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Business Angels investing in Crowdfunding: their impact on campaign success and post-campaign performance.

Supervisor:
Prof. Francesca Enrica Tenca

Co-Supervisor:
Prof. Benedetta Montanaro

Candidate:
Federico Oldani
Mat. n° 20029498

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Introduction

In recent years, the landscape of entrepreneurial finance has witnessed a significant transformation with the emergence of crowdfunding as a viable alternative to traditional investment channels. Within this evolving ecosystem, business angels have increasingly turned their attention towards crowdfunding platforms as avenues for investment. This shift in investor behavior underscores the growing significance of crowdfunding as a funding mechanism for early-stage ventures. This thesis seeks to explore the intersection of business angels and crowdfunding, specifically I aim at shedding light on the role of business angels on crowdfunding platforms to understand the implications for crowdfunding campaign success and the performance of the crowd-backed ventures in the long run. Research in entrepreneurial finance in these years, covers various actors such as venture capitalists, business angels and crowdfunding, but focus mainly as individuals and a few on the relationships and co-investments between different financial techniques. The investments of business angels in equity crowdfunding campaigns have not yet been fully explored so my goal is to make an initial contribution to this topic starting from the Italian landscape using data available so far.

This study seeks to bridge the existing gap by addressing two research questions: the first one is *"Does the presence of a professional Business Angel among the backers has a significant impact on the performance of a Crowdfunding campaign?"* that regards the impact of business angels only on the campaign success, while the second one is *"Does the presence of a professional Business Angel among the backers in the first investment round has a significant impact on the performance of the company in the long run?"* referring to the performance of the company after the first equity crowdfunding campaign. It seeks to understand whether such cooperation leads to improved company performance throughout a venture's lifecycle. To answer to these questions I have elaborated some hypotheses, specifically, if the presence of business angels among crowd investors (individual BA or a BA belonging to a group) conducts companies on a

different path compared to crowdfunding campaigns driven solely by non-professional investors. Moreover, I am going to understand if the impact of a member of a business angel group is different than an individual business angel. Other hypotheses also delves into the educational backgrounds and working experience of professional investors and their implications for both investment choices and company development in the future.

To conduct the research, an empirical analysis focused on successful equity crowdfunding (ECF) campaigns on all active Italian platforms from 2014 to 2020 was employed, utilizing data primarily sourced from the *Osservatori Digital innovation della School of Management at Politecnico di Milano*. The dataset contains 340 observations with over 500 variables, including campaign details, company characteristics, founders' and investors' educational backgrounds and working experiences. The ECF campaigns were sourced from various crowdfunding platforms, and variables covered campaign specifics, company characteristics, and financial information. I complemented this database identifying among crowd-investors, professional Business Angels (BAs). I distinguish BAs from the general crowd by identifying individuals who, as former entrepreneurs, have achieved a successful exit (IPO or M&A) within the five-year period preceding the ECF campaign in which they invested. Thus, BAs in our definition possess a combination of entrepreneurial and/or managerial skills alongside the financial means to reinvest in entrepreneurial ventures, being professionals with a considerable wealth (Mason C., 2006). I also identify among these BAs, members of the most prominent Italian Business Angels groups (and networks), cross referencing their names (and other demographics, e.g., age, residence) with those of BAs affiliated to BA groups/networks and *LinkedIn* profiles. Furthermore, *LinkedIn* was used to extract BA's educational backgrounds and work experiences, categorizing job positions into managerial, entrepreneurial, technical, or professional investor roles. The resulting dataset, after these additions and checks, provides a comprehensive understanding of the dynamics surrounding companies during the ECF and subsequent development phases. This expanded dataset serves as a valuable source for gaining insights into the intricacies of equity crowdfunding in the Italian context.

In order to verify my hypotheses, I implemented both a descriptive analysis and a multivariate analysis. The first one gives an overview on the data: insights on the crowdfunding campaign, on the company, the educational background and working experience of founders and investors. I used measures of Central Tendency (mean), measures of Dispersion (standard deviation, minimum and maximum) and absolute and relative frequencies. Instead, the re-

gression models are used to identify and describe the relations between the variables, with the aim to obtain the factors that vehicle the success of the crowdfunding campaign and the post-campaign performance of the company. For the hypotheses testing the success of the campaign itself, I implemented a model with dependent variable the logarithm of the collected amount during the ECF campaign, while as independent variable I used dummy variables (i.e., Yes/Not, 1/0) that explain the presence in the crowd-investors base of BAs in general, individual BAs versus BAs belonging to a group and variables regarding BAs' educational backgrounds and work experience, with the aim to understand the impact of the independent variables on the dependent one. For the second macro group of hypotheses, those that regard the long run performance of the company, I implemented two models: one with a dummy dependent variable explaining if the second round of investment was a success and one with the logarithm of the pre-money valuation just before the second funding round. For the former I used logistic model that investigate the relationship between binary or ordinal response probability and explanatory variables. Also, in these two models I used the same independent variables above-mentioned. The procedure of multivariate analyses for the different regression models is the same for all: a model with only the dummy variable BA, one with individual BA and BA group member, one adding only the variables of the educational background, one adding only the working experience and the last with all the variables together.

From the analyzed regression models, I discovered that the involvement of BAs has a beneficial effect on the performance of ECF campaigns. Their participation offers both financial backing and non-financial support, bolstering the campaign's credibility and attracting a larger pool of investors, thus increasing overall funding. Additionally, certain variables, such as the chosen target capital and pre-money valuation, also exhibit positive impacts. The former incentivizes investors by setting high expectations, while the latter enhances the campaign's attractiveness to potential backers, resulting in augmented funding. Upon closer examination, I observed that the presence of BAs affiliated with an Angel Group yields a more substantial positive influence compared to individual BAs on ECF campaign success. BAs within a group bring valuable benefits such as experience, expansive networks, credibility and strategic support, all of which significantly contribute to the success of a ECF campaign. Regarding the educational background of investors, only those with a Business degree demonstrated a positive impact on ECF campaign success. This finding suggests that BAs with a formal business education may enhance the management and decision-making processes of the venture, making

it more appealing to potential investors. Furthermore, the presence of managers, technicians and professional investors among BAs positively influences campaign success. Their expertise and advanced research methods serve to guide potential backers toward promising ventures, effectively signaling the campaign's potential and attracting increased participation, thereby resulting in higher total funds raised. This for the first macro group of hypotheses.

Considering companies' post-campaign performances, I obtained similar results, indicating that the presence of BAs as investors in an ECF campaign positively influences the long-term performance of the company. BAs not only contribute to the success of the campaign but also significantly impact the company's growth and development post-campaign. Their financial support, strategic guidance, industry networks and expertise collectively contribute to enhanced growth, credibility and long-term success. Moreover, the positive impact is even higher if a BA belongs to an Angel group. Regarding the educational background and working experience, I obtained mixed results: a BA with a Technical degree may negatively influence the success of the second investment round but positively affect the pre-money valuation before this round. However, considering the second result, it logically suggests a positive impact. Technicians facilitate better technology integration, improve analysis quality and promote cross-functional collaboration, ultimately benefiting the company's long-term performance. Similarly, for working experience, I obtained two opposing results, i.e, a BA who has a position as manager may negatively influence the success of the second investment round but positively affect the pre-money valuation before this round. Thus, it can be inferred that a BA with managerial experience positively influences long-term company performance because managerial experience often translates into leadership skills, fostering positive change within an organization. BAs with managerial skills play a pivotal role in optimizing campaign structure and success. Leveraging project management expertise, they contribute to clear goal-setting, efficient team coordination and timely task completion. Their leadership, risk mitigation and strategic decision-making abilities enhance overall campaign management, making it more appealing to potential backers and increasing the likelihood of success.

This work contributes to the literature on crowdfunding and the involvement of professional investors among the crowd, highlighting their positive role in boosting campaign success and companies' post-campaign performance. The results of the thesis bear important policy and managerial implications. They suggest that the relation among different investors, in this case BAs and crowd-investors, can enhance the startup ecosystem both in the short and long term,

thus maintaining BA connections is important for the future development and growth of the company.

The work is organized as follows. In Chapter 1, I am going to review the existing literature about the players of my analysis. In particular, defining who BAs are and the dynamics of BA groups, networks and syndicates, shedding light on collaborative investment strategies. In the second section the focus shifts to ECF, with a specific focus on its definition, the platforms present in Italy and the rules governing this market. The last part of the chapter is referred to past research and studies about these themes, data availability, methodologies implemented and the main results. Chapter 2 analyzes the market trends of BAs and crowdfunding and their evolution on a global scale and its specific landscape within the European and Italian market. For this part I examined different reports provided by: *EBAN* for the European business angels market; *IBAN* for the Italian one; *Cambridge Centre for Alternative Finance* (CCAF) for the Global and European crowdfunding market and *Osservatori Entrepreneurship Finance and Innovation* for the Italian one. Moving forward, Chapter 3 outlines the research questions and hypotheses guiding my study, aiming to investigate how the interaction between business angels and equity crowdfunding financing impacts companies. Chapter 4 details the sample data and methodology, providing insights into the datasets utilized and the analytical approaches employed. Then, Chapter 5 presents empirical results derived from my analyses, offering valuable insights into the co-investment between business angels and crowd-investors, in order to test my hypotheses. Finally, Chapter 6 discusses the managerial and policy implications arising from my findings, concluding with suggestions for future research directions in the field of entrepreneurial finance.

Chapter 1

Literature Review

As stated in the introduction, this chapter aims to define and explain key elements in the entrepreneurial world, providing a solid understanding for the upcoming chapters. After reviewing existing literature about business angels and crowdfunding, the focus will shift to examining past studies related to the topics explored in this research. The intention is to gain insights from previous research results, helping to shape and inform the subsequent stages of this study. This approach is designed to ensure a well-informed and thorough investigation, adding depth and relevance to the succeeding chapters of the thesis.

