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## Abstract

As companies choose to stay private longer, they increasingly resemble their public counterparts. Along multiple dimensions, the shift from private to public status resembles a gradual transition rather than a regime shift. First, there is growing overlap between the sources of capital employed by private and public firms. Second, corporate governance structures such as the Board of Directors evolve over the years both preceding and following the IPO. As private firms become larger with more disperse ownership, their governance demands more closely resemble those of public firms; post-IPO dynamics are consistent with governance demands continuing to evolve over the firm's life cycle. Third, while going public has been characterized as a means to obtain an acquisition currency, firms are increasingly growing via acquisition prior to the IPO. Macro-level changes reward economies of scale and scope, and the increased availability of capital to private firms facilitates acquisitions as a means to obtain rapid growth.

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As companies choose to stay private longer, they increasingly resemble their public counterparts. Along multiple dimensions, the shift from private to public status resembles a gradual transition rather than a regime shift. First, there is growing overlap between the sources of capital employed by private and public firms. Second, corporate governance structures such as the Board of Directors evolve over the years both preceding and following the IPO. As private firms become larger with more disperse ownership, their governance demands more closely resemble those of public firms; post-IPO dynamics are consistent with governance demands continuing to evolve over the firm's life cycle. Third, while going public has been characterized as a means to obtain an acquisition currency, firms are increasingly growing via acquisition prior to the IPO. Macro-level changes reward economies of scale and scope, and the increased availability of capital to private firms facilitates acquisitions as a means to obtain rapid growth.

## 1. Introduction

A common point of differentiation across companies is public versus private status. Many regulations are conditional on whether a company is publicly traded, and the ability of both individuals and many institutions to invest in companies frequently relates to the company's public status. Perhaps relatedly, academic literature frequently focuses only on public companies – or only on private companies. How different are these two groups of companies? Since 2000, many firms have elected to stay private, even after they have reached the scale at which they could go public. Commensurate with these changes, evidence suggests that many private and public firms have become more similar on certain dimensions. This chapter focuses on three issues related to this conclusion.

First, I discuss the sources of capital available to private versus public firms, and the ways in which this has changed over time. Private firms are typically characterized as being owned by founders and a very specialized set of investors who focus on the private space, including for example angel investors, venture capitalists and private equity firms. In contrast, public firms are owned by a much wider set of people, including for example mutual funds, hedge funds, other institutional investors, and retail investors. Historically, these characterizations were largely accurate. However, recent literature highlights the increasing exceptions to these 'norms, for example with mutual funds and hedge funds investing in private firms, and venture capitalists investing in public firms (see, e.g., Kwon, Lowry, and Qian (2020), Aragon, Li, and Lindsay (2018), and Iliev and Lowry (2020)).

Second, I discuss the governance structures of private versus public firms. The past decades have witnessed an increasing number of regulations related to companies' governance structures. These rules come from both the Securities and Exchange Commission (SEC) and the

stock exchanges, NYSE and Nasdaq. However, this does not necessarily mean that companies shift from zero abidance to these rules while private to 100% abidance at the time of an IPO. Recent research by Ewens and Malenko (2022) highlights the evolution of private firms' governance structures as these firms advance beyond the earliest stages of the life cycle, and Boone et al (2007) examine how governance continues to evolve after the IPO.

There is also considerable heterogeneity in firms' abidance to these exchange rules at the time they go public. Many companies register to go public as controlled companies, thereby excluding them from the exchange requirements.[1] Over time, a portion of these companies lose this controlled status. The ability of these companies to delay various governance-related mandates potentially provides various advantages. As shown by Field, Lowry, and Mkrtchyan (2013), Field and Lowry (2022), and Johnson, Karpoff and Yi (2022), newly public companies have governance demands that differ in many ways from their more mature counterparts.

Third, I discuss aspects related to firms' strategy, and the extent to which they relate to firms' public versus private status. Firms can pursue growth through either organic or inorganic means (or a combination of both). Much evidence suggests that private firms typically rely primarily on organic growth, and they shift toward inorganic growth after going public. For example, Bernstein (2015) finds that the quality of innovation is higher before firms go public, and Celikyurt, Sevilir and Shivdasani (2010) find a dramatic increase in acquisition activity after going public. If firms are staying private longer, fueled in part by the availability of private capital, how does this influence firms' growth strategies? Consistent with macro-level changes contributing to increasing economies of scale and scope and with many private firms being less

[1] A controlled company is defined by the SEC as a company in which over 50% of the voting power is held by an individual, a group, or another company.

financially constrained, I show that firms have become increasingly likely to make acquisitions while they are still private.

The increasing tendency of firms to stay private longer interacts with many other market dynamics. In the last section of the paper, I discuss several dimensions along which markets may evolve in the future and offer suggestions for further research.

## 2. Macro trends and conceptual framework

### *2.1 Macro trends*

The number of publicly traded firms dropped precipitously starting in the late 1990s, and it has not recovered since. From CRSP, I download the number of companies each month (defined according to permco). From this set, I limit the sample to ordinary common shares (defined as share code equal to 10 or 11), which trade on NYSE, Nasdaq or Amex, and which have a non-missing price. As shown in Panel A of Figure 1, the number of public firms reached a peak at 7,374 in November 1997, compared to only 3,528 in February 2018. The number has increased slightly in more recent years, equaling 4,335 as of the end of 2021, but remains far below the levels of the late 1990s.

The decline in public firms contrasts with growth in the US economy over this period. In a country with a growing economy, the number of firms should increase over time – the trend in the total number of firms, private and public, is consistent with this conjecture. From the United States Census Business Dynamics Statistics (BDS) dataset, I obtain the number of firms each year, 1980 – 2019.[2] As shown in Panel B of Figure 1, with the exception of the years following

[2] The BDS is created by US Census from the Longitudinal Business Database (LBD).

the 2008 – 09 Financial Crisis, there has only been one year in which growth was negative (1991, with growth of -0.7%) and no two years with consecutive decreases.

The obvious difference between Panels A and B is that the vast majority of firms have always been private. In 2019, across the more than 5 million firms included in Panel B, over 99.9% are private. As discussed by Stulz (2020), the economics of being private versus public suggest that relatively few of these firms will ever go public. Most companies are not characterized by sufficient economies of scale; we would not expect them to grow to a size at which the benefits of being public outweigh the costs. This is due to both the lower benefits of being public (e.g., they can raise sufficient capital from family and friends) and the fixed costs associated with being public.[3]

Panel C focuses on a group of companies that would plausibly go public if the business is sufficiently successful. Specifically, I examine trends among VC-backed companies. Venture capitalists invest in high-growth companies, and they seek to exit these investments by taking the companies public.[4] Since 2001, approximately 50% of IPOs have represented VC-backed firms.[5] Panel C shows the number of firms raising first round VC financing over the 1990 – 2021 time period. Similar to trends in the total number of firms depicted in Panel B, we observe a general upward trend. While this series is substantially more volatile (there was an 160% increase in the number of first-round VC backed firms between 1998 and 2000, followed by a 64% decrease in 2001), the number of high-growth VC startups has increased steadily since 2010, and it is generally greater than that in the pre-1999 period.

[3] Ewens, Xiao, and Xu (2022) conclude that the fixed costs associated with enhanced disclosure and SOX 404 compliance translate to 2.1% of the median firm's annual EBITDA; for small firms with a public float less than $15 million the rate is above 4%.
[4] VCs also exit many investments via acquisition by another firm, but the VCs earn the highest returns on IPO exits.
[5] See data on Jay Ritter's website. https://site.warrington.ufl.edu/ritter/ipo-data/

Collectively, these patterns suggest that the decrease in the number of public firms is not driven by a decrease in entrepreneurial activity. Doidge, Karolyi and Stulz (2017) conclude that the decrease in the number of public firms stems from both acquisitions between public firms and from fewer companies going public. Multiple explanations have been proposed to explain firms' decreasing propensity to go public, including:

- Increased availability of capital to private firms
- Increased confidentiality concerns among high growth startups, which stem from changes in company characteristics such as higher R&D spending and increased reliance on intangible assets
- Greater globalization, which increases economies of scope and thus incentivizes small firms to sell out to larger firms
- Increased regulatory requirements of public firms

Empirical analyses provide strong support for the first three of these factors, with more mixed support for the fourth. (See, e.g., Aghamolla and Thakor (2021); Ewens and Farre-Mensa (2020, 2022); Chemmanur, He, Ren, and Shu (2022); Stulz (2020); Doidge, Karolyi and Stulz (2017), Gao, Ritter and Zhu (2013); Ewens, Xiao and Xu (2022); Lattanzio, Megginson and Sanati (2021).)

While factors such as greater globalization can lead some companies to eschew going public (they choose to get acquired instead), other factors cause companies to delay their IPOs. In particular, confidentiality concerns incentivize startups to stay private longer, and the availability of private capital enables them to do so. If companies are choosing to stay private at a point in their life cycle when they could go public, the implication is that the type of private firm (or at least some private firms) has changed. A subset of private firms should increasingly resemble public firms along various dimensions.

Incremental to firms' decreased propensity to go public, macro-level changes have contributed to changes among all firms – both public and private. As we have shifted to a more global and knowledge-based economy, intangible assets have become relatively more important, and firm-level economies of scale and scope have increased.

How do these dynamics influence the differences between private and public firms? The next subsection provides a conceptual framework, and subsequent sections discuss empirical evidence.

*2.2 Conceptual framework*

Academic literature, the popular press, and regulatory circles all recognize the IPO as a key event in the life cycle of the firm. In addition to altering a primary source of capital, from private equity to public equity, the IPO is associated with other key changes. Many of these changes stem from regulatory requirements.

First, as a firm goes public, there are changes in its investor base. Individuals can only invest in private firms if they meet the requirements of accredited investors,[6] and many other categories of investors have policies that restrict their investments in ways that relate to firms' public status. Second, public firms face corporate governance requirements that are not necessary for private firms. Both the SEC and the exchanges have rules related to the composition of the Board of Directors, and the SEC also requires that public firms make substantive disclosures, for example, financial statements, ownership structure, compensation structure, officers and directors, and key firm events.

[6] An accredited investor is defined as a person who satisfies at least one of the following criteria: has income of at least $200,000 ($300,000 if including spouse or partner) in each of the prior two years with the expectation of similar income for the next year, has wealth of at least $1 million (excluding primary residence), or holds certain professional licenses relating to the financial industry.

Based on these factors, Figure 2 depicts two potential scenarios regarding firms' transition from private to public status. On the one hand, the IPO may represent a regime shift, driven perhaps by the sudden onset of various regulatory issues. Alternatively, firms may transition more gradually, with changes beginning years prior to going public and continuing years after.

Panel A of Figure 2 focuses on a firm's sources of capital in the years prior to versus after the IPO. Panel A1 represents the regime shift scenario. Prior to the IPO, firms raise 0% of their equity from investors who focus on public companies, e.g., mutual funds and hedge funds. Consistent with their private status, they raise capital exclusively from investors who focus on private firms, e.g., venture capitalists, private equity investors, and angel investors. Following the IPO, the firm relies 100% on investors focused on public companies. This scenario is consistent with both contrasting comparative advantages across different sets of investors and with the structure of different investment forms. Mutual fund managers have more expertise regarding public firms, and the requirement to meet redemption needs on a daily basis makes the illiquidity of private firms costly. In contrast, venture capitalists have more expertise evaluating private firms, and the VC's limited partners are unlikely to be excited to pay the required carried interest, typically 20% of assets under management, to invest in public companies.

In contrast, Panel A2 depicts a scenario in which the firm's sources of capital transition gradually in the years around the IPO. In this scenario, several years before going public the firm starts raising capital from investors who traditionally invest in publicly traded firms, for example hedge funds or mutual funds. Analogously, for the first few years after the IPO the firm continues to partially rely on investment from entities that traditionally focus on private firms, for example VCs and PEs. This scenario is also plausible, in particular given market dynamics

over the past two decades. For example, prior to the IPO, firms' decisions to stay private longer makes them increasingly resemble public firms and potentially makes them a good investment opportunity for mutual funds. After the IPO, newly public firms' elevated information asymmetry relative to more mature companies may make them a good investment opportunity for VCs, whose industry experience enables them to better overcome this asymmetry.

Panel B focuses on a firm's governance structure in the years around the IPO. The structure is similar to Panel A. Panel B1 depicts the regime shift scenario in which private firms satisfy none of the governance requirements of public firms, and after the IPO they immediately transition to 100% abidance. As an example, a firm would have no independent directors prior to the IPO but would have the exchange-mandated 50% independent board in the years after the IPO.

In contrast, Panel B2 depicts a scenario in which the firm's governance transitions more gradually. This view is consistent with the firm's governance demands evolving over the course of the life cycle. As a firm grows, it increasingly demands the expertise and monitoring abilities of independent directors. As depicted in the figure, the portion of independent directors gradually increases over time, with exchange requirements causing a discrete jump around the time of the IPO.

