Internet Appendix for
"The Deregulation of the Private Equity Markets
and the Decline in IPOs"

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IA.1 Brief Legislative History of NSMIA

One potential concern about our identification strategy is that the passage of the National Security Markets Improvement Act of 1996 (NSMIA) may have been anticipated by startups or their investors. Anticipation could lead startups or their investors to alter their investment behavior prior to the law's passage, which could invalidate the parallel trends assumption. Another potential concern is that NSMIA may have been passed in response to lobbying pressure by startups or their investors, which would raise the possibility that our results are confounded by reverse causality. This section addresses these potential concerns by describing the legislative history of NSMIA.

The passage of NSMIA in October 1996 can be seen as part of a private markets deregulation effort going back several decades. Indeed, as discussed in Section 2.2.1 of the paper, in 1958, former SEC chairman Armstrong (1958, p. 714) publicly decried the "crazy-quilt of state regulations" created by blue sky laws, which NSMIA would end up eventually addressing. The first public proposal of key specific components of NSMIA appeared in a 1992 SEC report entitled "Protecting Investors: A Half Century of Investment Company Regulation."[1] This report proposed changes to the Investment Company Act that closely mirrored what would become Title II of NSMIA.

These proposed changes only became law after major a political change in the U.S. Capitol. In 1994, the Republican Party won a majority in both the House of Representatives and the Senate for the first time since 1954, bringing with it a renewed deregulation agenda. In March 1995, a subcommittee of the House Committee on Commerce chaired by Rep. Mark Fields (R, TX) held a series of hearings on two new proposed pieces of legislation: the Capital Markets Deregulation and Liberalization Act of 1995 (H.R. 2131) and the Investment Company Act Amendments of 1995 (H.R. 1495). In addition to preempting state blue sky laws for a large set of private transactions, H.R. 2131 contained a number of more controversial provisions: the elimination of the Williams Act (a law requiring mandatory disclosure of information regarding cash tender offers), limitations on brokers' duties to recommend suitable investments, making prospectus delivery optional, and relaxing margin rules, among others. A former finance coun-

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[1] See `https://www.sec.gov/divisions/investment/guidance/icreg50-92.pdf`.

selor to Rep. Fields' subcommittee, Stephen A. Blumenthal, stated in a recorded conference call, "[H.R. 2131] wasn't seriously meant to pass but was a gesture aimed at ingratiating House Republicans to Wall Street" (Johnson, 2010, p. 162). Consequently, both H.R. 2131 and H.R. 1495 failed to leave committee in 1995.[2]

On March 5, 1996, a new bill was introduced in the House, again via the Committee on Commerce: NSMIA (H.R. 3005). Two of its main sections, Titles I and II, contained several provisions that followed closely parts of H.R. 2131 and H.R. 1495, respectively, suggesting that the committee repackaged some of the less controversial provisions of the two 1995 bills into a new combined bill. The House and Senate versions of NSMIA passed relatively quickly through the House (on June 19, 1996) and the Senate (on June 27, 1996) by large majorities; the reconciled final version was passed in the House on September 28, 1996, and in the Senate on October 1, 1996, and was signed into law by President Clinton on October 11, 1996.[3]

Public comments by lawmakers highlight the long legislative history of NSMIA and its predecessors, with Rep. Tom Billey (R, VA) noting on the House floor that the law was "the result of a long and difficult process."[4] Given this "long and difficult" legislative history that ended up culminating in a swift final passage, it would have been infeasible for startups or their investors to predict NSMIA's passage more than a few weeks in advance and meaningfully alter their behavior in anticipation of this passage.

This is particularly the case because one of the key differences between the House and the Senate versions of NSMIA was that the Senate bill (S. 1815, introduced in the Senate on May 23, 1996) defined covered securities more narrowly. In particular, S. 1815 did not include Rule 506 private placements (the most common type of security issued by private startups) among the covered securities exempt from blue sky compliance; the Senate version did include securities sold to "Qualified Purchasers," which would need to be later defined by SEC rule (Johnson, 2010). As a result, under the initial Senate version of NSMIA, the extent to which private startups would have been exempt from blue sky compliance when raising capital was

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[2] See https://www.congress.gov/bill/104th-congress/house-bill/2131/actions and https://www.congress.gov/bill/104th-congress/house-bill/1495/actions.

[3] See https://www.congress.gov/bill/104th-congress/house-bill/3005/actions.

[4] Congressional Record – House (H12047; September 28, 1996). Available at https://www.congress.gov/crec/1996/09/28/CREC-1996-09-28-pt2-PgH12037-2.pdf.

unclear.

The fact that Rule 506 private placements were not included among the covered securities in the initial Senate version of NSMIA underscores the fact that startups and their investors were not among the key backers of the legislation. Instead, the mutual fund industry, which prior to NSMIA also fell under the dual system of federal and state regulation (Stevens, 2009), appears to have been "a primary driver of the bill" (Johnson, 2010, p. 162).[5]

In sum, NSMIA's passage does not appear to have been the result of a major lobbying effort by startups or their investors. In addition, the precise timing of its passage within the narrow window of the diff-in-diff tests in our paper would have been all but impossible to predict by industry participants.

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[5] A representative of the National Venture Capital Association (NVCA) did testify in favor of NSMIA during a Senate legislative hearing on June 5, 1996. See `https://www.congress.gov/congressional-report/104th-congress/senate-report/293/1` (no transcript of the testimony appears to be available).

IA.2 The European Private Equity Markets' Regulatory Environment

This section provides a brief overview of the regulatory environment surrounding the private equity markets in the European Union (EU).[6] In particular, we describe the attempts of the European Member States to adopt a common regulatory framework to facilitate cross-border VC and PE fundraising and investments across the EU.

IA.2.1 The initial evolution of the EU capital markets regulation

As noted by Moloney (2014), efforts to integrate the European capital markets can be traced back to 1966 with the Segré Report, which highlighted a patchwork of duplicative and diverging rules imposed by European countries on capital market participants. The following decades saw a number of legislative attempts aimed at integrating the European capital markets, focused mostly on two fronts: the liberalization of capital movements and the harmonization of European Member State rules.

One key instrument of the integration of European capital markets has been the so-called "regulatory passport": a common set of rules such that financial instruments complying with those rules—as certified by their home country regulator—can be made available in all EU countries. The regulatory passport concept was first used in 1985 to regulate (open-end) mutual funds (in the language of Directive 85/611/EEC, "undertakings for collective investment in transferable securities," or UCITS).[7] The UCITS Directive created a set of "common basic rules" for the "the authorization, supervision, structure and activities of collective investment undertakings [mutual funds] situated in the Member States and the information they must publish" (preamble). The key premise of the Directive is that once a mutual fund is authorized by the national regulator of its home country under the "common basic rules" outlined in the Directive, this authorization confers a regulatory passport that authorizes the mutual fund to

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[6] For brevity, we use EU throughout this section to refer to both the European Union and its pre-1993 antecessor, the European Economic Community.

[7] The UCITS Directive is available here: `https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A31985L0611`.

operate across the EU.[8]

Close to 20 years later, the 2003 Prospectus Directive (2003/71/EC) relied on a similar principle to regulate security issues that would be available to public investors across the EU.[9] The purpose of the Prospectus Directive is "to harmonise requirements for the drawing up, approval and distribution of the prospectus to be published when securities are offered to the public or admitted to trading on a regulated market situated or operating within a Member State" (Article 1). The issuers of public securities that comply with the Prospectus Directive, as determined by the competent authority of their home country, are granted a "single passport, valid throughout the Community" (preamble).

Private security issues (those offered mainly to institutional or other "qualified" investors) are exempt from complying with the Prospectus Directive (and so were not granted access to a European regulatory passport by the Directive). That said, one key innovation of the Directive was the clarification and uniformization of the differences between a public and a private offer of securities. As noted in the Directive's preamble:

> On 17 July 2000, the [EU] Council set up the Committee of Wise Men on the regulation of European securities markets. In its initial report of 9 November 2000 the Committee stresses the lack of an agreed definition of public offer of securities, with the result that the same operation is regarded as a private placement in some Member States and not in others; the current system discourages firms from raising capital on a Community-wide basis and therefore from having real access to a large, liquid and integrated financial market.

