# Brokers and Finders in Startup Offerings

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**Abstract**

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JEL: L26, M13, G24, G29, G34
Keywords: Form D filings, Brokers, Finders, Startups, Private placements, Venture capital, IPO, Acquisition, Retail investors, Entrepreneurial finance, JOBS Act

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I use novel data to document new facts on brokered startup offerings, where 60% of brokers are FINRA-registered and 40% are unregistered "finders." Issuers with few sophisticated investors and more brokers in their zip code are more likely to match with brokers. While VCs seldom participate in brokered offerings, non-accredited investors heavily participate in offerings involving unregistered brokers. Using instrumental variables, data show that even though brokers help issuers raise funding, the issuers that use them have fewer successful exits and more closures post funding. Overall, these findings are consistent with brokers mitigating search costs for issuers that are left out of the market for VC funding.

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# I. Introduction

In 2019, companies with past venture capital (VC) funding issued more than 40% of all U.S. initial public offerings (IPOs). How did the other 60% of IPOs that did not involve past VC funding raise funding? For the first time, this paper uses new data to explore non-VC intermediation in startup funding. Specifically, it focuses on the role of brokers. The paper shows the characteristics of brokers in this market, factors driving issuer-broker matching, the characteristics of investors participating in brokered and non-brokered offerings, the extent to which brokers help issuers raise funding, and the post-funding outcomes of issuers in brokered offerings. In doing so, it sheds light on brokers' role in startup funding and how this role fits with existing theories of financial intermediation.[1]

My tests use new data on startup offerings from Form D filings with the U.S. Securities and Exchange Commission (SEC). The filings cover 28,000 first-time issuers, 87% of which were formed less than five years before the offering. These issuers raised $10 billion, on average, each year between 2010 and 2019. Brokers—either registered or unregistered—intermediated about 10% of these offerings, raising a combined average of $1 billion each year. (Registered brokers are licensed by the Financial Industry Regulatory Authority (FINRA); unregistered brokers are not licensed.) The remaining 90% of offerings were sold directly to investors.

The data shows that brokers intermediate 33% of all private offerings and 10% of the offerings in the startup funding market. Of the brokers participating in startup funding, 60% are registered with FINRA (a self-regulatory organization for brokers) and 40% are unregistered. Issuer-broker matching is strongly related to the absence of sophisticated investors and presence of brokers in the issuer's zip code. Sophisticated investors such as VCs seldom participate in brokered offerings, but less-sophisticated

[1] I focus exclusively on U.S.-based private operating firms raising equity. Unlike a venture capitalist that raises capital from investors and invests for her own account, a broker matches issuers with investors for a fee and does not typically invest for her own account.

non-accredited investors often do—especially in offerings involving unregistered brokers.

The data also reveals that while issuer-broker matching leads to better fundraising than direct offerings do, the issuers' post-funding outcomes vary along with broker registration status. Relative to issuers using registered brokers or placing offerings directly, issuers using unregistered brokers are the least likely to have successful exits or to raise a follow-on round of funding and the most likely to close post offering. Further, relative to issuers that place offerings directly, issuers using registered brokers are more likely to have successful exits and as likely to raise a follow-on round of funding, but they are also more likely to close. The evidence on the relative performance of issuers in direct offerings and brokered offerings is inconclusive, but data support the conclusion that issuers in unregistered-broker offerings perform worst.

To interpret the evidence on issuer-broker matching and the variation in post-offering outcomes, we turn to search and information models of intermediation. By looking at our evidence through the lens of these models, we can understand the brokers' role and the constraints leading to issuer-broker matching.

Information models predict that intermediaries screen issuers, separating those with good prospects from those with poor prospects (see, e.g., Leland and Pyle, 1977; Booth and Smith II, 1986; Chemmanur and Fulghieri, 1994). Empirical studies of underwriters in public markets have largely confirmed this prediction by showing that issuers that use intermediaries tend to be of high quality (using post-offering outcomes as proxies for issuer quality) (see, e.g., Carter and Manaster, 1990; Megginson and Weiss, 1991; Carter et al., 1998; Fang, 2005; Fernando et al., 2005). According to these models, if the brokers' main role is to certify issuers (reducing information costs), then issuers that use brokers should be of high quality, as the brokers will screen them and select the ones with the best prospects.

Some of our evidence is consistent with information models. First, it is important to note that registered brokers are exposed to the threat of regulatory penalties—

including possible loss of license—for brokering low-quality offerings. As a result, registered brokers are more likely to certify issuer quality than unregistered brokers are. Thus, our finding that issuers in unregistered-broker offerings perform worse than issuers in registered-broker offerings is consistent with information models. However, our finding that issuers in unregistered-broker offerings also perform worse than issuers in non-brokered offerings is inconsistent with these models.

To understand this discrepancy, we turn to the search models. Search models predict that intermediaries such as brokers decrease issuers' search costs by matching issuers to investors. These models assume that search costs are not necessarily correlated with issuer quality. As a result, they predict that there will be no difference in quality between issuers that use brokers and issuers that directly match with investors (see, e.g., Rubinstein and Wolinsky, 1987; Yavaş, 1994; Garmaise and Moskowitz, 2003). A simple example illustrates why search costs might indeed be unrelated to quality. First, in the market for startup funding, we could think of search costs as the probability that an issuer matches with an investor—a VC, for example—*before* the investor decides to screen or fund the issuer. For example, because there are more VCs in San Francisco than Ann Arbor, a technology company in San Francisco (Oka, Inc.) has a higher probability of matching with a VC than does a technology company of similar quality in Ann Arbor (Duo, Inc.). In this simple example, distance to VC (one of my empirical proxies for search costs) is likely to be unrelated to issuer quality.

The inconclusive evidence on the relative performance of registered-broker and direct offerings is consistent with the search models' proposition that brokers primarily mitigate search costs. However, the finding that unregistered-broker offerings perform worse is not. To understand this finding, we turn to the Bolton et al. (2016) paper. The paper shows that in a market with sophisticated and unsophisticated investors, sophisticated investors are better at identifying and investing in high-quality issuers—"cream-skimming," the authors call it—which in turn weakens the pool of issuers

that remains for other investors. If sophisticated investors are less likely to invest in brokered offerings (as we show), then the issuers that approach brokers may be of lower quality than the issuers in non-brokered offerings. Thus, there is likely to be adverse selection in the pool of issuers that approach brokers. If brokers do not screen these issuers, this could lead to lower-quality issuers in brokered offerings. (This could occur even if the brokers' main role is to reduce search costs.) And if unregistered brokers screen issuers less rigorously than registered brokers, then their offerings will perform worse.

My data show that search costs are indeed an important driver of issuer-broker matching. Using an indicator for whether an issuer has a VC in its zip code, I show that having a VC nearby decreases the issuer's likelihood of broker use by 28%, relative to the unconditional probability of using a broker. Issuers are more likely to use *unregistered* brokers when they (the issuers) employ fewer executives (a proxy for the issuer's network) and have fewer accredited investors in their zip code. A standard deviation increase in the number of accredited investors in an issuer's zip code decreases the likelihood that the issuer will match with an unregistered broker by 20%, relative to the unconditional probability of using an unregistered broker. Further, both types of brokers lead issuers to raise more funding. I use the presence of a registered or an unregistered broker in an issuer's zip code as an instrument for issuer-broker matching to establish causality.

Overall, these findings suggest that sophisticated investors such as VCs directly match with the best issuers, generating adverse selection in brokered offerings. Registered brokers partially mitigate this adverse selection by screening issuers. However, in the pool of issuers that use unregistered brokers, the adverse selection remains. Thus, my findings are consistent with unregistered brokers mainly reducing search costs and with registered brokers reducing search costs *and* screening issuers.

Before proceeding further, it is worth noting that the debate about the relative contribution of search and information costs to issuer-broker matching—the main subject

of this paper—is not just of theoretical interest. Practitioners are sharply divided on whether unregistered brokers should play a more prominent role in the startup funding markets. For example, the Consumer Federation of America opposed a recent proposal that unregistered brokers be allowed to play a larger role in private markets, noting that "deregulation of intermediaries that potentially enables fraud and deceit of both investors and businesses who seek capital can easily have the effect of diverting capital from productive and sustainable businesses to enrich a dishonest intermediary or other fraudulent enterprise." On the other hand, Chessiecap Securities supported the proposal, saying they were "in favor of the proposed exemptive order and believe it is a necessary recognition of the role finders play in introducing potential investors (in our case institutional investors) to an investment opportunity without breaching the activities that licensed persons properly serve." In general, these differences in opinion come down to whether one assumes that unregistered brokers mainly reduce search costs or mainly certify issuers. Practitioners who support a larger role for finders implicitly assume that finders reduce search costs; practitioners who oppose the larger role assume that finders are supposed to—but do not—certify issuer quality.

A potential concern with my analysis is that some unobserved characteristic of issuers (besides quality) could drive the difference I document in exit outcomes. For example, if brokered offerings mostly involve "cash cow"-type companies (i.e., companies that generate a steady cash flow stream for investors) and not firms aiming for an exit through an IPO or acquisition, then the analysis might find a negative relationship between issuer outcomes and brokered offerings that is unrelated to issuer quality.

I employ several strategies to alleviate this concern. To approximate the effect of issuer quality on outcomes, I first include restrictive state-year-industry indicators. These fixed effects allow me to compare two issuers that are doing business in the same industry, located in the same state, and raising funding in the same year. The fixed effects thereby capture variation in local regulation over time (state-year fixed

effects), aggregate changes in issuers' preference for different placement methods over time (industry-year fixed effects), and differences in industry-specific conditions across states (state-industry fixed effects).

Second, I use the presence of a registered or an unregistered broker in an issuer's zip code as an instrument to show that the difference in post-funding outcomes is likely a result of selection effects at the time of the offering. I show that the instruments are correlated with issuer-unregistered broker and issuer-registered broker matching and argue that they meet the exclusion restriction. I show that when I control for whether an issuer also has a VC in its zip code, the instruments are unrelated to issuer outcomes. In addition, I use a 1% sample of census data to show that early-stage entrepreneurs generally start their businesses where they are born, which makes it unlikely that they endogenously choose their locations based on where brokers are based.

This study contributes to two main research areas. First, it extends research on factors affecting the funding and success of young entrepreneurial firms. Petersen and Rajan (1994) show that relationships between banks and small businesses improve small businesses' access to credit. Bernstein et al. (2017) find that information about human capital causally affects startup funding. And Ewens and Townsend (2020) show that a founder's gender is associated with funding success. This study contributes to this line of inquiry by showing that brokers mitigate financing frictions in two ways: registered and unregistered brokers reduce issuers' search costs, and registered brokers also certify issuer quality.

Second, this study extends the literature on intermediation in capital markets by providing fresh data and insights on the role of brokers in the market for early-stage funding. Much of the existing literature in this area examines the effect of underwriter certification on public firms' cost of capital (Carter and Manaster, 1990; Megginson and Weiss, 1991; Fang, 2005; Dai et al., 2010) and venture capital and bank financing of private firms (Petersen and Rajan, 1994; Hellmann and Puri, 2002; Sørensen,

2007). Such studies typically focus on how reputational concerns affect the intermediaries' moral hazard incentives and, consequently, the quality of the offerings they intermediate. I expand on these findings by showing that while registered brokers play a similar certification role in private markets, unregistered brokers mainly mitigate search costs.

The rest of the paper proceeds as follows: Section II discusses institutional details of Form D filings and the types of issuers that file Form D. Section III presents empirical findings, and the final section concludes.

# II. Form D Institutional Details

The Securities Act of 1933 requires firms selling securities to register the sales with the SEC or rely on an exemption. In addition to often being time-consuming and expensive, registration with the SEC requires disclosures that are difficult for new firms to shoulder. Thus, most young, private firms prefer to fit their offerings into an exemption. Section 4(a)(2) of the Act describes the following characteristics that exempt private offerings from registration: investors have enough knowledge to evaluate investment risks or are wealthy enough that they can afford to lose their investment; investors can access information about the issuer that the issuer would have included in a public-offering prospectus; the issuer does not publicly advertise the offering; and the number of investors is consistent with a private offering. These requirements are vague in several areas. For example, an issuer would have to guess whether the number of investors is "consistent with" a private offering.

In addition to meeting federal guidelines, issuers relying on Section 4(a)(2) must comply with state securities laws. Thus, an issuer may have filing or reporting requirements in each state where it has investors.

Unlike Section 4(a)(2), Regulation D (Reg D) is a bright-line rule (a safe harbor exemption) on when an offering is a private placement. Any offering that follows Reg

D requirements is unambiguously exempt from registration. Reg D stipulates that issuers must raise most of their funding from qualified investors (investors that earn $200,000 or more each year) and file a Form D within 15 days of fundraising.[2] In addition, Rule 506 of Reg D (used by over 95% of firms) exempts issuers from state securities laws. Given that Reg D has clear guidelines on when an offering qualifies as a private placement, Form D data likely capture a representative cross-section of private firms' fundraising activities.[3]

Using data from PitchBook, Table 1 examines the representativeness and characteristics of the types of issuers that file Form D. It shows that 60% of firms raising VC funding (according to PitchBook) also file a Form D.[4] Conversely, less than 20% of Form D filers are in PitchBook. We also see that Form D filers have investors in multiple states. (Filing Form D allows them to avoid complying with multiple states' security laws.) Form D filers are more likely to be located in states with low Form D notice filing fees and to have a service provider, such as a lawyer, involved in the fundraising process.[5] Table 1 also shows that, relative to nonfilers, Form D filers are more likely to have a utility patent, raise follow-on funding three or more years after they raise their first round, and exit through an IPO or an acquisition. AT2 uses a chi-squared goodness of fit test to show that, while the geographic distribution of issuers filing Form D does not mirror the distribution of all U.S. small businesses, it is

[2] Although the filing is not a condition for the exemption, Reg D allows a court to disqualify issuers from future use of any Reg D exemption if they do not comply with the Form D requirement (Rule 507). Nevertheless, it is possible that some firms simply ignore filing Form D, even without relying on other exemptions, because Rule 507 is rarely enforced.

[3] Issuers can use other, more restrictive offering exemptions to avoid filing Form D, including (1) SEC Rule 701, provided that security sales are to the firm's officers, advisers, employees, and consultants and that the sales are for compensation purposes; (2) SEC Rule 147, Rule 147A, and the 1933 Act Section 3(a)(11), the intra-state exemption, provided that all investors are in the same state as the issuer; (3) SEC Rule 1001, provided that the firm is raising less than $5 million and is located in California, and that a majority of its shareholders are located in California; and (4) SEC Reg S, provided that all investors are non-US residents.

[4] Ewens and Malenko (2020) show that Form D covers about 65% of all VC funding rounds in VentureSource from 2010 to 2017. They also show that Form D filers are older than and raise more capital than non-filers, and are more likely be located outside California.

[5] Although filing a Form D with the SEC is free, several state security regulators require a Form D notice filing, which requires that the issuer also pay a fee to state regulators.

more representative of this distribution than the distribution of VC-backed startups is, as the chi-square test statistic for the distribution of Form D issuers is almost half as large as the test statistic for the distribution of VC-backed issuers.

[INSERT Table 1 ABOUT HERE.]

Form D includes the following information about the issuer and the offering: name; names of the issuer's executives, directors, and promoters; specific exemption from registration that the issuer is claiming; date the issuer began fundraising; number and types of investors (accredited or non-accredited) participating in the offering; and names and locations of brokers participating in the offering.

In 33% of all filings, issuers hire registered or unregistered brokers to intermediate their offerings.[6] FINRA directly regulates registered brokers, but, aside from the SEC, there is no assigned regulatory authority over unregistered brokers (commonly known as private placement finders). The Securities Exchange Act of 1934 requires that any third party "engaged in the business of effecting transactions in securities for the account of others" be registered as a broker with the SEC or relevant state authorities. Over time, through various no-action letters, the SEC has created an exemption ("the finders exemption") from broker registration with the SEC and states. This exemption allows various unregistered brokers to participate in the fundraising process.[7] These finders now account for 20% of all brokered offerings.

In terms of regulation, there are two major differences between registered and unregistered brokers. First, the SEC's guidance suggests that if a broker introduces investors to issuers but does not give advice on the investment structure or the suitability of the investment, then the broker is not "effecting transactions in securities"

[6] From my conversations with some of these brokers, they typically approach and offer assistance to issuers in their informal network that are looking to raise funding (about 70% of cases). Sometimes issuers reach out to brokers for help, again through the broker's informal network (about 30% of cases). Only rarely is contact made through a cold call to the advisory or brokerage firm.

[7] The SEC recently codified this exemption to make it generally applicable, since no-action letters, which are correspondences between the SEC and the person making the request, might not be broadly applicable to all unregistered brokers.

and is exempt from broker registration. By contrast, FINRA *requires* registered brokers to advise investors on investment suitability. FINRA's suitability rule (FINRA (2010)) requires that, before each offering, the registered broker investigate the issuer and its management, the assets held by the issuer, the business prospects of the issuer, and the intended use of the proceeds of the offering. Failure to perform this due diligence or recommend suitable investments can lead to enforcement action by FINRA and state regulators.