1.1 Business Angels

Business angel definition is generally quite uniform across literature. Most definitions agree that: Business Angels (BAs) are high wealthy individuals, who invest their own money in promising startups in which they have no direct connection, in exchange for an ownership stake, acting alone or through semi-formal and formal networks (Mason C. and Harrison R., 2008). Typically, business angels are seasoned entrepreneurs or managers with entrepreneurial backgrounds (Harrison R. and Mason C., 1992).

BAs could be categorized in:

- Serial investors: thanks to their broad background in angel investing, they make investments more than twice a year and own stakes in several companies. They know the rules of the game and play a central role in the biggest deals.

- Active investors: they make one or two investments a year and tend to be entrepreneurs, ex-entrepreneurs or managers of companies other than those in which they invest.

- Occasional investors: individuals who make investments less than once a year. These are professionals, such as lawyers, consultants or entrepreneurs with a potential that is not fully expressed.

- Potential investors: they do not hold active investments, but express their interest in making them in the future. This category includes individuals who have been BAs in the past.

- Latent investors, also known as "virgin angel": no experience in angel investing, but ready to make their first investment.

They are among the most appealing actors in the entrepreneurial ecosystem. The key role of BAs in the economy is to fill the so called "primary funding gap" between, on the one hand, the internal financing coming from the entrepreneurs and their friends, family and fools (3F) and, on the other hand, the external financing raised from institutional venture capital firms, when the size of the required investment is too great for the former and too small for the latter. The gap to fill is between the demand and supply for early-stage equity capital (Mason C. and Harrison R., 2000; Johnson W. C. and Sohl J., 2012; Capizzi V., 2015). This because BAs satisfy a certain size investment need (usually in the range of 100k – 300k Euros) that is not typically considered interesting or profitable for venture capitalists (VC) because of the relatively high costs of due diligence, contracting and monitoring associated with very early-stage businesses (Jeng L. A. and Wells P. C., 2000; Carpenter R. and Peterson B., 2002; Mason C., 2009).

The role of BAs are not simple providers of equity capital. They play a major role also granting strategic support, networking, knowledge, monitoring and control, even though in a less structured way compared to institutional investors. This kind of non-monetary contribution is deemed as valuable as the invested sum (Harrison R. and Mason C., 1992). Typically, BAs exercise these contributions either by becoming consultants of the invested firm, or by directly entering the board of directors of the venture (Mason C. and Harrison R., 1996) (Mason C., Harrison R. and Chaloner J., 1991) (Landström H., 1993). Moreover, a close tie and interaction is formed between the angel investor and the venture, to safeguard but also endorse

the investment. Sometimes, business angel are themselves former entrepreneurs. (Politis D. and Landström H., 2002). Other times, they were in a managerial position inside another company (De Clercq D., Fried V. H., Lehtonen O. and Sapienza H. J., 2006). Their past career is relevant as their contribution and know-how are related to entrepreneurial and management (Mason C., 2006; Politis D., 2008).

Most researches agree that BAs are an overall heterogeneous group. These heterogeneity is reflected not only in their past experience but also in their investment practices and processes (Croce A., Tenca F. and Ughetto E., 2016). Overall, Politis (2008) classifies the possible non-monetary value brought by an angel in four main categories:

- Strategy: the BA provides strategic input also based on its previous managerial or entrepreneurial experience. Its contribution lies in high-level decision making.

- Supervision and monitoring: the BA shows commitment to avoid mistake in the invested venture management, in order to protect its investment.

- Networking: the BA can further help the invested venture thanks to its professional contacts developed in a working lifetime. The network results helpful in finding business partners, in term of suppliers or customers and in raising additional capital.

- Mentoring: the BA relies on its experience to relief the startup from the burdens that unavoidably arise from starting a new business.

In many cases, angel financing can be structured as a loan that accrues interests over time and at maturity, converts to equity at a discount to the value of the first follow-on funding round led by an institutional investor (Bonini S. and Capizzi V., 2019).

Regarding the company in which they invest, BAs do not focus only on seed and startup investments, but they make equity stakes in mature small companies that are managed by an executive who is in their networks and that operates in industries that the BAs know very well, either because they have already invested in the industry or have previously succeeded as an entrepreneur in that industry (Kerr W. R., Lerner J. and Schoar A., 2014; Capizzi V., 2015). BAs are particularly important from a regional economic development perspective because the majority of their investments are local (Avdeitchikova S., 2009; Harrison R., Mason C. and Robson P., 2010).

Angels invest in projects associated with high uncertainty. The investments of business angels have a negatively skewed return distribution (Mason C. and Harrison R., 2002). Findings from the United Kingdom indicate that approximately half of these investments are loss-making or break even, whereas only 10% of these investments generated internal rate of returns (IRRs) exceeding 100%. In comparison to the return profile of early-stage venture capital funds, business angels have a lower share of loss-making investments, a higher share of investments that perform poorly or moderately, and a similar share of well-performing investments.

Regarding the investment practices of BAs, recent contributions emphasize the high selectivity of their investment decisions as measured by their high rejection rates, which are mostly related to the perceived quality of both the entrepreneur and the management team. In the due diligence and valuation of investment opportunities, their evaluation process emphasizes personal and informal sources over formal sources of information, thus bringing subjectivity, personal relationships and qualitative non-financial information to their investment decisions (Ali-Yrkkö J., Pajarinen M., and Ylhäinen I., 2019).

The decision-making process of angels has been analyzed in the context of decision-making models. Maxwell, Jeffrey, and Lévesque (2011) suggest that business angels do not apply comprehensive decision models that weight and score numerous attributes. Instead, they apply shortcut decision-making heuristics in the initial selection stage to reduce the potential number of financed projects. After that, they may use a different set of selection criteria in the final decisions and not necessarily utilize the criteria that were initially considered critical. Early-stage investors have an important role in affecting the strategy and future outcomes of their target firms: Wiltbank et al. (2009) study angel investors' use of predictive and non-predictive control strategies and document that the use of these strategies matters for venture performance. Angels emphasizing prediction make larger investments, and those using non-predictive control strategies exhibit fewer failures but do not experience a smaller number of successes.

Another unique feature of the operation of BAs is the method that they use to monitor their investments, which Bonini et al. (2018) refer to as "soft monitoring" mechanisms. Different from contractual-based monitoring mechanisms typically used by venture capitalists to reduce potential conflicts and the incentives for opportunistic behavior by entrepreneurs, the monitoring mechanisms preferred by angel investors are non-aggressive and informal control mechanisms based upon a close post-investment involvement in the relevant company through company visits, interactions with entrepreneurs and other control techniques based on trust.

Business angels have traditionally used simple and informal contracts that lack the common protections of contracts used by VCs, despite the extreme risks associated with their investments. Furthermore, due to both the minority equity stake usually acquired by angel investors and the above-mentioned weak legal protection implied by their soft-monitoring mechanisms, the small amount of formal control is beneficial to the development and the duration over time of a trust-based relationship between the angel investor and the entrepreneur. This, in turn, could make it easier to involve venture capitalists and other institutional investors, who, in contrast, will face uncertainty, information asymmetries and agency costs through contractual-based control and governance mechanisms, in making follow-on rounds of investment. The limited appetite of formal equity investors for potential investee companies with complex underlying contractual relationships between the entrepreneur and a business angel clearly implies that "the startup's need for further funding from venture capitalists sets de facto limits on the terms of the angel investment contract". Other studies that have investigated the dynamic interaction between business angels and venture capitalists, have revealed the existence of a chronological pecking order in the entrepreneurs' funding preferences, in which companies first access the informal investors and then seek equity capital from formal investors, but with the angels remaining in the investee companies, although with a reduced equity holding. (Bonini S. and Capizzi V., 2019)

Mason and Harrison (2002) suggest that angels hold their investments for a relatively short time period, averaging four years for successful investments. In principle, angels could be more patient investors than VCs, given that they invest their own funds and are not constrained by the need to exit within a limited and predefined time horizon (Croce A., Guerini M. and Ughetto E., 2018). Indeed, Sohl (1999) suggests that angels provide patient capital and make relatively long-term investments, typically in the range of 5 to 7 years.

1.1.1 Business Angels Groups/Network and Syndicates

While angel investors have a long history, angel investment organizations (AIOs) or, herein after, angel groups, are a more recent phenomenon. Angel investors have increasingly organized into associations also referred to as groups, networks or clubs, depending on the level of their internal structure (Mason C., Botelho T. and Harrison R., 2013). These organizations are called business angel Networks (BANs) or angel Groups (AGs).

Angel groups are structured as semi-formal or formal networks of high-net-worth individuals which convene as a group on a regular basis to evaluate and invest in startups typically within a specific geographic region (Bonini S. and Capizzi V., 2019). They emerged in the mid-1990s and have exhibited a strong growth since then, in contrast to other segments of the capital market whose growth was affected by the Global Financial Crisis.

