

# Founders' Commitment and Firm Financing: Multiple "Skins in the Game" as a Signal to Investors

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## **Abstract**

By examining companies raising funds on one of the largest US equity crowdfunding platforms, this study finds that companies with multiple founders with prior personal financial commitment ("Skin in the Game" (SITG)) raise more funds, suggesting a signaling mechanism to investors of founders' cross-validation of the project's prospects. Single founders lack such mechanism. The study uncovers a link between the team architecture, a key organizational aspect, and signaling to future stakeholders. The same mechanism may be at work in other contexts, such as angel and venture capital syndication, innovation in large organizations, and mutual fund management decisions. In addition, the work offers insights into the potential of crowdfunding.

Keywords: Equity Crowdfunding, Signaling, Startup Financing, Team Architecture

## 1. Introduction

New businesses are a cornerstone of a dynamic economy (Kortum and Lerner, 2000; Audretsch et al., 2006; Haltiwanger et al., 2013; Akcigit and Kerr, 2018) and they often need external financing to grow (Carpenter and Petersen, 2002; Robb and Robinson, 2014). Angel investors are an important source of seed funds (Kerr et al., 2011; Lindsey and Stein, 2018). By some approximations, they invested \$23B in the US in 2017 (Sohl, 2018). However, due to sheer uncertainty, lack of collateral, and a difficulty in credibly conveying merit to investors, entrepreneurs struggle to obtain funds (Hall and Lerner, 2010). In addition, the evidence on the relevant signals to the angels' investment selection process is overall scarce.

This study investigates whether the founding team's architecture and cohesion act as a credible signal to investors. The structure of the team is an important organizational design choice in the beginning of a startup's life. Teams may show operational (Wasserman, 2012) and information processing (Sah and Stiglitz, 1986; Halebian and Finkelstein, 1993) advantages over individual founders. Indeed, new ventures seem to be more commonly founded by teams and not lone entrepreneurs (Klotz et al., 2014), especially in tech startups (Beckman, 2006; Wasserman, 2012) and fast-growing teams (Cooney, 2005). Nevertheless, an entrepreneur may choose to go solo to retain control and save time negotiating with cofounders about the roles, rewards, and relationships within a startup, especially if cofounders bring no added human, financial, or social capital (Wasserman, 2012). While there is a considerable prior literature examining the link between team composition and performance in new ventures (Jin et al., 2017; Klotz et al., 2014), it is less known whether having cofounders plays a role in attracting future stakeholders, in this case, investors.

I examine a unique dataset containing detailed description of nearly 500 firms in the early-stage fundraising process on one of the largest US equity crowdfunding platforms<sup>1</sup>. Equity crowdfunding, a financing tool that has emerged as a new conduit of early-stage financing, provides an opportunity to identify the information that can credibly signal startup prospects to investors. In the case of teams, I find that having more than one founder contribute capital to the startup links to better fundraising outcomes. Single founders with personal financial commitment have a lower chance of raising funds, regardless of the amount of capital they contribute or the number of the non-contributing founders or hired managers they add.

Therefore, contributing capital, or having “Skin in the Game (SITG)”, is an essential cohesion factor. This suggests that initial self-funding of multiple founders may act as a credible signal to investors because of the properly aligned incentives among the cofounders. Specifically, if the startup fails, the founders also stand to lose their own investments. Hence, a cofounder is motivated to assess the business idea and the other founder's capability to execute it. They are also motivated to process information more effectively and monitor each other's progress as they move forward. Such cross-validation is not available in startups with single founders and may be essential given the high startup failure rate (Shane, 2009; Scherer and Harhoff, 2000; Hall and Woodward, 2010).

The results hold implications beyond the context of early-stage investment. They provide insights to decisions of angels and venture capital (VC) investors to syndicate, mutual fund managers to form teams, and ways larger organizations can innovate. Additionally, the work contributes to the

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<sup>1</sup> Platform is EquityNet. EquityNet's disclaimer: “The author(s) were provided a conditional license subject to strict confidentiality provisions to certain data compiles for EquityNet. Any opinions, findings, conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of EquityNet.” For more information on EquityNet visit [www.equitynet.com](http://www.equitynet.com)

understanding of the US equity crowdfunding market and offers guidance to the participating platforms in shaping their policy.