IA.2.2 Challenges to the integration of the European private equity markets

Despite the Prospectus Directive's clarification and uniformization of what constitutes a private offer of securities in 2000, cross-border VC and PE investments in Europe remained scarce during the following years. In a March 2007 "Expert group report on removing obstacles to cross-border investments by venture capital funds" published by the European Commission,

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[8] Specifically, the Directive states that "the application of these common rules is a sufficient guarantee to permit collective investment undertakings situated in Member States, subject to the applicable provisions relating to capital movements, to market their units in other Member States without those Member States' being able to subject those undertakings or their units to any provision whatsoever other than provisions which, in those states, do not fall within the field covered by this Directive" (preamble).

[9] The Prospectus Directive is available here: `https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32003L0071`.

the expert group noted (p. 10; emphasis in the original):[10]

> The group discussed national practices and regulatory approaches defining the environment of VC funds in Europe. The participants recognised that despite the increasing importance of venture capital funding in the EU, **it is unnecessarily complicated for venture capital funds to invest in firms outside their home country.** This is a barrier for the functioning of the single market. Because venture capital funds are often liable for separate registration or establishment in each Member State, cross-border operations become both expensive and time consuming. Tax legislation, administrative rules and legal requirements—all are the responsibility of national authorities—create major barriers for funds looking to invest outside their home country.

> The following barriers to improving the integration of European VC markets have been identified:

> - **On the supply side:** VC funds face obstacles when investing across borders in Europe, since they are often liable for **separate registration** or establishment in each Member State, which increases costs and time spent for fund structuring. Some larger VC funds that are nevertheless operating across EU borders have to channel investments through complex and costly **parallel vehicles** established in other countries. National regulatory frameworks could be more responsive in recognising the need for VC funds to be able to invest outside their home market without having to establish parallel structures.

> - **On the demand side:** many innovative and high-growth firms face difficulties in accessing equity finance. Although external equity capital is an important source of financing only for a limited number of innovative firms, understanding its importance for growth financing is essential also for entrepreneurs. Improving entrepreneurs' **investment readiness** is the necessary counterpart for improving the supply of venture capital and providing basis for a rapid expansion of high-growth firms.

Similar barriers affected PE funds. In a speech in July 2006 summarizing the "Report of the expert group on private equity," European Commissioner Charlie McCreevy noted:[11]

> Member States regulate part or all of the private equity value chain. But, Europe's national regimes do not interlink. The industry is internationalizing. The cross border dimension of this business could be significantly enhanced if a number of legal and tax barriers were tackled.

> The first set of issues concerns fund structuring. Cross-border capital-raising is hampered by failure to recognise partner country funds as fiscally transparent. The

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[10] The expert group report is available here: `https://ec.europa.eu/growth/content/removing-obstacles-cross-border-investments-venture-capital-funds-0_en`.

[11] The text of the Commissioner's speech is available here: `https://europa.eu/rapid/press-release_SPEECH-06-465_en.htm?locale=en`. We have not been able to obtain the expert group's report.

second set of issues concerns the cross-border placement of private equity funds: The Group calls for a common private placement regime to provide a safe harbour for private equity managers and qualified investors to negotiate freely, without hand-holding by the local supervisors.

Proposed solutions build on the concepts of mutual recognition of existing national laws and fund structures—rather than new harmonising measures. There is no need to super-impose European harmonising measures on the industry. What is needed is to free the industry from punitive double taxation and legal uncertainty that currently hold back onshore business—to the advantage of offshore structures.

In a December 2009 summary report on "Cross-border venture capital in the European Union," the European Commission acknowledged the lack of progress in integrating the European VC markets (p. 11):[12]

In general, the European venture capital markets remain fragmented and their potential is not yet fully exploited. Venture capital funds and their management companies still have to deal with a separate registration and different tax treatments when investing across borders in the EU and these regulatory barriers impede funds to specialise, diversify, grow and reach economies of scale. Cross-border problems have even worsened for the funds due to the impact of the financial crisis on fundraising and investing both locally and across borders.

Given the complexity of issues at stake, involving legal and taxation matters, promoting mutual recognition of national frameworks has been an initial effort to create an EU-wide framework for venture capital investments: the Commission had consulted the national and industry experts on measures they had considered to be possible in the short-term, based on which it proposed the mutual recognition of venture capital funds with its 2007 Communication. While the 2008 Council agreed with the proposed approach, in practice most of the Member States have not yet taken significant measures that would make fundraising and investing across borders easier for venture capital funds.

Having undertaken a substantial analytical work, collected inputs from public consultations, proposed policy actions and legislative measures in 2005-2009, barriers to cross-border operations of venture capital funds remain in the EU. This summary report is acknowledging that the short term approach of mutual recognition has not yet resulted in a removal of regulatory and tax obstacles and has not reduced fragmentation along national lines.

IA.2.3   EU regulatory passports for PE and VC funds

In June 2011, the Alternative Investment Fund Managers (AIFM) Directive (2011/61/EU) was adopted in order to "provide for an internal market for AIFMs and a harmonised and stringent

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[12] The European Commission summary report is available here: `https://ec.europa.eu/growth/content/cross-border-venture-capital-european-union-0_en`.

regulatory and supervisory framework for the activities within the Union of all AIFMs."[13] Alternative Investment Funds (AIF) include PE and VC funds, hedge funds, and real estate funds—in essence, all funds not covered by the 1985 UCITS (mutual fund) Directive and its successors. As is the case with the UCITS Directive, fund authorization under the AIFM Directive is the responsibility of the AIFM's home Member State (Article 7).

The AIFM Directive "lays down the conditions subject to which EU AIFMs may market the units or shares of EU AIFs to professional investors in the Union. Such marketing by EU AIFMs should be allowed only in so far as the AIFM complies with this Directive and the marketing occurs with a passport" (preamble). Unlevered AIFs with assets under management below EUR 500 million or levered ones with assets below EUR 100 million are exempt from complying with the Directive and thus are regulated nationally—at the cost of "not benefit[ing] from any of the rights granted under this Directive" (Article 3), including the European passport—unless they choose to opt in and comply with all the Directive's provisions.

In addition to having to comply with the "intensive operational and organizational regime" (Moloney, 2014, p. 294) that applies to all AIFMs, Section 2 of the AIFM Directive lists a number of "[o]bligations for AIFMs managing AIFs which acquire control of non-listed companies and issuers"—i.e., PE funds. Funds that acquire control of small and medium-sized enterprises, defined as those which (1) employ fewer than 250 persons and which (2) have an annual turnover not exceeding EUR 50 million or an annual balance sheet total not exceeding EUR 43 million, are exempt from these obligations—an exemption aimed at VC funds.

According to Moloney (2014, p. 303), these PE-specific obligations reflected "the European Parliament's hostility to the private equity industry." They include ownership notifications to the company, its shareholders, and the AIF's national regulator "similar to those required in respect of ownership in regulated-market-admitted companies" (Moloney, 2014, p. 303). PE managers are also required to disclose their "intentions with regard to the future business of the non-listed company and the likely repercussions on employment, including any material change in the conditions of employment" (AIFM Directive, Article 28). In addition, PE funds regulated by the AIFM Directive are subject to an asset stripping prohibition (Article 30)

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[13] The AIFM Directive is available here: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32011L0061.

that some scholars worry "may disrupt the private equity funding model, which is based on distributions from the portfolio company to the private equity fund, and thereby limit its ability to provide finance" (Moloney, 2014, p. 305).

In sum, for PE funds, the obtention of a EU passport (voluntary in the case of small funds, obligatory for large ones) comes with a number of potentially costly regulations. The costs associated with these regulations likely explain why the AIFM Directive was met with the "trenchant opposition from the private equity and venture capital industry, from the outset" (Moloney, 2014, p. 305).

The vast majority of European VC funds fall under the EUR 500 million size threshold imposed by the AIFM Directive (Moloney, 2014, p. 312) and thus do not have to comply with the directive—at the cost of not obtaining a EU passport to do business outside of their home country.[14] In response, in April 2013, the EU issued Regulation (EU) No 346/2013 creating a European passport for VC funds known as "EuVECA."[15] The EuVECA Regulation notes:

> It is necessary to lay down a common framework of rules regarding the use of the designation 'EuVECA' for qualifying venture capital funds, in particular the composition of the portfolio of funds that operate under that designation, their eligible investment targets, the investment tools they may employ and the categories of investors that are eligible to invest in them by uniform rules in the Union. In the absence of such a common framework, there is a risk that Member States take diverging measures at national level having a direct negative impact on, and creating obstacles to, the proper functioning of the internal market, since venture capital funds that wish to operate across the Union would be subject to different rules in different Member States.