The main difference between BANs and AGs lies in the BANs' less stringent obligations and engagement rules for membership, such as limited or no fees, no minimum participation requirements, and no obligation to share due diligence costs (Mason C., Botelho T. and Harrison R., 2013). BAN members can join through a solicited or unsolicited basis and can collaborate in organizing pitching events, training, and mentoring activities, and coordinated lobbying efforts. Entrepreneurs are solicited to submit their proposals to the BAN through websites and other networking activities taking place inside the community. There is no (or limited) organized deal-group processing, and the angel organization does not make investments on its own or recommend investments to members; rather, each member decides whether to invest on a deal-by-deal basis, joining other investors and co-investors and sharing preliminary valuations, due diligence, negotiations, and term sheets. In contrast to BANs, angel groups usually offer their associates the right to enjoy common services, including formal valuation and due diligence activities performed in accordance with a predefined set of formal rules. Additionally, by signing investment term sheets negotiated and set within the group itself, associates are allowed by their angel group to invest alongside a single well-connected angel or to join an investment vehicle together with other members of the group. (Bonini S. and Capizzi V., 2019)

These associations go from being investment clubs (Club degli Investitori (Torino) or Italian Angels for Growth (IAG)) to growing regional (i.e. BAN Trentino, Business Angels Verona, Angels4Impact), national (for instance, Angel Capital Association (ACA) in the United States, Business Angels Association (BBAA) in the UK and Italian Business Angels Network (IBAN) in Italy), and even continental proportions (among them, European Business Angel Network (EBAN) and Business Angels Europe (BAE) in Europe), increasingly differentiating among each other in terms of rules of engagement, internal structure, quality, variety, and cost of the services provided.

Another type of organization are Angel Syndicates (i.e., AngelList) that represent angels combining financial resources in a single investment vehicle (i.e. a fund created for one deal). These syndicates are typically organized around a lead investor, often a seasoned angel in-

vestor with experience in evaluating and supporting startup ventures. The difference between syndicates and groups is that the latter represent a longer-term collaboration than former.

Participation in such groups is beneficial for five main reasons (Kerr W. R., Lerner J. and Schoar A. , 2014):

1. It is easier for entrepreneurs and start-ups' founders to get in touch with business angel Networks rather than with individual investors. Investors are enabled to increase their investment portfolio.

2. BANs usually combine investment from individual investors. While the single angel can invest less and reduce their exposure, the overall investment amount in each venture is larger.

3. Angels are able to increase the diversification of their portfolio and therefore reduce the risk deriving from their early stage investments.

4. The economies of scale in investments results in lower legal costs and due diligence costs.

5. There is a higher likelihood of finding more experience angels inside a network, angels that can leave a higher impact on the invested startup.

The managers of the angel investment organizations (also known as "gatekeepers") organize periodic training meetings and pitching events aimed at stimulating the interactions between angel investors and entrepreneurs searching for funding. Regularly organizing these events helps to build a strong and collaborative ecosystem for startup investments. Investors can share their experiences and best practices, while entrepreneurs can find support, mentorship and resources to grow their businesses.

In addition to these insights, further research highlights other characteristics of business angel Networks (Mason C. and Harrison R., 1997):

- Often business angels Networks are locally developed.

- BANs tend to be not for profit organizations.

- BANs can have specific targets, showing for instance the propensity to invest in a specific industry, or focus on specific traits (as a BAN specialized in investing on women entrepreneurs, see Mason, Botelho and Harrison (2016).

Analyses deriving from BANs associations are the very promising, leading often to interesting results. For instance, BANs are found to provide valuable information, networking and monitoring to a level unachievable by an independent angel investor (Bonini S., Capizzi V., Valletta M. and Zocchi P., 2016). The same authors conclude that angels in groups benefit from risk reduction and decreased monitoring costs. Moreover, first findings on business angels' behaviors determine that their unwillingness to monitor negatively affect the investment amount, but only if the angel is independent. In case of investors inside a BAN, they can take advantage of the shared control exercised on the invested startup. Therefore, not only are BANs beneficial to angels, but angels also acknowledge these benefits and are willing to take advantage of them. Thanks to BANs and AGs, the informal venture capital market is currently much more visible and, hence, easier to access on both the demand and supply sides (Mason C., Botelho T. and Harrison R., 2013; Cumming D. and Zhang Y., 2016).

There are some operating features that angel groups typically adopt. First, entrepreneurs seeking finance from the group are required to submit an application, which will likely include a copy of their business plan/executive summary. This is followed by an initial screening phase, performed by the organization's staff, to reject submissions that do not fulfil the group's minimum investment criteria (i.e. size of investment). Firms that make it through this stage are invited to give a short presentation to a small group of members, followed by a question and answer session. Promising companies are then invited to present to all members at a monthly meeting. The presenting companies that generate the greatest interest enter a due diligence reviewing process. Finally, if the outcome of the in-depth analysis of all the information on the company is positive, the company will receive an offer of funding. The closing of the investment follows the negotiation of the group's standard investment agreements by the lead investor and some members of the management team of the angel group.

The more complex contracts utilized by angel groups can also be rational: indeed, angel groups have more similarities to venture capitalists than with traditional angels. First, angel groups are more professional and invest larger sums at a somewhat later stage. Second, angel groups have fewer chances for informal screening and monitoring compared to traditional angels

due to their more distant nature in relationship terms. Hence, angel groups need to mitigate this issue with contract terms. Third, given the higher investment amounts and longer duration, higher transaction costs are justified. Fourth, angel groups' private benefits are not negatively affected by using more detailed contracts. Overall, the rise of more formalized angel group investing has resulted in significant changes to the angel investing paradigm. (Ali-Yrkkö J., Pajarinen M., and Ylhäinen I., 2019).

Bonini, Capizzi, Valletta and Zocchi (2018) study the effects of business angel network membership on the investment decisions of the network members. First, these authors find that business angel network membership is positively associated with the share of angels' personal wealth allocated to angel investments. Second, they find that business angel network membership is negatively associated with the equity stake of angels in the target firms as measured by the net asset value. These authors suggest that angel affiliation provides benefits related to information, diversification, larger deal flow, networking, and monitoring. However, the decision to syndicate investments differs from person to person, and some angels may prefer to invest alone rather than syndicate investments; Block, Fisch, Obschonka and Sandner (2019) analyze the relation between angel investors' personality traits and syndication, suggesting that extroversion increases and conscientiousness decreases the likelihood of syndication. Angel personality traits do not appear to affect venture performance.

1.2 Crowdfunding

Crowdfunding is a collection of financial resources and feedback from a crowd of participants who voluntarily decide to join an open call published on a web platform, typically through small payments, in exchange for some sort of remuneration or as a donation (Butticè V. et al., 2018). It is defined as the means of an entrepreneur to connect with potential investors over the internet through platforms which present the business plan of the venture to potential investors. Belleflamme et al. (2014) describe crowdfunding as an entrepreneur's means to collect equity from an external source represented by a large community. Bruton et al. (2015) argue that crowdfunding is one of a few new alternative means of finance, initially devised by their institutional origins, yet evolving into new forms. In other words, even though crowdfunding is filling a growing equity gap in the technology sector, it is also steadily diversifying into niches such as real estate, music, art, and many more (Felipe et al., 2017).

Belleflamme, Lambert and Schwienbacher (2013) define the major constituting elements and players as follows: "crowdfunding involves an open call, mostly through the Internet, for the provision of financial resources either in the form of donation or in exchange for the future product or some form of reward and/or voting rights". This definition indicates that crowdfunding typically involves at least the following three key players:

1. the entrepreneur (the "fundraiser"), who is looking to raise money for a project or venture;

2. the crowd of people who pool relatively small individual contributions to support innovative projects (the so-called "backers"). They play an important role by providing the necessary funds and actively engaging with the project creators providing also non-financial support. They offer valuable feedback, new ideas, and insights that can help improve and develop the proposed projects and ideas in various and unpredictable ways;

3. the platform, intermediary which hosts the campaign and allows the fundraiser and the crowd to meet. It maintains transparency and trust which is essential for a thriving community.

Bradford (2012) identifies five subcategories of crowdfunding based on the return provided

for the capital provider:

- Donation-based crowdfunding: is designed for investors who do not require a direct return in exchange for their monetary contribution. This crowdfunding model does not provide any type of financial outcome for the investor but may offer an intangible non-monetary reward, such as a thank-you email or an acknowledgement in a movie or DVD. When the project has a humanitarian or philanthropic purpose and the fundraiser are mostly not-for-profit organizations and charitable organizations, this might be referred to as a "social lending" model.

- Reward-based crowdfunding: consists of individuals giving their money to a project or business with the expectation of receiving a non-financial reward in return, such as goods or services at a later stage.

- Pre-purchase: is a particular form of the reward-based crowdfunding model that gives investors the possibility to pay in advance for a product or service they would be willing to buy immediately had it been available for sale. Once the production is completed, the backers, who are also the final customers, will receive the product at a special discount in a type of pre-marketing stage as a compensation for helping the entrepreneur to develop a new product or service.

- Lending-based crowdfunding or peer-to-peer lending: is a direct alternative to a bank loan with the difference being that, instead of borrowing from a single source, companies borrow directly from a large number of individuals who are ready to lend in exchange for a financial return comprising, as in the case of a standard arm's length bank debt, periodic payments of the interest plus the principal at the maturity of the loan itself. In some cases, crowd-lenders often bid for loans by offering the interest rate at which they would be willing to lend. Borrowers accept the loan that is offered at the lowest interest rate.

- Equity crowdfunding: consists of selling an ownership stake in the business to a number of investors in exchange for a conventional financial return in the form of dividends and/or capital gains. The companies analyzed in my thesis are characterized by this type of crowdfunding.

