

# Are Family and Friends the Wrong Investors? Evidence from U.S. Startups

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JOB MARKET PAPER

November 2015

## Abstract

This paper investigates the effects of funding from family and friends (i.e. *informal* funding) on firms' subsequent access to venture capital. I retrieve information on small and young U.S. firms' financing activity and their use of informal funds from a novel hand-collected dataset based on SEC filings for private placements (Form Ds). To address potential endogeneity of informal finance, I use an instrument that hinges on founders' family size as an exogenous constraint on the supply of informal funds. This instrument is based on the frequency with which founders' last names occur in the Census survey, with infrequent last names identifying small extended families. My results show that informal finance reduces the probability of future financing events. Marginal effects range from -15% to -19%. I provide suggestive evidence that these effects are due to conflicts of interests between informal stakeholders and professional later stage investors.

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## 1 Introduction

In the staged investment process that characterizes entrepreneurial finance, reaching the next round of funding is often decisive for early-stage firms. Initial rounds, typically conducted with angel investors and *informal* funders (e.g., family and friends), are the stepping stone to obtaining follow-on capital provided by Venture Capital (VC) firms and subsequently exiting the venture via an acquisition or an IPO.<sup>1</sup> Progression towards later financing rounds is mostly driven by the profitability of the entrepreneurial project, but other factors, unrelated to firms' growth opportunities, can disrupt the funding process. For example, the background and investment objectives of funders in one round can prevent entrepreneurs from securing the next one. This may be due to conflicting views between early and late capital providers on management style, allocation of claims or distribution of control rights. Michael Arrington, founder of the influential blog TechCrunch, refers to this issue as follows: "Pick the wrong investor and you've closed the door on others".<sup>2</sup> This paper elaborates on the idea behind this quote, focusing on informal finance. Are family and friends the *wrong* investors, in the sense that they deter subsequent funding? If so, what is the nature of their conflict with other investors? The relevance of these questions extends beyond entrepreneurial finance and venture capital literature, since, due to a lack of accounting or market data, there is little empirical evidence on whether and how informal finance affects firms' outcomes. This is despite entrepreneurs' social circle provides the most accessible form of funding for young firms around the world (Bygrave and Quill [2006]).

I investigate the effects of informal finance on startups' ability to access additional capital during later funding stages. To do so, I select a sample of early-stage firms at the time of their seed funding round and track their future financing events. Differently from previous studies on early-stage and seed financing that largely rely on survey data, I use a novel hand-collected dataset based on SEC filings for private placements (Form Ds) of small, young, U.S. firms.<sup>3</sup>

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<sup>1</sup>It is common among practitioners and researchers to view the relationship between angel and VC investments as one of complementarity. Hellmann et al. [2013] explore the alternative substitution hypothesis, i.e. angel and VC are two distinct and incompatible sources of funding.

<sup>2</sup>"VCs And Super Angels: The War For The Entrepreneur" posted on TechCrunch on 15 August 2010.

<sup>3</sup>See for example Lerner et al. [2015], Kerr et al. [2014], Robb and Robinson [2012], Hellmann et al. [2013].

The advantages provided by this data are twofold. First, it relaxes sampling bias concerns, as filing is mandatory for firms that sell unregistered securities to outside investors such as family and friends, angels or investment funds.<sup>4</sup> Therefore, this dataset provides a more complete picture of private capital markets, including seed funding which precedes access to VC investments. This early investment phase has not been fully documented by the existing literature. Second, it provides new information on characteristics and financing choices for a large sample of startups. For example, along with industry, location and amount of capital raised, Form Ds contain data on the age of the company, its management team, the size of its revenues and the type of security offered in the private placement.

Crucially for the purpose of this paper, Form Ds also contain information on informal finance, as issuers must disclose whether informal investors are allowed to participate in the offering. Thus, this is one of the first studies that attempt to quantify and characterize recourse to informal finance in entrepreneurial literature.<sup>5</sup> In this sample, only 17% of firms use family and friends funding and when informal funders participate in initial rounds they typically co-invest with formal funders.<sup>6</sup> More importantly, I find that firms that raised capital with the support of informal funders have a lower probability of accessing future funding. The difference - at least -9% - persists after controlling for firm, seed round and management team related information. This observation constitutes the basis for my empirical investigation.

The ideal setting for such investigation is one where the researcher randomly assigns either A) formal or B) a mix of formal and informal seed funding to firms with identical investment opportunities and observes subsequent financing events. In this framework, the lower probability of accessing follow-on capital associated with B) can be interpreted as a direct effect of informal finance on the supply of funds in later stages.<sup>7</sup> The analysis of the interaction between

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<sup>4</sup>Although failing to file a form D does not result in the loss of the federal registration exemption, the SEC can seek to have the issuer enjoined from future use of Regulation D under rule 507. The violation can also constitute felony. It can be argued that enforcement of this requirement may be currently weak, but firms that have access to legal advice and that intend to proceed towards further VC funding are reasonably likely to comply. There are no filing fees and the “estimated average burden hours per response” is 4, as stated on the form.

<sup>5</sup>Using data from the Kauffman Firm Survey, Robb and Robinson [2012] show that only 17% of the small, young firms in their sample resort to informal sources of capital.

<sup>6</sup>Formal investors in seed rounds can be angels, seed firms, incubators or small VC firms.

<sup>7</sup>The implicit assumption here is that informal finance does not affect investment opportunities and demand

informal finance and access to capital, however, is complicated by the possibility that recourse to informal finance is correlated with unobservable project qualities, which may ultimately cause the observed negative relationship. For example, suppose that financial arrangements among members of a family or social network negatively affect entrepreneurs' social relationships.<sup>8</sup> If these social costs play a relevant role and entrepreneurs are more keen on formal rather than informal financing, then firms that resort to informal finance in seed rounds are the ones that were turned down by formal funders, who rank higher in the pecking order of financing sources.<sup>9</sup> It is also possible that entrepreneurs that choose family and friends funders over professional investors have a distinctive managerial style, perhaps not strictly profit oriented, that affects firm outcomes. These mechanisms establish an indirect link between informal finance and firms' performance through selection. Therefore, any attempt to empirically assess the effects of informal finance is exposed to the issue of the endogeneity of this explanatory variable.

My identification strategy relies on the idea that informal funding is exogenously affected by the number of entrepreneurs' extended family members. I construct an instrument that proxies for the size of founders' family using the Census Frequently Occurring Surnames (FOS) dataset on U.S. surnames. The instrument is a dummy variable (*SmallFamily*) that takes a value of 1 when a firm's founder team has a small combined family network, that is when the team has a higher than average component of individuals with *rare* last names. I classify last names as rare if they occur less than 100 times in the FOS. While details on each rare name's frequency are not provided, the summary statistics reported in the FOS show that the expected

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<sup>8</sup>Economic sociology provides support for this argument and suggests that the perception of financial obligations changes with the social distance between the receiver and the provider of capital, to the extent that formal, more impersonal sources of funding may be preferred because of the lower emotional burden attached to them. Dalits, the untouchables in the Indian caste system, often accept to be charged with extremely high rates by lenders outside of their village to avoid financial bonds within the community, as they create additional social obligations and dependency ( Guérin et al. [2013]). In France, low income individuals seeking consumer credit seem to prefer the discretion of financial companies that conduct their transactions over the phone or Internet, rather than negotiating in person with a banker, thus exposing themselves to (real or perceived) moral judgement (Ducourant [2009]). Although arguably distant from the American entrepreneurial environment, these examples illustrate how financial transactions within social networks and outside of them may be subject to different evaluation criteria, even when controlling for financial terms.

<sup>9</sup>In private capital markets, a preference for formal financing may arise if entrepreneurs derive personal validation and prestige by being funded by renowned angels or VC firms.

number of individuals that bear any one of these rare names is 4.5. Therefore, founders with rare surnames are statistically likely to have a small extended family. To illustrate the logic behind this approach, consider the example of a married male. Exactly five occurrences of his last name in the national survey may include records of himself, his spouse, one child and two parents. The count would easily exceed 5 if other relatives (siblings, cousins, uncles, etc.) were included.<sup>10</sup>

The relevance of this instrument is supported by its negative and significant first stage coefficient: firms with *SmallFamily* = 1 are 5% less likely to resort to informal finance. Importantly, the *SmallFamily* instrument has a significant positive effect (+4%) on the probability of future financing events. Its validity, however, relies on the hypothesis that founders with rare last names have no advantage in managing a business or accessing capital markets. Clark and Cummins [2015] suggest that rare last names typically belong to recent immigrants or small local families. It can be argued that foreign-born individuals are particularly prolific innovators (Kerr [2008]) or that small families' offspring is wealthier and better educated because of lower dispersion of family resources (Goodman et al. [2012], Downey [2001]). By means of a matching algorithm (Ambekar et al. [2009]), I associate founders' surnames with their ethnicities. I show that the positive relationship between the instrument and the outcome variable mostly originates from the subgroup of individuals with European origins and therefore it is unlikely to be due to recent immigration to the U.S. Furthermore, I collect online curricula for a subsample of founders. Startup founders are most likely to have a college or higher degree and approximately ten years of working experience, but differences between the rare last names group and the rest of the sample are not significant. Thus, in my sample, I find no evidence that individuals belonging to small families have more education or business skills.

At the firm level, the *SmallFamily* variable is not correlated with measures of profitability

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<sup>10</sup>There are few data available on size and structure of families for the general population in the U.S. In a study conducted by Garceau et al. [2008] on a sample of 1,019 individuals residing in Connecticut the average number of blood related immediate family members is 5.07 and the average number of blood related extended family members (aunt/uncle, niece/nephew, grandmother/grandfather) is 7.41. In Hampton et al. [2011], a survey of American Facebook users shows that immediate and extended family members account for 21 of the active contacts on average.

and growth opportunities. Revenues as reported at the time of the seed round are marginally lower than for the rest of the firms in the sample and, conditional on receiving additional funding, the instrument does not predict changes in revenue size between the seed and the follow-on round.

The endogeneity problem is formally addressed by means of a bivariate probit model (as in Greene [1998] and Evans and Schwab [1995]), where I simultaneously estimate the probabilities of accessing follow-on funding and of resorting to informal finance in the seed round. The instrument is included in the regression for the binary endogenous variable. My results show that recourse to informal finance has a negative and significant effect on the probability of future financing events ranging from -15% to -19%, with the strongest effect associated with later funding provided exclusively by formal investors. The magnitude of these estimates implies that marginal effects or coefficients computed from a single equation probit or a linear probability model, which range from -5% to -13%, underestimate the negative impact of informal finance.

The main results in this paper suggest that funding from family and friends affects future financial constraints. Therefore, while informal finance may constitute a cheaper source of capital as it mitigates some frictions in the formal capital market (Stiglitz [1990] and Besley and Coate [1995]), it may also impose costs further down the line.<sup>11</sup>

There are at least two explanations for these findings. First, informal funders may create corporate governance issues that deter professional investors from participating in later rounds. For instance, late stage VC-type investors may require control over the firms they finance, and in this aspect they differ from early stage formal investors. Goldfarb et al. [2012] and Wong [2002] argue that, unlike angels, VC firms use staging and various contractual provisions to protect their claims and pursue their investment objectives.<sup>12</sup> The most direct way to exert

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<sup>11</sup>Informal finance can relax capital constraints by mitigating asymmetric information and moral hazard problems. Social and physical proximity to the entrepreneurs provide informal funders with superior information and lower monitoring costs as compared to other financial intermediaries (Stiglitz [1990]). Also, reputational concerns enhance and correct incentives when capital transactions are conducted within a narrow community (Besley and Coate [1995]).

<sup>12</sup>Control is not usually claimed by angel investors because geographic proximity and higher equity stake left to founders allow for low monitoring. Also, firms in their early stages are presumably testing products and business models, which requires founders' specific skills, making external supervision unnecessary or even

control is to gain board seats and replace founders in the management team (Wasserman [2012]). Founders with a pronounced desire for control are likely to resist this process, and resistance can be difficult to overcome if family and friends stakeholders side with founders. Such unofficial shareholder agreements can originate from altruistic preferences of informal funders or from non-pecuniary private benefits of retaining control within the close social circle.<sup>13</sup> The expectation of a costly or time consuming negotiation over control with this informal coalition can discourage investments from outsiders.<sup>14</sup> The novel dataset employed in this paper allows me to explore this hypothesis. I provide suggestive evidence that late stage investors are less likely to gain control over firms that have informal funders, by showing that founders are more likely to retain executive positions after receiving follow-on capital when their firms are financed by family and friends.

A second potential explanation for the negative effect of informal finance on subsequent access to capital is a direct impact on businesses success and growth, which ultimately determines the likelihood of receiving additional funding. Informal finance is unlikely to provide entrepreneurs with the same level of guidance offered by professional investors. Using survey data for Chinese firms, Ayyagari et al. [2010] show that informal financing is associated with lower sales growth and reinvestment rates. Moreover, having relatives or friends as initial shareholders may affect the management style, for example by inducing too much risk aversion and causing firms to forgo profitable growth opportunities (Lee and Persson [2013]), or by introducing poor governance practices. If this conjecture is true, lower probabilities of raising additional funds simply reflect inferior business performance. Evidence based on survival data for a subsample of firms located in California does not support this argumentation. Like in the full sample, informal finance is negatively correlated with subsequent formal capital raising like in the full sample, but it does not predict lower survival probabilities. However, consistently

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counterproductive.