Second, according to the SEC guidance, unregistered brokers are not considered to be "engaged in the business" if they receive compensation for the introductions but do not link their compensation to the success of the actual fundraising. By contrast, registered brokers can tie compensation to fundraising success and advise firms on how to structure the offering.

## *A. Brokered Offerings and the JOBS Act*

As part of the Jumpstart Our Business Startups (JOBS) Act of April 2012, the SEC removed the ban on general solicitation and advertising in Rule 506 offerings. Following the change, an issuer using Regulation D could solicit a wider audience of investors, provided that all investors participating in the offering are accredited and the issuer takes reasonable steps to verify investors' accreditation status. The change also amended Form D, allowing issuers to check a box indicating whether they used the general solicitation exemption. As of March 2021, 13,500 unique issuers had used the general solicitation exemption to raise about $700 billion in funding.[8] The general solicitation exemption has an advantage over the general private placement exemption, 4(a)(2), because an issuer relying on 4(a)(2) cannot advertise.

[8] I computed these statistics from the raw unfiltered Form D data, which include operating and investment firms.

# III. Data and Summary Statistics

## *A. Sample Construction*

Given my focus on brokered offerings, my first step is to identify offerings that involve broker participation and then classify the broker by registration status. To this end, I begin with all brokers listed on Form D. I merge this list to the list of all current and previously registered brokers and investment advisers (the registered representatives' data), which I collect from FINRA's BrokerCheck and the SEC's Investment Advisor Public Disclosure (IAPD) websites. In addition to the broker's name, most offerings involving a broker also list the broker's Central Registration Depository (CRD) number—a unique identifier for a broker or investment adviser—when available. To identify which brokers are registered at the time of the offering, I merge these CRD numbers with the registered representatives' data. For broker names with no CRDs, I use the broker's name and location (also listed on Form D) to match her to the registered representatives' data. I classify a broker as registered if the SEC or FINRA lists her as registered in the same year that an issuer lists her on Form D. Otherwise, I classify the broker as unregistered. Appendix VI.B provides further details on this classification process.

To learn about the extent to which search costs and information costs drive issuer-broker matching, it is useful to focus on a homogeneous set of issuers in brokered and non-brokered offerings. As such, I focus on issuers raising equity and filing their first Form D. Focusing on equity offerings eliminates any effect of security choice on broker-issuer matching; keeping only the first offerings reduces the selection effect, on issuer-broker matching, of the success or failure of previous fundraising attempts. To isolate an issuer's first set of filings, I link all amended filings to the original using the original's accession number, a unique identifier for each filing. Offering proceeds is the amount reported on the last amended filing of an issuer's first set of filings. See Appendix VI.A for a specific example of how I calculate funding raised. My test

sample comprises issuers raising early-stage funding and filing Form D from 2010 to 2019.[9]

Another advantage of focusing on early-stage offerings is that, by combining the data with other sources, we can observe post-funding outcomes and the types of investors participating, such as venture capital (VC) investors. I collect data on IPOs and acquisitions from PitchBook, Crunchbase, and Securities Data Company (SDC) Platinum. After deduplicating the outcome data, I merge firms with IPOs or acquisitions from these databases to Form D issuers by name and the state where the issuer is located.[10] I also collect data on issuer closures. For each issuer, I instructed research assistants to search the corporate registry in the state the issuer reports as its principal place of business on Form D. I classify an issuer as inactive if the issuer's registration in that state is not active.[11] To identify offerings with VC participation, I merge funding rounds involving venture capital groups in PitchBook to Form D. A round is venture backed if a deal involving a VC in PitchBook matches a sample offering's issuer name, fundraising quarter, and state of operation. I also use PitchBook's data to identify zip codes where VCs are located.

Finally, I collect zip code characteristics on the number of accredited investors from the IRS summary of income (SOI) data, and gather data on whether an issuer obtained a patent from the USTPO as of December 2019 by merging the list of Form D issuers with patent assignees in the patent grant data from the USTPO. Table AT1 shows all data sources and defines all variables used in this study.

[9] See Table AT3 in the Internet Appendix for details on various sample filters.

[10] I use the python package *fuzzywuzzy* and require at least a 97% match rate of the name after first matching on state.

[11] To filter out inactive registrations driven by acquisitions, I rely on data from Crunchbase, PitchBook, and SDC Platinum.

## *B. Descriptive Statistics*

In this subsection, I first describe general fundraising patterns and compare the characteristics of brokers that are and brokers that are not involved in private offerings. I then turn to the issuers in my test sample, describing their fundraising patterns, geographic and industry dispersion, and offering characteristics. In describing these characteristics, I highlight differences between issuers in brokered and issuers in non-brokered offerings.

### *B.1. Fundraising by All Form D Filers*

The unfiltered Form D data include about 400,000 filings by 160,000 unique issuers from 2010 to 2019. Panel A of Table 2 shows the number of original and amended filings each year of the sample period, the number of unique issuers, the total dollar amount raised (in billions), and the mean and median dollar amounts raised (in millions). The total amount of funding raised is increasing steadily each year, from about $500 billion in 2010 to about $1.1 trillion in 2019, a growth rate of approximately 100%.[12] Funding raised is highly skewed, as the mean amount is about 20 times the median. As shown in Column (4) of Panel A, the median amount of funds raised is about $1 million. In addition, the number of unique issuers is also increasing every year. This growth in funding raised and the number of issuers underscores the importance of private placements as a source of funding. We also see that, on a size-weighted basis, one in three offerings involves a broker, a trend that has largely held steady over the sample period.

[INSERT TABLE 2 ABOUT HERE.]

[12] Yearly proceeds in Table 2 are lower than those reported in Bauguess et al. (2015) because I winsorize funds raised at the 1% and 99% levels to ensure their robustness to misreporting or outliers.

### *B.2. Which Brokers Participate in Form D Offerings?*

To characterize the brokers participating in Form D offerings, I merge the universe of brokers in all offerings to the registered representatives' data described in section III.A. *Form D B. Firms* is an indicator that equals one for brokerage firms in Form D offerings that have been matched to the registered representatives' data.

Table 3 shows that registered brokers are involved in several lines of business besides selling private shares, which Form D offerings capture. The brokers in Form D offerings also sell over-the-counter equity and debt securities and mutual funds, implying that selling private shares is only one source of their revenue. Brokerage firms involved in Form D offerings employ more brokers and are more likely to have current and past employee disclosures, which I define using the 23 categories of disclosures in Egan et al. (2019). On average, brokers in Form D offerings have been in business for about 15 years, where age is defined as the difference between the year of the offering and the year the brokerage firm was formed.

[INSERT TABLE 3 ABOUT HERE.]

### *B.3. Fundraising by Sample Issuers*

My test sample comprises 28,000 private operating firms that filed a first Form D between 2010 and 2019. Panel B of Table 2 shows yearly fundraising patterns for the issuers in my sample. The issuers raise about $7 billion to $13 billion a year in total, with a yearly per-issuer average of approximately $3 million and a per-issuer median of roughly $0.5 million. According to PitchBook and Crunchbase, the average seed round from 2010 to 2019 was about $1 million. Thus, the $0.5 million median amount suggests that more than half of Form D filings are made by firms raising seed capital. Registered and unregistered brokers participate in about 4% and 3% of these offerings, respectively. Brokers raise between 6% and 14% of all funding. Issuers that do not use brokers raise funding by selling their shares directly to investors. Seventy percent of the unregistered brokers in my sample were former brokers, where a former

broker is defined as a broker that is no longer registered with FINRA at the time of the Form D filing.

### *B.4. Geography and Industry of Sample Issuers*

To compare outcomes of issuers within the same regulatory, legal, and economic environment, all tests focus on issuers within the same state-industry-year. This implies that my tests comprise only state-industry-years with at least two issuers. Figure 1 shows the location of issuers in brokered and non-brokered offerings by state. Most issuers in brokered and direct offerings are located in California, Texas, New York, and Florida.

[INSERT FIGURE 1 ABOUT HERE.]

Figure 2 shows the proportion of issuers within each industry. About 50% of issuers are in the Technology category, and the distribution of brokered and direct offerings is roughly even across the various industries. Because Technology issuers typically lack collateral to pledge for a bank loan, the high proportion of these issuers in my sample implies that most of my issuers are unlikely to qualify for bank financing.

[INSERT FIGURE 2 ABOUT HERE.]

### *B.5. Issuer and Offering Characteristics by Placement Method*

Table 4 reports descriptive statistics, by offering type, for issuers that filed a first Form D between 2010 and 2019. About 23% of issuers in direct (non-brokered) offerings exit (as of the third quarter of 2021) via an acquisition or an IPO, vs. 17% of issuers in brokered offerings, 21% of issuers in registered-broker offerings, and 11% of issuers in unregistered-broker offerings. In addition, 17% of issuers in direct offerings raise a future round of funding three or more years following the current round, compared with 13% and 9% of issuers in registered- and unregistered-broker offerings, respectively. In direct offerings, 12% of issuers hold at least one utility

patent that they applied for before the offering, and 19% of issuers likely closed or went bankrupt following the offering (as of the third quarter of 2021). By comparison, 22% of issuers in registered-broker offerings and 23% of issuers in unregistered-broker offerings likely closed or went bankrupt following the offering.

[INSERT Table 4 ABOUT HERE.]

Issuers in direct offerings are more likely to be geographically closer to VCs: 54% of these issuers have at least one VC in their zip code, *I(VC Zip)*, vs. 49% and 39% of issuers in registered-broker and unregistered-broker offerings, respectively. Conversely, issuers in unregistered-broker offerings are more likely than issuers in direct offerings to have an unregistered broker in their zip code, *I(Unrg. Broker Zip)*, and issuers in registered-broker offerings are more likely than issuers in direct offerings to have a registered broker in their zip code, *I(Rg. Broker Zip)*. In addition, the percentage of accredited investors is higher in the zip codes of issuers in direct offerings (12%) than in the zip codes of issuers in registered-broker (11%) and unregistered-broker (9%) offerings. Taken together, these facts suggest a geographic element to issuer-broker matching—a point we investigate in subsequent sections.

Turning to fundraising outcomes, Table 4 also shows that, unconditionally, issuers in direct offerings raise more funding ($3 million), on average, than issuers in unregistered-broker offerings ($2 million) but less funding than issuers in registered-broker offerings ($4 million). On average, issuers pay about 5% of the offering amount in fees to the broker. As Figure 3 shows, the fee percentage is typically higher for unregistered-broker offerings, as these offerings tend to be smaller.

[INSERT FIGURE 3 ABOUT HERE.]

I next consider the investors that participate in these offerings. I find that unregistered-broker offerings are likely to be marketed to non-accredited investors (*I(Non Accredited Investor)*), while non-brokered offerings are more likely to attract VC investors

(*I(VC Investment*). In addition, we see that 18% of the issuers in unregistered-broker offerings engage in general solicitation and advertising (*I(Used advertising)*), vs. 11% of issuers in registered-broker offerings and 4% of issuers in direct offerings.

To capture an issuer's network, I take advantage of the Form D requirement that issuers list their executives. I hypothesize that issuers with more executives (whose contacts can be tapped for funding) have a larger network in general. On average, the number of executives listed on Form D (*# Executives*) is larger for issuers in registered-broker offerings (about 4 executives) than for issuers in direct or unregistered-broker offerings (about 3 executives each).[13]

# IV. Results

## *A. Broker-Firm Matching*

In this section, I explore why issuers use brokers. Existing theory suggests two main reasons: search-cost reduction and certification. As proxies for search costs, I use several measures that capture an issuer's distance to, and network of, potential investors. The first is an indicator for whether an issuer has a VC in its zip code, *I(VCs Zip)*. The second is the fraction of investors in the issuer's zip code that are accredited (make over $200,000 a year), *% Zipcode Accredited Investors*. The third is the number of executives the issuer employs, *Ln(# Executives)*. The intuition behind the first two measures is that issuers that are closer to potential investors have lower search costs because they are more likely to directly match with investors. The intuition for the third is that issuers with more executives have a larger network

[13] I also show that *# Executives* is a reasonable proxy for firm size, as larger issuers need—and list—more executives. Appendix Figure AF2 shows that the number of executives correlates positively (0.60) with firm assets for a sample of public issuers that filed Form D (following a PIPE offering) but are not part of this study. This result suggests that the number of executives is also a suitable proxy for size. Using data from PitchBook, Appendix Table AT4 shows that issuers primarily list founders and senior executives on Form D.

of potential investors (discussed above), which also lowers search costs. To the extent that search costs drive issuer-broker matching, I expect higher values of these measures to be negatively associated with matching.

If certification drives issuer-broker matching, we would expect that when investors can easily judge issuers to be of high quality, the issuers are less likely to match with brokers. As a proxy for issuer quality, I use *I(Has Patent)*, an indicator variable that equals one if an issuer has at least one utility patent according to the USTPO, and zero otherwise.

I also include measures of the distance between issuers and brokers to test the extent to which geography drives issuer-broker matching. Specifically, I define indicators for whether an issuer's zip code is home to an unregistered broker, *I(Unrg. Broker Zip)*, or a registered broker, *I(Rg. Broker Zip)*.

The final association I examine is the relationship between general solicitation and issuer-broker matching. *I(General Solicitation)* is an indicator that equals one for issuers relying on general solicitation following the JOBS Act. The effect of general solicitation on issuer-broker matching is ambiguous. On the one hand, we might expect issuer-broker matching to decline following the act because the issuers' search for investors is no longer confined to the issuers' network. Consistent with this argument, Figure 4 suggests that issuers with a small network (which I proxy for using an indicator that equals one if a firm has only one executive listed on Form D) are more likely to respond to the change by soliciting investors, suggesting that the change likely relaxed search costs. On the other hand, brokers, who might be more knowledgeable than issuers about which investors to target, can also participate in offerings that use general solicitation. This suggests that general solicitation could increase the likelihood of issuer-broker matching, as the broker's set of potential investors also increases.

[INSERT FIGURE 4 ABOUT HERE.]

To estimate the association between these variables and the likelihood of issuer-broker matching, I use the following pooled OLS regression:

$$
\begin{aligned}
\textit{I(Used Broker)}_{fjst} = \quad & \beta_1 \text{I(Unrg. Broker Zip)}_{fjst} + \beta_2 \text{I(Rg. Broker Zip)}_{fjst} \\
& + \beta_3 \text{I(VC Zip)}_{fjst} + \beta_4 \text{Ln(\# Executives)}_{fjst} + \beta_5 \text{I(Has Patent)}_{fjst} \\
& + \beta_6 \text{\% Zipcode Accredited Investors}_{fjst} + \beta_7 \text{I(General Solicitation)}_{fjst} \\
& + \Gamma X_{fjst} + \lambda_{stj} + \epsilon_{fjst}.
\end{aligned} \tag{1}
$$

I vary the definition of the main independent variable, *Used Broker*, to compare different groups. In Column (1) of Table 5, *Used Broker* is an indicator that equals one if the issuer uses a broker, and zero otherwise. In Column (2), it is an indicator that equals one if the issuer matches with an unregistered broker, and zero if the issuer does a direct offering. In Column (3), it is an indicator that equals one if the issuer matches with a registered broker, and zero if the issuer does a direct offering. And in Column (4), it is an indicator that equals one if the issuer matches with an unregistered broker, and zero if the issuer matches with a registered broker.

Table 5 presents results from estimating equation 1. I standardize *% Zipcode Accredited Investors* and *Ln(# Executives)* to have a mean of zero and a standard deviation of one. Column (1) shows that issuers located close to brokers and far from VCs are more likely to match with brokers; an issuer with an both an unregistered and a registered broker in its zip code is 5% more likely to match with a broker. Given the 7% unconditional probability of issuer-broker matching, this represents a 71% increase in the probability of matching with a broker. However, having a VC in the issuer's zip code reduces the probability of issuer-broker matching by 2%, a 28% decrease in the probability of issuer-broker matching relative to the unconditional mean.

[INSERT TABLE 5 ABOUT HERE.]

The results in Columns (2) and (3) show that the distance to a VC has a similar effect on issuer-broker matching for both broker types, although the effect is stronger for unregistered brokers. Column (2) also shows that, compared with issuers doing direct offerings, issuers in unregistered-broker offerings are more likely to be located in zip codes with few accredited investors. Estimates imply that a standard deviation increase in the fraction of accredited investors in the issuer's zip code reduces the probability of an issuer-unregistered broker match by 0.6%, a 15% decrease relative to the unconditional probability of unregistered-broker use. Similarly, the coefficient on *Ln(# Executives)* suggests that search costs drive issuer-unregistered broker matching more than other match types. My estimates in Column (2) imply that, compared with issuers in direct offerings, issuers in unregistered-broker offerings employ fewer executives (i.e., have smaller networks). In addition, the Column (3) results show that issuers with more executives are more likely to use registered brokers than unregistered brokers. These findings support the conclusion that search costs are an important driver of issuer-broker matching and especially of issuer-unregistered broker matching.

