Characterizing business angels and investigating the impact of their human capital on startup success

Lisa Maier
Technische Universität München
TUM School of Management
Munich, Germany

Prof. Dr. Philipp Sandner
Frankfurt School of Finance and Management
Management Department
Frankfurt, Germany
email@philipp-sandner.de

Prof. Dr. Richard C. Geibel
University Fresenius of Applied Sciences
Competence Center Entrepreneurship
Cologne, Germany
geibel@hs-fresenius.de

***Abstract*—The present study aims to comprehensively describe angel investment and its possible effects in determining a start-up's success by analyzing 2114 business angels by taking into account their professional and entrepreneurial experience, academic formation and their demographic characteristics. This study demonstrates that both the academic background and the industry sector in which the business angels work directly correlate with the industry sector in which the start-up operates. Additionally, this study shows that the angel investors had invested more than once before and had a history as founders or cofounders of start-ups themselves. We extend these findings by providing insights on how angel investors shape the success of new entrepreneurs.**

Keywords-business angel, start-ups, venture capital, seed and early stage funding

I. Introduction (Heading 1)

Both for start-ups themselves and experts in the entrepreneurial scene, funding has always been a topic of concern and constant discussion. Much of the discussion has centered on how young companies can somehow find a way of being financed at very early phases of their development [1]. Besides the well-known financial means that banks offer, there is a growing market of equity investors in the form of venture capital or private equity companies, among which some individual investors that operate on their own have made a name for themselves: Business Angels.

Business angels (BAs) or angel investors are, according to specialized literature on the topic, individuals who invest heavily with their own means in young, private companies and who during the funding process provide a very high amount of their own capital, while not being a friend or relative of the company's founders [2] [3].

While venture capital (VC) and private equity (PE) companies have been closely scrutinized, BAs have not been of special interest for researchers in the industry [4], despite their important role for young companies in particular. The available work on these individuals identifies a research gap in determining a relationship between the human capital of a BA and the eventual success of a start-up [5]. The purpose of the following analysis is to provide a detailed picture of BAs and to investigate how some of their similarities, such as professional experience and academic background, relate to the success of chosen companies.

The following pages first summarize the available insights from existing literature on the topic. To understand the benefits of BA financing, it is necessary to investigate their influential, unique human competences on the progress of invested start-ups. By drawing on a novel dataset, we analyze various traits such as job experience, socio-demographical characteristics, start-up experience, experience in the industry and academic education for 2,114 BAs. This analysis eventually leads to a clear portrait of the average BA in the US. In order to uncover the relationships between the characteristics of a BA and the effects they have on a company they invest in, we present three different case studies. We discuss BAs' effects on startups and conclude with comments for future research.

II. Theory

Before analyzing the relationship between a BA's role within the structure and history of a start-up and its eventual success, it is of special importance to showcase the current status and latest findings of available research on the topic.

A. Difficulties of start-up fund raising

Start-ups have recently been a matter of special interest not only because of how much attention they have received from media outlets, but also because of their critical importance for the economy [6]. They are essential drivers of major innovations in various industries. Despite this, start-ups often struggle for a number of reasons to assure the adequate financial means to keep their operation afloat and ensure their survival in a competitive economic environment [1] [7].

As a result, entrepreneurs often seek to obtain risk capital in the form of equity due to the fact that access to debt finance is difficult to procure [3]. This source of external equity can either come in the form of BA financing or VC financing. When it comes to arousing the interest of BAs or VC companies, it can be challenging to convince investors of the start-up's growth and investment potential [8]. For instance, it is a difficult task to assess a start-up's performance at the seed and early stages of its development [7]. Not only is raising capital hard because of the elevated risk a start-up pertains, but also because these young companies often have little to no experience in this area and do not yet have an established work routine [9]. Many of these young companies go bankrupt afterwards, with 23% of them doing so within the first two years after their foundation [10]. Moreover, the markets in which they operate tend to change considerably fast.

B. *Seed and early stage financing*

Start-ups are frequently dependent on external financing at different stages, especially in the form of informal capital [11]. This latter source of capital, which is needed for seed or early stage start-ups, can be contributed by BAs or the founders themselves together with friends and family [3]. Figure 1 shows the common types of investors and the different funding stages in which they normally operate.