<sup>13</sup>In the related family firms literature, Demsetz and Lehn [1985] refer to these benefits as the “amenity potential” of control. Informally funded firms are similar to family firms insofar as informal stakeholders are motivated by goals that are not purely related to financial performances. However, these firms do not necessarily share other distinctive features of family firms such as direct involvement of the family in the management or preference for within firm inter-generational transfers (Bennedsen et al. [2010])

<sup>14</sup>To continue the parallel with family firms literature, this mechanism can also explain why VC rarely invest in family firms. See for example Martí et al. [2013].

with previous studies, receiving follow-on funds significantly increases survival rates.

To summarize, family and friends seem to be the wrong investors, as they deter formal venture capital, which improves firms' chances of survival. Then why do entrepreneurs resort to them? Informal finance may be cheaper than formal. However, my data show that it is usually not sufficient to cover initial investment needs in full. Formal capital providers who co-invest with family and friends may anticipate the lower probability of follow-on rounds and raise the bar for access to seed rounds, thus undoing the cheapness of informal finance. If informal capital does not materially reduce the cost of funding, the benefits of involving family and friends must have a non pecuniary nature. The data on founder-manager turnover indicate that recourse to informal finance may depend on entrepreneurs' taste for control and on VC investment practices. Having trustworthy stakeholders increases the probability of retaining control in founders' hands, counterbalancing the negative effects on access to formal capital.

Thanks to the novelty and the scope of the SEC Form D dataset, this paper contributes to the entrepreneurial finance literature by significantly expanding empirical evidence on firm and founder characteristics and financing choices of private ventures in their early-stage investment phase. Importantly, my focus on informal finance adds to the current understanding of the role of this source of finance in startups' capital structure (Robb and Robinson [2012]) and firms' outcomes. The results on the negative effects of family and friends funding on access to formal capital are also new to the existing body of theoretical literature on informal finance (Stiglitz [1990], Besley and Coate [1995], Lee and Persson [2013]) . Finally, by providing suggestive evidence on corporate governance and performance related mechanisms, I connect informal finance literature with previous empirical and theoretical work on entrepreneurship (Hurst and Pugsley [2010], Hamilton [2000]), family firms (Demsetz and Lehn [1985], Burkart et al. [2003], Bennedsen et al. [2007], Miller et al. [2007]) and stage financing (Hellmann and Thiele [2015]).

The remainder of the paper is organized as follows. Section 2 describes the data . Section 3 illustrates the empirical methodology and Section 4 presents the results. Possible mechanisms are explored in Section 5. Section 6 concludes.



## 2 Data Description and Summary Statistics

### 2.1 Small and Medium Sized Firm Financing: Capital Raising with Unregistered Securities Offerings

Currently available data on financing choices of early-stage firms rely primarily on surveys that cover a small portion of total capital raising and it is naturally prone to sampling bias. In order to circumvent this problem, I construct a dataset based on online filings for private offerings conducted in exemption to US securities laws.<sup>15</sup> Securities laws (“Securities Act” 1933, “Exchange Act” 1934) apply to all companies that issue securities. The main purpose of these laws is to protect investors as they enforce transparency and disclosure of companies’ business and risk profile. The most common exemption for small businesses is the private placement exemption under SEC Regulation D,<sup>16</sup> which requires non-reporting firms to notify the SEC of the sale of securities via Form D. Angel investors and VC firms, for example, make their investments by purchasing in these private offerings of unregistered securities.<sup>17</sup> Regulation D requires that Form D must be filed within 15 days of securities first sale date, regardless of whether the total amount offered has been sold in full or not. Beginning in March 2009, the SEC has made it obligatory to file Form D electronically.

Any Form D filed is publicly available on the SEC website and contains the following information: issuer characteristics (year and state of incorporation, address, industry group, revenue range), type of securities issued (equity, debt, hybrid securities), offering and sales amount and the total number of investors who participated to the offering.

I collect all Form Ds that were filed with the SEC between March 2009 and October 2014. For the purpose of investigating the effects of informal finance, I identify a sample of issuers that display early stage business features and follow their capital raising activity over time. Each firm is uniquely identified by the Central Key Code, a numeric code assigned by the

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<sup>15</sup>See <http://www.sec.gov/info/smallbus/qasbsec.htm>

<sup>16</sup>Private offering can also be conducted under Section(a)(2) of the Securities Act. Ivanov and Bauguess [2013] show that the amount of capital raised through Section(a)(2) during the years 2009 to 2012 is less than 20% of the amount raised through Regulation D.

<sup>17</sup>Tracking investments in private firms via Form D filings is becoming increasingly popular in the business community. See for example the website [www.FormDs.com](http://www.FormDs.com).

SEC.

Specifically, this restricted sample includes 6,717 non-financial firms, selected according to the following criteria:

1. All firms filed a Form D for the first time in years 2011-2012<sup>18</sup>
2. Firms are less than 2 years old at the time of the first offering
3. First offerings are smaller than \$6M<sup>19</sup>
4. Disclosed revenues at the time of the first offering are smaller than \$5 million
5. Firms operate in the U.S. and are incorporated (if already so) in Canada or the U.S.

Filters 1. and 2. are used in order to identify young firms that access entrepreneurial finance for the first time. Filters 3. and 4. are added in order to exclude firms that, despite being young and new to private capital markets, are large in size and in a mature stage, as it would be the case for spin-offs of established companies. Filter 5. rids the analysis of potential additional complexity due to frictions in international capital markets.

Table 1 shows the industry breakdown: Technology (other than Biotechnology and Telecommunications) dominates the sample with 24.2% of the observations. Other relevant sectors are Commercial (7.4%), Health Care (other than Hospitals and Health Insurance, 6.1%) and Oil and Gas (6.1%). Most firms are located in California (19.2%), Texas (10.8%), New York (9.8%), Florida (4.7%) and Massachusetts (4.7%) (Table 2). The total amount offered by firms in the sample at the time of their first access to private capital markets ranges between \$1.2 billion and \$1.4 billion per quarter, while the average size of the offering is \$1.5 million

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<sup>18</sup>Choosing observations from the middle years of the larger sample makes sure that it is possible to track all previous offerings and restrict the sample only to first rounds for firms less than 2 years old and allows a little over 6 quarters after the first issuance to track future financing events.

<sup>19</sup>The rationale for this threshold is that VC firms usually participate in larger, late stage deals. Average Series A VC deal size was \$6.2 million, \$6.5 million and \$8.6million in years 2012, 2013 and in the first three quarters of 2014 respectively, according to Prequin Venture Capital Deals report October 2014.

(see Figure 1).<sup>20</sup> These descriptive statistics are consistent with survey-based data on seed financing as they match evidence and trends on angel investing highlighted by Halo Reports (provided by ARI, SVB and CB Insights) for the corresponding years.

The granularity of the information contained in these filings allows for the analysis of private capital markets along novel dimensions. In terms of firm characteristics, common legal entity types are Corporations (45.8%) and LLCs (44.4%), most firms are incorporated in Delaware (49.4%), while only 0.67% of the firms were not yet incorporated at the time of the deal. Half of the firms in the sample decline to disclose revenues, 27% of them had no revenues and the rest disclose revenues smaller than \$5 million. Table 3 reports characteristics of the seed round. The security type used is equity (alone or in combination with other securities) for 79.7% of the observations and debt (alone or in combination with other securities) for 14.8% of the observations. The issues are rarely conducted with the support of a registered financial intermediary (less than 5%). The average number of investors per deal is 11.42 and the median is 6 (Figure 2a).

In order to assess firms' ability to access private capital markets, I analyze follow-on rounds filed within six quarters of the initial round.<sup>21</sup> Only 19% of firms in the sample raise capital in a second offering.<sup>22</sup> The average amount offered is substantially higher than in first rounds ( \$3.2 million on average) and debt (alone or in combination with other securities) is more widely used (26%). Firm characteristics are essentially unchanged: 99% of the issuers are still incorporated in the same state, only 7% report to operate in a different sector and 14% report a change in revenue size (see the revenue size transition matrix in Table 4).

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<sup>20</sup>Since filing of Form D is required within 15 days since the day of the first sale, amounts offered and amounts sold by the filing date can differ. On average, firms report to have sold 58% of the amount offered.

<sup>21</sup>Conditional on observing a second offering after the first one, the average time between the first and the second issuance in the sample is 3.86 quarters, but decreases over time due to observability. 6 quarters represents the 75th percentile in the distribution of time elapsed between the first and the second offering for all of the 8 subsamples of firms by quarter of first issuance.

<sup>22</sup>For a comparison, the Angel Capital Association reports that in 2012 the number of VC deals was approximately 15% of the number of seed round deals provided by angels (<https://www.sec.gov/info/smallbus/acsec/acsec-091713-verrill-hudson-slides.pdf>)

## 2.2 A Proxy for Informal Finance: Non-Accredited Investors

The effect of informal finance on future access to capital is the main objective of this paper. Answering this question is difficult due to a lack of data on financing sources for young and small firms. However, SEC disclosure requirements for private placements allow me to construct an empirical proxy for informal finance. Firms filing Form D must disclose whether non-accredited investors can purchase the security offered: I use this information as the indicator for recourse to informal finance.

Regulation D (in its most commonly used rule, 506(b))<sup>23</sup> imposes restrictions to securities sales based on financial sophistication and need for protection of investors. Specifically, buyers in a private offering are assumed to be sophisticated if they comply with the definition of accredited investor. In the context of this study, the relevant accredited investor definition includes:<sup>24</sup> registered financial intermediaries, charity organizations, directors or executives of the firm, individuals with net worth greater than \$1 million or income exceeding \$200 thousands per year. Under Rule 506(b) there are no restrictions on participation and disclosures if securities are sold to accredited investors, while non-accredited investors cannot be more than 35 in each single offering and must be provided with specific disclosure documents, such as certified financial statements.<sup>25</sup> Since general solicitation, i.e. any form of advertisement of a private

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<sup>23</sup>Private offerings in exemption of securities laws can be conducted also under Rule 504, Rule 505 and, since September 2013, Rule 506(c). Rules 504 and 505 are applicable to smaller issuances (\$1 million or \$5 million) and, under certain circumstances, they relax constraints on non-accredited investors participation. However, only Rule 506(b) exempts from Blue Sky law registration. This seems to be the reason why Rule 506(b) has been used in 94% of the offerings between 2009 and 2012. See Ivanov and Bauguess [2013].

<sup>24</sup>The standards for accredited investor qualification were first set 1982 when Regulation D was issued. The first revision of these criteria was introduced in 2011 with the Dodd-Frank Act and enacted in December 2012. It excluded the house of first residence from the calculation of natural persons net worth. According to the Dodd-Frank Act, the SEC is now required to revise the accredited investor definition every four years.

<sup>25</sup>The constraint on the number of non-accredited investors does not appear to be binding for firms in this sample, as 96% of first round filings for completed offerings report less than 35 investors in total.

For offerings up to \$2,000,000 financial statements requirements are the following : balance sheets as of the end of each of the two most recent fiscal years (only the balance sheet, dated within 120 days of the start date of the offering, must be audited); statements of income, cash flow and changes in stockholders' equity for each of the two years preceding the date of the most recent audited balance sheet (or such shorter period as the issuer has been in business); and interim financial statements as of the end of the issuer's most recent fiscal quarter. For offerings up to \$7,500,000 the same requirements apply. However, the financial statements must be audited unless the issuer cannot obtain audited financial statements without unreasonable effort or expense. For offerings over \$7,500,000 the issuer must provide the financial statements required to be filed in a registration statement that the issuer would be entitled to use.

securities sale, is forbidden, investors must be approached directly by the issuer.<sup>26</sup> While financial intermediation companies are well known to the general public through websites or advertisement, angel investors usually organize themselves in groups operating via a website, in order to increase their visibility to entrepreneurs. The Angel Capital Association, the largest angel organization in the world, and the vast majority of angel groups in U.S.A., only accept accredited investors as members. Thus, non-accredited investors participating in these offerings are likely to be individuals within the entrepreneur's social network (such as family, friends or employees). This identification criterion is strict: depending on their wealth, family and friends of the entrepreneur may qualify as accredited investors and participate in the offering as such. As a consequence, the informal finance proxy may underestimate the extent to which firms rely on this type of investors for funding.

Table 5 provides descriptive statistics for the 1,117 firms (16.63% of the whole sample) that have informal funders among their initial investors (I will refer to this group as IF-firms) and compare them with the rest of the sample (NonIF-firms). Consistent with economic intuition, IF-firms are smaller (in terms of number of founders and amount offered in the first round) and at an earlier stage of business operations (as per revenue size, years since incorporation and entity type). Moreover, location and sector distributions are more dispersed than for NonIF-firms, with smaller weights on California and Tech companies.

97% of the completed IF-firms' first offerings have accredited investors participating alongside non accredited investors. Informal finance is rarely the only source of funding and it is usually combined with professional investments.