Turning to the certification channel, I do not find a significant relationship between my proxy for ex ante issuer quality, *I(Has Patent)*, and placement method. The results in Columns (1), (2), and (3) also show that general solicitation likely increased issuer-broker matching, as issuers that rely on general solicitation are 10% and 8% more likely to use unregistered and registered brokers, respectively.

Overall, the results in this section support the hypothesis that search costs drive issuer-broker matching, especially issuer-unregistered broker matching. To further understand the brokers' role, I turn to the characteristics of investors in brokered offerings in the next section.

## B. *Broker-Investor Matching*

The characteristics of investors participating in brokered offerings can also shed light on the brokers' role in the market for early-stage funding. If brokers reduce search costs and/or certify issuers, we would expect that investors with the ability to investigate issuer quality and investors with low search costs would be less likely to use brokers.

I consider two investor characteristics: an indicator that equals one if a VC firm invested in the offering, and zero otherwise (*I(VC Investment)*); and an indicator that equals one if any non-accredited investors participated in the offering, and zero otherwise (*I(Non-Accredited Investor)*). Non-accredited investors are retail investors that make less than $200,000 if single and less than $300,000 if married. Recall that *I(VC Investment)* is an indicator that equals one for venture-backed deals in PitchBook that match to a Form D filing on issuer name, fundraising quarter, and the state where the issuer is located. To the extent that brokers reduce search costs and/or certify issuers, we expect VC participation in brokered offerings to be low and non-accredited investor participation in brokered offerings to be high.

To test this hypothesis, I estimate the following reduced-form model using OLS:

$$\textit{Investor characteristics}_{fjst} = \beta_1 \text{I(Used Broker)}_{fjst} + \Gamma X_{fjst} + \lambda_{jst} + \epsilon_{fjst}, \quad (2)$$

where *Investor characteristics* is either *I(VC Investment)* or *I(Non-Accredited Investor)* and control variables are the same as in previous sections. Panel A of Table 6 shows the results for the association between issuer-broker matching and the likelihood of VC participation, while Panel B shows results for the the association between issuer-broker matching and the likelihood of non-accredited investor participation.

[INSERT TABLE 6 ABOUT HERE.]

As hypothesized, the results in Panel A show that VCs are more likely to directly invest instead of investing through brokers. From Column (1), we see that brokered offerings are 4% less likely to include VCs. Given the unconditional likelihood of VC participation of 20%, this implies that VCs are 20% less likely to be involved in brokered offerings than in non-brokered offerings. When we directly compare registered to unregistered broker offerings in Column (4), we see that VCs are 5% less likely to participate in unregistered-broker offerings than in registered-broker offerings, a 25% decrease relative to the unconditional mean.

Panel B shows estimates for the likelihood of non-accredited investor participation in brokered offerings. Column (1) shows that non-accredited investors are equally likely to invest in brokered and direct offerings. However, a more nuanced story emerges from the estimates in Columns (2) and (3). The estimates there show that unregistered brokers are more likely to place their offerings with non-accredited investors than registered brokers are. Column (2) of Panel B indicates that, compared with issuers raising funding directly, issuers matching with unregistered brokers are 8% more likely to sell shares to non-accredited investors. Non-accredited investors participate in about 10% of all offerings, so their participation is 80% higher when unregistered brokers are involved. When, in Column (4), when we restrict the sample to brokered offerings, the results show that non-accredited investors are even more likely to participate in offerings involving unregistered brokers than in offerings involving registered brokers.

I discuss one possible reason for low non-accredited investor participation in registered-broker offerings in Section II. Recall that FINRA's due-diligence requirements for registered brokers in private offerings make it easier for investors to sue, go into arbitration, or join class action lawsuits against registered brokers for failing to conduct adequate due-diligence on an issuer.[14] Registered brokers might respond to this risk

[14] For example, see this example of a law firm soliciting investors for a class action lawsuit against a registered broker.

by actively preventing non-accredited investors from participating in the deals they intermediate.

Overall, this section's findings on the investors who use brokered offerings suggest that brokers play roles in both search and certification. Sophisticated investors, who are likely to have lower search costs and more experience identifying the best issuers, are less likely to participate in brokered offerings, while unsophisticated investors, who are likely to have higher search costs and less experience identifying the best issuers, are more likely to participate in them.

# V. Brokered Offerings and Issuer Outcomes

## *A. Empirical Strategy*

In the previous sections, I examined the extent to which the characteristics of issuers and investors participating in brokered offerings are consistent with brokers reducing search and/or information costs.

One could further infer the brokers' role and the most relevant financing constraints driving issuer-broker matching by assessing variation in the issuers' outcomes. If search costs are the dominant friction and if the brokers' primary role is to reduce these costs, one would expect issuers in brokered offerings to have similar outcomes to issuers in direct offerings, assuming search costs (which are likely to be very high for all of the first-time issuers in my sample) are not strongly correlated with issuer quality. However, if information about issuer quality is the dominant friction and if the brokers' primary role is to certify issuer quality to investors, one would expect issuers in brokered offerings to have better outcomes than issuers in direct offerings.

To test whether issuer outcomes vary by placement method, I estimate the following cross-sectional regression via pooled ordinary least squares (OLS):

$$Y_{fjst} = \quad \beta_1 \text{Used Broker}_{fjst} + \Gamma X_{fjst} + \lambda_{stj} + \epsilon_{fjst}. \tag{3}$$

The unit of observation is a first-time Form D filer. Y is an outcome (funding raised, an initial public offering, an acquisition, another round of financing raised three years after the first, or firm closure) for firm (f) in industry (j) located in state (s) raising funding in year (t). Other control variables, $X_{fjst}$, fix other issuer characteristics that might be simultaneously related to outcomes and broker use. $X_{fjst}$ includes firm age, size, whether an issuer filed for at least one utility patent with the USTPO before the offering, whether the issuer lists a promoter on Form D, and the fraction of investors in the issuer's zip code that are accredited. I define all variables in Table AT1. $\lambda_{stj}$ are state-year-industry indicators.

For each outcome variable, I vary the definition of the main independent variable, *Used Broker*, to make four comparisons: (1) all brokered offerings to direct offerings, (2) unregistered-broker offerings to direct offerings, (3) registered-broker offerings to direct offerings, and (4) unregistered-broker offerings to registered-broker offerings.

The results in the previous sections suggest that issuer-broker matching is not random even when I condition on restrictive state-year-industry fixed effects. Recall that these fixed effects allow me to compare two issuers doing business in the same industry, located in the same state, and raising funding in the same year. The fixed effects capture variation in local regulation over time (state-year fixed effects), aggregate changes in issuers' preference for different placement methods over time (industry-year fixed effects), and differences in industry-specific conditions across states (state-industry fixed effects).

Given the non-randomness of issuer-broker matching, OLS coefficients of the effect of issuer-broker matching on outcomes are likely to be biased. The magnitude and direction of the bias depends on the outcome variable of interest.

On the one hand, if brokers reduce search costs and/or certify issuer quality to investors, then brokers should cause issuers to raise more funding. To identify the causal effect of issuer-broker matching on offering proceeds in the ideal experiment, we would twice observe the offering proceeds for each issuer that matched with a broker: once following broker use (which we do observe), and once if the issuer never matched with a broker (the counterfactual we do not observe). Given that the issuers that use brokers are likely the ones that anticipate fundraising difficulties, we expect the OLS estimate from a regression of offering proceeds on an indicator for issuer-broker matching to underestimate the true effect of broker use on offering proceeds—a negative selection effect. To approximate the causal effect of issuer-broker matching on offering proceeds, I use the presence of brokers in the issuer's zip code as an instrument for whether the issuer matches with a broker.

On the other hand, controlling for the amount of funding raised and the type of investors participating in the offering, I do not expect brokers to cause issuers to have better post-funding outcomes. My hypothesis is that the treatment effect of broker use mainly comes from the caliber of investors to which they match issuers and the amount of funding they help issuers raise. Unlike VCs, brokers do not independently raise money from investors before identifying investments, so they are unlikely to be involved in post-funding monitoring of the issuer. Consequently, most of the difference in outcomes between brokered and direct offerings (controlling for funding raised and investor quality) likely results from issuer quality at the time of the offering (selection) and not from an independent effect of broker use on issuer outcomes (treatment). To test this hypothesis, I also use the presence of brokers in the issuer's zip code as an instrument for whether the issuer matches with a broker. If my hypothesis is true, using the instrument should remove any association between issuer-broker matching and post-funding outcomes.

Although we saw in the last section that hiring a broker is correlated with my instrument, a valid intervention (IV) must only affect proceeds and other outcomes

through its effect on issuer-broker matching (exclusion restriction) to be valid.

### A.0.1 Is Proximity to a Broker a Valid Instrument?

Although I cannot test the exclusion restriction, I provide several arguments to support its validity. One violation of the exclusion restriction could occur if issuers choose to start their businesses in the same zip codes as brokers because they anticipate that brokers might assist them with future fundraising. However, existing research on the location choices of entrepreneurs is inconsistent with this argument. Dahl and Sorenson (2009, 2012) show that entrepreneurs tend to start their businesses where they have family and friends. Consistent with this research, Figure 5 shows, using a 1% random sample from the American Community Survey, that most entrepreneurs were born in the state where they do business.[15] It is therefore unlikely that the location of brokers with private placement experience has a meaningful impact on where entrepreneurs choose to start their businesses.[16]

[INSERT FIGURE 5 ABOUT HERE.]

Another threat to the exclusion restriction could result from a common factor (related to issuer outcomes) driving issuers and brokers to similar locations. One such factor, in this setting, could be the presence of venture capitalists. Issuers might locate themselves near VCs in anticipation of future funding needs and post-investment advice, while brokers might locate themselves near VCs to provide support services such as underwriting and M&A advice. We directly control for this possibility by including an indicator that equals one for zip codes where a VC fund is located. Table 7

[15] There is, however, some cross-sectional variation. For example, 11% of entrepreneurs in Nevada were born in Nevada, whereas 82% of entrepreneurs in Michigan were born in Michigan.

[16] An alternative endogenous channel that could result in a violation of the exclusion restriction comes from brokers choosing branch locations that are close to potentially successful businesses. This alternative is less of a concern than the first because most of the brokerage firms were established before the startups in this sample: the average brokerage firm is 15 years old (see Table 3), whereas 87% of issuers are less than five years old (see Table 4). Nonetheless, some brokers may choose to locate themselves close to VCs because they know that the VCs are more likely to back successful startups. We address this possibility next.

supports the exclusion restriction by showing that, after controlling for distance to VCs, the presence of an unregistered or registered broker near an issuer is unrelated to fundraising or exits via an IPO or acquisition. From Table 7, we also see that controlling for the presence of VCs in the issuer's zip code removes the correlation between the distance to brokers and issuer outcomes.

[INSERT TABLE 7 ABOUT HERE.]

In sum, the evidence in this section suggests that, conditional on the presence of a VC in the issuer's zip code, the issuers' distance to registered or unregistered brokers is uncorrelated to issuer outcomes other than through its effect on issuer-broker matching.

## *B. Brokered Offerings and Outcomes*

### *B.1. Brokered Offerings and Fundraising*

If brokers mitigate search and/or information costs for issuers, we expect the issuers that use brokers to raise more funding with the help of the broker than without it. As discussed in the previous section, we do not observe the counterfactual of no broker use for issuers in brokered offerings. To approximate the causal effect of broker use on fundraising outcomes, I use the local availability of brokers as an instrument for issuer-broker matching by running the following two stage least squares regression:

$$\begin{aligned} \textit{I(Used Broker)}_{fjst} = \quad & \beta_1 \text{I(Unrg. Broker Zip)}_{fjst} + \beta_2 \text{I(Rg. Broker Zip)}_{fjst} \\ & + \beta_3 \text{I(VC Zip)}_{fjst} + \Gamma X_{fjst} + \lambda_{jst} + \epsilon_{fjst}. \\ \textit{Ln(Proceeds Raised)}_{fjst} = \quad & \beta_1 \widehat{\text{I(Used Broker)}}_{fjst} + \Gamma X_{fjst} + \lambda_{jst} + \epsilon_{fjst}. \quad (4) \end{aligned}$$

*Ln(Proceeds Raised)* is the log amount of funding the issuer raised, and $\widehat{\text{I(Used Broker)}}$ is the predicted probability of broker use using the local supply of brokers as an instru-

ment. Note that the instrument does not condition on whether the issuer actually hires a broker that is nearby, because that decision could be subject to the same endogeneity issues as the decision to hire a broker. Table 8 shows the results from estimating equation 4. In Column (1), where the independent variable is broker use irrespective of type, the instrument is an indicator that equals one if an issuer has an unregistered or a registered broker in its zip code. In Columns (2) and (4), where the independent variable is an indicator for unregistered broker use, the instrument is an indicator that equals one if the issuer has an unregistered broker in its zip code. In column (3), where the independent variable is an indicator for registered broker use, the instrument is an indicator that equals one if the issuer has a registered broker in its zip code.

[INSERT TABLE 8 ABOUT HERE.]

#### B.1.1 Instrumental Variable Estimates of Broker Use on Fundraising

In Column (1), we see that using a broker causes firms to raise about 161% more funding. For a median issuer that raises $500,000, this estimate implies an $805,000 increase in offering proceeds. We see even larger effects in Columns (2) and (3) when we compare issuers in unregistered and registered broker offerings to issuers in direct offerings. For the median issuer, the estimates imply a treatment effect of $1.125 million and $1.282 million for matching with an unregistered broker and a registered broker, respectively. In Column (4), where we compare unregistered to registered brokers, the treatment effect does not appear to depend on broker type, although the instrument in this specification is weak.

Columns (1), (2), (3), and (4) show a Cragg-Donald Wald F Statistic (a weak-instrument test (Stock and Yogo (2002)) of 71.04, 51.24, 41.41, and 8.28, respectively. A 10% Stock-Yogo critical value of 16 implies that, except for Column (4), the instrument is not weak under very reasonable assumptions of IV bias relative to OLS. The IV estimates are also larger than simple OLS estimates, consistent with a negative

selection bias, as the issuers that match with brokers are those that expect positive benefits from broker involvement (corrective endogeneity in Jiang (2017)).[17]

In sum, the results of this section suggest that brokered offerings improve fundraising outcomes for issuers. The natural next question, which we turn to in the next section, is how brokered and non-brokered offerings perform post funding. Recall that if search costs are the dominant friction and brokers' primary role is to reduce them, we would expect issuers in brokered offerings to have similar outcomes to issuers in direct offerings, assuming that search costs (which are likely to be high for all the first-time issuers I study) are not strongly related to issuer quality. On the other hand, if information costs are the dominant friction and brokers' primary role is to certify issuer quality to investors, we would expect issuers in brokered offerings to have better outcomes than issuers in direct offerings.

### *B.2. Brokered Offerings and Post-Funding Outcomes*

This section presents OLS empirical estimates of equation 3, in which the dependent variable is an indicator that equals one for issuers that go public (IPO) or are acquired (Acquisition) by the fourth quarter of 2020, *I(Acquisition or IPO)*. For the next few tests, I limit the sample to issuers that filed their first Form D between 2010 and 2017 to allow time for an exit.

[INSERT TABLE 9 ABOUT HERE.]

Table 9 shows the results. Column (1) shows no difference in outcomes between brokered and direct offerings, but sharp differences emerge when brokered offerings are split by broker registration status in Columns (2) and (3). Issuers in unregistered broker offerings are 4% less likely to exit (Column (2)), and issuers in registered-broker offerings are 4% more likely to exit (Column (3)), than issuers in direct offerings.

[17] Recall from Table 4 that, unconditionally, issuers in unregistered-broker offerings raise less funding ($2 million vs. $3 million) than issuers in direct offerings, a relationship that flips when we quasi-randomly assign unregistered brokers to issuers using the instrument.

Column (4), which directly compares issuers using registered brokers to issuers using unregistered brokers, shows that the latter are about 7% less likely to have a positive exit.

If issuers in unregistered-broker offerings do not aim to exit via an IPO or acquisition but instead intend to provide a stable stream of cash flow for their investors, we might observe similar empirical estimates, which are not related to issuer quality or the treatment effect of broker use. To address this concern, Panels B and C of Table 9 estimate equation 3 by changing the outcome variable to an indicator. In Panel B, *I(Raised Future Round)* equals one if an issuer raises a round of funding three or more years after its current round, and zero otherwise; and in Panel C, *I(Inactive)* equals one if an issuer is no longer registered with state securities regulators in the state where it operates as of the third quarter of 2021, and zero otherwise. Note that issuers raising a future round of funding are also more likely to exit and less likely to close—the correlation between *I(Raised Future Round)* and *I(Acquisition or IPO)* is 0.28, and the correlation between *I(Raised Future Round)* and *I(Inactive)* is -0.07.

