How Do Venture Capital Funds Raise Capital?

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Abstract

Venture capital (VC) fund formation draws capital into the VC ecosystem, in turn contributing to innovation and economic growth. In VC fundraising, one of the most challenging tasks is identifying limited partners (LPs) that are likely to have a strong interest after being approached with the fundraising materials. The pool of potential LPs traditionally builds upon the general partners' (GPs) existing network, but GPs may choose to widen their reach through general solicitation (GS) and broker intermediation. 32% of the VC funds used GS and brokers in the sample from 2014 to 2021. This paper provides the first analysis in the literature about VC's choice of fundraising method to connect with potential LPs following a regulatory change that lifts an 80-year ban on general solicitation. GS and brokers impose costs on the issuer, but the costs differ. GS is permitted with high administrative burdens, while brokers require substantial financial compensation. Consequently, GS and brokered funds have distinctive characteristics from those that rely on existing networks. Furthermore, GS and brokers are utilized by different segments of the VC fundraising market. VC funds are more likely to use GS if they are located outside major VC hubs, have a higher percentage of female GPs, and have less experience. On the other hand, brokers are typically commissioned to raise larger funds, often by well-established VCs. GS funds, on average, underperform non-GS funds, while brokered funds do not have a systemic performance differential compared to non-brokered funds. One possible channel for GS funds' underperformance is their limited geographic reach for high-quality investment opportunities.

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1 Introduction and Contribution to the Literature

The US enjoys a robust ecosystem of venture capital (VC), which is considered an important driver of innovation and economic growth. Fund formation is a critical market activity and a multi-stage process that draws capital into the ecosystem.[1] Finding limited partners (LPs) that are likely to have a strong interest in providing capital is one of the most challenging tasks during fundraising. The pool of potential LPs traditionally builds upon the general partners' (GPs) existing network. Historically, a ban on the public announcement of private securities sales, or general solicitation (GS), has encouraged the VC industry to develop upon prior relationships. The 80-year ban on general solicitation was lifted by the Jumpstart Our Business Startups Act (JOBS Act) in September 2013, and VC funds have had the option to publicly advertise fundraising since then. Additionally, VCs can commission intermediaries such as brokers and finders to reach potential LPs. Although brokers have long been involved in the VC fundraising market, there is a gap in our knowledge about their activities. 32% of venture capital funds have used either GS or brokers in the fund sample from 2014 to 2021. This paper provides the first evidence in the literature about VC's choice of fundraising method to connect with potential LPs. I find that funds that use GS or brokers have distinctive characteristics from those that solely rely on existing networks. Furthermore, GS funds and brokered funds represent separate segments of funds. VC funds are more likely to use general solicitation if they are located outside major VC hubs, have a higher percentage of female GPs, and have less experience. On the other hand, brokers and finders are typically commissioned to raise larger funds, often by well-established VCs. GS funds, on average, underperform non-GS funds, while brokered funds do not have a systemic performance differential compared to non-brokered funds. The results are robust to various subsamples, econometric models, and control variables. One possible channel for GS funds' underperformance is their limited geographic reach for high-quality investment opportunities.

In the empirical analyses, I first examine VC funds' propensity to use general solicitation and brokers by analyzing the association between the fundraising method choice and fund char-

[1] The VC ecosystem consists of VC funds and their general partners (GPs), limited partners (LPs), entrepreneurs, and supporting industries such as legal and financial services. In planning to raise a fund, GPs form the investment team, define the investment strategy, and prepare the fundraising materials. The GPs then identify a list of limited partners to contact, which can be institutional investors and wealthy individuals. Pre-marketing is common, in which GPs engage with potential LPs before making a concrete fundraising plan. After multiple meetings and due diligence, LPs may finally commit to investing.

acteristics. I construct a variety of fund, firm, and offering features using data from SEC Form D filings and Refinitiv. Second, I compare the investment performance of funds that employ different fundraising methods. Three different estimation strategies show consistent results. Lastly, I investigate how and where the sample funds invest to illustrate the channels through which the performance differential is realized.

My paper contributes to the literature in four key aspects. First, it extends the literature on fund formation in venture capital. Gompers and Lerner (1998) examine how market-wide factors and VC firm-specific performance affect VC fundraising. They find that an increase in demand for VC funding drives aggregate VC fundraising on the state level, and past performance has a positive effect on fundraising at the VC firm level. Kaplan and Schoar (2005) also show that better-performing funds are more likely to raise follow-on funds and larger funds. Hochberg and Rauh (2012) find that LPs tend to overweight investments in local funds. This study contributes to this line of inquiry by analyzing how VC funds connect with potential LPs in the fund formation phase. This study offers insights into how fund-specific characteristics affect the VC fundraising method choice and introduces a variety of fund-level determinants that are applicable to emerging fund managers who do not have sufficient investment and performance history. The characteristics include fund investment focus, GP team size and gender diversity, firm experience and network, and offering structures. Some of these measures are novel yet based on widely available data sources, which can be useful for future research in venture capital.

Second, this paper contributes a policy-relevant analysis of the role of general solicitation in the VC funds market. To my knowledge, this is the first study on the effects of Title II of the JOBS Act from the perspective of private investment funds. The JOBS Act is considered the most significant modernization of federal securities laws in the past decade. While academic researchers have widely documented the law's impact on the IPOs (Title I) (see, e.g. Dambra et al., 2015; Chaplinsky et al., 2017), and to some extent on equity crowdfunding (Title III) (see, e.g. Catalini et al., 2016), less attention is given to Title II of the Act, which lifts an 80-year ban on general solicitation in the unregistered securities market (see the institutional background in Section 2). A concurrent paper by Agrawal and Lim (2021) also studies general solicitation but addresses a different type of issuer than the subject of this paper. They analyze the adoption of general

solicitation by small businesses and argue that GS offerings tend to be issued by lower-quality firms. My paper focuses on VC funds, representing private investment funds, another important but distinct type of issuers affected by Title II of the JOBS Act.

Third, this paper adds to the literature on financial intermediaries and sheds light on the role of brokers in VC fund formation. In VC fund formation, brokers serve as the intermediaries between VC GPs and potential LPs. Theoretical models provide several explanations about the purpose of intermediaries. Search models assume that issuer quality is similar and predict that intermediaries are used to reduce search costs by matching issuers to investors. Information models predict that intermediaries screen issuer quality and reduce costs of information asymmetry; hence issuers who transact with intermediaries are of higher quality. Results in this study are consistent with the search models. The fundraising choice propensity model and investment performance model suggest that there aren't quality differences between brokered and non-brokered funds in terms of issuer characteristics and ex-post performance. However, brokered funds tend to have a larger fund target size. To raise a larger fund, VCs either need to find select investors who can commit sizable investments or increase the number of investors; both would increase the search cost. Because broker commissions are non-trivial, we observe that brokers are mainly utilized by large funds with high search costs.

Finally, this study extends the literature on the private placement unregistered securities market, specifically Regulation D (Reg D) offerings. Capital formation through private unregistered securities has exceeded the amounts raised through the public market in recent years, and Reg D offerings are a large segment of the unregistered securities offerings market (Bauguess et al., 2018). Private funds, including VC funds, represent over half of the amounts raised under Reg D in 2010-2021 (see Figure 1). While existing studies have studied Reg D offerings in the context of entrepreneurship and angel investment (see, e.g., Denes et al., 2020; Xu, forthcoming), this paper is the first to utilize the rich and publicly available Form D filing data to study venture capital funds in the fundraising stage.

This study also has policy relevance on multiple fronts. First, it provides a timely assessment of Title II of the JOBS Act on its reception by the VC industry. Second, it contributes to the ongoing policy discussion about improving the private capital market and enhancing retail investor

access to investment opportunities.[2] Third, it examines the role of broker-dealers and finders in the VC industry, which could inform the SEC proposal related to the registration requirement exemption of these agents. Policy makers have found a lack of empirical evidence about the current state of broker activity; specifically, evidence that demonstrates that brokers do not tend to assist small issuers. This paper provides such evidence in the VC fundraising market.[3] Due to the U.S. federal securities law, private investment funds and private businesses usually raise capital under the same regulations. Any legislature devised with private businesses in mind inevitably affects private investment funds and vice versa. This study also aims to bring attention to such intricacies in policy-making, that the impact on all affected issuers should be considered when modifying securities laws. Section 6 expands on the paper's policy relevance.

The remainder of the paper is organized as follows. Section 2 provides the institutional background about general solicitation and brokers in Reg D offerings. Section 3 develops the hypotheses and empirical models. Section 4 describes the data, variable construction, and summary statistics. Section 5 presents the empirical results about the fundraising method choice, fund performance, and fund investment behavior. Section 6 concludes with a policy discussion.

2 Institutional Background

Typically, the outreach to potential LPs is facilitated by prior connections, such as past LPs, introduction by syndication partners and other professional contacts, and friends and family. However, funds may not always succeed in fundraising when relying solely on people they already know.

This paper studies two fundraising methods fund issuers may use to connect with potential LPs besides existing networks, namely, general solicitation and broker intermediation. The fundraising method indicators used in this research are constructed using SEC Form D filings, also known as the Notice of Sale of Securities. Form D is a required SEC filing when a Reg D offering takes place. Venture capital funds are typically issued under Reg D. This section provides the institutional background about Reg D, registration exemptions, a regulatory change regarding general

[2]For example, the JOBS Act 4.0 by the Senate Banking Committee.

[3]In response to the proposal, SEC Commissioner Caroline A. Crenshaw expressed reservation in a statement on October 7, 2020: "[The proposal] seeks to facilitate capital raising in the private markets. However, ..., the Notice provides no meaningful description of the current state of these markets, nor does it include any data supporting the need for this relief. To a significant extent, this is because the Commission lacks this information. I cannot support deliberately expanding markets that even our expert staff cannot accurately assess or analyze."

solicitation, and brokers and finders in the private capital market. The regulatory change timeline and the relationship among securities offering types and registration exemptions are also illustrated in Figure 2.

2.1 Regulation D Offerings

Regulation D offering is a type of unregistered securities issued in the US and represents a sizable segment of the unregistered securities market (Bauguess et al., 2018).[4] Reg D exemptions are utilized by both financial and non-financial issuers. Figure 1 displays the percentage distribution of Reg D offering count and amount raised, by the industry, in 2010-2021. The majority of the VC funds in the VentureXpert database self-identify as private equity, venture capital, or other investment funds in Form D. In 2010-2021, issuers within these industry groups constitute 24% of new offerings and 54% of the amounts raised by all Reg D offerings.

Regulation D was first adopted in 1982. One of the original purposes of this legislature was to collect and analyze data on issuers seeking registration exemption. However, issuers filed Form D on paper forms, making large-scale information extraction and statistical analysis difficult (Ivanov and Bauguess, 2012), until March 2009 when electronic filing of Form D became mandatory.[5]

Regulation D currently has two articles of exemption: Rule 504 and Rule 506.[6] Rule 506 accounts for more than 97% of the Reg D offerings and reported amounts raised. After the enactment of Title II of the JOBS Act in September 2013, issuers who claim Rule 506 exemption must choose either Rule 506(b) or 506(c) and declare as such on the Form D filing. Rule 506(c) provides communication flexibility through general solicitation, but also requires that all security buyers are accredited investors in the eventual sale and that the issuer takes reasonable steps to verify the accreditation status. The verification process increases the administrative burden of the funds.[7] On the other hand, 506(b) funds cannot use general solicitation to market the securities, but do not

[4] The Securities Act of 1933 requires that any offer or sale of a security must either be registered with the SEC or satisfy an exemption to remain unregistered. Registered securities are subject to public financial disclosure and reporting requirements, while exempted unregistered securities are not. Eligibility for such exemptions is, by and large, determined by the offering size and the number of shareholders. See more about the registration requirement here.

[5] The current version of Form D is available on the SEC website.

[6] Rule 504 applies to offers up to $5 million until November 2020, and up to $10 million thereafter. Rule 506 does not have an offer size limit.

[7] Accredited investor status is determined based on income or net worth. An accredited investor may be an individual, a household, or an entity. See the full definition here.

have the investor verification requirement and can have up to 35 non-accredited investors. Issuers who use general solicitation must claim exemption 506(c), while those who use brokers may claim either exemption based on its general solicitation status.

2.2 Regulatory Changes About General Solicitation

One of the fundraising methods we study is general solicitation. General solicitation, or general advertising, refers to the announcement and promotion of a private securities sale to the public. General solicitation by Reg D issuers was prohibited from 1933 to 2013, under The Securities Act of 1933 (the "Securities Act"). The ban has been eased when Title II of the Jumpstart Our Business Startups (JOBS) Act took effect on September 23, 2013.

General solicitation can take various forms. According to the SEC, examples of general solicitation include advertisements published in newspapers and magazines, public or unrestricted websites, communications broadcasted over television and radio, and seminars where attendees have been invited by general solicitation or general advertising.[8] Appendix Figure B1 shows examples of open-access website used by GS funds to advertise fundraising events.

In the Securities Act, the ban on general solicitation in unregistered securities sales is intended to protect investors. This is because investors who do not previously know the issuer are more likely to encounter fraudulent offerings. On the other hand, certain issuers may have difficulty raising the needed capital if their existing contacts cannot sufficiently fund the ventures. On April 5, 2012, the JOBS Act was signed into law with bipartisan support. The law is intended to increase American job creation and spur economic growth by reducing the compliance burden and easing securities regulations to facilitate access to capital, particularly for smaller companies. The JOBS Act contains provisions related to a variety of capital formation activities including private placements, IPOs, and equity crowdfunding. Among them, Title II of the JOBS Act eases restrictions on general solicitation, changing 80 years of regulatory practice. The VC industry is one of the largest issuer segments that are directly affected by this new rule (Figure 1).

[8] See the compliance guide at the SEC website.

2.3 Brokers in the Private Capital Market

Another fundraising method VC funds can utilize to raise capital is broker intermediation. Brokers, sometimes referred to as finders or placement agents, are financial intermediaries who identify and introduce potential investors to issuers, among other possible roles. Unlike general solicitation, which has only become permitted recently, brokers have long been involved in Reg D offerings and the broader private capital market. The compensation structure for brokers varies, for example, as a flat fee, as a percentage of capital commitments, or as a percentage of the GP management fee and carried interest. The expenses may be borne by the GPs, the GP's parent company, or the limited partners.[9]

In the US, brokers are regulated by the Securities Exchange Act of 1934 (the "Exchange Act"). Brokers must be registered with the SEC and join a self-regulatory organization such as the Financial Industry Regulatory Authority, Inc. (FINRA). Failure to register as a broker as required is a violation of federal securities law and is subject to SEC enforcement actions. Engaging an unregistered broker also has certain risks to the fund, such as investor rescission right (Robbins, 2013).[10]

Registration and compliance as a broker are costly and complicated. Intermediaries who introduce issuers and potential investors through casual channels such as friends and family rarely register as brokers.[11] In October 2020, the SEC issued a proposal that would grant broker registration exemption for individuals who engage in limited activities to assist issuers with raising capital in private markets from accredited investors. Currently, the SEC has yet to take final action regarding the proposal. The proposal is intended to "bring clarity to finders' regulatory

[9] Formal documentation of the commission amount and structure is lacking in the literature. Some issuers provide voluntary disclosure about such compensations in Form D filings: see the "clarification of sales commissions and finder's fees expenses" reported in Form D Item 15. The aforementioned compensation structure examples in the main text are drawn from these filing notes.

[10] However, the definition of a broker is vague in the legislature. According to the Exchange Act, a "broker" is "any person engaged in the business of effecting transactions in securities for the accounts of others." Yet, the Exchange Act does not define either "effecting transactions" or "engaged in the business." Courts have generally agreed that one is not subject to broker registration requirements if they don't participate in the negotiation or due diligence of a securities sale, nor do they receive compensation contingent on the transaction outcome. Such intermediaries are often referred to as finders. On Form D, broker sales commissions and finder's fees are separate entries. Only 22 funds (0.26%) in the sample reported finder's fees but not sales commissions.

[11] About 30% of the sales commissions recipient associated with the sample funds do not report a FINRA Broker Central Registration Depository (CRD) number on Form D, which indicates that they are potentially unregistered. This is an imperfect proxy for registration status, as a lack of the CRD number could be due to omission. Conversely, the reported CRD may not reflect valid, up-to-date registration.

status in a tailored manner that addresses the capital formation needs of certain smaller issuers while preserving investor protections." Although the policy proposal is rooted in small business capital formation, the proposed exemption would, as a matter of course, affect the intermediaries and issuers in the private fund formation market. This study sheds light on broker involvement in VC fundraising.

3 Hypothesis Development and Empirical Models

This paper examines the fundraising method utilized by U.S. VC funds from 2014 to 2021. For the first time in the literature, I provide empirical evidence about *how* funds connect with potential LPs to raise capital when they do not rely on existing networks, specifically through general solicitation and the intermediation of brokers. I analyze the propensity of funds to use either fundraising method choice, using novel fund-specific characteristics. Further, I compare each fundraising method's performance outcome and investment behavior. This section describes the main hypotheses about the adoption of GS and brokers and the empirical models.

3.1 Propensity to Use General Solicitation and Brokers

32% of the sample funds have used general solicitation and/or brokers to raise capital. The first-order question I ask is whether GS and brokered funds are different from the remainder that do not use either fundraising method. I conjecture that they have different characteristics because neither method is costless; if funds can raise sufficient capital from existing contacts of LPs, they would not opt for additional mechanisms to raise capital.

Both general solicitation and brokers help fund issuers to reach a wider range of potential investors. The next natural inquiry is whether general solicitation and brokers are used by funds for different reasons. This question also helps us evaluate a recent policy change and guide ongoing discussions about future legislatures. As introduced in Section 2, while brokers have always facilitated private placements, lifting the ban on general solicitation is considered an important change to the private capital markets. If GS is used by funds that would have used brokers in the absence of the GS option, the legislative change may have little impact on capital formation among private funds Reg D issuers.

I expect that GS and brokers are utilized by different types of funds due to the differences

in costs to the issuers. General solicitation has a higher regulatory burden, as the issuer must demonstrate that they have taken reasonable steps to verify investor accreditation status. The verification process may also discourage certain investors who are averse to sharing detailed financial information. However, apart from the administrative cost, general solicitation campaigns can be run inexpensively. For example, solicitation can be conducted through an open-access VC firm website or social media. In contrast, brokers do not add to the regulatory burden of a Reg D issuer, but they incur direct expenses in the form of commissions. Although we do not observe the commission schedule of the sample funds, information from Form D indicates that broker compensation can be up to 7% of the committed capital, which is high relative to the typical VC fund management fee of 2% per year. Whether the broker compensation is paid for by the fund or the LPs, the intermediary cost would counteract the investment return. Additionally, anecdotal evidence suggests that some brokers are unwilling to work with issuers who seek small amounts of capital because the profit potential is too small to make the effort worth their while. These factors impose a high barrier to using brokers. Due to the cost differences between the two methods, I hypothesize that GS funds and brokered funds have different characteristics, and they need to reach more potential LPs for different reasons.

H1 GS and brokered funds have different characteristics from funds that use neither method.

H2 General solicitation and brokers are used by distinct segments of funds.

To empirically test the hypotheses, I draw from the literature and market observations to devise characteristics that are potentially relevant to the fundraising method choice. There are two plausible explanations for why fund issuers may want to broaden the potential LP base. The first is that they have a slim LP base: the funds do not have sufficient existing contacts to pitch to. The alternative reason is expansion: the VC firm may plan to raise a larger-than-usual fund and the existing LPs cannot provide sufficient capital even if their commitment is acquired. Based on the *slim LP base* explanation and the *expansion* explanation, I hypothesize that fund location, GP characteristics, VC firm experience and network, VC firm past performance, fund investment stage focus, and fund size target affect how funds raise capital. The reasons are as follows.

Venture capital activity in the US is highly concentrated in a few hubs. Markets outside of the VC hubs are relatively thin; hence, funds are more likely to need help in finding investors there. The

VC industry is known to be overwhelmingly dominated by men. Due to the importance of personal relationships and plausible homophily bias in the industry, female-led VC funds may experience more difficulties in raising capital. Similarly, a smaller GP team may also share this challenge. The experience and network of the parent VC firm also matter. Existing literature has shown that VC experience and network affect fund performance and a firm's ability to raise follow-on funds (see, e.g. Kaplan and Schoar, 2005; Hochberg et al., 2007). It is plausible that a slim LP base could arise for reasons such as being new to the business and a lack of experience and connections. For follow-on funds issued by extant firms, funds may suffer from loss of existing investor base due to subpar performance by previous funds of the same firm. On the other hand, expansion could be associated with a good track record and a large fund size target. Additionally, later-stage VCs typically have a larger fund size due to the higher capital needs of late-stage ventures.

Due to the differences in costs associated with GS and broker, I hypothesize that:

H3 General solicitation is more likely to be used by firms who have a slim LP base.

(a) Funds located outside of VC hubs are more likely to use GS.

(b) Funds with a small GP team or more female GPs are more likely to use GS.

(c) Funds who lack experience, connections, and good track record are more likely to use GS.

H4 Brokers are more likely to be used by firms who attempt to expand, in other words, raise large amounts of capital.

(a) Funds that attempt to issue large amounts of capital are more likely to use brokers.

(b) Later-stage funds are more likely to issue large funds, and therefore use brokers.

(c) Funds offered by VC firms who have a good track record are more likely to expand and therefore use brokers.

Finally, I examine whether fundraising methods are associated with different business models and offering structures. Given a certain fund size target, fund GPs can raise capital from a varying number of LPs. Promotional materials issued by GS funds commonly highlight their low minimum investment requirements (see, e.g., Appendix Figure B1). This indicates that GS funds may have the business model of raising small investments from a large number of investors. On the other hand,

if brokered funds tend to be larger in size, they may also have many LPs but a higher investment threshold. Findings of this aspect would be informative to the ongoing legislative proposals that intend to enhance investment opportunities for small investors.

H5 GS and brokered funds have different offering structures from funds that use neither method.

(a) GS funds raise capital from a large number of LPs but have low minimum investment requirements.

(b) Brokered funds raise capital from a large number of LPs and have high minimum investment requirements.

I test this series of hypotheses using the following probit model specification, where the unit of observation is one sample fund:

$$\Pr(\mathrm{Y}{=}1|\mathbf{X}){=}\Phi(\mathbf{X}^T\boldsymbol{\beta}), \tag{1}$$

where

$$\begin{aligned}
&\mathrm{y}_{ikt} = \mathrm{I}(\text{fundraising method})_{ikt},\\
&\mathbf{x}'_{ikt}\boldsymbol{\beta} = \beta_0 + \mathbf{Fund\ Char}_{ikt}\boldsymbol{\beta_1} + \mathbf{Firm\ Char}_{i,t-1}\boldsymbol{\beta_2} + \mathbf{Offering\ Char_i}\boldsymbol{\beta_3}\\
&\qquad +\beta_4\text{Fund Year FE}_t + \beta_5\text{Fund Type FE}_k + \epsilon_{ikt}.
\end{aligned}$$

3.2 Investment Performance

Next, I compare the investment performance of funds by fundraising methods. Ex-post investment performance is a valuable indicator of issuer quality. This question is also particularly relevant for limited partners and regulators. From the perspective of potential limited partners, it is helpful to know whether the fundraising method is associated with differences in fund performance. For regulators, who consider investor protection a critical factor in policy-making, it is also important to know if there is a pattern of investment performance differential associated with the fundraising method. After all, strict broker regulations and the prior ban on general solicitation are both implemented with the intent to prevent fraud and protect investors, with a potential hindrance to capital formation.

