

Chapter 2

The Role of Angel Syndicates on the Demand and Supply of Informal Venture Capital

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Abstract

The recent explosion of the informal venture capital is stimulating finance scholars to deeply investigate the major determinants, characteristics and possible implications of this phenomenon within the start-up ecosystems. The rising literature on business angels (BAs) still misses to adequately cover many investigation areas, such as the operations and the role played by the different typologies of BA networks (BANs) and the valuation of the contributions provided by BAs to the performance of the angel-backed companies. The contributions of Bonini *et al.* (2018, 2019) are part of the ongoing debate on these two research areas that have not yet been exhaustively explored. The two papers show that the affiliation to an angel community affects BAs' investment decisions, though it doesn't seem to have a significant impact on the survival and profitability of the funded ventures. On the contrary, by co-investing in an angel syndicate, BAs may enjoy risk- and information-sharing benefits that structurally affect both their investment practices and the performance of the funded ventures. Also, the BAs' willingness to play an active role does have a positive impact on angel-backed companies' survival and growth. Finally, the intensity of BAs' soft monitoring seems negatively related to the performance of the funded ventures because of the impact on the trust-based entrepreneur–angel relationship. However, angel communities might be able to decrease and distribute within the network the need for individual monitoring while increasing members' confidence in the angel investments.

1. Introduction

The growing relevance of the role played by business angels (BAs) within the entrepreneurial finance eco-system emerges unambiguously by looking at market data at both the US and the European level (US ACA, 2016; Kraemer-Eis *et al.*, 2016; OECD, 2016; EBAN, 2017; Invest Europe, 2017).

BAs are: *high net worth individuals who invest their own money in small unlisted companies, with no family connections, typically assuming a minority equity stake as well as active involvement in portfolio companies* (Mason, 2008). Thanks to their growth as well as increasing professionalization angel investors have filled the so-called “funding gap” existing

between the demand and supply of early-stage equity capital, thus becoming crucial drivers of entrepreneurship and economic growth (Mason and Harrison, 2000; Johnson and Sohl, 2012; Mason *et al.*, 2013; Capizzi, 2015; Bonini and Capizzi, 2017). As a matter of fact, from the one hand, BAs meet a demand for an equity ticket size (on average between 100k and 300k euros) usually neglected by venture capitalists because of the relatively high costs required for due diligence, contracting and monitoring (Gompers, 1995; Jeng and Wells, 2000; Kaplan and Strömberg, 2001; Carpenter and Peterson, 2002; Mason, 2009; Cumming and Johan, 2013; Bernstein *et al.*, 2016). From the other hand, BAs, alongside with monetary resources, provide non-monetary resources, such as industrial knowledge, management experience, mentoring and personal relationship networks (Harrison and Mason, 1992; Landström, 1993; Politis, 2008).

The growing relevance of this informal segment of the equity capital markets gave rise to the development on a worldwide basis of a vast literature focused on business angels, adopting various theoretical perspectives, research scopes and methodologies (Landstrom and Mason, 2016; Edelman *et al.*, 2017; Tenca *et al.*, 2018). Relying on a well-accepted classification approach based on research themes, we can identify at least five focused streams of contributions, summarized in the following.

The first research theme examines the main features of both BAs and their investment decision-making process (Mason and Harrison, 2000; Van Osnabrugge, 2000; Shane, 2000; Paul *et al.*, 2007; Sudek *et al.*, 2008; Wiltbank *et al.*, 2009; Macht, 2011; Bammens and Collewaert, 2014; Harrison and Mason, 2017; Bonini *et al.*, 2018).

The second group comprises studies focusing on the comparison between the operations and the investment practices of angel investors and venture capitalists (VCs), trying also to investigate the nature of the relationship between BAs and VCs (Van Osnabrugge, 1998; Harrison and Mason, 2000; Madill *et al.*, 2005; Sohl, 2006; Ibrahim, 2008; Wong *et al.*, 2009; Johnson and Sohl, 2012; Vanacker *et al.*, 2013; Chemmanur and Chen, 2014; Hsu *et al.*, 2014; Kerr *et al.*, 2014; Hellmann *et al.*, 2017).

The third stream of contributions addresses the issue of the transformation of the angel market taking place after the rising of angel investment organizations (business angel networks (BANs), angel clubs or syndicates), identifying the major monetary and non-monetary contributions provided

to either the entrepreneurs of the BA joining a given group of angels (Mason and Harrison, 1997; Mason, 2008; Paul and Whittam, 2010; Collewaert *et al.*, 2010; Brush *et al.*, 2012; Mason *et al.*, 2013; Carpentier and Suret, 2015; Lahti and Keinonen, 2016; Croce *et al.*, 2017; Gregson *et al.*, 2017; Bonini *et al.*, 2019).

The fourth research topic deals with the identification and the measurement of the determinants of the profitability of BAs' investments (Lumme, 1996; Harrison and Mason, 1999; Mason and Harrison, 2002; Wiltbank, 2005; Wiltbank and Boeker, 2007; Werth and Boert, 2013; De Gennaro and Dwyer, 2014; Capizzi, 2015; Politis, 2016).