The EuVECA Regulation "allows venture capitalists to market their funds to investors across the EU through a voluntary EU-wide passport without having to meet all of the demands of the AIFM Directive."[16] A VC fund wishing to obtain a EuVECA passport is required to "invest at least 70% of its aggregate capital contributions and uncalled committed capital in assets that are qualifying investments," defined originally as investments in firms that, at the

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[14] Smaller funds can still opt in to be regulated under the AIFM Directive to obtain a EU passport, but this is typically "challenging for smaller fund managers, both from a logistical and cost point of view" (Barrett et al., 2014, p. 15).

[15] The EuVECA regulation is available here: `https://eur-lex.europa.eu/legal-content/en/ALL/?uri=celex%3A32013R0345`.

[16] See `https://www.investeurope.eu/policy/key-topics/manager-fund-regulation/euveca/`. Invest Europe is the association representing Europe's private equity, venture capital and infrastructure sectors.

time of the investment, were (1) unlisted, (2) employed fewer than 250 persons, and (3) had annual turnover not exceeding EUR 50 million or an annual balance sheet total not exceeding EUR 43 million (Article 3). The 250-employee limit for qualifying investments was increased to 499 in October 2017 by Regulation (EU) 2017/1991.[17]

IA.2.4 The current situation of European private equity markets

The EuVECA Regulation appears to have had a modest impact in integrating the European VC markets: As of August 29, 2019, the European Securities and Markets Authority (ESMA)'s registry of EuVECA funds included only 27 funds.[18] In addition, while the EuVECA Regulation is intended to make it easier for VC fund managers to raise funding across Europe, it does not address some of the other "major barriers" identified in the 2007 expert group report on cross-border VC investments, such as tax legislation. This is despite the fact that a 2012 study published by the European Parliament's Policy Department on the "Potential of Venture Capital in the European Union" notes (p. 12):[19]

> Each Member State provides a different operating environment for VC in the EU. Crossborder fundraising and investing is possible, but complex and costly due to legal burdens. Usually, funds have to set up additional companies in several EU countries. VC funds are repeatedly confronted with problems of double taxation, administrative obstacles related to taxation and substantial tax treatment uncertainties.

> The high fragmentation of the EU VC industry gives rise to additional costs that diminish funds' returns. The high fragmentation, which hinders mobility of venture capitalists, also results in markets that are too small for large institutional investors.

> Double taxation is a major obstacle for cross-border VC. Double taxation and the uncertainty about the tax treatments it entails can cause cross-border VC to be very costly and hinder the development of larger EU markets.

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[17] The 2017 EuVECA Amendment is available here: `https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32017R1991`. Tellingly, the 2017 EuVECA Amendment also found it "necessary to emphasise and clarify that the prohibition on the imposition by the host [non-home] Member State of requirements or administrative procedures in relation to the marketing of qualifying venture capital funds ... in its territory includes a prohibition on the imposition of fees and other charges" (preamble).

[18] See `https://registers.esma.europa.eu/publication/searchRegister?core=esma_registers_euveca&keyword=euveca`. Article 17 of the EuVECA Regulation requires ESMA to maintain a public database listing all EuVECA funds.

[19] The study is available here: `http://www.europarl.europa.eu/RegData/etudes/etudes/join/2012/475088/IPOL-ITRE_ET(2012)475088_EN.pdf`.

The European Parliament's study thus emphasizes the challenges associated with integrating the European private equity markets. Some of these challenges were specific to the regulatory environment surrounding PE and VC funds, and were largely addressed (at least on paper) by the 2011 AIFM Directive and the 2013 EuVECA Regulation, which in that sense can be seen as the European counterparts to NSMIA. However, some of the other challenges, in particular those related to tax legislation—which still largely remains the purview of the individual Member States—are not under the direct control of the EU institutions and appear to remain largely unaddressed.

A 2018 report published by the European Commission on "Science, research and innovation performance of the EU" highlights the costs for the European economy associated with the underdevelopment of the European VC market (pp. 11, 228–230; emphasis in the original):[20]

> With weaker framework conditions and a narrow capacity to translate its scientific excellence into technological performance and innovation, Europe appears capped in its ability to foster transformational entrepreneurship. The creation and scale-up of new companies that grow into global giants, and which seem to be reaping many of the innovation benefits across the world, is rather limited in Europe. While Europe scores relatively well on traditional entrepreneurship indicators, the gap with the United States is very large in both the number and relative importance of rapid high-growth companies, such as the unicorns, which are disrupting existing markets and largely reaping the benefits of innovation. More precisely, recent estimates point out that there were 20 private companies valued at US\$ 1 billion or more in Europe, while there were 106 in the United States and 50 in China. ...
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> **The European venture capital market, crucial for providing risk capital for innovation, remains less developed compared to the United States. While the market has almost recovered since the [2008 financial] crisis, later-stage financing in particular remains restricted.**
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> While the venture capital market has not only recovered in the United States, but even far exceeds its pre-crisis levels, the European venture capital market recovery is more modest ... Indeed, even though the recovery is clearly visible, the EU's venture capital market still lags far behind that in the United States. While, in 2007, EU venture capital companies attracted EUR 6.7 billion in funding from various investors, compared to EUR 25.57 billion in the United States, this amount dropped to its lowest level at EUR 2.57 billion in 2009, followed by an unstable rise, reaching EUR 6.01 billion in 2016, while the United States attracted EUR 38 billion in the same year. ...

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[20] The report is available here: `https://ec.europa.eu/info/research-and-innovation/strategy/support-policy-making/support-national-research-and-innovation-policy-making/srip-report_en`.

Since the crisis, funding for the scaling up of companies has become scarcer, with later-stage financing accounting almost entirely for the overall fall in venture capital funding, as opposed to the visible recovery of the seed and start-up funding.

[A] shift can also be observed when looking at the stages of companies in which venture capital funds are investing. A drop in venture capital funding from 0.039% [of GDP] to 0.027% can be seen following the crisis. When taking a closer look at the evolution of financing by company stages, it becomes clear that later-stage financing has suffered the most, with seed financing exceeding pre-crisis levels and start-up funding showing some recovery (0.012% [of GDP] in 2016 as compared to 0.015% in 2007) whilst later-stage financing remains considerably lower. The opposite is true in the United States, where not only the overall amount of venture capital financing, but also the share of later-stage financing in overall venture capital funding has increased.

The EU's challenges in creating an integrated private equity market thus appear to be particularly problematic for late-stage startups—precisely those that our paper shows benefited the most from NSMIA's creating a uniform regulatory environment for private security issues across all U.S. states.

IA.3 Identifying Startups' Exit Status

Below we list the steps we follow in Figure 3 and Tables 8 and IA.3 to identify a startup's exit status seven years after its first financing round:[21]

1. We identify IPOs and acquisitions that take place within seven years of a startup's first financing round using VentureSource's exit classification and exit dates.

   a. We classify startups that go public or are acquired more than seven years after their first financing round as still private as of year seven.

   b. We reclassify acquisitions (taking place within seven years of the first financing round) as failures if the acquisition value is less than the total capital raised by the firm in all pre-exit financings (see Puri and Zarutskie (2012) for a related discussion).

The remaining startups are either still private seven years after their first financing round or have failed. We next proceed to identify which startups have failed and which are still private.