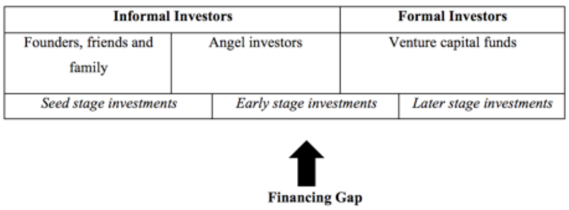

Figure 1. Equity investors at the seed, early and later stage in firm growth [12]

BAs are natural informal investors that, unlike their VC counterparts, tend to operate in a wider industry sector spectrum and who mostly invest during a company's early stages [13]. Reference [14] emphasizes that 28% of all BAs invest during the seed stage where 45% do so during a company's early stages. Regarding the market's size, [15] have pointed out that the informal investment sources have overtaken the formal ones. Reference [16] has published new research data that shows that VCs invest during the seed stage about 2% of the time, with 34% covering the early stages and the rest of them mostly investing in expansions and the later stages of a company.

Specialized literature [17] describes that it is precisely in this gap that BA investment flourishes. This role was particularly strengthened by the financial crisis, in which banks and venture capitals notoriously stopped financing start-ups at their riskiest stages. Banks have kept a low profile as important funding partners for start-ups because of the high risk normally associated with them. On the other hand, VC investors continuously try to minimize the risk they undertake by financing start-ups at their more intermediate and mature stages [12].

1) *Business angel financing*

References [18] describe BAs as "wealthy individuals, often former entrepreneurs themselves, who place their money into early stage entrepreneurial ventures, acting alone or in angel groups". The last decade has witnessed an ever-increasing role of these kinds of groups and individuals [19].

BA financing has many characteristics. As previously mentioned, not only do BAs support young companies at their most critical phases, but they also help the start-ups concerning other aspects. BAs sometimes offer mentorship to entrepreneurs and some of them actually act as a kind of external company directors for them [3] [17].

Nevertheless, in contrast to VC, little is known about the roles BAs play internationally [20]. And contrary to VCs, BAs target companies with financial needs that are lower than those that a VC tends to cover. Nonetheless, both of them carry out investments permeated with high risks and potential for even greater returns [21]. According to [22], they usually receive a return of about 25%.

Even though BAs are vital for seed and early start-up financing, many fields are still incompletely investigated and an in-depth understanding is lacking [3]. For instance, the full extent of BA financing is difficult to measure precisely since it is not subject to regulatory disclosure due to the fact that angel investments are made on an individual basis [14] [19]. Nevertheless, estimates suggest that BA financing is approximately of equal size to the VC market [12]. Together with the Center for Venture Research, [14] demonstrated that BA funding as whole represents a total sum of 24.6 billion USD among 304,930 active investors.

Despite the tremendous importance and rapid growth of BA financing, there are still areas which remain uninvestigated. Until now, human capital characteristics such as reputation, education and entrepreneurial experience have rarely been taken into account in research [4] [5]. In terms of understanding the benefits of BA financing, it is of utmost importance to investigate the relevance of human competences in influencing the progress of invested start-ups [5].

2) *Venture capital financing*

VC is a highly prevalent resource of capital for young and small technology start-ups with potential for high returns and great risk [3] [11] [23]. These entrepreneurial ventures are often active in constantly changing markets that allow little to no certainty to investors [23] and are as a result characterized by very high failure rates [10]. Above all, VCs are an important intermediary in the financial market and provide companies the needed capital when they cannot conventionally raise enough funds on their own [23] [24].

Existing research defines VCs as "independent, professionally managed, dedicated pools of capital, that focus on equity and equity-linked in privately held, high growth companies" [2]. Moreover, they are sometimes brought together by their common investment interests in the same way angel groups are [21].

VC companies play an important role in leading companies [25]. In the last 30 years, important companies in the US such as Google, eBay, and Apple, among others, have been supported financially by VCs [26].

III. CHARACTERISTICS OF BUSINESS ANGELS

A. Data collection

In order to extend the little previous research done on how traits of a BA can influence a start-up [5], data used for empirical analysis was collected from several sources. To compile an up-to-date list with active BA data, a list of 2,114 BAs was obtained from CrunchBase. CrunchBase is a crowd-funded platform that readily provides information on start-ups, their founders, their investors and both their company founding and funding processes. With the purpose of reaching the insight of a 'stereotypical' BA, different attributes were defined and completed using data from CrunchBase, LinkedIn and Twitter. The attribute list of human capital contains data on the BAs socio-demographic characteristics, work and funding experience as well as academic education.