The final group of studies, leveraging on the literature on venture capital and private equity (Gompers and Lerner, 2001; Davila *et al.*, 2003; Dimov and Shepherd, 2005; Hsu, 2006; Sørensen, 2007; Colombo and Grilli, 2010; Chemmanur *et al.*, 2011; Croce *et al.*, 2013; Grilli and Murtinu, 2014) focuses on the analysis of the performance of the angel-backed companies, disentangling also the impact of the different typologies of value-added contribution on the success of the funded ventures (Manigart *et al.*, 2002; Harrison and Mason, 2008; Pommet, 2012; Alemany and Villanueva, 2015; Lerner *et al.*, 2016; Levratto *et al.*, 2017; Cumming and Zhang, 2018; Bonini *et al.*, 2019).

Despite the notable flourishing of research on angel financing, however, what we do know about the behavior, operations and performance of BAs and angel investment organizations is still limited and hard to generalize, mostly because of the intrinsic limitations of either the anecdotal-based evidence or the survey-based empirical analysis so far performed to shed light over so opaque an asset class.

In this chapter, we aim at pointing out the major findings dealing with some BA-specific investment practices, as emerging from two recent related studies providing some original and incremental contributions to existing literature.

The two papers focus, respectively, on the supply (Bonini *et al.*, 2018) and the demand (Bonini *et al.*, 2019) for angel financing in the early stage segment of the Italian capital market sharing as a starting point for the build-up of the datasets a common information base: the annual survey of the Italian Business Angel Network (IBAN) delivered since 2007 to its associates and other unaffiliated BAs, which provides valuable qualitative

and quantitative information on the companies invested, the characteristics of the deals and the investment practices of the surveyed angels.

The first paper moves, among the others, from the previous contributions of Shane (2000), Sohl (2007), Paul and Whittam (2010), Mason *et al.* (2013), Mason and Botelho (2016) and Croce *et al.* (2017). These studies reveal the importance of the role played by angel groups, from the one hand, in collecting, processing, filtering, and disclosing information among members about possible investment opportunities and, from the other hand, in sharing within the group angels' previous experience as well as competences and relational networks. In the first paper, the authors aim at investigating the existing relationship between the membership in a BAN and the investment decisions of the BAN members, as measured by the share of angel personal wealth invested in a given deal or the amount of equity stakes in the portfolio companies.

The second paper focuses on the angel-backed companies, showing the impact on the performance and the probability of survival of the funded ventures played by some angel-specific factors, among which the presence of angel syndicates. One critical methodological issue underlying such a research goal is the selection of an accurate measure for the performance of the invested companies, given it's hard to adopt the same metrics developed in the literature investigating the impact of private equity and VC investors on the performance of portfolio companies (Bran and Gompers, 1997; Black and Gilson, 1998; Hellmann and Puri, 2000; Kortum and Lerner, 2001; Engel, 2002; Manigart *et al.*, 2002; Davila *et al.*, 2003; Bertoni *et al.*, 2011; Chemmanur *et al.*, 2011; Croce *et al.*, 2013; Cumming and Johan, 2013; Grilli and Murtinu, 2014).

Different from venture-backed companies, angel-backed firms are mostly pre-revenues, not yet able to produce a constant stream of future cash flows. In many cases, they are not fully active and running their business, up to the point that for most of them it's concrete the case they shut down without having generated any sale or having capitalized significant assets. Therefore, in the earliest stages of their life-cycle, accounting measures of performance (turnover or its growth, ebitda, market share, return on equity and capital assets) are likely to have a low informative power about a company's future survival and growth. Similarly, other commonly-used metrics in the literature on venture capital such as innovation, patent

licensing, employment growth, productivity or successful exits through IPOs or acquisitions can hardly be applied in the context of angel financing, where the funded ventures quite often operate in traditional low tech industries, do not show accelerated growth paths in limited time frames nor are ready to be listed in officially regulated capital markets. Therefore, in order to address the limitations of the above-mentioned metrics, Bonini *et al.* (2019) propose an original proxy (the *Performance Index, P.I.*) for the survival and growth of the angel-backed companies that, as explained in the following section, is an ordinal variable that can assume five different values, based on different combinations of revenues, assets and income reported for the sample companies.

The major finding empirically confirmed from both contributions points out the crucial role played by angel syndicates in both sides of the investigated informal venture capital market: from the supply side, angel investors affiliating to an angel investment organization show a higher propensity to invest in a given deal when compared to unaffiliated angels; from the demand side, angel syndicates are a major determinant of the performance and the probability of survival of angel-backed companies.

2. Unit of Analysis, Sample Data and Dependent Variables

The IBAN administered 3,000 questionnaires to 929 affiliates and 2071 non-affiliates from 2009 (2008 investment data) through 2015 (2014 investment data), with an overall response rate of 41.7% (47.2% for the sub-sample of affiliated angels and 39.2% for the non-affiliated angels). Each survey — resembling the typical structure of the questionnaires delivered on an annual basis by the national federations of BAs and BANs all over the world — enquired about investments in the previous year.

The first paper by Bonini *et al.* (2018) assumes as unit of analysis the investments made by Italian angel investors in the 2008–2014 time period, as shown in Table 1, Panel A.

After discarding incomplete or inconsistent filled IBAN questionnaires, the authors were able to build a final dataset based on 439 responses reporting an aggregate of 810 deals, for 619 unique companies, by 330 unique investors. Such sample was used to investigate the impact of a

Table 1: Sampling procedure.