Panel B of Table 9 shows that issuers in brokered offerings are less likely to raise a future round of funding and that this difference is entirely driven by issuers in unregistered-broker offerings. Similarly, Panel C shows that issuers in brokered offerings are more likely to be inactive post-funding, and the difference is again largely driven by issuers in unregistered-broker offerings. The coefficients on other control variables are consistent with intuition: issuers that raise more funding, issuers that employ more executives, older issuers, issuers in VC-backed offerings, and issuers with a patent are all more likely to have a positive exit and to raise a future round of funding and less likely to close.

### *B.3. Does the Association between Issuer-Broker Matching and Post-Funding Outcomes Reflect Selection or Treatment?*

Recall from the discussion in section V.A that, controlling for offering proceeds and the type of investor participating in the offering (treatment), we do not expect brokers to have a significant causal effect on issuer outcomes; i.e., conditional on offering proceeds and investor type, we expect most of the correlation between issuer-broker matching and outcomes to be driven by selection. To empirically verify the validity of this assumption, I use the presence of brokers in the issuer's zip code as an instrument for whether the issuer matches with a broker and employ *I(Acquisition or IPO)*, *I(Raised Future Round)*, and *I(Inactive)* as outcomes to re-estimate equation 4. If the selection effect drives the association, then the use of the instrument, which isolates the treatment effect, should remove any association.

Panels A, B, and C of Table 10 present IV estimates for the treatment effect of issuer-broker matching on *I(Acquisition or IPO)*, *I(Raised Future Round)*, and *I(Inactive)*, respectively. In contrast to the positive treatment effect of broker use on fundraising, we see no effect of broker use on outcomes when we instrument for issuer-broker matching, consistent with the hypothesis that issuer quality at the time of the offering largely drives the effects in Panels A, B, and C of Table 9.

[INSERT TABLE 10 ABOUT HERE.]

Overall, the results in this section suggest that selection effects largely drive differences in outcomes between brokered and direct offerings at the time of the offering. As we see from Table 9, offerings involving VCs are significantly more likely to exit. Thus, we expect the pool of issuers approaching brokers to be of lower quality, as these issuers are likely to have been rejected by VCs.[18] The evidence in this section is consistent with registered brokers—but not unregistered brokers—partly undoing the

[18] Recall that VCs seldom invest in brokered offerings and that issuers likely prefer VC investment given the VCs' track record of helping issuers to successful exits.

selection effect of a VC-skimmed issuer pool, leading to worse post-funding outcomes for issuers in unregistered-broker offerings.

# VI. Conclusion

This study characterizes the types of issuers, investors, and brokers that participate in brokered early-stage offerings and explores which factors drive issuer-broker matching. I show that, while one in three offerings in the private funding market involves a broker, brokers on a size-weighted basis intermediate about one in ten transactions for first-time issuers in the market for early-stage funding. About 60% of these brokers are registered with FINRA or the SEC, while 40% are unregistered, with 70% of unregistered brokers being formerly registered brokers.

Consistent with search costs driving issuer-broker matching, I find that the likelihood of matching is higher when issuers are far from investors, when the issuer's network is smaller, and when the issuer is close to the broker. These findings hold irrespective of the broker's registration status. I also show that VCs seldom participate in brokered offerings and that unregistered-broker offerings are more likely to place with non-accredited investors. A possible explanation for the latter finding is that registered brokers try to avoid the costs of investor complaints post offering. Using the local presence of brokers as an instrument, I show that brokers cause issuers to raise more funding and that selection effects at the time of the offering drive the association between issuer-broker matching and issuer outcomes. Overall, my findings are consistent with a model in which unregistered brokers mainly reduce search costs but registered brokers reduce search costs *and* screen issuers.

My results have policy implications, given recent changes and contemplated future changes to startup fundraising in private markets. The SEC recently proposed expanding the role of unregistered brokers by eliminating ambiguity about when these

brokers are allowed to intermediate private offerings.[19] Regulators might consider carefully enforcing rules on the types of investors participating in unregistered-broker offerings, as investors in these offerings might not understand the brokers' role or the adverse selection that is inherent in these offerings.

[19] Here is the press release announcing the change.

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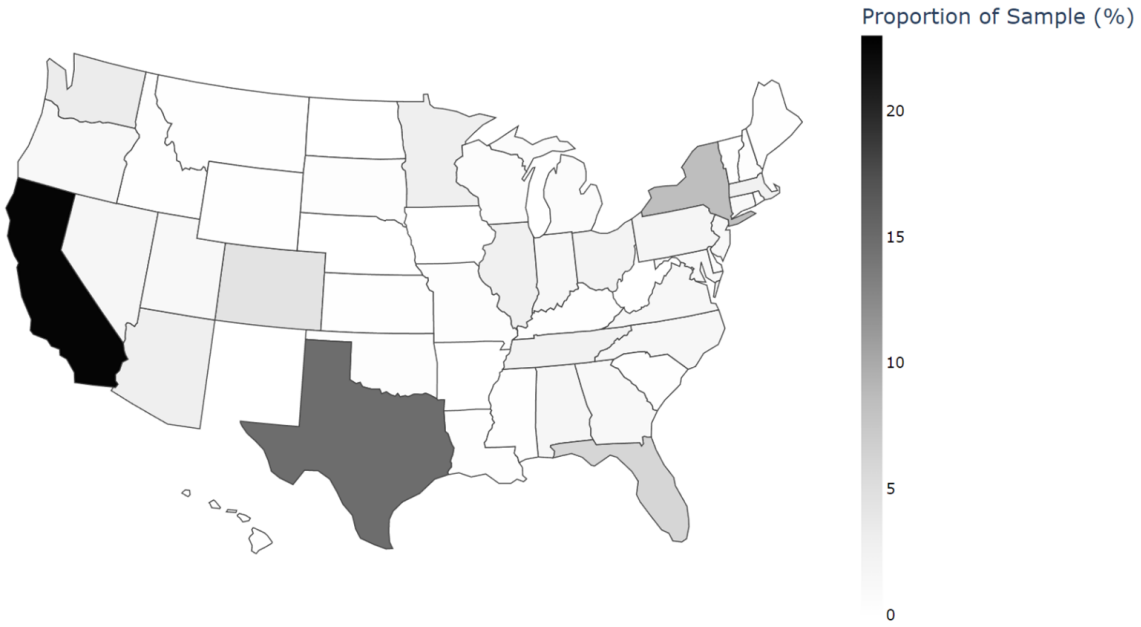
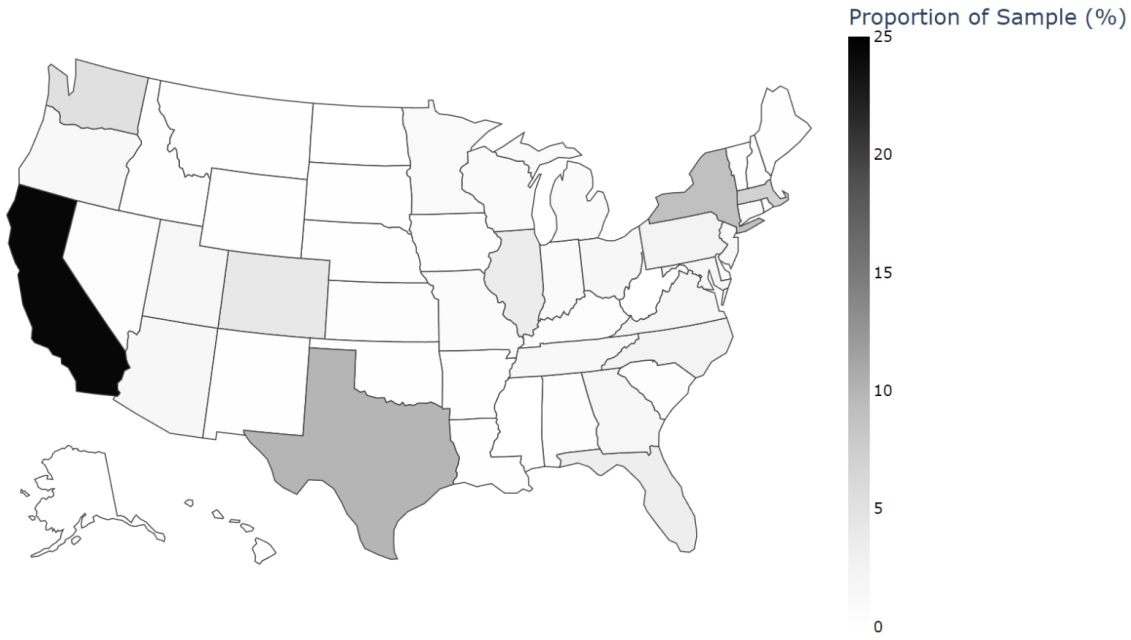



**Panel A:** Location of Issuers in Brokered Offerings




**Panel B:** Location of Issuers Non-Brokered Offerings

**Figure 1: Location of Issuers in Direct Offerings**
Figure 1Panel A shows the proportion of sample issuers in brokered offering by state, while Figure 1Panel B shows the proportion of sample issuers in non-brokered offerings. *Proportion of Sample (%)* is the number of issuers in the sample located in that state divided by the total number of issuers in the sample times 100. In 1Panel B, for example, about 10% of all issuers are located in Texas, 24% in California, and 0.54% in Kentucky. All states have at least one issuer. Alaska and West Virginia have the lowest number of issuers, two, representing about 0.007% of the sample.

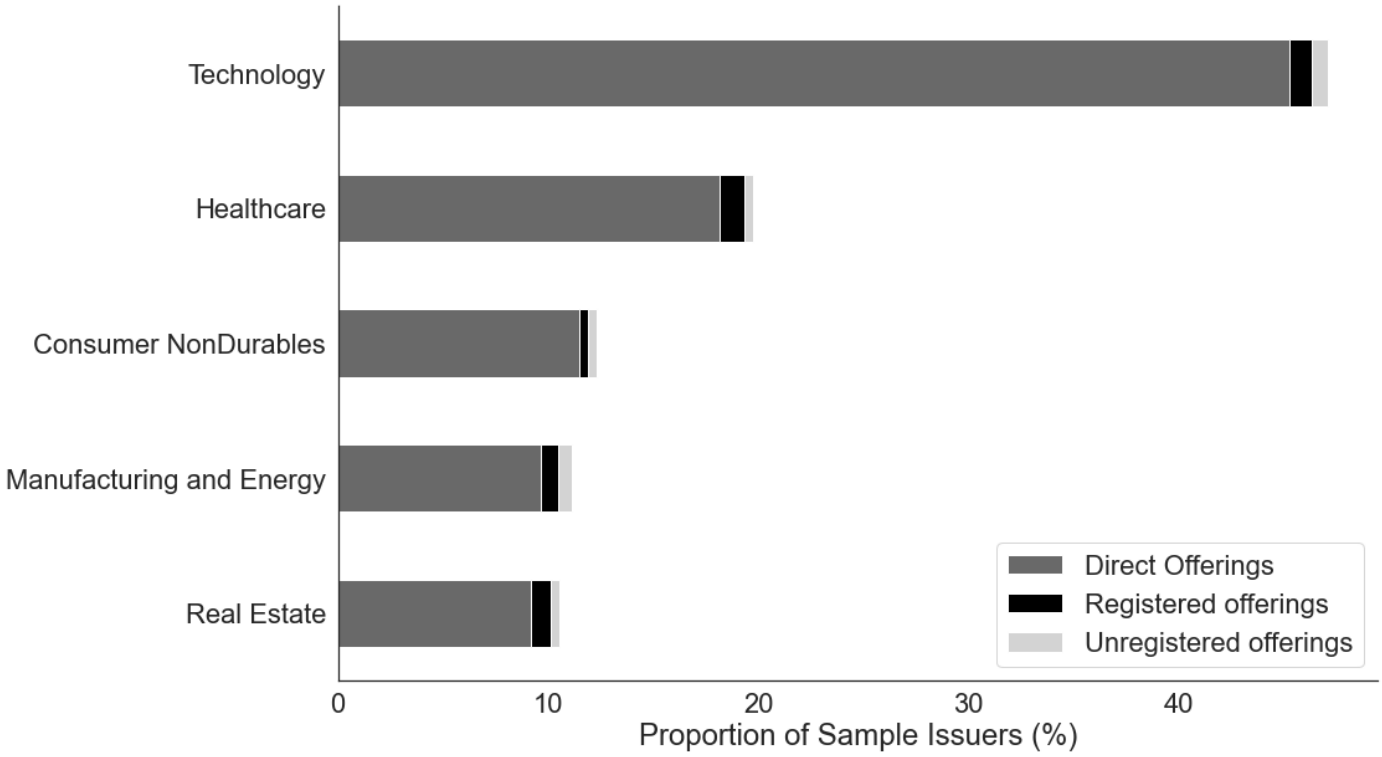



**Figure 2: Industry Distribution of Sample Issuers**
This figure shows the proportion of all the issuers in my sample that belong to each industry. Within each industry, the figure also shows the proportion of issuers that place their offerings directly as well as the proportion that use registered or unregistered brokers. In the ***Technology*** category, I group all firms that report their industry classification on Form D as Other Technology and Computers. I group firms that report their industry as Lodging and Conventions and Residential in the ***Real Estate*** category. The ***Manufacturing and Energy*** category comprises firms that report their industry as Manufacturing, Agriculture, Construction, Other Energy, Oil and Gas, Energy, Conservation, Environmental Services, Electric Utilities, Coal Mining, and Energy Conservation; ***Healthcare*** comprises Other Health Care, Biotechnology, Pharmaceuticals, Hospitals and Physicians, and Health Insurance; and ***Consumer NonDurables*** comprises Restaurants, Retailing, Business Services, Telecommunications, Other Travel, Tourism and Travel Services, and Airlines and Airports.

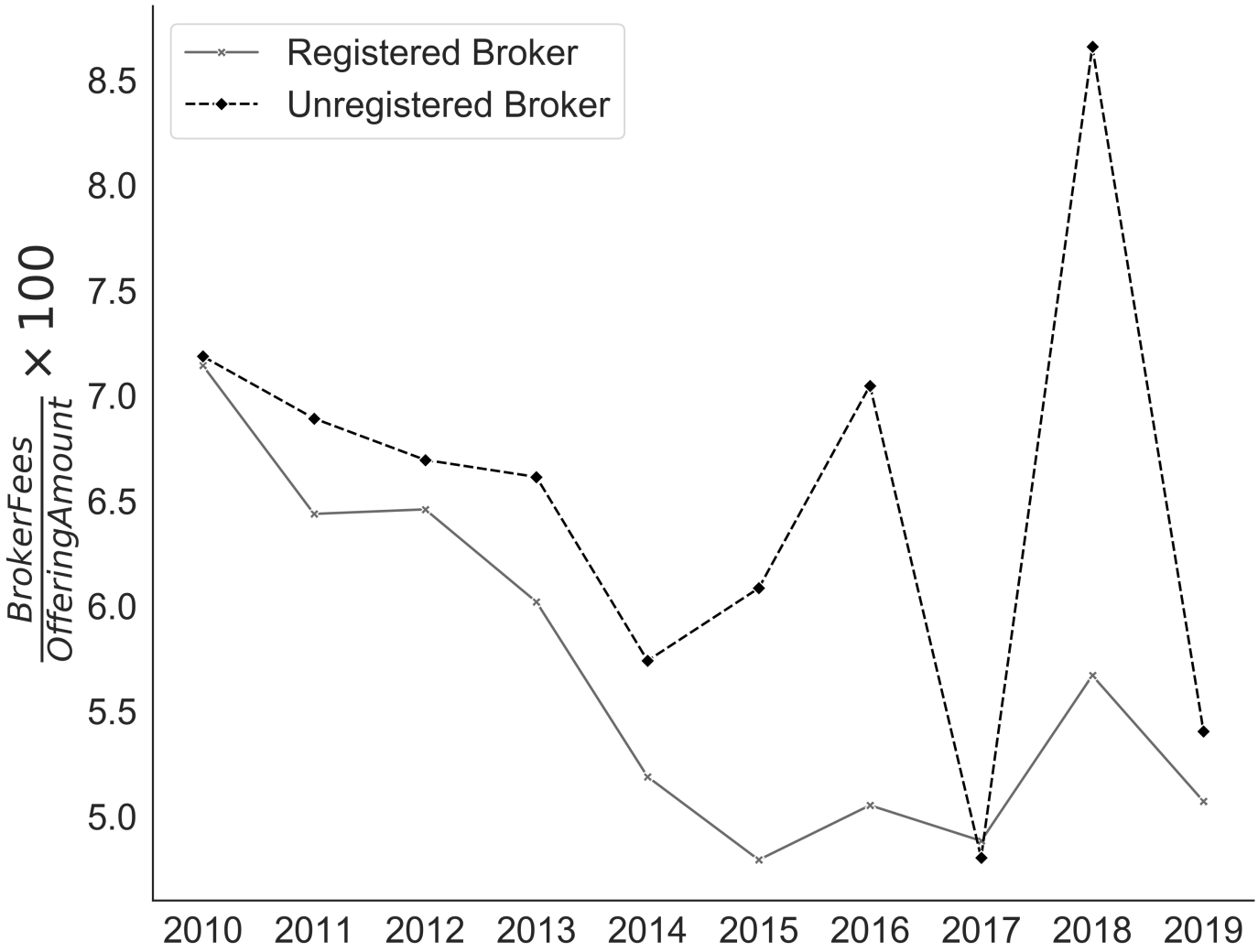



**Figure 3: Broker Fees by Registration Status**
This figure shows the percentage of the offering amount that is paid to the broker. The figure splits brokers by registration status, where *Unregistered Broker* is an indicator that equals one if the broker participating in the offering is not FINRA registered at the time of the offering.