The main proxy for VC fund performance in this study is the fund-level exit rate, or the fraction of a fund's portfolio companies that exited via going public or a sale to another company (M&A) as of the end of 2021.[12] In the estimation model, I control for known determinants of VC

[12]Ideally, VC fund investment performance is measured by the IRR a fund achieves over its lifecycle. However, the

fund performance, such as fund size (Kaplan and Schoar, 2005) and network centrality (Hochberg et al., 2007), and additionally GP team characteristics.[13] I use fund state, fund year, fund industry focus fixed effects to control for the regional economic condition, funding supply competition, and investment opportunities available to VCs. The model is estimated with OLS.

$$\begin{aligned}\textbf{Fund Exit Rate}_{ik\ell t} = \beta_0 + \mathbf{I}(\textbf{Fundraising Method})_{ik\ell t}\boldsymbol{\beta_1} + \textbf{Fund Char}_{ik\ell t}\boldsymbol{\beta_2} + \textbf{Firm Char}_{i,t-1}\boldsymbol{\beta_3} \\ + \beta_4 \text{Fund Year FE}_t + \beta_5 \text{Fund State FE}_k + \beta_6 \text{Fund Industry Focus FE}_\ell + \epsilon_{ik\ell t}\end{aligned} \tag{2}$$

The variables of interest are the fundraising method indicators. If the coefficient estimates are statistically equivalent to zero, there is no association between the fundraising method and fund investment performance. A statistically negative (positive) coefficient would indicate underperformance (overperformance).

Most of the sample funds have not completed the usual 7- to 10-year lifecycle by the exit outcome observation date (the end of 2021). To mitigate the concern about insufficient time to realize the investment outcome on the fund level, I also compare the round-level survival, where survival means either proceeding to subsequent funding rounds or exits. The average time between successive funding rounds is about one year. All investment rounds have lasted at least one year as of the outcome observation date, so the likelihood of an unrealized round survival is relatively low.

In the round-level survival model, I include the same firm and fund characteristics as in the fund-level performance model. Furthermore, I include a dummy variable to indicate if the portfolio company is within the industry focus of the fund, which should improve performance outcomes. Round-specific fixed effects are used to control for macro and industry conditions facing the investee company, which are investment round year, investee state, and the investee industry. The unit of observation is one investment round, and the explanatory variable values follow that of the lead investor of each round if there is a syndicate. The dependent variable is an indicator variable that equals one if the portfolio company has received a subsequent round of funding or exited. The

fund-level IRR is rarely available to researchers and not available through my primary data source Refinitiv. Exit rates are commonly used in the literature to measure fund investment performance because VC funds typically write off the majority of their investments, and the capital gain is from the small subsets of investees who realize an exit.

[13] In the investment performance models, I use the same fund and firm characteristics used in the fundraising method propensity models but replace fund size target to the amount raised (i.e., fund size).

model is estimated with probit maximum likelihood estimation (MLE).

$$\Pr(\text{Y}=1|\mathbf{X})=\Phi(\mathbf{X}^T\boldsymbol{\beta}), \tag{3}$$

where

$$\begin{aligned}
&\text{y}_{ik\ell t} = \text{I(survived round)}_{ik\ell t},\\
&\mathbf{x}'_{ik\ell t}\boldsymbol{\beta} = \beta_0 + \mathbf{I(Fundraising\ Method)}_i\boldsymbol{\beta_1} + \mathbf{Fund\ Char}_{ik\ell t}\boldsymbol{\beta_2}\\
&\qquad +\mathbf{Firm\ Char}_{i,t-1}\boldsymbol{\beta_3} + \beta_4\text{I(within focus)}_i + \beta_5\text{Investment Year FE}_t\\
&\qquad +\beta_6\text{Investee State FE}_k + \beta_7\text{Investee Industry FE}_\ell + \epsilon_{ik\ell t}.
\end{aligned}$$

The variables of interest are the fundraising method indicators. If the coefficient estimates are statistically equivalent to zero, there is no association between the fundraising method and the likelihood of investment round survival. A statistically negative (positive) coefficient would indicate a lower (higher) chance of proceeding to the next round of investment. Because the eventual portfolio company exit is conditional on round survival, a higher likelihood of round survival positively correlates with the fund-level exit rates.

Finally, I investigate whether the fundraising method contributes to differences in exit duration or the speed of an exit. For the same amount of capital gain, a faster exit equates to a higher IRR. Hence, a negative (positive) association between a fundraising method and the exit duration indicates better (worse) investment performance. The exit duration is calculated as the number of days between a portfolio company's first investment round and (1) the exit date, (2) the end of 2021. In the latter case, the observations are considered "right-censored" because they may not have had sufficient time to realize an exit. The unit of observation is one investee-lead-investor pair.

The dependent variable is the log exit duration in days, and the independent variables are the same as the round-level survival model. I estimate an accelerated-failure-time (AFT) model to account for the right-censored observations.[14] In this parametric hazard model, I assume that the log exit duration is normally distributed. This distribution assumption implies that the hazard rate is hump-shaped; in other words, the portfolio company's probability of an exit (given that an exit has not taken place) first increases and then decreases over time. This is realistic in the context of

[14]The general format of the AFT form of duration model is $T_i = exp(\mathbf{X}_i) \times u_i$. The equation is linearized by taking the natural log on both sides.

VC investments: firms become more likely to exit after reaching a certain level of maturity, but an exit becomes less likely after too much time has passed.[15]

$$\begin{aligned} ln(\text{Exit Duration}_{ik\ell t}) = \beta_0 + \mathbf{I(Fundraising\ Method)}_i\boldsymbol{\beta_1} + \mathbf{Fund\ Char}_{ik\ell t}\boldsymbol{\beta_2} \\ + \mathbf{Firm\ Char}_{i,t-1}\boldsymbol{\beta_3} + \beta_4 \text{I(within focus)}_i + \beta_5 \text{First Investment Year FE}_t \\ + \beta_6 \text{Investee State FE}_k + \beta_7 \text{Investee Industry FE}_\ell + \epsilon_{ik\ell t} \end{aligned} \tag{4}$$

Similarly, the variables of interest are the fundraising method indicators. If the coefficient estimates are statistically equivalent to zero, there is no association between the fundraising method and exit duration. A statistically negative (positive) coefficient would indicate faster (slower) exits. The coefficients in the AFT model can be interpreted as follows: every one unit change in X_m corresponds to a change of $100 \times [1 - exp(\beta_m)]$ percent in the expected survival time (i.e., exit duration).

3.3 Investment Behavior

Lastly, I compare if the fundraising method is associated with differences in how GPs deploy fund capital, in terms of variations in round duration and investment distance. This analysis may also reveal channels through which investment performance differential is realized, if one exists.

The first aspect, round duration, can be interpreted as the intensity of monitoring by the investors (Gompers, 1996). The shorter the duration of a financing round, the more frequently the VC funds monitor and re-evaluate the portfolio company's prospects. Round duration is calculated as the number of days between an investment round's investment date and (1) the following round's investment date or the exit date, or (2) the end of 2021 if the former is not applicable. I associate the round duration with the same regressors as in the round-level survival model (Equation 3), which include the fundraising method indicators, fund and firm characteristics, and investment-specific fixed effects. I use both an accelerated-fail-time (AFT) model and a linear model to estimate the association between round duration and the fundraising method, where the dependent variable is the natural log of round duration in days. As detailed in the exit duration model (Equation 4), the lognormal AFT model accounts for the right-censoring of the event of interest, which is subsequent

[15] The model estimation is almost identical under the log-logistic distribution assumption, which also implies a hump-shaped hazard rate. Alternative distribution assumptions may imply a constant hazard rate, or a monotonically increasing/decreasing hazard rate, which do not describe well the VC investment exit probabilities over time.

financing in this case. Because each round has lasted at least one year by the observation date, there is a relatively small chance that the round is ongoing. Hence, I also use OLS to estimate a linear multiple regression model, which does not rely on the lognormal round duration distribution assumption.

Secondly, I examine if the fundraising method is associated with the investment distance, based on investee-lead-investor pairs. Proximity to the portfolio company is another indicator of monitoring intensity. It can also be interpreted as the geographic reach of an investor. Because distant investees require a wide network during deal sourcing and additional efforts and resources after investing, less equipped investors may not be capable of non-local investment. The distances are calculated using geocoded street addresses, as described in Appendix A.3. In addition to the continuous distances, I also create indicator variables for distance ranges that correspond to various time commitment for an in-person visit: a few hours (<20 miles), within a day (20-200 miles), and multi-day (>200 miles). This allows for nonlinearity in the relation between investment distance and fundraising methods. OLS is used to estimate the continuous distance dependent variable model, and probit MLE is used for the binary indicator variable model. The same regressors apply.

4 Data and Summary Statistics

This section provides a detailed description of the data sources, sample and variable constructions, and the sample VC funds' characteristics.

4.1 Data Sources

The main data sources of this study are SEC Form D filings and Refinitiv. Data are collected through the end of 2021. Appendix Table B1 lists variable definitions and sources.

The main variables of interest, use of general solicitation and broker on the fund level, are from Form D. The general solicitation status of each Reg D offering is determined by the registration exemption(s) claimed. If 506(c) is selected, then the issuer is considered to have used general solicitation to raise capital. The brokered status is based on whether the fund has listed sales compensation recipients or incurred sales commissions and finder's fees. Other variables of interest from Form D include the list of issuer executive officers, number of existing outside investors, minimum investment, offering and sales amounts, and offering duration. Appendix A.1 provides

details about variable construction using the Form D data.

Refinitiv is formerly known as Thomson Reuters Securities Data Company (SDC) Platinum. I utilize three databases from Refinitiv: VentureXpert, SDC Merger and Acquisitions, and SDC Global New Issues. VentureXpert provides data on fund capital raising events and investment round details, as well as information about the VC firms, VC funds, and portfolio companies, such as their addresses and industry categorization. I use the latter two Refinitiv databases to supplement the exit status of portfolio companies. I describe the procedure to identify the investee company exit status in Appendix A.2.

Refinitiv provides a unique identifier called PermID to many entities in its data tables. When a PermID is not available, I use entity name and address to determine unique entities and assign alternative unique identifiers. Occasionally, one entity is assigned multiple PermIDs incorrectly by Refinitiv. I screen for and consolidate these observations. The cleaned unique identifiers are used to merge across Refinitiv data tables.

In this study, it is important to distinguish between venture capital firms and funds; portfolio companies and investment rounds. A VC firm can raise multiple VC funds. Form Ds are filed on the fund level. Different VC funds within one VC firm family typically differ by their fund year and investment strategy. A VC portfolio company raises capital through multiple investment rounds (known as staging), and more than one VC fund can participate in an investment round (known as syndication).

4.2 Fund Sample

The fund sample consists of 8,479 US funds with fund years from 2014 to 2021.[16] To construct the sample, I start with all US funds with fund years between 2014 and 2021 from VentureXpert's "fundraising" dataset.[17] I then merge VentureXpert fund data with Form D data, which provides the fundraising method. Other variables based on Form D filings include GP team size and gender composition, and offering characteristics.

There are no common identifiers between Form D and Refinitiv. Hence, I perform entity matching based on fund name, state, and year. I first apply fuzzy name matching between the

[16] The start year of the sample is the first full year when general solicitation in Reg D offerings became legal.

[17] Variables in the "fundraising" data table include VC fund name, VC firm name, fund size, fund size target, fund type (e.g. VC, generalist PE), fund stage (e.g. seed, early, later), and fund address (state, city, street).

VentureXpert fund name and Form D filer entity name. Form D filers who self-identify as financial issuers are considered for the entity matching.[18] In cases where VentureXpert funds are not matched to a Form D filer in the automated step, I search CIK by fund name in EDGAR manually. To eliminate incorrect matches, I further require that the fund state in VentureXpert matches with at least one Form D state associated with the CIK and that the VentureXpert fund year is within the Form D filings year range.[19] This screening process results in a fund sample size of 8,479 funds managed by 3,939 firms. In the sample, 643 funds (8%) have raised capital using general solicitation under Rule 506(c), and 2186 funds (26%) have utilized brokers or finders. The proportions are similar to those from all Reg D issuers in the same period. Figure 5 summarizes the fund sample size by year and fundraising method.

4.3 Investment Rounds Sample

VentureXpert's "investment details" dataset is used to analyze the investment behavior and performance outcome of funds, and to compute measures of VC firm experience, VC firm network centrality, and market network density. This dataset records the investee name, investment date, investor identity, and investment amount for each investment round.

I collect all "Private Equity/VC" investments made by US firm investors between 1980 and 2021 to US investee portfolio companies.[20] Excluding unknown investors and non-VC stage investments, the investment rounds sample consists of 49,416 portfolio companies funded by 17,535 fund investors, which are managed by 9,293 firm investors.[21]

In round-level regression analyses, I use the lead fund investor's characteristics for syndicated investment rounds. Lead investors serve as a liaison between the portfolio company and all syndicate

[18] A Form D filer is in the matching pool if their self-declared industry group is in the following categories: Pooled Investment Fund, Investing, Commercial, Construction, REITS and Finance, Residential, Other Real Estate, Other Banking and Financial Services, Insurance, Commercial Banking, and Investment Banking.

[19] 86% of funds in VentureXpert with fund name are matched to Form D with this procedure. VentureXpert funds not matched to Form D filings have similar states, fund year, and fund focus distribution but smaller average fund size, compared to the final fund sample. Appendix Table B2 summarizes the fund sample construction process.

[20] I use long history of investment rounds data to compute VC firm experience. VentureXpert has had good coverage of fund investments since around the 1980s (Kaplan and Lerner, 2017). Besides, venture capital became sought after by institutional investors around 1980, following several regulatory changes (see, Hochberg et al., 2007). I only evaluate the investment performance outcome for investments before 2021 to allow at least one full year of observation period at the end of 2021.

[21] Non-VC investment stages: LBO, PIPE, Open Market Purchase, Secondary Purchase, Secondary Buyout, Recap/Turnaround, VC Partnership, MBO.

members. They typically set the deal terms of a round and have the largest capital share. Lead investors can be different in each round of a portfolio company. The lead investor in each round is identified by the lead investor indicator in VentureXpert and the largest investment amount in the round if VentureXpert indicator is not available; ties are broken by cumulative investment amount, the earliest investment date to the investee company, and smallest distance to the investee company.

4.4 Fund-Level Summary Statistics

Here I describe the fund sample with regard to a series of characteristics that may relate to the fundraising method choice, as hypothesized in Section 3. The characteristics include fund geographic distribution, fund size, fund investment stage, GP team size and gender diversity, parent VC firm experience and network centrality, and offering characteristics. In the description, I highlight the differences between funds with different fundraising methods. Table 1 presents the summary statistics of the whole fund sample, which consists of 8,479 US funds with fund years from 2014 to 2021. Table 2 and Table 3 compare the characteristics by fundraising methods.

Geographic Distribution

Venture capital activities in the US are highly concentrated in a few regions. Figure 3 shows locations of the sample funds. Among all sample funds, 50% of are located in California (29.9%) and New York (20.5%), followed by Massachusetts (7.6%) and Texas (6.0%). Because CA and NY have an overwhelmingly high concentration of VC funds, I consider them the major VC hubs. Funds that use general solicitation are much less likely to be located in CA and NY (38%), while funds that use brokers have a similar but slightly lower likelihood of being in these two states (47%). Figure 4 shows heat maps of fund distribution by fundraising method. Compared to the full fund sample and the brokered funds sample, GS funds are less concentrated around VC hubs.

In addition to fund states as a geographic indicator, I utilize entity addresses to create variables such as the distance between investors and investees. I obtain the physical addresses of VC funds and portfolio companies from Refinitiv, supplemented by the "business address" reported on Form D. Addresses are converted to latitude and longitude coordinates using the OpenStreetMap API. The distance between VC fund investors and investee portfolio companies is calculated as the geodesic distance. Appendix A.3 provides additional details about geocoding using OpenStreetMap.

General Partner Team Size and Gender Diversity

In the sample, a VC fund on average has 3.4 general partners, which is consistent with the statistics reported by recent industry surveys. Funds that use brokers have a larger GP team, with an average of 4.5 people. The venture capital industry is commonly considered a "boys' club." On average, only 11% of the GPs are female in the sample, similar to recent industry-wide estimates published by Crunchbase and PitchBook. Due to the importance of personal relationships and plausible homophily bias in the industry, female-led VC funds may experience more difficulties in the fundraising phase. Hence, I conjecture that female-led funds are more likely to enlist help such as general solicitation and broker to raise capital. Based on sample means, this is indeed the case for general solicitation: on average, 14% of GPs of 506(c) funds are female, which is a 27% increase from the overall average. On the other hand, funds that use brokers on average have 9% female GPs.

GP gender composition is also closely related to other factors that may independently affect the fundraising method choice. Table 4 shows that funds with an all-female GP team tend to be less connected, younger and have less investment experience, and more likely to be located outside of major VC hubs, compared to funds with an all-male or mixed-gender GP team.

The general partner team size and gender diversity are constructed as follows. I collect names of general partners from the "Related Persons" field on Form D. I exclude non-natural persons such as "GP of the issuer". GP names are available for 92% of the fund sample. To compute the gender probability of each person by their name, I use the national data on the frequency of first names by gender from the Social Security Administration (SSA).[22] The annual name-gender frequency data is from Social Security Card applications for births. I calculate the gender probability of each first name by aggregating 1940-2000 data, as this is the plausible range of GP birth years. A handful of first names do not appear in the SSA database, likely representing foreign-born general partners. In these instances, I use Namsor to compute the gender probability.

[22]The Social Security Administration website. The data exclude names with fewer than five occurrences in a year.

Firm Experience and Network Centrality

I create measures for VC firm experience and network centrality on the firm-year level, then merge them to the VC funds by fund year with a one-year lag. The lagged values capture the *ex-ante* firm characteristics and avoid look-ahead bias. VC firm experience and network centrality have been shown to relate to fund performance and a firm's ability to raise follow-on funds (see, e.g. Kaplan and Schoar, 2005; Hochberg et al., 2007). I use firm age and firm cumulative total investment amount as proxies for firm experience.[23] Firm age is calculated by fund year minus VC firm founding year. VC firm founding year is provided by Refinitiv and supplemented by other sources such as company websites and Crunchbase profiles. The cumulative investment and network centrality are calculated using the investment rounds sample. Appendix A.4 describes the variable construction and interpretation of the network measures.

The firm age shows that general solicitation is favored by younger firms, whereas older firms are more likely to engage brokers. 29% of the sample funds are the first fund issued by their parent VC firm, and the average VC firm age is 13 years. General solicitation tends to be used by younger firms (mean=8 y/o), whereas brokers tend to be used by older firms (mean=17 y/o). 39% of the GS funds are their firm's first fund, 35% higher than the overall average. By contrast, only 18% of the brokered funds are their firm's first fund, 38% lower than the overall average. While younger, the GS funds' parent firms have on average invested more capital ex-ante compared to the full sample and the brokered fund sample. The mean firm invested amount as of the year before the fund year is \$232 million, \$327 million, and \$249 million, for the entire fund sample, the GS funds, and the brokered funds, respectively. A closer look at the variable distribution reveals that the relatively high average of GS funds is driven by a small number of large firms.

For a subset of VC firms with sufficient investment history (41% of the fund sample), I construct measures of past investment performance on the firm-year level, as measured by exit ratio. I compute the proportion of investments that exit by going public, M&A, and either method, weighted by investee count and dollars.[24] The cumulative and rolling 5-year measures are com-

[23] I also derive two other measures for experience: total number of investment rounds the VC firm has participated in and the number of investee companies the firm has backed. Both measures have a high correlation with the total investment amounts. For brevity, I do not report regression results using the alternative experience measures, but I obtain similar results using the alternative measures.

[24] Investment dollar amount is not available for all exit events. Hence, the number of observations of the dollar exit

puted to quantify the parent VC firms' complete historical and recent past performance. In this fund subsample, GS funds on average are offered by VC firms that have worse past investment performance. Using the recent 5-year total exit ratios as an example, the overall sample average is 42%, while the GS fund sample average is only 24%; brokered funds have an average of 47%, slightly higher than the overall mean. The underperformance by the GS funds' parent firms is more pronounced in M&A exits.

Offering Characteristics

Offering characteristics describe how the VC funds structure and implement its fundraising. The characteristics include the minimum accepted investment amount from outside investors, the number of LPs who have already committed capital, offering duration, and offering size. The variables are mainly derived from the Form D filings, as described by Appendix A.1.

Given a certain fund size target, fund GPs can raise capital from a varying number of LPs. Too many LPs increase the operational burden, while too few LPs could lead to those investors potentially having an unbalanced authority within the fund. The minimum investment amount accepted from outside investors and the number of LPs variables shed light on a fund's LP structure strategy. The average number of LPs in the sample is 38, and the average minimum accepted investment amount is $1.1 million. Both GS funds and brokered funds have a higher LP count than the overall sample, at 45 and 63, respectively. Not only do GS funds raise capital from a larger number of outside investors, but they also have a lower investment threshold ($0.54 million), at about half of the overall average. On the other hand, brokered funds have a higher average investment threshold ($1.8 million), which suggests that brokered funds aim to be large in fund size.

The offering size is either reported as a finite amount or an indicator of "indefinite" offering size. 67% of the funds have a finite fund target size, with an average of $400 million. The rest of the funds (33%) have an "indefinite" fund offering size target. Among GS funds, the average finite fund size target is $235 million, about 41% smaller than the sample average; 35% of GS funds

ratio is smaller than that of the count exit ratio. Exit ratios are based on investments made through the end of 2015, allowing at least six years to observe the exit outcome. For later years where insufficient time has passed, the values are imputed from the last available year. Past exit ratio measures are only available for firms that have invested by the end of 2015.

indicated an indefinite fund size target. Among brokered funds, the average finite fund size target is $917 million, more than twice of the sample average; 40% of GS funds indicated an indefinite fund size target.

The offering duration reflects GPs' expectations about how quickly they can achieve the fundraising goal. On Form D, the issuer indicates whether they intend the offering to last more than one year, where 31% of the sample funds indicated "yes". The proportion among GS funds is 39%, and 43% among brokered funds. Raising a VC fund typically takes a few months. A longer expected offering duration could be driven by factors such as a lack of certainty about fundraising success and a larger-than-usual fund size target. We explore these alternative explanations in the empirical analysis.

4.5 Investment Stage and Industry Focus

VC funds commonly specialize in a specific investment stage and industry, as investee companies in different stages and industries would require different capital amounts and investor expertise. 31% of the sample funds specialize in seed and early-stage investing.[25] GS funds are more likely to be seed/early-stage funds (37%), whereas brokered funds are much less likely to be one (11%). This is consistent with the previously observed pattern that brokered funds intend to be large in fund size: because VC funds typically have a limited number of investees, larger funds seek to invest more per portfolio company, which is likely to be in later stages.

The fund industry focus follows Refinitiv's six major industry groups (VEIC): computer-related, non-high-technology, semiconductors/other electronics, communications and media, medical/health/life science, and biotechnology. The categorical variable is constructed based on VentureXpert's fund industry focus variable, and when unavailable, based on the investee industry that obtains the highest percentage of the funds' investment.[26] Figure 6 shows the industry focus by fundraising methods. Computer-related and non-high-tech industries are the most common industry focus. The distribution of the overall sample and the GS funds sample are very similar. Among all sample funds, 59% of funds focus on computer-related companies and 25% focus on non-high-tech industries. A lower percentage of brokered funds focus on computer-related companies (42%),

[25] The classification into seed or early-stage funds follows VentureXpert's fund stage variable.

[26] The industry focus variable is available for a 40% of the sample funds and for all sample funds that have made any investments.

while a higher percentage of brokered funds focus on non-high-technology companies (42%). To control for industry-wide characteristics such as risk and business life-cycle timeline, I include fund industry focus fixed effects in the analyses about fund performance by fundraising method.

With a familiarity with the fund, firm, and offering characteristics of the sample, we proceed to Section 5 to discuss the estimation results of the empirical models developed in Section 3.