PANEL A — Paper#1: The determinants of BAs investment decisions			
	Surveys sent (2008–2014)	Final filled surveys selected	No. of deals reported
Full Sample	3,000	439 (14.6%)	810
BAN Members	929	246 (26.5%)	438
Non-BAN Members	2,071	193 (9.3%)	372
PANEL B — Paper#2: The performance of angel-backed companies			
No. of deals reported (2008–2012)	No. of fully identified deals	Panel firms	
(1)	(2)	(3)	(3)/(2)
695	302	111	37%

preselected set of factors related to BAs’ investment practices on the angels’ propensity to invest part of their wealth in a given deal. Two variables have been used as a measure of the BAs’ investment decisions: the amount of capital invested as a share of the individual BA’s personal wealth ($Y_1 = \textit{Wealth}\%$) and the amount of capital invested by an individual BA expressed as a share of the equity capital of the funded venture ($Y_2 = \textit{Participation}\%$).

Table 3, Panels A and B, provides descriptive statistics related to the two dependent variables: the average BA allocate about the 15.5% (median 14%) of his wealth in a given deal, which results in the acquisition of a minority equity-stake of about the 14.7% (median 8%) of the common equity of the investee company. Interesting to note, the number of observations for variable *Wealth%* (669) is considerably lower than for the variable *Participation%* (808); this is due to the lower number of surveyed angels who have answered the specific question asking for a disclosure about an angel’s personal wealth, confirming one relevant and intrinsic selection bias affecting all the empirical analyses dealing with survey-based questionnaires.

The second paper by Bonini *et al.* (2019) bases its analysis on a sample of 111 companies invested by the surveyed angels in the period 2008–2012. During those years, 695 deals were reported by IBAN respondents, but full information on the names of the target companies was only reported for 302 deals. The 111 companies were the target of those deals Table 1, panel B. The companies were monitored along a time horizon of four years (for a total of 444 observations), where t_0 is the time of the BA investment. Table 2 provides descriptive statistics of the temporal and industry distribution of the sample deals and companies investigated in both papers. The number of firms investigated in this work is significantly lower than that of both the deals and the angel-backed firm considered in the first paper for several reasons. Firstly, the explicit unit of analysis of the first paper is constituted by the individual investments made by each BA, implying that the same company can be present in the investigated sample as many times as the BAs that have invested in it at the same time or in different years. Secondly, for a remarkable number of deals the responding angel did not indicate the name of the investee company or wrote in the questionnaire a name that could not be traced back to any real company, preventing the subsequent data collection required by the empirical analysis to be run by Bonini *et al.* (2019). Finally, the need to observe angel-backed companies in a post-investment time horizon of at least three years did not allow the authors to use for the second paper the 2013 and 2014 IBAN questionnaires, as at the time when the data collection process was carried out, the last official annual financial statement was that of 2015.

The performance of the funded ventures has been measured through the creation of an original indicator, the P.I. is an ordinal variable based on pre-selected combinations of accounting variables relating to revenues, net income and net asset value. The P.I. can assume five different ordinal scores:

- (1) Revenues, net asset value and net income are positive → P.I. = 2
- (2) Revenues and net asset value are positive,
but net income is negative → P.I. = 1
- (3) Revenues are positive, but net asset value and
net income are negative → P.I. = 0

- (4) Revenues are zero, net income is negative, but net asset value is positive → P.I. = -1
- (5) Revenues are zero, net income and net asset value are negative → P.I. = -2

Table 2: Sample descriptive statistics.

PANEL A — Temporal distribution		
	Paper#1: The determinants of BAs investment decisions	Paper#2: The performance of angel-backed companies
	No. of deals	No. of firms
2008	95	2
2009	142	12
2010	137	27
2011	159	23
2012	162	47
2013	58	
2014	57	
Total	810	111
PANEL B — Industry distribution		
	Paper#1: The determinants of BAs investment decisions	Paper#2: The performance of angel-backed companies
Biotech	17.06%	17.12%
Cleantech	13.08%	13.51%
Commerce and distribution	10.09 %	9.01%
Electronics	9.34%	15.32%
Information and Communications Technology (ICT)	20.80%	18.02%
Media & Entertainment	9.96%	9.01%
Other sectors	19.68%	18.02%
Total	100.00%	100.00%

Table 3: Dependent variables: descriptive statistics.

PANEL A — Dependent variable = <i>Wealth%</i>	
Mean	15.48
Median	14
Maximum	60
Minimum	5
Standard deviation	11.8
No. of observation	669
PANEL B — Dependent variable = <i>Participation%</i>	
Mean	14.74
Median	8
Maximum	100
Minimum	1
Standard deviation	19.54
No. of observation	808
PANEL C — Dependent variable = <i>Performance Index</i>	
Ordinal Value	Total by value
2	91
1	179
0	40
-1	54
-2	16
No. of firms without financial statement in <i>t</i> 0	64
Total	444

In the 404 sample of company-years observations used in Bonini *et al.* (2019), 4.21% were in the lowest category of P.I., with negative income and net assets, and no revenues. 14.21% had only positive net assets, 10.53% only had positive revenues, 47.11% had both positive revenues and positive net assets and 23.95% also had positive net income.