B. Variables

Different variables were defined and suitable scales were selected. These variables were chosen as it is of particular interest to find out the extent to which characteristics of different BAs within the same or different companies resemble each other. On the other hand, it can shed light on the components that make up the success of a company, especially in the case when both the academic and professional experience of a BA correlates directly with the industry sector the company operates in.

C. Descriptive statistics

It is noticeable that 96% of the sampled individuals are male. More than a half are American and 89% of them currently reside in the United States. This result directly correlates with [16] case study that determined that the majority of available data on BAs actually originates from the United States. Notably, after the US, the most common countries of origin for the sampled BAs are India, Canada, UK and France. The average year of birth for the sample is 1972, which corresponds to an average age between 44 and 45 years. Interestingly, about 86% of the individuals in the sample have themselves founded or cofounded a start-up.

Regarding their professional careers, it can be seen that 95% of the 1,223 sampled individuals have had managerial roles as CEOs, chairmen or high-ranking executive positions within a company at some point in their careers. Remarkably, half of them had already been managers before that and about 30% of them had had a technical occupation. The clerical/administrative, consultant and mentor types are grouped under the category of "others".

The last part of the analysis focuses on the BA's academic background. More than half of the sampled individuals majored in business, 44% of them have a technical major, and 24.7% completed a degree in another area. Some BAs even completed two degrees. It is interesting to note that 39.3% completed a master's degree and 38% received a bachelor's degree. Moreover, only 6.5% hold a doctoral degree.

A further valuable understanding on BAs is provided by analyzing which industry sectors they currently work in. 43% of the BAs are active in the internet-based sector, followed by the VC and PE Sector (19%) and IT services (18.8%).

IV. CASE STUDIES

The previous dataset was enriched with company data and funding information retrieved from CrunchBase. After building up a BA profile in the previous section, the next section connects BAs with start-ups. Three different case studies are presented with the purpose of visualizing a cause and effect relationship between a BA and a company where similarities regarding the respective BA's human capital are highlighted and presented. For the following three ventures, information on the BA's characteristics was gathered. Similarities are identified below.

A. Google

For Google, five out of the seven of the involved investors of four funding rounds were BAs; that is, 62% of the total amount of investors present. Google is a multinational company that specializes in providing high quality internet-based services and solutions. When Google came into the market in 1997, not even its founders, Larry Page and Sergey Brin, two students from Stanford, suspected the impact this start-up would have. In Google's case, four different funding rounds raised a total amount of 36.1 million USD.

The internet giant from Mountain View got its first financial aid from external investors in August 1998 and the last funding round took place in June 1999. Figure 2 illustrates Google's four funding rounds and its investors in a chronological sequence.

Figure 2. Google timeline

Even before being registered as a company, the information shows that Google already had an investment pending from a BA ready to be signed. Andy Bechtolsheim was the first BA that invested in Google's business idea during the first funding round. Three months later, during the second funding round, he and three other BAs invested a considerable sum of money totaling 1 million USD.

It was not until more than half a year later that two known San Francisco-based VC companies finally invested capital in the company. Just as it was described by [27], it was also the case that several VC joined forces as a last step.

However, the starting funding capital for this nascent start-up from a garage in Menlo Park with just three coworkers thus came from BAs.

In order to find possible effects of the BA funding on Google, the human capital similarities among the BAs are first identified.

By observing the industrial sector where the BAs operate, it is noticeable that they all operate in sectors similar to those that Google seeks to capture and operate within as part of its strategy and company goals. The IT service-based industry, that covers the internet and computer networking services industry, better describes the main target industry sector. Their academic background in fields such as computer science, electrical engineering and business administration has a thematic orientation to this sector as well. All four BAs also have both managerial experience and highly developed skills and knowledge in technical areas. Remarkably, all of them have experience as start-up founders and they all are active, repeating investors. A last notable detail is the fact that all of them reside in the US and they all invested in a company in the very same country.

B. Uber

Case 2 deals with the development of Uber. In order to achieve a comprehensive picture of investors and start-ups, different startups of considerable size were analyzed.