Giving that my focus is on the last crowdfunding-Based category I am going to do an insight into this. ECF market offers two alternative shareholder structures to firms: the direct and the nominee shareholder structure. The direct shareholder structure allows crowd-investors to become direct shareholders of the firm. With the direct shareholder structure, crowd-investors receive shares with voting and preemptive rights when they invest equal to or beyond a pre-determined threshold set by the entrepreneur, while they receive shares without voting and preemptive rights when they invest below such threshold (Hornuf L. and Schwienbacher A., 2018). The alternative to the direct shareholder structure is the nominee shareholder structure, wherein the crowd is represented by one legal shareholder (i.e., the nominee) that holds the shares on behalf of the crowd-investors. With the nominee shareholder structure, crowd-funded firms sign a contract with the platform, which takes votes and issues consent on behalf of each individual investor. This means that the platform is the only legal shareholder declared in the shareholders' register of the firm. The nominee is authorized to take decisions on a variety of matters at general meetings, such as company liquidation, issue of ordinary and preference shares, transfer of company assets, loans application, managerial salary increase above an agreed level, etc. (Cumming D. et al., 2019). On the one hand, with the nominee structure, shareholders benefit from a coordinated effort to monitor and enforce their rights. In terms of economic benefits, investors maintain the right to participate to dividend distribution and keep fiscal advantages (e.g., tax reliefs) related to the investment. On the other hand, under this structure, firms do not need to coordinate the management of their crowd-investors on their own, such as organizing large corporate events, or worry about the attendance quorum at general meetings. The nominee is also granted special rights, i.e. preemptive rights, drag along and tag along rights. For instance, the nominee has the power to waive crowd-investors' preemptive rights if it is in the best interest of the company, such as a decision concerning a new investment round at a significantly higher valuation under time pressure. (Buttic'e V., Di Pietro F. and Tenca F. , 2020). Instead, one major pitfall of the nominee shareholder structure is the reduced possibility for entrepreneurs to reach out to their investors for advice, networking and mentoring (Dharwadkar R. et al., 2000).

The third fundamental player in crowdfunding is the platform that connects the supply and demand for seed capital. Belleflamme et al. (2015) provide an overview. The authors name four sources of revenue: 1) interest earned on committed capital by the crowd investor, 2) charges applicable for additional services rendered (such as payment charges), 3) a transaction

fee charged on the whole amount raised and 4) subscription fee paid by investor when completing the registration on the platform. Their paper also notes and provides examples of different platforms' strategies from different countries, leading to the conclusion that crowdfunding platforms are a heterogeneous field of entrepreneurial finance. Even though the authors note that crowdfunding platforms perform screening of potential ventures, the heterogeneity of these processes is also high. (Wallmeroth J., Wirtz P. and Groh P.A., 2017). Furthermore, there are other players involved in crowdfunding such as: outsourcers, such as gateway payment systems (Paypal) and companies that provide services, including platform design and management tools (Folkfunding and Katipult); legal advisors (Chiomenti, Hogan Lovells, Jenny Avvocati); marketing and consultancy services, especially on social networks, provided by platforms or external communication agencies; insurance companies, following the obligation imposed by the Consob Regulation for equity crowdfunding platforms to adhere to an indemnity system to protect investors and to take on insurance to cover their liability for damages caused to their customers (Axa, Generali, Lloyds); rating agencies, for lending platforms or providers of credit scoring, with the aim of determining the risk of insolvency of the people or companies financed and, at the end, information portals, which are active in the dissemination of information regarding crowdfunding and crowdinvesting (Crowdfundingbuzz.it, StartupItalia.eu...).

1.2.1 Crowdfunding Platforms in Italy

Equity crowdfunding is dominating the market in Italy. Based on the number of projects, the major equity crowdinvesting platforms in Italy are MamaCrowd, CrowdFundMe, Backtowork24, OPStart, 200 Crowd and Walliance, but I will focus on the first two.

MamaCrowd is an Italian equity crowdfunding platform that allows investors to financially participate in promising entrepreneurial projects in exchange for ownership stakes in startups. Founded in 2015, it was one of the first equity crowdfunding platforms to be authorized by Consob, the Italian financial markets regulator. MamaCrowd allows individuals to construct diversified portfolios, reducing investment risks while actively contributing to the growth of the real economy. MamaCrowd originated from the vision of SiamoSoci, a key player in Italy's startup ecosystem since 2011, facilitating private-public partnerships. In 2022, it became part of the Azimut Group, Italy's primary independent asset management conglomerate.

CrowdFundMe is one of Italy's leading equity crowdfunding platforms, providing a digital

marketplace for connecting investors with innovative startups and growing businesses seeking funding. Established in 2013, CrowdFundMe has played a significant role in democratizing access to capital by allowing individuals to invest in promising ventures across various sectors. The platform offers a comprehensive toolkit and safeguards to foster project success for both investors and entrepreneurs. It's registered with CONSOB's Portal Managers Register. In 2022, CrowdFundMe acquired a majority stake in Trusters S.r.l., a lending crowdfunding platform specializing in real estate investment.

1.2.2 Law and Regulations

The rules governing the European crowdfunding market are the new Regulation (EU) 2020/1503 on European Crowdfunding Service Providers (ECSP), complemented by recent national legislative measures (D.L. 30/2023) and the new Consob Regulation. Existing market players will need to obtain a new authorization (till 10 November 2023) and adapt to a series of innovations.

The crowdfunding landscape has undergone several significant changes and enhancements following the implementation of the new European Union regulation on equity crowdfunding and business lending crowdfunding, which is outlined in the European Crowdfunding Service Providers (ECSP) regulation (2020/1503).

One is the centralization of the register of portal managers at the European Securities and Markets Authority (ESMA), restructuring regulatory oversight. This move aims to promote consistency and transparency in the operation of crowdfunding platforms.

Moreover, the regulation extends the scope of crowdfunding beyond small and medium-sized enterprises (SMEs) to include larger companies. This expansion allows a wider range of businesses to access the risk capital through crowdfunding, potentially stoking economic growth and innovation.

To enhance investor protection and information transparency, the regulation mandates the provision of a standardized information document known as the Key Investment Information Sheet (KIIS).

The regulation imposes a maximum collection limit of €5 million per company over a year. This limit, while lower than the previous €8 million threshold in Italy, seeks to strike a balance between encouraging investment and safeguarding investors.

Retail investors are also provided with new opportunities, including the ability to under-write mini-bonds, expanding their investment options within the crowdfunding ecosystem. To better protect unsophisticated investors, the regulation introduces a more thorough "reinforced assessment" process, exceeding current practices. This assessment includes setting maximum investment limits to mitigate potential risks associated with inexperienced investors.

There is an introduction of stricter rules on conflict of interest, which include the prohibition for operators to adhere to offers published on their own platform, and prudential requirements envisaged in terms of minimum capital for platforms.

Furthermore, the regulation envisions the establishment of a secondary market for crowd-funding investments, similar to the existing practice in Italy. This secondary market provides investors with increased liquidity and flexibility in managing their crowdfunding investments. All crowdfunding platforms in Italy are regulated by Consob. In fact, it is possible to find the full listing of the registered crowdfunding platforms in Italy on its the official website. From November 10, 2023, all platforms will be required to operate based on the new plan-European legislation. Consob introduced an implementation plan for 2022 to enable a smooth transition for crowdinvesting portals to the new rules. Considering that the crowdinvesting market in Italy is well-segmented and highly specialized, the transition shall not be a challenge.

1.3   Past research and studies

After understanding who and how these players in the entrepreneurial finance act, in particular the one focused on venture capital, I am going to analyze the Literature about past research and studies.

Significant changes have occurred in the market for entrepreneurial finance over the last decades as a result of technological advancements and evolving investment practices. Digital platforms and alternative funding mechanisms, such as crowdfunding and peer-to-peer lending, have caused a disruption in traditional financing models, creating new opportunities for entrepreneurs to access capital. Governments and institutions have shown greater support for startups and innovation, fostering an environment conducive to entrepreneurial finance and fueling its continued growth.

Research in entrepreneurial finance in these years, covers various players such as venture capitalists, business angels and crowdfunding, but are focused primarily as individuals and not the relations and co-investments between different financial techniques. Numerous research areas and questions have been thoroughly examined, yielding significant insights. Nevertheless, these findings represent merely a fraction of the vast reservoir of untapped knowledge within the market. Additional insights and knowledge, yet to be unveiled, hold immense potential to enhance our understanding of this field. These studies and research have concentrated on a variety of themes and topics such as: venture capital role, BA investment practices, BA centrality, BAN, ECF campaigns, post-campaign performance, experience, co-investors, survival of the startups, the relationship between gender and many other topics. Going into detail, now I list some of studies to me relevant, to have an overview of the research in the Literature.

The first studies regards only venture capitalists (VC): the term originated in the United States in the early 20th century when entrepreneurs and investors began providing funds to high-risk but potentially high-growth new ventures, then gradually have expanded globally. At the beginning of the new millennium, academic interest in business angels, also known as informal venture capitalists, has increased, but research in this area was initially impeded by the invisibility of the angel market. Instead, research about crowdfunding began around the early 2010s, exploring its mechanisms and impact (Wallmeroth J., Wirtz P. and Groh P.A.. 2017).

The role of venture capital in the emerging entrepreneurial finance ecosystem was studied by Capizzi and Bonini (2019) in their paper after the emergence of alternative sources of early-stage finance, such as incubators, accelerators, science and technology parks, university-affiliated seed funds, corporate seed funds, business angels – including "super-angels", angel groups, business angel networks and angel investment funds – and both equity- and debt-based crowdfunding platforms. The paper reviews the main features, investment policies and risk-return profiles of the institutional and informal investors operating in the very early stage of the life cycle of entrepreneurial firms.

A study was conducted to examine why certain firms attract funding from a single investor in their first round, while others secure funding from multiple investor types . The hypothesis is that opportunistic investors, firms that value complementary resources and those who have prior multi-type co-investment experience are more likely to attract diverse funding sources (Verbouw J., Vanacker T. and Manigart S., 2021).