Although many alternative combinations of outcomes are technically possible from a mere computational standpoint, the authors argue their five selected outcomes are consistent with the five performance scenarios

commonly outlined in financial accounting literature (Anthony and Ramesh, 1992; Black, 1998; Fame and French, 2000; Nissim and Penman, 2001; Omrani and Karami, 2010; Dickinson, 2011) and practice (Damodaran, 2015; Fabozzi *et al.*, 2015).

The basic rationale underlying the P.I. is that it takes time for a small company receiving an equity injection to (i) fully deploy the projected operating investments disclosed in the fundraising process, (ii) adjust the business model and company operations, and (iii) start experiencing cash inflows, earnings and increase in the equity capital base. As a consequence, a common growth path to many angel-backed start-ups implies some years of zero or low revenues, negative profits and equity capital erosion, followed by either the increase of sales, earnings and cash flows, or the death of the company.

It's therefore a crucial issue understanding the major contributions provided by BAs and leading some companies after a few years since their foundation to be able to be alive and grow their business, differently from some others experiencing low performance and undergoing liquidation or bankruptcy procedures within the same time frame.

3. Main Research Hypotheses

The main research hypotheses set by the authors of both papers aim at investigating whether BAs' investment decisions and the performance of angel-backed companies are affected by two main typologies of factors: the interaction across angel investors and the interaction between BAs and the funded venture.

As for the first factor, Bonini *et al.* (2018) measure the interaction across BAs through an original pair of variables related to the investment practices of the surveyed angels: the membership to a BAN and the number of BA co-investing in a given deal.

Also the second factor, i.e., the interaction between BAs and the angel-backed company, is measured by two distinct variables, both based on the answers provided by the surveyed angels to specific questions about their investment decision-making process. The first measure discriminates between passive angel investors and actively involved ones, the formers being BAs investing just for financial purposes, the latters also providing relevant non-monetary contributions, such as mentoring, management

advisory, networking, sharing industry or product market knowledge related to their previous experience. The second measure is the intensity of the post-investment monitoring effort, that in the case of BAs, different from VCs, takes place basically through company visits and meeting with the funded entrepreneurs.

The main research hypotheses developed in the two works are presented in the following section.

3.1. *Affiliation to an angel community*

A significant transformation driver affecting the angel market in the last two decades is the emergence of angel investment organizations (Shane, 2000; Josè *et al.*, 2005; Aernoudt *et al.*, 2007; Ibrahim, 2008; Paul and Whittam, 2010; Brush *et al.*, 2012; Gregson *et al.*, 2013; Lahti and Keinonen, 2016; Mason *et al.*, 2016). It's now well clear that by joining an angel syndicate BAs can enjoy multiple benefits, mostly due to the information and knowledge sharing taking place inside the community. In particular, less experienced angels by getting in touch with more experienced angels may have the opportunity to increase their human capital, developing a better understanding about how to implement effective value-creating investment decisions.

Therefore, Bonini *et al.* (2018) argue the affiliation to an angel syndicate does have a double impact on BAs' investment decision. Firstly, due to the information sharing and screening contribution provided by angel investment organizations, which decreases the opaqueness as well as the perceived risk profile of BAs' typical investment opportunities, affiliate members should invest in companies belonging to this peculiar asset class more of their personal wealth than unaffiliated angels.

Secondly, BAs joining a BAN benefit from the deal flow disclosed inside the angel community and, therefore, are provided with both a higher number of and better quality investment opportunities compared to non-BAN members. However, given that the impact of angel syndicates on BA investments should not necessarily result in structural changes in either angels' risk aversion or angels' historical asset allocation strategies, affiliated angels offset the increase in the number and the unit size of deals with a decrease in the equity stake acquired in the investee companies.

Table 4: Business angels' investment intensity.

No. of deals in business angles' portfolios	Whole sample (%)	BAN members (%)	Non-BAN members (%)
>10	17.9	18.16	9.13
6-10	26.05	28.32	9.14
2-5	33.46	35.16	51.34
1	22.59	18.26	20.38
χ^2 (portfolio > 5)			32.02***

In support of such hypothesis, Table 4 shows that the Italian angels joining an angel syndicate have in their asset portfolio a number of angel deals higher than that of the unaffiliated angels: Only 18% of BAs who are not members of any given BAN own a portfolio with more than five investments, against about 47% of those angel investors affiliated with a BAN.

Finally, assuming the standpoint of the angel-backed companies, Bonini *et al.* (2019) observe many BANs arrange on a regular basis courses and training programs targeted to both their own affiliates or potential entrepreneurs, in order to increase the quality of the entrepreneur-investor relationship and maximize the post investment value contribution provided by BAs.

Additionally, BAN membership gives affiliated angels the opportunity to enjoy some common services, such as due diligence and contract designing, as well as to optimize BAs' decision-making styles according to their investment behavior in a trust-based environment, ultimately increasing the probability of the funded venture to run follow-on investment rounds (Wiltbank, 2009; Fili *et al.*, 2013; Bonnet *et al.*, 2013; Bammens and Collewaert, 2014). It is therefore possible that the contribution of angel syndicates is not limited to the generation and screening of investment opportunities, rather positively impacting the growth path and the value creation potential of the angel-backed companies.