## **2. Background**

Teams may reap advantages over an individual decision-maker due to different processing of information regarding prospective projects (Sah and Stiglitz, 1986). This dynamic can lead VCs to syndicate their investments (Lerner, 1994; Casamatta and Haritchbalet, 2007), especially the early-stage ones (Cumming et al., 2010; Hopp and Rieder, 2011). Also, syndicated VCs perform better (Hochberg et al., 2007). In corporations, the team centralization links to different business and investment strategies (Guadalupe et al., 2014) and larger teams may perform better in more turbulent environments (Haleblian and Finkelstein, 1993). In the mutual funds industry, management teams adopt more diversified portfolio strategies than single managers (Bär et al., 2011). Ensley et al. (2006) find that shared leadership may be more effective in startups than vertical leadership.

The decision to seek cofounders may influence another important factor - an opportunity to attract much needed funds from future investors. It is assumed that entrepreneurs know more about their project than the potential investors (Amit et al., 1990). This informational asymmetry presents a challenge when identifying high potential projects. Signaling theory (Spence, 1973) characterizes the properties required for signals to convey value to a less informed party. In abstract terms, senders (e.g. entrepreneurs), know more about their intentions and products than the receivers (e.g. investors) whose attention and resources they need. In a heterogenous pool of senders, the higher quality types need to stand apart from the lower quality ones. As a consequence, their signals to receivers need to satisfy certain properties. Credible signals need to be observable and more costly for lower types to send; otherwise, no

differentiation between the types takes place and market failure may ensue (Akerlof, 1970). Furthermore, signals need to have the right fit (Connelly et al., 2011) by reliably correlating to the underlying quality characteristics of interest to receivers. In finance, signaling theory has focused on the problem of managers signaling value to outside stakeholders (usually investors) through issuance of new stocks (Myers and Majluf, 1984), capital structure (Ross, 1977), and retaining equity ownership (Leland and Pyle, 1977)<sup>2</sup>.

In entrepreneurial finance, while there is evidence on signals and information relevant to venture capital (VC) investors (Chen et al., 2009; Petty and Gruber, 2011), empirical academic research in the area of angel investments is scarce. The VC decision process is different from that of angel investors (Freear et al., 1994), in part because angel investors focus on the earlier stage (Metrick and Yasuda, 2011) and invest their own assets. Angel groups focus more on market and execution risk than agency risk (Carpentier and Suvet, 2015). Bernstein et al. (2017) find that information on the human capital of the early-stage firms, although briefly described in typical pitches, is causally important for investors' initial interest. Bapna (2017) finds that signal complementarities play a more important role, specifically between product certification by expert intermediaries and acquiring prominent customers, and between product certification and social proof. Ahlers et al. (2015) find that detailing project risks leads to more successful fundraising on an Australian crowdfunding platform. Leland and Pile (1977) suggest that retaining a higher equity ownership signals a better quality project; similarly, in a crowdfunding environment, startups offering less equity tend to be more successful (Ahlers et al., 2015; Vismara 2016).

However, unlike ownership, less attention has been given to the contributed capital (Prasad et al., 2000; Loher et al., 2018) or so-called "Skin in the Game" (SITG)<sup>3</sup>. Busenitz et al. (2005) find that neither entrepreneurs' equity ownership nor financial commitment relate to subsequent favorable exits.

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<sup>2</sup> For an overview of the application of signaling theory in the broader management literature, see Connelly et al. (2011).

<sup>3</sup> For an overview of signaling in crowdfunding, see Vismara (2018).

However, this study looks at the sample of companies that have already been funded by VCs, in which case the informational asymmetry between investors and entrepreneurs is weaker.

This present study belongs to a broader agenda of understanding the fundraising dynamics and the overall potential of crowdfunding<sup>4</sup>. In hopes of enabling broader access to capital, US Congress passed the Jumpstart Our Business Startups (JOBS) Act (2012) that relaxed the Depression-era stringent rules regarding corporate solicitation of funds from the public. This deregulation effectively allowed and facilitated growth of equity crowdfunding, a method with which individuals and businesses finance their projects by reaching a wider audience through an internet platform and selling shares, or a financial stake, in their businesses.