5 Empirical Results and Discussions

This section discusses the estimation results of the empirical models developed in Section 3. The estimations show that general solicitation tends to be used by funds with a slim LP base, whereas brokers are commissioned to raise larger funds. The investment performance of GS funds is inferior to those that rely on existing networks after controlling for known factors that affect fund performance. There is no evidence of under- or over-performance by brokered funds, which suggests that brokers reduce search costs in the VC fundraising market and do not screen for quality. GS funds tend to invest locally outside of the hubs of entrepreneurial activities. The limited investment opportunity pool may explain their underperformance.

5.1 Propensity to Use General Solicitation and Brokers

Baseline Estimation

First, I investigate factors that influence the fundraising method choice. I relate the fundraising method choice to fund characteristics, firm characteristics, offering characteristics, and control for fund state and vintage year fixed effects. Fund characteristics include whether the sample fund is located in a VC hub, whether the fund focuses on seed or early-stage investments, the percentage of female general partners, and the number of general partners. The firm characteristics include firm age, cumulative investment amounts, and the eigenvector[27] syndication network centrality measure. Firm characteristics are measured as of the year before the fund year to capture the ex-ante parent firm attributes. The offering characteristics include the minimum acceptance amounts, the number of committed LPs, whether the offering duration is more than one year, and the target fund size.[28]

[27] Other network centrality measures produce similar regression results.

[28] Data on general partners and minimum accepted amounts are not available for all sample funds (see Table 1. To avoid a reduction in sample size, I include control variables to indicate whether the values are available in all regressions that use the related variables as regressors. Coefficient estimates for the control variables are omitted from the regression tables.

Table 5 presents the baseline estimation of Equation 1 using probit MLE. The base group consists of sample funds that use neither GS nor brokers. In Column (1), the dependent variable is an indicator variable that equals one if a fund uses either GS or brokers. This estimation shows that GS and brokered funds have different characteristics from funds that use neither method (Hypothesis H1). Column (1) shows that when either fundraising method is used, funds are less likely to focus on seed and early-stage investments, tend to accept a lower minimum investment amount, have more committed LPs, and have longer offering duration and larger target fund size. These differences are consistent with the understanding that advertising and intermediaries are used to expand the LP pools outside of the existing network.

Table 5 Column (2) compares GS funds to non-GS funds (Hypothesis H3). California and New York states are the major hubs of VC activities in the US, and they are home to 50% of the sample funds. Funds outside California and New York are more likely to use GS. Outside CA and NY, funds have a 3.2 percentage points higher predicted likelihood of using general solicitation.[29] Funds with more female general partners are also more likely to use general solicitation, and the economic significance of this factor is large. For example, with a typical team size of three general partners, an all-female team is 80% more likely to use GS than an all-male team, with an increase in the predicted likelihood of 5 percentage points. General partner team size also affects the propensity to use GS. The relationship is parabolic: smaller GP teams are more likely to use GS, but the relationship becomes positive when the GP team size exceeds 15, which is at the 99th percentile. The GS propensity is decreasing in parent firm experience, as shown by the negative coefficient on log firm age. A one standard deviation increase in firm age (14.3 years) from the mean (12.7 years) leads to a one percentage point decrease in GS propensity. Firm network centrality also has a parabolic relationship with GS propensity: in general, less centrally connected firms are more likely to use GS to raise a new fund; however, the relationship becomes positive for the best-connected firms. In terms of offering structure strategy, GS funds tend to raise from a larger number of investors but require a smaller minimum investment. This is expected as GS funds often market to non-institutional investors and highlight the low minimum investment threshold in advertisements (e.g., see Appendix B1). GS funds are also more likely to have an offering duration longer than

[29] Marginal effects after probit models are evaluated using the means of all other covariates unless otherwise specified.

one year. Overall, the estimation suggests that funds with a slim LP base are likely to use general solicitation; additionally, certain large and well-connected issuers also opt to use GS.

Table 5 Column (3) compares brokered funds to non-brokered funds (Hypothesis H4). Brokered funds are just as likely to be located in VC hubs as non-brokered funds. They are less likely to be an early or seed-stage fund: being an early/seed-stage funds reduce the likelihood of using brokers by 9.5 percentage points, or a 37% decline. Male GPs and older VC firms are more likely to use brokers, possibly due to connections with the intermediaries. With a typical team size of three general partners, an all-male team is 42% more likely to use brokers than an all-female team, with an increase in the predicted likelihood of 7 percentage points. A one standard deviation increase in firm age (14.3 years) from the mean (12.7 years) leads to a one percentage point increase in the predicted likelihood of using brokers. There is no significant difference in the GP team size or other firm characteristics between brokered and non-brokered funds. With regard to the offering strategy, brokered funds tend to have a longer offering duration and larger offering size. Altogether, funds hire brokers to raise a large amount of capital. This is unsurprising for two reasons. First, brokers demand costly financial compensation as a percentage of capital raised, which is not viable for smaller funds. Second, brokers often choose not to work with clients with smaller fundraising goals. Column (3) paints a very different picture than Column (2). The contrast between Column (2) and Column (3) indicates that general solicitation and brokers are indeed used by distinct segments of funds (Hypotheses H2, H5).

Robustness and Extensions

I conduct a number of robustness checks on the fundraising method propensity baseline estimation. First, I examine if the two fundraising methods are endogenous. Given the small overlap between funds that use each method, it is unlikely that the adoption of one fundraising method can predict the adoption of the other. Nevertheless, we test the association in a regression framework, where an indicator variable for the alternative fundraising method is included as an explanatory variable. Table 6 reports the estimation results, which affirm that GS and brokered funds are distinctive from one another. The coefficients of the alternative fundraising method indicators are statistically insignificant, while the estimates of other regressors remain similar to the baseline estimation.

Second, I apply alternative model specifications and sample screening criteria to the baseline

model. Appendix Tables B3 and B4 show the estimation results, respectively for propensity to use GS and propensity to use brokers. The estimations are highly similar when each of the following variations is applied: drop fixed effects, add state-level control variables about the economic condition and VC market characteristics, limit the sample to only follow-on funds, exclude buyout funds from the sample as indicated by VentureXpert's fund type variable, and limit the sample to independent private partnerships based on VentureXpert's fund investor type variable. The propensity model is robust to all alternative specifications and stricter sample selection rules.

Further, I extend the baseline model in two ways. The first extension is related to the offering characteristics. In the baseline estimates, both GS and brokered funds are associated with longer offering duration (more than one year). The amount of time it takes for a fund to reach its fundraising goal depends on many factors, including reputation and track record, investor network, market conditions, and fund strategy. A typical fundraising campaign lasts 6 to 12 months, after which GPs refocus on the deployment of the raised capital. The interpretation of a longer-than-one-year offering duration is ambiguous. One possible explanation is that GPs have low confidence that the fundraising goal will be met in a short period of time. Another possible explanation is that the long offering duration is an intentional and strategic choice for reasons such as a large fundraising goal. Similarly, the interpretation of an indefinite fundraising target is not clear-cut. On the one hand, it could indicate a large and unlimited fundraising goal, which would indicate that the GP team has the resources to support a mega fund. On the other hand, it could mean that fund managers have an undefined goal or are uncertain about their fundraising ability, in which case they are willing to manage any raised amount.

In order to shed light on these alternative explanations, I interact the offering duration (indefinite size target) with the actual amount raised as proxies to distinguish fund managers who have low confidence vs. those who are strategic and/or target a large fund size. Table 7 reports the estimation results. I create indicators for funds that have not reported any committed capital (i.e., raised \$0) and funds that have raised over \$500 million, which is approximately the top quintile amount raised in each fund sample year.[30] The indicators are interacted with the offering duration and indefinite fund size target. The estimation models are otherwise identical to those reported in

[30]Estimation results are similar using alternative cutoffs, such as the top decile and the top quantile.

the baseline estimates of Table 5. The inclusion of interaction terms does not alter other coefficient estimates, which again shows the robustness of the baseline estimation. Across all three columns, the indefinite and raised more than $500 million indicator is statistically positive. This implies that among funds that have an indefinite size target, they are more likely to use GS and brokers to expand the potential LP base in order to raise a large fund. This echo the previous findings that GS is used by certain large and well-connected VC firms, and brokers are engaged to raise larger funds. In Column (2), the amount raised and offering duration indicators show that, among funds that have an offering duration longer than one year, funds that have not yet raised capital are more likely to use GS, whereas funds that have raised over $500 are likely to use GS. This implies that fund managers who have low confidence in raising sufficient capital are likely to use GS, which is consistent with the previous finding that GS is used by funds that have a slim LP base. The amount raised and offering duration interaction terms are not statistically significant in the "propensity to use brokers" estimation reported in Column (3).

The second extension examines if the recent investment performance of the parent firm affects the fundraising method choice. The estimation is based on a subset of sample funds whose parent firms have sufficient investment history in the recent past (n=2,994). Venture capitalists commonly raise capital from returning LPs. When a VC firm has good recent investment performance, existing LPs are quick to subscribe to the new fund, in which case additional effort to reach potential LPs such as GS or broker intermediation would not be necessary. An exception is when the fundraising target is larger than usual. To test Hypotheses H3c and H4c, I include VC firms' recent exit rates within the five years prior to a fund's vintage year as explanatory variables. The exit rates are defined as the fraction of the firm's portfolio companies that exited via M&A and going public or either mechanism.[31] Table 8 reports the estimation results. The variables of interest are the exit rates, and the coefficient estimates of other independent variables are qualitatively similar. The dependent variable in Columns (1)-(3) is the GS indicator. The coefficients of the total exit rate and the M&A exit rate are statistically significant. There is a negative association between recent parent firm investment performance and the propensity to use general solicitation. Evaluated at

[31] Estimation results using the dollar exit rates, or the fraction of dollars invested, are very similar and not reported for brevity. Dollar exit rates are available for a smaller number of funds due to missing dollar investment data for some portfolio companies.

the means, firms that have one standard deviation (29%) decrease of the total exit rates from the mean (42%) are 22% more likely to use general solicitation, or a one percentage point increase in the predicted likelihood. When a VC firm underperforms, the existing LPs are less likely to commit to a new fund. This is in line with the other evidence that general solicitation is used when the funds have a slim existing LP base. In Columns (4)-(6), the dependent variable is the brokered indicator. The IPO exit rate coefficient in Column (5) is statistically positive, which is particularly meaningful to represent good past performance since IPO is considered the best VC investment exit outcome. VC firms are more likely to expand when they have had a good run. When the recent VC firm performance as measured by IPO exit rates increases by one standard deviation (18.1%) from the mean (10.8%), funds are 18.7% more likely to use brokers, or a 4.8 percentage points increase in the predicted likelihood. This resonates with the *expansion* explanation for brokered funds.

To conclude, the empirical evidence supports the hypotheses developed in Section 3. Brokers and general solicitation are used by funds to expand their existing LP base. Because each method is costly in its own way, brokered and GS funds are different from funds that rely on existing LP networks. Brokers and GS are used by distinct segments of funds. General solicitation has high administrative costs. GS is typically used by VCs who have a slim LP base: they tend to locate outside of major VC hubs, the GPs are more likely to be women, the GP team size is smaller, and the VC parent firms are younger, less experienced, and less connected. There are exceptions to the typical profile of GS funds: some large and well-connected firms also take advantage of the ability to generally advertise. For example, established VC firms such as Andreessen Horowitz, Sequoia Capital, and 500 Startups, to name a few, have issued funds using general solicitation. Brokers have high financial costs and tend to be selective with their clients. It is a less accessible way to expand the LP base. Brokered funds are less likely to be seed/early-stage funds (which tend to be smaller), are more likely to have an older and more experienced parent firm, and have larger fund size targets. In terms of the offering structure, both GS and brokered funds raise capital from a larger number of LPs; however, only GS funds tend to have lower minimum investment requirements.

5.2 Investment Performance

Further, I evaluate the investment performance of GS and brokered funds by comparing fund-level exit rates, round-level survival likelihood, and portfolio company exit duration while controlling for known factors that affect fund performance. The three comparison methods consistently show that GS funds underperform the average, while brokered funds do not exhibit performance differentials.

The association between fundraising method and investment performance, or the lack thereof, is of interest to potential limited partners and regulators. Ex-post investment performance is a parameter of fund quality. Limited partners are eager to know factors that can signify the future performance of a fund. Regulators seek to balance investor protection (stricter regulation) and capital formation (less regulatory burden) in devising new policies. For example, before the JOBS act, general solicitation is prohibited due to concerns about fraud and investor protection. If we don't find systematic underperformance of GS funds, there is evidence that general solicitation does not sacrifice investor protection. Such information is helpful in the regulator's current consideration of further easing GS requirements. Similarly, there is an ongoing SEC proposal about loosening the stringent broker registration rules to facilitate the capital formation of smaller issuers (by allowing smaller brokers to operate more freely). If brokered funds demonstrate systemic underperformance, the regulators should be more cautious about easing regulations.

Fund-Level Exit Rates

Due to the lack of fund-level IRR data, I use fund exit rates to measure the fund-level investment performance. The estimation is based on the subset of funds that have investment records by the end of 2020 (n=1,830). Table 9 shows the estimation result for the fund-level exit rates model described by Equation 2. Each column uses a different exit rate measure as the dependent variable, and the model specifications are otherwise identical across columns. The main regressors of interest are the fundraising method indicators. The general solicitation indicator coefficient is negatively associated with each of the six exit rate measures, and the negative association is statistically significant in four cases. The economic magnitude of the negative association is large. For example, in Column (1), concerning the total exit rate, the coefficient estimate suggests that all else equal, GS funds' exit rates are, on average, 3.8 percentage points lower than funds that rely on existing LP networks, which is a 25% reduction compared to the overall average total exit rates 15%.

This model controls for other factors that are known to affect VC investment performance. Exit rates are increasing in fund size and firm cumulative investment amount, consistent with prior literature. A one standard deviation increase ($609 million, based on the regression subsample) in fund size improves the total exit rate by 4.6 percentage points. A one standard deviation increase ($1,042 million, based on the regression subsample) in ex-ante firm cumulative investment amount improves the total exit rate by 9.7 percentage points. Seed and early-stage funds have lower exit rates because these investments tend to be riskier. In Columns (2) and (4), firm age is statistically negatively related to IPO exit rates; in other words, younger firms have higher IPO exit rates. Because some investments are recent, this negative association concurs with earlier finding that younger VCs "grandstand" by taking investees public early (Gompers, 1996). The estimation also suggests that funds with more female GPs have lower total exit rate and total dollar exit rate: a one standard deviation increase in GP female percentage (24 percentage points) corresponds to a 1.2 percentage points (=-4.831*0.24) reduction in total exit rate. Finally, fund year, fund state, and fund industry focus fixed effects are used to control for the regional economic condition, funding supply competition, and investment opportunities available to VCs during their investment window.

Furthermore, I extend the fund-level exit rates performance model by including the VC firm's past performance as an explanatory variable under firm characteristics. Kaplan and Schoar (2005) show that investment returns are persistent across funds managed by the same VC firm. Because some funds are issued by young VC firms that lack investment history, this estimation is based on a subset of the sample funds whose parent firms have sufficient investment history in the five years prior to a fund's vintage year (n=843). Table 10 reports the estimation result. The additional regressor is the issuing firm's IPO exit rates in the recent five years.[32] Unsurprisingly, recent firm performance has a strong and positive correlation with the fund exit rates. For instance, a one standard deviation increase in the parent firm's recent five-year IPO exit rates (18%) is associated with a 5.4 percentage points increase in the fund-level total exit rate. Even after controlling for the VC firm's recent track record, the negative relation between general solicitation and fund exit rates persist in this subset of funds. The estimation is statistically significant in Columns (4) and (6), where the dependent variables are the total dollar exit rate and the M&A dollar exit rate.

[32]Using alternative exit rate measures produces similar regression estimation results.

Similar to the previous estimation, there isn't a statistically significant relation between the fund performance and the use of brokers during fund formation.

Round-Level Survival Likelihood

The fund-level exit rates investment performance measure is imperfect because most of the sample funds have not completed the usual 7- to 10-year lifecycle by the exit outcome observation date (end of 2021). Hence, we cannot reliably assume that portfolio companies that have not exited are written off; rather, they may continue to operate and exit in the unobserved future. In order to address the concern that there is insufficient time for some investments to realize an exit, I also examine the association between fundraising methods and round-level survival. VC investments are made across multiple rounds, and the stepwise capital infusion is called staging. VC investment funding rounds typically take place every six to eighteen months. All investment rounds have lasted at least one year as of the outcome observation date. If an investment round has not received subsequent funding or exited after one year or longer, the portfolio company has a low chance of success.

Table 11 reports the probit maximum likelihood estimation results of Equation 3. The dependent variable is an indicator that equals one if the portfolio company has proceeded to a subsequent funding round or exited, and zero otherwise. The unit of observation is one funding round, where the firm and fund characteristics follow that of the lead investor of each round. In addition to the regressors used in the fund-level performance model, an "within industry focus" indicator is included, which equals one if the investee is in the same industry as the fund's industry focus, and zero otherwise. Overall, 50% of the sample rounds successfully survive to the next stage. Column (1) is estimated with all funding rounds led by the sample funds, and the remaining columns are based on the specified round sequence. Similar to the fund-level estimation, general solicitation is negatively associated with round-level survival, while brokered funds round level survival is not statistically different from those who rely on existing networks. Funds that use general solicitation have a 17.4 percentage points lower likelihood of surviving a round than those that rely on existing networks, which is a 35% reduction from the average survival likelihood. The estimation by round sequence shows that GS funds particularly have a harder time in the first round and the later stage. The "within industry focus" indicator has a strong and positive relation with the round survival probability: portfolio companies who are in the same industry as the lead investor fund's

industry focus have an 11.6 percentage points higher chance of success in a round. Interestingly, this effect attenuates in later rounds, which means that fund industry expertise is only important at the early stage, possibly through selection, while other factors such as investee-specific traits take precedence later on. Other positive factors for round survival are fund size and firm experience as measured by cumulative investment amount. Seed and early-stage funds experience lower round survival, consistent with the fund-level estimation. Oder firms appear to have lower round survival, particularly in later rounds.

To sum up, the round-level survival likelihood analysis shows consistent conclusions as the fund-level exit rate investment performance analysis: GS funds, on average, have a lower chance of success compared to funds that rely on existing networks, while brokered funds do not exhibit significant performance differentials.

Portfolio Company Exit Duration

We turn to the third and last measure of investment performance, in terms of exit duration. I define exit duration as the number of days between a portfolio company's first investment round and (1) the exit date, (2) the end of 2021. Table 12 reports the estimation results of the accelerated-failure-time model described by Equation 4. In this model, a positive coefficient estimate indicates a longer exit duration, or a slower exit. Among firms that have exited, the average exit duration is 4.9 years; allowing for right-censoring, the average exit duration is 4.75 years. The model uses the same regressors as in the round-level survival model. The unit of observation is one investee-lead-investor pair, where the investees include all portfolio companies whose lead investor is a sample fund (n=7,061). The estimation shows that general solicitation funds have a slower exit than funds that do not use GS: all else equal, the portfolio companies of GS funds take 3.6% longer to realize an exit, which is about two months at the mean. On the other hand, brokers do not have a significant association with the exit duration. Figure 7 plots the predicted exit probability over time since the first investment evaluated at the covariate means and shows the contrasts between fundraising methods. Exit duration is also shorter when the investee industry and the fund industry focus align. The proportion of female GPs, firm age, and focus on seed and early investments are factors that prolong the exit process.

The three investment performance comparison models provide consistent evidence that GS

funds on average underperform compared to non-GS funds, as shown by GS funds' lower fund-level exit rates, lower likelihood to receive subsequent financing after an investment round, and longer time to realize an exit. On the other hand, brokered funds on average perform similarly to non-brokered funds.

GS funds are typically marketed to inexperienced non-institutional limited partners. The underperformance of GS funds is alarming and shows that potential LPs should carefully evaluate the investment opportunity against other options before committing capital. The general advertising materials often emphasize the upside potential of venture investments, but GS funds do not appear to perform above average among VC funds.

5.3 Investment Behavior

Finally, we explore if the fundraising method is associated with different patterns in how the funds deploy their capital, focusing on the round duration and distance to investee companies. To interpret the estimation results, I turn to two theories in the literature about how venture capitalists play a role in promoting innovation and business growth, specifically the monitoring and selection channels. The monitoring explanation suggests that VC involvement improves portfolio companies' operations. The selection explanation suggests that VCs are good at screening for portfolio companies that are poised to succeed. The duration between successive financing rounds and the distance to investees are both measures of monitoring intensity. Distance to investees is also and indicator of the investment opportunity selection pool within a VC fund's reach.

Table 13 shows the estimation results of the AFT and linear models of the relation between round duration and the fundraising method. The mean and median round duration in the sample are 13 and 12 months, respectively. The AFT model assumes the probability of receiving subsequent funding first increases and then decreases over time, while the linear model does not make such a parametric assumption. Columns (1) and (2) are estimations of the lognormal AFT model, and Columns (3) and (4) are OLS estimations. Column (1) does not include the round sequence fixed effects, while all other columns do. The addition of round sequence fixed effects does not much affect the estimation results, suggesting that the relationship is robust across rounds. Across all specifications, investment rounds led by brokered funds have shorter round duration, and the magnitude ranges from a 3.4% to 12.8% reduction in round duration, or about 0.4 to 1.5 months

evaluated at the mean. Round duration is also shorter when the fund industry focus and the investee industry are the same and when the parent VC firm has cumulatively invested more capital. This suggests that brokered funds, funds with industry expertise, and experienced VC firms tend to reevaluate the portfolio companies more frequently. There is also weak evidence that GS funds have longer round duration, or less intense monitoring, in the AFT model.

Table 14 reports the estimation results of the linear and probit models of the relation between investment distance and the fundraising method. The mean and median investor-investee distances in the sample are 802 and 280 miles, respectively. Column (1) is estimated by OLS, where the dependent variable is the log distance between the fund investor and the investee company in miles. There is a negative association between the distance and the general solicitation indicator, which suggests that GS funds tend to invest in portfolio companies closer to the fund location than the base group. The point estimator magnitude is large: all else equal, the distance between GS funds and their portfolio company is on average 42% shorter than the base group, which is approximately 337 miles at the mean and corresponds to a typical travel time of a day or longer. Brokered funds on average have a similar investment distance as the base group. Additionally, seed and early-stage funds and older VC firms tend to invest more locally. Because early-stage companies are riskier, have more information asymmetry, and require smaller amounts of capital, it is not surprising that they are funded by local investors. Firms who have deployed more capital on average fund portfolio companies farther away, as they have a larger footprint and resources to source and manage portfolio companies in wide geographic distribution.

I also hypothesize that the relation between investment distance and fund characteristics is nonlinear. For example, VC investments traditionally have a 20-min drive rule, which allows close and frequent interactions with the portfolio companies. Similarly, within or outside of driving distance is also a reasonable cutoff. Hence, I create indicator variables of distances based on their typical travel time and estimate their relation with the independent variables with probit MLE. Columns (2)-(4) reports the results. In Column (2), the dependent variable is equal to one if the distance is shorter than 20 miles, which is typically considered a short drive. The dependent variable in Column (3) is equal to one if the distance is between 20 and 200 miles, which is within about 3 hours of driving distance or a short regional flight. The dependent variable in Column (4)

is equal to one if the distance is greater than 200 miles, which typically requires travel by air and multi-day business trips. Across Columns (2)-(4), we find that the result in Column (1) is mainly driven by GS funds' much higher likelihood to invest within a short drive. I repeat the estimation by separating funds located in the VC hub states (CA and NY) and other states, as shown in Columns (5) and (6). The results show that GS funds outside of CA and NY are more likely to invest in a short radius. Combined with the fact that GS funds are more likely to be located outside of the major VC hubs where the concentration of high-quality entrepreneurs is high, this finding suggests that the investment opportunity pool of GS funds is more limited than average, which potentially contributes to their underperformance. On the other hand, brokered funds have a lower propensity to invest in the 20-200 miles range and a higher propensity to invest beyond 200 miles. Because brokered funds tend to be larger in size, they likely have the resources to seek investment opportunities regardless of the distance.