One can imagine a similar set of figures depicting firms' growth strategy. On the one hand, firms may rely entirely on inorganic growth prior to the IPO, and then shift to a combination of organic and inorganic growth after going public. Alternatively, to the extent that Figures A2 and B2 represent better descriptions of firms sources of capital and governance structures, respectively, one might expect a similar pattern for firms' growth strategies. That is,

firms may be more likely to gradually transition to increased reliance on inorganic growth in the years prior to going public.

The following sections analyze the extent to which the 'regime shift' scenario or the 'gradual transition' scenario represents a better description of firms' evolution in the years around the IPO. The discussion throughout focuses on the set of companies that could plausibly go public, that is, high-growth companies with high demands for capital.

## 3. Sources of capital to private versus public firms

Section 3.1 focuses on the tendency of investors that had traditionally invested almost exclusively in public firms to increasingly invest in private firms. Section 3.2 focuses on the corollary, the extent to which private firm investors are investing in public firms. Section 3.3 overviews the benefits to both investors and the underlying firms, of these changing sources of capital.

### *3.1. Tendency of investors that traditionally invested in public firms to invest in private firms*

Mutual funds are commonly defined as financial vehicles that invest in publicly traded securities, for example stocks and bonds. This suggests that only public companies would have mutual fund investors. However, mutual funds have the latitude to invest in private firms as well,[7] and Kwon et al. show that mutual funds are increasingly taking advantage of this option. Figure 3 provides evidence on mutual funds' increasing investments among private VC-backed companies.

[7] Throughout this discussion, mutual funds refers to open-end funds. Because these funds must allow investors to redeem shares daily, the funds face limits in the percent of assets held in restricted securities, defined by the SEC as securities that cannot be sold within 3 - 7 days without changing the market value of the investment. Under SEC rules at time of this writing, each mutual fund has the latitude to choose the maximum percentage of assets that can be invested in restricted securities. However, a fund cannot purchase additional illiquid investments once it reaches a 15% threshold. For more detail see https://www.sec.gov/divisions/investment/guidance/secg-liquidity.htm.

Panel A shows that as of 2016, nearly 40% of VC-backed IPOs had mutual fund investment prior to the IPO, compared to less than 5% of companies in every year up until 2010. Moreover, mutual funds are providing substantial capital to these firms. Panel B shows that among VC rounds with mutual fund participation, mutual funds provided over 35% of the total capital (on average), over the 2011 - 2016 period.

Aragon, Li and Lindsey (2018) show that hedge funds are also investing in private firms. While the percent of private firms with hedge fund investment peaked at 3.5% in 2000, the percent of capital provided by hedge funds has been increasing. Their evidence on percent of capital is replicated in Figure 4. Among financing rounds with either VC or hedge fund participation, the percent of capital provided by hedge funds increased from less than 1% in the early 1990s to over 6% in the 2014 – 2016 period.

Ewens and Farre-Mensa (2022) provide a summary view of the extent to which private firms are increasingly raising capital from non-traditional sources. They show that the number of VC rounds with mutual fund or hedge fund participation increased from approximately 100 to 600 between 2002 and 2019. The percent late-stage money from non-traditional investors, which they define as including private equity (PE) funds, corporations, mutual funds and hedge funds, increased from 54% to 73% over this period. These statistics, as provided by Ewens and Farre-Mensa (2022), are shown graphically in Panels A and B of Figure 5.

Figures 3 – 5 all tell a similar story: investors that typically focus on publicly traded firms are increasingly investing in private firms. This naturally raises the question – why? Perhaps not surprisingly, no single factor is likely to provide the complete explanation. Moreover, some explanations have a bit of a chicken-and-the-egg flavor to them: because private companies can raise increasing amounts of capital they elect to stay private longer, and because private

companies stay private longer they increasingly attract a different type of investor. The remainder of this subsection discusses three sets of factors, which collectively relate to this interplay.

One factor relates to the fact that many private companies increasingly look like public companies. Companies are electing to stay private, even when they have achieved a scale at which they could go public. Panel A of Figure 6 shows both the median size of the last VC round prior to the IPO (solid red line) and the median proceeds raised in IPOs (blue dashed line), over the 1980 – 2021 period. Both are expressed in real 2020 dollars. The striking takeaway is that late-stage VC rounds in recent years are of similar magnitude to proceeds raised in IPOs in earlier periods. Median VC rounds in 2014 – 2018 resemble median proceeds raised throughout much of the 1980s, between $40 – 70 million. Since 2019, median VC rounds have increased further and fall into the $70 – 100 million range – this is similar to median proceeds raised in the 1989 – 1997 period.

Consistent with companies becoming larger prior to going public, Panel B shows that they are also older. Among VC-backed companies, median firm age at the time of IPO has increased from 6 years in the 1980s and 1990s, to 7 years between 2000-2009, and 8 years since 2010. This trend holds among both VC-backed companies (depicted with the solid red line) and non-VC backed companies (depicted with the dashed blue line).

Ewens and Farre-Mensa (2020) provides a different perspective on this same phenomenon, and I reproduce an updated version of their analysis in Figure 7. For each year over the 1987 – 2021 period, the navy bars show the number of companies that have raised $100 million or more (in real 2020 dollars) over the first seven years following their initial VC financing. The number of companies raising these relatively large amounts of capital while still

private has increased markedly over time. In 1987, there were only 510 companies that had raised this amount of money in VC rounds over their initial seven years. In comparison there have been more than 1000 such companies in nearly every year since 2013; in 2021, 3,887 companies satisfied this criteria.

The red line in Figure 7 depicts the percent of these companies that go public within the first ten years after initial financing. While the number of private companies raising $100 or more has increased, the percent going public within ten years has substantially decreased, from approximately 20% in the early 1990s to 1 – 3% in the 2000s.

If mutual fund investment in private firms is driven in part by private firms' similarity to public firms, then we would expect mutual funds to invest in the subset of private firms that look most like public firms. Figure 8 provides evidence consistent with this conjecture. Among the set of VC-backed private firms, those with pre-IPO mutual fund investment are both older and larger, as proxied by number of VC rounds received and the amount of money received in VC rounds, respectively. They are also more successful, as proxied by number of patent applications.

A second set of factors behind the increased mutual fund and hedge fund investment in private firms relates to regulatory changes. Ewens and Farre Mensa (2020) conclude that regulatory changes in the late 1990s increased the ability of private equity firms to invest in private firms. The National Securities Markets Improvement Act (NSMIA) of 1996 increased private firms' ability to raise capital, through two separate channels. First, the Act effectively decreased private firms' costs of raising capital from out-of-state investors, by exempting the firms from many Blue Sky laws. Second, the Act decreased VC and PE funds' costs of raising large amounts of capital, by increasing the number of investors in a fund without necessitating registration under the Investment Company Act (ICA).

Finally, a third set of factors relates to changes in public equity markets. The decreased number of publicly traded companies means that actively managed equity mutual funds and hedge funds have fewer stocks in which to invest. At the same time, increased competition from passive investment strategies led to increased pressure to differentiate themselves and to earn alpha.

*3.2 Tendency of private firm investors to invest in public firms*

Venture capitalists are commonly defined as financial intermediaries who invest in private, high-growth companies and exit as soon as possible after the IPO, for example at the end of the lock-up period. Similarly, private equity is defined as an investment strategy that primarily focuses on private companies. This may be in the form of either direct investment in private firms, or investment in public firms with the intention of bringing them private via a leveraged buyout (LBO). Iliev and Lowry (2020) and Jenkinson, Jones and Rauch (2022) show that there exist many exceptions to these typical views.

Jenkinson et al. analyze a sample of 330 PE-backed IPOs (also commonly referred to as reverse leveraged buyouts (LBOs)), each of which is owned by one or more PE firms. These represent companies that were acquired in an LBO by a PE fund and which are now re-accessing public markets. They classify these PE-backed IPOs by the number of years it takes the PE to divest its position, following the IPO. As shown in Figure 9, by the end of the first year after the IPO, PEs had divested their positions in only 21% of IPOs. By the end of year two, less than half had divested. A full five years after the IPO, PEs continued to hold positions in 17% of the IPO firms.

Perhaps even more surprising, Iliev and Lowry (2020) show that VCs invest *more* money into many firms, following their IPOs. Looking at Figure 10, within the sample of VC-backed

IPOs, VCs invest additional money within the first five years after the IPO in approximately 15% of cases. Approximately half of these investments are made by a venture capitalist that also invested prior to the IPO. This rate varies over time but shows no particular trend. The greatest percent of these investments occur within the first year after the IPO, and the frequency decreases with each subsequent year.

These patterns again raise the question – why? Why do institutions such as venture capitalists and private equity funds, which typically invest in private companies, invest so often in public companies? The reasons mirror factors that drive mutual funds' investments into private companies.

There are some public companies that resemble private companies, at least along certain dimensions. In particular, they are characterized by high information asymmetry, which makes it costly for them to raise public equity (Myers and Majuf, 1984). As shown in Figure 11, VCs are more likely to invest in post-IPO companies that are younger and smaller, and that have negative cash flow from operations, higher R&D expenditures, and lower profitability. VCs have a comparative advantage in overcoming the high information asymmetries of these companies, for example due to industry experience and/or past investments with the firm. These factors increase VCs' ability to identify the subset of companies with positive NPV projects.

Denis and McKeon's (2021) analysis of all publicly traded firms provides added evidence regarding the relation between firm information asymmetry and sources of capital, and the ways in which this has changed over time. The evolution towards an information-based economy, as opposed to a manufacturing-based economy, is associated with increases in intangible assets and increases in economies of scale and scope that incentivize fast growth. These dynamics suggest that an increasing portion of firms will be characterized by high information asymmetry.

Consistent with this conjecture, Denis and McKeon document that firms with negative NCFs play an increasing role in our economy.

Denis and McKeon place firms into deciles each year according to NCF / assets. As shown in Panel A of Figure 12, among firms in the lowest decile, average NCF / assets has decreased over time: -0.23 in the 1970s, -0.51 in the 1980s, and -0.68 in 2010-2018. Moreover, among firms with negative NCFs, these NCFs are increasingly persistent. The combination of more negative and more persistent NCFs necessitates more frequent equity issues.

As shown in Panel B, firms in the lowest NCF decile issued an average 0.46 equity issues per firm-year in the 1985 – 89 period, compared to 1.0 in the 2010 – 18 period. An increasing percent of these equity offers represent PIPEs rather than SEOs. The primary difference between SEOs and PIPEs is that the PIPEs are restricted to institutional investors who largely purchase restricted shares; the shares are only eligible to trade after they become registered.[8] While PIPEs are typically offered at a discount to the current market price, the advantage for the company lies in the ability to attract investors who can overcome the high information asymmetry. That is, PIPEs represent a way to overcome Myers and Majluf (1984) type problems that can thwart public equity financing. Consistent with this, Denis and McKeon find that within their sample, many PIPE investors are repeat investors. As summarized by Denis and McKeon, this set of public firms has funding needs and financing patterns that more closely represent the staged financing of private firms (see also, Hertzel et al. (2012)).

*3.3 The blurring of lines in sources of capital – is it a good thing?*

[8] Within a subsample with available data, Brophy, Ouimet and Sialm (2009) report that the inter-quartile range between PIPE closing date and registration effective date is 38 – 118 days. Within a subsample of firms that have gone public within the past five years, Iliev and Lowry report that the median (mean) days to registration is 67 (118).

As discussed in sections 3.1 and 3.2, the demarcation between public market investors and private market investors is more blurred than commonly recognized. Moreover, along several dimensions it has become increasingly blurred over the past two decades. This section overviews the evidence regarding the consequences of these dynamics, for both firms and investors.

During the 1995 – 2016 time period of Kwon et al's study, mutual funds did well with these strategies. As shown in Figure 13, mutual funds earned 2.6 to 3.8 times as much in their private firm investments, compared to a market-wide index over the same period of time. The wealth relatives are even higher among non-unicorns, defined as companies with a valuation of less than $1 billion. While the private firms are likely riskier than mutual funds' other investments, the low correlation between returns on the private firms and the market index suggests that this risk is largely idiosyncratic. In sum, mutual funds were able to obtain both higher returns and diversification benefits through their private firm investments during this time period.[9]

Just as mutual funds have been able to earn positive alpha through their private firm investments, Iliev and Lowry find that venture capitalists have been able to earn positive alphas through their public firm investments. Venture capitalists' unique ability to overcome the informational asymmetries of this set of public firms is reflected in their positive abnormal returns. As shown in Panel A of Figure 14, VCs earn an average 31% abnormal return in their post-IPO investments, over a 12-month horizon. Consistent with higher-quality VCs having greater expertise and thus greater ability to differentiate the high-quality firms from the lower quality, the top-10 VCs earn an average 61%, compared to 22% among other VCs.

[9] Huang et al. (2021) conclude that mutual funds' investments in pre-IPO firms also benefit the VC investors in these firms, for example by contributing to lower initial returns and facilitating VC exit with less price impact.