Crucially in the context of this paper, the likelihood of raising capital in a second offering drops dramatically for the IF subsample: approximately 10% of the firms access capital markets for a second time, and less than 5% do so via offerings conducted exclusively with formal investors (see Table 5 ).

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<sup>26</sup>The solicitation of an offering became less restricted with the JOBS act in 2012. The new Rule 506(c) allows general solicitation provided that the offering is addressed only to accredited investors.

### 2.3 The Founders Team

“Have you ever noticed how few successful startups were founded by just one person?” asks Paul Graham in his blog.<sup>27</sup> Undoubtedly, the size of the management team matters for professional investors when deciding whether to finance a project. Ability to work in teams and complementarities in product development and management skills are often quoted as the motive for easier access to VC capital of firms with two or more founders.

Form D contains the full name and address of “related persons”, namely issuer’s executive officers, directors or promoters.<sup>28</sup> I refer to the group of related persons in each deal as the management team. In the absence of any legal or conventional definition, I assign the *founder* status to individuals with managerial positions in the firm at the time of its first round of capital raising, provided that it takes place within two years since incorporation. Therefore, I refer to the group of managers in the seed round as the founders.

This sample contains the names of 19,498 founders: 44.13% of the individuals in this group are directors, 46.31% are executive officers and 9.56% are promoters, with 4% of them being other business entities. The size distribution of the founders management team is illustrated in Figure 2b. Mean and median size of founders teams is 3 and 99% of the firms have less than 9 founders. Consistently with Graham’s quote, single-founder firms (20% of the sample) are less likely to raise capital after the first deal: 13% of these issuers access the market a second time, versus 20% of firms with 2 or more founders.

In order to gain further insight on founders demographics and lacking any information on their biographies, I match founder’s last names with linguistic group/ethnicity according to the algorithm in Ambekar et al. [2009]. This automated ethnicity classifier uses hidden Markov

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<sup>27</sup>Paul Graham is a known tech entrepreneur, venture capitalist and co-founder of Y Combinator, a seed capital firm.

<sup>28</sup>The definition of promoter includes: (i) Any person who, acting alone or in conjunction with one or more other persons, directly or indirectly takes initiative in founding and organizing the business or enterprise of an issuer; or (ii) Any person who, in connection with the founding and organizing of the business or enterprise of an issuer, directly or indirectly receives in consideration of services or property, or both services and property, 10 percent or more of any class of securities of the issuer or 10 percent or more of the proceeds from the sale of any class of such securities. However, a person who receives such securities or proceeds either solely as underwriting commissions or solely in consideration of property shall not be deemed a promoter within the meaning of this paragraph if such person does not otherwise take part in founding and organizing the enterprise. Securities Act of 1933, Rule 405, 17 C.F.R. § 230.405.

models and decision trees to assign names to one of 13 ethnic/linguistic categories (Table 6, Panel A shows the hierarchical structure of the categories). Panel B in Table 6 illustrates the ethnic mix of the founders teams. The average founders team is mostly composed of individuals with a European descent (84%). Interestingly, the average composition of teams that access capital markets for a second time is broadly similar to the full sample's. Similarly, teams with a majority of European descendants don't seem to be more likely to raise more funding after the first round when compared to the full sample or the subsample of firms with a balanced ethnic mix (i.e. no ethnicity represents more than 50% of the team).

## 2.4 Rare Surnames and Informal Finance

Since financing decisions are made by firms' managers, investigating personal characteristics of founders can help identify sources of variation in the use of informal finance. For example, the size of founders' extended family network might affect the supply of informal funds. I construct a proxy for small combined family network of the founder team, based on information on founders' surnames contained in the Frequently Occurring Surnames dataset (FOS) provided by the Census Bureau.

The FOS ranks all American last names (6.2 million) in order of occurrences, i.e. in terms of number of U.S. residents with each surname. This dataset shows, along with names and occurrences, statistics on ethnicity and race of individuals associated with each name. For example, the last name Smith ranks first with over 2.3 million occurrences and is mostly borne by non-Hispanic white (73%) and non-Hispanic black (22%) individuals. For privacy reasons related to the disclosure of such sensitive demographic data, the list is truncated to exclude names that occur less than 100 times. However, summary statistics for these *rare* names are provided by Word et al. [2008]. There are 6,096,744 rare names that correspond to over 27 million people ( 10% of the surveyed population). Thus, each rare name corresponds on average to 4.5 individuals. Furthermore, over 90% of these rare names occur less than 10 times.<sup>29</sup>

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<sup>29</sup>Similar distributional properties of Spanish and English last names have been exploited by Güell et al. and

As a consequence of this truncation, some founders' names in my sample (13.87%) cannot be matched with the FOS list and are classified as rare. On the basis of the judgment that 4.5 expected occurrences of a last name reveal an exiguous number of familiar links, I identify founders with small family networks as the ones bearing a rare surname.

I define the *SmallFamily* dummy variable  $S_i = 1$  if the proportion of founders in firm  $i$  with rare last names is greater than the sample average. Consistently with the intuition above, firms with  $S_i = 1$  (1,954 observations) are less likely to resort to informal finance as compared to the full sample (12.69% versus 16.67%).<sup>30</sup> Importantly, these firms also seem to be associated with a higher probability of raising capital more than once (21.85% versus 19.04%).<sup>31</sup> The issue of robustness of the correlation between  $S_i$  and informal finance and the question of whether channels other than family size can affect the relationship between  $S_i$  and subsequent financing events are addressed in the next section.

### 3 Empirical Strategy

#### 3.1 Empirical Specifications

A simple way to estimate the impact of informal finance on future financing events is via a single equation probit model. Let the indicator variable  $Y_i = 1$  if firm  $i$  raises capital in private markets within 6 quarters since its first offering. The ability to issue new securities is described by the latent variable model

$$Y_i^* = X_i\beta + IF_i\delta + \epsilon_i$$

where  $Y_i^*$  is the unobserved ability,  $X_i$  is a vector of firm, first round, location and time variables and  $IF_i$  is a dummy variable that takes value 1 when non-accredited investors are allowed to participate in the first offering and  $\epsilon_i$  is a standard normally distributed random error. Firms will raise capital in a second round if their ability score is positive. The probability

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Clark and Cummins [2015] to establish family links among individuals and track inter-generational mobility.

<sup>30</sup>This difference is significant at 1% confidence level

<sup>31</sup>This difference is significant at 1% confidence level



of  $Y_i = 1$  is

$$\Pr [Y_i = 1] = \Pr [X_i\beta + IF_i\delta + \epsilon_i > 0] = \Phi [X_i\beta + IF_i\delta] \quad (1)$$

where  $\Phi [\cdot]$  is the standard normal cdf.

In this single-equation probit model the informal finance coefficient is treated as exogenous. There are, however, ample reasons why this may not be the case. If entrepreneurs prefer formal to informal finance and the supply of capital is limited, the best projects will receive full financing by professional investors while other projects will either not receive funding or will be funded by a mix of formal and informal investors.<sup>32</sup> The best projects are also more likely to successfully raise capital in a second round. Thus, the informal finance effect is due to an unobservable omitted “project quality” variable rather than a causal link with future access to capital. Some of the descriptive statistics presented above point in this direction: IF-firms are smaller and younger on average. As future cash flows are uncertain, these firms are presumably more likely to be denied funding by professional investors. Notice however that the richness of the SEC data allows for extensive controls on size and age.

In order to allow for the possibility of endogeneity, I estimate model (1) jointly with a probit model for the informal finance variable (see Greene [1998] and Evans and Schwab [1995] for applications in education economics).

Suppose that the probability of  $IF_i = 1$  is described by

$$\Pr [IF_i = 1] = \Pr [Z_i\theta + \mu_i > 0] = \Phi [Z_i\theta] \quad (2)$$

where  $Z_i$  is a vector of observable and  $\mu_i$  is a random error.

In this setting, both the outcome variable and the potentially endogenous regressor are dichotomous and as a consequence both the first stage and the structural model are non linear. Following Heckman [1978], I employ a bivariate probit model approach.

To account for the possibility that  $IF_i$  and  $Y_i$  are determined by correlated unobservable

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<sup>32</sup>Entrepreneurs’ preference for one source of funding over the other is not an uncontroversial issue. While informal finance imposes regulatory and “emotional” burdens on founders, it might be significantly cheaper than formal finance, especially when capital supply is exiguous and there is strong inequality of bargaining power between entrepreneurs and professional investors.

variables ( say “project quality”) I assume that  $\epsilon_i$  in (1) and  $\mu_i$  in (2) are distributed bivariate normal with  $E[\epsilon_i] = E[\mu_i] = 0$  ,  $var[\epsilon_i] = var[\mu_i] = 1$  and  $corr[\epsilon_i, \mu_i] = \rho$  . In this model there are 4 possible states of the world ( $IF_i = 0$  or  $IF_i = 1$  and  $Y_i = 0$  or  $Y_i = 1$  ) and corresponding likelihood function is a bivariate probit. This model is identified if at least one variable (the instrument) in  $Z_i$  is not contained in  $X_i$ .<sup>33</sup> Equation (2) can be rewritten as

$$\Pr [IF_i = 1] = \Pr [X_i\lambda + S_i\pi + \mu_i > 0] = \Phi [X_i\lambda + S_i\pi] \quad (3)$$

where the instrument  $S_i$  is the proxy for small combined family as defined in the previous section.

An alternative strategy consists in a 2SLS estimation where non linear fitted values for  $IF_i$  from (3) are used as instrument (Angrist and Pischke [2008]). While the linear IV method provides consistent estimates of the average effect, it can be biased in small samples and its performance can be inferior to a correctly specified maximum likelihood estimation approach. Despite these drawbacks, in the next section I present 2SLS estimates along with bivariate probit model results for comparison.

Finally, since large social networks may support founders through multiple stage of financing, the indicator dependent variable can be redefined as  $Y_i = 1$  if firm  $i$  raises capital in private markets with *accredited investors only* within 6 quarters since its first offering. With this specification I evaluate the impact of informal finance on funding from formal investors.

In all of the above specifications, the full vector of covariates  $X_i$  includes:

- Firm characteristics: industry, revenue size, legal entity type, state of location, state of incorporation, year of incorporation
- Founders Team characteristics: size, ethnicity mix (based on Level 2 as per Table 6 ), a *Corp* dummy that takes value 1 if one or more of the related persons are other business entities, a *family* dummy that takes value 1 is two or more founders have the same last

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<sup>33</sup>Han and Vytlačil [2013] extend this identification result to a wider class of models that includes bivariate probit models as a special case

name

- Seed Round characteristics: amount offered, number of investors, quarter of issuance, type of security issued, an *Intermediation* dummy that takes value 1 if the offering was conducted with the support of a registered financial intermediary, a *Hot Deal* dummy that takes value 1 if more than 80% of the amount offered was sold at the time of the filing
- An interaction term between year of incorporation and quarter of first issuance, to capture the effect of firms' age in different capital markets conditions

The coefficient of interest is  $\delta$  in equation (1), which captures the effect of informal finance on future financing.<sup>34</sup> Any claim of causality relies on the validity of the instrument used, which is discussed next.

### 3.2 Rare Last Names, Informal Finance and Access to Private Capital Markets

For the bivariate probit model to be identified we need *a*) the instrument to belong to the set of explanatory variables in (2) and *b*) the instrument to be excluded from the structural model in (1). In order to verify the relevance of instrument  $S_i$  I estimate the first stage single equation probit in (3).

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<sup>34</sup> In order to measure the qualitative importance of the covariates I report Average Marginal Effects. For the *j*-th covariate, these are given by

$$AME_j = \gamma_j \frac{1}{n} \sum_{i=1}^n \varphi(A_i \gamma)$$

for continuous covariates and

$$AME_j = \frac{1}{n} \sum_{i=1}^n \{ \Phi(A_i \gamma | \gamma_i^j = 1) - \Phi(A_i \gamma | \gamma_i^j = 0) \}$$

for dummy variables, where  $n$  is the sample size,  $A_i$  is the full vector of covariates and  $\varphi(\cdot)$  is the first derivative of  $\Phi(\cdot)$

Estimated coefficients and average marginal probabilities are reported in Table 7 together with coefficient estimates for a linear probability model. Results show that  $S_i$  has a significant negative effect (-5%) on the probability of firms resorting to informal finance. The interpretation of this coefficient is relatively straightforward: if the founders team has a small combined family network it is less likely for the firm to have informal funders. The magnitude of this coefficient is considerable when compared with the unconditional probability of resorting to informal finance for firms in my sample (17%). Incidentally, coefficients estimates of equation (3) offer an interesting insight on startups financing choices. Informal finance is less likely for bigger issuances or intermediated offerings, but the size of the management team does not seem to play a significant role. The estimated coefficient for the *Hot Deal* dummy is negative and significant: first rounds that are open to professional investors only are subscribed faster.

As the relevance of the instrument is confirmed, the credibility of the identification strategy relies on the hypothesis that the proxy for founders family network size does not affect the ability of the firm to raise capital in private markets a second time (other than via less frequent recourse to informal finance). At the firm level, small combined family networks do not seem to be associated with higher growth potential. Table 8 shows that the instrument is not correlated with higher revenue size or capital raised in the seed round, nor it predicts changes in revenue size for firms that access follow-on financing. Furthermore, the instrument does not explain faster expansion processes where financing needs (measured by proportional change in capital raised between seed and follow-on round) grow more rapidly.