This company, founded in 2009 in San Francisco, offers rides to customers via an app without even having a fleet of vehicles of its own. This innovative idea for new channels for personal transportation has challenged the market dominion exercised by private cab drivers until this point.

The company went through 14 different funding rounds where it amassed an impressive sum of money totaling 11.46 billion USD. The last investment was accepted in September 2015. Figure 3 shows chronologically the various investments that were made in the company throughout its funding course.

Figure 3. Uber timeline

The first funding round took place in August 2009 with an initial funding of 200,000 USD. In October 2010, Uber received 1.25 million USD in investments through angels alone. This first round opened the possibilities for further funding rounds in which venture capital companies such as Benchmark, Menlo Ventures and Google Ventures participated. The fourth investment round saw the cooperation of capital belonging to Goldman Sachs. After several tryouts, the 14th investment round was highlighted by the presence from capital coming from the famous investment bank Morgan Stanley.

BAs were present as well. Altogether, 16 BAs invested in the company during the second funding round. 13 of them were lone investors while the remaining 3 were angel groups. These angel groups are a group of individual BAs that strongly vary in their number of members and their internal structure [19].

After examining all the different BAs that have taken part in Uber's funding, it can be seen that, despite their numbers and different personal stories, they share common ground in some aspects. All of them have founded a start-up or have at least been a cofounder of one of them. They all reside in the USA as well, the very same country where Uber's headquarters are located. According to [3], it is often the case that BAs invest locally in the places where they live. The industry sector where they invest is not a coincidence, after all, given the case that they strive to connect Uber's core business. Most of them have studied Management, Computer Science or Mechanical Engineering.

As a final note, it is notable that all of the investors in Uber once had high-ranking management roles in other companies with three of them having had a technical position before. All of them have invested in at least three companies and have as a result gained important experience in the investment branch.

C. Grockit

In order to achieve a more meaningful insight into the relationship between the angel investment and the related, possible success unleashed within a company, a third case is analyzed. Since the previous cases focused on the investment schemes of large, successful companies, this case instead concentrates on a medium sized internet-based company.

Grockit is one of the first online social learning websites, founded in December 2006 with an innovative concept. Students from all ages are able to learn together with a combination of multimedia and rich content in order to make rapid progress in their chosen subjects. The website's content was developed in collaboration with universities and students. Grockit offers, for instance, preparation courses for well-known academic admission tests such as GMAT, SAT, IIM and so on. The company, headquartered in New York, went through seven founding rounds that brought in 44.74 million USD in capital. The first round was dominated by BAs, just as shown in Figure 4 in a chronological order.

Figure 4. Grockit timeline

After the first round, the most important investments were made by BAs with other VC companies soon following and providing the company with more capital.

All of Grockit's investors reside in the US and they all invested in a company headquartered in this country. This follows the same pattern seen previously, where BAs invest in the countries they live in. Four out of five BAs were already active in the internet-based service industry at the time of their investment in the company and already had a strong understanding of the inner workings of this industry. All of them had already been high-ranking managers before and three of them had actually pursued this field of study. Surprisingly, two out of five investors worked in a more technical-oriented role before. Most of them already had experience with the management and investment of companies, with Marc Hustvedt being the only one whose first ever investment was in Grockit.

V. RESULTS AND DISCUSSION

A. Results

The objective of this analysis was to determine which human competences present in a BA decisively contribute to the eventual success of a company.

In this context, data referring to BAs has been analyzed and results have been shown. These results are now expanded with the findings from each of the case studies presented in the previous section. After having identified similarities among the BAs for each of three successful companies, Google, Uber and Grockit, the next step is to show the results taken from each case that point to the same direction.

To do so, Table 1 lists the three cases in the first column and shows the different categories in which the BAs present in each case both diverge or converge in order to round up the key findings.

