-backed		Non-VC-backed	
	Number	percent	Number	percent
The founder	3	0.52%	4	0.50%
Blood-based family members	41	7.16%	49	6.09%
Father	8	1.40%	6	0.75%
Mother	3	0.52%	0	0.00%
Brother	13	2.27%	20	2.48%
Sister	5	0.87%	6	0.75%
Cousins	1	0.17%	2	0.25%
Son	5	0.87%	5	0.62%
Daughter	2	0.35%	8	0.99%
Nephew	1	0.17%	1	0.12%
Others	3	0.52%	1	0.12%
Marriage-based family members	42	7.33%	38	4.72%
Wife	26	4.54%	24	2.98%
Husband	1	0.17%	0	0.00%
Father/mother in-law	2	0.35%	1	0.12%
Wife’s brother	2	0.35%	2	0.25%
Wife’s sister	2	0.35%	4	0.50%
Brother/sister in-law	4	0.70%	2	0.25%
Daughter in-law	0	0.00%	3	0.37%
Others	5	0.87%	2	0.25%
Number of departing family member in the subsample	86	15.01%	91	11.30%

Panel C: Numbers of family members departing from management positions sorted by gender

	VC-backed		Non-VC-backed	
	Number	percent	Number	percent
Male	43	7.50%	43	5.34%
Female	43	7.50%	48	5.96%
Number of departing family member in the subsample	86	15.01%	91	11.30%

Table A2. Propensity Score Matching Analysis of the Effect of VC-backing on Family Control Rights, Cash-Flow Rights, and the Separation between the Two: Univariate Tests

This table reports mean differences of changes of family control rights, cash-flow rights, and the separation between the two between VC-backed and matched non-VC-backed family firms. Each VC-backed family firm is matched with one or more non-VC-backed firms using propensity score, Gaussian kernel, or regression-adjusted local linear matching approaches, respectively. Matching is conducted with replacement and common support. Standard errors are bootstrapped standard errors with 50 replications. Confidence intervals are 95% selection bias adjusted confidence intervals. Matching variables include CSRC industry code dummies, family firm headquarter province dummies, *ln*(total assets) at the end of IPO -3 year, *ln*(firm age) at the end of IPO -3 year, number of family members (co-)founding the firm, total ownership of founding family members at firm startup, and education background of founders. Proxies of changes of family ownership include *△Control rights* (Panel A), *△Cash-flow rights* (Panel B), *△Separation* (Panel C), and *Control Loss* (Panel D). ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

	Propensity Score	Gaussian Kernel	Regression-Adjust Local Linear
Panel A: The percentage change of family control rights (△Control rights)			
Difference in means	-0.055	-0.057	-0.056
Standard error	0.025	0.020	0.022
z-statistics	-2.22**	-2.91***	-2.59***
Confidence interval	[-0.104, -0.006]	[-0.095, -0.019]	[-0.099, -0.014]
Panel B: The percentage change of family cash-flow rights (△Cash-flow rights)			
Difference in means	-0.058	-0.053	-0.052
Standard error	0.022	0.023	0.022
z-statistics	-2.61***	-2.26**	-2.37**
Confidence interval	[-0.101, -0.014]	[-0.099, -0.007]	[-0.095, -0.009]
Panel C: The change of separation between control rights and cash-flow rights (△Separation)			
Difference in means	-0.010	-0.006	-0.006
Standard error	0.004	0.003	0.003
z-statistics	-2.32**	-1.86*	-1.68*
Confidence interval	[-0.018, -0.002]	[-0.012, 0.0003]	[-0.012, 0.001]
Panel D: Dummy of founding family losing voting control (Control Loss)			
Difference in means	0.064	0.060	0.060
Standard error	0.032	0.029	0.029
z-statistics	2.02**	2.11**	2.06**
Confidence interval	[0.002, 0.127]	[0.004, 0.116]	[0.003, 0.116]

Table A3. The Effect of Corporate Governance Changes due to VC-backing on Post-IPO Operating Performance