Instead, regarding the growth of funded companies, the research is centered on the individual attributes and investment approaches of business angels (BAs) that affect the growth of funded companies (performance) by distinguishing between two firm types: gazelles[1] and ponies[2]. The hypotheses indicate that involvement of multiple co-investors and membership in a Business Angel Network contribute to better performance. The performance is negatively impacted by a temporally delayed equity infusion pattern and less intensive monitoring by business angels (Croce A., Ughetto E., Bonini S. and Capizzi V. 2020).

Furthermore, research investigated what business angel investment practices are correlated with follow-on venture capital financing, and uncover the strategies that determine a complementary-based or a substitution- based relationship with VCs. The hypotheses concern a company's likelihood of receiving follow-on VC funding based active monitoring by business angels, on rejection rates from business angels and if members in BANs (Capizzi V., Croce A. and Tenca F., 2021).

Regarding the BANs there was also a study about the effects of membership in a BAN on the investment decisions of the members, in particular on the share of angel personal wealth

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[1]A gazelle company is a high-growth company that has been increasing its revenues by at least 20% annually for four years or more, starting from a revenue base of at least $100,000. (Research Institute of Industrial Economics, 2021).

[2]A company relatively slow growth rates but high resilience, as they appear to survive for longer periods. (The Economist, 2019)

invested in each deal or the amount of equity stake in portfolio companies (Bonini S., Capizzi V., Valletta M. and Zocchi P., 2018).

Talking about characteristics of business angels a paper investigates BA investment sensitivity to international differences in legal, economic, and cultural conditions, the probability of successful exits through IPO or acquisition and the effects of funding by angel investors in the initial stages (Cumming D. and Zhang M., 2018).

Butticè , Croce and Ughetto (2018) studied how the network position of a BA within this network affects the likelihood that a company will receive investments from the BA group. They analyzed relationship between the centrality of the BA and the probability of a company being funded by the BA group. Moreover, they explored how the experience of a BA and the geographical proximity between the BA and the company influence such a relationship.

As it was blinded before, the role of gender in entrepreneurial finance was studied. Research aim to understand the differences of backgrounds, investment approaches and preferences between men and women in the business angel market and for both the number of ventures supported and total capital flows (Harrison R. and Mason C., 2007).

Shifting the focus to equity crowdfunding, it was studied if a successful crowdfunding campaign could be considered a positive signal to venture capitalists and also how the shareholder structure of the crowdfunding campaign affect the attraction of VC financing (Butticè V., Di Pietro F. and Tenca F., 2020).

Valuable insights were gained from the correlation between the alignment of interests between entrepreneurs and investors, the separation of ownership and control, and the success of crowdfunding offerings, particularly on the possibility of attracting professional investors in subsequent investment rounds (Cumming D., Meoli M. and Vismara S., 2019).

An interesting past research investigates certification effects and rational herding in reward-based crowdfunding (RBCF) campaigns of cultural projects. They tested the impact of different backer categories on campaign success, composition of the crowd and overall day-by-day funding dynamics to examine if contributions from expert backers trigger additional contributions and improve the success probability of a funding campaign. (Petit A. and Wirtz P., 2022)

For my purpose it is important to mention a paper that gives insights from co-investments of angels and the crowd. The presence of angels alongside the crowd on equity crowdfunding platforms has raised questions whether these digital platforms can continue to play their role in

democratizing access to capital. In order to answer to these questions they examined examine the interplay between the investment decisions of angels and the crowd according to the signaling theory, in particular if high-contribution pledges by angels in a campaign have a greater positive effect on the subsequent amount pledged by other angel investors in the same campaign, compared to high-contribution pledges by crowd investors. Signaling theory was studied also for Business Angels on Venture performance, in details the well-known ones, with the scope to understand whether founders should consider not only the professional reputation of BAs but also the degree to which they are known to a general audience. (Wang W., Mahmood A., Sismeiro C. and Vulkan N. , 2019; Blaseg, D. and Hornuf L., 2024)

1.3.1 Sample Data and available Databases

Datasets are crucial in statistical research because contain real and observable data, which are essential for conducting valid and reliable analyses. They allow researchers to delve deeply into the data, identifying patterns, trends and relationships that may not be apparent at first glance. This analysis is crucial for understanding the context of the phenomena being studied and for formulating hypotheses about possible explanations or causal relationships. By sharing datasets with other researchers, transparency and reproducibility of research are promoted. Other scholars can examine the same data to confirm published results or explore new research questions, thereby contributing to the growth and validity of the results. In the research field of entrepreneurial finance, the availability of data is a critical aspect that researchers must contend with. The accessibility of data in this domain is notably limited and the available datasets often lack substantial volume. Consequently, addressing specific aspects or features necessitates meticulous data collection and rigorous data cleaning processes, which may last several years. In this field, to obtain data is difficult because startups often have limited historical financial data, making it difficult to analyze long-term trends or predict future outcomes accurately; publicly available data on early-stage investments, private funding rounds and the performance of entrepreneurial firms are few. In general, there are some databases used, i.e. PitchBook[3],

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[3]PitchBook is a financial data and software company with offices in London, New York, San Francisco and Seattle. Serving clients in 19 languages, they provide thousands of global business professionals with comprehensive data on the private and public markets to help them discover and execute opportunities with confidence.

Crunchbase[4], Orbis Bureau Van Dijk[5] and AIDA[6] among others. These datasets was created with information from some crowdfunding platforms or *LinkedIn* that provides valuable human capital information and data about investors and founders. In this section I am going to illustrate some datasets used in past research to comprehend the situation an overview of the situation about entrepreneurial finance world.

One dataset used is composed by 2,161 ventures that sought angel investment from the members of Italian Angel Group (IAG) from February 2008 to April 2014. IAG provided access to their database under the explicit request that the information on all ventures and angels remain confidential. The dataset includes information on the localization and industry of the ventures applying for BA funding and on the motivations underlying the rejection of business proposals at the different phases of the investment process, as well as on the channels through which the projects have been forwarded to the BA group. Moreover, the sample also includes the successful deals and the corresponding list of BAs that made the investments. They matched the data with venture financial accounting records, retrieved from the AIDA (for Italian-based companies) and Orbis Bureau Van Dijk (for foreign-based companies).They also collected information regarding the educational and professional background of the members of IAG from LinkedIn and/or other available web sources (e.g. AngelList[7], Crunchbase). The completed dataset contains 1,942 companies. (Croce A., Tenca F. and Ughetto E., 2017)

Another dataset is composed by a multiple sources. First, they used Crowdcube and Seedrs[8] websites to identify and collect data on companies that successfully raised funds via these two equity crowdfunding platforms, between 2011 and March 2018. This activity resulted in a total sample of 603 campaigns launched by 451 different firms. These companies were situated in

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[4]Crunchbase is a company that provides information about businesses. Their content includes investment and funding information, individuals in leadership positions, and corporate news. Their software includes tools for investment analytics, trend analysis, web traffic review, and marketing. They also carry news regarding startups.

[5]Orbis is the largest database available with data on global companies. It has information on over 450 million companies and entities worldwide - including 45 million with detailed financial information. It is the most comprehensive resource of comparable data on listed and unlisted companies worldwide.

[6]The AIDA database contains financial statements, financial information, personal and commercial data, the historical series of data up to 10 years, indices and product sector for Italian companies and shareholders; holdings, consolidated financial statements and financial statements in IFRS.

[7]AngelList is a U.S. website for fundraising and connecting startups, angel investors, and limited partners. Founded in 2010, it started as an online introduction board for tech startups that needed seed funding. Since 2015, the site allows startups to raise money from angel investors free of charge.

[8]Crowdcube and Seedrs are the two largest equity crowdfunding platforms in the UK for volume raised and for number of transactions (Cambridge Centre for Alternative Finance, 2018). Both platforms are located in London and have been among the first to operate in the UK equity crowdfunding market. Together, they are seen as the most active equity crowdfunding platforms in Europe.

the UK and were less than 10 years old when they received their initial equity crowdfunding investment. The availability of financial statements allowed for a detailed analysis, and the investment patterns of these companies were tracked using Crunchbase. The dataset comprises also a control sample of 50,000 firms that were randomly selected from a larger pool of 1,020,888 firms. These firms, active in the UK and incorporated between 2008 and 2018, did not receive any external seed financing. A range of matching criteria, including prosperity score, industry, age, size, debt ratio, and geographical location, were considered to enable a meaningful comparison. A second control sample was built involving 448 firms that received angel financing between 2011 and 2018 and were in the UK. Financial data from Orbis Bureau Van Dijk was gathered to facilitate analysis and insights into these firms' performance. The final sample consists of 290 unique firms that raised equity crowdfunding. (Butticè V., Di Pietro F. and Tenca F., 2020)

Cumming and Zhang (2018) used PitchBook database which provides information at the deal level on 85,940 deals completed between 1977 and 2012 in 42,617 investee firms from 96 countries. Angels funded 5,397 of those deals in 4,266 investee firms from 42 countries.

