

Money talks: Empirical insights on the impact of investors' connections for entrepreneurs' success

Anaxamène Dimitriadès *

Claudia Jonczyk Sédès *

January 2020

1 Introduction

An important asset for the investor and the company he is investing in are the connections that he may have in the industry. It makes for a pool of resources comprised of person/companies he might know or might have worked with, which may prove valuable in the future. The study of the impact of these connections on a company is the subject of my work. It can be rephrased in this fashion: what is the impact of an investor's connections for the company in which he is investing?

My answer to this question is built by viewing a complete network of past relationships from all investors. According to this knowledge of previous business links, I investigate the role that the centrality of an investor within the global network can have for his investee.

The question can further be broken down to several sub questions. Does investment from a prominent investor at an early stage increase the chances of its investee to secure later successful rounds of funding? And can a favourable network position of an investor increase the odds that a startup will become public?

*Université de Neuchâtel

2 Framework

2.1 Smart money

In Morten (2007) those effects are highlighted, showing that a company backed by a more experienced VC is more likely to reach a successful outcome; in direct link with the fact that an experienced VC has survived in a very competitive environment, and has therefore accumulated more resources. As well, Bernstein et al. (2015) shows that a more involved VC (dedicating more time to monitor/help its investee) will result in an increase of the startup's level of innovation and of its likelihood of a successful exit.

Venture capital firm have the ability to help with a startup's professionalisation by making its structures evolve. Therefore, they are contributing to its future success while using money in that view. This is shown in Hellmann & Puri (2002) which put in depict this relation between the VC and the development of a more structured, professional, startup (i.e. by suggesting a change of CEO). Young companies are often created by non-business people, hence counseling from the VC can help founders to develop into a more efficient business.

Similarly, it is proven that VCs can intervene in non-monetary ways to help foster innovation (and select it), thus reducing the time to market new products for a firm, as per Hellmann & Puri (2000).

2.2 Certification

Given that a large portion of a VCs' time and effort are spent to monitor the market and its investment (in order to keep investing or not), as noted by Kaplan & Stromberg (2001), a direct effect must be that a firm will only take risks to invest if it has enough trust into the founders dedication and abilities.

Indeed, it can seem intuitive that the simple fact that an investor is willing to give some of its own money to a startup can act as an oath of trust toward the quality of the entrepreneur. This goes along the argument of Lewis & Sappington (2000), given that with unknown ability of the entrepreneur may come extra cost to his success, which must be alleviated by the investor. Mechanically, the more powerful/famous the investor, the stronger the sign should be that prospects about the company are high.

Information asymmetry and lack of information make for the existence of such certification bias. This point is documented by Megginson & Weiss (1991), specifying the impact that this certification can hold, by highlighting a startup due to the sole presence of a notable VCs in its capital. As well, it establishes that this privileged

situation of the VCs allows for the extraction of surplus from VCs.

An opposite view might be the one introduced in Howell (2017). She informs us that in the case of grant funding for governmental agencies, there was no observable sign of certification effects and that the benefits were coming purely from the advantage introduced by fresh capital to be used by the startup for the development of new products. Therefore, one may argue that the impact of the certification effects is to be found on investors that are private (thus spending their own money and aiming toward a high return on investment) and accountable of reputational capital to some extent (clearly not a concern of US Department of Energy).

2.3 Reputation & Networks

More powerful and famous investor is likely to have a beneficial effect on the firm in which he is investing.

This point is demonstrated by Hochberg et al. (2007). They show that the performance of a VCs' fund is increased for a better position of the VC in the network. To that point, I will differ as I focus on the effects for the startup rather than investors. Yet, they also specify that companies under study had a higher chance of survival given better-networked investors. The point is also raised by Checkley et al. (2010), as they find an increase in IPO generation as a benefit from syndication ties.

Based on a network study with selected participants from the industry, Walske et al. (2007) find that the success of a startup is increasing with the strength of venture syndicates ties.

3 Data & Methodology

The main source of data is coming from the company Crunchbase (crunchbase.com). They propose an access to a "master record of data on the world's most innovative companies", intended for the use of investors and analysts. I use this dataset to build a network of all known past investment deals, and to derive values of centrality that I use later in my estimations.