This table presents results of the effect of corporate governance changes during the pre-IPO period on the improvement of post-IPO operating performance for subsamples of VC-backed firms and non-VC-backed firms, separately. The dependent variable, *△Adjusted OROA*, is the change of industry- and performance-adjusted operating return on assets (OROA), which subtracts the industry- and performance-adjusted OROA in the year prior to IPO (year -1) from the industry- and performance-adjusted OROA in subsequent years (years 0 through 3). The main independent variables in different panels are: *△Control rights* (Panel A), *△Cash-flow rights* (Panel B), *△Separation* (Panel C), *Control loss* (Panel D), and *Turnover1* (Panel E), respectively. In Panels B, C, D, and E, we only report results for the main independent variable and omit results on control variables for brevity. Coefficients of industry dummies are omitted for brevity. Z-statistics (t-statistics) based on robust standard errors are reported in parentheses. ***, **, and * indicate significance at 1%, 5%, and 10%, respectively.

Panel A: The effect of the change of family control rights on post-IPO operating performance

	VC-backed firms				Non-VC-backed firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent variables	*△Adjusted OROA (IPO -1 to IPO)*	*△Adjusted OROA (IPO -1 to IPO +1)*	*△Adjusted OROA (IPO -1 to IPO +2)*	*△Adjusted OROA (IPO -1 to IPO +3)*	*△Adjusted OROA (IPO -1 to IPO +0)*	*△Adjusted OROA (IPO -1 to IPO +1)*	*△Adjusted OROA (IPO -1 to IPO +2)*	*△Adjusted OROA (IPO -1 to IPO +3)*
△Control rights	-0.054**	-0.068***	-0.046*	-0.044	0.032	0.029	0.027	0.036
	(-2.495)	(-2.631)	(-1.667)	(-1.545)	(1.479)	(1.503)	(1.275)	(1.193)
Political connection	0.006	0.016	0.011	0.013	0.004	0.002	0.004	0.018*
	(0.706)	(1.423)	(1.003)	(1.016)	(0.573)	(0.198)	(0.579)	(1.688)
Business connection	0.005	-0.005	-0.003	0.009	-0.010	0.005	0.000	-0.005
	(0.614)	(-0.426)	(-0.255)	(0.701)	(-1.325)	(0.591)	(0.055)	(-0.525)
Education	-0.005	0.003	0.007	-0.014	-0.007	-0.006	-0.016**	-0.014
	(-0.655)	(0.363)	(0.523)	(-1.087)	(-0.888)	(-0.686)	(-2.097)	(-1.539)
Firm age	-0.006	0.001	0.005	0.001	0.003	0.015**	0.015**	0.007
	(-0.867)	(0.171)	(0.499)	(0.152)	(0.475)	(2.321)	(2.422)	(0.987)
Size	0.012**	0.012*	0.007	-0.002	0.016***	0.009*	0.005	0.002
	(2.304)	(1.911)	(1.005)	(-0.180)	(3.162)	(1.781)	(1.044)	(0.231)
Leverage	-0.008	0.004	-0.055	-0.016	0.040	0.035	0.049	0.040
	(-0.273)	(0.149)	(-1.327)	(-0.333)	(1.035)	(1.021)	(1.427)	(0.772)

Prior ROA	-0.253***	-0.207**	-0.262***	-0.111	-0.219***	-0.112	-0.047	-0.008
	(-2.774)	(-2.000)	(-2.629)	(-0.850)	(-2.648)	(-1.417)	(-0.624)	(-0.059)
Constant	-0.275**	-0.216	-0.143	0.009	-0.349***	-0.255***	-0.174*	-0.099
	(-2.325)	(-1.501)	(-1.026)	(0.047)	(-3.705)	(-2.702)	(-1.855)	(-0.770)
Industry Dummy	control	control	control	control	control	control	control	control
Observations	202	202	202	142	279	279	279	217
R-squared	0.248	0.181	0.108	0.072	0.269	0.157	0.146	0.072
Difference between the coefficient estimates of *⊿Control rights* in VC-backed and non-VC-backed firms (Chi-square in parentheses)								
⊿Control rights (VC-backed) *－⊿Control rights* (non-VC-backed)	-0.086 (-8.32)***	-0.097 (-9.57)***	-0.073 (-4.11)**	-0.080 (-4.00)**				