Fundraising success through crowdfunding has been linked to factors such as the importance of the founders' social network (Mollick, 2014; Colombo et al., 2015; Agrawal et al., 2015; Vismara, 2016a), early fundraising momentum (Zhang and Liu, 2012; Burtch et al., 2013; Colombo et al., 2015; Vismara, 2016b; Kuppuswamy and Bayus, 2017), and investments of business angels (Ralcheva and Roosenboom, 2016). A strand of the literature looks at the promise of crowdfunding to break the geographical barriers and assesses the home bias in the "crowd" (Günther et al., 2018; Agrawal et al., 2015; and Lin and Viswanthan, 2015). Hornuf and Schwienbacher (2017) investigate the impact of security allocation mechanism on the crowdfunding dynamics and Belleflamme et al. (2014) explore the strategic choice of the type of crowdfunding campaign. Evidence suggests that in the investment crowdfunding, investors are motivated by the financial returns (Cholakova and Clarysse, 2015; Vulkan et al., 2016). However, there is little evidence on the performance of projects after they raised funds (Cumming and Groh, 2018). Signori and Vismara (2018) find that the online campaigns in which no sophisticated investor participated were

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<sup>4</sup> In 2018, the global equity crowdfunding market is projected to attract \$11B with an expected annual growth rate of 29.3% for the next four years (Statista, 2018). The Crowdfunding literature has exploded over the last several years. For the latest in-depth overview see the book "The Economics of Crowdfunding" (2018) edited by Cumming and Hornuf.

more likely to subsequently fail, pointing to the importance of distinguishing small from qualified investors.

### **3. Data**

The data come from EquityNet, one of the oldest and largest internet crowdfunding platforms in the US. To raise funds, entrepreneurs publish a profile on the website containing basic information regarding their enterprise and the funding campaign. In parallel, they may decide to fill out an in-depth business plan detailing the firm's management, products, markets, intellectual property, capitalization, and financials. While the profile is available to all registered investors, to share a business plan and communicate with investors, entrepreneurs need to subscribe to EquityNet. This is the main source of income for the platform as it does not take any transaction fees. The platform does not broker investment transactions nor does it limit the length of the funding campaigns, although they generally last around six months. Furthermore, it does not employ the provision point mechanism, whereby firms get to keep the raised funds only if they surpass a preset threshold. It allows access to accredited (i.e., high income or wealth) investors only. All of the information provided by the firms is self-reported. Therefore, it would be most accurate to understand EquityNet as an ad platform for entrepreneurs to broadly solicit investments from angel investors.

The sample consists of US startups that initiated funding campaigns from March 2013 until the end of 2015. Companies in the sample raised on average \$150K (nearly \$75M in aggregate). The snapshot of the data was collected in March 2016. Companies in the sample submitted essential funding campaign information as well as details regarding management, product, and ownership components of the business plan. Also, they subscribed to EquityNet at least once.

Table 1 shows descriptive statistics for 494 fundraising campaigns in the sample. Most companies sell equity, although they can choose to offer either debt or convertible notes (debt with the option to convert to equity later). Most companies in the sample are looking for seed capital; more than half of the firms are seeking amounts greater than \$500,000. Target amounts are bigger than the ones reported in Ahlers et al. (2015), Vismara (2016), and Vulkan et al. (2016); this is likely due to the targeted audience being accredited investors, and to the lack of the "all-or-nothing" mechanism that prompts entrepreneurs to set more modest targets.

**Table 1. Funding Campaigns Descriptive Statistics**

|                                 |              |                            |                         |
|---------------------------------|--------------|----------------------------|-------------------------|
| <b>Observations</b>             | 494          |                            |                         |
| <b>Financial Instrument</b>     |              | <b>Funding Goal</b>        |                         |
| Convertible Note                | 67           | 500K or less               | 239                     |
| Debt                            | 58           | 500K - 1M                  | 96                      |
| Equity                          | 369          | more than 1M               | 159                     |
| <b>Equity Offering</b>          |              | <b>Pre-Money Valuation</b> |                         |
| (Firms Selling Equity)          |              | 1M or less                 | 197                     |
| (0,25]                          | 189          | 1M - 5M                    | 177                     |
| [25,50)                         | 99           | 5M- 20M                    | 95                      |
| [50,75)                         | 45           | more than 20M              | 25                      |
| [75,100]                        | 36           |                            |                         |
| <b>Funds Raised (% of goal)</b> | <b>Total</b> | <b>First Week</b>          | <b>After First Week</b> |
| 0                               | 265          | 318                        | 399                     |
| (0,10)                          | 77           | 66                         | 45                      |
| [10,20)                         | 53           | 41                         | 23                      |
| [20,50)                         | 59           | 47                         | 10                      |
| [50, 100)                       | 27           | 13                         | 13                      |
| 100+                            | 13           | 9                          | 4                       |
| <b>Averages</b>                 | 15%          | 11%                        | 4%                      |
|                                 | \$150K       | \$104K                     | \$46K                   |

For the subsample of firms selling equity, the share of the company offered is in the great majority of cases below 25%. However, there are founders willing to sell the majority share in the company. The size of the equity offering is constructed using the funding goal and the reported pre-money valuation, which in most cases lies below \$5M.