Taken together, the evidence suggests that one channel for GS funds' underperformance is limited access to good investment opportunities. GS funds are likely located in areas with a lower level of VC activities and entrepreneur presence, but they also tend to invest in their backyard. Such an investment pattern could be a choice based on the funds' operational capacity. Alternatively, it could be driven by the fact that GS funds are less experienced and connected and hence do not have sufficient resources to source and manage opportunities from far away. On the flip side, this is positive evidence that the JOBS Act contribute to the capital formation of small business in areas without strong VC presence through the activities of GS funds.

The investment behavior analysis with regard to brokered funds shows that brokered funds tend to structure shorter funding rounds, which is an indication of close monitoring. Because brokered funds are larger, it is reasonable to infer that each round investment amount is also higher than average. The higher stake of capital could explain why brokered funds favor staging.

6 Policy Discussion and Conclusion

This study sheds light on VC's choice of fundraising method and the involvement of general solicitation and brokers in the VC fundraising market. This section highlights the main findings and discusses how this research contributes to policy discussions.

6.1 Summary of Findings

In the empirical analysis, we first characterize the funds that choose to use general solicitation and brokers. Currently, two options are available to GPs to broaden their LP base: general solicitation and broker intermediation. Section 2 of the paper provides the institutional details about these methods. The main trade-offs facing the issuers in the fundraising method choice are as follows. A general solicitation marketing campaign is inexpensive but requires additional administrative work, as GS issuers are required to verify investor accreditation status under Reg D Rule 506(c). In contrast, brokers require costly financial compensation but no additional administrative burden on the issuers' end. Due to the cost differences, I hypothesize that different reasons lead to using GS and brokers. The empirical results show that VC funds are more likely to use GS if they are located outside major VC hubs, have a smaller team of GPs, have a higher percentage of female GPs, and have less experience. On the other hand, brokers are typically commissioned to raise larger funds that focus on late-stage investments, often by well-established VCs. Both GS and brokered funds are more likely to have a larger number of LPs, but only GS funds have a lower minimum investment requirement. A subset of funds with sufficient parent firm investment history show that worse past firm performance increases the likelihood of choosing to use GS in raising new funds, while better past firm performance increases the likelihood of using brokers.

We then investigate the association between the fundraising method and investment performance using three estimation strategies. On average, GS funds have worse performance than non-GS funds: GS funds have lower exit rates on the fund level, have lower probability of survival between investment rounds, and have slower exits. Brokered funds perform similarly to non-brokered funds. Lastly, we examine the staging strategy and geographic reach of the VC funds to explore the channels of the investment performance differential. Brokered funds have shorter duration between successive investment rounds, which indicates that they monitor portfolio companies through more frequent evaluation. GS funds tend to invest in portfolio companies closer to the fund location, especially within a short drive. GS funds' underperformance is possibly due to their limited access to good investment opportunities, as they are more likely located outside of main VC hubs and have limited geographic reach.

6.2 Policy Discussion

The policy relevance of the study is two-fold. First, it evaluates the recent policy change concerning general solicitation in the context of private investment funds. Second, it provides valuable inputs for future legislatures that are under consideration, such as the ongoing SEC proposals about broker registration rules and the JOBS Act 4.0. In this policy discussion, I focus on investor protection and facilitation of capital formation, two of the SEC's mandates.

Venture capital investment funds are private investment funds, typically issued under Reg D in the US. Therefore, VC fund issuance is subject to the same regulations as private business security issuance. In recent years, improving private capital formation and small investor access to such investment opportunities has been on the lawmakers' agenda. However, private investment funds are often not the focus of policy discussions, despite accounting for the vast majority of the capital raised under Reg D (see Figure 1).

This is the first study on the effects of Title II of the JOBS Act from the perspective of private investment funds. Title II of the JOBS Act lifts an 80-year ban on general solicitation, which was originally put in place to protect investors. The JOBS Act is implemented to facilitate capital formation. Results from this study show that GS has a positive impact on capital formation in VC fundraising. GS funds are likely located outside of the conventional VC hubs and tend to invest locally, indirectly contributing to the capital formation of small businesses. The ability to openly advertise also encourages emerging, and female venture capitalists, which helps diversify the VC industry and direct funding to under-served entrepreneur demographics.[33] Is investor protection compromised? Possibly, but the underperformance of GS funds found in this study does not provide direct evidence of fraud or mismanagement by the GPs. The performance differential is potentially driven by portfolio company characteristics unobserved in this study. Nevertheless, GS funds are typically marketed to non-institutional limited partners, who are less experienced in the private markets and thus more susceptible in the event of fraud. Regulators may consider producing investor education materials about GS private investment funds to strengthen investor protection in such transactions.

[33] For example, women venture capitalists are twice as likely to invest in female founders according to a 2021 Harvard Business Review article.

This is also the first study of broker activities in the VC fund formation market. Brokers are subject to regulations by the Exchange Act and have high compliance costs. The compliance cost does not increase proportionally with the broker size; therefore, it is particularly burdensome for smaller brokers who are more likely to assist smaller issuers. In 2020, the SEC proposed to ease some of the requirements if the investors are accredited so as to facilitate capital formation for issuers that lack "established, robust capital raising networks." The proposal's final ruling currently stands pending. This study shows that brokers' role in VC fundraising is primarily to reduce search costs, rather than screening issuer qualities.[34] If the proposal takes effect, there likely will be an increasing number of small and informal intermediaries, which are more accessible to smaller VC fund issuers. The proposed rules also shift the responsibility of investor accreditation verification to the intermediaries. As such, an emerging VC manager may choose between GS and brokers based on whether they are willing to bear a higher administrative cost or compensate brokers financially. This study does not find potential adverse side effects of the proposed rule in the VC fund formation market.

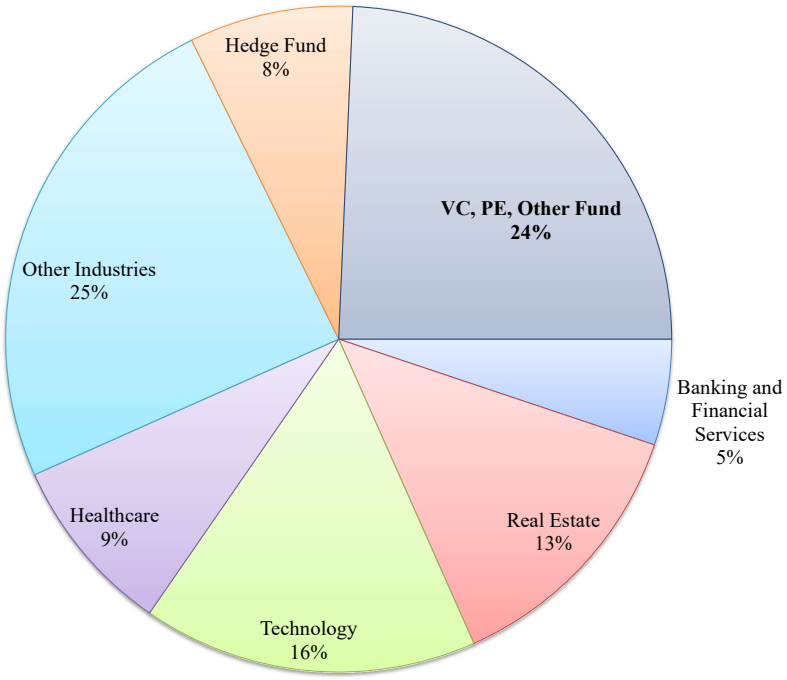
[34]The fundraising method propensity models and ex-post fund performance comparison show that brokered and non-brokered funds have similar qualities, but brokered funds tend to have larger fundraising target and therefore face higher search costs.

Figure 1: Reg D Offering Count and Amount Raised 2010-2021

Figure 1 displays the percentage distribution of Reg D offering count and amount raised, by the industry, in 2010-2021. Statistics are based on author calculation using 2010-2021 Form D filings. Each Form D filing is considered one "new" offering. Amount raised includes incremental sales reported on Form D/As (amendments), where the increments are computed as the difference between the amendment and the previous filing of the same offering.

Typically, VC funds are issued as Reg D offerings and the fund issuers self-identify as private equity, venture capital, or other investment funds in Form D. In 2010-2021, issuers within these industry groups constitute 24% of new offerings and 54% of the amounts raised by all Reg D offerings.

(a) New Reg D Offering by Industry Group, 2010-2021



(b) Reg D Offering Amount Raised by Industry Group, 2010-2021

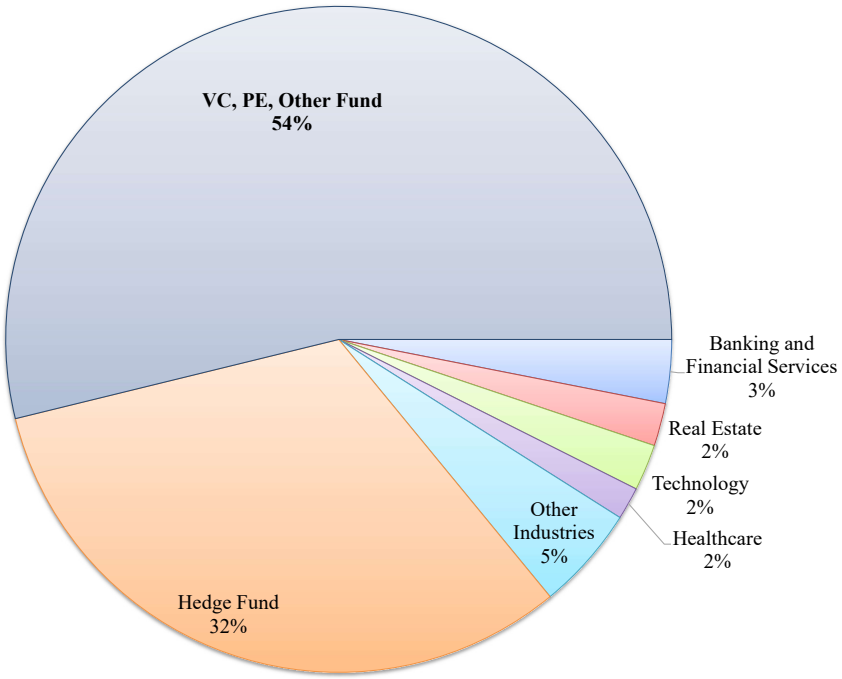


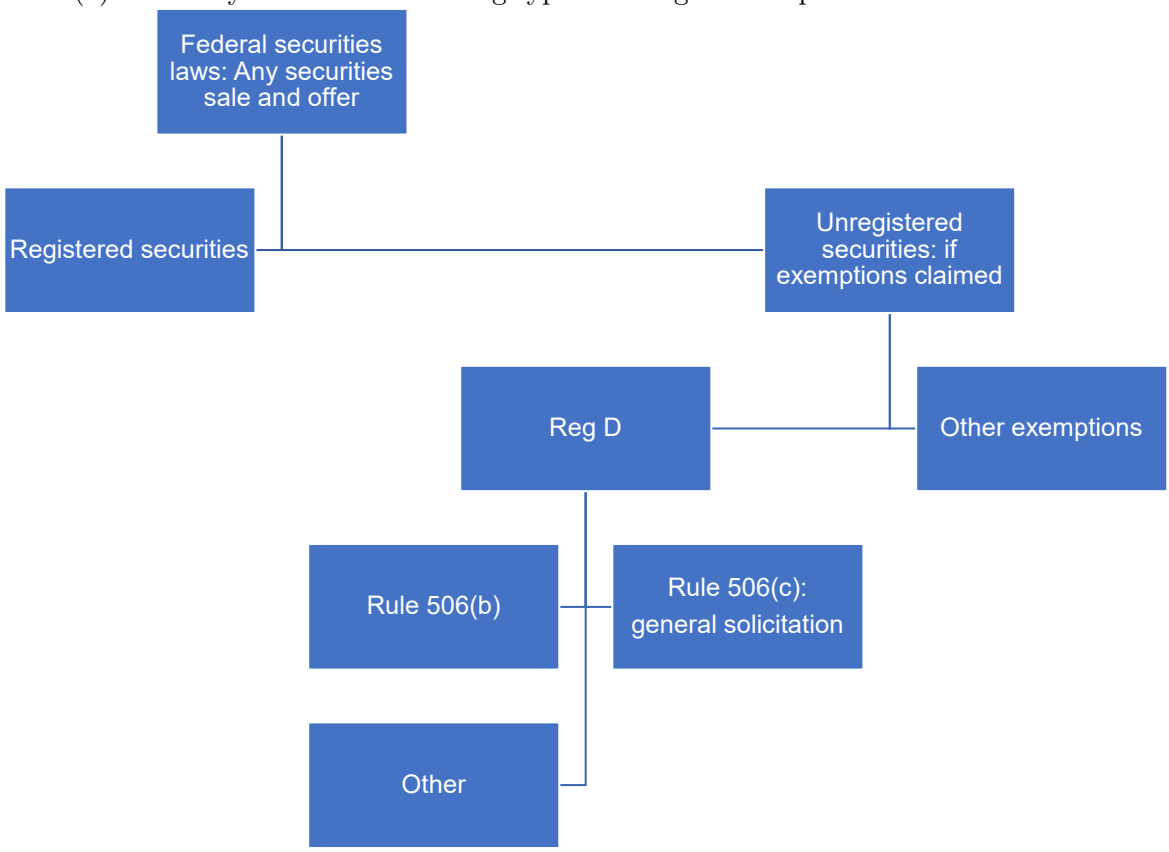
Figure 2: Securities Offering Regulations

Figure 2 illustrates (a) the relationship among securities offering types and registration exemptions, (b) the regulatory change timeline, as detailed by Section 2.

The Securities Act of 1933 requires that any offer or sale of a security must either be registered with the SEC or satisfy an exemption to remain unregistered. Regulation D offering represents a sizable segment of the unregistered securities market Bauguess et al. (2018).

Regulation D was first adopted in 1982, but the electronic filing of Form D did not become mandatory until March 2009. After the enactment of Title II of the JOBS Act in September 2013, issuers who claim Rule 506 exemption must choose either Rule 506(b) or 506(c). Rule 506(c) allows general solicitation. Rule 504 is another article of exemption in Reg D; it only accounts for less than 3% of the Reg D offerings and reported amounts raised.

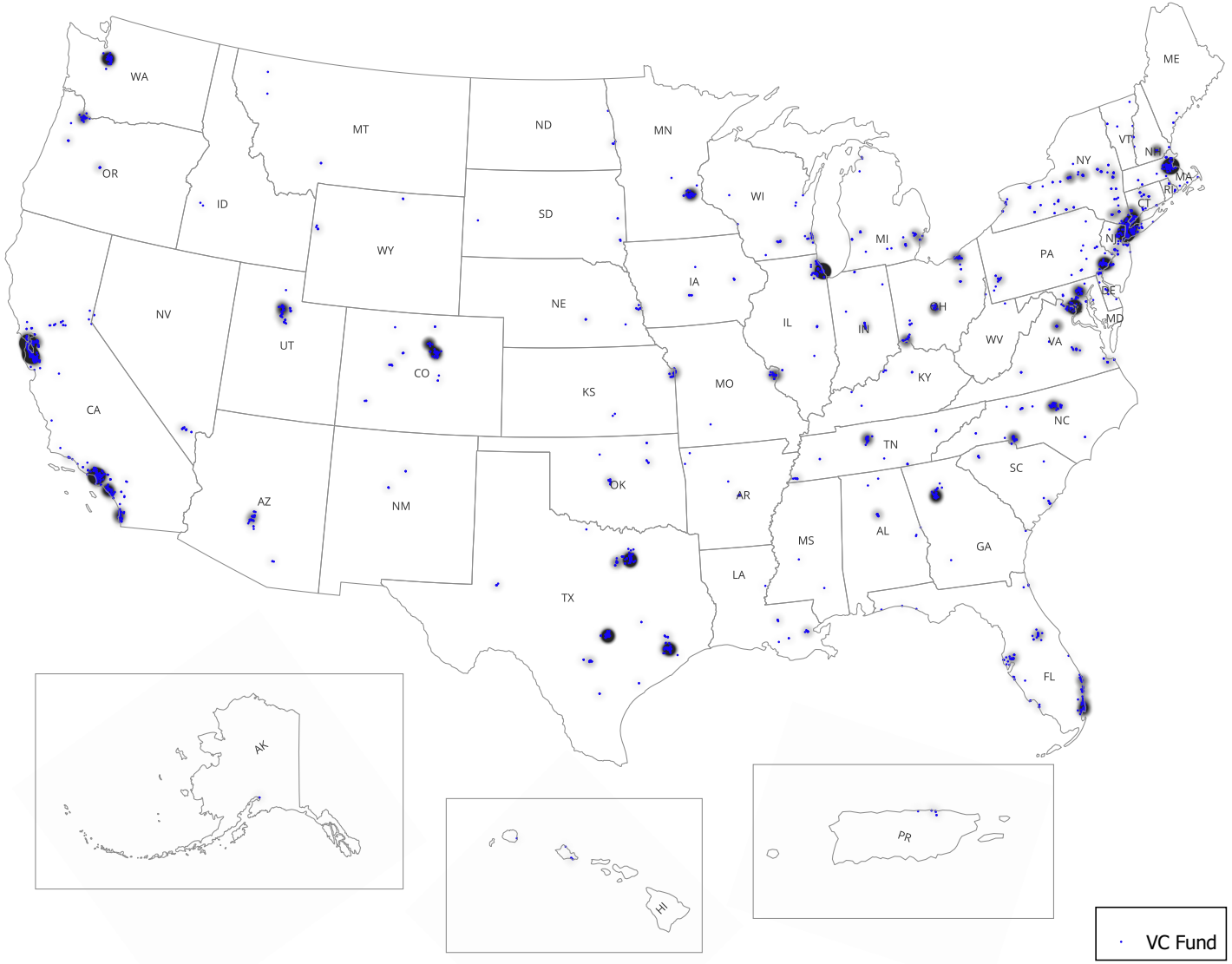
(a) Hierarchy of securities offering types and regulations post Title II of the JOBS Act



(b) Timeline of regulatory changes related to Reg D offerings

Figure 3: Geographic Distributions of VC Funds, 2014-2021

Figure 3 shows the geographic distribution of VC funds in the sample. Each blue dot represents one fund. The greyscale shadow indicates the density of funds, where a darker and larger shadow corresponds to a higher density and a larger number of funds.



Alaska, Hawaii, and Puerto Rico maps are not to scale.

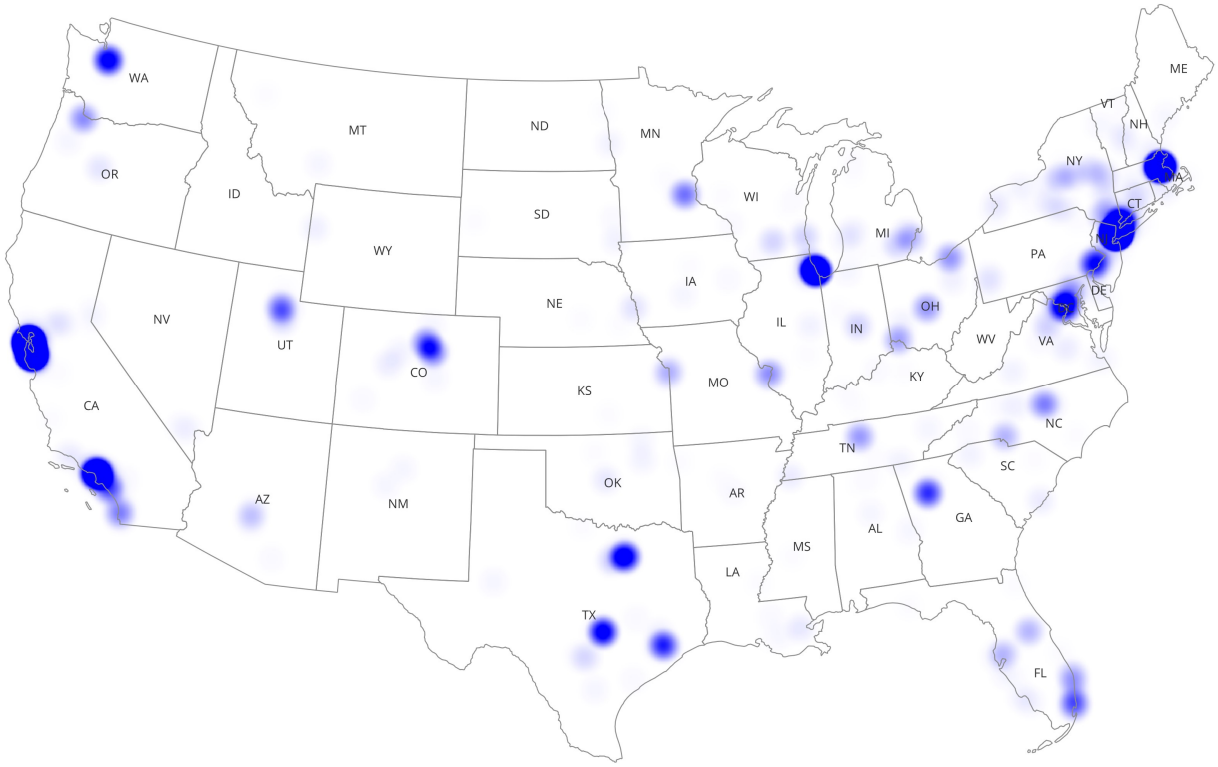
Figure 4: Geographic Distributions Heat Map of VC Funds by Fundraising Methods

Continental U.S., 2014-2021

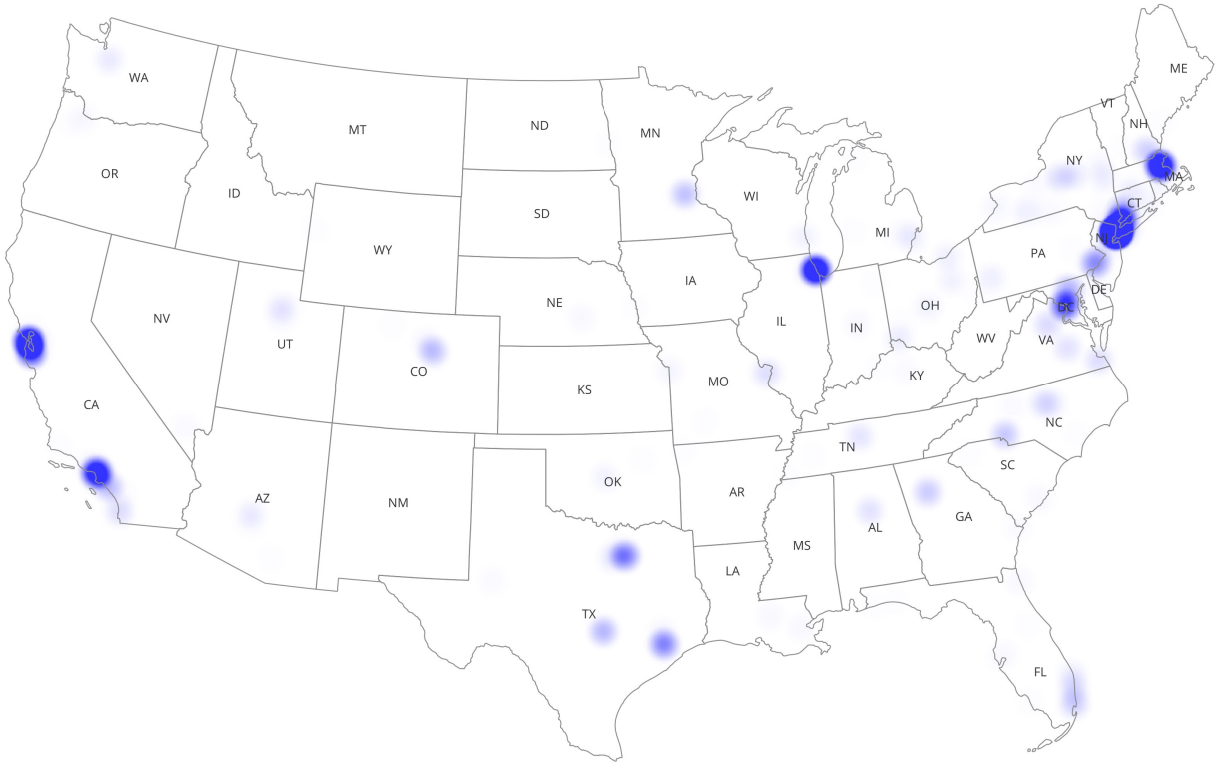
Figure 4 shows heat maps of fund distribution by fundraising method. The blue shadow gradient indicates the density of funds, where a darker and larger shadow corresponds to a higher density and a larger number of funds.