Records are spanning on a period starting as early as 1968 (with an investment made in a promising chip company, Intel) until today. Yet, syndicate deals remain rare in the table until the end of the nineties, past which the vast majority of deals are recorded. Hence, this dataset provides a great value to my study, given its size - about 240 000 funding rounds are referenced, from small seed funding to multi-billion

deals; and its scope – covering all open economies for over five decades. This makes for a sampling that is as representative of true market activities as can be, lowering considerably the risk of any bias.¹

3.1 Network

The first step that I take is to make a representation of the global network of investors. Using data from Crunchbase, I have informations regarding all investments made by investors on each project. From here I construct a mapping of all investors who worked together.

This is done for the period 1968-2010, used as training data, from which I derive centrality metrics. The remaining of the dataset's records (which accounts for the bigger share of entries, from 2010 to 2018) is used as my test set, from which I estimate each coefficient.

The result is an undirected network where nodes are investors (either individuals or investment institutions) and edges are connections between them created by common (syndicated) deals.

By using Blondel et al. (2008) algorithm, I find that there are a few large communities (1200-2000 nodes), a few more 10-500 nodes communities and a remaining larger part of isolated players. That is understandable given the basic segmentation of investors around their location and industry.

3.2 Centrality measures

A second step after having built a usable network is to extract measures of centrality that I will use in the remaining of this paper. Intending to keep things simple, the measures that I use are fairly common ones in the network literature: degree and eigencentrality.

The degree measure accounts for the number of connections that an agent had in the network. Not surprisingly, I find that the distribution of degree is uneven. If the average degree is 1.71, most agents hold a very limited number of connections while a few powerful one account for up to 2000 connections.

¹There may be a bias in the case where completely undisclosed deals doesn't appear in the dataset.

4 Results

Factors that matter in "pre-IPO" phase would be all success factors that a startup is seeking up to the point of going public. For this period, I focus on two measures of success: how does an investor centrality affect the probability of getting another round of funding and ultimately of increasing further fundings opportunity? And does it influence the likelihood of going public?

4.1 Pre-IPO

4.1.1 Going to the next round

Being able to continue raising cash is critical for a young company. It allows the startup to continue growing, to recruit new staff, develop its product and conquer new markets. The criticality of this factor makes me ask the next question: does the centrality of investors in a startup make it more likely to get another round of funding?

$$\begin{aligned} \text{Next round} = & \beta_0 + \beta_1 \times \text{Log(raised amount)} + \beta_2 \times \text{Log(highest degree)} \\ & + \beta_3 \times \text{Size syndicate} + \beta_4 \times \text{Geographical area} + \epsilon \end{aligned} \quad (1)$$

To answer this interrogation, I turn to a simple logit model, following equation 1, to estimate which factors affect the probability of reaching a new round of funding. A first thing to note is that in my database, a little less than 70% of the present companies only enjoyed a single round of funding, while the remaining part got two or more.

I find a significant effect of an investors centrality on his investee's likelihood of getting more funding. As seen in table 1, I find it to be strongly significant (at the 0.001 level) and having a positive effect of 0.35 per 1 log of degree. Using the log of the degree of the investor holding the highest degree among the syndicate, I find its effect to be constantly positive (from 35% to 9% increase in the probability of getting another round for each increase of 1 log of degree), in that sense, a more central investor will increase the probability that its investee gets a new round of funding compared to a less connected investor.

Other metrics also play a significant role in the chance of getting a new round, such as the raised amount during the first round, which remain significant, even though its impact is quite small, for all my estimations.