At the individual founder level, it has to be assessed whether founders with rare last names somehow “special” in their ability to run a business or securing funding. In order to address this question, I examine further the demographics of the rare last names group and compare it with the rest of the sample. As suggested by Clark and Cummins [2015], individuals surnames classify as rare in three instances

1. Small local families
2. Early generations immigrants

### 3. Spelling mistakes/name mutations.

Each of the above classification groups poses specific challenges to the identification strategy.

Insofar as the non-rare surnames subsample is mostly composed of second-or-later generation Americans, an instrument that oversamples individuals belonging to small U.S. families can fail the validity test if these families have larger wealth or more powerful social networks, as this might imply better access to funding. Such conjecture is consistent with the idea that lower fertility can improve the socioeconomic conditions of descendants because of lower dispersion of family resources (Goodman et al. [2012], Downey [2001]). Concerns over the validity of the instrument motivated by the argument above are mitigated by the fact that the population of entrepreneurs in this sample is presumably homogeneous in terms of (higher than average) wealth and education.<sup>35</sup>

Previous literature explored the role of immigration in innovation and entrepreneurship. Kerr [2008] shows how Chinese and Indian inventors were important contributors to innovation in the U.S in the 1990s by matching a name-ethnicity database with individual patent records. Immigrants may have better or more innovative ideas, perhaps because of better education systems outside of U.S. or because they are more motivated. On the other hand, Michelacci and Silva [2007] provide evidence that entrepreneurs who work in the same region where they were born are more successful than outsiders as they are better at taking advantage of financial opportunities arising in that region. Although geographical distance from family can certainly discourage informal finance, if the first effect dominated, the instrument proposed would be also picking up better unobservable project quality. Notice that, in this study, the “recent immigrant” status does not necessarily associate with the rare last name category: an entrepreneur named Elena Garcia would not be part of the rare surname subsample (Garcia is the 8st most common surname in U.S.), even if she just moved from Mexico to California.

Finally, while unable to verify the incidence of name mutations (i.e. surname spelling mistakes at the time of registration in public records), spelling mistakes are unlikely to be frequent

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<sup>35</sup>According to a report published in 2010 by CB Insights, 52% of the founders of firms involved in Internet Seed and Series A rounds have graduate level education, with 7% of the sample holding a PhD degree.

in the dataset as the filings are filled in by the founders themselves (or their representative) and machine readable. Of course, if name mutations and spelling mistakes were the major reason why surnames are classified as rare the conjectured link with the family size would no longer be grounded. In that case, however, it would be difficult to make sense of the first stage results presented in Table 7.

To investigate whether individuals with small families in my sample are more likely to have higher social status or business skills, I extract information on founders education and past working experience from LinkedIn, an internet-based professional network. Each individual  $j$ , founder of firm  $i$  is uniquely identified if first and last name correspond to a member of the network and if this member's curriculum includes a working experience in firm  $i$ . Although the working experience criterion reasonably ensures that individuals in the sample are correctly paired with network members, it reduces the probability of matching, as legal entity names often do not coincide with company names used on CVs or for commercial purposes. As a result, only 24% (4,422 individuals) of the founders were uniquely matched with a member's profile. The matched subsample however appears to be representative of the population. The differences in the distributions of matched and unmatched individuals by location, sector, revenues size, team size, role and ethnicity are not statistically different from zero. The results support the validity of the instrument. Education attainments and the length of past working experience are remarkably similar between the two groups (see Table 3 and Figure 3). The representative founder has college-level or higher education and approximately 10 years of previous working experience.

This result does not necessarily contradict the idea that individuals who belong to small families achieve higher than average socio-economic conditions, but rather it highlights how such achievements are common among the population of entrepreneurs in this sample, regardless of the size of their families. In this sense, the evidence suggests that founders with rare last names do not possess superior business skills as compared to the rest of the sample.

Finally, Panel A in Table 10 shows the ethnic classification of the rare last names group versus the full population sample. The comparison of the two distributions is largely in line

with the idea of foreign born individuals being over-represented, but presents some peculiar features, especially when viewed in juxtaposition with U.S. immigration dynamics over the last two centuries (Figure 4). East Asian and Hispanic ethnicities are under-represented, despite China and Mexico being the largest contributors to recent immigration in terms of country of origin. Indian origin is over-represented, consistently with strong Indian immigration flows in the 2000s, but so is the Italian, even though immigration from this country substantially stopped in the 1980s. This mixed picture reveals that rare last names do not predominantly belong to early generation immigrants. Different surnames distributions of different linguistic groups are due to historical, cultural, geographical and biological evolution (Manrubia and Zanette [2002]) and affect the probability of surnames from these groups to fall into the rare category. Italian last names distribution, for example, is one of the most dispersed while the Chinese and Korean ones are very concentrated.<sup>36</sup> As immigrants over time bring the name distribution feature of their linguistic group into the host country, names belonging to groups with more (less) dispersed distributions can qualify as rare (non-rare) even for second-or-later (first) generations. Therefore, the ethnicity classification is insightful but not fully informative of whether rare last names mostly belong to foreign born individuals.

An additional characterization of the rare last names group in terms of early immigrants versus small American families can be provided by looking at first names. I split the sample in *American* versus *Early Generation* individuals by matching first names with the list of the 2,438 most common given names as reported in the 1990 Census. The logic behind this classification is that names that were popular at the beginning of the 1990s must belong to the dominant cultural/ethnic heritage of current second-or-later generation Americans. Therefore, names within the list are labelled as American and unmatched names are labelled as Early Generation. In the rare subsample, American individuals have mostly European origins (88%) while Early Generation ones have more diverse ethnic background (Table 10, Panel B). Importantly, the American component in the non-rare subsample is significantly higher than in the rare group (89% versus 75%).

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<sup>36</sup>Rossi, the most common Italian last name approximately belongs to 0.2% of the population while more than 20% Koreans bear the family name Kim

The ethnicity mix of founders is included in the set of explanatory variables  $X_i$ , but an exact control for recent immigration is not viable due to lack of data. Thus, I use the notion that European origins are mostly associated with second or later generations Americans to conduct robustness checks and show that the main results hold even in subsamples where founders' recent immigration is unlikely to play a role.

## 4 Results

Firms with small combined founders' family are 4% more likely to access follow-on capital. Coefficient estimates and average marginal effects for a probit model of the follow-on funding outcome on the exogenous variables and the *SmallFamily* instrument  $S_i$  are presented in Table 11, together with estimates for a linear probability model. The full set of covariates is employed as control. In Panel B the outcome variable is redefined as  $Y_i = 1$  if firm  $i$  raises capital in private markets with *formal investors only* within 6 quarters since its first offering. The coefficient on the instrument  $S_i$  is significant at conventional levels in both specifications. Other results in Table 11 are consistent with the intuition and anecdotal evidence on entrepreneurial finance. Firms with larger founders teams are more likely to secure subsequent financing while larger initial offerings are less likely to be followed by second offerings in the immediate future.

The main results on the effect of informal finance on subsequent access to venture capital stem from the joint estimate of (1) and (3) with a bivariate probit model and are illustrated in Table 12. Columns 1, 2, 5 and 6 show coefficient estimates and average marginal effects using the two proposed definitions for the outcome variable  $Y_i$ . Results of 2SLS estimations are presented for comparison in columns 3 and 7. Despite the potential endogeneity issue related to the informal finance choice, I include estimates of average marginal effects for the single equation probit model in (1) in columns 4 and 8. Informal finance has a negative and significant effect on the probability of future financing events ranging from -15% to -19%, with the strongest effect associated with follow-on funding from formal investors only.<sup>37</sup> Notice

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<sup>37</sup>The significance of the informal finance variable is not overstated by its dichotomous specification. In unreported estimations, I replicate the analysis using the proportion of non-accredited investors over total



that the Hot Deal variable does not affect probability of future financing events. This suggests that seed rounds conducted with no informal investors are subscribed faster for reasons that are unrelated to high unobservable quality of the entrepreneurial idea. It is possible that some formal investors anticipate a lower probability of securing further finance in the future for informally funded firms and this drives the negative relationship between the Hot Deal variable and informal finance in the seed round. This interpretation is supported by the fact that informal finance coefficients and marginal effects as computed with the single equation probit model are smaller in absolute value as compared to the ones computed using the instrument. In other words, it appears that the bar for accessing formal seed financing is set higher for firms open to informal funding.

Revenue size is arguably a relevant variable for this analysis and unfortunately approximately 50% of the firms in the sample decline to disclose this information. In order to check whether the results above are driven by bad controls for revenues size I estimate the same models for the restricted sample of firms that disclose revenues : the average effect of informal finance is still negative (-14%) and significant when I look at follow-on rounds conducted exclusively with formal investors (Table 13).

The main results presented above are computed using models that include all variables in the control set  $X_i$  defined in Section 3.1. Table 14 shows that average marginal effects in a bivariate probit model that only includes firm size controls (column 2) or firm size, industry and location controls (column 3) are not significantly different from estimates for the full model.<sup>38</sup> Thus, a more parsimonious specification with only size, industry and location controls is viable with no significant loss in the explanatory power of informal finance. Further robustness checks are presented in Table 14. In columns 4 and 5 I make use of the ethnicity classification for founders in different ways. Instead of using the proportion of people belonging to the same ethnic/linguistic group for each firm, I include either a dummy variable that takes value 1 if the majority of the founders have European descent or a dummy variable that takes value

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number of investors as proxy for informal finance. The coefficient estimates are negative and significant at 1% level in both the probit and the linear probability model and with both specifications for the dependent variable. However, the categorical definition is preferred because it is more accurate as the proportion of non-accredited to accredited investors may change once the offering is completed.

<sup>38</sup>Size controls include revenue size, legal entity type and amount offered in the seed round.

1 if no ethnic group represents more than 50% of the founders team. The purpose of these different specifications is to account for homogeneity versus multiethnicity of the founders team composition rather than focusing on the specific ethnicity breakdown. This different approach does not yield different estimates for the effects of informal finance. In column 6 I restrict the sample to firms where the majority of the founders have European origins. In doing so, I verify that the effects of informal finance are not related to recent immigration of founders. Finally I restrict the sample to Hot Deals, namely firms that sold at least 80% of the offering amount at the time of the filing for their seed round. Column 7 shows that the magnitude and significance of marginal effects on funding from all investors types drop for this subsample but stay constant when follow-on funding from formal investors only is used as dependent variable.<sup>39</sup>

## 5 Direct Effects on Performance or Frictions in Private Capital Markets?

Having documented the effect of informal finance on the ability of firms to secure financing, I now turn to explore some possible explanations.

Family and friends stakeholders can directly affect firms performance by influencing the management style. For example, they can induce higher risk aversion, which can curb growth and expansion or even generate losses. Informal finance could also lead to bad management practices, such as hiring under-qualified family members or friends in return for financial support. IF-firms will then be less suitable for follow-on rounds within a short period of time. If that is the case, ability of raising new capital further down the line stems from success of the entrepreneurial project. In order to verify this conjecture, alternative measures of firm performance are needed. Given the modest size of the firms in my sample, usual accounting or market performance indicators are not available. As a second best approach, I look at survival probabilities for the subsample of California firms.

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<sup>39</sup>For this specification, given the sensible reduction in the number of observations, I used a more parsimonious model where I included only size, industry and location as control variables

## 5.1 Direct Effects: The California Subsample

I collect data on corporate status as reported on the Business Entities section of the Secretary of State (SoS) webpage (as of June 2015) for California-based firms. California SoS provides information on the status of companies registered in California and companies that perform repeated and successive transactions in the state, regardless of the jurisdiction of incorporation. The search criterion is the legal entity name. Records of corporate status were found for 1046 out of 1288 California firms in the sample.

Corporate status can be recorded as: active, canceled (if the formation or qualification filing was canceled because the payment for the qualification status was not honoured), suspended or forfeited (if the business entity failed to file the required forms with the SoS or failed to meet tax requirements), dissolved, surrender (if the business entity surrendered its right to transact business in the State of California), merged out (the business entity merged out of existence in California into another business entity), converted out (the business entity converted to another type of business entity or to the same type under a different jurisdiction as provided by statute), term expired (if the business entity's term of existence has expired, as provided by the entity's Articles of Incorporation), inactive.<sup>40</sup>

Descriptive statistics are provided in Table 15. Not surprisingly, the technological sector dominates this subsample. IF-firms are more likely to operate in the service industry and are smaller in terms of revenues size. The interesting fact emerging from Table 15 is that the distributions of corporate status are identical (differences are not statistically significant) for IF and NonIF firms. In other words, informal finance does not seem to affect survival probabilities. Moreover, among firms that did not raise further capital after the first offering, IF-firms are marginally more likely to survive. This evidence is investigated more formally in what follows.