Panel B: The effect of the change of family cash-flow rights on post-IPO operating performance

⊿Cash-flow rights	-0.039*	-0.054**	-0.044*	-0.034	0.031	0.027	0.026	0.031
	(-1.802)	(-2.159)	(-1.766)	(-1.297)	(1.452)	(1.512)	(1.249)	(1.050)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	202	202	202	142	279	279	279	217
R-squared	0.236	0.172	0.108	0.067	0.269	0.156	0.146	0.070
Difference between the coefficient estimates of *⊿Cash-flow rights* in VC-backed and non-VC-backed firms (Chi-square in parentheses)								
⊿Cash-flow rights (VC-backed)－*⊿Cash-flow rights* (non-VC-backed)	-0.070 (-5.59)**	-0.081 (-7.36)***	-0.070 (-4.23)**	-0.065 (-2.91)*				

Panel C: The effect of the change of separation between family control and cash-flow rights on post-IPO operating performance

⊿Separation	-0.144*	-0.168**	-0.175*	-0.155**	0.057	0.090	0.057	0.108
	(-1.858)	(-2.037)	(-1.693)	(-2.082)	(0.671)	(1.225)	(0.742)	(1.359)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	202	202	202	142	279	279	279	217
R-squared	0.231	0.160	0.104	0.066	0.265	0.156	0.143	0.070

Difference between the coefficient estimates of *⊿Separation* in VC-backed and non-VC-backed firms (Chi-square in parentheses)								
⊿Separation (VC-backed)－*⊿Separation* (non-VC-backed)	-0.201 (-3.23)*	-0.258 (-5.77)**	-0.232 (-2.94)*	-0.263 (-6.28)**				

Panel D: The effect of founding family losing voting controls on post-IPO operating performance

Control loss	-0.002	0.002	0.004	0.000	-0.005	0.000	0.022	0.044
	(-0.212)	(0.207)	(0.261)	(0.010)	(-0.210)	(0.014)	(0.956)	(1.237)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	177	177	177	122	233	233	233	184
R-squared	0.191	0.175	0.092	0.085	0.244	0.160	0.159	0.076
Difference between the coefficient estimates of *Control loss* in VC-backed and non-VC-backed firms (*Chi-square* in parentheses)								
Control loss (VC-backed)－*Control loss* (non-VC-backed)	0.003 (0.01)	0.002 (0.01)	-0.018 (-0.51)	-0.044 (-1.28)				

Panel E: The effect of family members departing from management positions on post-IPO operating performance

Turnover1	-0.010	-0.013	-0.011	-0.016	0.007	0.013	0.006	0.005
	(-1.239)	(-1.254)	(-0.949)	(-1.027)	(0.888)	(1.541)	(0.769)	(0.485)
Other controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	209	209	209	147	289	289	289	218
R-squared	0.208	0.149	0.116	0.060	0.264	0.160	0.151	0.067
Difference between the coefficient estimates of *Turnover1* in VC-backed and non-VC-backed firms (Chi-square in parentheses)								
Turnover1 (VC-backed)－*Turnover1* (non-VC-backed)	-0.017 (-2.40)	-0.026 (-4.03)**	-0.017 (-1.57)	-0.021 (-1.37)				

In Table A3 above, we test our hypothesis regarding the effect of corporate governance changes due to VC-backing on post-IPO operating performance. The dependent variable is post-IPO operating performance (*⊿Adjusted OROA*), which is the change of industry- and performance-adjusted operating return on assets (OROA) from the year prior to IPO (year -1) to the year of IPO (year 0), and the three years post-IPO (year 1 through year 3).