Then, a dataset utilized is made of 597 equity crowdfunding offerings posted on Crowdcube since its inception in 2011 to the end of 2015. The authors exclude 12 mini-bond offerings and 94 equity offerings conducted by companies that had already raised funds in the same platform. The final sample is made of 491 offerings. (Cumming D., Meoli M. and Vismara S., 2019)

A past study used investment data for 50,999 unique investors and 1151 unique campaigns from July 2012 to August 2017 on one of UK's leading ECF platforms[9]. The platform authors studied acts as the nominee of the participating investors, facilitating future funding rounds and preventing share dilution. It is also similar to other major ECF platforms (e.g., Crowdcube) in terms of size, type, number of deals completed on the platform, and fee structure. It has successfully attracted ventures across 13 sectors, with the most popular being financial services, food & drink, digital media, entertainment, and technology. (Wang W., Mahmood A., Sismeiro C. and Vulkan N., 2019)

A unique dataset was used compiling from four entrepreneurial television programs spanning 15 years, including Shark Tank (US), Dragons' Den (Canada and UK), and Höhle der Löwen (Germany), comprising 43 seasons and 657 episodes. Through manual extraction and

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[9]A Non-Disclosure Agreement prevents them from disclosing the identity of the platform.

machine learning algorithms on 3,260 pitch videos totaling over 500 hours, textual information such as venture details and outcomes was extracted. Verification of data accuracy involved random selection of 800 pitches, with a 91% match between manual and automated extraction, discrepancies primarily attributed to transcription errors. The obtained information was used to create variables and supplement data from external sources for 358 ventures where basic information was unavailable. (Blaseg, D. and Hornuf L., 2024)

1.3.2 Empirical models and Methodologies implemented

The use of multiple models is crucial in understanding the complexities and dynamics of financing startup ventures in entrepreneurial finance research. To investigate investment decisions, funding patterns, and performance outcomes in entrepreneurial settings, researchers use a variety of models, including econometric models, network models and many others. Despite this, there are challenges in applying these models. When modeling and analyzing entrepreneurial financial phenomena, it is important to take into account the unique characteristics of entrepreneurial finance, such as information asymmetry, limited data availability and high uncertainty. Selecting variables in statistical models is a critical aspect that significantly impacts the quality and reliability of analyses and predictions. The variables chosen must directly relate to the phenomenon or process under investigation; otherwise, there's a risk of obtaining misleading or inconclusive results. By carefully choosing variables, researchers can effectively capture the underlying relationships between various influencing factors, thereby gaining deeper insights into the mechanisms at play. Furthermore, a well-considered variable selection process can streamline and enhance the model's performance, making it more accurate and predictive. However, it is important to exercise caution in variable selection to avoid over-fitting or omitting significant factors. Another important role is played by dummy variables that represent a very important component of these models and are commonly used to capture categorical or qualitative variables that cannot be directly measured on a continuous scale. These variables are often binary, representing the presence or absence of a specific characteristic or condition. By including dummy variables in models, researchers can effectively account for the influence of categorical factors on various financial outcomes. Dummy variables serve as valuable tools in understanding how specific characteristics or conditions impact entrepreneurial finance, helping researchers uncover patterns, make comparisons and draw meaningful conclusions. In the

following paragraphs, I am going to introduce some of models implemented by authors for past studies.

A regression model was utilized to examine the probability of startups being funded based on several variables. The model included a centrality variable indicating the position of a BA inside a BAN, mostly connected to the number of human connections, centrality squared and interaction terms with control variables (prior experience and proximity). The hypotheses investigated the relationships between attracting central business angels, funding probability and moderating factors. The model aimed to understand the influence of centrality, prior experience, and proximity on startups' likelihood of receiving funding from the group of business angels. The model was utilized to investigate investors' choices in dual-class equity crowdfunding campaigns, specifically between cash and voting rights, allowing to explore various factors that influence a certain behavior, or a decision made. The main variables of interest are the Voting rights and Cash Flow rights, which measure ownership of profits, dividends, and decision-making authority. The factors under examination are: investor characteristics (age, gender, investment experience), crowdfunding campaign characteristics (funding goal, campaign duration), and company characteristics (industry sector, size). (Cumming D., Meoli M. and Vismara S., 2019)

Ordinary least squares (OLS) regressions was utilized by Bonini, Capizzi, Valletta and Zocchi P. (2018) in their research in order to analyze the commitment of BAs in financing new ventures. Two metrics are used to measure this commitment: the percentage of wealth invested and the amount of capital invested as a share of post-financing equity capital. The study employs two-stage instrumental variable regressions and propensity score matching regressions. The first analysis focuses on the determinants of personal wealth invested by BAs; the second one examines factors influencing the amount invested by BAs, employing the same set of explanatory variables. Observations of BAN members and non-BAN members are matched through propensity-score matching based on variables such as age, education, wealth, prior investment experience, background, and year of investment.

Another model is the Semi-parametric Cox model (1972) that has the function to calculating the probability of a specific behavior based on input variables, in this case the ECF success, VC previous investment, age, total Assets, equity ratio, debt ratio, current ratio and dummy variables. By incorporating these variables, the model enabled a comprehensive analysis of the factors influencing the impact of equity crowdfunding on the attraction of venture capital

(VC) financing and the role of shareholder structure in this relationship. It allowed researchers to assess the impact of various factors on the outcome, providing valuable insights into the relationships between these variables and the behavior under consideration (Bonini S. and Capizzi V., 2019).

An empirical analysis was conducted to explore the relationship between business angels' investment motivations and their risk propensity. Using an ordered probit model, the authors examined the influence of control variables (financial and entrepreneurial experience, proportion of wealth invested) and motivations (fiscal, return, diversification, passion) on risk propensity (Cumming D. and Zhang M., 2018).

The following explained study employs a two-stage model with sample selection for various dependent variables. In the first stage, the likelihood of a venture receiving an offer is predicted, considering venture-, entrepreneur-, and investor-specific control variables. An exclusion restriction is also included to ensure model identification. In the second stage, conditional on selection, the latent outcome is estimated using an OLS model for continuous variables and a probit model for binary dependent variables, incorporating relevant control variables. To address selection bias, the inverse Mills ratio from the first-stage regressions is included in the second-stage models. Furthermore, the economic importance of the "Degree of Being Known" and other variables on venture performance is assessed through a relative weight analysis. This analysis decomposes the total predicted variance into weights reflecting the relative contribution of each explanatory variable, even in the presence of correlated predictors. Standardized regression coefficients are obtained by transforming explanatory variables into orthogonal representations, allowing for the identification of predictors explaining significant variance in outcomes. (Blaseg, D. and Hornuf L., 2024)

In the last part of this chapter, I am going to review some important findings studied through the models and analyzed by some academics in past years.

1.3.3 Main results found

The results obtained from past research and studies on entrepreneurial finance reveal important insights into the landscape of ventures capital. Venture capitalists and business angels are pivotal players in the early-stage startup ecosystem, providing essential capital, expertise, and networking opportunities. While venture capitalists typically offer substantial funding and

strategic guidance, business angels serve as valuable alternative sources of financing, particularly for startups that may not attract venture capital attention. Although crowdfunding has gained traction, it still lags behind traditional venture capital and angel investments in terms of size and scope. However, co-investments between various investor types can mitigate risk and significantly improve the prospects of success for early-stage ventures. Research in entrepreneurial finance continues to grow, offering a vast landscape of exploration into optimal financing strategies. Despite this, existing studies offer valuable insights into the mechanisms available to entrepreneurs.

New funding options such as start-up incubators, accelerators, science and technology parks, university-affiliated seed funds, and crowdfunding have expanded the financial system's capacity to support innovation and entrepreneurship, they are unlikely to replace traditional venture capital. These alternatives face challenges such as a lack of investment expertise, information asymmetry, and difficulties in understanding and selecting high-risk projects. It concludes that traditional closed-end venture capital funds continue to play an important role in early stage finance because of their unique competences (e.g. screening, negotiating and monitoring).(Capizzi V. and Bonini S., 2019)

Business angels (BAs) make non-monetary contributions to the ventures they invest in, offering valuable expertise, industry knowledge, managerial guidance, mentorship, and access to personal networks. Interestingly, the level of investor monitoring demonstrates an inverse correlation with performance, suggesting that excessive influence over venture management may adversely impact the overall performance of companies backed by BAs. Additionally, the impact of BAs' investment experience and coaching on the growth rates of both fast-growing companies (referred to as "gazelles") and steady-growth companies (referred to as "ponies") does not yield statistically significant results. Moreover, while monitoring efforts contribute to improved performance among ponies, they impede growth among gazelles. (Croce A., Ughetto E., Bonini S. and Capizzi V., 2020)

The decision to pursue angel, private equity (PE), or venture capital (VC) funding is influenced by a combination of legal, economic, and cultural factors. Angels tend to invest in smaller, more dynamic entrepreneurial ventures situated in countries with less robust legal systems and cultures that prioritize individualism and risk-taking. This trend is observed across initial and subsequent rounds of funding. Companies backed by angel investors face a reduced likelihood of successful exits via IPOs or acquisitions, although the presence of effective legal frameworks can

help mitigate these challenges, particularly concerning IPO exits. However, there is no evidence to support the notion that angel investments serve as a precursor to successful divestment in later funding rounds. (Cumming D. and Zhang M., 2018)

Angel investors exhibit a relatively risk-loving attitude, with investment returns being a prime motivation for the majority. Previous experience in entrepreneurial and financial sectors significantly influences angels' tolerance for risk. Moreover, their dedication to angel investing and supplementary income from employment further bolsters their willingness to undertake risks. (Croce A., Ughetto E. and Cowling M., 2019)

The involvement of business angels (BAs) in subsequent venture capital (VC) financing is influenced by factors such as their experience, selectivity, affiliation with angel networks (BANs) and monitoring activities. Companies receiving subsequent VC funding often have higher capital investments from BAs and a greater number of co-investors. BAs with more experience increase the likelihood of securing VC funding for the same company. Additionally, higher levels of selectivity and affiliation with BANs positively impact the probability of obtaining follow-on VC financing. However, intensive BA monitoring can negatively affect the chances of obtaining later VC funding. Interestingly, the impact of BAs' rejection rates on VC funding differs based on BAN membership status. For BAs not affiliated with a BAN, a higher rejection rate may be beneficial. Conversely, if part of a BAN, intense monitoring may convey a negative signal to VCs, potentially influencing funding decisions. (Capizzi V., Croce A. and Tenca F., 2021)