Define  $Y_i^S = 1$  if firm  $i$ 's status is reported as active or merged out. I estimate

$$\Pr [Y_i^S = 1] = \Pr [Z_i\gamma + IF_i\delta + u_i > 0] = \Phi [Z_i\gamma + IF_i\delta] \quad (4)$$

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<sup>40</sup>See <http://www.sos.ca.gov/business-programs/business-entities/cbs-field-status-definitions/>

where  $Z_i \equiv [X_i, Y_i]$  and  $u_i$  is a random error. Thus,  $Z_i$  includes all controls in (2) plus the financing event dummy  $Y_i$ . Marginal effects of  $IF$  and  $Y$  are reported in Table 16, together with marginal effects obtained by estimating (2) on the California sample.<sup>41</sup>

The effect of informal finance on the probability of future financing events confirms the general findings based on the analysis of the full sample and discussed in the previous section. In model (4), financing events are associated with higher probabilities of survival. There are several possible explanations behind this result. Formal investors in follow-on rounds may be able to select successful firms, they may directly contribute to performance improvement with mentoring and guidance or they may simply relax financial constraints by providing capital for operations and expansion. Crucially, marginal effects of informal finance are positive but not significant. Hence, informal finance does not negatively affect performance (proxied by survival probabilities).

A consistent interpretation of these results suggests that investors are more inclined to provide capital to firms where family and friends of founders are not involved as stakeholders but the motivations behind such preference are not directly related to the quality of the entrepreneurial project.

## 5.2 Frictions in Private Capital Markets: the Fight for Control

An alternative explanation is related to the business model of the venture capital industry. Late stage, VC-type investors typically demand some degree of managerial control over the firms they finance. This requirement is motivated by the assumption that, once the start-up has successfully overcome its embryonic phase and the business idea has been proven commercially viable, professional management is needed in order to grow revenues and scale

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<sup>41</sup>In unreported estimations, I use the same instrumental variable approach employed for deriving the main results in Section 4. Because of the sensible drop in the sample size I use a more parsimonious model, where only size controls are included in the set of the exogenous covariates. Marginal effects of financing events on survival probabilities range between 12.7% (follow-on events conducted with formal investors only) and 13.3% (all follow-on events) and are statistically significant at 1% confidence level. Marginal effects of informal finance on survival probabilities are not statistically different from zero. Therefore, results from this estimation are essentially the same as the ones reported in Table 16

up operations. This often implies displacing founders leadership, for example by replacing existing managers and directors with individuals chosen by the investors. In a 2008 article on the Harvard Business Review, this is how Noam Wasserman describes his findings on the issue of founders control: “When I analyzed 212 American start-ups that sprang up in the late 1990s and early 2000s, I discovered that most founders surrendered management control long before their companies went public. By the time the ventures were three years old, 50% of founders were no longer the CEO; in year four, only 40% were still in the corner office; and fewer than 25% led their companies’ initial public offerings”.<sup>42</sup>

Founders-entrepreneurs, who are often motivated by non pecuniary goals such as decisional autonomy in the workplace (Hurst and Pugsley [2010], Hamilton [2000]), are likely to resist this transition process. In the article cited above, Wasserman continues: “Founders don’t let go easily, though. Four out of five entrepreneurs, my research shows, are forced to step down from the CEO’s post. Most are shocked when investors insist that they relinquish control, and they’re pushed out of office in ways they don’t like and well before they want to abdicate”.

The clash over managerial leadership can be costlier and more time consuming for outside investors if existing shareholders/friends side with the founders. Such support may be granted on the basis of altruistic preferences of informal funders. A plausible conjecture follows: informal finance may discourage funding from formal investors because it makes it harder to impose control on funded firms.

To test this hypothesis, I look at changes in the management team for a subsample of 674 firms. For all of these firms, at least 2 financing events after the initial one are recorded so that the names of the managers right before the third event are observable. The majority of these companies (55%) operate in the technological industry and are mostly located in California (24%), New York (11%), Massachusetts (8%) , Washington (6%) and Texas (5%). The proportion of founders in management teams at the time of the second round of capital raising is higher for IF-firms. The median (mean) value for this proportion is 82% (71%) for IF-firms and 67% (63%) for NonIF-firms. Moreover, IF-firms are more likely to have founders controlled teams (proportion of founders>51%): 67% versus 59% for NonIF-firms, on average.

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<sup>42</sup><https://hbr.org/2008/02/the-founders-dilemma>

Finally, I estimate the effects of informal finance on the probability of founders retaining executive positions after two rounds of funding. In other words, I investigate whether family and friends help founders keep control of the company.

At the time of the first offering, 846 founders had an executive officer role and 46.2% of them retained this position after the second round. Define  $E_{j,i} = 1$  if founder  $j$  of firm  $i$  still holds an executive position at the time of the third financing event. I estimate

$$prob[E_{j,i} = 1] = \Phi[A_{j,i}\theta + IF_i\vartheta]$$

where  $A_{j,i}$  is a set of controls that includes industry, revenue size, location, number of quarters between round 1 and round 3, founder’s ethnicity.<sup>43</sup> Both the marginal effect of the single equation probit and the coefficient of a linear probability model are positive and significant, indicating that informal finance increases the probability of executive-founders maintaining their roles by approximately 19% (Table 17).

### 5.3 Alternative mechanisms

Once in place, informal finance may directly affect *demand* for funds, by shifting founders’ preferences from venture capital to alternative forms of funding. In other words, the “amenity potential” of control increases for entrepreneurs when family and friends are involved in the venture. In this case, some of the informally funded firms that did not receive follow-on capital may have successfully financed expansion differently, for example with bank loans. This mechanism places the origin of the causal effect of informal finance on a reshuffle of firms’ financing sources pecking order, but hinges on the same argument based on control as the supply driven explanation proposed above.

Finally, professional investors may forgo investment opportunities in firms with informal

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<sup>43</sup>In this subsample, given the substantial drop in the number of observations, the negative correlation between the instrument and recourse to informal finance is too weak to support an IV approach. However, concerns on endogeneity are alleviated by the fact that all these firms are equally successful, as they access private capital markets at least three times in 3 years. The evidence provided here is also consistent with entrepreneurs with strong taste for control choosing informal finance.

stakeholders because of potential constraints on exit options, such as IPOs or acquisitions. An IPO process can be suspended by the SEC if the issuer hasn't previously complied with the regulations concerning exemptions to securities laws (Regulation D, for example). The length of the necessary checks and the probability of a breach can increase with the higher regulatory fulfillment requirements associated with offerings conducted with non accredited investors, increasing legal risks for existing shareholders. If, instead of going public, the firm is acquired by another company, the buyer will have to disclose its financial statements to non accredited shareholders. This can discourage acquisitions by non publicly traded companies.

Whether regulations imposed to financial markets in order to protect unsophisticated investors can impose additional constraints to entrepreneurship as the argument above suggests is an interesting and relevant question. However, because of lack of exit data, it cannot be addressed within this study.

## **6 Conclusions**

Despite the strong interest that entrepreneurship and its role in economic growth attracts among the general public and policy makers, there is limited academic knowledge on small and young firms choices in terms of financing sources and what repercussions these may have on firms survival and success. This is mostly due to lack of relevant and readily available databases. In this paper I contribute closing this gap by examining whether recourse to family and friends financing during the early stages of business investment affects firms ability to raise capital in later rounds.

To answer this question empirically, I employ a novel dataset based on SEC filings for securities offerings conducted by small and young firms raising capital in private markets. The information contained in these filings includes recourse to funding from non-accredited investors, which I use as an indicator for informal finance. Incidentally, the extensiveness of the collected dataset sheds new light on a blind spot of entrepreneurial finance literature,

namely the pre-VC phase of startups.

In order to address the issue of endogeneity of informal finance, I construct an instrument based on founders surnames which is employed as a proxy for small family size. A bivariate model is estimated, where the instrument is included in the regression for the potentially endogenous variable. I find that informal finance reduces the probability of future financing events in private capital markets by 15% to 19% . These results suggest that, while informal finance can relax financial constraints in early stages, it can impose additional restrictions on future access to capital.

I provide arguments and formal tests for two possible mechanisms underlying the documented effects. Informal finance may cause a deterioration of the entrepreneurial project, due to, for example, lower risk tolerance, and this ultimately decreases the probability of receiving funds from professional investors. Alternatively, the second mechanism proposed relies on a corporate governance argument and on the VC industry business model. In particular, concerns over the ability of gaining control, due to conflicting objectives between existing and prospective shareholders, can discourage professional investors. Evidence from subsamples of this dataset supports this last hypothesis while it is less consistent with the first argument.

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**Table 1: Summary Statistics: Industry\***

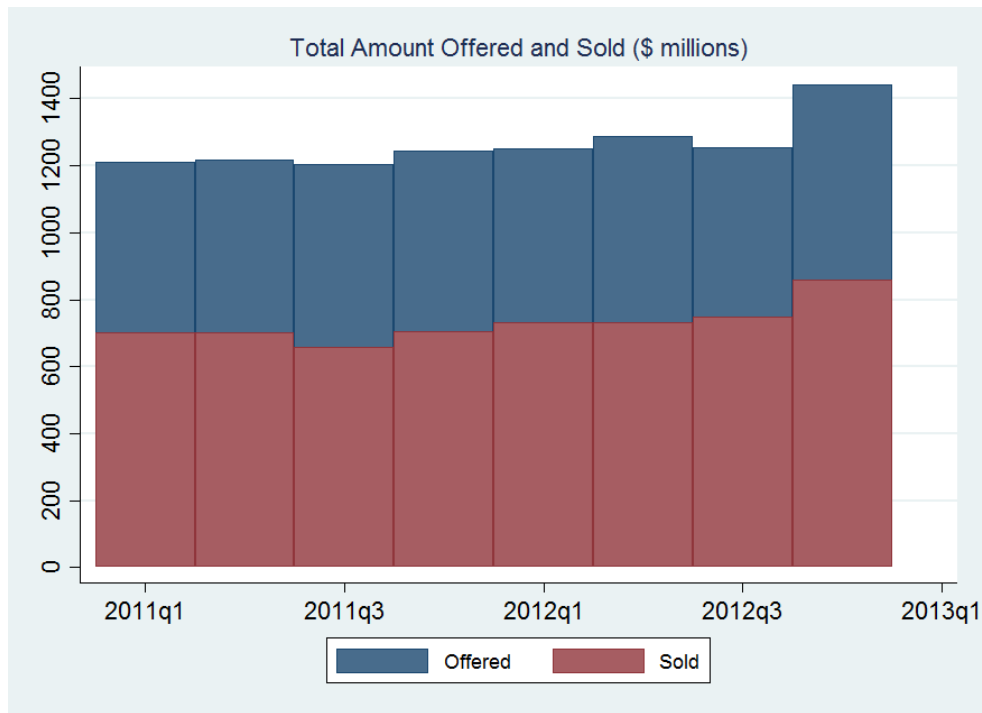
<b>Industry</b>	<b>Frequency</b>	<b>%</b>
Agriculture	41	0.6%
Airlines and Airports	4	0.1%
Biotechnology	157	2.3%
Business Services	178	2.6%
Coal Mining	1	0.0%
Commercial	497	7.4%
Computers	160	2.4%
Construction	32	0.5%
Electric Utilities	23	0.3%
Energy Conservation	31	0.5%
Environmental Services	14	0.2%
Health Insurance	3	0.0%
Hospitals and Physicians	28	0.4%
Lodging and Conventions	24	0.4%
Manufacturing	238	3.5%
Oil and Gas	411	6.1%
Other	1,568	23.3%
Other Energy	128	1.9%
Other Health Care	413	6.1%
Other Real Estate	344	5.1%
Other Technology	1,627	24.2%
Other Travel	14	0.2%
Pharmaceuticals	56	0.8%
Residential	321	4.8%
Restaurants	183	2.7%
Retailing	155	2.3%
Telecommunications	53	0.8%
Tourism and Travel Services	14	0.2%
<b>Total</b>	<b>6,718</b>	<b>100.0%</b>

\*The list of industry categories is provided on Form D. The filing issuer chooses the one that best qualifies its business.