The distribution of funding outcomes is highly skewed, a common occurrence in the crowdfunding industry (Agrawal et al., 2014). In order to more precisely measure funds raised while a firm advertises on the platform, EquityNet internally records the reported total funding raised as a sum of two amounts – one reported within the first seven days after a company submits its profile, and another raised after the initial seven-day cutoff; this allows the platform to disaggregate funds contributed in the same funding round but prior to advertising on EquityNet.

The main dependent variable in this study is the second term, or the later funding raised, giving more confidence to the assumption that the key startup features reported online were representative of the firm prior to advertising on EquityNet, and not a consequence of the later funds raised. On average, the firms report raising 4% of the funding target after the first seven days<sup>5</sup>. The average raise before the 7-day cutoff is around 11% of the goal.

**Table 2. Company Descriptive Statistics**

|                                   |       |                 |     |
|-----------------------------------|-------|-----------------|-----|
| <b>Product/Service Available</b>  | 28.4% | <b>Firm Age</b> |     |
| <b>Patents , TM, or Copyright</b> | 45.9% | Not Yet Founded | 110 |
| <b>in CA, NY, MA</b>              | 26.7% | up to 2Y        | 208 |
| <b>Product Offered</b>            | 65.8% | 2Y-5Y           | 93  |
|                                   |       | more than 5Y    | 83  |
| <b>Revenue (Annual)</b>           |       | <b>Assets</b>   |     |
| 0                                 | 349   | 0               | 299 |
| (0, 500K]                         | 87    | (0, 500K]       | 141 |
| 500K+                             | 58    | 500K+           | 54  |

A company's age is calculated as the time between the founding date and when it opened a profile on EquityNet. More than 50% of the companies in the sample are younger than 2 years (Table 2). Two thirds of the companies offer product, standalone or along with a service. At the time of account creation,

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<sup>5</sup> This corresponds to \$45K. The total funding corresponds to \$160K.

only 29% of firms had an offering available for sale. Nearly half claim some sort of intellectual property. Most companies do not have revenue nor assets. Lastly, a third of the companies come from the three states in the US with the largest pool of venture capital - California, New York, and Massachusetts, in that order (National Venture Capital Association, 2018)<sup>6</sup>.

The majority of firms are solo-founded with a small proportion of them having more than two founders. Firms in the sample may divulge information on contributed capital ahead of the campaign. If they do, they report the amount in dollars, the contributor's relationship to the company (e.g., founder), and what he/she received in return (e.g., equity). One-sixth of the firms do not report contributed capital, and in many cases no founders report contributing to the startup in a form of equity contribution (Table 3). For a great proportion of the startups, founders own the majority if not the entire company. For those founders contributing capital, the smallest contributions tend to be significant - above \$10K.

**Table 3. Founders Descriptive Statistics**

| <b>Founders with Ownership</b> |     | <b>Founders with Contributed Equity Capital</b> |     |
|--------------------------------|-----|---|-----|
| 1                              | 325 | No Info   | 77  |
| 2                              | 124 | 0   | 184 |
| 3                              | 28  | 1   | 193 |
| 4                              | 14  | 2   | 30  |
| 5                              | 3   | 3+  | 10  |
| <b>Founder Ownership</b>       |     | <b>Founders' Smallest Contribution</b>          |     |
| [0, 50%]                       | 32  | (Firms with Contributing Founders)              |     |
| (50%,100%)                     | 130 | 0-10K   | 42  |
| 100%                           | 332 | 10K-100K  | 97  |
|                                |     | 100K-1M   | 78  |
|                                |     | >1M   | 16  |

The entire management team is on average small, with little over 10% having more than four managers. As a point of comparison, a sample of startups applying to the Tech Coast Angel Group for

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<sup>6</sup> The distribution of startups across industries is in Appendix A1.

financing had an average of 5.5 managers (Kerr et al., 2011). This suggests that the firms in this sample are at an earlier stage of development or that they contain a proportion of firms that do not intend to grow. The average management age tends to be in the forties, with at least one manager having significant industry experience.