Panel A of Table A3 reports the estimated effect of the change of family control rights on the improvement of post-IPO operating performance among VC-backed firms (Columns 1-4) and non-VC-backed firms (Columns 5-8). The results in Columns 1 to 3 suggest that VC-backed firms with larger reduction of family control rights experience greater improvement of post-IPO operating performance in the two years post-IPO. The estimated coefficient of *⊿Control rights* in Column 4 is also negative, but marginally insignificant, possibly because the number of observations of operating performance goes down significantly in the third year post-IPO. Columns 5 to 8 of Panel A show that the effect of the change of family control rights on post-IPO performance is not significant within non-VC-backed firms. At the bottom of Panel A, we also report the differences between the coefficient estimates of *⊿ Control rights* in the subsamples of VC-backed and non-VC-backed firms, which are all negative and significantly different from zero at 1% or 5% level. These findings indicate that the effect of the reduction of family control rights on the improvement of post-IPO operating performance is significantly greater among VC-backed firms than among non-VC-backed firms.

Panel B of Table A3 reports the estimated effect of the change of family cash-flow rights on the improvement of post-IPO operating performance. In Panel B and all the later panels of Table A3, we only report the coefficient estimates of corporate governance change variables, and omit the controlling variables to save space. Results in Panel B show that a decrease of family cash-flow rights will lead to an increase in post-IPO performance among VC-backed firms (Columns 1 to 4). On the other hand, this effect is not significant among non-VC-backed firms (Columns 5 to 8). The differences between the coefficient estimates of *⊿Cash-flow rights* in the subsamples of VC-backed and non-VC-backed firms are all negative and significant, suggesting that the effect of the reduction of family cash-flow rights on the improvement of post-IPO operating performance is stronger among VC-backed firms

than among non-VC-backed firms.

In Panel C of Table A3, we find that the coefficient estimates of the change of the separation between family control rights and cash-flow rights (△*Separation*) are all negative and statistically significant in the subsample of VC-backed firms (Columns 1 to 4). These effects are also economically significant. A one standard deviation decrease in the separation between family control rights and cash-flow rights (0.041) improves the adjusted operating performance of VC-backed firms by 0.59%, 0.69%, 0.72%, and 0.64% in year 0, 1, 2, and 3 post-IPO relative to the year prior to IPO, respectively. In Columns 5 to 8, we show that none of the coefficient estimates of△*Separation* among non-VC-backed firms is significant. At the bottom of Panel C, we also show that the effect of the change of separation between family control rights and cash-flow rights on post-IPO operating performance is significantly stronger among VC-backed firms compared to that among non-VC-backed firms.

Panel D of Table A3 shows that whether the founding family loses voting control has no statistically significant effect on the improvement of post-IPO operating performance, among both VC-backed and non-VC-backed firms. Panel E of Table A3 shows that departures of family members from top management positions have no significant effect on the improvement of post-IPO operating performance among both VC-backed and non-VC-backed firms. We further investigate whether the reduction of family members holding top management positions to 2 persons or less could result in the improvement of post-IPO performance (the median number of family members holding top management positions in the year prior to IPO is 2). We find that such reduction of family members to 2 or less indeed improves firm post-IPO operating performance (not tabulated).

We further explore whether the effect of corporate governance changes due to VC-backing on the improvement of post-IPO firm operating performance increases with the relative power of VCs versus the founding family (as proxied by VCs' equity ownership) and with VC board representation. To address this question, we add the interaction terms of corporate governance changes (*Y'*) with *VC shareholdings* (or *VC director*), as well as *VC shareholdings* (or *VC director*) into Model (4), and estimate the regression model among sample VC-backed family firms. We find that the coefficient estimates of the interaction terms of corporate governance changes (*Y'*) with *VC shareholdings* (or *VC director*) are

negative and statistically significant when corporate governance changes (*Y'*) is proxied by *△Control rights*, *△Cash-flow rights*, or *△Separation*, but not statistically significant when *Y'* is proxied by *Control loss* or *Turnove1* (not tabulated). These results suggest that declines in family control rights, cash-flow rights, and the separation between the two translate more effectively into better firm operating performance when VCs have greater power relative to the founding family (as proxied by VCs' shareholdings) and when VCs have board representation.