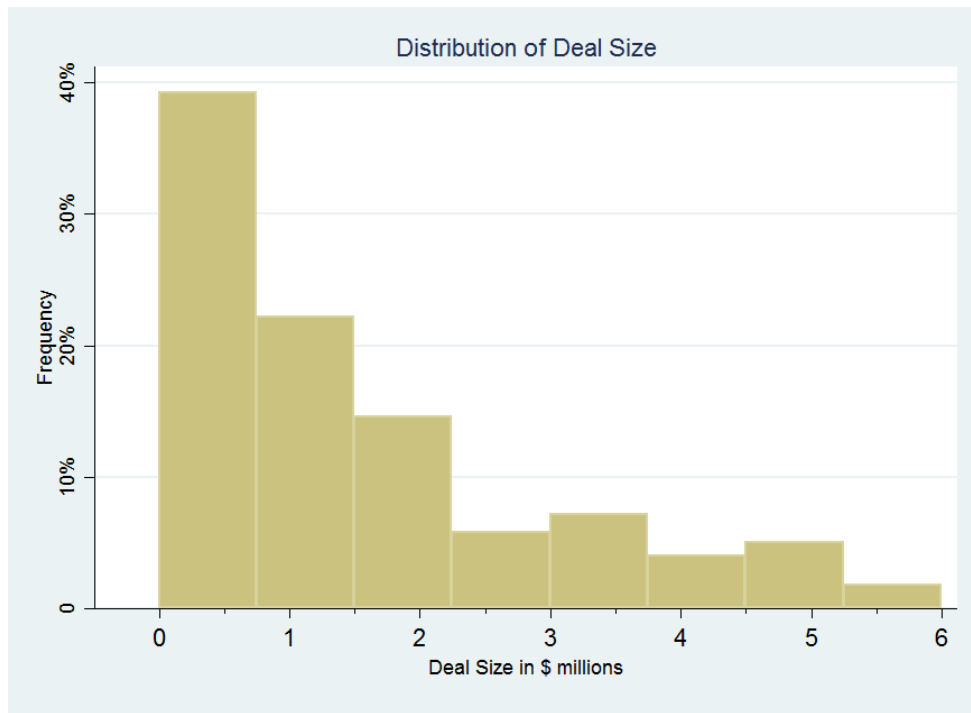
**Table 2: Summary Statistics: State of Location**

State	Frequency	%
ALABAMA	34	0.5%
ALASKA	4	0.1%
ARIZONA	138	2.1%
ARKANSAS	28	0.4%
CALIFORNIA	1,288	19.2%
COLORADO	257	3.8%
CONNECTICUT	108	1.6%
DELAWARE	22	0.3%
DISTRICT OF COLUMBIA	34	0.5%
FLORIDA	319	4.7%
GEORGIA	157	2.3%
HAWAII	12	0.2%
IDAHO	20	0.3%
ILLINOIS	243	3.6%
INDIANA	76	1.1%
IOWA	16	0.2%
KANSAS	36	0.5%
KENTUCKY	120	1.8%
LOUISIANA	22	0.3%
MAINE	21	0.3%
MARYLAND	117	1.7%
MASSACHUSETTS	316	4.7%
MICHIGAN	90	1.3%
MINNESOTA	87	1.3%
MISSISSIPPI	15	0.2%
MISSOURI	43	0.6%
MONTANA	11	0.2%
NEBRASKA	27	0.4%
NEVADA	77	1.1%
NEW HAMPSHIRE	30	0.4%
NEW JERSEY	108	1.6%
NEW MEXICO	20	0.3%
NEW YORK	661	9.8%
NORTH CAROLINA	144	2.1%
NORTH DAKOTA	10	0.1%
OHIO	123	1.8%
OKLAHOMA	36	0.5%
OREGON	116	1.7%
PENNSYLVANIA	177	2.6%
RHODE ISLAND	12	0.2%
SOUTH CAROLINA	32	0.5%
SOUTH DAKOTA	24	0.4%
TENNESSEE	112	1.7%
TEXAS	726	10.8%
UTAH	94	1.4%
VERMONT	18	0.3%
VIRGIN ISLANDS, U.S.	1	0.0%
VIRGINIA	121	1.8%
WASHINGTON	312	4.6%
WEST VIRGINIA	10	0.1%
WISCONSIN	82	1.2%
WYOMING	11	0.2%

Figure 1: Summary Statistics: The Seed Round



(a) Total Amounts Offered and Sold



(b) Deal Size

**Table 3: Summary Statistics: The Seed Round. Deal and Firm Characteristics**

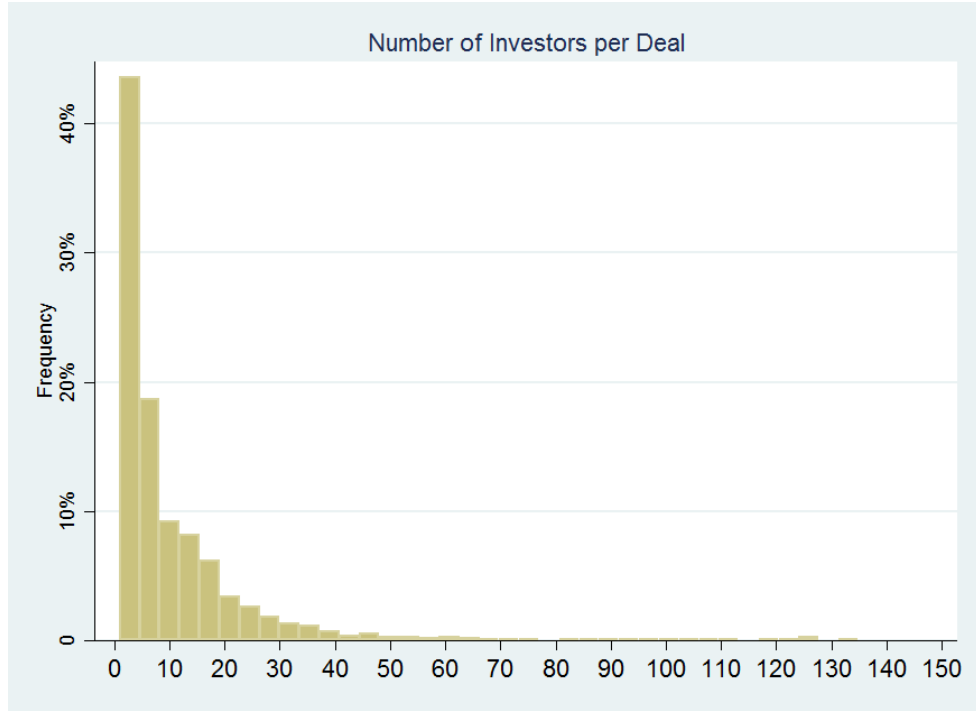
<b>DEAL CHARACTERISTICS</b>	<b>Frequency</b>	<b>%</b>
<b>Security<sup>a</sup></b>		
Debt	319	4.7%
Debt&Other	400	6.0%
Equity	4,566	68.0%
Equity&Debt	161	2.4%
Equity&Debt&Other	116	1.7%
Equity&Other	512	7.6%
Other	644	9.6%
<b>Issuance Year</b>		
2011	3,297	49.1%
2012	3,421	50.9%
<b>Intermediation<sup>b</sup></b>	290	4.3%
<b>FIRM CHARACTERISTICS</b>		
<b>Entity Type</b>		
Business Trust	8	0.1%
Corporation	3,078	45.8%
General Partnership	58	0.9%
Limited Liability Company	2,985	44.4%
Limited Partnership	445	6.6%
Other	144	2.1%
<b>Revenue Size</b>		
\$1 - \$1,000,000	1,011	15.0%
\$1,000,001 - \$5,000,000	263	3.9%
Decline to Disclose	3,392	50.5%
No Revenues	1,835	27.3%
Not Applicable	217	3.2%
<b>Year of Incorporation</b>		
2009	433	6.4%
2010	1,563	23.3%
2011	2,940	43.8%
2012	1,781	26.5%

<sup>a</sup> The category Other includes: option, warrant or other right to acquire another security, security to be acquired upon exercise of option, warrant or other right to acquire security, tenant-in-common securities, mineral property securities, other securities (unspecified)

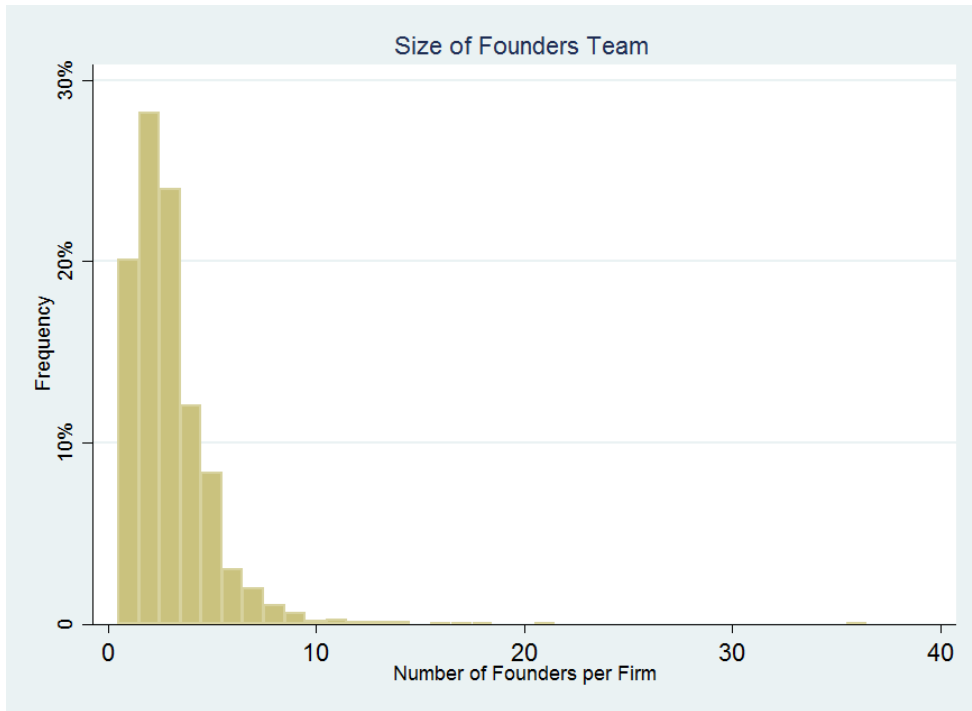
<sup>b</sup> Issuers provide information on whether services of a registered financial intermediary were employed during the offering and, if so, name and registration number of the intermediary and the amount of fees paid.

**Figure 2: Summary Statistics: The Seed Round. Investors and Founders**

**(a) Distribution of total number of investors per deal as reported in Form D.**  
The sample is restricted to offerings where the first sale already occurred (5,510 observations)



**(b) Distribution of number of founders per deal**





**Table 4: Revenue Size Transition Matrix**

Change in revenue size for firms that received follow-on funding (N: 1,279). Cell  $i,j$  represents the probability of having revenue size  $j$  at the time of its second offering for a firm with revenue size  $i$  at the time of the first offering.

Revenue Size (Seed Round)	Revenue Size (Follow-on Round)					
	\$1-\$1,000,000	\$1,000,001 - \$5,000,000	Decline to Disclose	No Revenues	Not Applicable	Over \$5,000,001
\$1 - \$1,000,000	73.76%	4.96%	17.02%	4.26%	0%	0%
\$1,000,001 - \$5,000,000	12.50%	58.33%	25.00%	0%	4.17%	0%
Decline to Disclose	0.96%	0.12%	98.07%	0.72%	0.12%	0%
No Revenues	25.24%	2.24%	16.79%	56.34%	0%	0.37%
Not Applicable	0%	0%	18.75%	0%	81.25%	0%

**Table 5: Summary statistics: IF-firms vs NonIF-firms\***

	<b>NonIF-firms</b>		<b>IF-firms</b>		<b>Full Sample</b>	
	Freq.	%	Freq.	%	Freq.	%
<b>Revenue Size</b>						
\$1-\$1,000,000	769	13.7%	242	21.7%	1,011	15.0%
\$1,000,001 - \$5,000,000	226	4.0%	37	3.3%	263	3.9%
Decline to Disclose	3,106	55.5%	286	25.6%	3,392	50.5%
No Revenues	1,349	24.1%	486	43.5%	1,835	27.3%
Not Applicable	151	2.7%	66	5.9%	217	3.2%
<b>Year of Incorporation</b>						
2009	374	6.7%	59	5.3%	433	6.4%
2010	1,326	23.7%	237	21.2%	1,563	23.3%
2011	2,440	43.6%	500	44.8%	2,940	43.8%
2012	1,460	26.1%	321	28.7%	1,781	26.5%
<b>Entity Type</b>						
Business Trust	8	0.1%	0	0.0%	8	0.1%
Corporation	2,684	47.9%	394	35.3%	3,078	45.8%
General Partnership	46	0.8%	12	1.1%	58	0.9%
Limited Liability Company	2,382	42.5%	603	54.0%	2,985	44.4%
Limited Partnership	385	6.9%	60	5.4%	445	6.6%
Other	96	1.7%	48	4.3%	144	2.1%
<hr/>						
	Mean	Median	Mean	Median	Mean	Median
<b>Number of Founders</b>	2.98	3	2.73	2	2.93	3
<b>Amount Offered</b>	1.5864	1	1.1004	0.5625	1.5056	1
<hr/>						
	Freq.	%	Freq.	%	Freq.	%
<b>Follow-on Round?</b>						
YES	1,168	20.85%	111	9.94%	1,279	19.04%
NO	4,433	79.15%	1,006	90.06%	5,439	80.96%

\*IF-firms are firms that reported recourse to informal finance in the seed round of funding.

**Table 6: Ethnic/Linguistic Categories definition, founders' team mix and follow-on funding**

**Panel A:** Ethnic/Linguistic groups are identified as in Ambekar et al. (2009). The algorithm operates via a series of classifiers assigning name strings to subgroups at each level. Level 3 is only defined for West European and Greater Asian groups.

Level 1	Level 2	Level 3
Greater European	West European	Italian Hispanic Nordic French German
	East European British Jewish	<i>East European</i> <i>British</i> <i>Jewish</i>
Asian	Greater East Asian	East Asian Japanese
	Indian	<i>Indian</i>
African	Muslim African	<i>Muslim</i> <i>African</i>

**Panel B:** Average ethnic mix of founders' team for the full sample and for firms that access follow-on funding. In the upper section I report average ethnic group proportion in founders' teams. Standard error are in parenthesis. In the bottom section I report the proportion of firms that have more than 50% of Greater European origin founders (as by Level 1 classification above) and the proportion of firms where no ethnic group represents more than 50% of the founders.