Companies also benefit from these investments. As shown in Panel B of Figure 14, across all VC investments in these newly public firms, the average company earns abnormal returns of 7% in the [-2,+10] day period around announcement of the post-IPO VC investment. Consistent with benefits being greater when the VC has a larger comparative advantage in identifying high quality versus low quality companies, abnormal returns are greater when the VC has a director on the company's Board, owns shares in the company, and invested prior to the IPO. Benefits are also greater among companies facing higher information asymmetry who are more constrained in their ability to raise capital, as indicated by the greater abnormal returns when market returns are lower and more volatile.[10]

Celikurt, Sevilir and Shivdasani (2014) find that VCs' propensity to focus on public firms is not limited to the first five years after the IPO. They document that nearly one-third of S&P1500 firms have a director who is a venture capitalist. Unlike Iliev and Lowry's analysis, these directorships are not necessarily accompanied by financing. However, they similarly conclude that VCs' involvement is beneficial to firms: VCs' investment of time (via service on the board) is accompanied by positive announcement returns, and it contributes to increased innovation and improved operating performance among these relatively mature firms.

In sum, the lines between private and public ownership are blurred. Investors that typically focused almost exclusively on public companies are increasingly investing in private companies. Mutual funds and hedge funds are notable examples. Analogously, investors that are commonly described as only investing in private companies frequently invest in public companies, and the financing patterns of some public companies resembles that of private

[10] Jenkinson et al. (2022) conclude that the PE firms do not add value through their sell-down strategy, that is, the observed PE fund returns obtained by selling blocks at certain points in time does not generate higher returns than an algorithmic strategy of selling an equal portion each month. Jenkinson et al. do not examine whether the PE fund managers enhance portfolio firm value through the advice or monitoring they provide to the companies.

companies. Looking back at Figure 2, the gradual transition shown in Panel A2 frequently represents a more accurate characterization than the regime shift depicted in Panel A1. Importantly, both firms and financial intermediaries frequently benefit from this flexibility.

## 4. Governance of private versus public firms

Corporate governance represents a set of mechanisms that facilitates the monitoring and advising of management. Firms' corporate governance evolves over their life cycle, due both to changing economic fundamentals and to pressures from investors and regulators. As discussed by Jensen and Meckling (1976), the monitoring dimension focuses on minimizing agency costs, and agency costs tend to be more severe among public firms; the investor base is more disperse and managerial ownership is lower (Gogineni et al. (2022)). In contrast to the public firms' higher monitoring demands, private firms tend to have higher demands for advising, for example due to executives' lack of experience. These dynamics suggest that publicly traded firms' optimal governance structures differ from those of private firms.

Multiple factors influence firms' governance; regulatory requirements and investor demands represent two key forces, and they frequently relate to firms' public status. The US and many countries around the world have various regulations to protect atomistic shareholders, and La Porta et al (2007) highlight the benefits of such regulations, for example in contributing towards more developed markets. If regulations focused on public firms represent the sole determinant of firms' governance, then the regime shift model presented in Panel B2 of Figure 2 should best describe firms' governance in the years around the IPO. Alternatively, does the increased dispersion of shareholders prior to the IPO, combined with firms' continued evolution in the years after the IPO, mean that the gradual transition model presented in Panel B1 better

characterizes firms' governance? Ex ante it is not clear: Brav et al. (2008) highlight the influence of activist investors on firms' governance, where one of the most common demands of activist investors is to modify the Board of Directors, but Chernenko et al. (2021) show that pre-IPO mutual fund investors focus less on key dimensions of governance such as monitoring.

Sections 4.1 and 4.2 discuss pre-IPO and post-IPO governance dynamics, respectively. As such, they provide evidence on the extent to which the evolution of firms' governance in the years around the IPO mirrors observed patterns in ownership structure (as discussed in the prior section).

*4.1 Corporate Governance prior to the IPO*

Ewens and Malenko (2022) collect data on private firms' Boards of Directors, among VC-backed firms. Figure 15 shows average board size (solid line) and average percent independent directors (dashed line) over the ten years following the first VC financing. The average Board size increases from 3.6 to 5.8 over the ten years following the first VC financing. This increase comes from additions of both investors (e.g., VCs) and independent directors, but not insiders (see also, Amornsiripanitch, Gompers and Xuan (2019)). Consistent with these changes, average Board independence increases from 13% to 22%.

At the time of the first financing round, 37% of firms have one or more independent directors, compared to 65% as of the fourth financing round. Amornsiripanitch et al show that the VCs frequently recruit these outside directors from their professional networks (see also Venugopal and Yerramilli (2020)). The fact that VC investors, who are highly incentivized to maximize firm value, recruit outside directors prior to the IPO provides strong evidence on the perceived value of this form of corporate governance – even while the firm is still private.

It is important to recognize that these outside directors likely fulfill multiple roles. First, demand for monitoring arguably increases as companies become more complex even while they remain private; WeWork, Uber, and Theranos provide notable examples. Second, firms also demand increasing types of expertise as they grow larger and more complex. This includes, for example, supply chain expertise, access to customers, and knowledge regarding foreign markets, among others.[11] Finally, regulatory issues also appear to play a role. Comparing startups that ultimately exit via IPO with those that do not, Ewens and Malenko find that the former group adds more independent directors.

An outstanding question in the literature relates to whether private companies' governance structures are sufficiently developed, by the time they go public. Aggarwal et al. (2022) conclude that the increase in private capital has enabled founders to retain higher control rights in more recent years. In particular, they conclude that this has facilitated founders' ability to go public with a dual class share structure. One can imagine that greater founder power might similarly contribute to many other types of dictatorship-like governance. While anecdotal evidence abounds (e.g., WeWork, Uber, Theranos, etc.), future research in needed.

*4.2 Corporate Governance after the IPO*

Just as firms' governance structures evolve in the years prior to the IPO, they continue to evolve in the years following the IPO. A growing body of evidence suggests that newly public firms, commonly defined as companies that have gone public within the past five years, differ from their more mature counterparts on multiple dimensions. As discussed by Field, Lowry and Mkrtchyan (2013), management of newly public firms typically has minimal public market-related experience. For example, they tend to have little knowledge regarding: filing public

[11] See also survey evidence in the Rock Center for Corporate Governance, 2018 report.

statements with the SEC, managing relations with institutional investors, communicating with the media, interacting with analysts, raising public capital in either debt or equity markets, or navigating corporate restructurings such as a merger or acquisition. Another dimension on which newly public firms differ is their concentration of ownership: management frequently owns a larger portion of the company, compared to more mature companies.

The unique characteristics of newly public firms contribute to a fundamentally different set of corporate governance demands. Demands for advising are higher, as the relatively inexperienced management looks to Board members for their expertise and connections. At the same time, monitoring demands are lower, as management's higher ownership represents a strong incentivize to maximize shareholder value.

As the company matures, these unique characteristics wane, and we expect governance demands to evolve toward those of more mature firms. Boone et al. (2007), Field, Lowry and Mkrtchyan (2013) and Field and Lowry (2022) provide evidence consistent with this prediction.

Field, Lowry and Mkrtchyan (2013) focus on the ways in which newly public firms' differential demands for advising versus monitoring (compared to more mature firms) affect the composition of their Boards. In particular, they focus on the frequency of busy boards, defined as a Board of Directors on which more than half of the directors serve on three or more Boards. Such directors are weaker monitors but more effective advisors, due to the combination of more stringent time constraints but stronger connections and experience. As the company matures, the demands for monitoring increase (as management's ownership share declines) and demands for advising decrease (as management experience grows). Consistent with these changes in governance demands, while 49 % of firms have busy boards at the time of the IPO, this decreases to 37% and 31% five and ten years after the IPO, respectively.

Boone et al. focus on board characteristics similar to those examined by Ewens and Malenko: board size and board independence. Their findings in many ways represent an extension post-IPO of the pre-IPO trends documented by Ewens and Malenko. The blue dashed line in Panels A and B of Figure 16, respectively, shows how average board size and board independence increases over the ten years following the IPO, among firms that went public in 1988 – 1992. Putting together results in both papers, the evolution in Board size is consistent with firm complexity increasing in the years prior to the IPO, experiencing a jump at the time the firm goes public, and then continuing to increase after. The patterns in board independence is consistent with demands for monitoring and advising evolving in a similar way.

In addition to showing an upward trend in both board size and board independence over the years following the IPO, Panels A and B of Figure 16 also show a contrast between companies that went public in the 1988 – 1992 period of the Boone et al study (blue dashed line) and the 1996 – 2009 period of the Field et al. (2013) study (red solid line). Specifically, compared to the 1988 – 92 sample, both board size and board independence within the 1996 – 2008 sample are higher at the time of the IPO and evolve more gradually over subsequent years. Several factors potentially contribute to this change, including both regulatory changes such as SOX and with firms in the later subperiod having grown and developed more while they were still private. Among the 1988 – 1992 IPOs, firms' boards grew from 6.2 to 7.0 directors over the first five years after going public, and board independence increased from 62% to 69%. In contrast, among the 1996 – 2008 sample, these metrics equaled 6.8 and 71% at the time of the IPO, i.e., they resemble the year five values of the earlier sample. As firms delay going public, their governance structures evolve more while they are still private.

In sum, firms' governance transitions in ways that are very similar to their ownership structure. There is a gradual evolution over time, which begins long before the IPO and extends long after the IPO. In addition, there is also a discrete jump at the time of the IPO, as both regulatory factors and additional demands associated with being a public firm contribute to more sudden change. Finally, there is some evidence that as firms are staying private longer, a greater portion of this evolution in governance is occurring prior to the IPO.

## 5. Firm strategy: organic versus inorganic growth

Given the observed changes in the evolution of both firm ownership and firm governance in the years around the IPO, it is natural to also consider whether there have been changes in firm strategy. As discussed earlier, two fundamental factors influencing markets are the increased financing available to private firms and the move toward a more global, knowledge-based economy that rewards economies of scale and scope. Do these factors influence firms' decisions regarding organic versus inorganic growth, while still private?

Inorganic growth includes acquisitions of entire firms as well as purchases of key assets. Prior literature suggests that private firms rely somewhat on inorganic growth, but such growth plays a larger role after firms go public. In a study of VC-backed firms that received first round financing between 1980 and 2013, Kwon (2019) finds that 10% of firms purchase patents while they are still private, and in a study of all IPOs across the 1985 – 2004 period Celikurt et al. find that 19% of firms make acquisitions over the five years prior to going public.

Celikurt et al. conclude that a key motive for going public is to enable increased levels of inorganic growth, i.e., to obtain an acquisition currency. They find that the percent of firms making acquisitions within the five years after the IPO is 74% (compared to 19% in the prior

five years). The capital raised through public listing facilitates both cash and stock acquisitions. Such acquisitions enable companies to grow more rapidly, compared to reliance on internal growth. The implication is that rapid growth is valued, but financing constraints prevented firms from pursuing this path prior to going public.[12] This raises the question of whether the increased availability of capital to private firms in recent years has led more firms to pursue pre-IPO acquisition activity.

Figure 17 provides evidence consistent with the prediction that private firms' propensity to grow inorganically has changed over time. The sample consists of VC-backed IPOs between 1980 – 2016, and I track the number of acquisitions from four years before through four years after each IPO. Year 1 (year -1) represents the 365 days following (preceding) the offer date, with other years defined analogously. Among companies that went public in the 1980s, virtually none made acquisitions prior to the IPO, and there is a large increase in the first year after the IPO. Across the decades, the frequency of pre-IPO acquisitions has increased, and there is less of a change in acquisitions after going public. Specifically, over the decades, the average number of acquisitions in the year -1 has increased from 0.02 per firm-year among IPOs in the 1980s to 0.27 in the post-2010 period. Consistent with the decreased impact of the IPO on acquisition activity, the percentage increase in acquisitions from year -1 to year +1 has fallen: the average jump was 529% in the 1980s, compared to only 24% in the post-2010 period.

It is noteworthy that among IPOs through 2009, the greatest increase in acquisition activity occurred after the IPO, that is, between years -1 and +1. In contrast, among IPOs in the 2010 – 2016 period the largest increase occurs prior to the IPO, specifically between years -2 and -1 where there is a 65% increase.

[12] Cornaggia et al. (2021) conclude that the IPO also causes firms to change the type of acquisitions, in ways that facilitate geographic expansion.

Interestingly, pre-IPO firms' increasing tendency to grow inorganically is concentrated among VC-backed firms. I do not find similar evidence for non-VC backed firms. This potentially reflects the aforementioned trends being concentrated among VC-backed firms. For example, the regulatory changes that increase the availability of capital to private firms predominantly affect VC-backed firms. It is also possible that the increase in economies of scale and scope are concentrated within industries in which VCs typically invest, for example industries characterized by intangible assets and high growth.