**Table 4. Management Statistics**

| <b>Management Size</b>   |     | <b>Management Age (Firm Average)</b>                     |     |
|--|-----|--|-----|
| 1  | 182 | [20,35]  | 83  |
| 2  | 134 | (35,50]  | 236 |
| 3  | 82  | >50  | 175 |
| 4+   | 96  |  |     |
| <b>Previous Startups (Active)</b><br>(Averaged over Mgmt. No.) |     | <b>Industry Experience</b><br>(Most Experienced Manager) |     |
| 0  | 61  | [0, 5]   | 99  |
| (0,1]  | 292 | (5,20]   | 216 |
| (1,2]  | 86  | >20  | 179 |
| >2   | 55  |  |     |

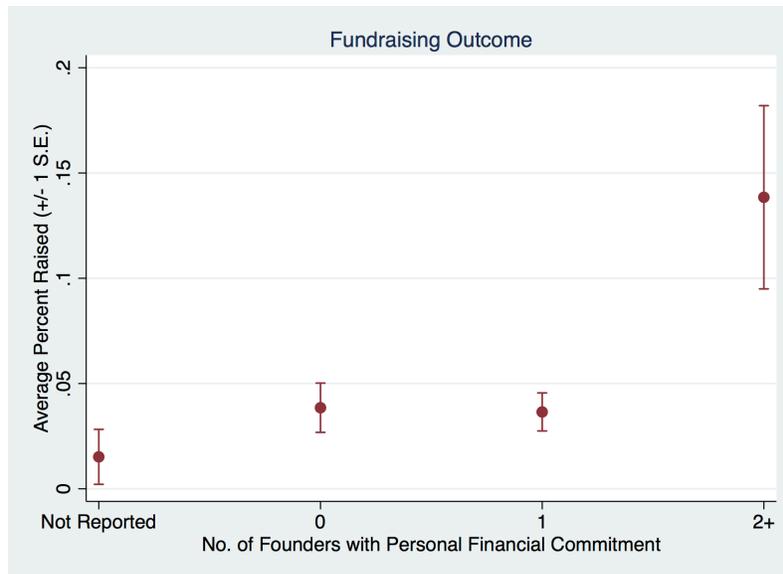
**4. Results**

The variation of the fundraising success with the number of founders reporting contributing capital (the measured Skin in the Game, or SITG) (Figure 1) indicates that teams with more than one founder committing capital raise more funds, while on the opposite side, companies that do not report prior contributors are unsuccessful. Interestingly enough, companies with either 0 or 1 founder with SITG do not fare much better.

All the companies with two or more founders contributing capital are consolidated in one group to preserve statistical power. The same result holds if the “2+” group is split into groups “2” and “3+”, or if we re-define SITG as a more substantial capital contribution (Appendix A2). Furthermore, the result is

not driven by a few most successful fundraising campaigns. Appendix A2 shows the cumulative distribution function of outcomes based on the same subgroups.

**Figure 1. Financial Commitment and Fundraising Success**



Multiple linear regression analysis (Table 4) confirms the result identified in Figure 1. Controlling for variables describing the deal terms, management, and financial statements, the results suggest that companies with more than one founder with SITG raise 8-9% more of their targeted goals than their counterparts with only one founder contributing capital, an economically meaningful increase given the 4% overall average (Table 1). The result is not driven by social capital factors, such as the number of founders appearing on the capitalization table, nor by the management team size.

More importantly, I do not see that founders attract additional funds by contributing more capital themselves. This implies that a single founder cannot compensate for the lack of co-founders' commitment with more self-capitalization; in other words, two founders contributing \$25 k will fare

better than one founder contributing \$50 k. This also suggests that the funds raised are not reported “self-financing”, a strategy sometimes used in crowdfunding to boost follow-on funding.

Companies offering a smaller piece of the company raise more funds, in line with both theory (Leland and Pyle, 1977) and some previous findings (Ahlers et al., 2015; Vismara, 2016a). However, the relationship is small in magnitude. Furthermore, the choice of the financial instrument does not play a role either, even though VCs contract through convertible securities extensively (Kaplan and Strömberg, 2003), and theory predicts that raising funds by offering equity may signal a lower project value (Ross, 1977; Myers and Majluf, 1984; Amit et al., 1990; Cornelli and Yosha, 2003; Schmidt, 2003; Casamatta, 2003).

Contrary to previous findings of the British crowdfunding platform (Vismara, 2016b), early fundraising success does not seem to correlate to later funding success, nor is it affected by previous outside investments<sup>7</sup>. Utilizing a US platform for a field experiment, Bernstein et al. (2017) find that notable investors do not attract subsequent investors’ attention. The combined results suggest the “crowds” under investigation are different in US and Europe, due to the regulatory framework. It is likely that the funds raised by the companies in this study come from investors accredited by US Securities and Exchange Commission policies, while in Europe they are more likely to be small investors. According to Signori and Vismara (2018), that distinction is important.