The causal relationships above argued have been tested through the use of the dummy variable *BAN-membership*, that assumes the value of one if at least one BA joining a given deal shows a BAN affiliation.

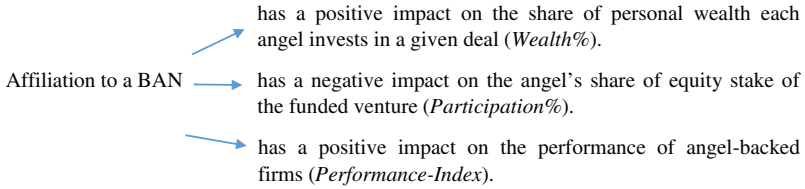


Figure 1: Hypothesized effects of the affiliation to an angel community.

The expected relationships between the dummy *BAN-membership* and the dependent variables investigated in the two papers are depicted in Figure 1.

3.2. *The co-investment across BAs*

Alongside with angel investment organizations, another rising phenomenon affecting the informal venture capital market is the emergence of the practice of co-investment, that can be pursued according to more or less structured modes, involving a plurality of investments or just a single deal raising the interests of multiple BAs forming an investment syndicate (or “club deal”) on a spot basis.

From the IBAN data on the Italian market, a rather heterogeneous scenario emerges, where the number of co-investors varies from a maximum of 15 to a minimum of 0, assumes an average value of 4 and a median value of 2, confirming co-investment as a structural investment practice within the angel market.

The co-investment yields some valuable advantages to BAs. First, it allows them to reduce their individual equity stake in the investee companies, without sacrificing the opportunity to play an active role and eventually provide value-added contributions, due to the cumulative equity position held by all the BAs co-investing in a given deal, that is higher than “solo” angels’ equity stake (Paul and Whittam, 2010). Second, consistent with modern portfolio theory (Elton and Gruber, 2005), the co-investment option is a pure rational diversification strategy aimed at reducing the risk from a given investment opportunity and, therefore, at relying on more diversified investment portfolios (Harrison and Mason, 2002; Mason *et al.*, 2013). Third, similar to an analogous argument developed about angel

syndicates, BAs, by co-investing in a given deal, can get access to risk-reducing information coming from the reciprocal knowledge, background and previous experience (Aernoudt, 2005; Sohl, 2012).

As a consequence of the above said, Bonini *et al.* (2018) assume rational BAs deciding to co-invest are likely to adopt a risk-sharing perspective also when deciding the amount of their personal wealth to allocate to a given deal, therefore individually investing a smaller amount of capital than “solo” angels.

When assuming the perspective of the investee ventures, Bonini *et al.* (2019) argue a company being funded by a syndicate of angels might enjoy a wider set of both monetary and non-monetary contributions than that possibly provided by a solo angel, thus increasing its growth potential as well as its future probability of survival. As for the monetary contributions, it's clear a high number of co-investing angels implies the opportunity to immediately start the business with a higher size scale, market potential and an increased probability to run follow-on investment rounds over time. A further monetary contribution for the angel-backed companies comes from the possibility to benefit from the sharing taking place across co-investing angels of the costs of due diligence, contracting and monitoring. As for the non-monetary contributions, the angel-backed companies can enjoy multiple sources of coaching and mentoring and can benefit from each BA's industrial knowledge, previous investment experience and relationship network.

The magnitude of the co-investment, as measured by the number of co-investors in a given deal, therefore implies a higher quality selection process and a more effective post-investment involvement than those of the “solo” angels, because of the possibility to benefit from wider experience, knowledge and social capital.

Such research hypothesis has been tested through the variable *Co-investors*, which corresponds to the number of BAs joining a given deal. The expected relationships between the variable *Co-investors* and the dependent variables selected in the two papers are described in Figure 2.

3.3. Active or passive investors?

As anticipated in the previous section, the contribution BAs can provide in a given deal is often not limited to just the subscription of equity capital,

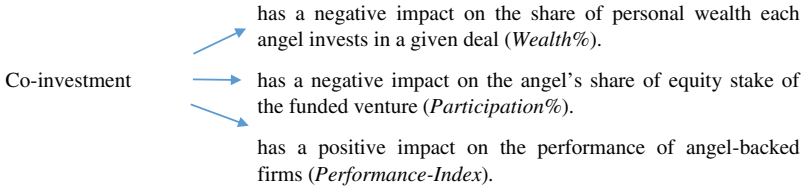


Figure 2: Hypothesized effects of the co-investment in a given deal.

but, as pointed out by the literature, it might be aimed at seeking active involvement with their portfolio companies, supporting them in the value creation process through a hands-on approach. The willingness to share with the entrepreneur own industry skills, to offer mentoring and advisory services, to participate in the strategic design process, to optimize corporate governance, to provide previous experience, to make the funded venture benefit from their own network of industry and financial relationships are all examples of non-monetary contributions possibly available to angel-backed companies (Mason and Harrison, 2000; Mason, 2006; Politis, 2008; Landström and Mason, 2016; Croce *et al.*, 2018).

On the contrary, it is not uncommon to observe BAs not willing and/or able to play such an active role in the funded ventures: rather, they behave according to a hands-off approach typical of purely financial investors, being attracted by potential capital gains and by the portfolio diversification benefits associated to angel investments.