2. If VentureSource identifies the startup as having failed, we try to identify its failure date. To do so, we supplement the information provided by VentureSource with data from PitchBook, Correlation Ventures, OpenCorporates, and website domain histories. Specifically, we proceed as follows, where the order of the steps reflects the order in which we follow and prioritize them:

   a. PitchBook includes a "Most Recent Financing Status" data field that, for failed firms, typically reads: "The company went out of business on [failure date]. The company is no longer actively tracked by PitchBook." When available, we extract the failure date from this data field.

   b. We obtain additional failure dates from Correlation Ventures, which collects failure dates from portfolio companies and a variety of other sources (e.g., from syndicate partners that share with Correlation Ventures their portfolio histories).

   c. VentureSource aims to contact startups twice a year (though it is not always successful in doing so). When VentureSource has a history of successfully contacting a startup and at some point is no longer able to do so, it reports a "last contacted" date. When neither PitchBook nor Correlation Ventures report a failure date and VentureSource reports a "last contacted" date, we use the "last contacted" date as the failure date.

   d. We search for those startups whose failure dates we cannot identify using steps (a) through (c) on OpenCorporates, which contains business registration (i.e., incorporation) data for all U.S. states. In some instances, the business registration data

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[21] We follow analogous steps to identify a startup's exit status 10 years after its first financing round in Figure IA.2.

include the so-called withdrawal date of the corporation. We use this date as the failure date when available.

    e. Several websites provide URL registration histories.[22] If we cannot find a startup's failure date using the previous four steps, we search for the startup's URL history and try to use it to determine whether the startup failed within seven years of its first financing round.

If we are able to identify a startup's failure date using steps (a) through (e) and this date falls within seven years of the startup's first financing round, we classify the startup as failed as of year seven; if the failure date is more than seven years after the startup's first financing round, we classify the startup as still private as of year seven.

If we are unable to identify the failure date of a startup that VentureSource identifies as having failed, we classify the startup as having failed as of year seven. This is conservative in that it reduces the number of startups that we classify as still private as of year seven.

The remaining startups were all identified as still being active (and private) by VentureSource as of the date of our most recent search in 2018Q4. However, further investigation reveals that some of these startups had actually failed prior to that date. In order to ensure that we only classify as still private as of year seven startups that are truly active, we take the following additional step:

3. We create a set of "failure candidates" consisting of those startups satisfying the following three criteria: (i) the startups are identified as still being active and private in VentureSource, (ii) they have not raised any capital within four years of the seventh anniversary of their first financing round (i.e., they have not raised any capital more than three years after their first financing round), and (iii) they have not been contacted by VentureSource within one year of the seventh anniversary of their first financing round (i.e., they have not been contacted by VentureSource more than six years after their first financing round).

We classify firms that VentureSource identifies as still being active (and private) and that are not failure candidates as still private seven years after their first financing round.

In the case of those startups that are failure candidates, we proceed as follows:

    a. First, we try to verify whether these firms have indeed failed and try to identify their failure date using the data sources described in step 2 above.

    b. If we are able to identify a startup's failure date and this date falls within seven years of the startup's first financing round, we classify the startup as failed as of year seven;

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[22] See, e.g., `http://research.domaintools.com/research/whois-history/`.

if the failure date is more than seven years after the startup's first financing round, we classify the startup as still private as of year seven.

c. Finally, we conservatively classify all those failure candidates whose failures we cannot verify or date as having failed within seven years of their first financing round.

IA.4 Variable Definitions

Has out-of-state investors? is an indicator set equal to one if at least one of the investors in the financing round has offices outside the startup's headquarter state.

Fraction of out-of-state investors is the fraction of investors in the financing round with offices outside the startup's headquarter state.

Late-stage round is an indicator set equal to one if the financing round is a Series C or higher.

Log round no. is the natural logarithm of the sequence number of the startup's financing round.

IT startups are those operating in one of the following industries according to VentureSource: Business Support Services, Communications and Networking, Consumer Information Services, Electronics and Computer Hardware, Media and Content, Semiconductors, Software.

Non-uniform blue sky state is an indicator set equal to one if the startup is headquartered in a state that had not adopted the Uniform Limited Offering Exemption (ULOE) or the Small Corporate Offering Registration (SCOR) by the time of NSMIA's passage in October 1996.

Log capital committed to fund is the natural logarithm of the total capital committed to a VC or PE fund by the fund's limited partners at the time of the fund's final closing.

% late-stage investments is equal to one if the fund is identified as a "late stage fund" or a PE fund in VentureSource or PitchBook. Otherwise, *% late-stage investments* equals the fraction of the fund's first five investments going to firm's raising a Series C or higher.

Founders' initial equity stake is an estimate of the founding team's as-if-converted equity stake one year after the startup's first financing round, where as-if-converted means that we assume that all preferred investors convert to common. The vast majority of startups raise only one financing round (their first financing round) during the one year period that begins on the date of their first round. In such case, we compute *Founders' initial equity stake* as $1 - \frac{K}{V+K}$, where V denotes the startup's reported pre-money valuation at its first round and K the total capital raised by the startup in that first round. In the case of startups that raise two rounds during that year, we compute *Founders' initial equity stake* as $(1 - \frac{K_1}{V_1+K_1}) \times (1 - \frac{K_2}{V_2+K_2})$ where V_1 and V_2 denote the startup's reported pre-money valuation at its first and second financing rounds, respectively, and K_1 and K_2 denote the total capital raised by the startup in the first and second rounds, respectively. In the case of startups that raise more than two rounds during that year, we account for the additional dilution analogously.

IPO or successful acquisition in 7 years is an indicator set equal to one if the startup exits via an IPO or a non-low valuation acquisition within seven years of its first financing round. We define a non-low valuation acquisition as an acquisition that values the startup at a value that is higher than (a) twice the total capital raised by the startup in all pre-exit financings and (b) $25 million.

IPO in 7 years is an indicator set equal to one if the startup exits via an IPO within seven years of its first financing round.

State pension assets is the value (in trillions of real 2009 U.S. dollars) of the total assets ("Total cash and investment holdings") held by a state's public pension funds (state and local). It is based on data from the Census Bureau's Annual Survey of Public Pensions (ASPP). ASPP data from 1993 to 2017

are available here: `https://www.census.gov/programs-surveys/aspp/data.html`; data for 1992 can be found here: `https://www.census.gov/prod/2/gov/gc92-4/gc924-6.pdf` (Table 4).

% state officials in board is the fraction of members of a public pension's board of trustees that are state officials (appointed or ex officio). Following Andonov, Hochberg, and Rauh (2018), we classify a board member as a state official if she is a government official of the state, county, city, or other public entity who has obtained her board seat either because she has been appointed by a government executive or because she serves by virtue of holding another position (ex officio). Andonov, Hochberg, and Rauh (2018, p. 2047) explain: "Typical examples of state-ex officio board members include state treasurer, controller, personnel director, director of finance, and superintendent. State-appointed trustees are usually appointed by the governor, mayor, speaker of the state house of representatives, or president of the state senate; frequent examples are senators, representatives, elected officials of local government, and school board representatives." The data have been kindly provided by Andonov, Hochberg, and Rauh (2018). In the case of states with multiple state or local pension funds, *% state officials in board* is the weighted average of the fraction of state officials in the boards of the different public pension funds in the state, where we use each fund's assets as weights.

Log capital raised is the natural logarithm of the total capital raised by the startup (in real 2009 U.S. dollars) from its founding up to one year after its first financing round.

Log no. startups in state-year is the natural logarithm of the total number of one- or two-year-old startups in each state-year (where age here is measured since founding). It is based on data from the Census Bureau's Business Dynamic Statistics, available here: `https://www.census.gov/ces/dataproducts/bds/data_firm.html` ("Firm Age by State" file). Our focus on startups that are one or two years old is motivated by the finding in Puri and Zarutskie (2012, Table AII) that 74% of startups are one or two years old when they raise their first VC round.

Log no. pension funds in state-year is the natural logarithm of the number of public pension funds (state and local) in each state-year. It is based on the data kindly provided by Andonov, Hochberg, and Rauh (2018). Following Gonzalez-Uribe (2014), we measure our instrument, $State\ pension\ assets \times \% state\ officials\ in\ board$, one year before a startup's first financing round because the process for VCs of raising a fund and beginning to deploy capital takes about one to two years. Accordingly, we also lag the number of public pension funds in the state by one year in Equation (3).

Log state-year population is the natural logarithm of the population of each state-year. It is based on data from the Census Bureau's intercensal population estimates. Time series state population data are available here: `https://scholar.harvard.edu/awatanabe/data`.