The diminished effects of the IPO on firms' acquisition behavior raises the question of whether there have been similar changes in internal growth, including for example in innovation and investment. Along these dimensions, prior literature provides contradictory evidence regarding the effects of public listing. For example, Bernstein (2015) concludes that going public causes the quality of firms' internal innovation to decrease, whereas Acharya and Xu (2016) and Driver et al. (2020) conclude that public listing has a positive impact on firm innovation, particularly within external finance-dependent industries. Regarding investment, Asker et al. (2015) conclude that short-termism causes public firms to invest less, whereas Gilje et al. (2016) conclude that increased financing flexibility causes public firms to invest more.[13] Regarding labor, Borisov, Ellul and Sevilir (2020) find that the IPO causes hiring to increase, while Babina et al. (2020) and Bias et al. (2021) find that the IPO causes a re-allocation of labor, for example towards a more diversified and more hierarchical structure. Interestingly, Bias et al. show that at least some of these changes begin two years prior to the IPO. In sum, the effects of going public on internal growth are nuanced, and less is known regarding the ways that these relations may have changed over time. This represents a fruitful avenue for future research.

[13] Sheen (2020) finds that private firms invest more optimally than public firms, as measured by likelihood to invest before versus after demand shocks.

In sum, evidence on the frequency of acquisitions in the years prior to versus following the IPO represents one more piece of evidence on the blurring of lines between public and private ownership. While financing constraints previously made acquisitions largely the domain of public firms, this is no longer the case. In recent years, late-stage private firms rely heavily on inorganic growth. This potentially represents a means for these firms with ample capital to grow more rapidly, and to thereby achieve economies of scale and scope.

## 6. Conclusion

The lines between private and public firms have become increasingly blurred. The tendency of startup firms to stay private longer has led a set of private firms that increasingly resemble public firms. These private firms are larger, their ownership is more diverse, their governance structures include larger and more independent boards, and they increasingly employ acquisitions as a means of growth. Along each of these dimensions – sources of financing, governance, and means of growth – IPOs in recent years exhibit a more gradual transition over the years leading up to the IPO.

Firms continue to transition in the years following the IPO. Compared to more mature firms, high levels of information asymmetry in the years immediately following the IPO lead firms to rely on sources of financing more frequently employed by private firms, for example private equity financing and financing from players such as VCs that can overcome such asymmetries. Firms' governance also evolves over the years following the IPO, as firms' increasing experience with public markets lowers their demands for advising and the increasing ownership dispersion increases the demands for monitoring.

Two key factors behind these changes are the increased availability of capital to private firms and the transition to a more global information-based economy, which increases economies of scale and scope. While these market-level changes have contributed to firms staying private longer, they also raise questions regarding what other changes we may expect in the future.

First, as founders prefer to stay private longer, VCs find it increasingly difficult to liquidate their investments and distribute proceeds to limited partners. VC funds typically have 10 to 12 year lives, a criteria that is increasingly difficult to satisfy. While the VC general partners can obtain extensions from their limited partners, this is far from a complete solution. This raises the question of whether VCs will increasingly adopt the practice used frequently in private equity, whereby a PE investor sells a firm to another PE firm, rather than relying on an IPO or acquisition as a means of exiting the investment. While such fund-to-fund sales are frequent in the PE world, they remain relatively rare in the VC world. However, it is quite possible that this will change.

Second, as fewer companies are publicly traded, retail investors have fewer options. This raises the question of whether the restrictions related to investing in private companies should be lessened, to allow more retail investment. The SEC, under the chairmanship of Jim Clayton, examined this issue. An understanding of the extent to which the lines between public and private status have become increasingly blurred can shed light on this debate.

Third, does the increasing tendency of companies to stay private influence society's approach towards environmental and social issues? On the one hand, Shive and Foerster (2020) and Li and Wu (2020) conclude that public listing negatively impacts firms' environmental practices, a finding that is attributed to the greater agency costs among public firms. However,

Liang et al. (2022) find that stock market listing positively impacts workplace safety, a funding that they attribute to the greater regulatory focus and media attention on public firms.

In conclusion, as the lines between private and public status become increasingly blurred, it becomes imperative to think carefully about the structure and impact of regulation, investor pressure, and even media attention. The differences between late-stage private firms and public firms are smaller than commonly recognized, and the differences among newly public firms and their more mature counterparts are larger than commonly recognized.

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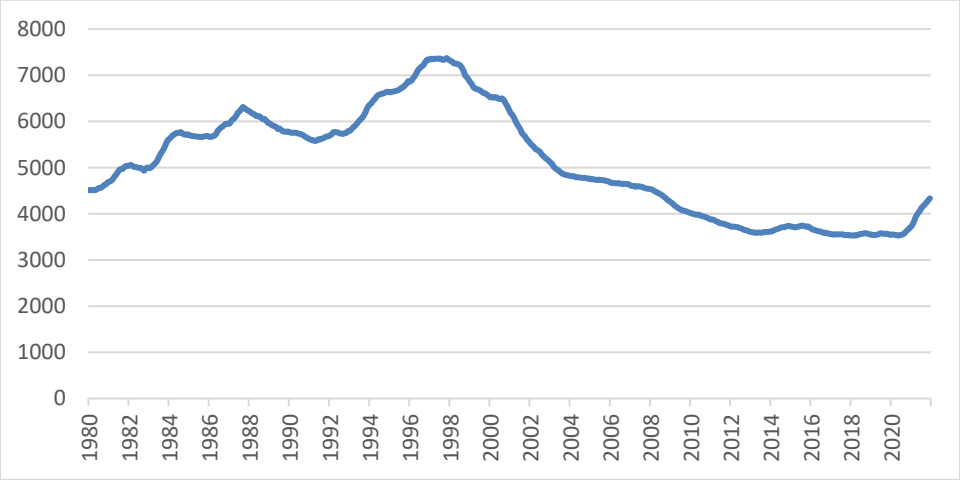
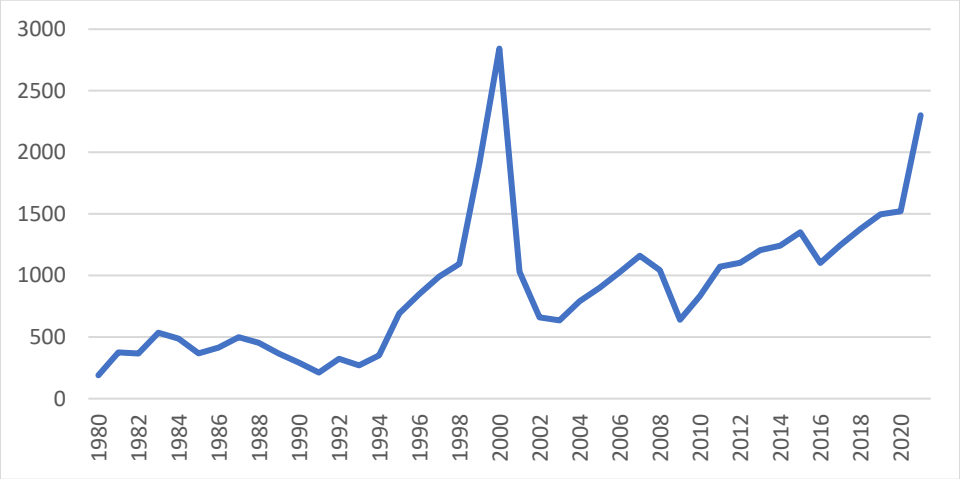
**Figure 1: Number of Firms**

Panel A shows the number of publicly traded firms with ordinary common shares (defined as share code equal to 10 or 11) that trade on NYSE, Nasdaq or Amex, with a non-missing price, as listed on CRSP, between 1980 and 2021. Panel B shows the number of firms receiving first round VC financing, each year between 1980 and 2021. Data come from VentureXpert, and require nonmissing information on the financing round date and financing round amount. Panel C shows the number of firms each year between 1980 and 2019, as recorded in the US Census Business Dynamics Statistics (BCS) dataset. The BDS is created by US Census from the Longitudinal Business Database (LBD).

*Panel A: Number of Publicly traded firms, 1980 - 2021*




*Panel B: Number firms receiving first VC-round financing, 1980 - 2021*



*Panel C: Number of Firms (private and public) in United States, 1980 - 2019*

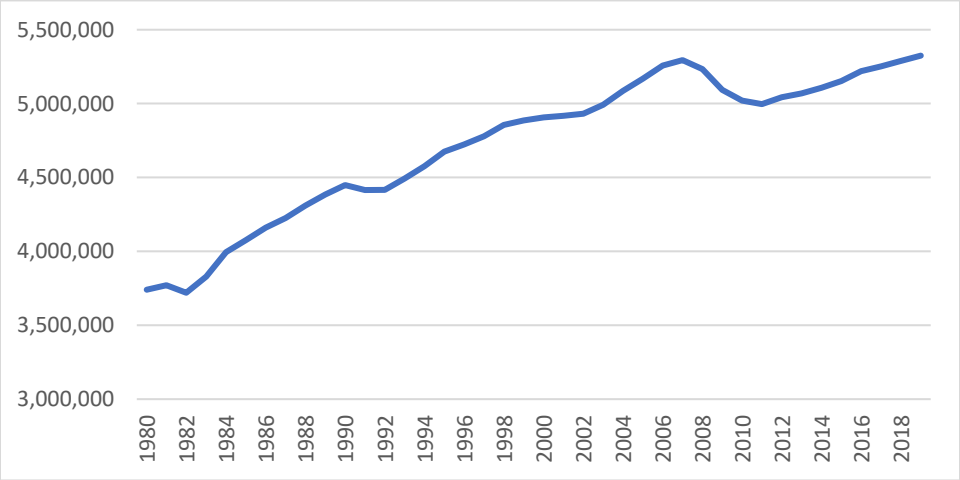
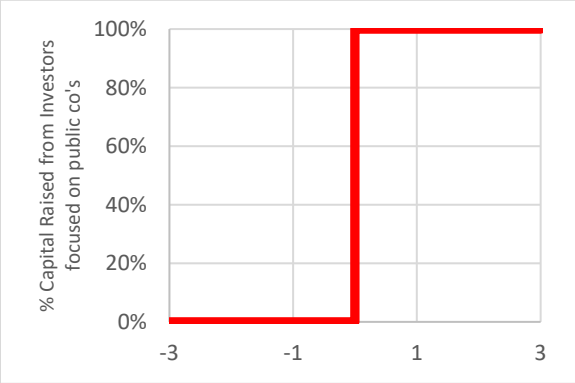


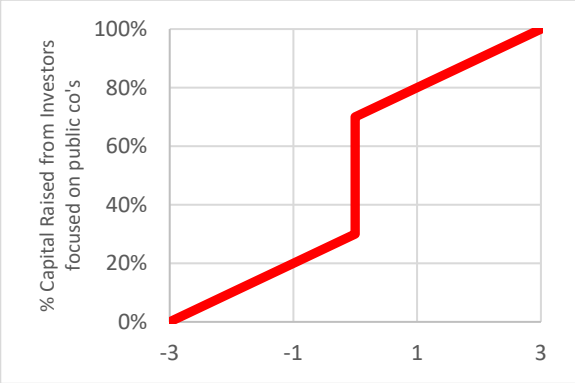
**Figure 2: Alternative patterns in firm financing and governance, around time of IPO**

Panel A shows two alternative patterns in firms' sources of capital, in years -3 through +3, where year 0 represents the year of the IPO. The y-axis represents the percent capital raised from investors who typically focus on private companies, for example venture capital funds, private equity funds, and angel investors. Panel B shows two alternative patterns in firms' governance, in the same seven-year period. The y-axis represents percent compliance with regulatory requirements of public firms, where regulatory requirements include the rules of the exchange on which the firm is listed.