Hence, Bonini *et al.* (2018) assume that “active” and “passive” investors exhibit a structurally different investment pattern. More in detail, the exclusive orientation to financial yields and diversification benefits is likely to have a negative impact on both the share of BAs’ personal resources to be invested and the size of their equity stakes in the funded ventures.

Such hypothesis has been tested through the dummy variable *Passive investor*, that takes a value of one if the responding angel states that the investment decision was driven exclusively by capital gain motivation and not by other reasons suggesting his willingness to play an active role in the angel-backed company.

The expected relationships between the dummy *Passive investor* and the variables *Wealth%* and (*Participation%*) are represented in Figure 3.

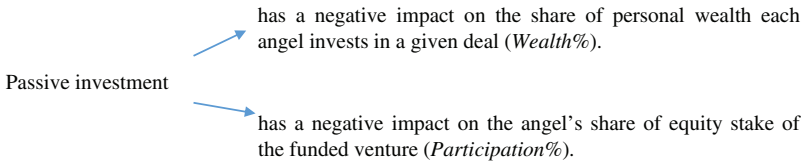


Figure 3: Hypothesized effects of the BAs' "passive" investment behavior.

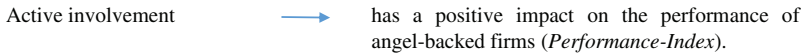


Figure 4: Hypothesized effects of the BAs' "active" involvement.

Differently from controversial findings from the venture capital industry, the impact of BAs' active involvement on portfolio companies is generally found to be positive as for the possibility of angel-backed companies to both raise follow-on funds and create value for their stockholders (Madill *et al.*, 2005; Chua and Wu, 2012; Landström and Mason, 2016). In line with these evidences, Bonini *et al.* (2019) hypothesize a positive relationship between the *Performance Index* of the funded ventures and BAs' active involvement in company operations (Figure 4).

3.4. The intensity of monitoring

Finance literature has deeply addressed the role of the monitoring as a way to reduce the problems related to information asymmetry and moral hazard stemming from any type of securities investments (Jensen and Mecking, 1976; Diamond, 1984; Aghion and Bolton, 1992).

As far as VC and private equity investments are concerned, a wide stream of studies has extensively investigated how institutional investors monitor target companies and the major contingent contracts, clauses and mechanisms used to manage such problems and realign incentives between investors and company owner-managers (Sahlman, 1990; Triantis, 2001; Kaplan and Strömberg, 2003; Gompers and Lerner, 2004; Chemmanur *et al.*, 2011; Cumming, 2008; Wong *et al.*, 2009; Metrick and Yasuda, 2010; Cumming and Johan, 2013; Bernstein *et al.*, 2016; Erenburg *et al.*, 2016).

In the case of angel financing, however, several contributions point out that BAs hardly adopt the typical monitoring mechanisms used by venture capitalist, preferring instead to implement “non-aggressive” and informal control mechanisms which Bonini *et al.* (2018, 2019) define as “soft monitoring” ones, such as geographical proximity to the angel-backed company, BAs’ knowledge of the industry, experience gained from previous investments and, most importantly, interactions with entrepreneurs through periodic meeting or company visits (Van Osnabrugge, 2000; Kelly and Hay, 2003; Wiltbank and Boecker, 2007; Ibrahim, 2008; Chemmanur and Chen, 2014; Goldfarb *et al.*, 2014; Bonini and Capizzi, 2017).

It is then reasonable to assume the more intense the soft monitoring effort put by BAs, the lower the investment risk perception by BAs in their investment decision-making process, hence positively impacting on both the amount invested and the size of their equity stakes in the funded ventures.

However, when considering the perspective of the angel-backed companies, one has to remind the tight fiduciary relationship existing between the BA and the entrepreneur, mutually nurtured by reciprocal trust (Chua and Wu, 2012; Bammens and Collewaert, 2014). Therefore, it might be the case that tightening the degree of soft monitoring could harm the trust-based relationship between the entrepreneur and the angel investor, negatively impacting on the mutual perception on each other’s contribution, possibly worsening the future company performance.

The above-developed research hypothesis has been investigated using the variable *Soft-monitoring*, that may take a value from 1 to 5, depending on the frequency of the visits a BA makes to its portfolio companies. The expected relationships between the variable *Soft-monitoring* and the dependent variables being studied in the two papers are shown in Figure 5.

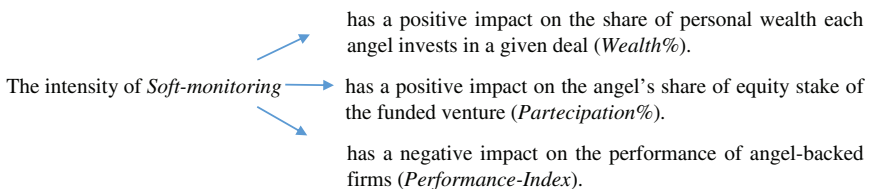


Figure 5: The intensity of the *Soft-monitoring*.

4. Methodology and Main Results

In the first paper, the authors investigate the determinants of BAs' investment decisions by running an ordinary least squares (OLS) regression model between the two selected dependent variables (*Wealth%* and *Participation%*) and a set of independent variables related to the research hypotheses developed in the previous sections: *BAN membership*, *Co-investors*, *Passive investor* and *Soft-monitoring*.