The number of investors taking part in the first round is significant (at 0.001) and strongly positive (with a coefficient of 1.4). Hence, having a syndicated deal (therefore with 2 or more investor) makes it almost automatic, at least statistically, for

| | Access next round of funding (1= startup had 2+ rounds) | | | | |
|--------------------------|---|-----------------------|-----------------------|-------------------------|-------------------------|
| | (1) | (2) | (3) | (4) | (5) |
| Log raised amount | 0.168*** (0.00408) | | 0.0218** (0.00783) | -0.0660*** (0.00890) | -0.0733*** (0.00917) |
| Log highest degree | | 0.349*** (0.0100) | 0.339*** (0.0107) | 0.100*** (0.0127) | 0.0909*** (0.0131) |
| Size syndicate | | | | 1.391*** (0.0243) | 1.387*** (0.0247) |
| <i>Geographical area</i> | | | | | |
| Africa (base) | | | | | 0 (.) |
| Americas | | | | | 0.639** (0.218) |
| Asia | | | | | 0.732*** (0.222) |
| Europe | | | | | 0.571** (0.219) |
| Oceania | | | | | 0.872** (0.287) |
| Constant | -2.246*** (0.0565) | -0.0722** (0.0264) | -0.366*** (0.109) | -1.172*** (0.122) | -1.640*** (0.252) |
| Observations | 51660 | 23091 | 23086 | 23085 | 22508 |
| Pseudo R^2 | 0.025 | 0.046 | 0.046 | 0.304 | 0.302 |

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Data: worldwide, 2010-2018.

Table 1: Logit estimation of the probability of getting more than one round of funding. Log raised amount and size syndicate are characteristics of the first funding round. Log highest degree is the log of degree of the most central investor taking part in the first round of funding. Geographical area is a group categorisation of the startup localisation.

a startup to get an additional round of funding. This result perfectly illustrates the benefit from having a larger group of investors at first, which are more likely to renew their trust in the company via a consecutive round of funding.

4.1.2 Increasing capital needs

Even though there may be exceptions, it is usually a good sign for the startup if the amount of cash raised increases. Given that a young company has a higher need for capital, it means that it is able to match those needs in order to grow.

Therefore, I want to test that a higher centrality of investors contributes to the obtention of higher funding in the future. Hence, I look for elements that may impact the amount of capital that a startup will raise during his last funding before going public (in the case of a company which didn't attain an IPO, I take the last round available). Of course, for this test I restrict the sample to the population of startups which accounted for 2 rounds or more.

$$\text{Raised amount}_{\text{last}} = \beta_0 + \beta_1 \times \text{Raised amount}_{\text{first}} + \beta_2 \times \text{Higher centrality} + \epsilon \quad (2)$$

Using a regression model as shown in equation 2, I find the effect of an investor centrality to be strong and significant (above the 0.001 level) in all the dimensions that I tested, see table 2. I take the eigencentrality of the least central and of the most central investor, as well as the mean eigencentrality among all investors participating in the first round. This latter appears to have in isolation the strongest effect on the capital raised during the last round, with a coefficient of $6.70e + 07$. Thus, each increase in my model of 1 percent of mean centrality of investors forecasts an increase of more than 6.7 million dollars in raised amount for the last round.

There is a clear impact from the network position of investors on their investee's chances of getting a higher amount of cash at the last round, which is also impacted by the amount raised at the first round.

4.1.3 Going public

The last element that I test for this "pre-IPO" phase is the impact of investor's centrality on the odds of going public for a startup.

$$\text{IPO} = \beta_0 + \beta_1 \times \text{Log(Raised amount)} + \beta_2 \times \text{Higher centrality} + \epsilon \quad (3)$$

For my analysis, I wish to explain a dummy that is equal to 1 if the company had an IPO, and 0 otherwise. I report the results of my logit regression, as in equation 3 in the upper panel of table 3.