Regarding the gender of BAs, female business angels show a slight inclination towards investing in women-owned businesses, but this preference is not driven by gender considerations in their investment decisions. Notable differences exist within the groups of female and male angels, suggesting that gender does not significantly impact access to business angel finance. Despite generally minor inter-gender discrepancies, some women express a willingness to adjust investment criteria for female entrepreneurs and provide support. (Harrison R. and Mason C., 2007)

Participating in a Business Angel Network (BAN) significantly influences investment practices among angels, leading to increased investment activity. BAN membership offers diversification benefits and facilitates co-investment opportunities, thereby reducing individual stakes in companies. The percentage of personal wealth invested by angels is influenced by their personal characteristics, with wealth exhibiting a negative correlation. Furthermore, BAN membership

and backgrounds play contrasting roles, as non-BAN members tend to invest less compared to angels with similar education levels but BAN affiliation. Moreover, the presence of co-investors has a negative impact on both the amount invested and the size of equity stakes. Passive investors and soft monitoring by BAs also influence investment decisions, particularly among non-BAN members. (Bonini S., Capizzi V., Valletta M. and Zocchi P., 2018)

Angel syndicates and active involvement of business angels have a positive impact on the performance and survival of investee companies. However, excessive monitoring efforts, particularly from less experienced angels, can have a negative effect. Fragmenting equity investment among angels is also detrimental to financial performance and survival. The immediate investment of committed capital indicates a strong commitment from angels, which is associated with positive outcomes. Furthermore, active involvement of business angels surpasses soft monitoring in driving profitability and survival, especially for ventures with limited revenue capacity. (Bonini S., Capizzi V. and Zocchi P., 2018)

Always dealing with BA groups, a past research found that attracting a central business angel (BA) within a BA group increases the likelihood of a company receiving funding. However, the effect follows an inverse U-shaped relationship, meaning that excessively high levels of centrality negatively influence the probability of funding. The presence of a central BA carries a certification effect, but when a BA is too central, other BAs in the group may not follow their investment decision due to information overload. The negative effect of being too central can be moderated by the prior investment experience of the BAs and geographical proximity, which reduce information asymmetries. (Butticè V., Croce A. and Ughetto E., 2018)

Some findings about equity crowdfunding campaigns attest that they can have a positive impact on subsequent venture capital (VC) financing, especially for firms with a nominee shareholder structure. These results suggest that crowdfunding, through a nominee shareholder structure, increases the likelihood of attracting follow-on VC funding compared to angel-backed firms. However, equity crowdfunding also presents challenges in terms of coordination costs and governance issues, particularly for firms with a direct shareholder structure. The success of an equity crowdfunding campaign depends on the ability of new ventures to signal their value, and the shareholder structure plays a crucial role in screening potential VC investors. (Butticè V., Di Pietro F. and Tenca F., 2020)

Ownership structure in crowdfunding can significantly influence the success and survival

of ventures. While experienced founders may mitigate negative effects, challenges may arise for family firms in attracting investors due to concerns about control and decision-making. Investors use cash-flow stakes to align interests, but issues may arise with controlling shareholders. Professional investors bid for voting rights, and ownership decisions influence financial outcomes. The expansion of crowdfunding has generated debates on regulation and the promotion of equity crowdfunding. (Cumming D., Meoli M. and Vismara S., 2019)

A study addresses a research gap by examining how angel investors interact with crowdfunding platforms, in response to previous calls for evidence-based research in this field. Authors' findings highlight the close relationship between the growth of large crowdfunding campaigns and the involvement of angel investors, who play a vital role in their success. However, crowd investors also play a significant role, particularly in funding smaller campaigns that don't attract angel investors. This symbiotic relationship underscores the democratic nature of ECF. Moreover, angels' presence and behavior on digital ECF platforms help reduce information asymmetry in early-stage financing, improving market efficiency. Angel investment decisions, especially their high-contribution pledges, serve as valuable signals of venture quality, facilitating information flow from experienced investors to the crowd. Overall, their research suggests that the digital environment of ECF platforms benefits novice investors by providing real-time access to information about angel investment behavior, potentially addressing concerns about the financial well-being of small non-professional investors. (Wang W., Mahmood A., Sismeiro C. and Vulkan N., 2019)

Academics found that BAs' degree of being known has a positive impact on target firm survival, web traffic, and sales. The impact of BAs' general degree of being known is particularly strong if the congruency between the investors and the target ventures is high. These effects exist over and above potential selection effects, the professional reputation of the BA, and the greater financial resources of a funded venture. The empirical findings indicate that well-known BAs can have a positive effect on venture performance and that founders should consider not only the professional reputation of BAs but also the degree to which they are known to a general audience. (Blaseg, D. and Hornuf L., 202)

This section has highlighted some key findings in the research area of entrepreneurial finance. While these findings are not exhaustive, they provide a valuable foundation and starting point for my upcoming analysis. My thesis aims to delve deeper into the performance of startups by examining and comparing the impact of various financing actors. Through this investigation

into the effects of different funding sources on startup performance, I aim to add to the existing body of knowledge in this field.

Chapter 2

Market Trends

The economic and entrepreneurial global landscape has witnessed significant shifts in the past decade, with the emergence of new forms of funding and support for startups. Among these, Business Angels and crowdfunding have stood out as two key options, offering emerging businesses not only the necessary capital but also access to valuable expertise, networks and mentorship. This chapter aims to examine the Business Angels market in Europe, with a specific focus on the Italian scenario and the global Crowdfunding market, with a specific focus on the European and Italian cases.

2.1   Business Angels: European Market

Business Angels market is difficult to quantify because a significant percentage of the total investments made, are made outside of angel associations and not reported. Hence, this report focuses only the so-called "visible" market.

According to *EBAN*[10] Annual Statistics Compendium of 2022[11] the visible angel investment market on the European continent, data from the 38 different countries, has grown substantially

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[10]European Business Angels Network is the pan-European representative for the early stage investor community gathering over 100 member organizations in more than 50 countries today. Established in 1999 by a group of pioneer angel networks in Europe with the collaboration of the European Commission and EURADA, EBAN represents a sector estimated to invest 11.4 billion Euros a year and playing a vital role in Europe's future, notably in the funding of SMEs. EBAN fuels Europe's growth through the creation of wealth and jobs.

[11]The Statistics Compendium is Europe's most extensive annual research on the activity of business angels and business angel networks. The Compendium provides information on the overall early-stage market and on how business angel networks operate, as well as insight into their investment attitudes. The information featured in the EBAN 2022 Statistics Compendium was collected in 2022 - 2023 and reports on activities that took place in 2022.

from the 764 Million Euros invested before the Covid pandemic in 2019 to 1,402 Million Euros invested in 2022. There has however been a slight contraction from 2021 to 2022, with the total number of investments decreasing by -3.7% from 1,456 Million Euros in 2021 (fig. 2.1).
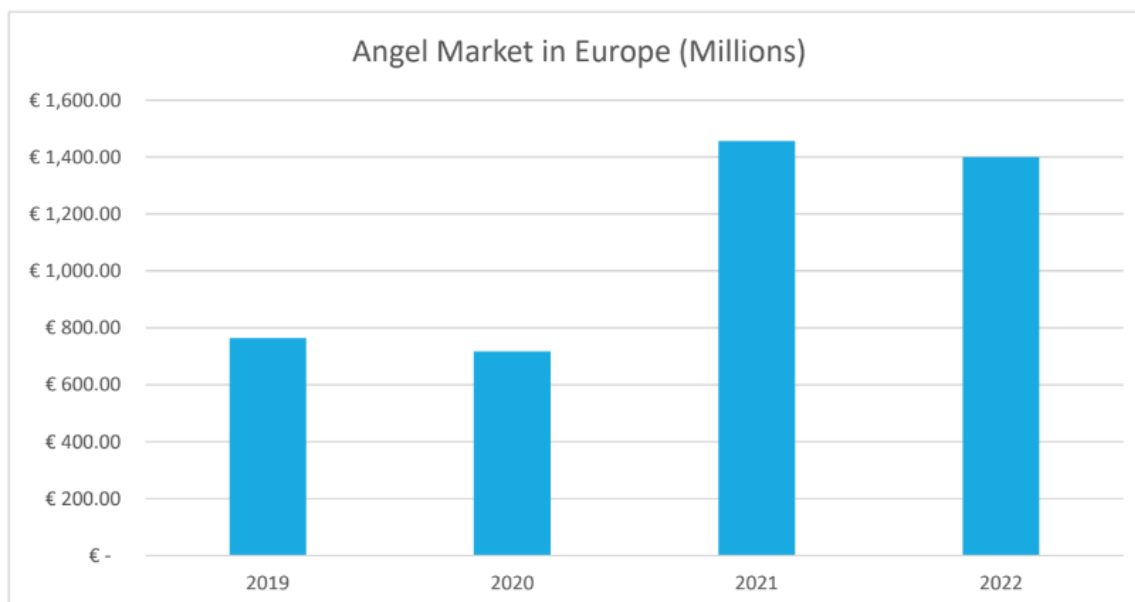

Figure 2.1. Angel Market in Europe (38 countries); Investment Values in Millions Euro.

Despite this small drop, over the past decade since 2013, the size of the business angel investment market on the European continent has more than tripled, from approximately 430 Million Euros invested then, to the 1.4B Euros invested in 2022. The strong growth over the past 10 years is due to multiple factors. Firstly, as access to angel data is improving, so does our ability to measure the so-called "visible" angel investment market. Secondly, the growing popularity of angel investing across Europe has attracted more and more newcomer investors to join networks and make their first investments, as visible in the growth of the angel investor population across many parts of Europe and in the number of deals recorded. The decrease of investment can be attributed to the war in Ukraine that has a huge impacts on local, regional and global markets. The huge spike in energy costs triggered exceptional inflation, which had a significant impact on startups and their plans by notably increasing the cost of doing business. This goes a long way to explain both the drop in total investments as well as the increase in total rounds, as startups and current portfolio companies were subject to decreasing valuations and needed significantly more bridge rounds.