Compared to the funds that use neither GS nor broker (Figure 4a) and the brokered funds (Figure 4b), GS funds are less concentrated around VC hubs (Figure 4c).

(a) Funds Using Neither Method



(b) Funds Using Brokers



(c) Funds Using General Solicitation

Figure 5: Fund Counts by Year and Fundraising Method

The fund sample used in this study consists of 8,479 funds managed by 3,939 firms, with fund years from 2014 to 2021. In the sample, 643 funds (8%) have raised capital using general solicitation under Rule 506(c), and 2186 funds (26%) have utilized brokers or finders. This column chart shows the number of funds by fund vintage year and fundraising method. Percentages in the data labels are calculated as the proportion of the yearly fund sample size. In each column, the fundraising methods from the bottom to the top are: used neither broker nor GS, only used broker, only used GS, and used both broker and GS.

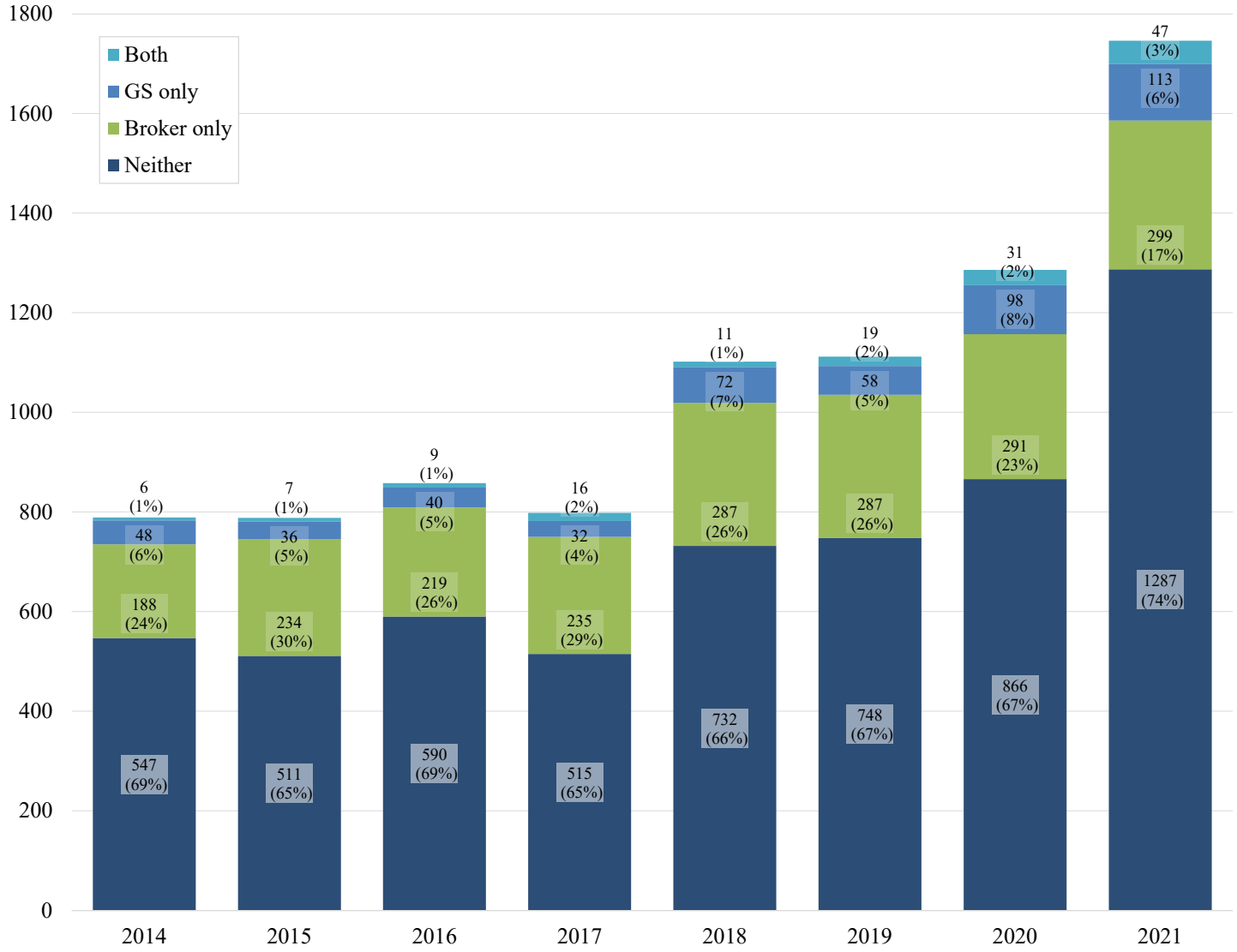
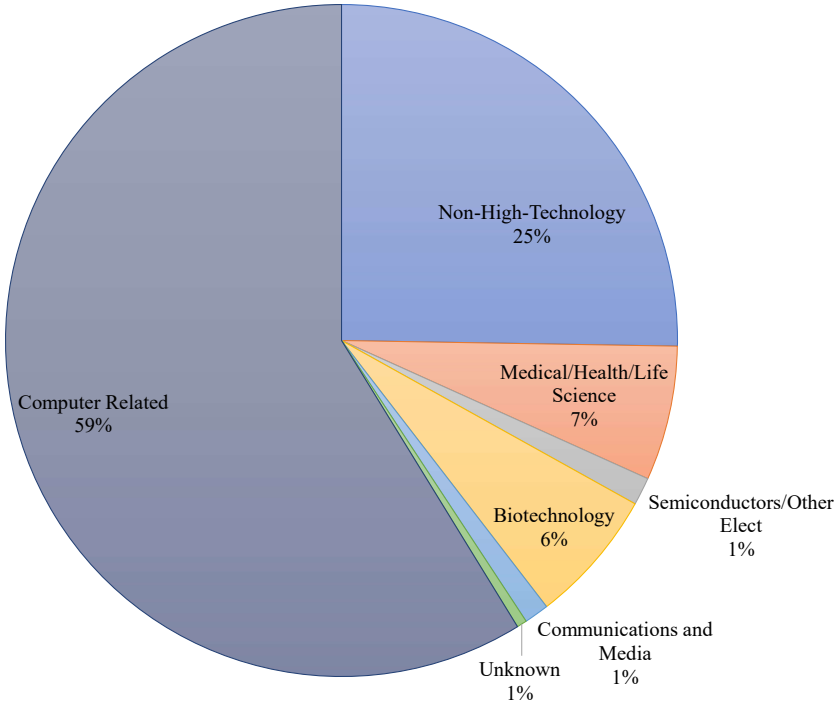


Figure 6: Fund Investment Industry Focus by Fundraising Methods

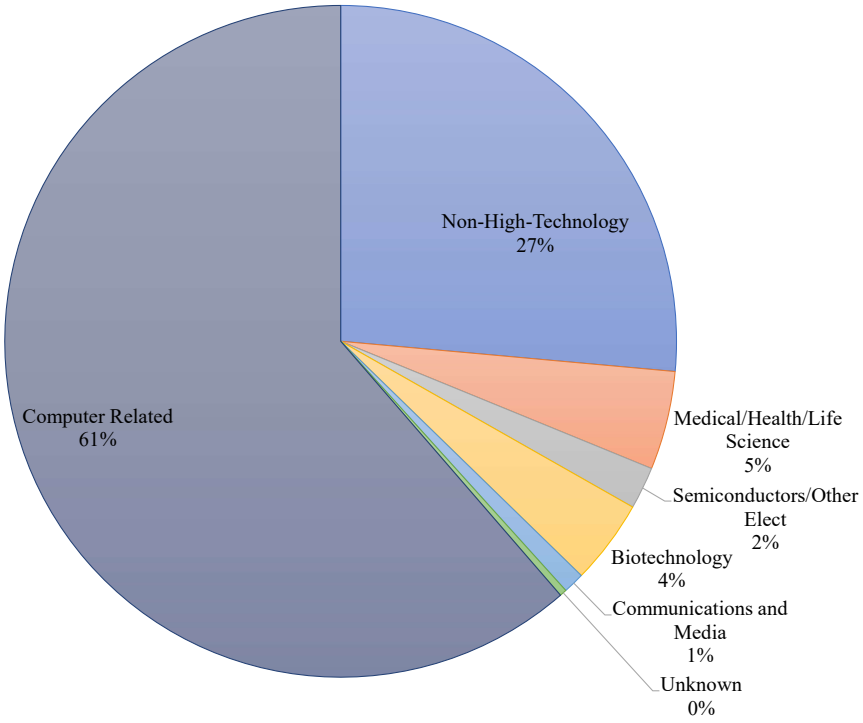
Figure 6 shows the industry focus by fundraising methods. The fund industry focus follows Refinitiv's six major industry groups (VEIC): computer-related, non-high-technology, semiconductors/other electronics, communications and media, medical/health/life science, and biotechnology. The categorical variable is constructed based on VentureXpert's fund industry focus variable and, when unavailable, based on the investee industry that obtains the highest percentage of the fund's investment.

Computer-related and non-high-tech industries are the most common industry focus. The distribution of the overall sample (Figure 6a) and the GS funds (Figure 6b) sample are very similar. Among all sample funds, 59% of funds focus on computer-related companies and 25% focus on non-high-tech industries. A lower percentage of brokered funds focus on computer-related companies (42%), while a higher percentage of brokered funds focus on non-high-technology companies (42%) (Figure 6c).

(a) All Sample Funds



(b) Funds Using General Solicitation



(c) Funds Using Brokers

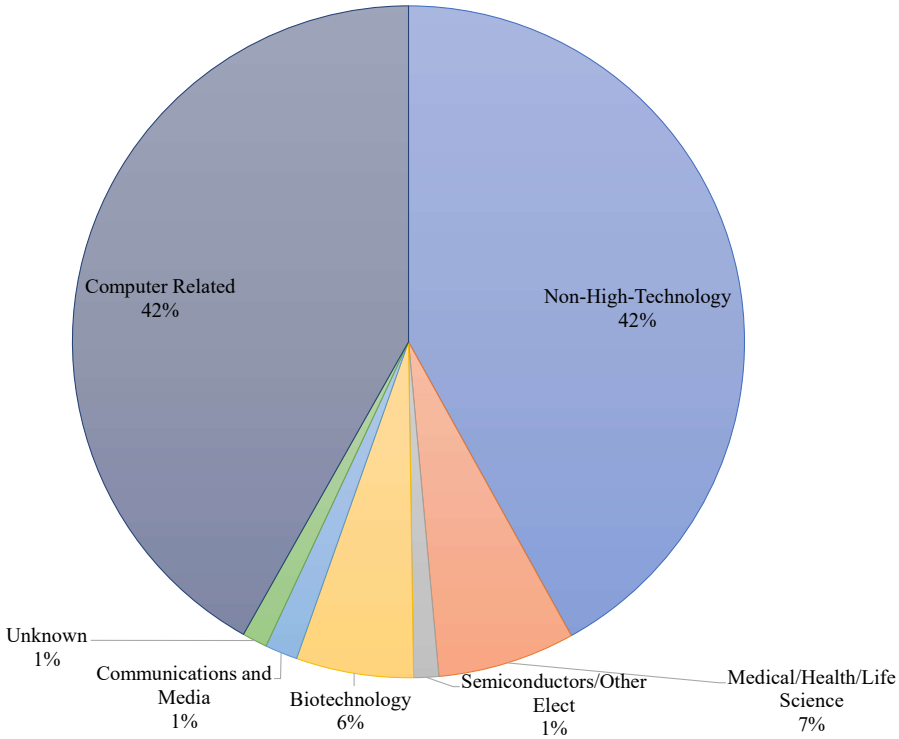
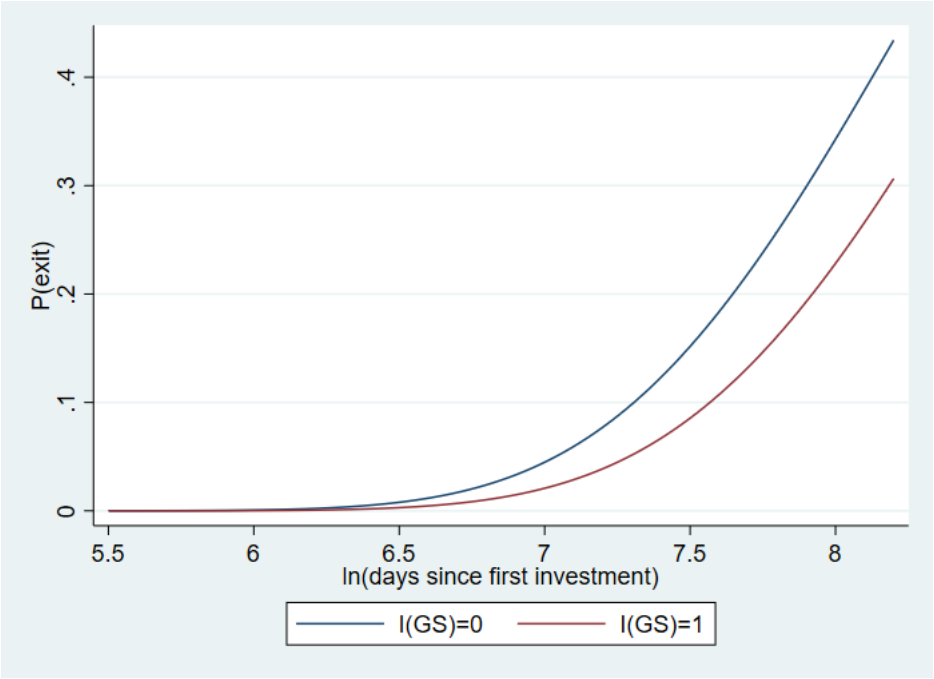


Figure 7: Predicted Exit Function of the Accelerated-Fail-Time Exit Duration Model

Figure 7 displays the predicted exit probability over time, computed at the means of the covariates. The time range in ln(days) is equivalent to from 8 months to 10 years since the first investment round.

(a) GS vs. Non-GS Funds



(b) Brokered vs. Non-Brokered Funds

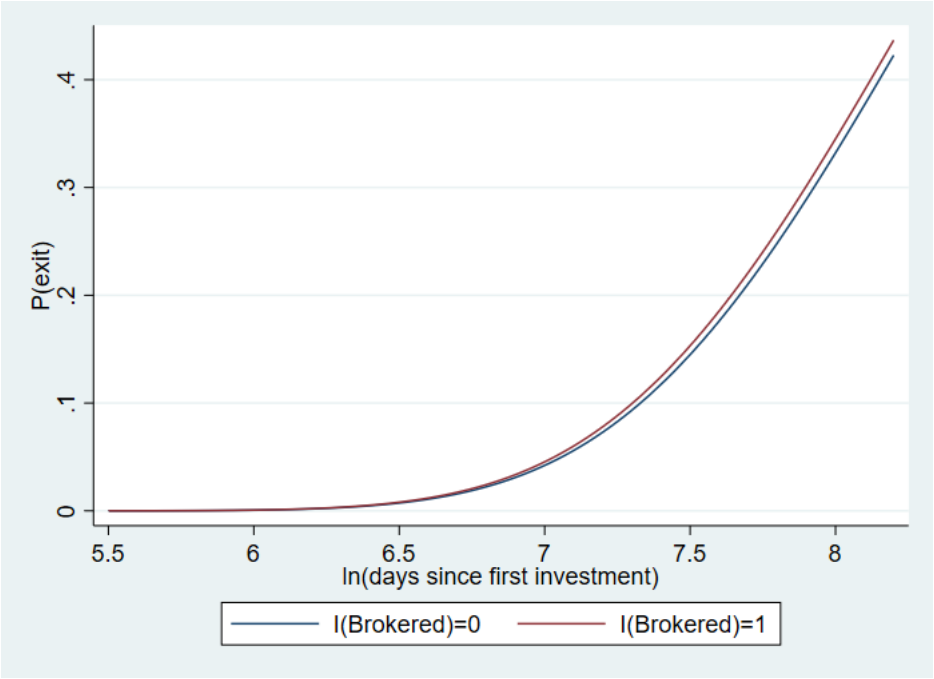


Table 1: Fund Level Descriptive Statistics

Table 1 presents the summary statistics of the fund sample, which consists of 8,479 US funds with fund year from 2014 to 2021. I(variable) indicates binary variable that equals either 0 or 1; the summary statistics of binary variables represent proportions and omit the percentage sign. Firm characteristics are merged to fund-level variables by fund year with a one year lag.

variable	count	% n/a	mean	stdev	min	p25	median	p75	max
Panel A: Fund Characteristics									
I(GS)	8479	0%	8	26	0	0	0	0	100
I(Brokered)	8479	0%	26	44	0	0	0	100	100
I(CA_NY)	8479	0%	50	50	0	0	100	100	100
I(early/seed fund)	8479	0%	31	46	0	0	0	100	100
I(GP reported)	8479	0%	92	28	0	100	100	100	100
GP female pct.	7772	8%	11	23	0	0	0	14	100
GP count	7772	8%	3	4	1	1	2	4	99
Panel B: Firm Characteristics									
firm age	8479	0%	13	14	0	2	8	19	146
I(first fund)	8479	0%	29	45	0	0	0	100	100
firm invested amount $M	8479	0%	232	871	0	0	0	64	15025
eigenvector pctl	8479	0%	28	38	0	0	0	66	100
Panel C: Offering Characteristics									
I(indefinite fund size target)	8479	0%	33	47	0	0	0	100	100
finite size target $M	5653	33%	400	1220	0	25	100	300	24714
fund size $M	8479	0%	388	1334	0	1	38	250	24559
I(min accepted reported)	8479	0%	29	46	0	0	0	100	100
min accepted amt. $M	2490	71%	1	7	0	0	0	0	230
LP count	8479	0%	38	88	0	0	13	47	2492
I(>1 year)	8479	0%	31	46	0	0	0	100	100
Panel D: Firm Past Exit Ratios									
all exits recent 5 years	2994	65%	42	29	0	20	43	60	100
all exits historical	3478	59%	46	27	0	29	50	63	100
IPO recent 5 years	2994	65%	11	18	0	0	0	15	100
IPO historical	3478	59%	12	16	0	0	6	20	100
M&A recent 5 years	2994	65%	31	26	0	10	31	44	100
M&A historical	3478	59%	34	23	0	20	35	45	100
Panel E: Fund Exit Ratios									
fund total exit rate	1830	78%	15	27	0	0	0	20	100
fund IPO exit rate	1830	78%	6	19	0	0	0	0	100
fund M&A exit rate	1830	78%	9	21	0	0	0	8	100
fund total dollar exit rate	1753	79%	17	30	0	0	0	21	100
fund IPO dollar exit rate	1753	79%	7	21	0	0	0	0	100
fund M&A dolalr exit rate	1753	79%	9	23	0	0	0	4	100

Table 2: Fund Level Mean Comparison by General Solicitation Status

Table 2 presents the t-test results between GS funds and non-GS funds. I(variable) indicates binary variable that equals either 0 or 1; the summary statistics of binary variables represent proportions and omit the percentage sign. Firm characteristics are merged to fund-level variables by fund year with a one year lag.

	506(b)		506(c)		506(b)-506(c)		
variable	n	mean	n	mean	t stat	p-value	diff
Panel A: Fund Characteristics							
I(Brokered)	7836	26	643	23	1.85	0.06	3.33
I(CA_NY)	7836	51	643	38	6.52	0.00	13.34
I(early/seed fund)	7836	31	643	37	-3.10	0.00	-5.90
I(GP reported)	7836	92	643	91	0.35	0.72	0.40
GP female pct.	7185	11	587	14	-3.05	0.00	-2.98
GP count	7185	3	587	3	2.54	0.01	0.43
Panel B: Firm Characteristics							
firm age	7836	13	643	8	7.91	0.00	4.63
I(first fund)	7836	28	643	39	-5.98	0.00	-11.10
firm invested amount $M	7836	224	643	327	-2.89	0.00	-103.18
eigenvector pctl	7836	28	643	26	1.01	0.31	1.56
Panel C: Offering Characteristics							
I(indefinite fund size target)	7836	33	643	35	-1.10	0.27	-2.14
finite size target $M	5237	413	416	235	2.87	0.00	178.17
fund size $M	7836	406	643	160	4.52	0.00	246.83
I(min accepted reported)	7836	27	643	59	-17.43	0.00	-32.00
min accepted amt. $M	2111	1	379	1	1.93	0.05	0.72
LP count	7836	37	643	45	-2.09	0.04	-7.55
I(>1 year)	7836	30	643	39	-4.36	0.00	-8.28
Panel D: Firm Past Exit Ratios							
all exits recent 5 years	2809	43	185	24	8.61	0.00	18.91
all exits historical	3285	47	193	28	9.49	0.00	18.62
IPO recent 5 years	2809	11	185	9	1.60	0.11	2.20
IPO historical	3285	12	193	9	2.43	0.02	2.95
M&A recent 5 years	2809	32	185	16	8.49	0.00	16.71
M&A historical	3285	35	193	19	9.35	0.00	15.68
Panel E: Fund Exit Ratios							
fund total exit rate	1681	16	149	7	3.68	0.00	8.49
fund IPO exit rate	1681	6	149	2	2.45	0.01	3.88
fund M&A exit rate	1681	9	149	5	2.64	0.01	4.61
fund total dollar exit rate	1609	18	144	8	3.57	0.00	9.32
fund IPO dollar exit rate	1609	8	144	3	2.39	0.02	4.42
fund M&A dolalr exit rate	1609	10	144	5	2.50	0.01	4.90

Table 3: Fund Level Mean Comparison by Broker Status

Table 3 presents the t-test results between brokered funds and non-brokered funds. I(variable) indicates binary variable that equals either 0 or 1; the summary statistics of binary variables represent proportions and omit the percentage sign. Firm characteristics are merged to fund-level variables by fund year with a one year lag.