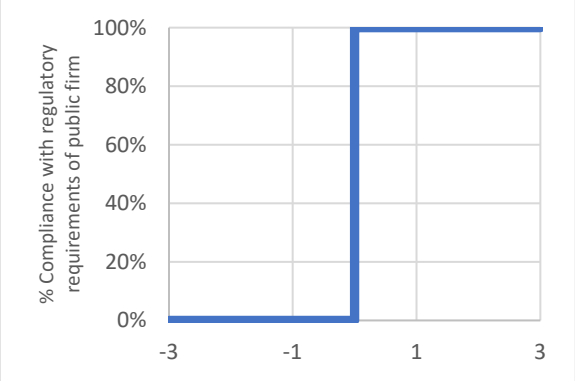
*Panel A1: Sources of capital, Case 1*




*Panel A2: Sources of capital, Case 2*




*Panel B1: Governance, Case 1*




*Panel B2: Governance, Case 2*

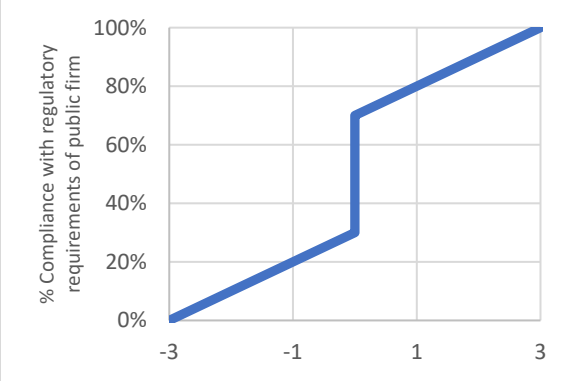
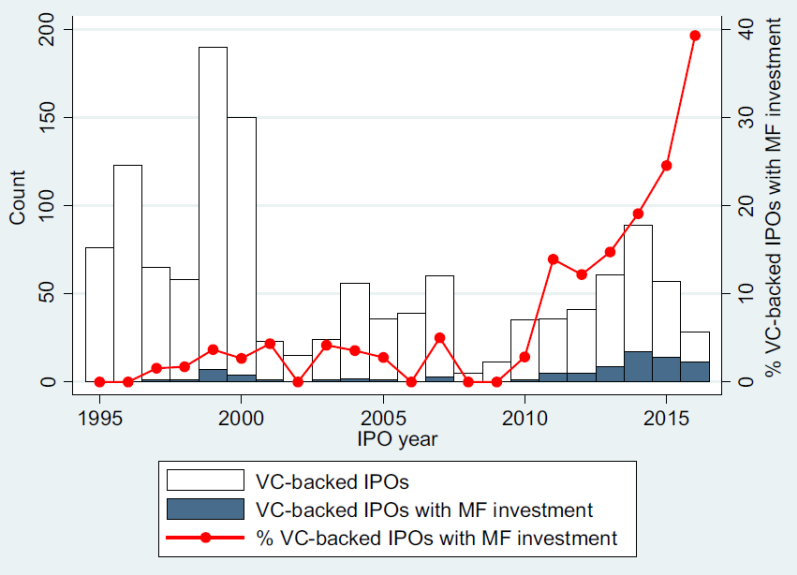


**Figure 3: Mutual fund investment in private firms**

Panels A and B represent replications of Figure 3 and Panel A of Figure 2, respectively, from Kwon et al (2020). In Panel A, the sample consists of the 1,278 VC-backed IPOs between 1995 and 2016, of which 83 received mutual fund investment prior to the IPO. The white bars depict the number of VC-backed IPOs each year, the blue bars depict the number that received mutual fund investment prior to the IPO, and the red line shows the percent of VC backed IPOs that received pre-IPO mutual fund investment. In Panel B, the sample consists of 234 VC funding rounds across 195 unique companies, in which the company received first round VC financing between 1990 and 2016, and the round included mutual fund investment. The blue (white) bars show the average (median) percent of capital provided by mutual funds in these rounds, categorized across three different time periods.

*Panel A: Number of VC-backed IPOs with mutual fund investment prior to IPO*




*Panel B: Percent capital provided by mutual funds, among VC rounds with mutual fund participation*

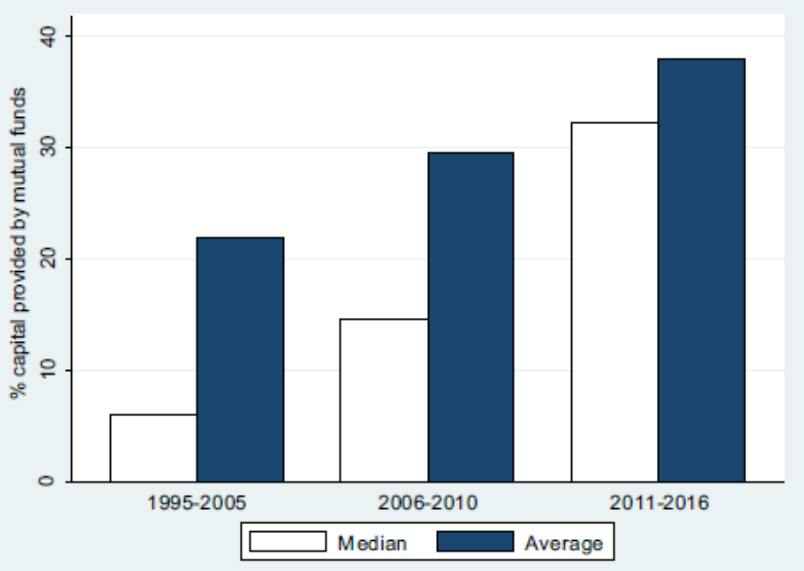


**Figure 4: Hedge fund investment in private firms**

This figure is a replication of Panel B of Figure 1, from Aragon, Li and Lindsey (2018). The percent of capital provided by hedge funds, in private firms with either VC or hedge fund investment. The figure shows the percent of total capital provided by hedge funds each year, within financing rounds with either VC or hedge fund participation.

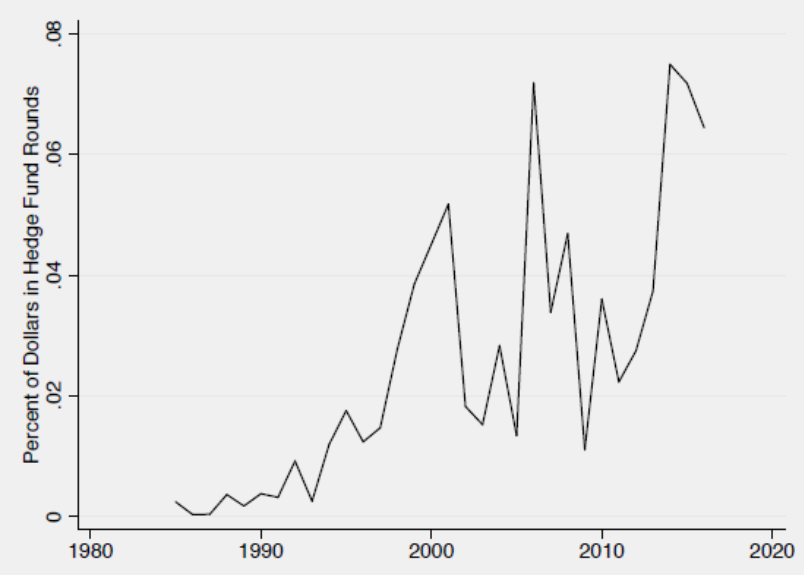
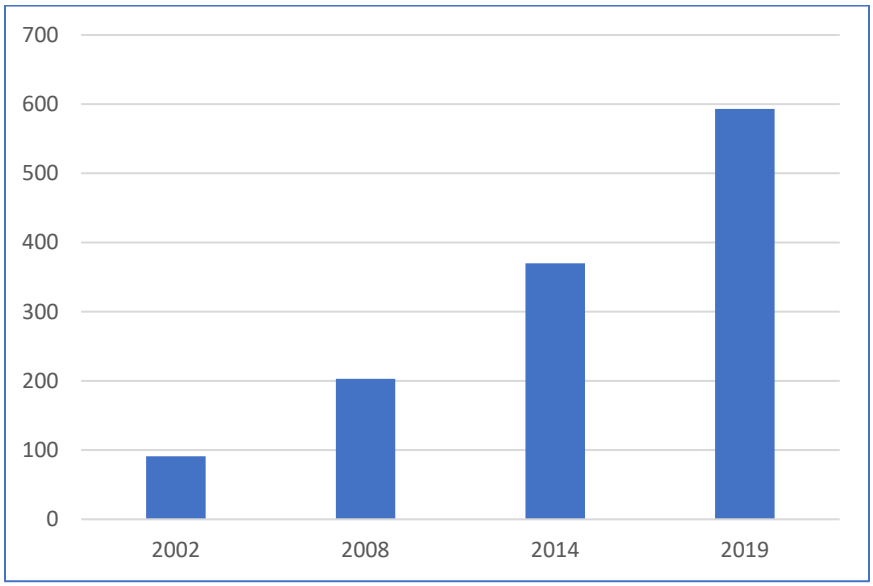


**Figure 5: Non-traditional financings to private firms**

This figure is based on data provided in Table 1 of Ewens and Farre-Mensa (2022). Panel A shows the number of financing rounds raised by VC-backed startups that included one or more mutual funds or hedge funds in the financing syndicate, from Pitchbook data. Panel B shows the percent of al dollars invested in late-stage rounds that were supplied by non-traditional startup investors, including PE funds, corporations, mutual funds, and hedge funds.

*Panel A: Number of Financing rounds with mutual fund or hedge fund participation*




*Panel B: Percent late-stage capital from non-traditional investors*

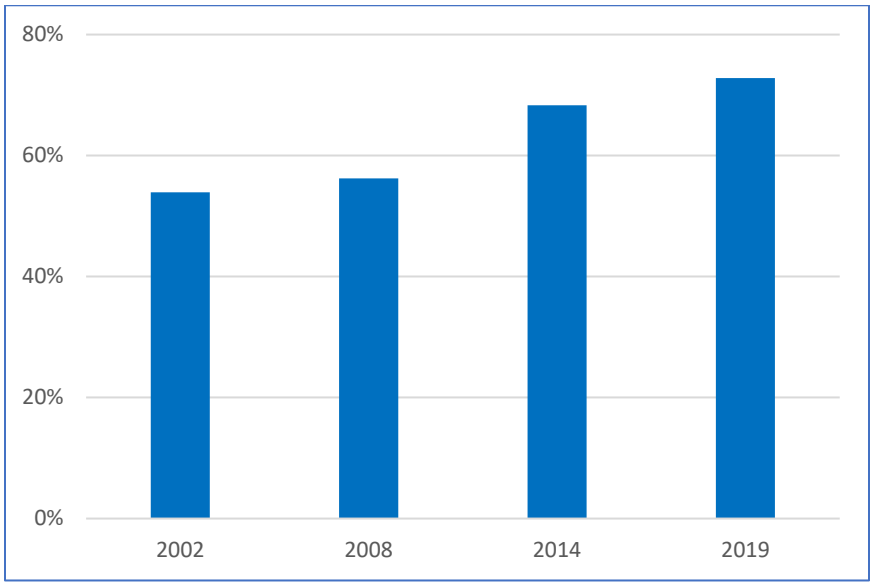
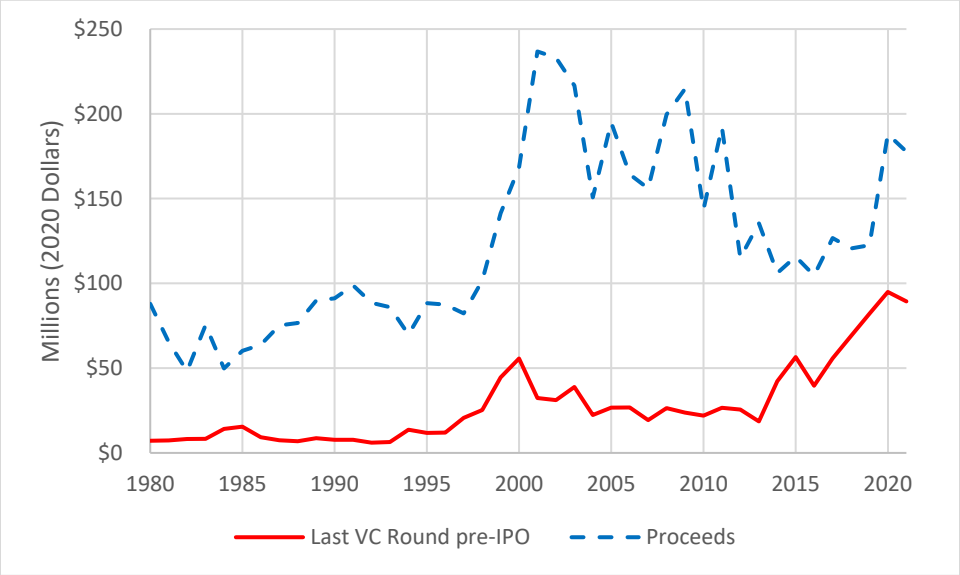


**Figure 6: Changes in types of firms going public**

Panel A compares the size of the last VC round raised prior to the IPO with proceeds raised in the IPO. The sample consists of VC-backed companies. The blue dashed line shows median proceeds raised in IPOs each year, and the solid red line shows median proceeds raised in the last VC round prior to the IPO, both expressed in millions of 2020 dollars. Panel B shows the median firm age at time of IPO, for IPOs each year between 1990 and 2021. The blue dashed line represents median age among non-VC backed companies, and the red solid line represents median age among VC-backed companies. Data come from Jay Ritter's website.