| | Raised amount (USD) at last round | | | | | |
|--|-----------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| Raised amount (USD) | 1.17e+00*** (8.09e-03) | | | | 1.17e+00*** (8.10e-03) | 1.17e+00*** (8.37e-03) |
| Lower centrality | | 4.97e+07*** (9.34e+06) | | | | |
| Mean centrality | | | 6.70e+07*** (6.79e+06) | | | |
| Higher centrality | | | | 3.98e+07*** (3.54e+06) | 1.52e+07*** (2.66e+06) | 1.42e+07*** (2.75e+06) |
| <i>Geographical area</i> | | | | | | |
| Africa (base) | | | | | | 0.00e+00 (.) |
| Americas | | | | | | -7.76e+06 (7.09e+06) |
| Asia | | | | | | 3.79e+06 (7.19e+06) |
| Europe | | | | | | -9.71e+06 (7.13e+06) |
| Oceania | | | | | | -1.05e+07 (8.34e+06) |
| Constant | 7.04e+06*** (5.20e+05) | 1.76e+07*** (7.00e+05) | 1.57e+07*** (7.37e+05) | 1.48e+07*** (7.55e+05) | 5.72e+06*** (5.69e+05) | 1.26e+07 (7.05e+06) |
| Observations | 26543 | 26543 | 26543 | 26543 | 26543 | 25950 |
| Adjusted R^2 | 0.441 | 0.001 | 0.004 | 0.005 | 0.442 | 0.435 |
| Standard errors in parentheses | | | | | | |
| * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ | | | | | | |

Table 2: Regression of the determinants impacting the last amount of capital (USD) raised by startups. Raised amount (USD) is a characteristic of the first funding round. Lower centrality and higher centrality correspond to the eigencentralities of the least central, respectively most central, investor taking part in the first round of funding. Mean centrality is the average of eigencentralities of all investor taking part in the first round of funding. Geographical area is a group categorisation of the startup localisation.

| | IPO dummy (1 = startup went public) | | | | |
|--------------------|-------------------------------------|-----------------------|-----------------------|-----------------------|----------------------|
| | (1) | (2) | (3) | (4) | (5) |
| <i>First round</i> | | | | | |
| Log raised amount | 0.707*** (0.0258) | | | | 0.678*** (0.0269) |
| Lower centrality | | 2.593*** (0.299) | | | |
| Mean centrality | | | 3.815*** (0.218) | | |
| Higher centrality | | | | 2.500*** (0.137) | 1.219*** (0.151) |
| Constant | -14.74*** (0.426) | -3.927*** (0.0450) | -4.129*** (0.0501) | -4.248*** (0.0547) | -14.51*** (0.441) |
| Observations | 26540 | 26543 | 26543 | 26543 | 26540 |
| Pseudo R^2 | 0.168 | 0.010 | 0.041 | 0.049 | 0.179 |

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3: Logit estimation of the probability of going public. Log raised amount is a characteristic of the funding round. Lower centrality and higher centrality correspond to the eigencentrality of the least central, respectively most central, investor taking part in the round of funding. Mean centrality is the average of eigencentralities of all investor taking part in the round of funding.

I find the effects of investors' centrality to be significant and positive. Indeed, I find that lower centrality (which correspond to the eigencentrality of the least central investor taking part in the first round of funding) has an associated coefficient of 2.6, respectively 3.8 and 2.5 for mean centrality and higher centrality. In isolation, taking a constant around 4, its represent a large added probability for a startup to go public if we refer solely to this variable. Therefore, there is a strong, positive, effect linked to the centrality of investors on the likelihood for a startup to go public. The money raised in the first round of financing appears to impact significantly and positively the probability of an IPO taking place for a startup, with an associated coefficient of 0.7 per log of raised amount.

This effect combined with the high centrality effect remain strong. Hence, telling us that a combination of a central enough investor and of enough raised cash can considerably increase the chance of a company going public.

5 Discussion

The centrality of an investor provide answers around three axes: getting a new round of funding, increasing the amount received from funding, and, finally, accessing top public markets.

This represents a logic path for a hot startup. And we can easily imagine that it is driven by prominent investors. As a startup can secure funding from a group of central investors, this is likely to signal it as a hot prospect in the investing community (given that information flow freely in the community). Hence, the company is likely to get noticed and to wrap with more ease a successive round of funding from an extended group of investors given that it could show progress. If the balance sheet appears less bright as expected, it could still extract value from this initial highlight and succeed in financing enough capital to correct the course of the ship.

Looking through the lens of increasing amount of capital raised from the previous section, I can reach a similar conclusion. It seems plausible that by using the power associated with the centrality of its investor, the firm is able to develop faster than its competitors. An explanation may be that the investor earned its position through previous wise investment which helped him survive in the competitive investment scene. In return, it allowed him to mechanically accumulate more links in the networks (as well as resources) as years went by. Consequently, the investee with such a support has the opportunity to tap into those resources.