In addition to the four independent variables defined above, the model also introduces control variables related to the characteristics of the BAs (age, education, wealth, previous investment experience, professional background), the characteristics of the funded ventures (company size, age and stage in the life cycle, geographical location) and to the characteristics of the reference industry (industry price-to-book value ratio and industry capital intensity). Finally, the authors add to some model specifications time and industry-fixed effects to account for possible heterogeneity in BAs' behavior.

The analysis is then replied for the sub-samples of affiliated and unaffiliated BAs separately, in order to be able to identify structural differences in BAs' investment practices likely driven by the different degree of networking, information and knowledge sharing across the two groups.

In the second paper, being the dependent variable the five-stage ordinal variable *Performance Index*, the authors run a set of ordinal logistic (Ologit) regression analysis.

The explanatory variables are related to the main research hypotheses: *BAN_membership*, *Co-investors*, *Active-Involvement*, *Soft-Monitoring*. Moreover, the authors included firm-specific controls (company age, size, location and stage in the life cycle) and angel-specific controls (BA's age, experience and equity stake in the funded venture), together with fixed temporal and industry effects.

The results, reported in Table 5, show that being a member of an angel community increases the share of wealth invested in a deal by approximately 16% (column 2) and reduces the size of the equity stake in the investee venture by approximately 14% (column 5), thus confirming the authors' hypotheses about the role of angel syndicates on BAs' investment decisions.

Table 5: Huber–White heteroskedasticity-consistent standard errors are reported in parentheses under each coefficient.

Independent variables	Y = Wealth%			Y = Participation%			Y = Performance-Index
	Whole sample	BAN Member	Non-BAN Member	Whole sample	BAN Member	Non-BAN Member	Whole sample
	(2)	(3)	(4)	(5)	(6)	(7)	(8)
BAN_membership	0.155*** (0.05)			-0.139* (0.07)			0.225 (0.37)
Co-investors	-0.017*** (0.01)	-0.035*** (0.01)	-0.007 (0.01)	-0.067*** (0.01)	-0.075*** (0.01)	-0.069*** (0.01)	0.063** (0.03)
Passive Investor	-0.064 (1.08)	-0.023 (0.25)	-0.163** (2.08)	-0.186** (0.08)	-0.262** (0.13)	-0.264*** (0.09)	
Active Involvement							0.479 (0.31)
Soft-Monitoring	0.054* (1.92)	-0.053 (1.62)	0.154*** (4.60)	0.214*** (0.04)	0.116** (0.05)	0.287*** (0.06)	-0.316*** (0.12)
ANGEL F.E.	YES	YES	YES	YES	YES	YES	YES
FIRM F.E.	YES	YES	YES	YES	YES	YES	YES
INDUSTRY F.E.	YES	YES	YES	YES	YES	YES	YES
YEAR F.E.	YES	YES	YES	YES	YES	YES	YES
cut 1							-7.129***
cut 2							-5.354***
cut 3							-4.874***
cut 4							-2.235*
R ²	0.27	0.35	0.37	0.56	0.51	0.67	0.10
Observations	569	292	277	569	292	277	303

Notes: *, **, *** indicate statistical significance at the 10%.

However, the affiliation to an angel network does not seem to have a statistically significant impact on the performance of angel-backed companies (column 8), maybe due to the intrinsic features of the authors' survey-based dataset, which does not allow the possibility to account for the qualitative differences in the various forms of potentially existing angel investment organizations.

Ceteris paribus, a one-unit increase in the number of co-investors reduces the percentage of BAs' personal wealth invested in a single *deal* by 2% (column 2) and decreases the individual participation in the investee company by an economically significant 7%; therefore, co-investing appears to be an effective way to pursue risk-minimizing investment decisions while enjoying the upside of portfolio diversification.

Moreover, by comparing affiliated angels to unaffiliated angels, Bonini *et al.* (2018) observe the BAs' wealth allocation is affected by the presence of co-investors only for the sub-sample of the BAs affiliated to an angel community, implying that there could be a positive effect played by the trust established within a given angel community. On the opposite, the absence of an effect for unaffiliated angels might be interpreted as the result of a lack of knowledge of other investors' profiles and characteristics, eventually preventing BAs from co-investing because of potential free-riding and/or opportunistic behavior (columns 3 and 4).

As for the variable *Participation%*, results confirm the expected negative relationship between the number of co-investors and the equity stake in the investee company for both sub-samples (columns 6 and 7), though showing higher significance for affiliated angels. The phenomenon of co-investment also positively affects the performance of angel-backed companies, as expected (column 8).

When considering BAs' motivations to invest, it is confirmed the existence of a negative relationship between a "passive" investment aptitude and BAs' investment decisions, though limited to just unaffiliated angels. Bonini *et al.* (2018) argue that within an angel community the possibility of benefitting from co-investing with other affiliated angels, the possibility of enjoying other angels' experience and knowledge may provide incentives that ultimately positively affect the percentage

wealth invested by passive BAs, similarly to actively involved BAs' investment decisions.