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<sup>7</sup> The following relationships to the company have been defined as outside investors: anonymous, commercial bank, family member of founder/manager, former manager, government entity, individual, investment firm, other credit institution, and service provider. About 40% of the startups report having an outside investor.

**Table 4. Linear Regression Analysis**

| Dependent Variable  | Percent of the Goal Raised |         |          |
|---|----------------------------|---------|----------|
|   | (1)                        | (2)     | (3)      |
| <b>No. of Founders with Contributed Capital (Baseline= One Founder with SITG)</b> |                            |         |          |
| Not Reported  | -0.007                     |         |          |
|   | 0.018                      |         |          |
| 0   | 0.001                      | 0.003   | 0.029    |
|   | 0.015                      | 0.016   | 0.025    |
| 2+  | 0.088*                     | 0.093** | 0.130*** |
|   | 0.045                      | 0.045   | 0.048    |
| <b>No. of Founders with Ownership (Baseline= One Founder with Ownership)</b>      |                            |         |          |
| 2   | 0.035*                     | 0.03    | -0.027   |
|   | 0.021                      | 0.022   | 0.019    |
| 3+  | -0.034                     | -0.036  | -0.062*  |
|   | 0.021                      | 0.026   | 0.033    |
| Founders Total SITG Amount  |                            | 0.000   | 0.000    |
|   |                            | 0.000   | 0.000    |
| Previous Outside Investment Amount  |                            | 0.000   | 0.000    |
|   |                            | 0.000   | 0.000    |
| <b>Deal:</b>  |                            |         |          |
| Pre-money Valuation (log)   | 0.003                      | 0.003   |          |
|   | 0.002                      | 0.002   |          |
| Equity Offering   |                            |         | -0.060** |
|   |                            |         | 0.025    |
| Initial Raise (%)   | 0.054                      | 0.051   | 0.092    |
|   | 0.072                      | 0.074   | 0.104    |
| <b>Management:</b>  |                            |         |          |
| No. of Managers   | 0.003                      | 0.004   | 0.001    |
|   | 0.003                      | 0.004   | 0.006    |
| No. of Previous Startups per Manager  | -0.003                     | -0.002  | -0.001   |
|   | 0.006                      | 0.007   | 0.01     |
| Average Management Age  | 0.001                      | 0.001   | 0.001    |
|   | 0.001                      | 0.001   | 0.001    |
| Industry Experience (max)   | 0.000                      | 0.000   | 0.000    |
|   | 0.001                      | 0.001   | 0.001    |
| <b>Financial Statements:</b>  |                            |         |          |
| Revenue (log(x+1))  | 0.000                      | 0.000   | 0.000    |
|   | 0.001                      | 0.001   | 0.002    |
| Assets (log(x+1))   | 0.000                      | -0.001  | 0.001    |
|   | 0.001                      | 0.001   | 0.001    |
| Patents or TM   | -0.007                     | -0.004  | -0.015   |
|   | 0.015                      | 0.017   | 0.015    |
| Constant  | 0.009                      | 0.018   | 0.002    |
|   | 0.081                      | 0.088   | 0.079    |
| Controls  | YES                        | YES     | YES      |
| r2  | 0.129                      | 0.138   | 0.197    |
| N   | 494                        | 417     | 307      |

Model: OLS with robust S.E below coefficients. Model (1) - full sample, Model (2) - companies with reported capital contributions. Model (3) - Model 2 with equity offerings only. Controls include: funding goal, security type, location, age, product or service dummy, industry, and time fixed effects.

Finally, management characteristics and financial statement items do not relate to fundraising success, likely due to high uncertainty and the limited reliability of these proxies to relate true firm and management merit. For example, the number of active startups previously founded by the management may not be a valuable signal online as there are no further details on those companies nor on the managers' prior associated roles.

Deeper inspection of the team architecture may offer additional insights. Table 5 depicts the average fundraising success disaggregated by the number of founders and number of them with SITG. Duos tend to perform better than solo founders, but also tend to perform better than teams with three or more founders irrespective of how many of them commit funds to the project. The results, albeit noisy, suggest that there might be an optimal team architecture; the marginal cost of adding a third cofounder may outweigh additional benefits. In other words, too many cooks may spoil the broth.