As a results, this could potentially trigger more growth for the startup, and mechanically, increase its need for fresh capital in order to pursue its expansion (as cash needs, often, goes increasingly). Hence, the startup will be benefiting from this position of its investor and will be more likely to get a higher last round - even more as it is already more likely to get another round of funding as discussed previously (which according to our data is by far not the rule).

The last point of going public may be the one that exacerbates the value created by being backed by a prominent investor. As we saw that it is likely to lead to higher chance of getting another round of funding, and of receiving more money in the subsequent rounds; this mechanically increases the chances of a company going public as it will more easily be able to reach its targets. Furthermore, that result can be in line with Banerjee et al. (2016), asserting that firms with better growth opportunities are more susceptible of going public earlier than others. Hence, it could be that this population of firms acceded to the public markets earlier than their competition, giving them an edge in their expansion. This could be at the expense of their competition getting a lower perspective of going public in the future.

6 Conclusion

In this paper, I provide a view of the effects that an investors' centrality within the global network of investors can have.

I decompose its relevance on the axes of "pre-IPO" development of a startup, by making it more likely to access a new round of funding, to get increasing amount of funding, and more importantly, to go public through an IPO. I attribute those positive factors to a certification effect which allow the startup to get more recognition and an easier path to further funding.

An implication of this work is that it might be fully rational for entrepreneurs in some cases to accept funding from more prominent investors, even if it comes with a lower amount of cash. Indeed, as they should seek to increase their chances of surviving and performing, they can't oversee the role of a powerful backing.

This gives an explanation regarding the attractiveness of prominent investors for an entrepreneur, as I developed all the perks that were linked to the investors' position for the startup.

References

- Banerjee, S., Güçbilmez, U. & Pawlina, G. (2016), 'Leaders and followers in hot ipo markets', *Journal of Corporate Finance* **37**, 309–334.
- Bernstein, S., Giroud, X. & Townsend, R. R. (2015), 'The impact of venture capital monitoring', *The Journal of Finance* **71**(4), 1591–1622.
- Blondel, V. D., Guillaume, J.-L., Lambiotte, R. & Lefebvre, E. (2008), 'Fast unfolding of communities in large networks', *Journal of statistical mechanics: theory and experiment* **2008**(10), P10008.
- Checkley, M., Añón Higón, D. & Angwin, D. (2010), 'Venture capital syndication and its causal relationship with performance outcomes', *Strategic Change* **19**(5-6), 195–212.
- Hellmann, T. & Puri, M. (2000), 'The interaction between product market and financing strategy: The role of venture capital', *The Review of Financial Studies* **13**(4), 959–984.
- Hellmann, T. & Puri, M. (2002), 'Venture capital and the professionalization of start-up firms: Empirical evidence', *The Journal of Finance* **57**(1), 169–197.
- Hochberg, Y. V., Ljungqvist, A. & Lu, Y. (2007), 'Whom you know matters: Venture capital networks and investment performance', *The Journal of Finance* **62**(1), 251–301.
- Howell, S. T. (2017), 'Financing innovation: Evidence from r&d grants', *American Economic Review* **107**(4), 1136–64.
- Kaplan, S. N. & Stromberg, P. (2001), 'Venture capitals as principals: Contracting, screening, and monitoring', *American Economic Review* **91**(2), 426–430.
- Lewis, T. R. & Sappington, D. E. M. (2000), 'Motivating wealth-constrained actors', *American Economic Review* **90**(4), 944–960.
- Meggison, W. L. & Weiss, K. A. (1991), 'Venture capitalist certification in initial public offerings', *The Journal of Finance* **46**(3), 879–903.
- Morten, S. (2007), 'How smart is smart money? a two-sided matching model of venture capital', *The Journal of Finance* **62**(6), 2725–2762.
- Walske, J. M., Zacharakis, A. & Smith-Doerr, L. (2007), 'Effects of venture capital syndication networks on entrepreneurial success', *Frontiers of Entrepreneurship Research* **27**(3), 2.