*Panel A: Size of last VC round versus IPO proceeds*




*Panel B: Firm age at IPO*

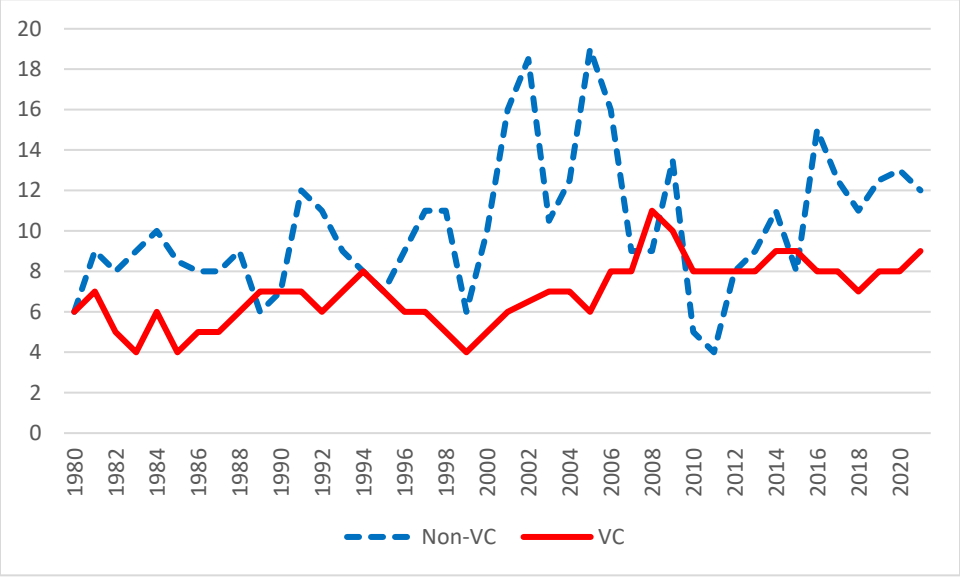


**Figure 7: Companies raising $100 or more, and percent of these companies that go public**

The sample consists of VC-backed companies who received their first round of VC financing (as listed in VentureXpert) in 1980 – 2021. To allow at least seven years of financing for each company, the first sample year in the figure is 1987. The navy bars represent the number of companies each year that have raised $100 million or more (in real 2020 dollars) in financing over the past seven years. The red line shows the percent of these companies that go public in an IPO, within the first ten years after the first VC financing. This figure is similar to Figure 5 in Ewens and Farre-Mensa (2020).

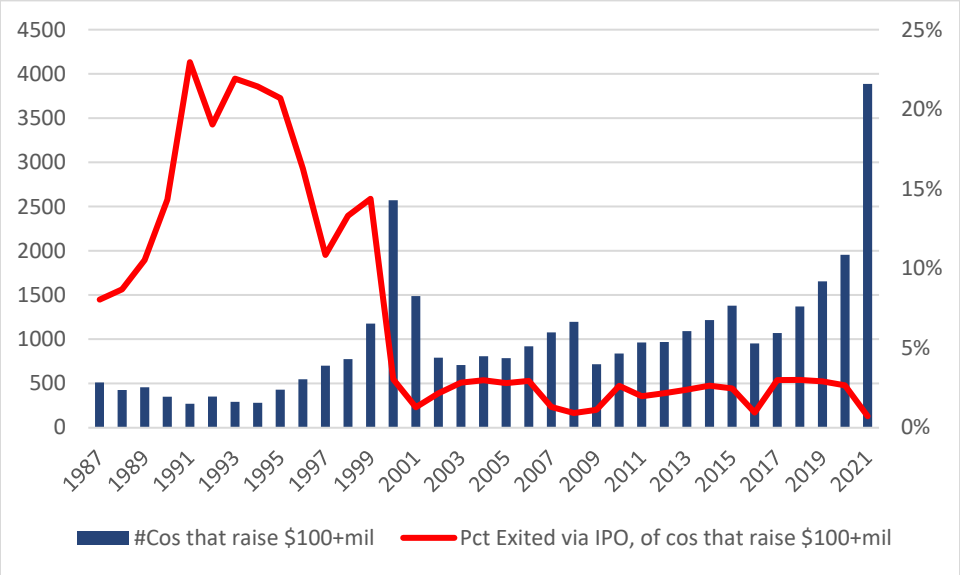
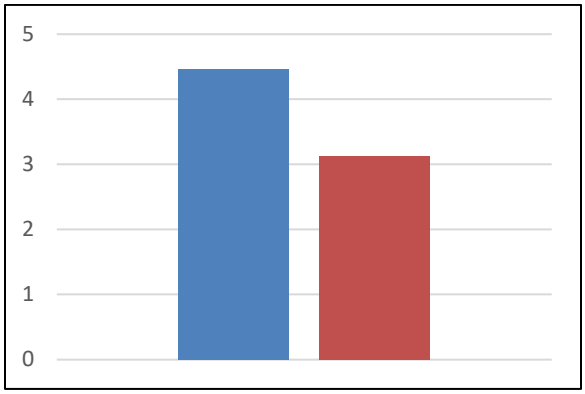


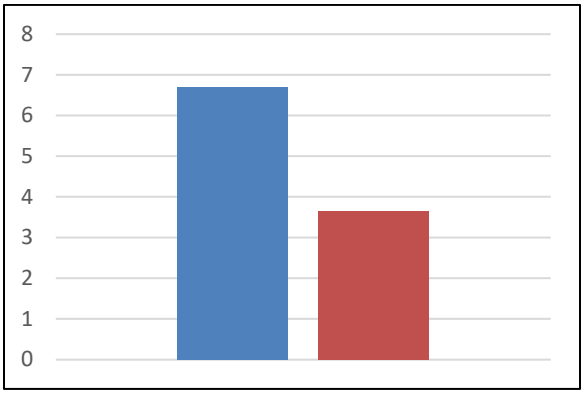
**Figure 8: Types of companies in which mutual funds invest**

This figure is based on data provided in Table 1, Panel A of Kwon et al. The sample consists of 28,516 VC-backed private firms that received their first VC round between 1990 and 2016. The blue bars show average characteristics of the 270 firms that obtained mutual fund financing, measured as of the time of mutual fund financing. The red bars show average characteristics of the 28,246 firms that did not obtain mutual financing, measured at the earlier of exit from private status (or becoming defunct) or last financing round date. Panel A shows the number of VC rounds received, Panel B shows average VC syndicate size in the last VC round, Panel C shows the amount of capital raised in the last VC round, and Panel D shows the number of patent applications.

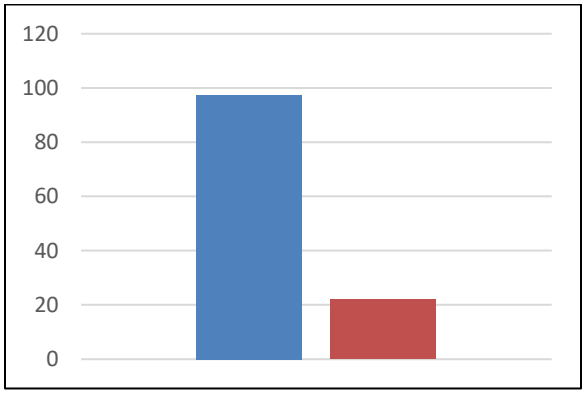
*Panel A: # VC Rounds*




*Panel B: VC Syndicate Size, in last VC round*




*Panel C: Capital Raised in Last VC Round*




*Panel D: # Patent Applications*

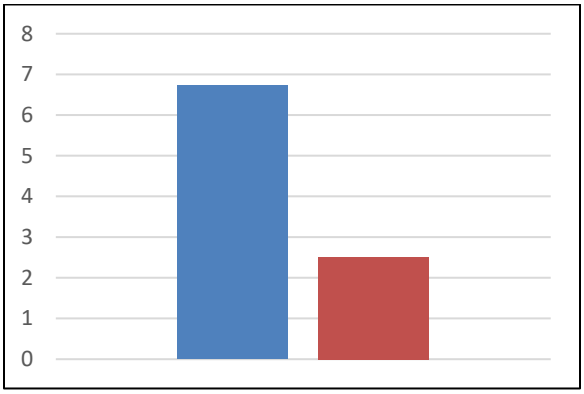


**Figure 9: Percent of PE-backed IPOs in which the PE has divested its position, for each year following IPO**

This figure is produced from data provided in Table 4 of Jenkinson, Jones and Rauch (2022). It is based on 330 PE-backed IPOs, over the 1995 – 2014 time period. The figure shows the percent of PE-backed IPOs in which the PE has divested its position, categorized by the number of years since the IPO.

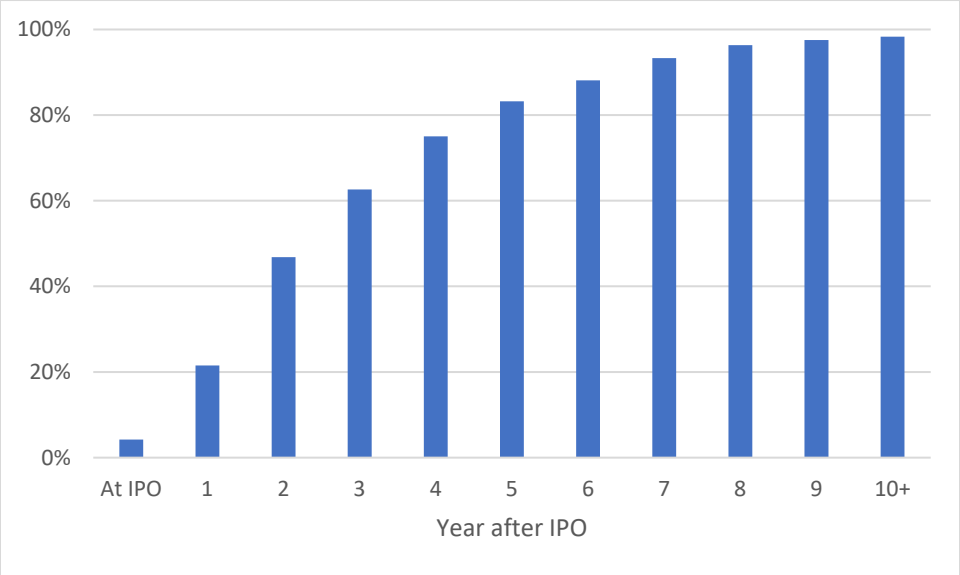


**Figure 10: Percent of VC-backed IPOs, with additional VC investment after IPO**

This figure comes from Figure 1 of Iliev and Lowry (2020). The sample consists of VC-backed IPOs between 1995 and 2010. The red solid line shows the percent of IPOs each year, in which one or more VCs invested additional capital into the company within the first five years after the IPO. The green dashed line shows the percent of IPOs each year in which one of the pre-IPO VCs invested additional capital within the first five years after the IPO.

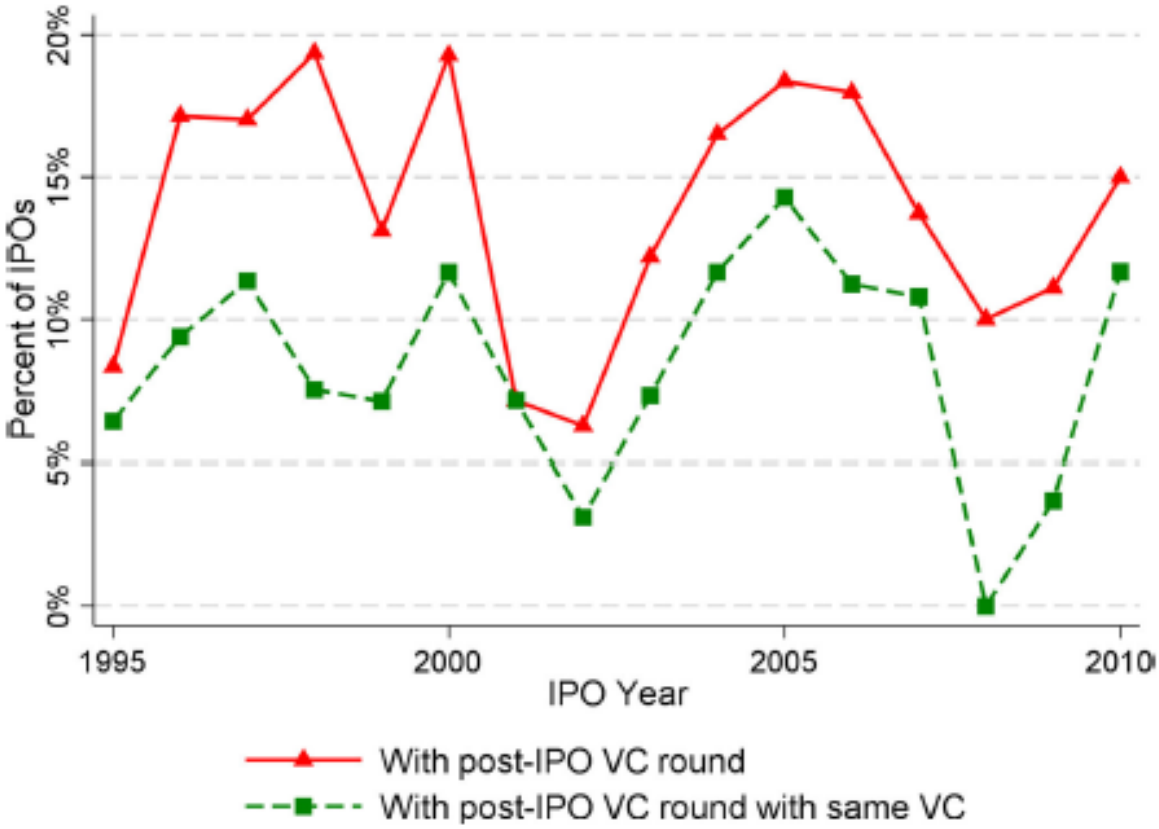
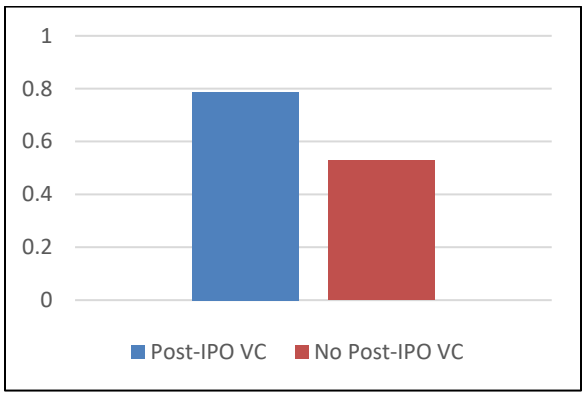


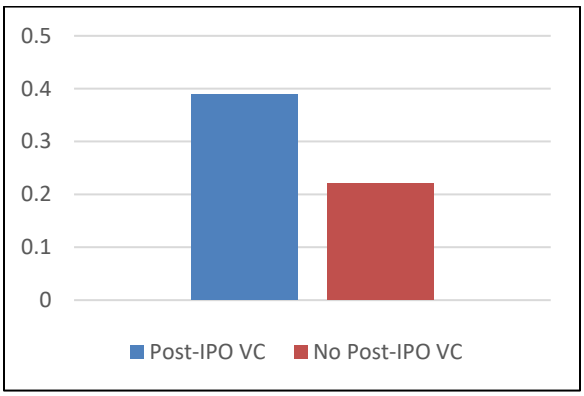
**Figure 11: Types of public companies in which VCs invest**

This figure comes from data in Table 1 of Iliev and Lowry (2020). The sample consists of VC-backed IPOs between 1995 and 2010. The blue bars depict the characteristics of the 268 firms that received VC financing within the first five years after gong public, and the red bars depict the characteristics of the 1,487 firms that did not receive VC financing within the post-IPO period.