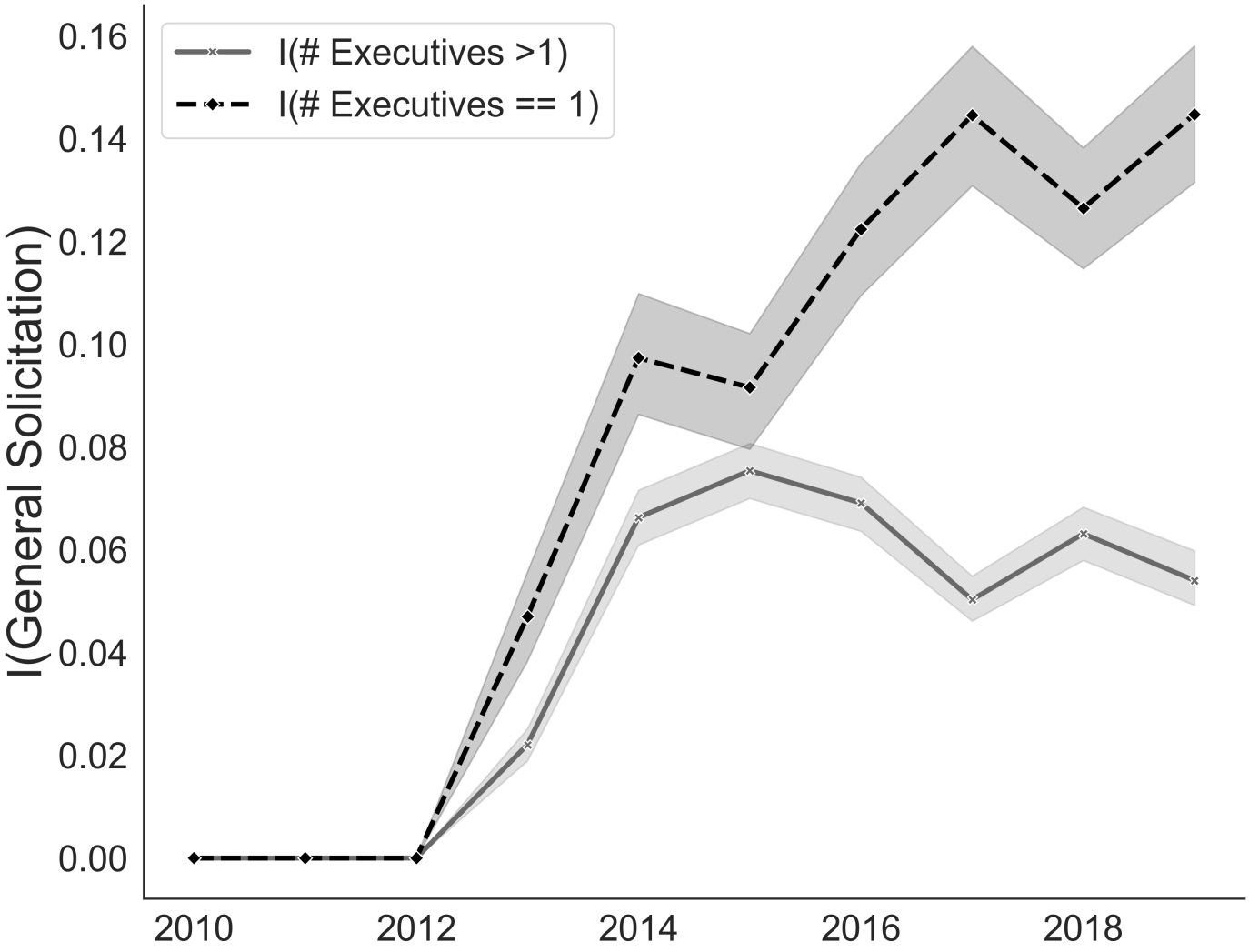



**Figure 4: Issuers Using General Solicitation**
This figure shows the proportion of issuers in my sample that used general solicitation following the repeal of the ban in September 2013. The figure splits issuers by the number of executives listed on their Form D, a proxy for the issuer's size. *I(# Executives ==1)* is an indicator that equals one if only one executive is listed on the issuer's Form D filing, and zero otherwise.

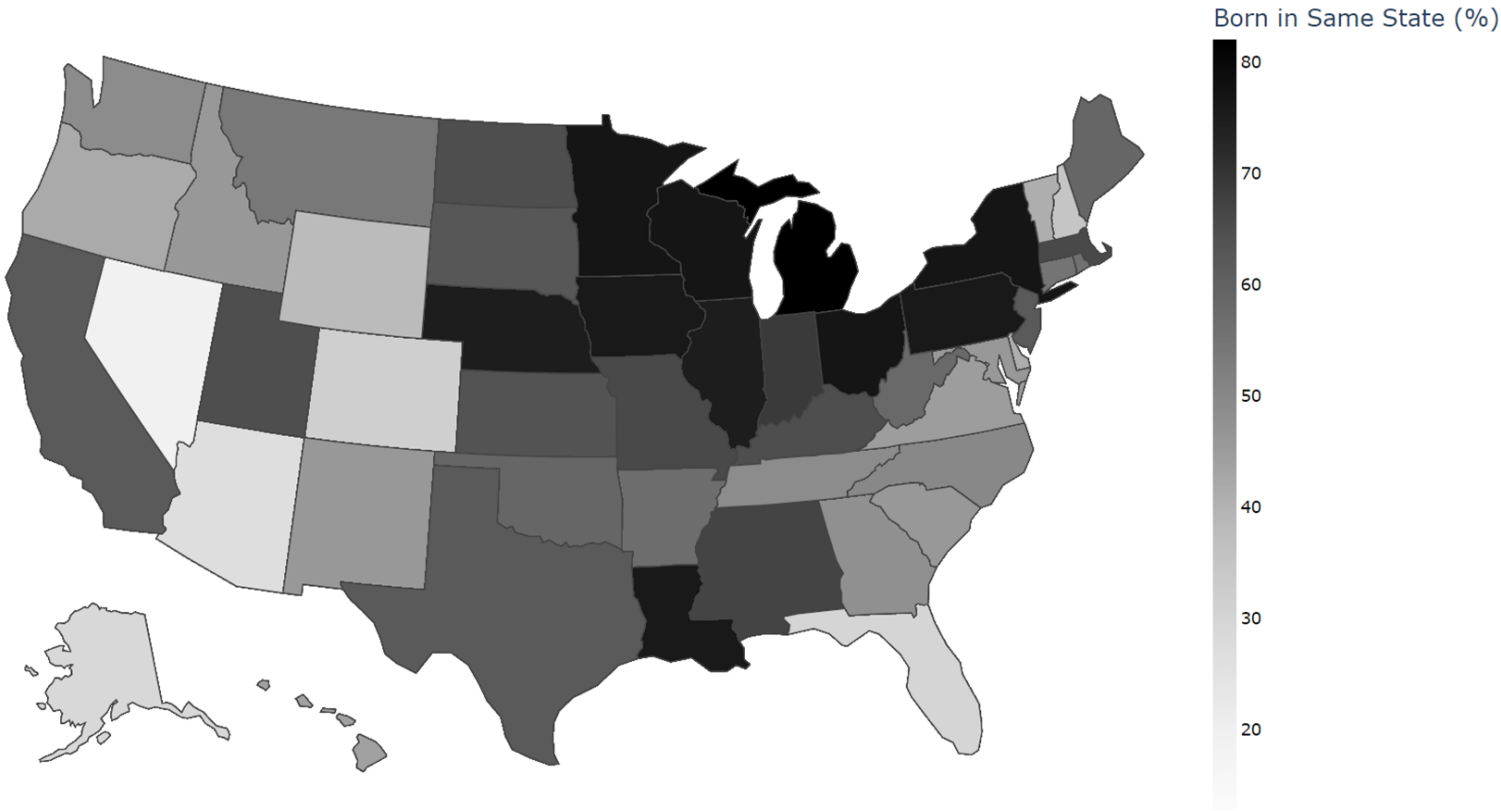



**Figure 5: Proportion of Entrepreneurs in a State Born in the Same State**
This figure plots the proportion of entrepreneurs in a state that were born in that state, *Born in Same State (%)*. This figure uses one year estimates from the American Community Survey from 2010 to 2019, which comprises a 1% national random sample of the population. To identify entrepreneurs in a state, I filter survey respondents that are self-employed, running their own incorporated business, and living in that state as of the year preceding the survey. For this set of entrepreneurs, I calculate the proportion that report also being born in that state and plot the average proportion from 2010 to 2019 in the figure above. While 11% percent of entrepreneurs in Nevada were born there (the minimum), 82% of entrepreneurs in Michigan were born there (the maximum).

**Table 1: Who Files Form D? Evidence from PitchBook**

This table reports characteristics of U.S.-based issuers in the PitchBook database split by issuers I matched, by name and state where the issuer is headquartered, to at least one Form D filed between 2010 and 2018. I selected issuers that are headquartered in the U.S., have data on date of business formation, and have raised a positive amount of venture funding. To capture VC funding rounds, I keep issuers whose deal types in PitchBook are: *Early Stage VC*, *Later Stage VC*, *Seed Round*, *Accelerator/Incubator*, and *Angel (individual)*. The unit of observation is a U.S.-based private operating firm in PitchBook, formed between 2009 and 2017, that raised some funding from outside investors. *# Service Provider* is a count of the number of service providers, such as lawyers, that PitchBook associates with each issuer. *# Unique Investor States* is the number of unique states where the issuer's investors are located. *Form D Filing Fees* is the cost of filing a Form D notice in the state where the issuer is located. If the cost depends on proceeds from the offering, the cost equals the maximum filing fee. *PE Hub* is an indicator that equals one for issuers headquartered in California, Massachusetts, or New York. *Funds Raised ($ Millions)* is the total amount of funding the issuer has raised. *I(Angel Investor)* is an indicator that equals one if an angel investor ever participated in the issuer's funding rounds. *# Executives* is the number of senior executives and founders of the issuer, as recorded by PitchBook. *# Unique Investors* is the number of unique investors that have invested in the company thus far. *Year Founded* is the year the company was formed. *Pitchbook Deal Number* is the number of unique fundraising rounds by the company. I define all other variables in the appendix. T-stat reports $t$-statistics from a difference in means test with significance reported according to: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

| | **No FormD** | | **Has Form D** | | |
|---|---|---|---|---|---|
| | **N = 16,699** | | **N = 28,820** | | |
| | Mean | Median | Mean | Median | T-stat |
| I(Acquisition or IPO) | 0.15 | 0.0 | 0.20 | 0.000 | 14.71*** |
| I(IPO) | 0.01 | 0.0 | 0.03 | 0.000 | 19.14*** |
| I(Acquired) | 0.14 | 0.0 | 0.17 | 0.000 | 8.54*** |
| I(Raised Future Round) | 0.22 | 0.0 | 0.47 | 0.000 | 56.74*** |
| I(Has Patent) | 0.17 | 0.0 | 0.31 | 0.000 | 35.43*** |
| # Service Providers | 0.38 | 0.0 | 0.72 | 0.0 | 34.15*** |
| Unique Investor States | 2.25 | 2.0 | 3.21 | 3.0 | 45.97*** |
| Form D Filing Fees | 425.95 | 300.0 | 410.28 | 300.0 | -4.73*** |
| I(PE Hub) | 0.57 | 1.0 | 0.47 | 0.0 | -20.02*** |
| Funds Raised ($ Millions) | 3.23 | 0.4 | 4.73 | 1.22 | 8.01*** |
| I(Angel Investor) | 0.37 | 0.0 | 0.45 | 0.0 | 16.16*** |
| I(Has Investor Information) | 0.09 | 0.0 | 0.22 | 0.0 | 36.52*** |
| # Executives | 3.84 | 3.0 | 6.15 | 5.0 | 51.54*** |
| # Unique Investors | 5.23 | 3.0 | 7.72 | 5.0 | 33.68*** |
| Year Founded | 2011 | 2013 | 2010 | 2012 | -18.01*** |
| Pitchbook Deal Number | 1.65 | 1.0 | 1.90 | 1.0 | 20.30*** |

**Table 2: Capital Raised Using Regulation D**

This table presents summary statistics for issuers that raised private capital and filed a Form D between 2010 and 2019. Each panel presents yearly statistics on the number of unique issuers, the total amount raised (in billions of dollars), the mean and median amounts raised (in millions of dollars), the percentage of filings that record using a broker, and the percentage of all funding raised that involved a broker. Panel A presents statistics for all issuers filing Form D, while Panel B presents statistics only for issuers in my final sample, operating issuers filing their first Form D. I describe how I collect the data and compute funding flows in the appendix. I winsorize proceeds at the $1^{st}$ and $99^{th}$ percentiles to minimize the influence of misreporting.

| | Unique Issuers | Total Raise ($ Billions) | Mean Raise ($ Millions) | Median Raise ($ Millions) | Used Broker (%) (by filings) | Used Broker(%) (by amount) |
|---|---|---|---|---|---|---|
| **Panel A: Form D Filings by Year (All Issuers)** | | | | | | |
| | (1) | (2) | (3) | (4) | (5) | (6) |
| 2010 | 20,082 | 496.4 | 19.24 | 0.88 | 22.75 | 30.43 |
| 2011 | 23,917 | 702.51 | 23.68 | 1.02 | 22.28 | 33.57 |
| 2012 | 24,847 | 734.22 | 24.16 | 1.00 | 22.13 | 31.78 |
| 2013 | 27,155 | 797.24 | 23.94 | 1.00 | 22.39 | 34.85 |
| 2014 | 30,478 | 940.02 | 25.43 | 0.99 | 21.24 | 33.07 |
| 2015 | 31,784 | 930.99 | 24.51 | 0.96 | 21.56 | 32.62 |
| 2016 | 32,574 | 894.18 | 23.09 | 0.85 | 22.15 | 32.56 |
| 2017 | 34,567 | 946.92 | 23.14 | 0.90 | 22.42 | 36.33 |
| 2018 | 37,198 | 1,051.21 | 24.08 | 0.90 | 20.69 | 34.82 |
| 2019 | 38,196 | 1,102.94 | 24.65 | 0.88 | 21.70 | 35.23 |
| **Panel B: Form D Filings by Year (Sample Issuers)** | | | | | | |
| 2010 | 3,358 | 13.14 | 3.91 | 1.00 | 7.95 | 9.74 |
| 2011 | 2,667 | 8.75 | 3.28 | 0.60 | 6.00 | 9.23 |
| 2012 | 2,424 | 7.02 | 2.90 | 0.52 | 6.44 | 11.63 |
| 2013 | 2,520 | 6.77 | 2.69 | 0.50 | 7.34 | 13.49 |
| 2014 | 2,885 | 7.89 | 2.74 | 0.50 | 6.24 | 12.13 |
| 2015 | 2,921 | 9.0 | 3.08 | 0.60 | 6.40 | 7.84 |
| 2016 | 2,806 | 8.16 | 2.91 | 0.55 | 5.74 | 5.82 |
| 2017 | 2,763 | 8.41 | 3.05 | 0.65 | 5.47 | 6.45 |
| 2018 | 2,993 | 9.2 | 3.07 | 0.64 | 5.21 | 7.39 |
| 2019 | 2,750 | 9.32 | 3.39 | 0.73 | 6.91 | 5.90 |

**Table 3: Characteristics of Brokerage Firms Listed on Form D Filings**

This table reports summary statistics of my panel of brokerage firms split by whether the firm is active in the private placement market. The data are from FINRA's BrokerCheck from 2005 to 2018. *Form D B. Firms* is an indicator that equals one for brokerage firms whose CRD we identified on a Form D filing and matched to merge FINRA's BrokerCheck. *N* is the number of broker-years. *Diff* is *Cohen's d*, the normalized difference in means of the characteristic in Column (1) to facilitate comparison across rows. *T-Stat* reports the t-statistic from a regression of each variable in Column (1) on the *RegD* dummy, with standard errors clustered by brokerage firm (*Firm CRD*).