Census divisions are defined by the U.S. Census Bureau. There are nine Census divisions: New England (CT, ME, MA, NH, RI, VT), Middle Atlantic (NJ, NY, PA), East North Central (IN, IL, MI, OH, WI), West North Central (IA, KS, MN, MO, NE, ND, SD), South Atlantic (DE, DC, FL, GA, MD, NC, SC, VA, WV), East South Central (AL, KY, MS, TN), West South Central (AR, LA, OK, TX), Mountain (AZ, CO, ID, NM, MT, UT, NV, WY), and Pacific (AK, CA, HI, OR, WA); see `https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf`.

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IA.5 Figures and Tables

Figure IA.1: Pre-NSMIA macroeconomic trends in uniform and non-uniform blue sky states.

This figure shows pre-NSMIA macroeconomic trends in uniform and non-uniform blue sky states, the two sets of states that form the basis of our Section 3.3.1 analysis of cross-state differences in the impact of NSMIA. Panel A shows the average GDP growth rates for the two sets of states, while Panel B shows their average October unemployment rates. GDP data are from the BEA, while unemployment data are from FRED and the BLS.

(A) GDP growth rates
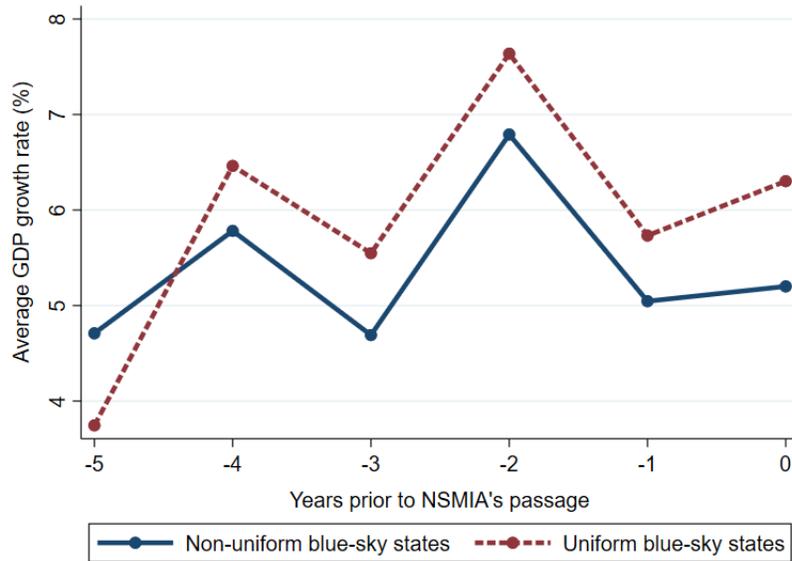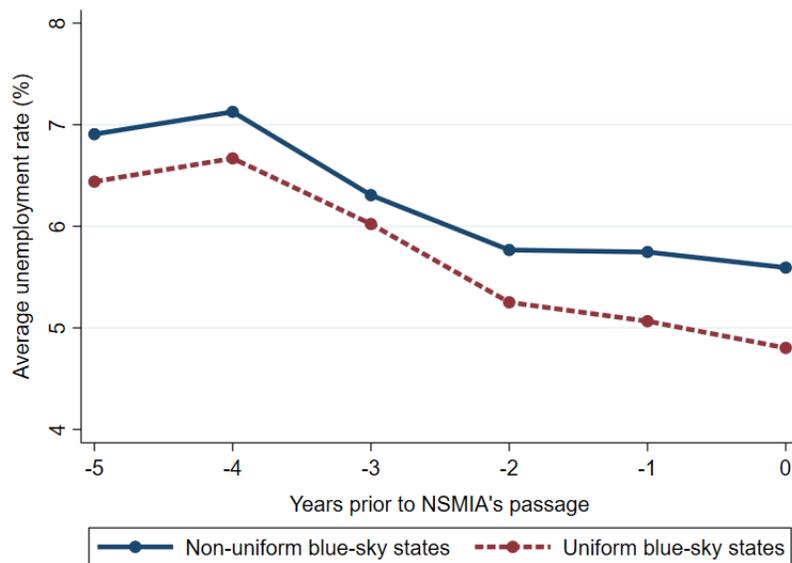

(B) Unemployment rates

Figure IA.2: Exit status by year of first VC financing – Exits within 10 years.

For startups that raised their first financing round between 1992 and 2006, the figure shows the (stacked) fractions of startups that (1) go public, (2) are acquired, (3) fail, or (4) remain private during the 10 years following that first financing round. (E.g., for firms that raised their first financing round in 2000, we measure exits as of 2010. We observe exits through 2016, so ending the sample of first financing rounds in 2006 allows us to observe 10 full years of exits for all firms.) Section IA.3 describes how we define and identify exits, failures, and firms that are still private.
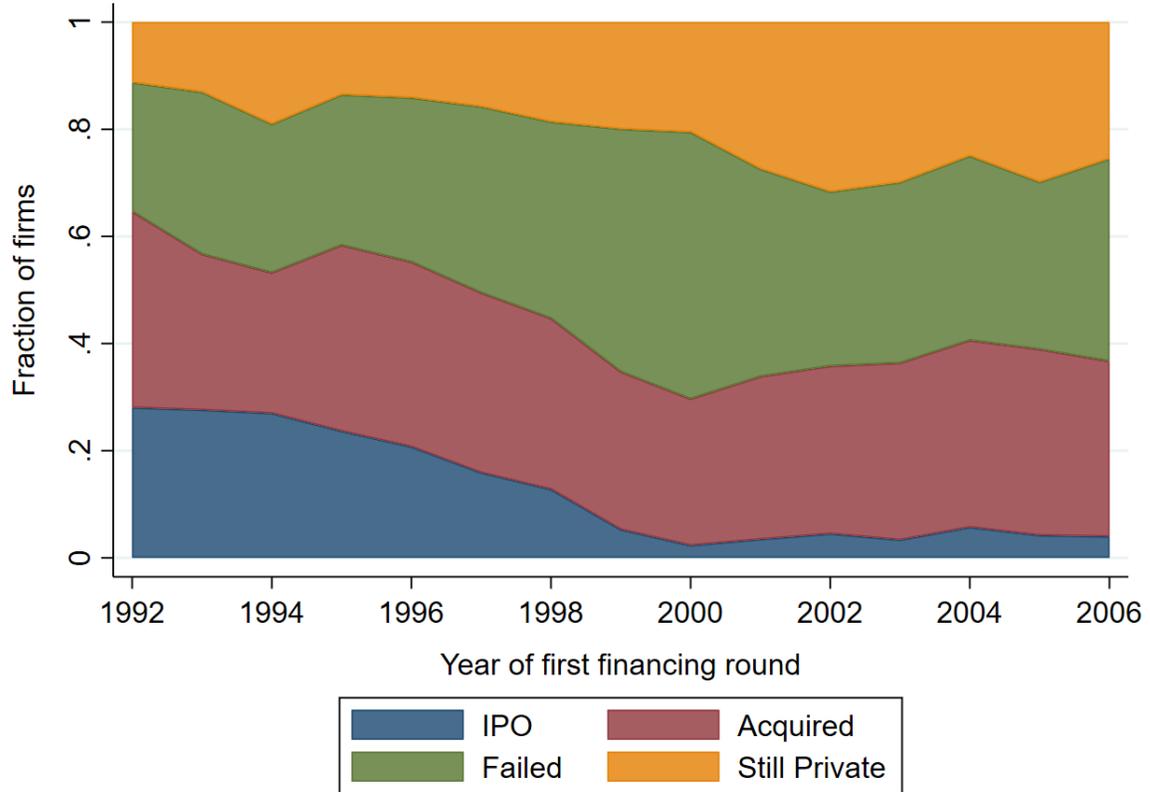
Figure IA.3: Reaching scale as a private firm – Sales.