**Table 5. Average Percent Raise**

**Disaggregated by No. of Founders and the No. of ones with SITG**

|           | No. of Founders with SITG |      |      |    |               |
|-----------|---------------------------|------|------|----|---------------|
|           | Not Reported              | 0    | 1    | 2+ |               |
| <b>1</b>  | 0.00                      | 0.04 | 0.03 |    | <b>(Mean)</b> |
|           | 0.00                      | 0.02 | 0.01 |    | <b>(S.E.)</b> |
|           | 52                        | 123  | 150  |    | <b>(N)</b>    |
| <b>2</b>  | 0.06                      | 0.04 | 0.09 |    | 0.16          |
|           | 0.06                      | 0.02 | 0.05 |    | 0.06          |
|           | 18                        | 50   | 28   |    | 28            |
| <b>3+</b> | 0.00                      | 0.01 | 0.01 |    | 0.08          |
|           | 0.00                      | 0.01 | 0.01 |    | 0.06          |
|           | 7                         | 11   | 15   |    | 12            |

## 5. Discussion

This study proposes that the important strategic decision of the founding team architecture, aside from having operational consequences, may affect a startup's ability to attract future investors. The presence of a co-founder signals a cross-validation of the business plan and, equally importantly, a sign that the founders vetted each other's capabilities, whereas a single founder may have greater difficulty objectively vetting his/her own business idea. The presence may also signal the advantage of the team to process information better and make better decisions in the future. Higher investments are less likely to be linked to other team advantages, namely the complementarity of skills, the division of labor, and social or financial capital.

Furthermore, the study identifies the founders' financial commitment as an important validation mechanism, as the beneficial effect of co-founders is considerably amplified with their "Skin in the Game" assuring that a founder has a financial incentive to acquire and communicate information to her partners. In addition, skin in the Game may offer an added incentive for founders to monitor each other's efforts and progress frequently, a costly task to prospective investors. Nikolowa (2009) finds that mutual monitoring is optimal for high values of the monitoring cost. In early-stage ventures, this validation mechanism may not come from small investors, family and friends, or hired management, as none of these groups are as strongly incited to identify potential downsides in the prospective business, think carefully through big strategic decisions, or monitor its progress.

The signaling aspect of teams with SITG may hold implications for the other side of a crowdfunding platform too. Evidence shows that syndicated investments have been a successful vehicle in crowdfunding (Agrawal et al., 2016). They may also be relevant in other contexts. VCs may syndicate to send a signal to investors in their future funds. Mutual fund managers may signal their style to prospective investors by

forming a team. In a technology company, an engineer may indicate to her supervisor the merits of a potential project if she convinces other engineers to commit first.

The results question crowdfunding's ability to help founders without personal funds to invest, in contrast to one of the purported motivations for some of the regulatory changes in the United States allowing crowdfunding. , the results also show that the amount does not matter but the ability to convince more than one founder to contribute. Nevertheless, the results may point to novel prospective crowdfunding policies, such as requiring information on founders' personal financial commitments. The platform may then use that information to order companies in the online listings. On the other hand, the platform may choose to promote the importance of signaling SITG, as founders may be unaware of the importance of this information and consequently fail to disclose that information accurately, if at all. In a different business model, a platform could create an investment vehicle for investors to invest alongside the founders.

## 6. Limitations and Future Research

Alternative to a signaling process, a selection mechanism may operate. Single founder companies may be more volatile than those founded by a team; firms run by CEOs with more decision-making power have more volatile stock returns (Adams et al., 2005; Kim et al., 2016). Mutual fund management teams experience less extreme performance outcomes than single managers (Bär et al., 2011). In other words, the best single founder is better than the best team, but the worst single founder is worse than the worst team. If so, the observed result could be a consequence of crowdfunding attracting lower quality companies overall. Although I control for a broad set of startup characteristics, this interpretation cannot be completely ruled out.

Finally, while the results may be relevant to attracting investors, the performance of companies soliciting funds online will be the ultimate indicator. Indeed, angels are typical investors looking for opportunities on US crowdfunding platforms, and Kerr et al. (2011) present evidence that some of these groups are successful in their investment choices. However, to this date, due to the relatively young state of the equity crowdfunding industry, there is scarce evidence of the performance of companies raising money with this methodology (Cumming and Groh, 2018) and even less so on whether signals that attract investments also link to productive outcomes (Vismara, 2018). These questions ought to be priorities in future research.