| | **Other B. firms** | | **Form D B. Firms** | | **Tests** | |
|---|---|---|---|---|---|---|
| | **N = 40,284** | | **N = 15,927** | | | |
| | Mean | Std. Dev. | Mean | Std. Dev. | Diff | T-stat |
| Sells equity OTC | 0.40 | 0.49 | 0.52 | 0.50 | 0.24 | 7.88*** |
| Sells debt OTC | 0.34 | 0.48 | 0.48 | 0.50 | 0.28 | 9.01*** |
| Sells mutual fund | 0.42 | 0.49 | 0.52 | 0.50 | 0.21 | 6.75*** |
| Sells private shares | 0.47 | 0.50 | 0.87 | 0.34 | 0.87 | 34.07*** |
| Underwriter | 0.19 | 0.39 | 0.40 | 0.49 | 0.50 | 14.73*** |
| # Brokers Employed | 47.54 | 275.80 | 377.27 | 2044.22 | 0.30 | 6.11*** |
| Flow Misconduct | 0.76 | 5.52 | 1.08 | 4.52 | 0.06 | 4.75*** |
| Stock Misconduct | 3.15 | 10.83 | 5.17 | 10.30 | 0.19 | 8.44*** |
| Age | 15.28 | 12.70 | 15.79 | 13.88 | 0.04 | 1.27 |

**Table 4: Summary Statistics of Issuers by Placement Method**

This table reports summary statistics for a cross-section of operating issuers that raised private capital and filed a first Form D between 2010 and 2019. I define all variables in the appendix. I winsorize all continuous variables at the 1% and 99% levels to minimize the influence of outliers. **BROKER** is an indicator that equals one for issuers that report using a broker for fundraising on their Form D. **R.BR** is an indicator that equals one for issuers that use a registered broker, and **UR.BR** is an indicator that equals one for issuers that use an unregistered broker.

| | **DIRECT** | **BROKER** | **UR. BR** | **R. BR** |
|---|---|---|---|---|
| **% Sample (Number of Issuers)** | **92.75 (26,051)** | **7.25 (2,036)** | **2.87 (806)** | **4.38 (1,230)** |
| I(Acquisition or IPO) | 0.23 | 0.17 | 0.11 | 0.21 |
| I(IPO) | 0.01 | 0.03 | 0.02 | 0.04 |
| I(Acquired) | 0.21 | 0.14 | 0.09 | 0.16 |
| I(Raised Future Round) | 0.17 | 0.11 | 0.09 | 0.13 |
| I(Inactive) | 0.19 | 0.23 | 0.23 | 0.22 |
| I(Raised Funding) | 0.87 | 0.69 | 0.64 | 0.73 |
| Proceeds Raised ($ Millions) | 3.04 | 4.28 | 2.03 | 5.75 |
| I(Has Patent) | 0.12 | 0.11 | 0.10 | 0.12 |
| I(Rg. Broker Zip) | 0.41 | 0.48 | 0.41 | 0.53 |
| I(Unrg. Broker Zip) | 0.15 | 0.21 | 0.23 | 0.20 |
| I(VC Zip) | 0.54 | 0.45 | 0.39 | 0.49 |
| # Investors | 9.10 | 14.28 | 10.12 | 17.00 |
| I(VC Investment) | 0.19 | 0.08 | 0.05 | 0.11 |
| I(Non Accredited Investor) | 0.11 | 0.15 | 0.23 | 0.09 |
| I(Used advertising) | 0.04 | 0.14 | 0.18 | 0.11 |
| # Executives | 3.34 | 3.45 | 2.64 | 3.97 |
| I(Older than 5) | 0.13 | 0.19 | 0.16 | 0.21 |
| I(Promoter) | 0.04 | 0.11 | 0.08 | 0.13 |
| % Zipcode Accredited Investors | 0.12 | 0.11 | 0.09 | 0.11 |

**Table 5: Association between Issuer Distance to Brokers and VCs and Broker Use: OLS Regression Estimates**

This table presents coefficients from cross-sectional OLS regressions, with standard errors in parentheses. A unit of observation is an issuer filing its first Form D between January 2010 and December 2019. The dependent variable, **I(Used Broker)**, is an indicator that equals one for offerings that involve any broker (registered or unregistered) and zero for non-brokered offerings. In Columns (2) and (4), the outcome variable equals one only for offerings that involve an unregistered broker and zero for non-brokered offerings. In Column (3), it equals one for offerings that involve a registered broker and zero for non-brokered offerings. The key independent variables in Columns (1) to (4) are **I(Unrg. Broker Zip)**, an indicator that equals one if an issuer has an unregistered broker in its zip code, **I(Rg. Broker Zip)**, an indicator that equals one if an issuer has a registered broker in its zip code, and **I(VCs Zip)**, an indicator that equals one if an issuer has a VC in its zip code. The number of observations varies across columns depending on the two placement methods I am comparing. For example, the number of observations in Column (2) is lower because it excludes registered-broker offerings. One might expect that the sum of the difference between Columns (1) and (2) and Columns (1) and (3) would equal the number of observations in Column (4). However, because state-year-industry cells with fewer than two observations are not part of the estimation, the number of observations in Column (4) is lower than one would expect. I cluster standard errors, shown in parentheses, by issuer and represent significance according to $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

| **Dependent Variable**: | **I(Used Broker)** | | | |
|---|---|---|---|---|
| Used Broker = 1<br>Used Broker = 0 | Any broker<br>Direct | Unregistered<br>Direct | Registered<br>Direct | Unregistered<br>Registered |
| | (1) | (2) | (3) | (4) |
| I(Unrg. Broker Zip) | 0.030*** | 0.022*** | 0.011** | 0.125*** |
| | (0.005) | (0.004) | (0.004) | (0.040) |
| I(Rg. Broker Zip) | 0.018*** | 0.002 | 0.017*** | -0.114*** |
| | (0.004) | (0.003) | (0.003) | (0.036) |
| I(VC Zip) | -0.018*** | -0.012*** | -0.007** | -0.039 |
| | (0.004) | (0.003) | (0.003) | (0.036) |
| Ln(# Executives) | 0.006*** | -0.009*** | 0.014*** | -0.127*** |
| | (0.002) | (0.001) | (0.002) | (0.015) |
| I(Has Patent) | -0.004 | -0.002 | -0.003 | -0.070 |
| | (0.005) | (0.003) | (0.004) | (0.058) |
| I(Older than 5) | 0.032*** | 0.013*** | 0.023*** | -0.022 |
| | (0.005) | (0.003) | (0.005) | (0.041) |
| I(Promoter) | 0.108*** | 0.025*** | 0.096*** | -0.038 |
| | (0.012) | (0.008) | (0.011) | (0.054) |
| % Zipcode Accredited Investors | -0.007*** | -0.005*** | -0.003* | -0.012 |
| | (0.002) | (0.001) | (0.002) | (0.020) |
| I(Used advertising) | 0.157*** | 0.098*** | 0.084*** | 0.041 |
| | (0.012) | (0.010) | (0.010) | (0.049) |
| State x Year x Industry FE? | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.13 | 0.10 | 0.12 | 0.28 |
| # Issuers | 28087 | 26774 | 27230 | 1460 |
| Observations | 28087 | 26774 | 27230 | 1460 |

**Table 6: Association Between Broker Use and the Type of Investors Participating in Offering: OLS Regression Estimates**

This table presents coefficients from cross-sectional OLS regressions. The unit of observation is an issuer filing its first Form D between January 2010 and December 2019. The dependent variable in Panel A, **I(VC Investment)**, is an indicator that equals one if an issuer received institutional venture capital funding, and zero otherwise. The dependent variable in Panel B, **I(Non-Accredited Investor)**, is an indicator that equals one if a non-accredited investor participated in the offering, and zero otherwise. The key independent variables in Columns (1) to (4) are indicators for how the offering was placed. In Column (1), **I(Used Broker)** is an indicator for offerings that involve any broker. In Columns (2) and (4), the same indicator variable equals one only for offerings that involve an unregistered broker. In Column (3), the indicator equals one for offerings that involve a registered broker. See the appendix for a discussion of how I identify broker registration status and define other variables. The number of observations varies across columns depending on the two placement methods I am comparing. For example, the number of observations in Column (2) is lower because it excludes registered-broker offerings. One might expect that the sum of the difference between Columns (1) and (2) and Columns (1) and (3) would equal the number of observations in Column (4). However, because state-year-industry cells with fewer than two observations are not part of the estimation, the number of observations in Column (4) is lower than one would expect. I cluster standard errors, shown in parentheses, by issuer and represent significance according to: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

| **Dependent Variable**: | **Panel A: I(VC Investment)** | | | |
|---|---|---|---|---|
| Used Broker = 1<br>Used Broker = 0 | Any broker<br>Direct | Unregistered<br>Direct | Registered<br>Direct | Unregistered<br>Registered |
| | (1) | (2) | (3) | (4) |
| I(Used Broker) | -0.036*** | -0.062*** | -0.028*** | -0.048** |
| | (0.008) | (0.010) | (0.010) | (0.023) |
| Ln(# Executives) | 0.059*** | 0.059*** | 0.060*** | 0.034*** |
| | (0.003) | (0.003) | (0.003) | (0.011) |
| I(Has Patent) | 0.064*** | 0.062*** | 0.065*** | 0.132** |
| | (0.010) | (0.010) | (0.010) | (0.053) |
| I(Older than 5) | -0.047*** | -0.052*** | -0.047*** | 0.028 |
| | (0.008) | (0.008) | (0.008) | (0.030) |
| I(Promoter) | -0.016* | -0.014 | -0.018* | -0.035 |
| | (0.009) | (0.010) | (0.010) | (0.025) |
| % Zipcode Accredited Investors | 0.006** | 0.006** | 0.005** | -0.010 |
| | (0.003) | (0.003) | (0.003) | (0.012) |
| State x Year x Industry FE? | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.12 | 0.12 | 0.12 | 0.22 |
| # Issuers | 28087 | 26774 | 27230 | 1460 |
| Observations | 28087 | 26774 | 27230 | 1460 |

**Table 6 - *continued***

| **Dependent Variable**: | **Panel B: I(Non Accredited Investor)** | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| I(Used Broker) | 0.009 | 0.076*** | -0.038*** | 0.119*** |
| | (0.009) | (0.016) | (0.009) | (0.027) |
| Ln(# Executives) | -0.017*** | -0.015*** | -0.016*** | -0.011 |
| | (0.002) | (0.002) | (0.002) | (0.016) |
| I(Has Patent) | -0.026*** | -0.025*** | -0.023*** | -0.025 |
| | (0.005) | (0.005) | (0.005) | (0.032) |
| I(Older than 5) | -0.010* | -0.011** | -0.009 | -0.056 |
| | (0.005) | (0.005) | (0.005) | (0.035) |
| I(Promoter) | -0.009 | 0.004 | -0.012 | -0.069* |
| | (0.011) | (0.012) | (0.011) | (0.042) |
| % Zipcode Accredited Investors | -0.019*** | -0.019*** | -0.017*** | -0.008 |
| | (0.002) | (0.002) | (0.002) | (0.015) |
| State x Year x Industry FE? | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.15 | 0.16 | 0.16 | 0.21 |
| # Issuers | 28087 | 26774 | 27230 | 1460 |
| Observations | 28087 | 26774 | 27230 | 1460 |

**Table 7: Association Between Issuer Outcomes and Distance to Brokers: OLS Regression Estimates**

This table presents coefficients from cross-sectional OLS regressions. A unit of observation is an issuer filing its first Form D between January 2010 and December 2017. The dependent variable, **I(Raised Future Round)**, is an indicator that equals one if the issuer files another Form D three or more years following its first filing, and zero otherwise. The key independent variables in Columns (1) to (4) are indicators for how the offering was placed. In Column (1), **I(Used Broker)** is an indicator for offerings that involve any broker. In Columns (2) and (4), the same indicator variable equals one only for offerings that involve an unregistered broker. In Column (3), the indicator equals one for offerings that involve a registered broker. See the appendix for a discussion of how I identify broker registration status and define other variables. The number of observations varies across columns depending on the two placement methods I am comparing. For example, the number of observations in Column (2) is lower because it excludes registered-broker offerings. One might expect that the sum of the difference between Columns (1) and (2) and Columns (1) and (3) would equal the number of observations in Column (4). However, because state-year-industry cells with fewer than two observations are not part of the estimation, the number of observations in Column (4) is lower than one would expect. I cluster standard errors, shown in parentheses, by issuer and represent significance according to: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

| **Dependent Variable**: | **I(Acquisition or IPO)** | | **I(Raised Future Round)** | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| I(Unrg. Broker Zip) | 0.002 | -0.008 | 0.004 | 0.002 |
| | (0.008) | (0.008) | (0.006) | (0.006) |
| I(Rg. Broker Zip) | 0.020*** | 0.003 | 0.001 | -0.002 |
| | (0.006) | (0.006) | (0.004) | (0.005) |
| I(VC Zip) | | 0.062*** | | 0.012** |
| | | (0.006) | | (0.005) |
| State x Year x Industry FE? | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.14 | 0.14 | 0.13 | 0.13 |
| # Issuers | 28087 | 28087 | 28087 | 28087 |
| Observations | 28087 | 28087 | 28087 | 28087 |

**Table 8: Causal Effect of Brokered Offerings on Offering Proceeds: OLS Regression Estimates**

This table presents coefficients from two stage least squares regressions (2SLS) with standard errors in parentheses. A unit of observation is an issuer filing its first Form D between January 2010 and December 2019. The dependent variable, **Ln(Funding Raised)**, is the log amount of funding an issuer raised. The key independent variables in Columns (1) to (4) are indicators for how the offering was placed. In Column (1), **I(Used Broker)** is an indicator for offerings that involve any broker. In Columns (2) and (4), the same indicator variable equals one only for offerings that involve an unregistered broker. In Column (3), the indicator equals one for offerings that involve a registered broker. The instrument in Column (1) is an indicator that equals one if an issuer has an unregistered or a registered broker in its zip code. In Column (2) and (4), it is an indicator that equals one if the issuer has an unregistered broker in its zip code. In column (3) the instrument is an indicator that equals one if the issuer has a registered broker in its zip code. See the appendix for a discussion of how I identify broker registration status and define other variables. The number of observations varies across columns depending on the two placement methods I am comparing. For example, the number of observations in Column (2) is lower because it excludes registered-broker offerings. One might expect that the sum of the difference between Columns (1) and (2) and Columns (1) and (3) would equal the number of observations in Column (4). However, because state-year-industry cells with fewer than two observations are not part of the estimation, the number of observations in Column (4) is lower than one would expect. I cluster standard errors, shown in parentheses, by issuer and represent significance according to: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

| **Dependent Variable**: | **Ln(Proceeds Raised)** | | | |
|---|---|---|---|---|
| Used Broker = 1<br>Used Broker = 0 | Any broker<br>Direct | Unregistered<br>Direct | Registered<br>Direct | Unregistered<br>Registered |
| | (1) | (2) | (3) | (4) |
| I(Used Broker) | 1.610*** | 2.250*** | 2.564*** | -0.507 |
| | (0.430) | (0.805) | (0.738) | (0.819) |
| Ln(# Executives) | 0.272*** | 0.299*** | 0.246*** | 0.242** |
| | (0.007) | (0.010) | (0.013) | (0.107) |
| I(Has Patent) | 0.212*** | 0.209*** | 0.208*** | 0.313** |
| | (0.020) | (0.020) | (0.021) | (0.131) |
| I(Older than 5) | 0.015 | 0.027 | 0.012 | 0.084 |
| | (0.023) | (0.022) | (0.026) | (0.091) |
| I(Promoter) | -0.196*** | -0.016 | -0.278*** | -0.367*** |
| | (0.058) | (0.039) | (0.081) | (0.134) |
| I(VC Investment) | 0.585*** | 0.576*** | 0.577*** | 0.700*** |
| | (0.017) | (0.017) | (0.018) | (0.161) |
| % Zipcode Accredited Investors | 0.034*** | 0.030*** | 0.029*** | 0.082* |
| | (0.007) | (0.008) | (0.007) | (0.045) |
| I(VC Zip) | 0.174*** | 0.190*** | 0.164*** | 0.012 |
| | (0.013) | (0.014) | (0.013) | (0.087) |
| State x Year x Industry FE? | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | -0.10 | -0.11 | -0.21 | -0.13 |
| # Issuers | 28087 | 26774 | 27230 | 1460 |
| Observations | 28087 | 26774 | 27230 | 1460 |
| Cragg-Donald Wald F | 71.04 | 51.24 | 41.41 | 8.28 |