TABLE I. CASE STUDY – BAS COMMONALITIES

	Investments	Socio-demographic characteristics		Main industry	Experience			Academic education
	Serial Investor	Nationality	Residence	Sector	Start-up (Founder)	Executive job	Dual job (managerial& technical)	Degree program
Google	***	-	***	***	***	***	***	**
Uber	***	**	***	**	***	***	*	**
Grockit	**	***	***	***	***	***	*	*

Notes: commonalities in respective category for BAs founded in case studies

*** = all BAs; ** = vast majority; * = several; - = no correspondence

First of all, it can be determined that almost all BAs have invested in more than one company. There was only one case, where a BA had only made a single investment. All of the angel investors present in the three cases had already been founders or cofounders of start-ups or other ventures at some point of their lives before investing in the companies presented. Regarding their job experience, it was found that all BAs from Uber, Google and Grockit had or currently have high-ranking jobs within a company. An important portion of all sampled BAs not only had experience in managerial roles, but also already had experience in more technical, technology-oriented positions. Just as it was the case with their professional experience, it was determined that the choice of academic studies predominantly coincides with the industry sector the company belongs to or that it at least presents a close relationship to the company's segment and main business core. Remarkably, all of the BAs have invested in companies headquartered in the country in which they themselves reside, which was the US for all of them. This was the case for all of the three case studies. It is the case with Uber and Grockit that the BAs from each of these companies have the nationality of the country where each company is headquartered.

Taking the direct human capital aside, it has been found out that the investment behaviors present a set of similarities.

B. Discussion

Using a sample of 2,114 angel investors, this analysis has strengthened a part of the definition of a BA. According to [28], a BA is defined as someone who often has entrepreneurial experience. 86% of the sampled BAs fit into this definition, as well as all of the investors discussed in the three case studies. Because of their own entrepreneurial experience, some BAs are in a good position to mentor young, small companies.

However, this definition can be extended to include some of the characteristics discussed before. For instance, over 90% of BAs are men and most of them reside in the US. This point directly correlates with [3] observation that BAs often invest in the places where they live and that a majority of innovative start-ups, which coincidentally attract most of the attention of investors, are usually headquartered in the US. The three cases presented before confirm this.

Moreover, Reference [2] has pointed out that angel investors invest in areas in which they have experience of their own and in which they have a genuine interest. The case studies sustain the idea that the academic background and the professional experience of these angel investors correlate with the company's own industry sector. A possible reason for this may be found in [29] work, where it is emphasized that BAs often carry a huge risk on their investments because of the nature of the company's development stage during which they mostly invest. However, it is possibly the case that they try to compliment this risk with their own experience in order avoid huge monetary failures and to enrich a company's structure with their own expertise.

The results from all three cases are presented in Table 1, where it is shown that it is often a combination of managerial experience and technical knowledge that truly defines an angel investor. This supports the idea that they represent an important asset for new companies.

Another interesting observation from this analysis that coincides with observations from prior research refers to investment behavior. The presented timelines show that all BAs, except for one exception, have been active in a founding round once per company. This is in line positively with [3] work, that concluded that often BAs do not distribute their investments in different stages but actually, almost 75% invest only once in a company [30].

VI. Conclusion, Limitations and Further Research

BAs are, in the area of venture financing, just as important as VC [18] [30] [31]. Even though they may not be under the spotlight [3], they help young companies to overcome their funding problems [17]. They usually invest in quantities below 1 million USD [32].

In addition, angel investors are present in the companies they invest in, either as mentors or as external executives [32]. That is why this study, which investigates how BAs potentially influence the course of a start-up though their own human competences, is meaningful in its approach to understand the funding nature of a company. For this purpose, three successful companies were chosen with the objective of identifying similarities among the BAs relevant to each of them. A general overview on the human capital from the 2,114 sampled BAs shows that some characteristics can influence the success of a company. This is achieved with their rich academic formation and wide entrepreneurial and professional experience in a variety of positions [33]. Since BAs in all cases had experience in the sector of the industry from the company they invested it [29], they proved to be a valuable asset for entrepreneurs to more effectively and wisely take decisions.

The present work had as an objective to illustrate through three different case studies, a relationship between the human characteristics of BAs investing a company and the company's performance. Nonetheless, the following limitations must be kept in mind during the interpretation of results. For instance, only ten randomly chosen successful companies were considered. The description that followed regarding the way the BA based funding rounds are carried out for these companies does not necessarily imply that all BA-based funding rounds for other companies work the same way. On the other hand, only three cases were used to find similarities among BAs. Even though the objective was to analyze different kinds of companies taking into consideration their various size and focus, this must be taken into account.

The limitations explained before open the door for new future research opportunities. In order to further deepen the understanding of a BA's human capital and its influence on the success of a start-up, it is advisable to conduct further case studies with BAs. A challenge is to directly, numerically trace a company's success back to the BAs that were present.

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