	Full Sample	Follow-on Firms
African	1.3% (0.0775)	1.3% (0.0762)
British	49% (0.3701)	50% (0.3495)
East European	2.9% (0.1135)	3.3% (0.1243)
Greater East Asia	4.6% (0.1638)	4.6% (0.1485)
Indian Subcontinent	3.3% (0.1389)	4.4% (0.1611)
Jewish	18% (0.2794)	18% (0.2644)
Muslim	2.1% 0.1084	2.7% (0.122)
West European	15% (0.2657)	15% (0.25)
European Majority Teams	80.7%	81.2%
No Ethnic Majority Teams	14.1%	13.7%

**Table 7: Small Family and Informal Finance**

Estimates stem from a probit model (columns (1) and (2) )and a linear probability model (column (3)) of the informal finance variable  $IF_i$  on the *SmallFamily* instrument  $S_i$  and exogenous controls.  $IF_i$  is a dummy variable that takes value 1 when non-accredited investors are allowed to participate in firm  $i$ ' s seed round.  $S_i$  is a dummy variable that takes value 1 when the proportion of founders in firm  $i$  with rare last names is greater than the sample average. Controls include firm, seed round and founder characteristics and an interaction term between year of incorporation and quarter of seed issue. Column (2) shows average marginal effects for the probit specification. Standard errors in parentheses.

Dependent Variable: $IF_i$	(1) Probit Coefficient	(2) Probit AME	(3) LPM Coefficient
$S_i$	-0.254*** (0.0927)	-0.0503*** (0.0175)	-0.0442** (0.0185)
Team Size (Founders)	0.0168 (0.0131)	0.00347 (0.00271)	0.00373 (0.00273)
Amount Offered (Seed Round)	-0.138*** (0.0165)	-0.0286*** (0.00339)	-0.0243*** (0.00316)
Total Investors (Seed Round)	0.00478*** (0.00140)	0.000990*** (0.000290)	0.00102*** (0.000317)
Intermediation (Seed Round)	-0.516*** (0.126)	-0.0872*** (0.0165)	-0.0956*** (0.0224)
Hot Deal (Seed Round)	-0.325*** (0.0456)	-0.0666*** (0.00921)	-0.0614*** (0.00937)
Year of incorporation#Quarter of Issue	Yes		Yes
Firm Characteristics	Yes		Yes
(Other) Founders	Yes		Yes
(Other) Seed Round	Yes		Yes
Observations	6,718		6,718
Log-Likelihood	-2,476.01		
(Pseudo)R-squared	0.1773		0.155

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 8: Small Family and Growth**

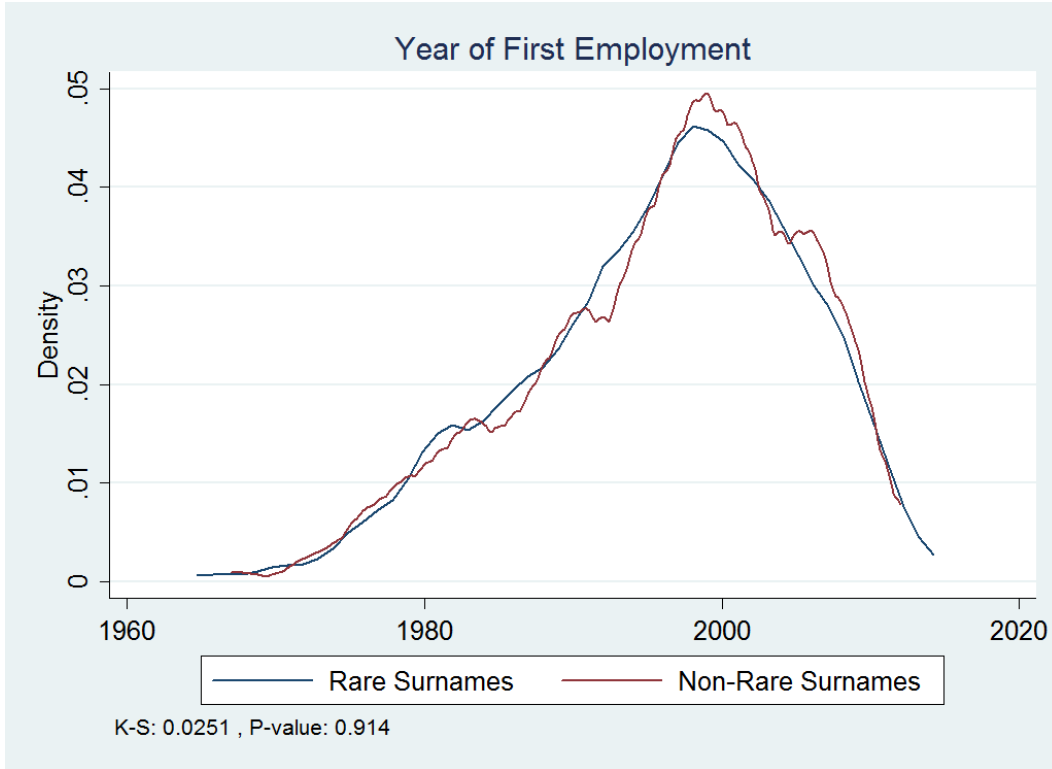
Panel A shows revenue size and size of the seed round deal for firms with small combined family network ( $S_i = 1$ ) and for the rest of the sample ( $S_i = 0$ ). All firms disclosed revenues in seed round Form D. The instrument is associated with smaller revenue size, but there is no significant difference in capital raised. In Panel B I focus on firms that secured follow-on funding (1,279 observations). Change in Deal Size is computed as amount offered in seed round divided by amount offered in follow-on round. Standard errors in parentheses.

<b>Panel A: Seed Round (Disclosed Revenues)</b>	$S_i = 0$	$S_i = 1$	Difference
<b>Revenue Size</b>			
No Revenues	1,315 57.70% (.0103)	520 62.65% (.01679)	-4.95%** (.0197)
\$1-\$1M	772 33.87% (.0099)	239 28.80% (.0157)	5.1%*** (.0186)
\$1M-\$5M	192 8.42% (.0058)	71 8.55% (.0097)	-0.01% (.0113)
<b>Amount Offered (\$ Million)</b>			
Mean	1.38 (.0296)	1.45 (.0495)	-0.074 (.0254)
<b>Panel B: Follow-on vs Seed Round</b>			
<b>Change in Revenues</b>			
YES	127 14.91% (.0122)	56 13.11% (.0163)	1.79% (.0204)
NO	852 85.1% (.0122)	427 86.9% (.01633)	-1.8% (.0204)
<b>Change in Deal Size</b>			
Mean	1.65 (.0633)	1.48 (.0821)	0.17 (.1063)

Standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Figure 3: Founders: Year of First Employment.** Based on online CVs for the subsample of founders matched with LinkedIn members (N: 4,422).



**Table 9: Founders: Education Attainment.** Highest education degree as reported on online CVs for the subsample of founders matched with LinkedIn members(N: 4,422).

	Non Rare Surnames		Rare Surnames	
	Freq.	%	Freq.	%
Associate	34	0.9%	5	0.8%
Bach.	1,070	28.1%	168	27.2%
J.D.	127	3.3%	23	3.7%
MBA	582	15.3%	88	14.2%
MD	66	1.7%	11	1.8%
Master	686	18.0%	120	19.4%
No data	668	17.6%	104	16.8%
Other	134	3.5%	25	4.0%
PhD	248	6.5%	39	6.3%
Private	189	5.0%	35	5.7%
Total	3804		618	

Pearson  $\chi^2_{(9)} = 2.5113$  ,  $Pr = 0.981$

Region and country of last residence	1820 to 1829	1839	1849	1859	1869	1879	1889	1899	1909	1919	1929	1939	1949	1959	1969	1979	1989	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>Europe</b>	77%	79%	96%	93%	90%	82%	88%	97%	92%	79%	60%	64%	55%	56%	35%	19%	11%	14%	16%	17%	17%	15%	14%	16%	13%	11%
Austria-Hungary	0%	0%	0%	0%	2%	2%	6%	14%	24%	18%	1%	2%	2%	5%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Denmark	0%	0%	0%	0%	1%	1%	2%	2%	1%	1%	1%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
France	6%	7%	5%	3%	2%	3%	1%	1%	1%	1%	1%	2%	4%	2%	1%	1%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Germany	4%	23%	27%	35%	35%	27%	28%	16%	4%	3%	9%	17%	14%	23%	7%	2%	1%	1%	1%	2%	2%	1%	1%	1%	1%	1%
Ireland	40%	32%	46%	37%	21%	15%	13%	11%	4%	3%	5%	4%	2%	2%	1%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Italy	0%	0%	0%	0%	0%	2%	5%	16%	24%	19%	12%	12%	6%	7%	6%	4%	1%	1%	0%	0%	0%	0%	0%	0%	0%	0%
Norway-Sweden	0%	0%	1%	1%	4%	7%	11%	9%	5%	3%	4%	2%	2%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Poland	0%	0%	0%	0%	0%	0%	1%	3%	0%	0%	5%	4%	1%	0%	2%	1%	1%	2%	1%	1%	1%	2%	1%	1%	1%	1%
Portugal	0%	0%	0%	0%	0%	1%	0%	1%	1%	1%	1%	1%	1%	1%	2%	2%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Russia	0%	0%	0%	0%	0%	1%	3%	12%	18%	17%	1%	0%	0%	0%	0%	0%	1%	4%	5%	5%	5%	5%	4%	5%	4%	
United Kingdom	20%	14%	15%	16%	26%	21%	15%	9%	6%	6%	8%	9%	15%	8%	7%	3%	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Yugoslavia	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	1%	1%	0%	1%	1%	1%	1%	3%	1%	1%	2%	1%
<b>Asia</b>	0%	0%	0%	1%	3%	5%	1%	2%	4%	4%	3%	3%	4%	5%	11%	33%	38%	29%	30%	32%	31%	33%	33%	34%	33%	34%
China	0%	0%	0%	1%	3%	5%	1%	0%	0%	0%	1%	1%	2%	0%	0%	0%	3%	3%	5%	5%	5%	5%	5%	6%	7%	7%
India	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	3%	4%	4%	4%	5%	6%	6%	7%	7%	5%	5%
Korea	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	6%	5%	2%	2%	2%	2%	2%	2%	2%	2%	2%
Philippines	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	8%	8%	5%	5%	5%	5%	5%	6%	5%	6%	7%
Taiwan	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%	1%	1%	1%	1%	1%	1%	1%	1%	1%
Vietnam	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
<b>America</b>	8%	6%	4%	3%	6%	13%	10%	1%	3%	17%	37%	33%	38%	37%	52%	45%	43%	53%	47%	44%	45%	43%	43%	39%	43%	41%
Canada and Newfoundland	2%	2%	2%	2%	6%	12%	9%	0%	2%	11%	22%	23%	19%	14%	13%	4%	3%	2%	3%	3%	3%	2%	2%	3%	2%	2%
Mexico	3%	1%	0%	0%	0%	0%	0%	0%	0%	3%	12%	5%	7%	11%	14%	15%	16%	28%	20%	19%	20%	16%	18%	14%	13%	14%
Caribbean	2%	2%	1%	0%	0%	1%	1%	1%	1%	2%	2%	3%	5%	5%	13%	17%	13%	10%	10%	9%	9%	10%	9%	8%	11%	11%
Central America	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	2%	2%	3%	3%	5%	6%	7%	7%	6%	8%	6%	5%	6%	5%
South America	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	1%	2%	3%	8%	6%	6%	6%	7%	6%	7%	8%	7%	9%	11%	10%
<b>Africa</b>	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%	4%	5%	5%	5%	6%	7%	7%	9%	8%
Not Specified	15%	16%	1%	3%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	2%	2%	2%	1%	3%	4%	1%	4%

**Figure 4: Immigration to U.S. 1820-2007, Source: U.S. Department of Homeland Security.** Based on records of persons obtaining permanent resident status by region and selected country of last residence. The first 18 columns until year 2000 represent decades. Starting from 2000 each column refers to single years.