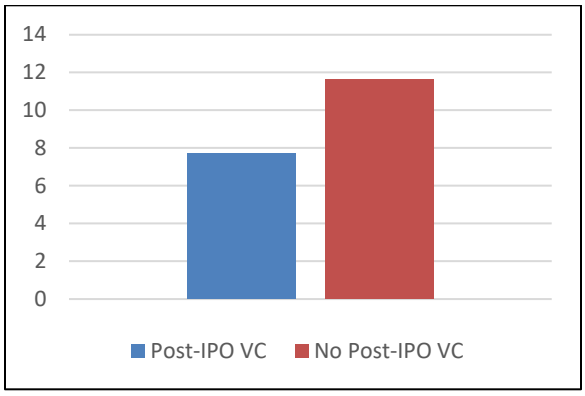
*Panel A: % firms with negative CFO*



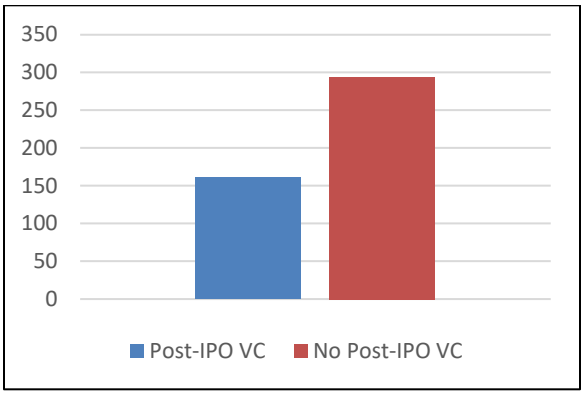

*Panel B: Average R&D / assets*




*Panel C: Average firm age*




*Panel D: Average total assets*




*Panel E: Average ROA*

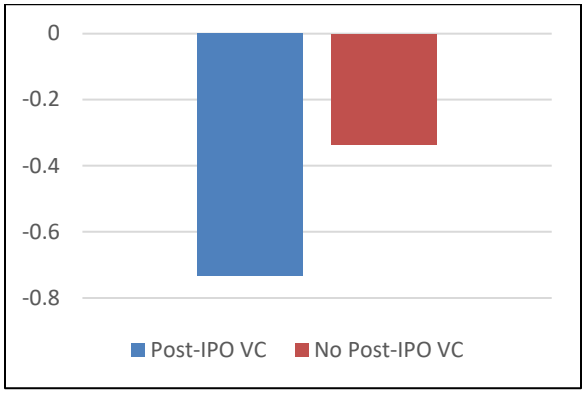
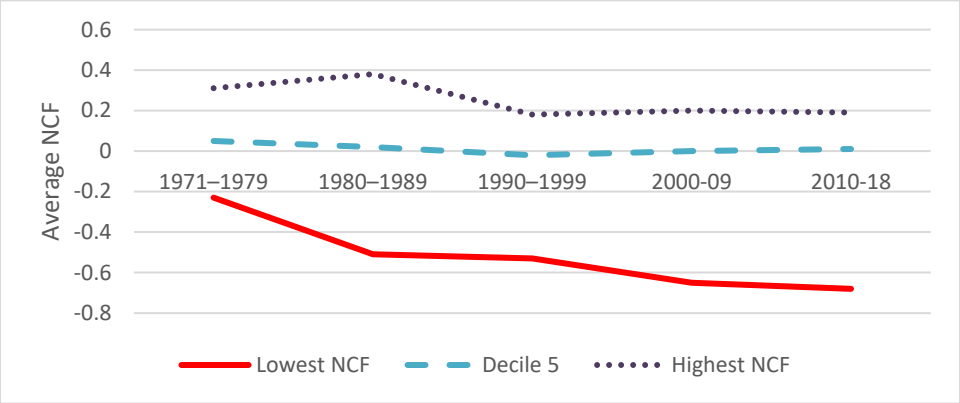


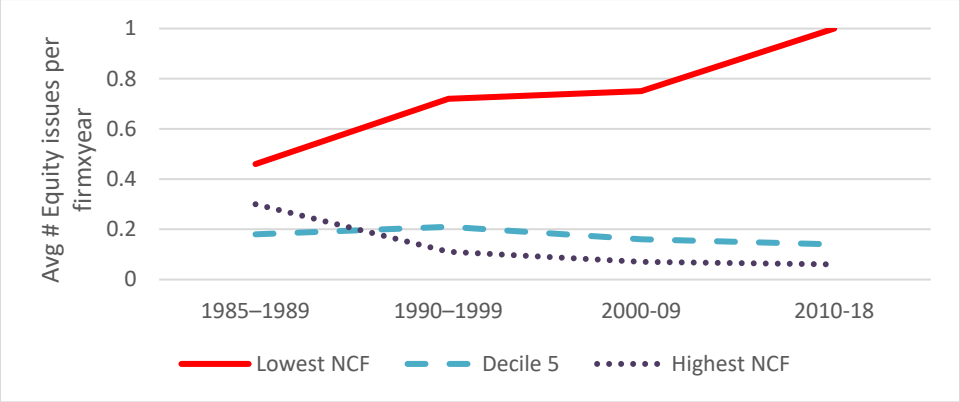
**Figure 12: Net Cash Flows of publicly traded firms, and financing patterns**

Data in Panel A come from Table 1 of Denis and McKeon (2021) and data in Panel B come from Table 6 of Denis and McKeon. Firms are placed into deciles according to their net cash flow from operations (NCF). Panel A depicts the average NCF of firms in deciles 1 (lowest NCF), 5, and 10 (highest NCF) in each of five time periods. Panel B shows the average number of equity offerings per firm x year, among the same three NCF deciles, in each of four time periods. Panel C shows the percent of equity offerings that are private placements, for firms with negative versus positive NCF each year.

*Panel A: Average NCF across each NCF decile*




*Panel B: Average number equity offerings per firm year, across each NCF decile*




*Panel C: Percent equity issues that are private placements*

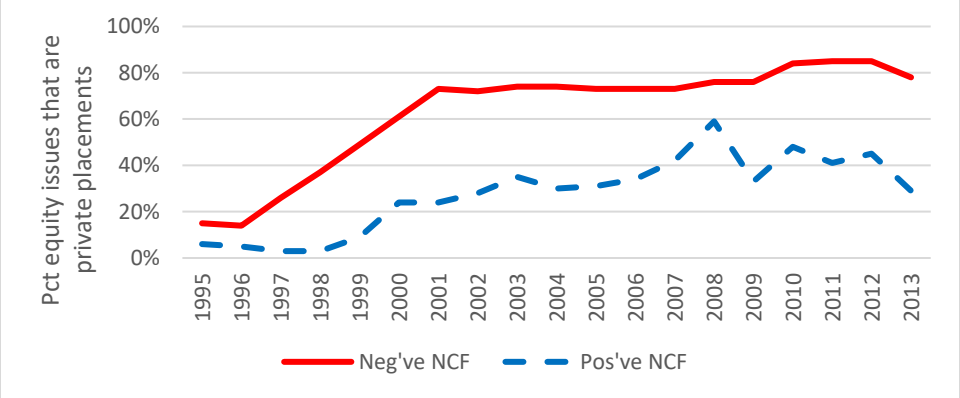


**Figure 13: Mutual funds' returns to investing in private startups**

The figure is based on data in Table 8 of Kwon et al. (2020). The sample consists of mutual fund investments in private VC-backed companies that received first-round VC investment between 1990 and 2016. Wealth relatives are calculated for each mutual fund investment as $\frac{Return\ on\ Invt}{Return\ on\ EW\ Market\ Index}$, where the numerator and denominator are calculated over equivalent time intervals. For companies that exit via IPO, investment duration equals the number of months between mutual fund purchase date and expiration of lockup period (assumed to be 180 days after IPO), and returns are calculated between the fund's acquisition cost and the closing price and the end of the lockup period plus the average incremental allocation obtained in the IPO times money left on the table. For companies that exit via acquisition, investment duration equals the number of months between mutual fund purchase of shares and acquisition date, and returns are assumed to be zero. For companies that go defunct, investment duration equals the number of months between mutual fund purchase of shares and the last reporting date the firm appears in mutual fund filings, and returns are assumed to be -90%. For firms that have not exited and are not classified as defunct, are assumed, on average, to experience the same outcomes as the observed cases. Unicorns are defined as companies that obtain a valuation of $1 billion or more while still private, and all other companies are classified as non-unicorns.

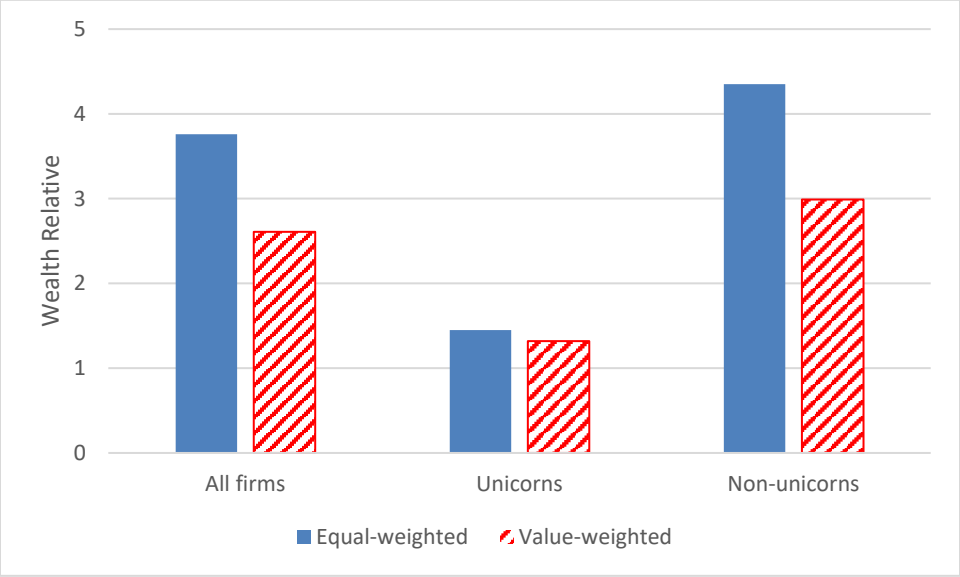
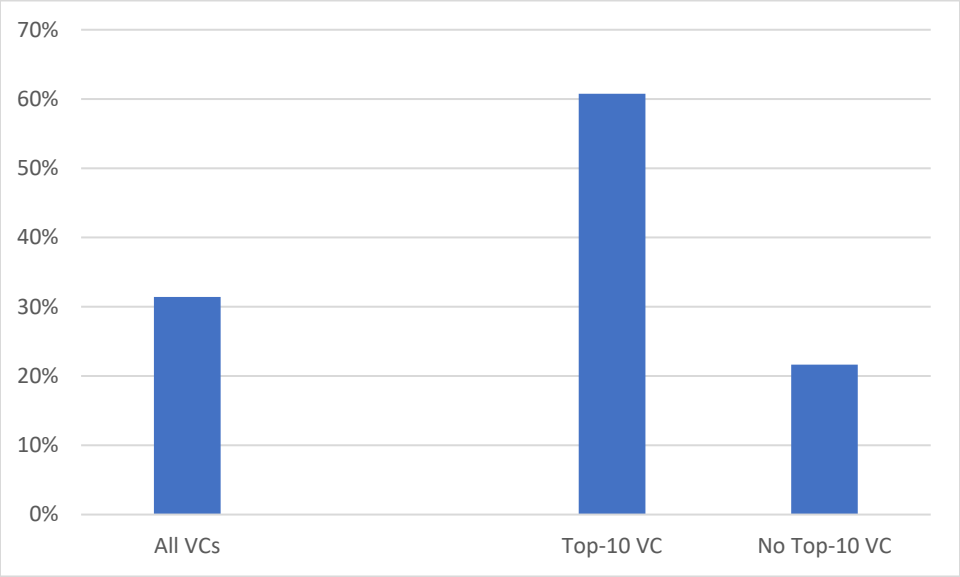


**Figure 14: Performance of Post-IPO VC Investment**

Panel A is produced from data in Table 4 of Iliev and Lowry (2020), and Panel B is produced from data in Table 6 of Iliev and Lowry. The sample consists of VC-backed IPOs between 1995 and 2010, that received post-IPO VC financing within the first five years after going public. In Panel A, buy-and-hold returns are calculated as the raw return in the IPO firm net of the value-weighted return on firms in the size-matched decline index, over a 12-month period. BHARs are shown across all post-IPO VC investments (left-hand bar) and subset by whether the VC was classified by Nahata (2008) as Top-10 or not (right-hand bars). In Panel B, abnormal returns are calculated as the raw firm return over the [-2,+10) period, minus the return on the matched size decile over the same period. ARs are shown across all companies with post-IPO VC financing, and subset by various company and market characteristics.