**Table 9: Association Between Brokered Offerings and Outcomes: OLS Regression Estimates**

This table presents coefficients from cross-sectional OLS regressions. The unit of observation is an issuer filing its first Form D between January 2010 and December 2017. In Panel A, the dependent variable, **I(Acquisition or IPO)**, is an indicator that equals one if the issuer exits via an IPO or an acquisition in the years following the offering, and zero otherwise. In Panel B, the dependent variable, **I(Raised Future Round)**, is an indicator that equals one if the issuer files another Form D three or more years following its first filing, and zero otherwise. In Panel C, the dependent variable, **I(Inactive)**, is an indicator that equals one if an issuer is no longer registered with state securities regulators where it operates and zero otherwise. The key independent variables in Columns (1) to (4) are indicators for how the offering was placed. In Column (1), **I(Used Broker)** is an indicator for offerings that involve any broker. In Columns (2) and (4), the same indicator variable equals one only for offerings that involve an unregistered broker. In Column (3), the indicator equals one for offerings that involve a registered broker. See the appendix for a discussion of how I identify broker registration status and define other variables. The number of observations varies across columns depending on the two placement methods I am comparing. For example, the number of observations in Column (2) is lower because it excludes registered-broker offerings. One might expect that the sum of the difference between Columns (1) and (2) and Columns (1) and (3) would equal the number of observations in Column (4). However, because state-year-industry cells with fewer than two observations are not part of the estimation, the number of observations in Column (4) is lower than one would expect. I cluster standard errors, shown in parentheses, by issuer and represent significance according to: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

| **Dependent Variable**: | **Panel A: I(Acquisition or IPO)** | | | |
|---|---|---|---|---|
| Used Broker = 1<br>Used Broker = 0 | Any broker<br>Direct | Unregistered<br>Direct | Registered<br>Direct | Unregistered<br>Registered |
| | (1) | (2) | (3) | (4) |
| I(Used Broker) | 0.009<br>(0.010) | -0.040***<br>(0.014) | 0.043***<br>(0.014) | -0.072***<br>(0.027) |
| Ln(Proceeds Raised) | 0.050***<br>(0.003) | 0.051***<br>(0.003) | 0.050***<br>(0.003) | 0.032***<br>(0.009) |
| Ln(# Executives) | 0.059***<br>(0.003) | 0.058***<br>(0.003) | 0.059***<br>(0.003) | 0.066***<br>(0.014) |
| I(Has Patent) | 0.060***<br>(0.010) | 0.055***<br>(0.010) | 0.059***<br>(0.010) | 0.147***<br>(0.054) |
| I(Older than 5) | 0.044***<br>(0.009) | 0.047***<br>(0.010) | 0.047***<br>(0.010) | -0.033<br>(0.036) |
| I(Promoter) | -0.019<br>(0.012) | -0.013<br>(0.013) | -0.022*<br>(0.013) | -0.074***<br>(0.027) |
| I(VC Investment) | 0.214***<br>(0.010) | 0.214***<br>(0.010) | 0.213***<br>(0.010) | 0.268***<br>(0.059) |
| % Zipcode Accredited Investors | 0.005<br>(0.003) | 0.006*<br>(0.004) | 0.005<br>(0.004) | -0.013<br>(0.016) |
| State x Year x Industry FE? | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.20 | 0.19 | 0.20 | 0.36 |
| # Issuers | 22344 | 21288 | 21626 | 1182 |
| Observations | 22344 | 21288 | 21626 | 1182 |

**Table 9 - *continued***

| **Dependent Variable**: | **Panel B: I(Raised Future Round)** | | | |
|---|---|---|---|---|
| Used Broker = 1<br>Used Broker = 0 | Any broker<br>Direct | Unregistered<br>Direct | Registered<br>Direct | Unregistered<br>Registered |
| | (1) | (2) | (3) | (4) |
| I(Used Broker) | -0.027*** | -0.041*** | -0.018 | -0.009 |
| | (0.009) | (0.013) | (0.012) | (0.023) |
| Ln(Proceeds Raised) | 0.023*** | 0.024*** | 0.023*** | 0.011 |
| | (0.002) | (0.003) | (0.003) | (0.008) |
| Ln(# Executives) | 0.017*** | 0.016*** | 0.016*** | 0.023* |
| | (0.003) | (0.003) | (0.003) | (0.012) |
| I(Has Patent) | 0.042*** | 0.043*** | 0.043*** | -0.034 |
| | (0.010) | (0.010) | (0.010) | (0.045) |
| I(Older than 5) | -0.007 | -0.011 | -0.009 | 0.101*** |
| | (0.009) | (0.009) | (0.009) | (0.038) |
| I(Promoter) | -0.020* | -0.020* | -0.019* | -0.021 |
| | (0.011) | (0.012) | (0.012) | (0.030) |
| I(VC Investment) | 0.071*** | 0.070*** | 0.071*** | 0.031 |
| | (0.009) | (0.009) | (0.009) | (0.056) |
| % Zipcode Accredited Investors | -0.001 | -0.002 | -0.002 | -0.003 |
| | (0.003) | (0.003) | (0.003) | (0.015) |
| State x Year x Industry FE? | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.10 | 0.10 | 0.10 | 0.19 |
| # Issuers | 22344 | 21288 | 21626 | 1182 |
| Observations | 22344 | 21288 | 21626 | 1182 |

**Table 9 - *continued***

| **Dependent Variable**: | **Panel C: I(Inactive)** | | | |
|---|---|---|---|---|
| | (1) | (2) | (3) | (4) |
| I(Used Broker) | 0.050*** | 0.068*** | 0.039*** | -0.014 |
| | (0.009) | (0.013) | (0.012) | (0.025) |
| Ln(Proceeds Raised) | -0.017*** | -0.016*** | -0.017*** | -0.022** |
| | (0.002) | (0.002) | (0.002) | (0.010) |
| Ln(# Executives) | -0.013*** | -0.012*** | -0.013*** | -0.025** |
| | (0.002) | (0.002) | (0.002) | (0.012) |
| I(Has Patent) | -0.016** | -0.014** | -0.017*** | -0.003 |
| | (0.006) | (0.006) | (0.006) | (0.037) |
| I(Older than 5) | -0.009 | -0.009 | -0.007 | -0.056** |
| | (0.006) | (0.006) | (0.006) | (0.028) |
| I(Promoter) | -0.001 | 0.004 | 0.004 | -0.084*** |
| | (0.010) | (0.011) | (0.011) | (0.028) |
| I(VC Investment) | -0.054*** | -0.055*** | -0.054*** | -0.100** |
| | (0.006) | (0.006) | (0.006) | (0.047) |
| % Zipcode Accredited Investors | 0.000 | -0.000 | -0.000 | 0.015 |
| | (0.002) | (0.002) | (0.002) | (0.015) |
| State x Year x Industry FE? | Yes | Yes | Yes | Yes |
| Adjusted $R^2$ | 0.50 | 0.51 | 0.50 | 0.43 |
| # Issuers | 22344 | 21288 | 21626 | 1182 |
| Observations | 22344 | 21288 | 21626 | 1182 |

**Table 10: Causal Effect of Brokered Offerings on Exits: IV Regression Estimates**

This table presents coefficients from two stage least squares regressions (2SLS). In Panel A, the dependent variable, **I(Acquisition or IPO)**, is an indicator that equals one if the issuer exits via an IPO or an Acquisition in the years following the offering, and zero otherwise. In Panel B, the dependent variable, **I(Raised Future Round)**, is an indicator that equals one if the issuer files another Form D three or more years following its first filing, and zero otherwise. In Panel C, the dependent variable, **I(Inactive)**, is an indicator that equals one if an issuer is no longer registered with state securities regulators where it operates and zero otherwise. The key independent variables in Columns (1) to (4) are indicators for how the offering was placed. In Column (1), **I(Used Broker)** is an indicator for offerings that involve any broker. In Columns (2) and (4), the same indicator variable equals one only for offerings that involve an unregistered broker. In Column (3), the indicator equals one for offerings that involve a registered broker. The instrument in Column (1) is an indicator that equals one if an issuer has an unregistered or a registered broker in its zip code. In Columns (2) and (4), it is an indicator that equals one if the issuer has an unregistered broker in its zip code. In Column (3) the instrument is an indicator that equals one if the issuer has a registered broker in its zip code. The number of observations varies across columns depending on the two placement methods I am comparing. For example, the number of observations in Column (2) is lower because it excludes registered-broker offerings. I cluster standard errors, shown in parentheses, by issuer and represent significance according to: $^{*}p < 0.10$, $^{**}p < 0.05$, $^{***}p < 0.01$.

| **Dependent Variable**: | **Panel A: I(Acquisition or IPO)** | | |
|---|---|---|---|
| Used Broker = 1<br>Used Broker = 0 | Any broker<br>Direct | Unregistered<br>Direct | Registered<br>Direct |
| | (1) | (2) | (3) |
| I(Used Broker) | -0.250 | -0.629 | -0.046 |
| | (0.237) | (0.482) | (0.376) |
| Ln(Proceeds Raised) | 0.045*** | 0.041*** | 0.049*** |
| | (0.005) | (0.007) | (0.003) |
| Ln(# Executives) | 0.060*** | 0.053*** | 0.059*** |
| | (0.004) | (0.005) | (0.006) |
| I(Has Patent) | 0.061*** | 0.056*** | 0.060*** |
| | (0.010) | (0.011) | (0.010) |
| I(Older than 5) | 0.053*** | 0.056*** | 0.049*** |
| | (0.012) | (0.012) | (0.012) |
| I(Promoter) | -0.001 | -0.003 | -0.017 |
| | (0.022) | (0.016) | (0.030) |
| I(VC Investment) | 0.208*** | 0.209*** | 0.208*** |
| | (0.010) | (0.010) | (0.010) |
| % Zipcode Accredited Investors | -0.004 | -0.003 | -0.003 |
| | (0.004) | (0.004) | (0.004) |
| I(VC Zip) | 0.044*** | 0.041*** | 0.047*** |
| | (0.007) | (0.008) | (0.007) |
| State x Year x Industry FE? | Yes | Yes | Yes |
| Adjusted $R^2$ | -0.04 | -0.07 | -0.01 |
| # Issuers | 22344 | 21288 | 21626 |
| Observations | 22344 | 21288 | 21626 |
| Cragg-Donald Wald F | 49.90 | 29.20 | 30.81 |

**Table 10 - *continued***

| **Dependent Variable**: | **Panel B: I(Raised Future Round)** | | |
|---|---|---|---|
| Used Broker = 1<br>Used Broker = 0 | Any broker<br>Direct | Unregistered<br>Direct | Registered<br>Direct |
| | (1) | (2) | (3) |
| I(Used Broker) | -0.114 | -0.034 | -0.206 |
| | (0.209) | (0.420) | (0.337) |
| Ln(Proceeds Raised) | 0.022*** | 0.024*** | 0.022*** |
| | (0.004) | (0.006) | (0.003) |
| Ln(# Executives) | 0.017*** | 0.016*** | 0.019*** |
| | (0.003) | (0.004) | (0.005) |
| I(Has Patent) | 0.042*** | 0.043*** | 0.043*** |
| | (0.010) | (0.010) | (0.010) |
| I(Older than 5) | -0.004 | -0.011 | -0.005 |
| | (0.011) | (0.011) | (0.011) |
| I(Promoter) | -0.014 | -0.020 | -0.006 |
| | (0.019) | (0.014) | (0.027) |
| I(VC Investment) | 0.070*** | 0.069*** | 0.069*** |
| | (0.009) | (0.009) | (0.009) |
| % Zipcode Accredited Investors | -0.003 | -0.004 | -0.004 |
| | (0.003) | (0.004) | (0.003) |
| I(VC Zip) | 0.007 | 0.008 | 0.008 |
| | (0.006) | (0.007) | (0.006) |
| State x Year x Industry FE? | Yes | Yes | Yes |
| Adjusted $R^2$ | -0.10 | -0.09 | -0.11 |
| # Issuers | 22344 | 21288 | 21626 |
| Observations | 22344 | 21288 | 21626 |
| Cragg-Donald Wald F | 49.90 | 29.20 | 30.81 |

**Table 10 - *continued***

| **Dependent Variable**: | **Panel C: I(Inactive)** | | |
|---|---|---|---|
| | (1) | (2) | (3) |
| I(Used Broker) | 0.156 | 0.410 | -0.029 |
| | (0.160) | (0.332) | (0.261) |
| Ln(Proceeds Raised) | -0.015*** | -0.012*** | -0.017*** |
| | (0.003) | (0.004) | (0.003) |
| Ln(# Executives) | -0.013*** | -0.010*** | -0.012*** |
| | (0.003) | (0.003) | (0.004) |
| I(Has Patent) | -0.016** | -0.014** | -0.017*** |
| | (0.006) | (0.007) | (0.006) |
| I(Older than 5) | -0.012 | -0.014* | -0.005 |
| | (0.008) | (0.008) | (0.008) |
| I(Promoter) | -0.009 | -0.002 | 0.009 |
| | (0.016) | (0.013) | (0.022) |
| I(VC Investment) | -0.052*** | -0.053*** | -0.053*** |
| | (0.007) | (0.007) | (0.007) |
| % Zipcode Accredited Investors | 0.003 | 0.002 | 0.001 |
| | (0.003) | (0.003) | (0.003) |
| I(VC Zip) | -0.010** | -0.007 | -0.011** |
| | (0.005) | (0.005) | (0.005) |
| State x Year x Industry FE? | Yes | Yes | Yes |
| Adjusted $R^2$ | -0.10 | -0.14 | -0.10 |
| # Issuers | 22344 | 21288 | 21626 |
| Observations | 22344 | 21288 | 21626 |
| Cragg-Donald Wald F | 50.39 | 30.62 | 29.60 |

# Brokers and Finders in Startup Offerings

# Internet Appendix

# Table of Contents

This Internet Appendix contains supplementary discussions and analyses, which are organized as follows:

# Data description and variable construction

## *A. Grouping Form D Filings*

This analysis uses data from Form D filings with the SEC from 2010 to 2019. I use the structured data the SEC extracts from Form Ds that is available on its website.[20] Issuers file orginal and amended filings to update their fundraising efforts, especially if they raise ten percent or more of the total proceeds they reported on their last Form D. I combine original and amended filing numbers to isolate the first group of filings for each issuer. Table VI.A shows an example of how I isolate a set of filings for each issuer. I generate the *Original Accession Number* field to track all the filings that amend an original filing, as the first filing number in a sequence in not reported on all subsequent amendments. The filing date alone is not sufficient to isolate the last amended filing because multiple amended filings can be filed on the same day. For this issuer, the amount raised is $2.5 million, corresponding to the last amended filing.

**Table 1:** Isolating Orginal and Amended Filings

| Accession Number | Prior Accession Number | Original Accession Number | Filing Date Number | Offering Amount | Amount Raised | Funding Flows |
|---|---|---|---|---|---|---|
| 143634310000001 | | 143634310000001 | 20jan2010 | 2.50 | 0.54 | 0.54 |
| 143634310000002 | 143634310000001 | 143634310000001 | 20jun2010 | 2.50 | 0.81 | 0.27 |
| 143634310000003 | 143634310000002 | 143634310000001 | 20oct2010 | 2.50 | 0.85 | 0.04 |
| 143634310000005 | 143634310000003 | 143634310000001 | 28nov2010 | 2.50 | 0.99 | 0.14 |
| 143634311000001 | 143634310000005 | 143634310000001 | 11jan2011 | 2.50 | 2.40 | 1.41 |
| 143634311000002 | 143634311000001 | 143634310000001 | 24may2011 | 2.50 | 2.50 | 0.10 |

## *B. Broker registration status*

Form D has a field for the firm to list all participating intermediaries. Specifically, I have data on the names of the intermediaries (individuals or firms) and their CRDs (unique individual or firm identifiers assigned by FINRA). I categorize intermediaries

[20] https://www.sec.gov/dera/data/form-d

as registered or unregistered brokers by taking the following steps.

First, I use the Form D data on intermediaries to create two data sets. The first one (*Data set one*) has all the intermediary names with CRDs, and the second (*Data set two*) has all the intermediary names without CRDs. I clean the names without CRDs by eliminating junk names such as "No Sales Compensation Received."

To assign registration status to intermediaries with CRDs, I first create a database of the 25,000 investment advisory and brokerage firms listed on the SEC's IAPD website (https://adviserinfo.sec.gov/) and FINRA's BrokerCheck (https://brokercheck.finra.org/). I repeat the same process for the 1.3 million individual investment advisors and brokers (commonly called registered representatives) listed on these websites. For each individual or firm, I know when they first registered and whether they are currently registered. Then, I merge the CRD numbers from *Data set one* to the data on individuals and firms registered with the SEC or with FINRA. I match 99 percent of all CRDs from Form D to the data on registration status.