**Table 10: Ethnicity of Founders: Rare and Non Rare Surnames**

**Panel A:** Level 2 ethnicity of founders with rare and non rare surnames. Total number of founders (excluding business entities): 18,716

	<b>Rare Surnames</b>	<b>Non Rare Surnames</b>
African	4.93%	0.84%
British	25.31%	55.6%
East European	10.36%	2.15%
Greater East Asian	3.74%	4.7%
Indian Subcontinent	8.13%	2.43%
Jewish	20.53%	18.58%
Muslim	6.20%	1.41%
West European	20.8%	14.29%

**Panel B:** Founders with first name included in the 1990 Census list of the 2,438 most common first names are classified as American while other founders are classified as Early Generation

	<b>Rare Surnames</b>		<b>Non Rare Surnames</b>	
	American	Early Generation	American	Early Generation
Greater European	87.65%	45.33%	93.52%	67.66%
Asian	6.12%	28.94%	4.84%	25.21%
Greater African	6.23%	25.73%	1.64%	7.13%
Observations	1,943	653	14,311	1,809
	74.85%	25.15%	88.78%	11.22%



**Table 11: Small Family and Future Financing Events**

Panel A. $Y_i$ : Follow-on Financing with Both Investors Types			
Dependent Variable: $Y_i$	(1) Probit	(2) AME	(3) LPM
$S_i$	0.172** (0.0810)	0.0407** (0.0196)	0.0354* (0.0197)
Team Size (Founders)	0.0320*** (0.0120)	0.00740*** (0.00276)	0.00898*** (0.00291)
Amount Offered (Seed Round)	-0.0547*** (0.0150)	-0.0126*** (0.00346)	-0.0119*** (0.00337)
Total Investors (Seed Round)	0.00136 (0.00153)	0.000314 (0.000355)	0.000284 (0.000338)
Intermediation (Seed Round)	-0.151 (0.130)	-0.0332 (0.0270)	-0.0283 (0.0238)
Hot Deal (Seed Round)	0.0860** (0.0418)	0.0199** (0.00970)	0.0205** (0.00998)
Year of incorporation#Quarter of Issue	Yes		Yes
Firm Characteristics	Yes		Yes
(Other) Founders	Yes		Yes
(Other) Seed Round	Yes		Yes
Observations	6,718		6,718
Log-Likelihood	-2,756.57		
(Pseudo)R-squared	0.1514		0.137

Panel B. $Y_i$ : Follow-on Financing with Formal Investors Only			
Dependent Variable: $Y_i$ (Formal Only)	(1) Probit	(2) AME	(3) LPM
$S_i$	0.182** (0.0828)	0.0409** (0.0191)	0.0355* (0.0191)
Team Size (Founders)	0.0333*** (0.0122)	0.00730*** (0.00268)	0.00878*** (0.00283)
Amount Offered (Seed Round)	-0.0365** (0.0152)	-0.00799** (0.00334)	-0.00792** (0.00327)
Total Investors (Seed Round)	0.000807 (0.00159)	0.000177 (0.000349)	0.000123 (0.000328)
Intermediation (Seed Round)	-0.121 (0.133)	-0.0253 (0.0266)	-0.0214 (0.0231)
Hot Deal (Seed Round)	0.0894** (0.0428)	0.0196** (0.00942)	0.0207** (0.00969)
Year of incorporation#Quarter of Issue	Yes		Yes
Firm Characteristics	Yes		Yes
(Other) Founders	Yes		Yes
(Other) Seed Round	Yes		Yes
Observations	6,718		6,718
Log-Likelihood	-2,621.56		
(Pseudo)R-squared	0.1556		0.134

Standard errors in parentheses  
\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 12: Bivariate Probit Model: Full Sample**

Dependent Variable:	Follow-on with Both Investors Types				Follow-on with Formal Investors Only			
	(1) BiProbit Coefficient	(2) BiProbit AME	(3) 2SLS Coefficient	(4) Probit AME	(5) BiProbit Coefficient	(6) BiProbit AME	(7) 2SLS Coefficient	(8) Probit AME
$IF_i$	-0.7927*** (0.3052)	-0.1476*** (0.046)	-0.1956*** (0.0698)	-0.0709*** (0.0121)	-1.3078*** (0.3258)	-0.1903*** (0.0336)	-0.2322*** 0.0674	-0.133*** (0.00965)
Team Size (Founders)	0.0406*** (0.0111)	0.0094*** (0.0026)	0.011*** (0.0026)	0.00935*** (0.00256)	0.0417*** (0.0114)	0.0092*** (0.0025)	0.0108*** (0.0025)	0.00902*** (0.00246)
Amount Offered (Seed Round)	-0.0703*** (0.0164)	-0.0162*** (0.0039)	-0.0166*** (0.0038)	-0.0139*** (0.00347)	-0.0591*** (0.017)	-0.013*** (0.004)	-0.0133*** (0.0037)	-0.0103*** (0.00331)
Total Investors (Seed Round)	0.0022 (0.0015)	0.0005 (0.0004)	0.0004 (0.0003)	0.00039 (0.00035)	0.002 (0.0016)	0.0004 (0.0004)	0.0003 (0.0003)	0.000314 (0.00034)
Intermediation (Seed Round)	-0.2288* (0.1328)	-0.049* (0.0265)	-0.0417* (0.0244)	-0.0396 (0.0263)	-0.2393* (0.1371)	-0.0488* (0.0262)	-0.0408* (0.0236)	-0.0374 (0.0251)
Hot Deal (Seed Round)	0.0413 (0.0469)	0.0096 (0.0108)	0.007 (0.0109)	0.0162* (0.00968)	0.0289 (0.0491)	0.0064 (0.0107)	0.0048 (0.0105)	0.0133 (0.0093)
Year of incorporation# Quarter of Issue	Yes		Yes	Yes	Yes		Yes	Yes
Firm Characteristics	Yes		Yes	Yes	Yes		Yes	Yes
(Other) Founders	Yes		Yes	Yes	Yes		Yes	Yes
(Other) Seed Round	Yes		Yes	Yes	Yes		Yes	Yes
Observations	6,717		6,718	6,718	6,718		6,718	6,718
Log-Likelihood	-5,219			-2,744.07	-5,039.6			-2,564.7
R-squared			0.1237				0.1303	

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 13: Bivariate Probit Model: Disclosed Revenues**

Dependent Variable:	Follow-on with Both Investors Types				Follow-on with Formal Investors Only			
	(1) BiProbit Coefficient	(2) BiProbit AME	(3) 2SLS Coefficient	(4) Probit AME	(5) BiProbit Coefficient	(6) BiProbit AME	(7) 2SLS Coefficient	(8) Probit AME
$IF_i$	-0.5702 (0.4172)	-0.0877 (0.0579)	-0.1722** (0.0803)	-0.0535*** (0.0124)	-1.2098*** (0.4457)	-0.1406*** (0.0471)	-0.2179*** (0.0754)	-0.0984*** (0.0102)
Team Size (Founders)	0.0504*** (0.0196)	0.0088*** (0.0034)	0.0119*** (0.0036)	0.00896** (0.00348)	0.06*** (0.0206)	0.0096*** (0.0033)	0.0127*** (0.0034)	0.00956*** (0.00324)
Amount Offered (Seed Round)	-0.0367 (0.0287)	-0.0064 (0.0051)	-0.00514 (0.005)	-0.01** (0.00454)	-0.0163 (0.031)	-0.0026 (0.0051)	-0.0059 (0.0048)	-0.00027 (0.00423)
Total Investors (Seed Round)	0.0016 (0.0025)	0.0003 (0.0004)	0.0003 (0.0004)	0.00021 (0.00043)	0.0006 (0.0028)	0.0001 (0.0005)	0.0001 (0.0004)	-0.00002 (0.0004)
Intermediation (Seed Round)	-0.1378 (0.1814)	-0.0228 (0.0286)	-0.0273 (0.0279)	-0.0185 (0.0283)	-0.1519 (0.1903)	-0.0229 (0.0277)	-0.0285 (0.0262)	-0.0148 (0.0265)
Hot Deal (Seed Round)	0.0732 (0.0885)	0.0129 (0.0154)	0.0085 (0.0162)	0.0185 (0.0127)	0.0212 (0.0985)	0.0034 (0.0156)	0.0021 (0.0152)	0.0125 (0.012)
Year of incorporation#Quarter of Issue	Yes		Yes	Yes	Yes		Yes	Yes
Firm Characteristics	Yes		Yes	Yes	Yes		Yes	Yes
(Other) Founders	Yes		Yes	Yes	Yes		Yes	Yes
(Other) Seed Round	Yes		Yes	Yes	Yes		Yes	Yes
Observations	3,326		3,326	3,326	3,326		3,326	3,326
Log-Likelihood	-2,622.6			-1,049.08	-2,495.1			-921.93
R-squared			0.1335			0.1363		

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

**Table 14: Marginal Effect of Informal Finance on the Probability of Future Financing Events**

Marginal effects of informal finance on future financing events conducted with all investors types and with formal investors only. Estimates stem from a bivariate probit model under different specifications. Standard errors are in parentheses.

	Full Model (1)	(2)	(3)	(4)	(5)	(6)	(7)
$Y_i$ : Both Investors Types	-.1476*** (0.046)	-.164*** (0.0503)	-.1582*** (0.0476)	-.1582*** (0.0445)	-.1543*** (0.0454)	-.1541** (0.07)	-.1416 (0.0874)
$Y_i$ : Formal Only	-.19*** (0.0336)	-.1919*** (0.0421)	-.2*** (0.0343)	-.202*** (0.0338)	-.1983*** (0.0344)	-.1722*** (0.063)	-.1984*** (0.0573)
A) CONTROLS							
Size		✓	✓				
Industry and Location			✓				
B) ETHNICITY							
European Descent(>50%)				✓			
No Ethnic Majority					✓		
C)European Descent(>50%) ONLY						✓	
D)Hot Deals ONLY							✓
Observations	6,718	6,718	6,718	6,718	6,718	5,421	3,168
Log-Likelihood (Both Investors Types)	-5,219	-5,520.46	-5,351.82	-5,252.32	-5,254.05	-4,527.06	-2,383.31
Log-Likelihood (Accredited Only)	-5,039.58	-5,329.39	-5,170.02	-5,074.14	-5,076.31	-4,366.9	-2,313.34

**Table 15: The California Subsample: Descriptive statistics and Business Entity Status (as of June 2015)**

	NonIF-firms	IF-firms
<b>Descriptive Statistics</b>		
<b>Sector*</b>		
Health	6.2%	1.2%
Manufacturing	2.6%	3.1%
Other Sector	32.2%	36.4%
RE	7.6%	8.6%
Service	5.9%	17.9%
Energy	2.0%	1.2%
Tech	43.4%	31.5%
<b>Revenue Size</b>		
\$1 - \$1,000,000	14.2%	27.0%
\$1,000,001 - \$5,000,000	2.6%	2.9%
Decline to Disclose	61.5%	24.8%
No Revenues	20.5%	43.8%
Not Applicable	1.2%	1.5%
<b>Status</b>		
active	70.8%	71.5%
canceled	5.9%	7.3%
converted out	0.6%	1.5%
dissolved	3.0%	2.2%
forfeited/suspended	11.6%	13.1%
merged out	0.7%	0.7%
surrender	7.5%	3.6%
<b>Total</b>	<b>909</b>	<b>137</b>
Distributions by Status: Pearson $\chi^2_{(6)} = 4.8603$ <i>Prob</i> = 0.562		

\*Sectors are defined as follows:

Tech= Biotechnology,Computers,Other Technology,Telecommunications

Energy= Coal Mining,Energy Conservation,Oil and Gas,Other Energy

Health=Health Insurance, Hospitals and Physicians,Other Health Care, Pharmaceuticals

RE=Construction,Lodging and Conventions,Residential, Other RE

Service=Environmental Services,Restaurants,Tourism and Travel Services,Business Services

**Table 16: Survival vs Follow-on Financing Probability**

Marginal effects of informal finance ( $IF_i$ ) on follow-on financing ( $Y_i$ ) and survival ( $Y_i^S$ ) and of  $Y_i$  on  $Y_i^S$  in the following two models:  $Prob[Y_i = 1] = \Phi[X_i\beta + IF_i\lambda]$  (Columns 1 and 3) and  $Prob[Y_i^S = 1] = \Phi[X_i\beta + Y_i\zeta + IF_i\lambda]$  (Columns 2 and 4).  $Y_i^S = 1$  if firm  $i$  is active or merged out. Standard errors in parentheses.

	Y <sub>i</sub> = Financing Event, All Investors Types		Y <sub>i</sub> = Financing Event, Accredited Only	
	(1)	(2)	(3)	(4)
	Y <sub>i</sub>	Y <sub>i</sub> <sup>S</sup>	Y <sub>i</sub>	Y <sub>i</sub> <sup>S</sup>
<i>IF<sub>i</sub></i>	-0.066* (0.0385)	0.05 (0.04)	-0.156*** (0.0295)	0.06 (0.0393)
<i>Y<sub>i</sub></i>		0.125*** (0.0307)		0.133*** (0.0311)
Log-Likelihood	-468.24	-563.43	-434.85	-562.91
Observations	1,046	1,046	1,046	1,046

**Table 17: Informal Finance and Control**

Coefficient estimates (column (1)) and average marginal effects (column (2)) of informal finance ( $IF_i$ ) and *Time* from the probit model  $Prob[E_{i,j} = 1] = \Phi[A_{i,j}\theta + IF_i\vartheta]$  where  $E_{i,j} = 1$  if founder  $j$  of firm  $i$  still holds an executive position at the time of the third financing event and  $A_{i,j}$  is a set of controls that includes industry, revenue size, location, number of quarters between round 1 and round 3 (*time*) and founder's ethnicity. Coefficients from a linear probability model in column (3).

	(1)	(2)	(3)
	Probit	AME	LPM
<b>IF</b>	0.541** (0.2504)	0.197** (0.0862)	0.191** (0.0946)
<i>Time</i>	-0.05*** (0.0166)	-0.0183*** (0.006)	-0.0185*** (0.0063)
Log likelihood	-533.89		
Observations	846		846
R-squared			0.1054

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1