## **7. Summary**

Using a nascent investment mechanism of "equity crowdfunding", this study offers a window into the early-stage investment process by leveraging a unique and comprehensive data set on companies raising funds on a US equity crowdfunding platform. The results suggest that the "Skin in the Game", or financial investment by multiple founders, is linked to fundraising success. This may be a signal of founders' mutual cross-validation, an indicator not easily replicated by alternative stakeholders such as hired management or small investors. The results uncover a signaling function of team architecture to attract future stakeholders and hold implications beyond the context of early-stage investment.

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Appendix

A1

Table A1.1 Industry Distribution

|   |     |
|---|-----|
| Biotech, Pharmaceuticals, Healthcare, Medical Devices & Equipment | 45  |
| Business Products & Services, IT Services                         | 67  |
| Communications  | 8   |
| Computers & Control Systems, Peripherals, Robotics                | 6   |
| Consumer Products & Services, Retailing                           | 131 |
| Electronics & Instrumentation, Semiconductors, Nanotechnology     | 7   |
| Energy & Utilities  | 26  |
| Financial Services & Real Estate                                  | 57  |
| Industrial & Manufacturing, Materials, Chemicals                  | 19  |
| Media & Entertainment   | 45  |
| Software  | 65  |
| Transportation & Distribution, Aerospace, Defense                 | 18  |

A2

Figure A2.1 shows the cumulative distribution of funding outcomes based on whether or not they reported capital contributions to the company, and on the number of founders they listed as contributors. The relationship is not driven by a few large successes.

Figure A2.1

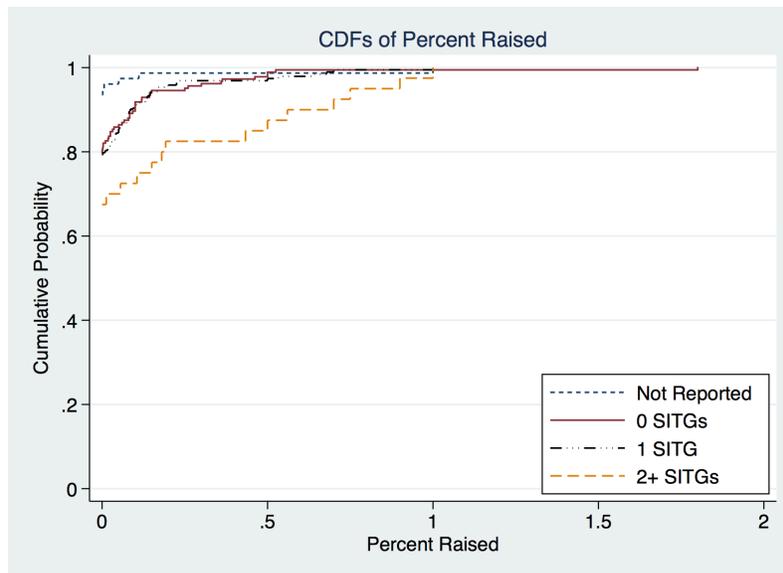
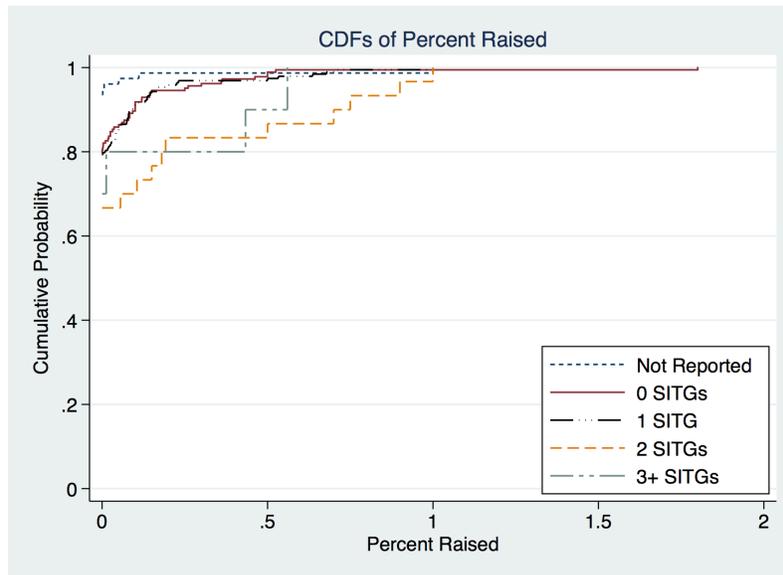


Figure A2.2 shows that the results are similar whether we take 2+ or 3+ as a truncating cutoff.

**Figure A2.2**



The result also holds if the minimum threshold of capital contribution is lifted to \$20K. (Figure A1.3)

**Figure A2.3**