	No Broker		Used Broker		No Broker - Used Broker		
variable	n	mean	n	mean	t stat	p-value	diff
Panel A: Fund Characteristics							
I(GS)	6293	8	2186	7	1.85	0.06	1.22
I(CA_NY)	6293	52	2186	47	3.40	0.00	4.22
I(early/seed fund)	6293	38	2186	11	25.16	0.00	27.93
I(GP reported)	6293	91	2186	95	-6.42	0.00	-4.39
GP female pct.	5697	12	2075	9	4.68	0.00	2.72
GP count	5697	3	2075	5	-16.50	0.00	-1.66
Panel B: Firm Characteristics							
firm age	6293	11	2186	17	-17.73	0.00	-6.19
I(first fund)	6293	33	2186	18	12.90	0.00	14.39
firm invested amount $M	6293	226	2186	249	-1.09	0.28	-23.59
eigenvector pctl	6293	29	2186	24	5.47	0.00	5.11
Panel C: Offering Characteristics							
I(indefinite fund size target)	6293	31	2186	40	-7.95	0.00	-9.27
finite size target $M	4346	244	1307	917	-17.95	0.00	-672.16
fund size $M	6293	215	2186	884	-20.70	0.00	-668.92
I(min accepted reported)	6293	30	2186	26	3.87	0.00	4.37
min accepted amt. $M	1919	1	571	2	-2.67	0.01	-0.85
LP count	6293	29	2186	63	-15.83	0.00	-34.03
I(>1 year)	6293	27	2186	43	-14.42	0.00	-16.37
Panel D: Firm Past Exit Ratios							
all exits recent 5 years	2212	41	782	47	-5.21	0.00	-6.32
all exits historical	2463	44	1015	51	-7.01	0.00	-6.97
IPO recent 5 years	2212	9	782	15	-6.74	0.00	-5.04
IPO historical	2463	11	1015	15	-6.61	0.00	-4.01
M&A recent 5 years	2212	31	782	32	-1.17	0.24	-1.27
M&A historical	2463	33	1015	36	-3.47	0.00	-2.96
Panel E: Fund Exit Ratios							
fund total exit rate	1556	14	274	22	-4.51	0.00	-7.96
fund IPO exit rate	1556	5	274	10	-4.42	0.00	-5.36
fund M&A exit rate	1556	9	274	11	-1.94	0.05	-2.61
fund total dollar exit rate	1496	15	257	24	-4.38	0.00	-8.86
fund IPO dollar exit rate	1496	7	257	12	-3.99	0.00	-5.70
fund M&A dolalr exit rate	1496	9	257	12	-2.08	0.04	-3.16

Table 4: Fund Level Mean Comparison by Fund General Partner Gender Composition

Table 4 summarize the fund-level sample mean by GP gender composition: all female GP team, all male GP team, vs. mixed gender GP team, which are categorized based on the "GP female pct." variable. It also includes the t-test results between the all male and all female GP teams. I(variable) indicates binary variable that equals either 0 or 1; the summary statistics of binary variables represent proportions and omit the percentage sign. Firm characteristics are merged to fund-level variables by fund year with a one year lag.

variable	all female mean	all male mean	mixed mean	all male - all female diff	t stat	p-value
Panel A: Fund Characteristics						
I(GS)	15.02	7.63	6.76	-7.39	-4.41	0.00
I(Brokered)	10.99	25.57	27.66	14.58	5.45	0.00
I(CA_NY)	64.84	50.76	48.35	-14.07	-4.55	0.00
I(early/seed fund)	51.65	31.73	28.28	-19.92	-6.87	0.00
GP count	1.34	2.55	5.82	1.20	10.75	0.00
Panel B: Firm Characteristics						
firm age	6.50	10.93	16.87	4.44	5.65	0.00
I(first fund)	50.55	31.15	22.39	-19.40	-6.73	0.00
firm invested amount $M	23.99	168.76	377.86	144.77	3.68	0.00
eigenvector pctl	20.54	25.63	33.17	5.10	2.25	0.02
Panel C: Offering Characteristics						
I(indefinite fund size target)	34.43	29.29	41.22	-5.14	-1.82	0.07
finite size target $M	85.63	332.58	594.81	246.96	3.46	0.00
fund size $M	89.45	327.87	535.75	238.42	3.39	0.00
I(min accepted reported)	22.71	31.22	26.35	8.51	2.97	0.00
min accepted amt. $M	1.03	0.98	1.56	-0.05	-0.06	0.95
LP count	34.33	36.19	41.09	1.86	0.36	0.72
I(>1 year)	23.08	30.19	33.62	7.12	2.51	0.01
Panel D: Firm Past Exit Ratios						
all exits recent 5 years	28.89	41.30	44.23	12.41	2.87	0.00
all exits historical	31.24	44.70	47.84	13.46	3.46	0.00
IPO recent 5 years	8.80	9.86	12.35	1.06	0.41	0.68
IPO historical	8.43	10.96	13.08	2.52	1.07	0.28
M&A recent 5 years	20.09	31.44	31.89	11.35	2.86	0.00
M&A historical	22.81	33.75	34.76	10.94	3.21	0.00
Panel E: Fund Exit Ratios						
fund total exit rate	7.35	15.22	15.21	7.87	2.52	0.01
fund IPO exit rate	2.88	6.28	5.46	3.39	1.53	0.13
fund M&A exit rate	4.46	8.94	9.74	4.48	1.93	0.05
fund total dollar exit rate	8.87	17.09	17.33	8.22	2.37	0.02
fund IPO dollar exit rate	3.58	7.75	7.06	4.17	1.65	0.10
fund M&A dollar exit rate	5.29	9.34	10.28	4.05	1.60	0.11
no. of observations	273	5455	2751			

Table 5: Propensity of Fundraising Method Choice

This table presents the probit maximum likelihood coefficient estimates of the fundraising method propensity model (Equation 1). The unit of observation is one sample fund and the sample consists of 8,479 funds issued between 2014 and 2021. The dependent variables are indicator variables that equal one if the fund uses the said fundraising method, and zero otherwise. The base group is funds that do not use GS or brokers. In Column (1), the dependent variable is equal to one if a fund uses either general solicitation or brokers. In Column (2), the dependent variable is equal to one if a fund uses general solicitation; Column (2) excludes funds that only use brokers. In Column (3), the dependent variable is equal to one if a fund uses brokers; Column (2) excludes funds that only use general solicitation.

	(1) I(GS or Brokered)	(2) I(GS)	(3) I(Brokered)
Fund Characteristics			
I(CA_NY)	-0.0690	-0.227**	-0.0308
	(-1.06)	(-2.24)	(-0.47)
I(early/seed fund)	-0.245***	-0.0543	-0.334***
	(-4.22)	(-0.72)	(-5.39)
GP female pct.	-0.0229	0.322**	-0.251**
	(-0.18)	(2.08)	(-2.00)
GP count	0.0180	-0.129***	0.0462
	(0.58)	(-2.82)	(1.43)
GP count sq	-0.0000179	0.00874**	-0.00185
	(-0.01)	(2.57)	(-0.87)
Firm Characteristics			
ln(firm age)	-0.0136	-0.124***	0.0462*
	(-0.54)	(-3.31)	(1.66)
ln(firm invested amt $M)	0.0122	-0.0650	0.00524
	(0.55)	(-1.41)	(0.24)
eigenvector pctl	-0.210	-1.944***	0.197
	(-0.62)	(-3.00)	(0.53)
eigenvector pctl sq	0.289	3.049***	-0.184
	(0.70)	(4.31)	(-0.37)
Offering Characteristics			
ln(min accepted amt. $M)	-0.188**	-0.458***	-0.0947
	(-1.97)	(-3.05)	(-0.97)
LP count(000s)	2.923***	2.374***	2.974***
	(6.10)	(3.10)	(5.88)
I(>1 year)	0.274***	0.312***	0.266***
	(4.92)	(3.29)	(5.03)
I(indefinite size target)	0.122*	0.104	0.188**
	(1.83)	(1.01)	(2.23)
ln(finite size target $M)	0.141***	0.0141	0.217***
	(7.99)	(0.55)	(9.27)
Observations	8479	6439	7982
Pseudo R^2	0.121	0.130	0.186
Fund Year FE	Yes	Yes	Yes
Fund Type FE	Yes	Yes	Yes

t statistics in parentheses

Standard errors are clustered at the firm level

Omitted: constant, controls

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Endogeneity Check of Fundraising Method Choice

This table presents the probit maximum likelihood coefficient estimates of an alternate fundraising method propensity model (Equation 1), where the alternative fundraising method is included as an independent variable. The unit of observation is one sample fund and the sample consists of 8,479 funds issued between 2014 and 2021. In Column (1), the dependent variable is equal to one if a fund uses general solicitation. In Column (2), the dependent variable is equal to one if a fund uses brokers. This model examines if the fundraising methods are endogenous, in other words, whether using one method is related to the propensity of using the other method.

	(1) I(GS)	(2) I(Brokered)
I(GS)		0.177
		(1.09)
I(Brokered)	0.0613	
	(0.56)	
Fund Characteristics		
I(CA_NY)	-0.233**	-0.00207
	(-2.48)	(-0.03)
I(early/seed fund)	-0.0258	-0.320***
	(-0.34)	(-5.22)
GP female pct.	0.341**	-0.281**
	(2.26)	(-2.27)
GP count	-0.135***	0.0585**
	(-3.23)	(1.97)
GP count sq	0.00844***	-0.00256
	(2.91)	(-1.32)
Firm Characteristics		
ln(firm age)	-0.132***	0.0718***
	(-3.67)	(2.59)
ln(firm invested amt $M)	-0.0708	0.00391
	(-1.60)	(0.18)
eigenvector pctl	-1.994***	0.359
	(-3.09)	(1.01)
eigenvector pctl sq	3.132***	-0.409
	(4.43)	(-0.89)
Offering Characteristics		
ln(min accepted amt. $M)	-0.414***	-0.0519
	(-3.16)	(-0.59)
LP count(000s)	1.221*	2.769***
	(1.80)	(5.74)
I(>1 year)	0.248***	0.232***
	(2.74)	(4.41)
I(indefinite size target)	0.0938	0.181**
	(0.98)	(2.28)
ln(finite size target $M)	-0.0109	0.219***
	(-0.46)	(9.33)
Observations	8479	8479
Pseudo R^2	0.139	0.189
Fund Year FE	Yes	Yes
Fund Type FE	Yes	Yes

t statistics in parentheses
Standard errors are clustered at the firm level
Omitted: constant, controls
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Offering Duration and Size Target in the Fundraising Method Choice

This table presents the probit maximum likelihood coefficient estimates of an extension of the fundraising method propensity model (Equation 1). In addition to the independent variables in the base model (Table 5), the extended model includes the interaction terms between the offering duration (size target) and the amount raised, in order to guide the interpretation of the offering duration and indefinite size target. The unit of observation is one sample fund and the sample consists of 8,479 funds issued between 2014 and 2021. The dependent variables are indicator variables that equal one if the fund uses the said fundraising method, and zero otherwise. The base group is funds that do not use GS or brokers. In Column (1), the dependent variable is equal to one if a fund uses either general solicitation or brokers. In Column (2), the dependent variable is equal to one if a fund uses general solicitation; Column (2) excludes funds that only use brokers. In Column (3), the dependent variable is equal to one if a fund uses brokers; Column (2) excludes funds that only use general solicitation.

	(1) I(GS or Brokered)	(2) I(GS)	(3) I(Brokered)
Fund Characteristics			
I(CA_NY)	-0.0971	-0.236**	-0.0600
	(-1.48)	(-2.31)	(-0.92)
I(early/seed fund)	-0.237***	-0.0484	-0.326***
	(-4.13)	(-0.64)	(-5.35)
GP female pct.	0.00397	0.333**	-0.220*
	(0.03)	(2.15)	(-1.77)
GP count	0.0110	-0.129***	0.0385
	(0.36)	(-2.83)	(1.19)
GP count sq	-0.0000544	0.00853**	-0.00181
	(-0.03)	(2.56)	(-0.87)
Firm Characteristics			
ln(firm age)	-0.0220	-0.126***	0.0377
	(-0.87)	(-3.41)	(1.35)
ln(firm invested amt $M)	-0.000109	-0.0735	-0.00614
	(-0.00)	(-1.61)	(-0.28)
eigenvector pctl	-0.186	-1.860***	0.216
	(-0.55)	(-2.89)	(0.59)
eigenvector pctl sq	0.305	2.989***	-0.167
	(0.74)	(4.24)	(-0.34)
Offering Characteristics			
ln(min accepted amt. $M)	-0.199**	-0.456***	-0.110
	(-2.07)	(-3.00)	(-1.13)
LP count(000s)	2.663***	2.527***	2.610***
	(5.57)	(3.55)	(5.23)
I(>1 year)	0.258***	0.300***	0.290***
	(4.26)	(3.10)	(5.18)
I(>1 year, raised 0)	0.0523	0.244*	-0.145
	(0.47)	(1.86)	(-0.98)
I(>1 year, raised >500$M)	0.0887	-0.383*	-0.00467
	(0.80)	(-1.68)	(-0.04)
ln(finite size target $M)	0.159***	0.0223	0.237***
	(8.64)	(0.85)	(10.02)
I(indefinite)	-0.0214	0.00695	0.0307
	(-0.30)	(0.06)	(0.38)
I(indefinite size target, raised 0)	0.0931	0.146	0.0982
	(0.90)	(1.02)	(0.82)
I(indefinite size target, raised >500$M)	0.643***	0.605***	0.675***
	(6.46)	(3.46)	(6.70)
Observations	8479	6439	7982
Pseudo R^2	0.131	0.135	0.196
Fund Year FE	Yes	Yes	Yes
Fund Type FE	Yes	Yes	Yes

t statistics in parentheses
Standard errors are clustered at the firm level
Omitted: constant, controls
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Propensity of Fundraising Method Choice Conditional on Firm Past Performance

This table presents the probit maximum likelihood coefficient estimates of an extension of the fundraising method propensity model (Equation 1), where the recent-five-year VC firm exit rates are added to the independent variables in the base model (Table 5). The unit of observation is one sample fund. The estimation is based on the subset of funds whose parent firms have sufficient investment history in the five years prior to a fund's vintage year (n=2,994). The dependent variables are indicator variables that equal one if the fund uses the said fundraising method, and zero otherwise. The base group is funds that do not use GS or brokers. In Columns (1)-(3), the dependent variable is equal to one if a fund uses general solicitation; Columns (1)-(3) exclude funds that only use brokers. In Columns (4)-(6), the dependent variable is equal to one if a fund uses brokers; Columns (4)-(6) exclude funds that only use general solicitation.

	(1) I(GS)	(2) I(GS)	(3) I(GS)	(4) I(Broker)	(5) I(Broker)	(6) I(Broker)
Firm Past Performance (Exit Rate)						
all exits recent 5 years	-0.896**			-0.00701		
	(-2.50)			(-0.04)		
IPO recent 5 years		0.362			0.547**	
		(0.94)			(2.03)	
M&A recent 5 years			-1.462***			-0.236
			(-3.23)			(-1.36)
Fund Characteristics						
I(CA_NY)	-0.154	-0.187	-0.124	-0.100	-0.101	-0.0981
	(-0.95)	(-1.06)	(-0.80)	(-0.83)	(-0.83)	(-0.82)
I(early/seed fund)	0.0749	0.111	0.0947	-0.350***	-0.319***	-0.350***
	(0.68)	(1.02)	(0.88)	(-3.89)	(-3.61)	(-3.83)
GP female pct.	0.648**	0.696**	0.637**	-0.111	-0.115	-0.123
	(2.12)	(2.23)	(2.07)	(-0.49)	(-0.51)	(-0.55)
GP count	-0.104	-0.117	-0.106	-0.0210	-0.0198	-0.0206
	(-1.23)	(-1.35)	(-1.27)	(-0.39)	(-0.37)	(-0.39)
GP count sq	0.00304	0.00376	0.00336	0.00188	0.00184	0.00191
	(0.48)	(0.61)	(0.54)	(0.59)	(0.57)	(0.61)
Firm Characteristics						
ln(firm age)	-0.217	-0.227	-0.193	0.0700	0.0726	0.0683
	(-1.31)	(-1.27)	(-1.19)	(0.58)	(0.63)	(0.57)
ln(firm invested amt $M)	0.0724	0.0253	0.0661	-0.00863	-0.0137	-0.00157
	(1.15)	(0.38)	(1.03)	(-0.15)	(-0.25)	(-0.03)
eigenvector pctl	-2.174**	-2.448**	-2.156**	0.141	0.0974	0.140
	(-2.21)	(-2.37)	(-2.14)	(0.27)	(0.18)	(0.26)
eigenvector pctl sq	2.943***	3.214***	2.915***	-0.0478	-0.0702	-0.0731
	(2.79)	(2.84)	(2.66)	(-0.07)	(-0.10)	(-0.11)
Offering Characteristics						
ln(min accepted amt. $M)	-1.008*	-1.051*	-1.025*	-0.0142	-0.0210	0.000804
	(-1.86)	(-1.87)	(-1.94)	(-0.07)	(-0.10)	(0.00)
LP count(000s)	0.362	0.0722	0.510	2.085***	2.030**	2.125***
	(0.25)	(0.05)	(0.36)	(2.67)	(2.53)	(2.73)
I(>1 year)	0.276	0.228	0.283	0.331***	0.316***	0.340***
	(1.16)	(0.91)	(1.19)	(3.95)	(3.73)	(4.00)
I(indefinite size target)	0.456***	0.430***	0.429***	0.408**	0.410**	0.405**
	(3.00)	(2.74)	(2.94)	(2.44)	(2.42)	(2.44)
ln(finite size target $M)	-0.0126	-0.0190	-0.0127	0.204***	0.203***	0.203***
	(-0.22)	(-0.32)	(-0.21)	(4.32)	(4.28)	(4.35)
Observations	2234	2234	2234	2866	2866	2866
Pseudo R^2	0.226	0.209	0.239	0.169	0.172	0.170
Fund Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund Type FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm Industry Focus FE	Yes	Yes	Yes	Yes	Yes	Yes

t statistics in parentheses
Standard errors are clustered at the firm level. Omitted: constant, controls
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Fund-Level Exit Rates and Fundraising Method

This table presents the OLS coefficient estimates of the fund-level investment performance model (Equation 2). The unit of observation is one sample fund. The estimation is based on the subset of funds that have investment records by the end of 2020 (n=1,830). The dependent variables are exit rate measures, namely, fund total exit rate, fund IPO exit rate, fund M&A exit rate, fund total dollar exit rate, fund IPO dollar exit rate, and fund M&A dollar exit rate. All six columns have the same independent variables, which include the fundraising method indicators, fund characteristics, firm characteristics, and fixed effects. The number of observations is smaller than the number of funds with investment records due to fixed effects (Columns 1-6), or due to the lack of investment dollar amount data (Columns 4-6).

	(1) all	(2) IPO	(3) M&A	(4) all $	(5) IPO $	(6) M&A $
I(GS)	-3.765**	-0.778	-2.987***	-3.844**	-0.806	-3.038***
	(-3.69)	(-0.77)	(-4.85)	(-3.22)	(-0.65)	(-6.20)
I(Brokered)	2.392	1.374	1.018	2.594	0.787	1.806
	(1.51)	(1.13)	(0.80)	(1.30)	(0.75)	(1.23)
Fund Characteristics						
ln(fund size $M)	0.712*	0.670**	0.0425	0.854	1.132***	-0.278
	(2.27)	(2.92)	(0.28)	(1.94)	(4.61)	(-1.20)
I(early/seed fund)	-4.373*	-2.886	-1.487	-3.649*	-2.219	-1.430
	(-1.95)	(-1.64)	(-1.05)	(-2.41)	(-1.37)	(-1.15)
GP female pct.	-4.831***	-2.901	-1.930	-5.074**	-3.374*	-1.700
	(-6.96)	(-1.81)	(-1.83)	(-2.86)	(-2.07)	(-1.95)
GP count	-0.157	-0.469	0.312	-0.406	-0.775	0.369
	(-0.29)	(-0.98)	(0.82)	(-0.38)	(-1.02)	(0.73)
GP count sq	0.0265	0.0448	-0.0183	0.0557	0.0639	-0.00812
	(0.37)	(0.73)	(-0.54)	(0.43)	(0.71)	(-0.14)
Firm Characteristics						
ln(firm age)	-1.189	-1.657**	0.468	-1.663	-2.284**	0.621
	(-1.02)	(-3.47)	(0.50)	(-1.08)	(-3.61)	(0.53)
ln(firm invested amt $M)	1.397**	1.230	0.167	2.056***	1.577*	0.478
	(2.96)	(1.79)	(0.45)	(4.04)	(2.02)	(1.11)
eigenvector pctl	2.392	6.443**	-4.051	5.137	6.918**	-1.781
	(0.75)	(2.90)	(-1.11)	(1.29)	(3.19)	(-0.51)
eigenvector pctl sq	-2.788	-4.793	2.005	-7.147	-5.681	-1.466
	(-0.58)	(-1.52)	(0.42)	(-1.50)	(-1.37)	(-0.36)
Observations	1824	1824	1824	1746	1746	1746
Adjusted R^2	0.157	0.230	0.063	0.155	0.216	0.051
Fund Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund State FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund Industry Focus FE	Yes	Yes	Yes	Yes	Yes	Yes

t statistics in parentheses

Standard errors are double clustered at the firm investor and fund focus industry levels

Omitted: constant, controls

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10: Fund-Level Exit Rates and Fundraising Method Conditional on Firm Past Performance

This table presents the OLS coefficient estimates of an extension of the fund-level investment performance model (Equation 2), where the recent-five-year VC firm IPO exit rate is added as an independent variable. The unit of observation is one sample fund. The estimation sample the subset of funds that have investment records by the end of 2020 and whose parent firms have sufficient investment history in the five years prior to a fund's vintage year (n=843). The dependent variables are exit rate measures, namely, fund total exit rate, fund IPO exit rate, fund M&A exit rate, fund total dollar exit rate, fund IPO dollar exit rate, and fund M&A dollar exit rate. All six columns have the same independent variables, which include the fundraising method indicators, fund characteristics, firm characteristics, and fixed effects. The number of observations is smaller than the number of funds with investment records due to fixed effects (Columns 1-6), or due to the lack of investment dollar amount data (Columns 4-6).

	(1) all	(2) IPO	(3) M&A	(4) all $	(5) IPO $	(6) M&A $
I(GS)	-3.413	-1.684	-1.729	-6.411**	-3.704	-2.707*
	(-1.93)	(-0.75)	(-0.73)	(-2.69)	(-1.58)	(-2.37)
I(Brokered)	-1.513	-0.611	-0.902	-2.164	-0.666	-1.498
	(-0.86)	(-0.30)	(-0.79)	(-1.65)	(-0.58)	(-1.03)
Fund Characteristics						
ln(fund size $M)	0.451	0.763	-0.312	0.764	1.393**	-0.629
	(0.70)	(1.68)	(-1.13)	(1.18)	(3.67)	(-1.94)
I(early/seed fund)	-4.314	-4.225	-0.0894	-3.651	-3.505	-0.146
	(-1.78)	(-1.59)	(-0.06)	(-1.79)	(-1.12)	(-0.08)
GP female pct.	-8.502**	-3.265	-5.237***	-10.40**	-3.955	-6.442***
	(-3.33)	(-1.31)	(-6.60)	(-3.45)	(-1.82)	(-4.18)
GP count	-1.159	-1.794**	0.635	-0.868	-1.762*	0.894
	(-0.89)	(-3.07)	(0.51)	(-0.63)	(-2.02)	(0.73)
GP count sq	0.130*	0.134*	-0.00399	0.108	0.128	-0.0194
	(2.01)	(2.22)	(-0.05)	(1.31)	(1.45)	(-0.26)
Firm Characteristics						
IPO recent 5 years	30.23**	22.65**	7.582***	26.86**	20.18**	6.679**
	(3.53)	(2.83)	(5.21)	(3.46)	(2.83)	(3.55)
ln(firm age)	-3.762	-1.808	-1.955***	-5.365*	-4.055*	-1.310
	(-1.92)	(-0.97)	(-4.73)	(-2.25)	(-2.08)	(-1.91)
ln(firm invested amt $M)	1.827**	0.401	1.426**	2.294**	0.872	1.421**
	(3.07)	(0.98)	(3.33)	(2.78)	(1.89)	(2.68)
eigenvector pctl	12.00	6.551	5.453	10.67	3.655	7.018
	(1.39)	(1.10)	(0.89)	(0.98)	(0.51)	(0.63)
eigenvector pctl sq	-9.958	1.288	-11.25	-8.925	4.869	-13.79
	(-1.38)	(0.23)	(-1.77)	(-0.70)	(0.48)	(-1.21)
Observations	839	839	839	805	805	805
Adjusted R^2	0.233	0.329	0.054	0.221	0.319	0.048
Fund Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund State FE	Yes	Yes	Yes	Yes	Yes	Yes
Fund Industry Focus FE	Yes	Yes	Yes	Yes	Yes	Yes

t statistics in parentheses

Standard errors are double clustered at the firm investor and fund focus industry levels

Omitted: constant, controls

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 11: Round-Level Survival and Fundraising Method

This table presents the probit maximum likelihood coefficient estimates of the round-level survival investment performance model (Equation 3). The unit of observation is one investment round. The round sample includes all investment rounds led by the sample funds (n=8,546). The dependent variable is an indicator that equals one if the portfolio company has received a subsequent round of funding or exited, and zero otherwise. All columns have the same independent variables, which include the fundraising method indicators, a "within industry focus" indicator, fund characteristics, firm characteristics, and fixed effects. The independent variable values follow of the lead investor of each round. Columns (1) includes all investment rounds. Columns (2)-(4) are estimated using subsets of investment rounds based on round sequence. The number of observations are smaller than the round sample size due to fixed effects.