*Panel A: Returns to VCs*




*Panel B: Abnormal Returns to companies, Days -2, +10 around investment*

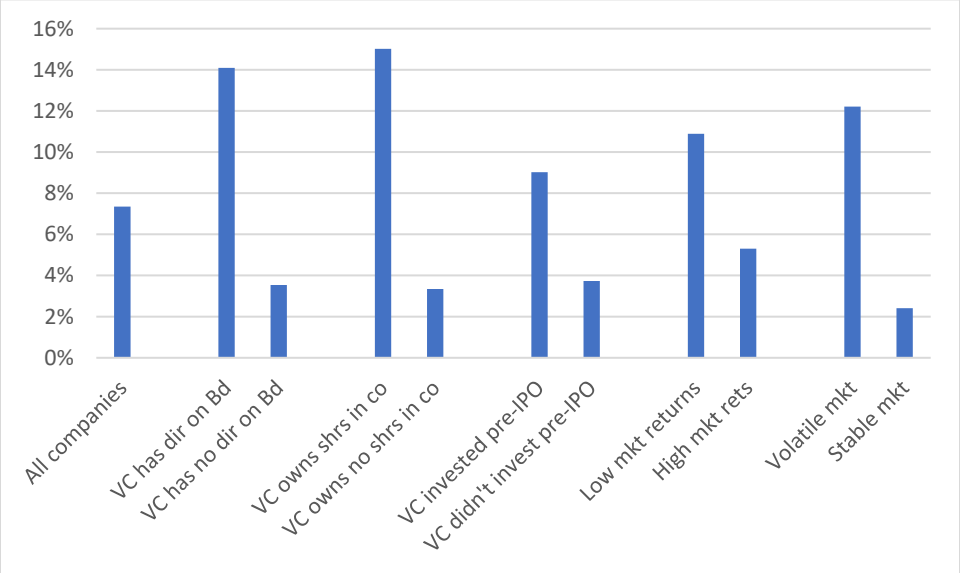


**Figure 15: Evolution of private firms' Board of Directors**

This figure is based on data from Figure 2 of Ewens and Malenko (2022). The sample consists of VC-backed companies, which raised at least one round of VC financing between 2002 and 2017. The blue solid line depicts average Board size, from the year of initial VC financing (denoted year 0) through year ten. Directors are classified as either executives, investors, or independent directors, and the red dashed line shows the average percent of independent directors on a firm's Board, over the same ten-year period.

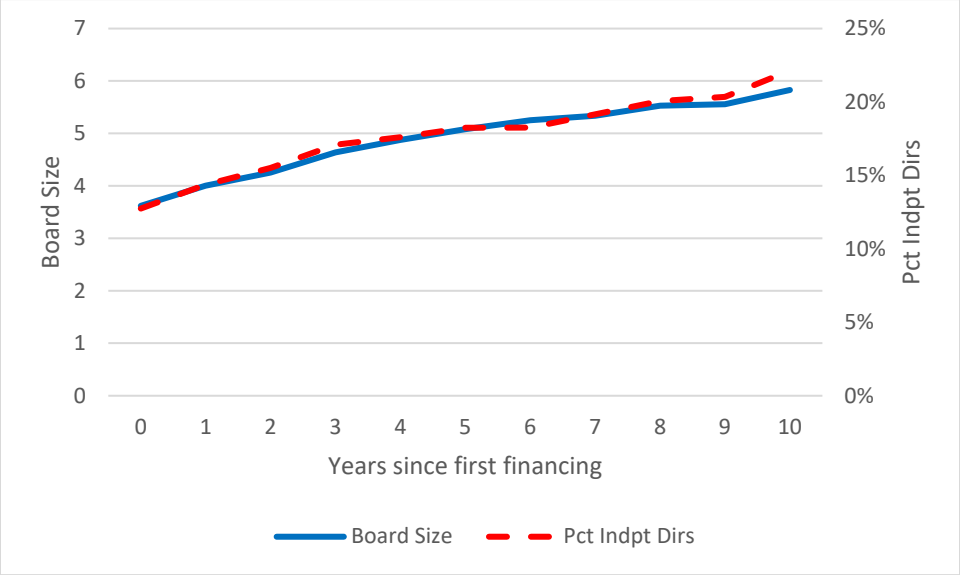
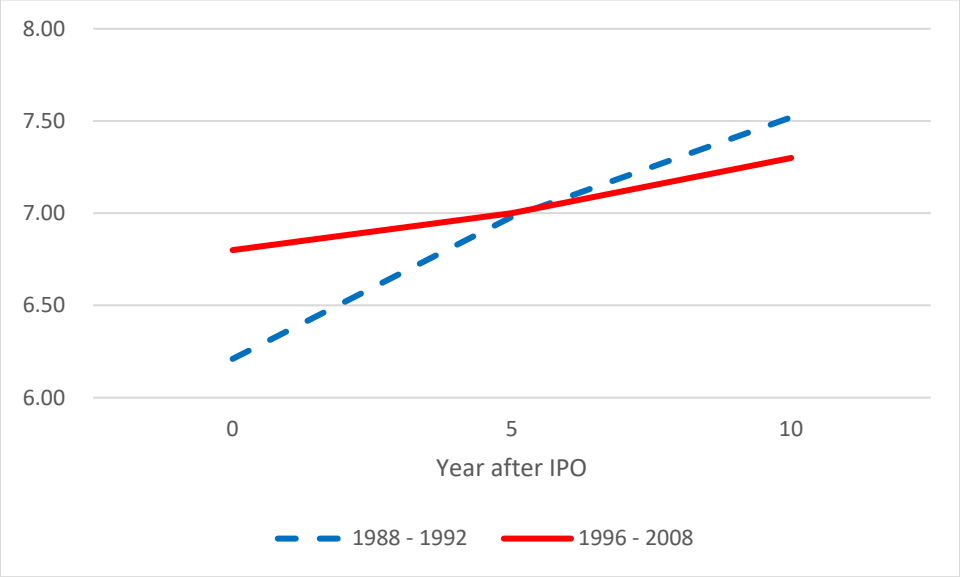


**Figure 16: Evolution of Post-IPO governance, IPOs in 1988-1992 vs 1996 – 2009**

In each panel, the blue dashed line represents data from Table 3 of Boone et al, which covers IPOs over the 1988 – 1992 period, and the red solid line represents data from Field et al, which covers IPOs over the 1996 -2008 period. Panel A shows average Board size at the time of the IPO (denoted year 0), five, and ten years after the IPO. Panel B shows average board independence, at the same points in time.

*Panel A: Board Size*




*Panel B: Percent independent directors*

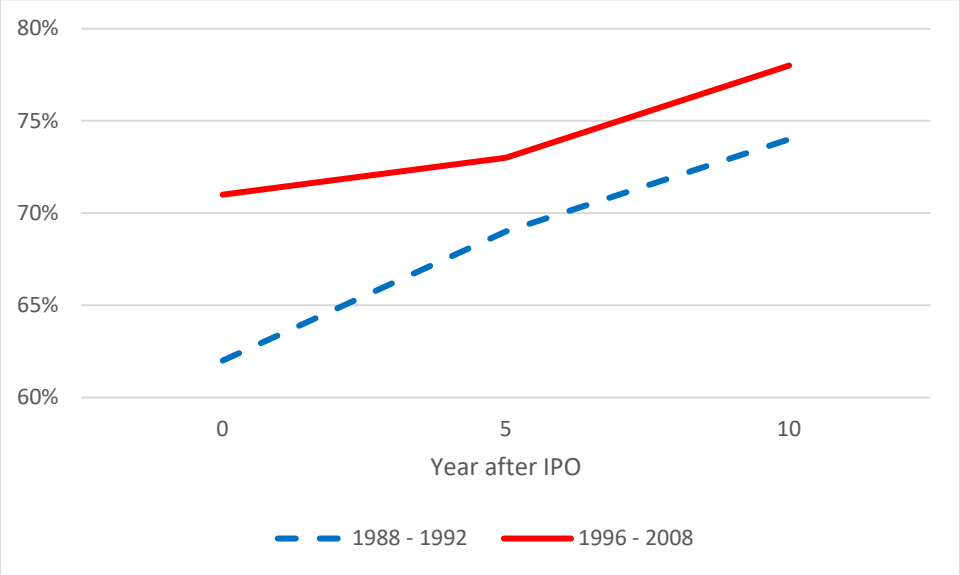
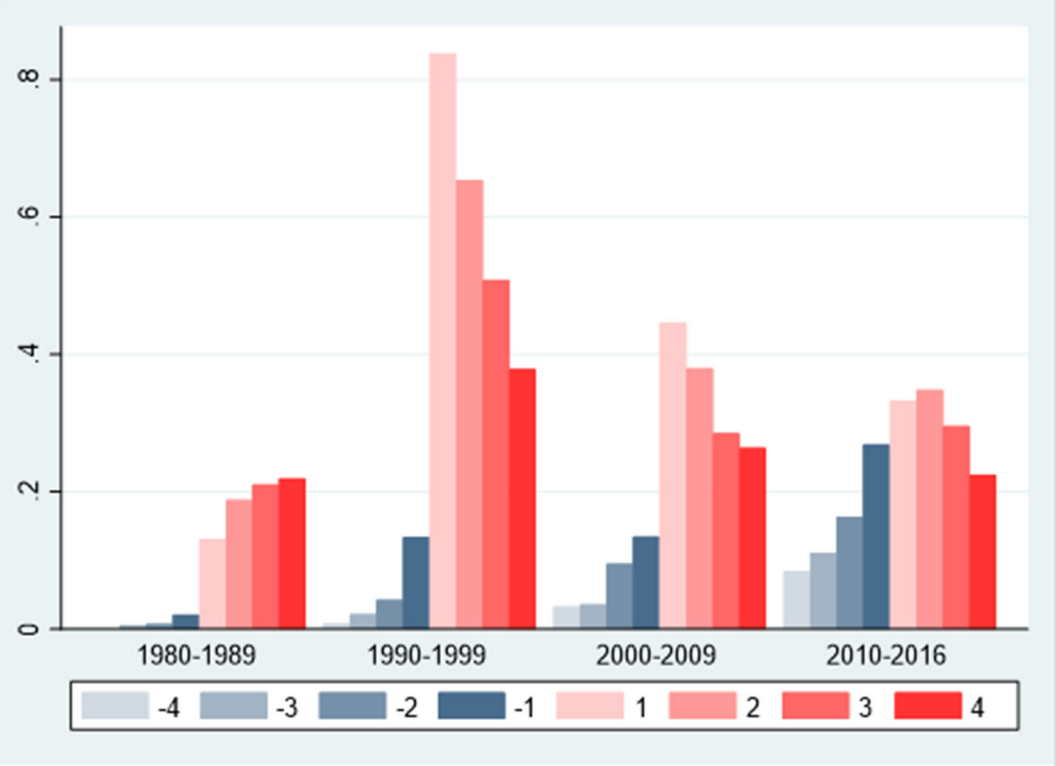


**Figure 17: Inorganic growth among private VC-backed firms**

The sample consists of firms that went public in an IPO between 1980 and 2016, and the sample is split into four subsamples: 1980-1989 IPO, 1990-1999 IPOs, 2000-2009 IPOs, and 2010-2016 IPOs. For each subsample, the darkest blue bars denote the average number of acquisitions one year prior to the IPO, defined as the 365 days prior to the offer date. Subsequent blue bars denote the average number of acquisitions 2, 3, and 4 year prior to the IPO, where each year is defined as a 365-day period. Similarly, the red bars denote the average number of IPOs 1, 2, 3, and 4 years after the IPO.



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