For each first financing round year, the figure reports the number of VC-backed startups with at least $40 million in sales at some point during the seven years following their first financing round (red line), as well as the fraction of these startups that go public during these seven years (blue bars). Both here and in Figure IA.4, sales data for private firms come from VentureSource and the National Establishment Time Series (NETS) database; sale data for public firms come from Compustat.
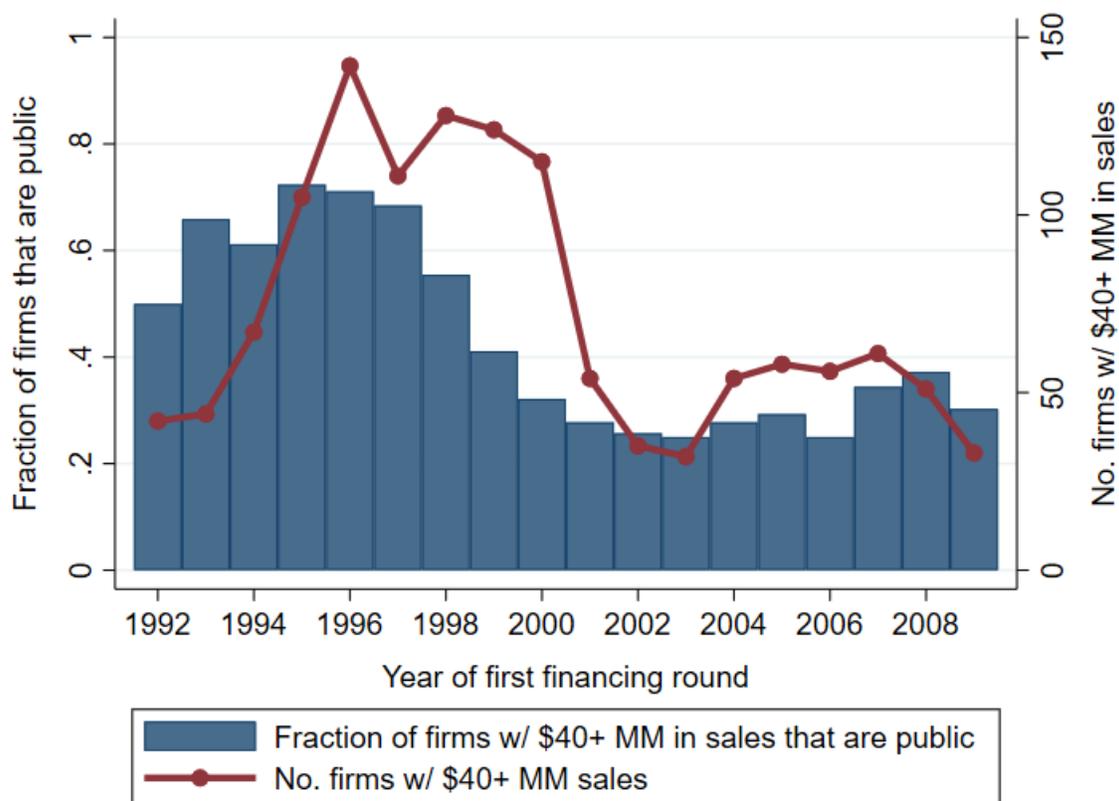
Figure IA.4: Evolution of the relationship between a startup's sales and the likelihood that the startup is public.

The figure shows the evolution over time of the relationship between a startup's maximum level of sales during the seven years following its first financing round and the likelihood that the startup goes public during these seven years. Specifically, the figure plots the annual coefficient estimates β_t (alongside their 95% confidence intervals) from the following regression:

$$Y_{7it} = \beta_t \ \mathrm{Log} \ Sales_{7it} + \gamma_t + \eta_s + \theta_j + \varepsilon_{it}$$

where i indexes startups and t indexes the year of their first financing round. Y_7 is an indicator equal to one if the startup goes public during the seven years following its first financing round; $Sales_7$ is the startup's maximum level of sales during these seven years; and γ, η, and θ denote first-financing year, state, and industry fixed effects, respectively. Robust standard errors are used to construct the 95% confidence intervals.
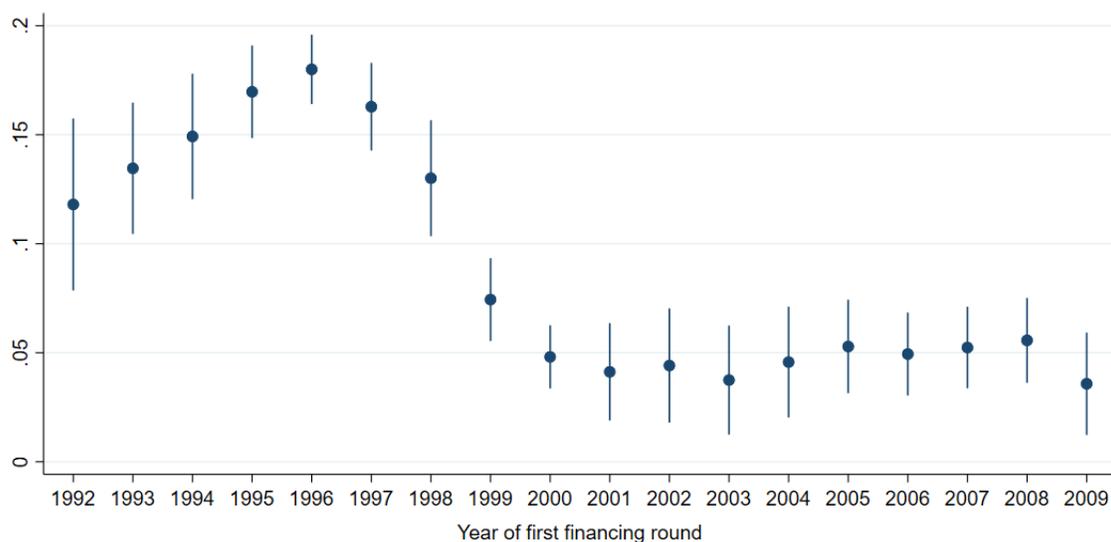
Figure IA.5: Evolution of the capital raised by late-stage startups – No. startups raising late-stage rounds.

For each financing year, the figure shows the number of unique VC-backed private startups at least four years old raising private capital that year, where age is defined as the number of years since the first financing round.
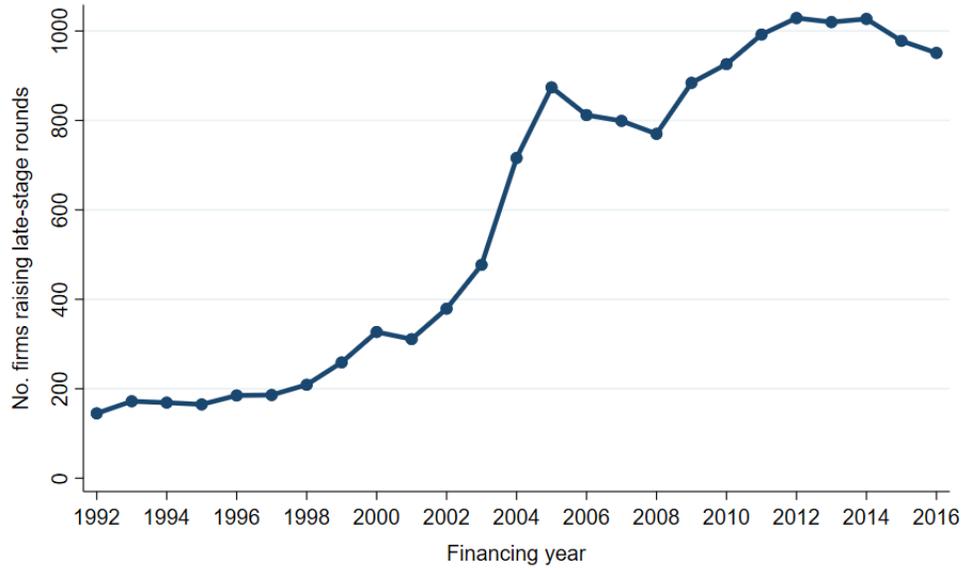
Figure IA.6: Evolution of startup founders' equity stake three years after their first financing.