	(1) all	(2) round 1	(3) round 2-3	(4) round 4+
I(GS)	-0.174**	-0.169	-0.116	-0.274**
	(-2.26)	(-1.63)	(-1.09)	(-1.97)
I(Brokered)	0.0874	0.147	0.00702	0.0777
	(1.52)	(1.35)	(0.09)	(0.85)
I(within ind. focus)	0.116**	0.164**	0.0659	0.0127
	(2.37)	(2.36)	(0.86)	(0.13)
Fund Characteristics				
I(CA_NY)	0.0748*	0.0617	-0.00782	0.182**
	(1.77)	(1.03)	(-0.12)	(2.50)
ln(fund size $M)	0.0299***	0.0198	0.0425**	0.0169
	(2.94)	(1.32)	(2.49)	(0.87)
I(early/seed fund)	-0.106**	-0.0132	-0.120*	-0.159**
	(-2.51)	(-0.23)	(-1.90)	(-2.29)
GP female pct.	-0.100	-0.145	0.0802	-0.222
	(-1.29)	(-1.36)	(0.74)	(-1.33)
GP count	0.0155	-0.0170	0.0756	-0.00630
	(0.47)	(-0.40)	(1.55)	(-0.11)
GP count sq	0.000922	0.00349	-0.00550	0.00370
	(0.30)	(0.80)	(-1.34)	(0.70)
Firm Characteristics				
ln(firm age)	-0.0538*	-0.00839	-0.0496	-0.142**
	(-1.69)	(-0.22)	(-1.07)	(-2.54)
ln(firm invested amt)	0.0417**	0.00243	0.0449	0.0724**
	(1.99)	(0.09)	(1.50)	(1.99)
eigenvector pctl	-0.230	-0.684**	0.390	-0.425
	(-1.05)	(-2.15)	(1.10)	(-1.12)
eigenvector pctl sq	0.161	0.749**	-0.508	0.308
	(0.67)	(2.12)	(-1.31)	(0.78)
Observations	8385	3542	2810	2006
Pseudo R^2	0.182	0.179	0.207	0.189
Investment Year FE	Yes	Yes	Yes	Yes
Investee State FE	Yes	Yes	Yes	Yes
Investee Industry FE	Yes	Yes	Yes	Yes

t statistics in parentheses

Standard errors are clustered at the firm investor level

Omitted: constant, controls

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 12: Investee Company Exit Duration and Fundraising Method

This table presents the estimation results of the lognormal accelerated-failure-time model of exit duration (Equation 4). The unit of observation is one investee-lead-investor pair, where the investees include all portfolio companies whose lead investor is a sample fund (n=7,061). The dependent variable is the log exit duration in days. The independent variable includes fundraising method indicators, a "within industry focus" indicator, fund characteristics, firm characteristics, and fixed effects. The number of observations is smaller than the investee-lead-investor pair sample size due to fixed effects.

	(1)	(2)	(3)
I(GS)	0.0353***		0.0349***
	(3.81)		(3.75)
I(Brokered)		-0.00494	-0.00359
		(-0.78)	(-0.57)
I(within ind. focus)	-0.0126**	-0.0133**	-0.0126**
	(-2.06)	(-2.18)	(-2.06)
Fund Characteristics			
I(CA_NY)	-0.00359	-0.00407	-0.00354
	(-0.62)	(-0.71)	(-0.61)
ln(fund size $M)	-0.00217	-0.00186	-0.00199
	(-1.62)	(-1.35)	(-1.45)
I(early/seed fund)	0.0149***	0.0146***	0.0143***
	(3.23)	(3.11)	(3.08)
GP female pct.	0.0367***	0.0358***	0.0363***
	(3.54)	(3.42)	(3.50)
GP count	-0.00458	-0.00434	-0.00429
	(-1.22)	(-1.14)	(-1.12)
GP count sq	0.000190	0.000172	0.000162
	(0.57)	(0.51)	(0.48)
Firm Characteristics			
ln(firm age)	0.00719*	0.00734*	0.00729*
	(1.81)	(1.84)	(1.85)
ln(firm invested amt)	-0.000438	-0.000634	-0.000471
	(-0.17)	(-0.25)	(-0.18)
eigenvector pctl	0.0131	0.0117	0.0136
	(0.48)	(0.43)	(0.50)
eigenvector pctl sq	-0.0260	-0.0264	-0.0270
	(-0.87)	(-0.88)	(-0.90)
/			
lnsigma	-2.270***	-2.269***	-2.270***
	(-63.44)	(-63.30)	(-63.41)
Observations	6940	6940	6940
First Investment Year FE	Yes	Yes	Yes
Investee State FE	Yes	Yes	Yes
Investee Industry FE	Yes	Yes	Yes

t statistics in parentheses

Standard errors are clustered at the firm investor level

Omitted: constant, controls

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 13: Round Duration and Fundraising Method

This table presents the estimated relation between round duration and the fundraising method. The unit of observation is one investment round. The dependent variable is the natural log of round duration in days. Columns (1) and (2) are estimations of the lognormal accelerated-failure-time model, where Column (2) includes the additional round sequence fixed effects. Columns (3) and (4) are OLS estimations of the linear regression model. Column (3) includes all round observations. Column (4) only includes rounds that have received subsequent financing or been followed by an exit, to mitigate any concerns about unobserved subsequent financing due to right-censoring of the data. The number of observations are smaller than the round sample size due to fixed effects and exclusions applied.

	(1)	(2)	(3)	(4)
	AFT	AFT	OLS	OLS survived round
I(GS)	0.0323*	0.0280*	0.0547	-0.0456
	(1.93)	(1.75)	(1.33)	(-0.78)
I(Brokered)	-0.0354***	-0.0334**	-0.1000**	-0.137**
	(-2.59)	(-2.50)	(-2.28)	(-2.45)
I(within ind. focus)	-0.0229*	-0.0209**	-0.0611**	-0.0188
	(-1.95)	(-2.01)	(-2.00)	(-0.45)
Fund Characteristics				
I(CA_NY)	-0.0181*	-0.0160*	-0.0277	-0.0136
	(-1.89)	(-1.72)	(-0.94)	(-0.34)
ln(fund size $M)	-0.00373	-0.00365	-0.00540	0.0147
	(-1.50)	(-1.56)	(-0.76)	(1.38)
I(early/seed fund)	0.0130	0.00309	0.000120	-0.0765*
	(1.33)	(0.33)	(0.00)	(-1.94)
GP female pct.	0.0214	0.0168	0.0412	0.0157
	(1.25)	(1.01)	(0.88)	(0.21)
GP count	-0.00854	-0.00749	-0.0269	-0.0352
	(-1.12)	(-1.04)	(-1.24)	(-1.18)
GP count sq	0.000586	0.000621	0.00292	0.00532**
	(0.87)	(1.01)	(1.54)	(2.15)
Firm Characteristics				
ln(firm age)	0.00380	0.00364	-0.00136	-0.0578**
	(0.52)	(0.51)	(-0.07)	(-2.35)
ln(firm invested amt)	-0.0143***	-0.0107**	-0.0374***	-0.0416**
	(-3.00)	(-2.35)	(-2.72)	(-2.37)
eigenvector pctl	0.00124	0.0158	0.0452	-0.208
	(0.02)	(0.33)	(0.31)	(-0.95)
eigenvector pctl sq	0.0575	0.0237	0.0992	0.501*
	(0.97)	(0.44)	(0.55)	(1.77)
/				
lnsigma	-1.352***	-1.365***		
	(-67.42)	(-69.38)		
Observations	8398	8398	8398	4216
Adjusted R^2			0.091	0.137
Investment Year FE	Yes	Yes	Yes	Yes
Investee State FE	Yes	Yes	Yes	Yes
Investee Industry FE	Yes	Yes	Yes	Yes
Round Sequence FE	No	Yes	Yes	Yes

t statistics in parentheses

Standard errors are clustered at the firm investor level

Omitted: constant, controls

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 14: Investment Distance and Fundraising Method

This table presents the estimated relation between investment distance and the fundraising method. The unit of observation is one investee-lead-investor pair. The regressors are the same across columns. Column (1) is estimated by OLS and the dependent variable is the log distance between the fund investor and the investee company. Columns (2)-(6) are estimated by probit MLE and the dependent variables are binary indicators of the distance. The number of observations are smaller than the investee-lead-investor pair sample size due to fixed effects and exclusions applied.

	(1)	(2)	(3)	(4)	(5)	(6)
	ln(dist)	<20 miles	20-200 miles	>200 miles	<20 miles CA NY	<20 miles other states
I(GS)	-0.546*	0.299**	-0.145	-0.186	0.0904	0.369*
	(-1.96)	(2.18)	(-1.49)	(-1.50)	(0.70)	(1.96)
I(Brokered)	0.202	-0.0642	-0.150*	0.151*	-0.120	0.0196
	(1.39)	(-0.79)	(-1.68)	(1.82)	(-1.14)	(0.13)
I(within ind. focus)	0.124	-0.113**	0.120**	0.0199	-0.0998	-0.0738
	(1.13)	(-2.03)	(2.04)	(0.36)	(-1.19)	(-0.82)
Fund Characteristics						
I(CA_NY)	0.105	-0.0706	-0.0309	0.0628		
	(0.68)	(-0.92)	(-0.49)	(0.84)		
ln(fund size $M)	0.00126	-0.00554	-0.00903	0.00862	0.00687	-0.0189
	(0.05)	(-0.36)	(-0.60)	(0.60)	(0.41)	(-0.55)
I(early/seed fund)	-0.566***	0.285***	0.0483	-0.273***	0.208***	0.410***
	(-4.95)	(4.61)	(0.78)	(-4.68)	(2.80)	(3.86)
GP female pct.	-0.0641	-0.0275	0.190	-0.106	-0.138	-0.0520
	(-0.29)	(-0.20)	(1.46)	(-0.90)	(-0.85)	(-0.21)
GP count	0.0408	-0.0155	0.0327	0.00433	-0.0388	-0.0393
	(0.42)	(-0.26)	(0.72)	(0.09)	(-0.61)	(-0.45)
GP count sq	0.00760	-0.00508	-0.00487	0.00549	0.00355	-0.00481
	(0.78)	(-0.76)	(-1.21)	(1.10)	(0.57)	(-0.51)
Firm Characteristics						
ln(firm age)	-0.214***	0.0979**	0.0371	-0.101**	0.0658	0.109*
	(-2.67)	(2.25)	(0.87)	(-2.36)	(1.19)	(1.71)
ln(firm invested amt)	0.154***	-0.0760**	0.0161	0.0518*	-0.0977**	-0.0103
	(2.78)	(-2.37)	(0.42)	(1.68)	(-2.49)	(-0.18)
eigenvector pctl	-0.581	0.463	-0.759**	0.0467	0.977***	-0.435
	(-0.95)	(1.44)	(-2.35)	(0.15)	(2.59)	(-0.72)
eigenvector pctl sq	0.235	-0.307	0.706*	-0.152	-0.699	0.175
	(0.35)	(-0.84)	(1.70)	(-0.42)	(-1.49)	(0.27)
Observations	6664	6584	6543	6642	2947	2093
Adjusted R^2	0.094					
Pseudo R^2		0.062	0.055	0.078	0.034	0.188
First Investment Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Investee State FE	Yes	Yes	Yes	Yes	Yes	Yes
Investee Industry FE	Yes	Yes	Yes	Yes	Yes	Yes

t statistics in parentheses

Standard errors are clustered at the firm investor level

Omitted: constant, controls

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendices

A Variable Construction

A.1 Form D Data

The SEC requires issuers of Regulation D offerings to file the Form D notice within 15 days after the first sale of securities in the offering.[35] If there is any material mistake or change in information, the issuer must file an amendment to the previously filed Form D. Amendments are also required annually if the offering is continuing at that time.[36] Amendments have the same format as Form D and are referred to as Form D/A. Form D and amendments are filed electronically, and the SEC does not charge any filing fee for them. For VCs, each fund is typically organized as an independent limited partnership; hence Form Ds are filed at the fund level. For example, fund "500 Fintech, L.P." and fund "500 Falcons, L.P." each has its own CIK, although both are offered by the VC firm "500 Startups Management Company LLC."

This study uses Form D to determine the fundraising method, several other fund characteristics, and offering characteristics. I use the structured Form D data, which is publicly available and updated quarterly on the SEC website. Form D and subsequent Form D/A can be linked by the variable "previous accession number."[37] The most common amendments are variables related to additional sales. When there are amendments, I apply specific aggregation rules to create fund-level variables, which I describe in the remainder of this section. In the unusual cases where multiple new sales notice Form Ds are filed by one fund issuer, I use the first notice filed in the fund year.

The general solicitation status of each fund is based on Form D's federal exemptions claimed. During the sample period, each Reg D offering must claim one of the three exemptions, 504, 506(b), or 506(c). Federal exemptions cannot be amended in one offering. A small number of 2014 funds filed initial Form D prior to the effective date of Title II of the JOBS Act, where the distinction between 506(b) and 506(c) did not exist. I code a fund as having used general solicitation if any of its Form D or Form D/A claims 506(c).

[35] If an issuer fails to file Form D, the regulators could seek to enjoin the issuer from relying on Regulation D for future capital raises (see, Reg D Rule 507). Currently, such a penalty is rarely enforced.

[36] See the SEC's Form D compliance guide about situations where amendments are not required.

[37] Accession Number is a unique ID for every SEC filing on EDGAR.

The brokered status of each fund is based on sales compensation recipient (i.e. broker names) and sales commissions and finder's fees (i.e., broker compensation).[38] I clean broker names by dropping entries such as "no sales people."

To characterize the GP team size and gender diversity, I use the "Related Persons" field on Form D. Non-natural person entries such as "GP of the issuer" are excluded. I include names from Form D and the amendments to capture every individual involved in the fund management.

The fund-level offering characteristics include minimum investment amount, number of outside investors (i.e., LPs), intended offering duration, and offering and sales amounts (i.e., fund size target and fund size). If amendments are filed, the aggregation rules for these variables are as the following. The minimum investment amount is the minimum of all non-zero values reported in Item 11 of Form D. Number of outside investors is the maximum of all reported values in Item 14 of Form D. The fund is coded as offering for more than one year if at least Form D or Form D/A indicated so. The offering and sales amounts are based on the maximum reported value, which typically corresponds with the last amendments as funds continue to raise capital. Finally, fund size target and fund size are also reported in Refinitiv VentureXpert. When Refinitiv and Form D indicate different amounts, I take the larger values, with the assumption that the funds raised additional capital and one of the sources failed to update. Offering size is coded as indefinite if a finite size target is absent in either source.

A.2 Investee Company Exit Status

The investee company exit status is determined using the investment rounds sample, which includes investments made by funds outside of the fund sample of this study. The investment round sample universe begins with all "Private Equity/VC" investments made by US firm investors between 1980 and 2020 to US investee companies. To limit the observations to venture capital investments, I first filter to "VC Deals" identified by Refinitiv. Further, I drop an investee portfolio company and associated investment rounds if all its investment rounds are in a non-VC investment stage. Most entities in the Refinitiv database have a unique Refinitiv PermID. Occasionally, one firm is assigned

[38] All funds that report a non-zero commission report a sales compensation recipient, but all brokered funds report a positive compensation amount. This is because some funds have enlisted brokers but have not compensated the brokers yet, as of the Form D filing date. An alternative but narrower definition of brokered funds only considers funds that report a non-zero commission as a brokered fund (1290 funds, 15%); this alternative definition produces similar empirical results in this paper.

multiple PermIDs incorrectly. I screen for and consolidate these observations.

To determine the exit status of the investee companies, I supplement VentureXpert with SDC M&A and Global New Issues databases, all obtained through Refinitiv. The common identifier across the databases is the Refinitiv PermID; if an entity does not have a PermID, fuzzy name match and manual verification are applied.

First, I use the VentureXpert "exit" dataset to identify firms that went public or sold to another firm through merger and acquisition. The "exit" data table contains the investee company name and PermID, exit type (e.g., merger, IPO), and exit date, which I merge with the investment rounds sample. Then, following the literature, I search for additional exit events using SDC, from which I obtain M&A and IPO data from 1980 through December 2021. The IPO database includes all IPO offerings made by US firms and includes deal information such as issuance date. An investee company is considered to have gone public if there is an IPO issuance post the earliest VC funding round. The M&A deal database includes all M&A deals announced during the data period, where either the target or the acquiror is a US firm.[39] An investee company is considered to have exited through M&A if it is the *target* of an M&A deal post the earliest VC funding round. The first exit event is retained if multiple exits are identified through the match.

Further, I use the "Investee Company Status" field in VentureXpert's "investment details" table to identify potential exits not captured by the previous procedure. Investees with valid IPO dates and a "Went Public" status are considered potential IPO exits. Investees whose status are "Merger" or "Acquisition" are considered potential M&A exits. For potential IPO exits, I collect all their completed public equity offering deals from SDC.[40] For potential M&A exits, I collect all completed M&A deals where the investees are the target.[41]

Additionally, I manually code the exit status to be "Went Public" for a handful companies that went public by direct listing but not included in the SDC New Issue Database.

Finally, if an investee has an exit event prior to the first investment date in VentureXpert, I drop the investee from the sample (N=606), as these firms are typically not startup companies

[39] Country restriction is applied due to bulk data download limit from Refinitiv. The filter is removed in a later step to ensure completeness.

[40] Query by issuer PermID in Refinitiv, without restricting filters in the previous step such as IPO, U.S. issuer)

[41] Query by PermID in Refinitiv, without the restrictive filters such as the form of deal or target nation.

but have undergone restructuring or buyout. The final investee sample with exit status includes 47,265 portfolio companies that received the initial investment between 1980 and 2020. By the end of 2021, 8.1% of them went public, and 25.6% of them exited through M&A. I compute fund-level and firm-level exit ratios with the investee exit status, using the fund and firm investors' identities reported in the investment rounds sample. The exit status is right-censored due to firms not having sufficient time to realize an exit. To address this issue, I apply round-level survival analysis and hazard regressions in addition to fund-level exit ratio regression analysis in the investment performance analysis section of the paper.

A.3 Location Data and Geocoding

I obtain the physical addresses of VC funds and portfolio companies from Refinitiv, supplemented by the "business address" reported on Form D. Addresses are converted to latitude and longitude coordinates using the OpenStreetMap API. The addresses consist of the street address, city, state, and ZIP code.

OpenStreetMap is a free and community-contributed geographic database of the world. Its coordinate reference system (CRS) is EPSG:3857. To obtain a valid query response, street addresses need to be cleaned by removing unit numbers and associated entity names. I check the accuracy of the query output by comparing the city, state, and country of the address input and geocode output. I modify and rerun the queries until all errors are addressed through this iterative process.

In the venture capital literature, it is common to use the center of entity ZIP code to represent its geographic location (see, e.g., Hochberg et al., 2010; Tian, 2011; Bernstein et al., 2016). Because ZIP codes are not geographic boundaries, using ZIP codes for geospatial analysis is inaccurate and often misleading.[42] With the recent and rapid development of open-source geocoding databases such as OpenStreetMap API, street addresses should be used in future research whenever possible. As an alternative, the Google Maps Platform API also provides geocoding services but charges a fee. It uses the same database and search algorithm that power the interactive Google Maps. Compared to OpenStreetMap, Google Maps has better coverage for smaller streets and is more proficient at handling ambiguous query input. Hence, Google Maps demand less data cleaning

[42] For example, for this reason, the US Census Bureau has created ZIP Code Tabulation Areas (ZCTAs), which are a generalized areal representation of United States Postal Service (USPS) ZIP code service areas.

effort from the researchers.

A.4 VC Firm Syndication Network Centrality

The syndication network centrality measures are constructed using the network analysis techniques based on graph theory as in Hochberg et al. (2007). In venture investing, investment rounds are often funded by multiple venture capitalists, known as syndication. VCs form syndicates to share risks and pool expertise and resources. Graph theory provides tools to measure the relative importance of each investor in the syndication network. I prepare three undirected network measures (degree, betweenness, and eigenvector) and two directed network measures (indegree and outdegree) using rolling 5-year of investment rounds data. The undirected measures treat each firm investor in an investment round equally, whereas the directed graphs distinguish lead investors. In the reported regression results, I use the eigenvector centrality measure to represent a VC firm's relative importance in the syndication network. As the five centrality measures have high correlations, regression results remain similar when alternative centrality measures are used.

Each centrality measure describes a different aspect of a VC firm's influence in the co-investment network. Degree is based on the number of other VCs a firm has syndicated with; it is a proxy for deal flow, contacts, and capital pools to which a firm has access. Betweenness represents the number of times a VC serves as a common tie between other VCs, which proxies an investor's ability to be an intermediary. Eigenvector is based on the centrality of one's network neighbors and thus measures access to the best-connected VCs. Outdegree measures a VC's ability to lead investment rounds and generate co-investment opportunities. Finally, indegree measures the frequency that a VC participates as a non-lead investor; this indicates their access to investment opportunities and the extent to which they are considered to add value by other VCs.