Finally, the variable *soft-monitoring*, is significant and has a positive impact on both the dependent variables *Wealth%*, (column 2) and *Participation%* (column 5), confirming the authors' hypothesis. By looking at the results of the analysis run separately for affiliated and unaffiliated BAs, it turns out that the impact of BAs' monitoring is statistically significant only for investors not joining an angel community, thus confirming the quality of the contribution in terms of deal flow and screening provided by angel groups to their members. In fact, it is likely that affiliated angels put a higher effort in monitoring only on ventures perceived as riskier and, thus, more opaque. When considering the impact of soft monitoring on the performance of angel-backed companies, the results of the empirical analysis show a statistically significant negative relationship, supporting the argument that tightening the control on the funded venture might damage the underlying trust-based fiduciary relationship and eventually worsen the future probability of survival and growth.

In Bonini *et al.* (2018), the authors provided further support to their results by performing multiple robustness checks (including a set of two-stage instrumental variable regressions and propensity score matching regressions) to face possible sample bias or endogeneity issues dealing with the decision to join a given angel investment organization. Results, not reported in this chapter, are qualitatively unchanged.

In Bonini *et al.* (2019), on top of the various robustness checks performed, the authors tested the predictive power of their P.I. by creating a dummy variable (*Survival*) assuming the value one for those ventures that have survived four years after the initial investment, or zero otherwise. They then run a set of logistic regressions on such variable against the P.I. as explanatory variable on both the sample of angel-backed companies and a homogeneous sample of control companies not funded by BAs. Table 6 shows the results of this regression analysis, which confirms the predictive power on the survival of angel-backed firms of the P.I. for both samples, differently from other traditional accounting measures (total assets and revenues).

Table 6: Predictive power of different performance measures.

	(1)		(2)		(3)	
	Angel-backed firms	Control sample	Angel-backed firms	Control sample	Angel-backed firms	Control sample
Performance-Index	0.623** (0.29)	0.359* (0.191)				
Total Assets			-0.163 (0.18)	0.038 0.141		
Revenues					0.081 (0.06)	0.032 0.043
Industry-FE	YES	YES	YES	YES	YES	YES
Intercept	0.759 (0.53)	0.682** (0.341)	3.497 (2.48)	0.557 (1.764)	0.49 (0.76)	0.728 (0.495)
Pseudo R ²	0.159	0.06	0.131	0.03	0.119	0.04
N	80	114	80	114	80	114

Notes: In this table are presented results for a set of logistic regressions estimating the survival of firms through the Performance Index and two other traditional measures of performance. The dependent variable is a dummy (“Survival”) assuming value one for those firms that have survived four-years after the initial investment, or zero otherwise. Huber–White heteroskedasticity-consistent standard errors are reported in parentheses under each coefficient. *, **, *** indicate statistical significance at the 10%, 5% and 1% levels, respectively.

5. Conclusions

The recent explosion of the informal venture capital market all over the world is stimulating finance scholars to deeply investigate the major determinants, characteristics and possible implications of this phenomenon within the start-up ecosystems. Though now rather developed and well differentiated by major research themes, literature on BAs still misses to adequately cover many actual investigation areas where, up to date, the knowledge is still limited. Examples of relatively low explored topics deal with the operations and the role played by the different typologies of BA networks or, also, the valuation of the contributions provided by BAs to the survival and growth of the angel-backed companies.

The contributions of Bonini *et al.* (2018, 2019) are part of the ongoing debate on these two research areas that have not yet been exhaustively explored. The two papers show that the affiliation to an angel community does affect BAs' investment decisions, though it doesn't seem to have a significant impact on the survival and profitability of the funded ventures, except for the weakest performing ones. On the contrary, by co-investing on a deal-specific basis in a given angel syndicate, BAs may enjoy risk-sharing and information-sharing benefits that structurally affect both their investment practices and the performance of the funded ventures.

Also the BAs' willingness to play an active role by providing value-added contributions in terms of industry skill, experience, mentoring and networking opportunities plays a major role in driving the angel-backed companies to survival and growth.

On the contrary, the intensity of BAs' soft monitoring seems negatively related to the performance of the funded ventures because of the impact on the trust-based entrepreneur–angel relationship. However, angel communities might be able to decrease and distribute within the network the need for individual monitoring while increasing members' confidence in the angel investments.

Future research will have to shed more light on the pivotal role played by angel syndicates — both inside and outside angel communities — within the entrepreneurial finance ecosystem, given their intrinsic potential as mechanisms for sharing across BAs information, experience and knowledge. Another promising area of future research stems from the extension of the analysis at an international level through worldwide-based BA samples, in order to find out best practices inside angel investment organizations as well as focused public policies aimed at creating favorable environments for angel investors.

One concrete example of one possible policy measure could be the design of dedicated financing facility schemes leveraging on the value-adding potential of BAs, such as the creation of public–private angel co-investment funds.

Finally, the analyzed contributions suggest a number of possible action schemes also for BAs, on the one hand, and entrepreneurs, on the other hand. As a matter of fact, the business model of “solo angels” looks like less effective and value-adding than that of BAs deciding to co-invest

and, therefore, to enjoy the many benefits associated to an angel syndicate, ultimately positively impacting the investment risk and the performance of the funded venture. From the entrepreneurs' side, it is crucial to consider the major contribution provided by angel investors is not just a pure monetary one: therefore, involving as equity investors a pool of co-investors is a unique opportunity to exploit multiple background experiences, know how, industry and product market knowledge, networks of personal relationships as well as the standing and reputation of all the angels co-investing in a given deal.

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