The figure reports the annual average fraction of equity held by startup founders three years after their first financing round (which is why the figure ends in 2013, three years before the end of our sample period). The approach we use to compute the fraction of equity held by startup founders three years after the startup's first financing round (and, in particular, to account for the founders' dilution in the case of multiple financing events) is analogous to the approach we use to calculate the fraction of equity held by the founders one year after the first round, described in Section IA.4.
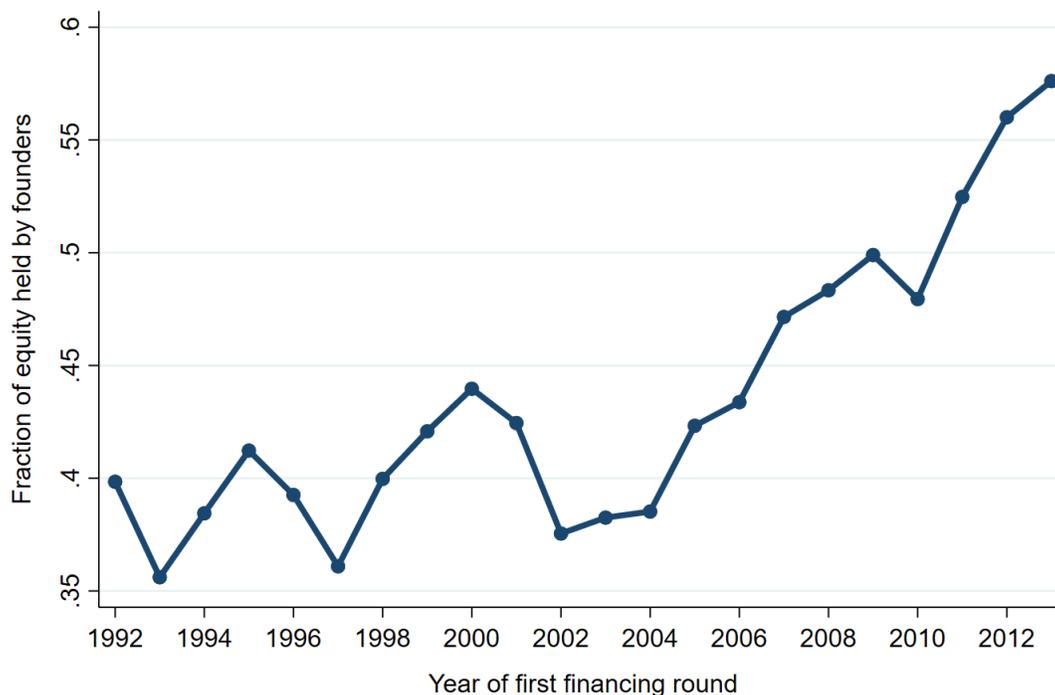
Figure IA.7: Evolution of startup founders' initial equity stake – CA vs. non-CA startups.

The figure reports the annual average fraction of equity held by the founders of startups based in and outside of California one year after their first financing round (which is why the figure ends in 2015, one year before the end of our sample period). Section IA.4 in the Internet Appendix describes how we compute the founders' initial equity stake.
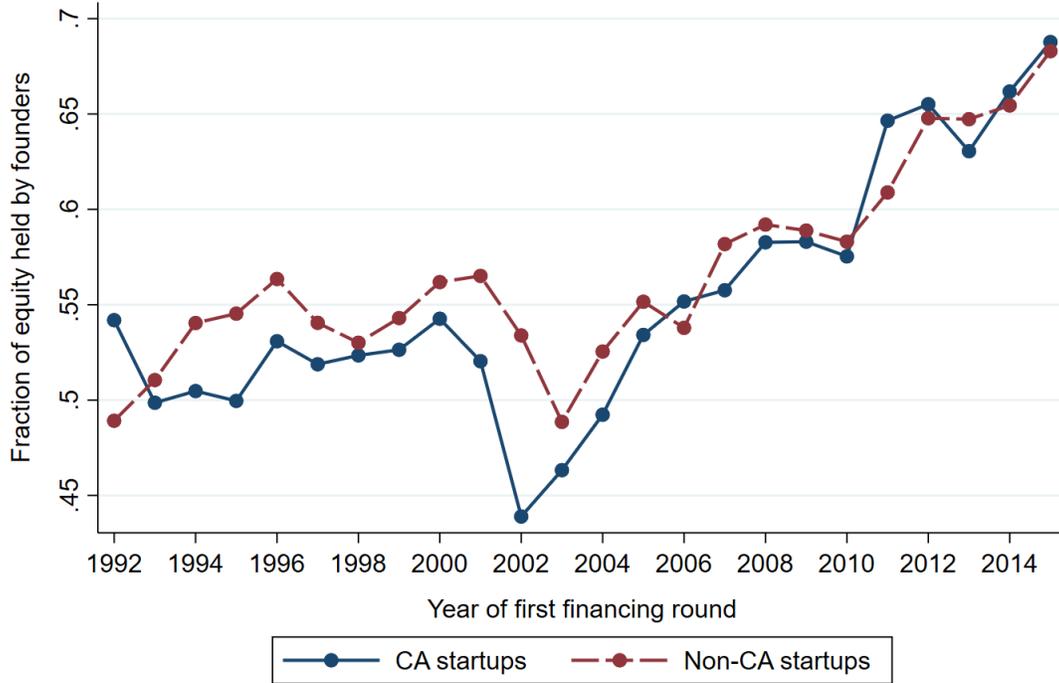
Figure IA.8: Evolution of the presence of redemption rights in first-round financings – CA vs. non-CA startups.

The figure reports the annual fraction of first-round VC financing contracts involving California and non-California startups that have redemption rights. Redemption rights allow investors to force startups to repurchase their shares after a specified period of time, often triggering an exit as startups do not have the necessary cash to buy investors out. The figure begins in 1995 because this is the first year for which we observe contract features such as redemption rights.

Table IA.1: Comparing the behavior of VC and non-VC investors when investing in startups.

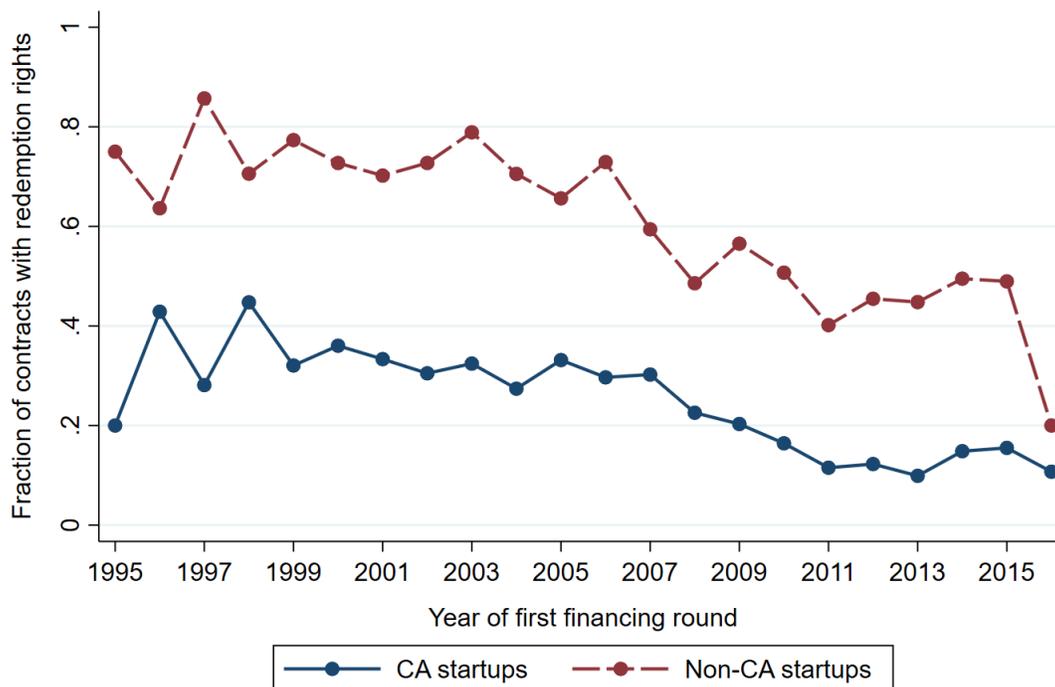The table compares the behavior of VC and non-VC investors when investing in startups by estimating OLS regressions where the unit of observation is the *first* investment in a startup made by an investor. In columns 1 and 2, the dependent variable is the log of one plus the startups age (in years) at the time of the investor's first investment, where we measure age since the startup's first financing round. In columns 3 and 4, the dependent variable is an indicator set equal to one if the investor does not have an office in the same state where the startup is located. In columns 5 and 6, the dependent variable is the log of one plus the distance (in miles) between the investor and the startup. The control variable *Non-VC investor* is an indicator set equal to one if the investor is a non-VC investor (see Section 4.3 for further details). *Log round size ($ million)* is the log of the capital (in real 2009 U.S. dollars) raised by the startup from all investors in the financing round that constitutes the investor's first investment, while *Log syndicate size* is the log of the number of investors in that same financing round. All regressions include financing year, state, and industry fixed effects. In addition, columns 3 through 6 include financing round number fixed effects (capped at five). Robust standard errors clustered at the startup level are reported in parentheses. We use ***, **, and * to denote significance at the 1%, 5%, and 10% level (two-sided), respectively.