To assign registration status to *Data set two* (intermediaries without CRDs), I hired an RA to search the SEC's IAPD website and FINRA's BrokerCheck to classify the 3,000 names in the second data set. These might be names of currently registered brokers whose CRD numbers the firm omitted from Form D for some reason. The RA classified 500 of these names as registered at the time of the offering.

Registered broker is an indicator that equals one if at least one participating intermediary was registered with the SEC or with FINRA at the time of the offering. Past broker is an indicator that equals one for brokers that were previously registered with FINRA but whose registration status was not active at the time of the offering. Unregistered brokers are past brokers and other intermediaries that are not registered with the SEC or FINRA at the time of the offering.

**Table AT1: Variable Definitions and Data Sources**

| Variable Name | Definition | Data Source |
|---|---|---|
| **Outcome Variables** | | |
| I(Acquisition or IPO) | Indicator equals one for issuers that went public or were acquired as of Q3 2021 | VentureXpert, PitchBook, and Crunchbase |
| I(Raised Future Round) | Indicator equals one if an issuer files a new Form D three or more years following its first filing | SEC Filings (Form D) |
| I(Inactive) | Indicator equals one for issuers that do not have an active registration as of Q3 2021 in the state they report as their principal place of business | State corporate registries. For example, the corporate registry for Michigan is LARA. |
| I(Used Broker) | Indicator equals one for issuers that reported using a broker on their Form D filing | SEC Filings (Form D) |
| I(VC Investment) | Indicator equals one for issuers that received institutional venture capital funding. I match issuers in PitchBook that received funding from an institutional VC firm on issuer name, state, and quarter of deal to Form D. The indicator is one for Form D issuers with a match. | PitchBook |
| I(Non-Accredited Investor) | Indicator equals one for offerings comprising non-accredited investors | SEC Filings (Form D) |
| Proceeds Raised ($ Millions) | Funding raised by the issuer as reported on Form D | SEC Filings (Form D) |
| # Investors | The number of investors that participated in the offering. | SEC Filings (Form D) |
| # State Notices | The number of state notices the issuer filed with its Form D. This shows where investors participating in the offering are located. | EFD Filings |
| **Issuer & Issue characteristics** | | |
| I(Has Patent) | Indicator equals one for issuers that we matched to at least one patent in the USTPO data using assignee name and location. This indicator is only one for issuers that obtained the patent before filing Form D. | 2019 USTPO Patent Assignment data |
| I(Older than 5) | Indicator equals one if firm was incorporated (formed) more than five years from the Form D filing date. | SEC Filings (Form D) |
| I(Promoter) | Indicator for issuers with at least one promoter, a blockholder holding at least 10 percent of any class of securities, a founder or external manager of the issuer, or person receiving ten percent or more of offering proceeds | SEC Filings (Form D) |
| # Executives | Number of officers and directors listed on the Form D filing, including the signature field | SEC Filings (Form D) |
| I(Rg. Broker Zip) | Indicator that equals one if an issuer has a registered broker located in its zip code that intermediates at least one private offering in the same year the issuer files Form D. | SEC Filings (Form D) |
| I(Unrg. Broker Zip) | Indicator that equals one if an issuer has an unregistered broker located in its zip code that intermediates at least one private offering in the same year the issuer files Form D. | |
| I(VC Zip) | Indicator that equals one if an issuer has a venture capital group located in its zip code that funds at least one startup in the same year the issuer files Form D. VC location data is from PitchBook. | PitchBook and Form D |
| **Zipcode Level Characteristics** | | |
| % Zipcode Accredited Investors | Fraction of tax filers earning over $200,000 | IRS Summary of Income data |

**Table AT2: How Representative is Form D data?**

This table tests whether the geographic distribution of issuers filing Form D data mirrors the geographic distribution of all U.S. small businesses using a Chi-Square goodness of fit test. To approximate the geographic distribution of all U.S. businesses, I use one-year estimates of the American Community Survey comprising a 1% sample of respondents from 2010 to 2019. Next, I identify entrepreneurs in the state as self-employed respondents, running their own incorporated business and reporting living in the state. Using the average number of entrepreneurs in a state from 2010 to 2019, I calculate the fraction of entrepreneurs by state. I also calculate the fraction of entrepreneurs in each state receiving VC funding using PitchBook data on VC-funded startups. Finally, using the fraction of startups from the census and PitchBook, I calculate the expected number of issuers in each state using data on the total number of issuers in my sample. *Chi-Square Form D* is the test statistic from comparing the actual distribution of issuers to the expected distribution of issuers according to census data. Similarly, *Chi-Square PitchBook* is the test statistic from comparing the expected distribution of issuers according to PitchBook to the distribution of issuers according to the census. Chi-Square (49, 0.01) is the one percent critical value from a chi-squared distribution with 49 degrees of freedom.

| **State** | **Sample Issuers** | **Expected Issuers PitchBook** | **Expected Issuers Census** |
|---|---|---|---|
| ALABAMA | 118 | 67 | 419 |
| ALASKA | 2 | 8 | 45 |
| ARIZONA | 482 | 248 | 237 |
| ARKANSAS | 70 | 42 | 264 |
| CALIFORNIA | 6823 | 10402 | 2274 |
| COLORADO | 1188 | 740 | 407 |
| CONNECTICUT | 313 | 301 | 381 |
| DELAWARE | 142 | 198 | 80 |
| DISTRICT OF COLUMBIA | 181 | 170 | 193 |
| FLORIDA | 1003 | 645 | 944 |
| GEORGIA | 528 | 448 | 690 |
| HAWAII | 32 | 39 | 102 |
| IDAHO | 69 | 42 | 170 |
| ILLINOIS | 1015 | 714 | 1533 |
| INDIANA | 306 | 244 | 669 |
| IOWA | 69 | 61 | 500 |
| KANSAS | 136 | 66 | 356 |
| KENTUCKY | 153 | 98 | 414 |
| LOUISIANA | 38 | 60 | 493 |
| MAINE | 42 | 59 | 153 |
| MARYLAND | 507 | 429 | 425 |
| MASSACHUSETTS | 1894 | 2106 | 729 |
| MICHIGAN | 301 | 320 | 1235 |
| MINNESOTA | 398 | 285 | 818 |
| MISSISSIPPI | 15 | 15 | 265 |
| MISSOURI | 214 | 207 | 613 |
| MONTANA | 32 | 33 | 174 |
| NEBRASKA | 47 | 78 | 311 |
| NEVADA | 200 | 124 | 64 |
| NEW HAMPSHIRE | 81 | 78 | 92 |
| NEW JERSEY | 397 | 451 | 911 |
| NEW MEXICO | 56 | 58 | 146 |
| NEW YORK | 2519 | 3184 | 2677 |
| NORTH CAROLINA | 690 | 456 | 698 |
| NORTH DAKOTA | 15 | 12 | 153 |
| OHIO | 505 | 434 | 1281 |
| OKLAHOMA | 66 | 72 | 358 |
| OREGON | 398 | 298 | 319 |
| PENNSYLVANIA | 712 | 834 | 1470 |
| RHODE ISLAND | 35 | 67 | 125 |
| SOUTH CAROLINA | 131 | 119 | 331 |
| SOUTH DAKOTA | 39 | 12 | 151 |
| TENNESSEE | 415 | 301 | 416 |
| TEXAS | 2913 | 1360 | 1529 |
| UTAH | 448 | 333 | 326 |
| VERMONT | 38 | 47 | 72 |
| VIRGINIA | 535 | 504 | 555 |
| WASHINGTON | 1463 | 996 | 528 |
| WEST VIRGINIA | 2 | 15 | 192 |
| WISCONSIN | 278 | 192 | 727 |
| WYOMING | 33 | 15 | 73 |
| Chi-Square Form D | **22,257.38** | | |
| Chi-Square PitchBook | **39,865.63** | | |
| Chi-Square (49, 0.01) | **74.92** | | |

**Table AT3: Sample Selection for Regressions**

This table reports our sample-selection process. Our initial sample comprises all Form D filings in the SEC Edgar database from 2010 to 2019. In the table, the first column describes the data-filtering procedure and the second column reports the number of observations lost after each filter. I filter public firms from my sample by removing any firm that filed a 10-K or 10-Q with the SEC for the first time prior to filing Form D. I use the Edgar master file of firm filings' to identify public firms. Non-residential real estate comprises issuers listing their industry group as Other Real Estate, Other, Commercial, and Construction. Non-equity offerings is an indicator that equals one if an issuer did not check the equity security box on Form D. Other amended filings are other amendments to the first filing besides the last one, which I use to determine the amount of funding raised. See Appendix VI.A for an example of how I isolate the last filing from an issuer's first set of filings.

| Filter | Number of Observations |
|---|---|
| Form D (D/A) filings 01/01/2010 – 12/31/2019 | 391,175 |
| Less Offerings by : | |
| Pooled Investment Funds | (183,704) |
| Financial Firms | (72,477) |
| Non-US based Issuers or missing zipcode | (20,025) |
| Public firms | (8,220) |
| Non-residential Real Estate | (30,603) |
| Non-equity offerings | (29,513) |
| Other amended filings | (18,546) |
| Final Sample (one observation per filing) | 28,087 |
| Unique Issuers (CIK) | 28,087 |

**Table AT4:** Executives Listed on Form D: Evidence from PitchBook

This table investigates which executives are listed on Form D using detailed data on executives in PitchBook. We first merge FormD to PitchBook using the issuer's CIK number in PitchBook. For issuers without CIK numbers, we match on issuer name and state where the issuer is headquartered. Next, we collect data on people working for these issuers according the Pitchbook. For each person in PitchBook, we create an indicator that equals one if someone with the same first and last name was ever listed on a Form D filing by the same issuer. We keep the top ten most frequent titles listed in PitchBook for company executives and tabulate, by executive title, the number of executives that were only in PitchBook but never listed on Form D, *PitchBook*, and the number of executives listed in PitchBook and Form D, *Pitchbook-FormD*. *Total* shows the total number of people with each title and *PercentFormD* shows the percent of executives with each title that were both in PitchBook and Form D.

| Full PitchBook Title | PitchBook | PitchBook-FormD | Total | PercentFormD |
|---|---|---|---|---|
| Chief Financial Officer | 4568 | 4944 | 9512 | 52.0 |
| Co-Founder, Chief Executive Officer & Board Member | 6081 | 320 | 6401 | 5.0 |
| Co-Founder | 1974 | 3403 | 5377 | 63.0 |
| Chief Technology Officer | 607 | 4649 | 5256 | 88.0 |
| Chief Operating Officer | 1227 | 3251 | 4478 | 73.0 |
| Chief Executive Officer | 2591 | 1874 | 4465 | 42.0 |
| Co-Founder & Chief Executive Officer | 3405 | 840 | 4245 | 20.0 |
| Chief Executive Officer & Board Member | 3116 | 714 | 3830 | 19.0 |
| Co-Founder & Board Member | 2130 | 340 | 2470 | 14.0 |
| Co-Founder & Chief Technology Officer | 983 | 1454 | 2437 | 60.0 |
| All | 26682 | 21789 | 48471 | 45.0 |

**Table AT5: Characteristics of brokers listed on Form D filings**

This table reports summary statistics of our panel of brokers split by whether the broker is active in the private placement market. Data, which we collect from FINRA's BrokerCheck, are from 2005 to 2018. *RegD* is a dummy equal to one for brokers whose CRD we identified on a Form D filing and matched to FINRA's BrokerCheck. *Diff* is *Cohen's d*, the normalized difference in means of the characteristic in column one to facilitate comparison across rows. *T-Stat* reports the t-statistic from a regression of the each variable in column one on the *RegD* dummy, with standard errors clustered by brokerage firm (*Firm CRD*).

| | **Other brokers** | | **Form D Brokers** | | **Tests** | |
|---|---|---|---|---|---|---|
| | **N = 15,938,916** | | **N = 55,020** | | | |
| | Mean | Std. Dev. | Mean | Std. Dev. | Diff | T-stat |
| Experience (Years) | 10.03 | 10.23 | 20.20 | 10.55 | 0.99 | 54.99*** |
| Female | 0.33 | 0.46 | 0.14 | 0.35 | -0.42 | -34.19*** |
| Non White | 0.13 | 0.33 | 0.07 | 0.25 | -0.19 | -15.51*** |
| **Registration** | | | | | | |
| FINRA Registered | 0.53 | 0.50 | 0.79 | 0.41 | 0.52 | 40.07*** |
| Investment Adviser | 0.26 | 0.42 | 0.60 | 0.49 | 0.83 | 44.22*** |
| Barred | 0.01 | 0.08 | 0.01 | 0.11 | 0.07 | 3.19*** |
| **Disclosures** | | | | | | |
| Misconduct (flow in one year) | 0.00 | 0.07 | 0.03 | 0.17 | 0.34 | 22.84*** |
| Misconduct (stock) | 0.03 | 0.17 | 0.14 | 0.34 | 0.62 | 24.34*** |
| **Exams and Qualifications** | | | | | | |
| No. Qualifications | 3.40 | 1.41 | 4.53 | 1.45 | 0.81 | 49.04*** |
| No. State Registrations | 1.10 | 0.60 | 1.46 | 0.55 | 0.61 | 41.84*** |
| Uniform Sec. Agent St. Law (63) | 0.71 | 0.44 | 0.82 | 0.39 | 0.24 | 17.44*** |
| General Sec. Rep. (7) | 0.63 | 0.51 | 0.87 | 0.33 | 0.47 | 45.30*** |
| Inv. Co Products Rep. (6) | 0.40 | 0.49 | 0.30 | 0.46 | -0.21 | -14.12*** |
| Uniform Combined St. Law (66) | 0.23 | 0.40 | 0.28 | 0.45 | 0.13 | 7.10*** |
| Uniform Inv. Adviser Law (65) | 0.15 | 0.34 | 0.36 | 0.48 | 0.62 | 27.30*** |
| General Sec. Principal (24) | 0.12 | 0.30 | 0.35 | 0.48 | 0.77 | 30.61*** |
| Security Industry Ess. Exam | 0.72 | 0.42 | 0.93 | 0.26 | 0.49 | 49.74*** |

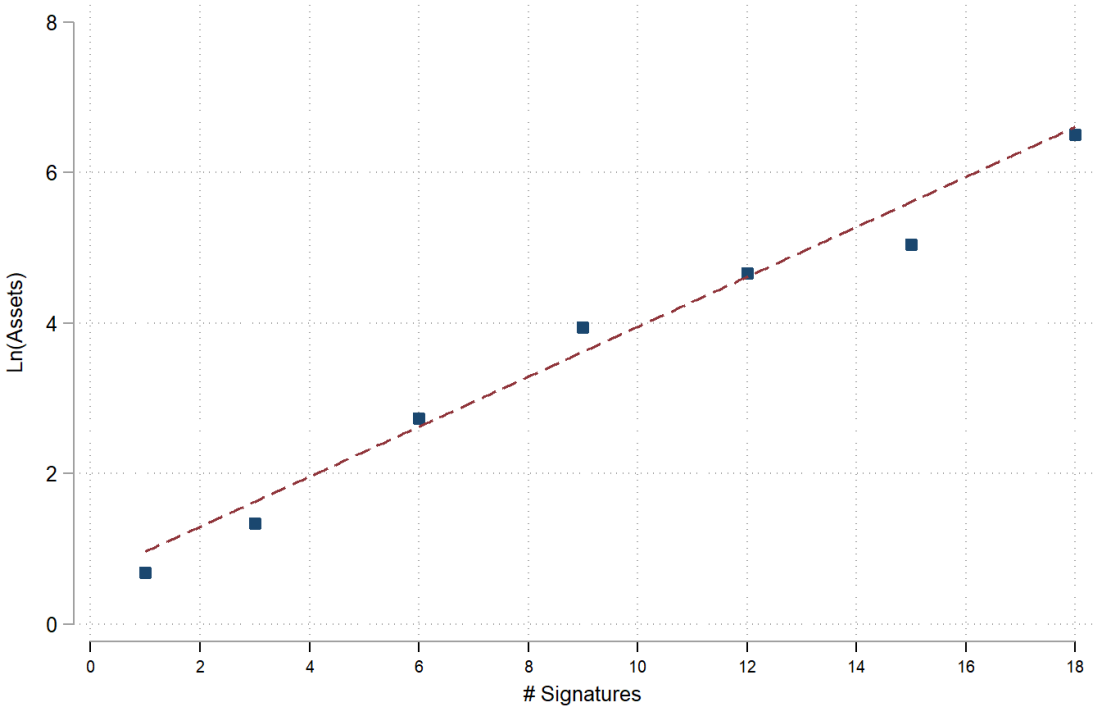



**Figure AF1:** Form D signatures and firm size

**Figure AF2:** This figure shows the correlation between the number of executives listed on Form D and log assets for public firms filing Form D, which are not part of my analysis. The correlation between Ln(Assets) and # Signatures is 0.60.