B Supplementary Tables and Figures

Appendix B contains supplementary tables and figures, which are organized as follows:

1. Figure B1 shows examples of general solicitation by open-access websites.

2. Table B1 defines all the variables used in this study.

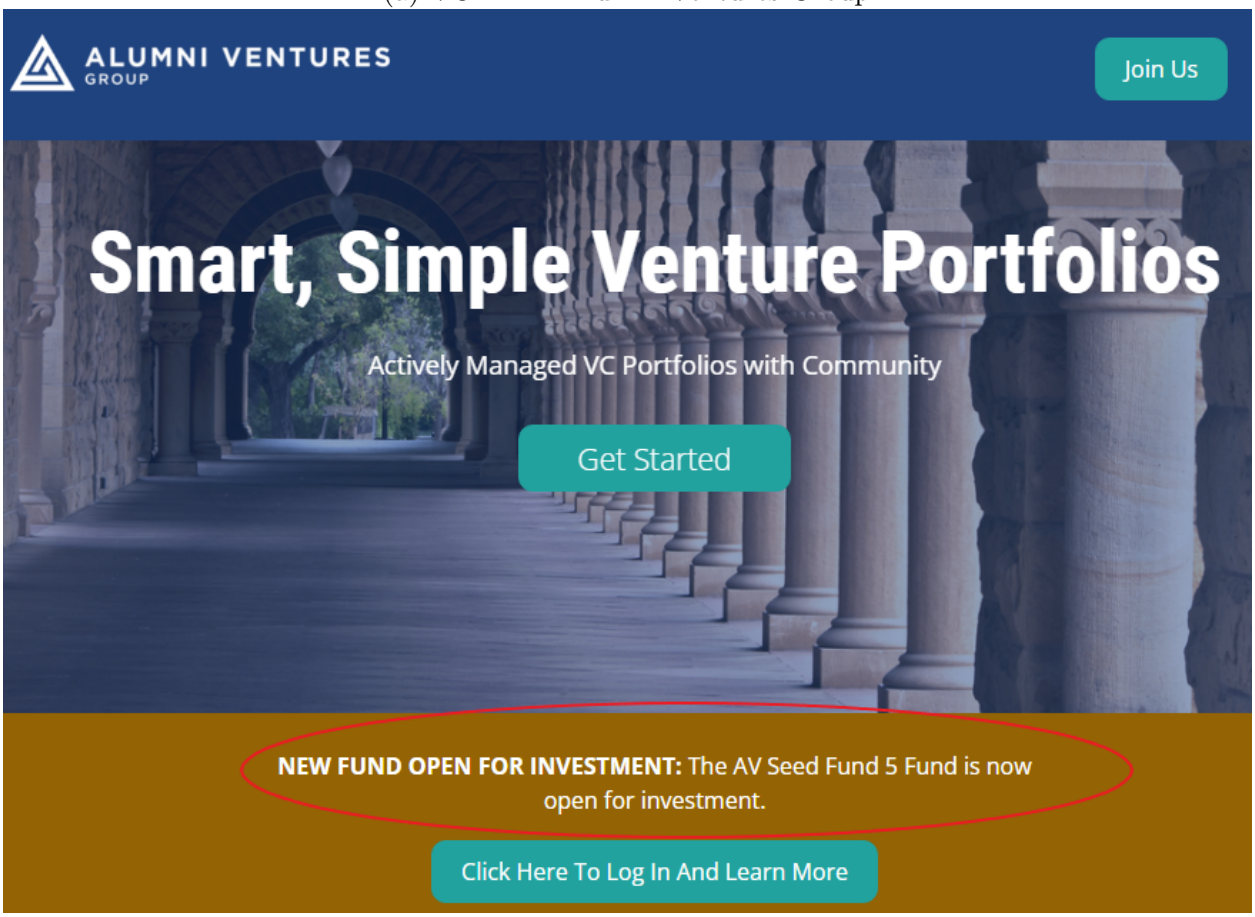
3. Table B2 describes the fund selection process.

4. Table B3 is a robustness check extension of Table 5, where I examine if the propensity to use general solicitation is robust to alternative sample selection conditions and model specifications.

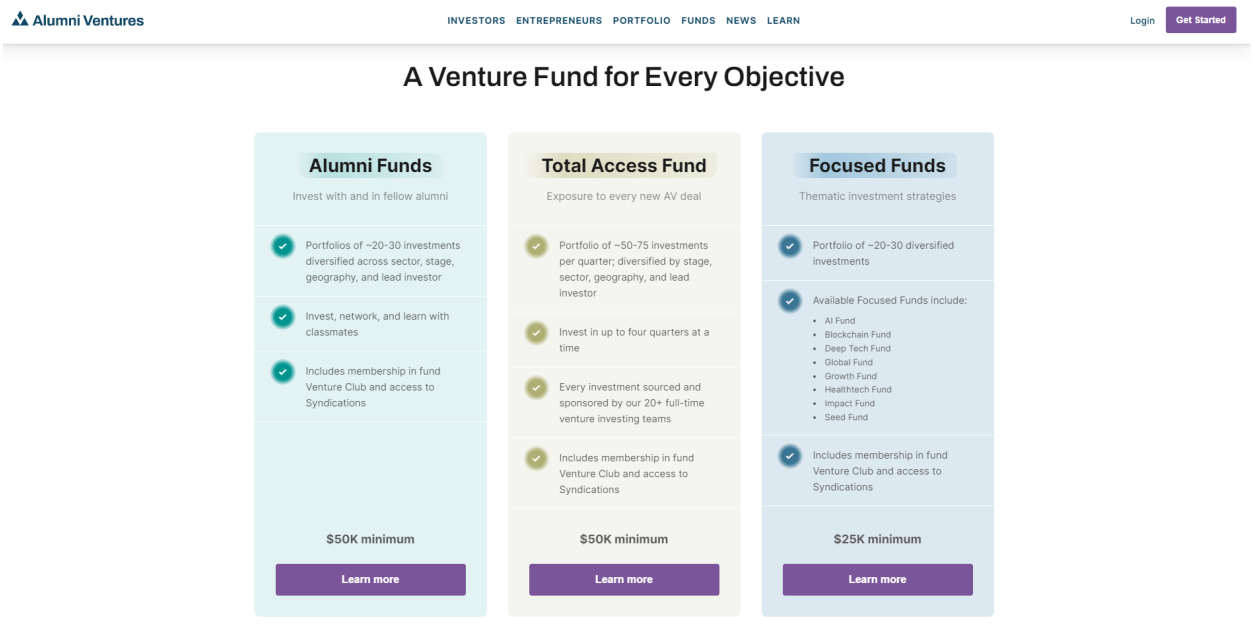
5. Table B4 is a robustness check extension of Table 5, where I examine if the propensity to use brokers is robust to alternative sample selection conditions and model specifications.

Figure B1: Examples of General Solicitation by Open-Access Website

(a) VC Firm: Alumni Ventures Group

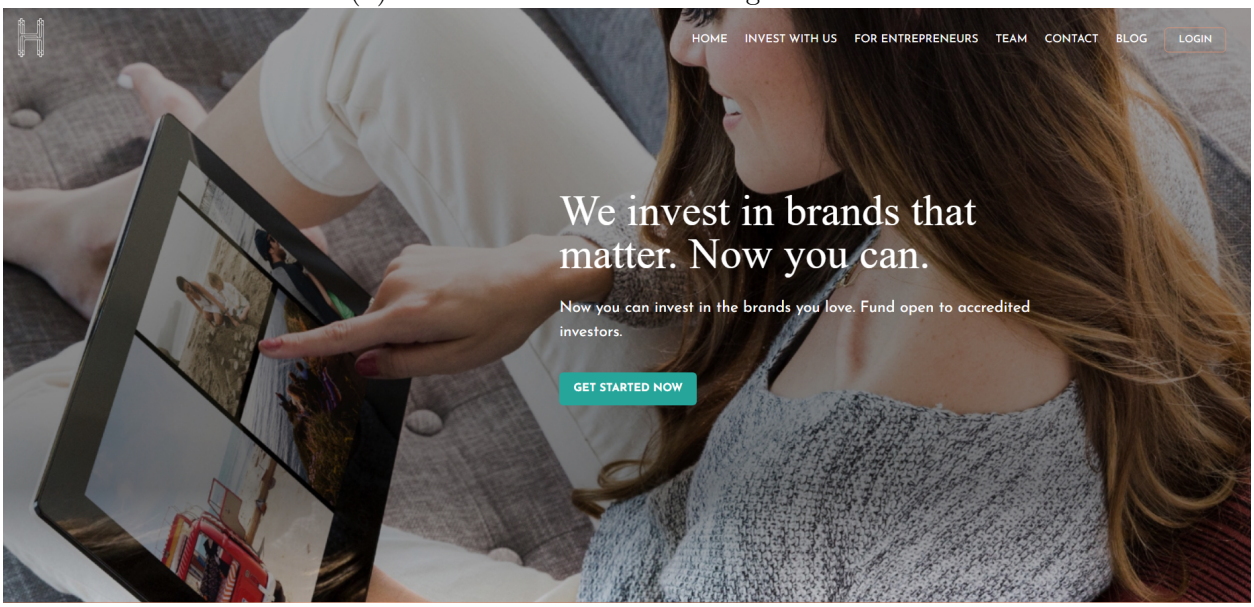


(Webpage retrieved in October 2021)



(Webpage retrieved in July 2022)

(b) VC Firm: H Venture Management LLC



(Webpage retrieved in July 2022)

(Webpage retrieved in July 2022)

Table B1: Variable Definitions

Variable Name	Definition
	Panel A: Fund Characteristics
I(GS)	=1 if the fund is offered under rule 506(c) using general solicitation, Form D Item 6
I(Brokered)	=1 if the a sales compensation recipient is reported or if fund incurred sales commissions and finder's fees, Form D Items 12 and 15
I(CA_NY)	=1 if the fund is located in California or New York, Refinitiv fund state
I(early/seed fund)	=1 if fund stage is early or seed, Refinitiv
I(GP reported)	=1 if general partner names are reported, Form D Item 3
I(first fund)	=1 if firm age is 0 or indicated as "new fund" or "sole fund" by Refinitiv
GP female pct.	percentage of female general partners
GP count	number of general partners, screened for natural persons only
fund size $M	max(amount sold Form D Item 13, Refinitiv fund size), ($ million)
fund year	Refinitiv fund vintage year
fund industry focus	Refinitiv industry focus, if unavailable, VEIC that accounts for the largest share of the fund's portfolio, based on dollars invested
all exits	fraction of fund's portfolio companies that exited via going public or M&A
IPO exits	fraction of fund's portfolio companies that exited via going public
M&A exits	fraction of fund's portfolio companies that exited via M&A
all exits $	fraction of fund's invested dollars that exited via going public or M&A
IPO exits $	fraction of fund's invested dollars that exited via going public
M&A exits $	fraction of fund's invested dollars that exited via M&A
	Panel B: Firm Characteristics
firm age	year - VC firm founding year
firm invested amt	cumulative investment amount ($ million)
eigenvector pctl	undirected syndication network centrality measure based on the centrality of the VC firm's network neighbors. Percentile is based on rank within each year.
firm industry focus	VEIC that accounts for the largest share of the firm's portfolio, based on dollars invested
all exits recent 5 years	fraction of portfolio companies that exited via either going public or M&A in the past five years
all exits historical	fraction of portfolio companies that exited via either going public or M&A in the firm's history
IPO recent 5 years	fraction of portfolio companies that exited via going public in the past five years
IPO historical	fraction of portfolio companies that exited via going public in the firm's history
M&A recent 5 years	fraction of portfolio companies that exited M&A in the past five years
M&A historical	fraction of portfolio companies that exited via M&A in the firm's history

(Continued on the next page)

Panel C: Offering Characteristics	
min. invest amount	minimum investment accepted from any outside investor ($ million), Form D Item 11
I(min. amt reported)	=1 if a non-zero minimum investment amount is reported
LP count	number of investors who have already invested in the fund, Form D Item 14
I(>1 year)	=1 if the issuer intends the offering to last more than 1 year, Form D Item 8
fund size target	max(amount offered Form D Item 13, Refinitiv target fund size), ($ million)
I(indefinite)	=1 if the fund size target is indefinite
Panel D: Investment Round Level	
I(survived round)	=1 if investee raised capital in a subsequent investment round or had an exit
I(within ind. focus)	=1 if investee is in the VC firm's focus industry
time to next round	number of days until the next investment round or the exit event

Notes:
I(variable) indicates binary variable that equals either 0 or 1.
Log transformed variabes are calculated as ln(1+variable).
Firm-level variables are merged to fund-level variables by fund year with a one year lag.
Continuous variables are winsorized at the 1% and 99% levels in regressions to minimize the influence of outliers.

Table B2: Fund Sample Selection Process

The fund sample consists of 8,479 US funds with fund year from 2014 to 2021. To construct the sample, I start with all US funds with fund year between 2014 and 2021 from VentureXpert's "fundraising" dataset (n=12,422). Funds without names are dropped (n=2,587).

Form D data is required to determine the fundraising method. I merge VentureXpert fund data with Form D data by fuzzy name matching and manual search. To eliminate incorrect matches, I require that the fund state in VentureXpert matches with at least one Form D state associated with the CIK, and that the VentureXpert fund year is within the Form D filings year range. 86% of funds in VentureXpert with fund name are matched to Form D with this procedure, which result in the fund sample size of 8,479.

VentureXpert funds not matched to Form D filings have similar states, fund year, and fund focus distribution, but smaller average fund size as recorded in VentureXpert, compared to the final fund sample.

Fund Sample Construction	
US funds with fund year 2014-2021 from VentureXpert	12,422
Fund name unknown in VentureXpert	-2,587
Not matched to Form D filings	-1,356
Fund sample size	8,479

Table B3: Robustness Check of Propensity to Use General Solicitation

This table presents the probit maximum likelihood coefficient estimates of alternative specifications of the fundraising method propensity model (Equation 1) as robustness checks. The dependent variable is equal to one if the fund uses general solicitation. The base group is funds that use neither fundraising method. Column (1) is identical to Column (2) of Table 5. Columns (2)-(6) make incremental changes to the base model reported in Column (1). Column (2) excludes the Fund Year and Fund Type fixed effects. Column (3) includes additional state-level control variables as of the year before the fund year: unemployment rate, real GDP growth, VC network density, and an indicator variable of the investor tax credit program. Column (4) excludes first-time funds. Column (5) excludes buyout funds based on VentureXpert's fund type variable. Column (6) only includes independent private partnerships based on VentureXpert's fund investor type variable.

	(1) base model	(2) drop FE	(3) add state-level control vars	(4) follow-on funds only	(5) excl. buyout	(6) IPP only
Fund Characteristics						
I(CA_NY)	-0.227**	-0.235**	-0.138	-0.260*	-0.233**	-0.203*
	(-2.24)	(-2.28)	(-1.52)	(-1.85)	(-2.17)	(-1.75)
I(early/seed fund)	-0.0543	-0.0877	-0.0550	-0.0731	-0.0476	0.0160
	(-0.72)	(-1.28)	(-0.73)	(-0.77)	(-0.64)	(0.19)
GP female pct.	0.322**	0.338**	0.340**	0.518**	0.305*	0.359*
	(2.08)	(2.20)	(2.24)	(2.37)	(1.89)	(1.88)
GP count	-0.129***	-0.139***	-0.130***	-0.150***	-0.153***	-0.142**
	(-2.82)	(-2.98)	(-2.87)	(-2.75)	(-3.22)	(-2.50)
GP count sq	0.00874**	0.00922***	0.00889***	0.00960**	0.0106***	0.00869**
	(2.57)	(2.69)	(2.66)	(2.40)	(2.97)	(2.31)
Firm Characteristics						
ln(firm age)	-0.124***	-0.111***	-0.122***	-0.175**	-0.140***	-0.171***
	(-3.31)	(-3.04)	(-3.24)	(-2.32)	(-3.49)	(-4.13)
ln(firm invested amt $M)	-0.0650	-0.0674	-0.0650	-0.0437	-0.0532	-0.0342
	(-1.41)	(-1.48)	(-1.43)	(-0.86)	(-0.98)	(-0.70)
eigenvector pctl	-1.944***	-1.970***	-2.005***	-2.462***	-1.986***	-2.044***
	(-3.00)	(-3.05)	(-3.22)	(-3.42)	(-2.94)	(-2.66)
eigenvector pctl sq	3.049***	3.081***	3.104***	3.490***	3.040***	3.166***
	(4.31)	(4.43)	(4.40)	(4.51)	(4.05)	(3.92)
Offering Characteristics						
ln(min accepted amt. $M)	-0.458***	-0.462***	-0.455***	-0.482**	-0.466***	-0.544***
	(-3.05)	(-3.12)	(-3.00)	(-2.56)	(-2.93)	(-2.99)
LP count(000s)	2.374***	2.360***	2.402***	2.300**	2.129***	1.854**
	(3.10)	(3.07)	(3.13)	(2.47)	(2.79)	(2.11)
I(>1 year)	0.312***	0.303***	0.321***	0.362**	0.287***	0.324***
	(3.29)	(3.28)	(3.42)	(2.56)	(2.77)	(3.04)
I(indefinite size target)	0.104	0.127	0.105	0.0565	0.102	0.144
	(1.01)	(1.23)	(1.05)	(0.40)	(0.93)	(1.24)
ln(finite size target $M)	0.0141	0.0166	0.0171	-0.0141	0.0250	0.0210
	(0.55)	(0.66)	(0.67)	(-0.44)	(0.89)	(0.67)
Observations	6439	6439	6439	4352	5719	5116
Pseudo R^2	0.130	0.125	0.133	0.154	0.138	0.143
Fund Year FE	Yes	No	Yes	Yes	Yes	Yes
Fund Type FE	Yes	No	Yes	Yes	Yes	Yes

t statistics in parentheses

Standard errors are clustered at the firm level

Omitted: constant, controls

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table B4: Robustness Check of Propensity to Use Brokers

This table presents the probit maximum likelihood coefficient estimates of alternative specifications of the fundraising method propensity model (Equation 1) as robustness checks. The dependent variable is equal to one if the fund uses brokers. The base group is funds that use neither fundraising method. Column (1) is identical to Column (3) of Table 5. Columns (2)-(6) make incremental changes to the base model reported in Column (1). Column (2) excludes the Fund Year and Fund Type fixed effects. Column (3) includes additional state-level control variables as of the year before the fund year: unemployment rate, real GDP growth, VC network density, and an indicator variable of the investor tax credit program. Column (4) excludes first-time funds. Column (5) excludes buyout funds based on VentureXpert's fund type variable. Column (6) only includes independent private partnerships based on VentureXpert's fund investor type variable.

	(1) base model	(2) drop FE	(3) add state-level control vars	(4) follow-on funds only	(5) excl. buyout	(6) IPP only
Fund Characteristics						
I(CA_NY)	-0.0308	-0.0511	0.0749	-0.0418	-0.0924	-0.0199
	(-0.47)	(-0.78)	(1.01)	(-0.53)	(-1.24)	(-0.27)
I(early/seed fund)	-0.334***	-0.521***	-0.322***	-0.334***	-0.342***	-0.332***
	(-5.39)	(-8.50)	(-5.19)	(-4.34)	(-5.61)	(-5.10)
GP female pct.	-0.251**	-0.268**	-0.235*	-0.163	-0.185	-0.179
	(-2.00)	(-2.14)	(-1.88)	(-1.03)	(-1.42)	(-1.38)
GP count	0.0462	0.0611*	0.0478	0.0211	0.0351	0.0235
	(1.43)	(1.89)	(1.49)	(0.58)	(0.92)	(0.62)
GP count sq	-0.00185	-0.00253	-0.00204	-0.000452	-0.00138	-0.000862
	(-0.87)	(-1.19)	(-0.96)	(-0.19)	(-0.56)	(-0.36)
Firm Characteristics						
ln(firm age)	0.0462*	0.113***	0.0405	0.0639	0.0646*	0.0672**
	(1.66)	(4.46)	(1.46)	(1.26)	(1.93)	(2.27)
ln(firm invested amt $M)	0.00524	-0.0113	0.00569	0.00769	0.00971	0.0124
	(0.24)	(-0.54)	(0.26)	(0.33)	(0.34)	(0.53)
eigenvector pctl	0.197	-0.0771	0.147	0.180	0.380	-0.0704
	(0.53)	(-0.21)	(0.40)	(0.44)	(0.99)	(-0.17)
eigenvector pctl sq	-0.184	-0.117	-0.118	-0.192	-0.374	-0.0539
	(-0.37)	(-0.24)	(-0.24)	(-0.38)	(-0.72)	(-0.10)
Offering Characteristics						
ln(min accepted amt. $M)	-0.0947	-0.0870	-0.0968	-0.0776	-0.166	-0.0978
	(-0.97)	(-0.88)	(-1.00)	(-0.65)	(-1.45)	(-0.88)
LP count(000s)	2.974***	3.044***	3.005***	2.931***	2.940***	2.266***
	(5.88)	(6.05)	(5.91)	(5.36)	(5.06)	(4.02)
I(>1 year)	0.266***	0.265***	0.256***	0.248***	0.302***	0.250***
	(5.03)	(5.03)	(4.90)	(3.96)	(4.87)	(4.24)
I(indefinite size target)	0.188**	0.215**	0.172**	0.225**	0.152	0.206**
	(2.23)	(2.55)	(2.03)	(2.07)	(1.54)	(2.10)
ln(finite size target $M)	0.217***	0.241***	0.216***	0.202***	0.202***	0.234***
	(9.27)	(10.20)	(9.20)	(6.99)	(7.94)	(8.41)
Observations	7982	7982	7982	5748	6570	6284
Pseudo R^2	0.186	0.170	0.189	0.161	0.170	0.180
Fund Year FE	Yes	No	Yes	Yes	Yes	Yes
Fund Type FE	Yes	No	Yes	Yes	Yes	Yes

t statistics in parentheses

Standard errors are clustered at the firm level

Omitted: constant, controls

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

References

Agrawal, Anup and Yuree Lim. 2021. Does general solicitation improve access to capital for small businesses? Evidence from the JOBS Act. *Working Paper* .

Bauguess, Scott, Rachita Gullapalli, and Vladimir Ivanov. 2018. Capital raising in the U.S.: An analysis of the market for unregistered securities offerings 2009-2017. Tech. rep., Division of Economic and Risk Analysis (DERA), U.S. Securities and Exchange Commission.

Bernstein, Shai, Xavier Giroud, and Richard R. Townsend. 2016. The impact of venture capital monitoring. *The Journal of Finance* .

Catalini, Christian, Catherine Fazio, and Fiona Murray. 2016. Can equity crowdfunding democratize access to capital and investment opportunities. Tech. rep., MIT Innovation Initiative Lab for Innovation Science and Policy Report.

Chaplinsky, Susan, Katheleen Weiss Hanley, and S. Katie Moon. 2017. The JOBS Act and the costs of going public. *Journal of Accounting Research* .

Dambra, Michae, Laura Casares Field, and Matthew T. Gustafson. 2015. The JOBS Act and IPO volume: Evidence that disclosure costs affect the IPO decision. *Journal of Financial Economics* .

Denes, Matthew, Sabrina T. Howell, Filippo Mezzanotti, Xinxin Wang, and Ting Xu. 2020. Investor tax credits and entrepreneurship: Evidence from U.S. States. *Working Paper* .

Gompers, Paul A. 1996. Grandstanding in the venture capital industry. *Journal of Financial Economics* .

Gompers, Pual A. and Josh Lerner. 1998. What drives venture capital fundraising? *Brookings Papers on Economic Activity: Microeconomics* .

Hochberg, Yael V. and Joshua D. Rauh. 2012. Local overweighting and underperformance: Evidence from limited partner private equity investments. *The Review of Financial Studies* .

Hochberg, Yael V., Alexander Ljungqvist, and Yang Lu. 2007. Whom you know matters: Venture capital networks and investment performance. *The Journal of Finance* .

———. 2010. Networking as a barrier to entry and the competitive supply of venture capital. *The Journal of Finance* .

Ivanov, Vladimir and Scott Bauguess. 2012. Capital raising in the U.S.: The significance of unregistered offerings using the Regulation D exemption. Tech. rep., Division of Risk, Strategy, and Financial Innovation White Paper, U.S. Securities and Exchange Commission.

Kaplan, Steven N. and Josh Lerner. 2017. Venture Capital Data: Opportunities and Challenges. In *Measuring Entrepreneurial Businesses: Current Knowledge and Challenges*. University of Chicago Press.

Kaplan, Steven N. and Antoinette Schoar. 2005. Private Equity Performance: Returns, Persistence, and Capital Flows. *The Journal of Finance* .

Robbins, Robert B. 2013. Rescission Offers under Regulation D .

Tian, Xuan. 2011. The causes and consequences of venture capital stage financing. *Journal of Financial Economics* .

Xu, Jiajie. forthcoming. Is there a trade-off between protecting investors and promoting entrepreneurial activity? Evidence from angel financing. *The Journal of Financial and Quantitative Analysis* .