Dep. var.:	*Log startup age*		*Startup outside investor's state?*		*Log distance btw. startup and investor*	
	(1)	(2)	(3)	(4)	(5)	(6)
Non-VC investor	0.310***	0.237***	0.069***	0.063***	0.748***	0.671***
	(0.005)	(0.005)	(0.003)	(0.003)	(0.017)	(0.018)
Log round size ($ million)		0.155***		0.050***		0.210***
		(0.003)		(0.002)		(0.009)
Log syndicate size		0.138***		0.081***		0.102***
		(0.006)		(0.003)		(0.016)
Constant	0.584***	0.216***	0.328***	0.209***	4.692***	4.369***
	(0.017)	(0.018)	(0.009)	(0.009)	(0.051)	(0.055)
Observations	107034	102550	107034	102550	97200	93226
R^2	0.106	0.246	0.116	0.153	0.077	0.088

Table IA.2: Correlation between the initial equity stake of the founders of a startup and the fraction of board seats they control.

The table shows the correlations between the equity stake owned by the founders of a startup one year after the startup's first financing round (defined in Section IA.4) and the fraction of board seats that the founders (column 1) and investors (column 2) control one through seven years after the first round. The analysis uses board membership data from Form D filings for all VC-backed startups that raised capital between 2002 and 2018. Form Ds identify which directors are "Executive Officers" of the startup, which we assume are founders. The remaining directors are either investors or outsiders; we rely on VentureSource to identify those directors that are investors. We use ***, **, and * to denote significance at the 1%, 5%, and 10% level (two-sided), respectively.

Years after the first financing round	Correlation between the founders' initial equity stake and the fraction of the board controlled by the ...	
	founders (1)	investors (2)
1	0.240***	-0.255***
2	0.230***	-0.242***
3	0.188***	-0.209***
4	0.176***	-0.210***
5	0.169***	-0.190***
6	0.143***	-0.172***
7	0.147***	-0.182***

Table IA.3: Instrumented effect of founder control on startup exits – Excluding firms that either fail or have a low-valuation acquisition more than seven years after their first financing round.

The table examines how the initial equity stake owned by a startup's founders affects the startup's future exit probability by estimating Equation (3) using an instrumental variable (IV) model. The IV, *State pension assets × % state officials in board*, interacts two plausibly exogenous sources of variation in VC supply at the state-year level, both measured the year before a startup's first financing round: (1) variation in the assets of state and local pension funds, and (2) variation in the fraction of state officials in the funds' boards of trustees (Andonov, Hochberg, and Rauh, 2018). The models estimated here are identical to those reported in Table 8, with only one exception: We exclude from the sample *all* startups that either (1) fail or (2) are acquired at a low valuation that is less than or equal to twice the total capital they raised in all pre-exit financings or $25 million, regardless of whether these failures or low-valuation acquisitions take place within seven years of the startups' first financing round or later. All variables are defined in Sections IA.3 and IA.4. All regressions include first-financing year, state, and industry fixed effects. Robust standard errors clustered at the state level are reported in parentheses. We use ***, **, and * to denote significance at the 1%, 5%, and 10% level (two-sided), respectively.

Dep. var.:	Founders' initial equity stake	IPO or successful acquisition in 7 years			IPO in 7 years		
	First stage (1)	OLS (2)	Reduced form (3)	2SLS (4)	OLS (5)	Reduced form (6)	2SLS (7)
Founders' initial equity stake		-0.011 (0.030)		-1.344** (0.580)	0.036** (0.014)		-1.630*** (0.627)
State pension assets × % state officials in board	0.420*** (0.081)		-0.565*** (0.189)			-0.685*** (0.224)	
Log capital raised	-0.097*** (0.006)	0.062*** (0.013)	0.063*** (0.012)	-0.067 (0.056)	0.059*** (0.007)	0.056*** (0.007)	-0.101* (0.061)
Log no. startups in state-year	-0.128*** (0.033)	0.008 (0.083)	0.126 (0.099)	-0.045 (0.101)	-0.182*** (0.058)	-0.041 (0.079)	-0.249*** (0.093)
Log no. pension funds in state-year	0.010 (0.006)	-0.005 (0.016)	-0.008 (0.014)	0.005 (0.016)	0.028* (0.015)	0.025** (0.012)	0.040** (0.017)
Log state-year population	0.117 (0.087)	0.074 (0.190)	0.048 (0.165)	0.206 (0.212)	-0.034 (0.160)	-0.061 (0.165)	0.130 (0.274)
Constant	0.167 (1.441)	-1.507 (2.704)	-2.243 (2.307)	-1.164 (2.301)	2.221 (2.740)	1.310 (2.504)	1.716 (2.800)
Observations	6999	6999	6999	6999	6999	6999	6999
R^2	0.338	0.319	0.320	.	0.329	0.330	.
First stage F statistic	27.09						

Table IA.4: Instrumented effect of founder control on startup exits – Non-CA sample with division instead of state fixed effects.

The table examines how the initial equity stake owned by a startup's founders affects the startup's future exit probability by estimating a modified version of Equation (3) using an instrumental variable (IV) model. The IV, *State pension assets × % state officials in board*, interacts two plausibly exogenous sources of variation in VC supply at the state-year level, both measured the year before a startup's first financing round: (1) variation in the assets of state and local pension funds, and (2) variation in the fraction of state officials in the funds' boards of trustees (Andonov, Hochberg, and Rauh, 2018). The models estimated here are identical to those reported in Table 8, with two exceptions: We exclude from the sample all startups based in California, and Equation (3) includes Census division fixed effects instead of state fixed effects. All variables are defined in Sections IA.3 and IA.4. All regressions include first-financing year, Census division, and industry fixed effects. Robust standard errors clustered at the state level are reported in parentheses. We use ***, **, and * to denote significance at the 1%, 5%, and 10% level (two-sided), respectively.

Dep. var.:	*Founders' initial equity stake*	*IPO or successful acquisition in 7 years*			*IPO in 7 years*		
	First stage (1)	OLS (2)	Reduced form (3)	2SLS (4)	OLS (5)	Reduced form (6)	2SLS (7)
Founders' initial equity stake		0.086*		-2.079*	0.071***		-1.181
		(0.044)		(1.127)	(0.023)		(0.984)
State pension assets × % state officials in board	0.177**		-0.369***			-0.210*	
	(0.077)		(0.124)			(0.124)	
Log capital raised	-0.104***	0.082***	0.073***	-0.142	0.071***	0.063***	-0.059
	(0.005)	(0.008)	(0.007)	(0.118)	(0.006)	(0.006)	(0.103)
Log no. startups in state-year	0.029	-0.043	0.030	0.090	-0.011	0.031	0.066
	(0.040)	(0.038)	(0.050)	(0.114)	(0.031)	(0.049)	(0.105)
Log no. pension funds in state-year	0.004	0.002	0.000	0.009	0.010	0.009	0.014
	(0.004)	(0.007)	(0.007)	(0.010)	(0.007)	(0.007)	(0.009)
Log state-year population	-0.036	0.054	-0.003	-0.078	0.005	-0.029	-0.072
	(0.039)	(0.042)	(0.049)	(0.116)	(0.033)	(0.045)	(0.104)
Constant	1.111***	-0.826**	-0.508	1.757	-0.228	-0.021	1.229
	(0.275)	(0.338)	(0.340)	(1.624)	(0.259)	(0.293)	(1.414)
Observations	4193	4193	4193	4193	4193	4193	4193
R^2	0.337	0.206	0.205	.	0.228	0.227	.
First stage F statistic	5.26						