In 2022, angel investors were involved in over 5738 (+13.1% from 2021) observed funding rounds, consisting of both initial investments and follow-on investments made in European

based startups. Based on the reports provided by national federations, local angel networks and national venture capital associations, there are approximately 43,340 active business angel investors on the European continent who are part of a local investment network or association. Business angel networks had been growing in number at an average of 17% from 2003 through 2012 but began to level off in 2013. Between 2013 and 2022, the number has levelled off and began to decrease, mainly due to consolidation efforts where many smaller investor networks merged to exploit economies of scale and synergies.

In 2022, there were 358 business angel organizations involved in matchmaking startups seeking capital with business angel investors across 38 countries observed in Europe, which although is an increase from 2021, is still significantly less than in 2020, over 400 networks[12].

Regarding angel investments by country (fig. 2.2, the United Kingdom continues to lead the European angel market with 394.5 Million Euros of angel investment recorded in 2022, representing a +2% increase from 2021 when 388.5 Million Euros were invested. The German business angel market, second in Europe in size, accounted for 206.5 Million Euros of investments in 2022 (an increase of +29% compared to 2021) and was followed by France, with 134.4 Million Euros invested by business angels in 2022 (a decrease of - 12% compared to 2021). It is interesting to note that compared to 2021, several countries saw a strong increase of angel investment activity and new investment activity records set, notably in: Greece (+96%), Lithuania (+51%), Ireland (+46%), Romania (+46%), Luxembourg (+42%), Sweden (+16%). It is important to note that the growing presence of government-backed funds investing directly in startups, crowdfunding platforms, seed, and early-stage VCs; have made the environment a lot more competitive for business angels in many countries over the past couple of years.

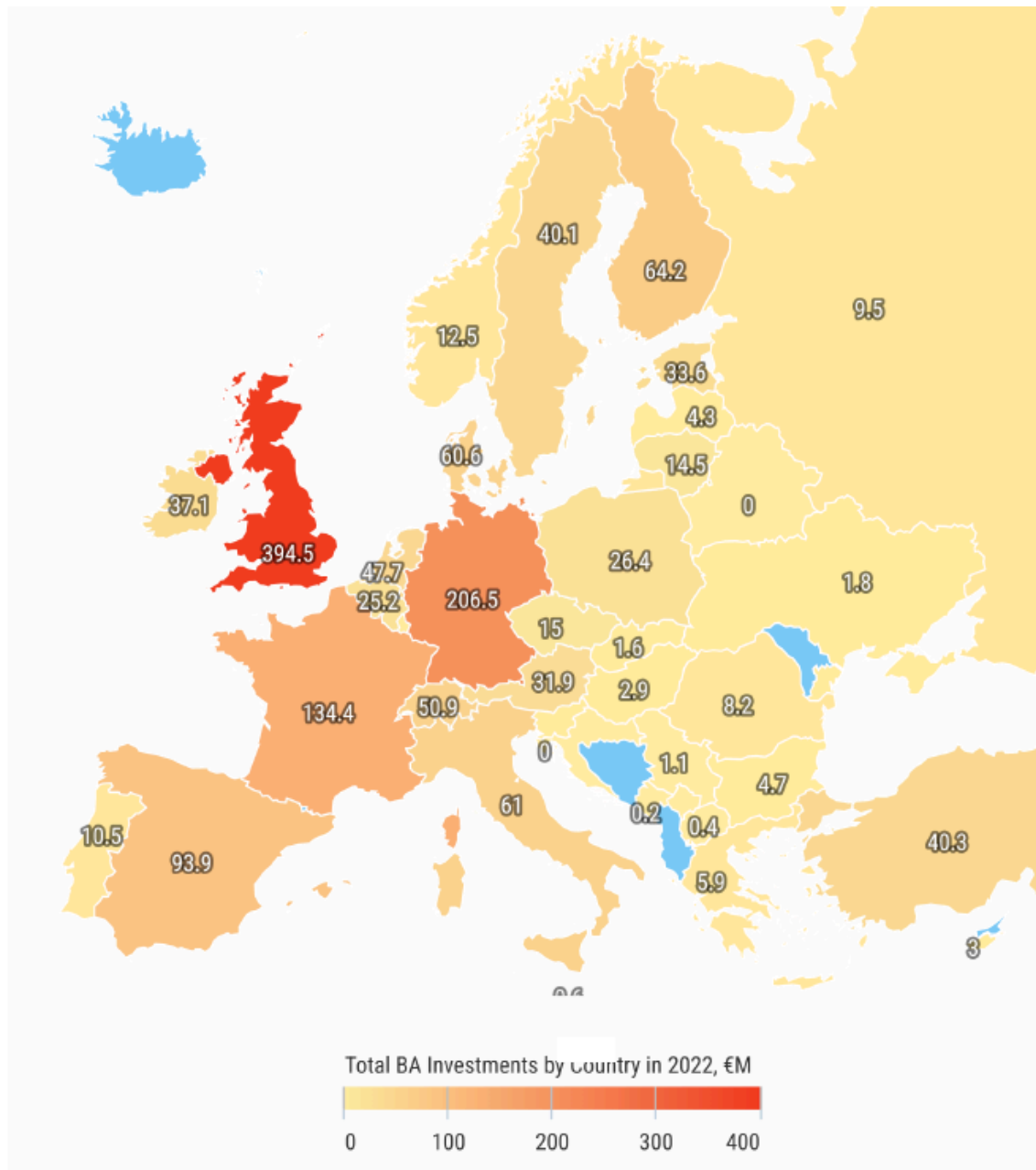[12]EBAN Data Report - BANs and Angel Federations in Europe 2023

Figure 2.2. Heatmap of Overall Business Angel Investments by Country.

Comparing the amounts of angel investment to GDP[13] for each country provides a different perspective on the importance of angel investment communities across countries (fig. 2.3). In this case, some smaller countries (i.e. Estonia, Finland, Lithuania and Denmark) demonstrate that they have highly active angel investment scenes, while countries with higher GDP (i.e. Germany, France) push the average down.

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[13]Gross domestic product (GDP) is the total monetary or market value of all the finished goods and services produced within a country's borders in a specific time period.
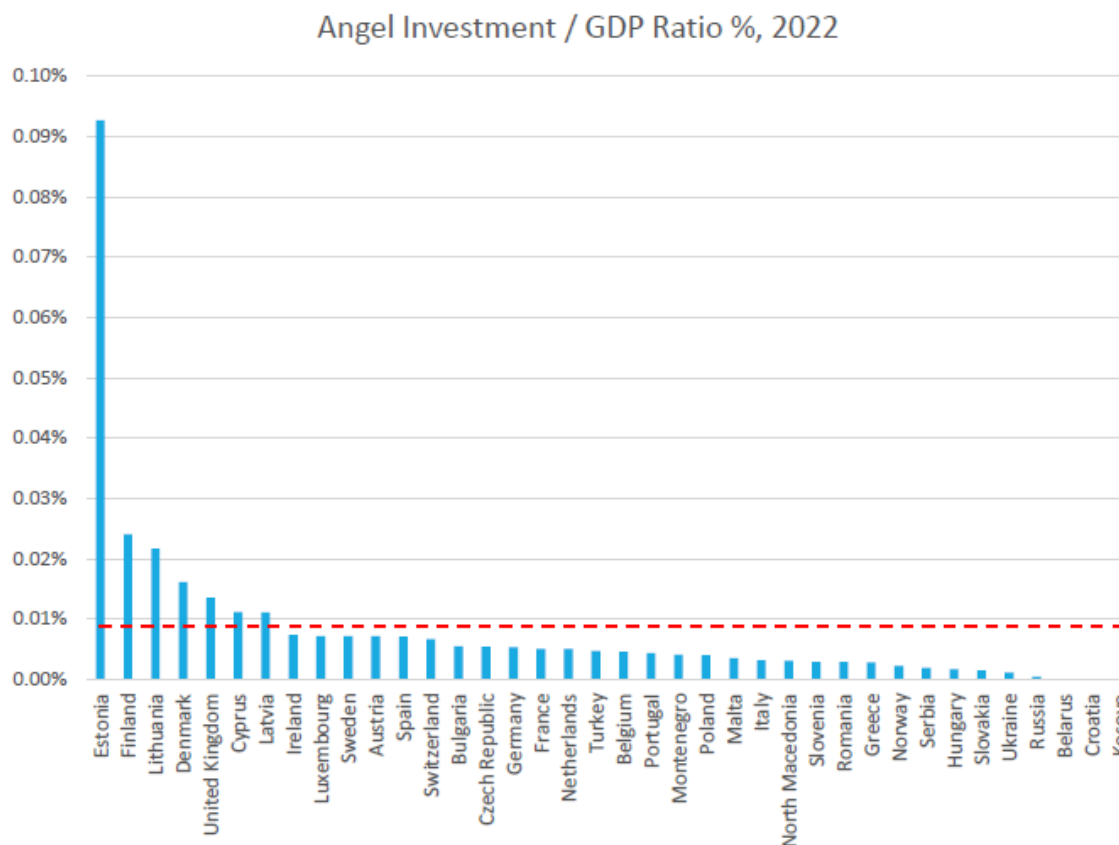
Figure 2.3. Angel investment/GDP ratio, %; Visible Market Statistics.

The average amount invested by angels (individually, as syndicates or as co-investments with other early-stage investors) per company, per round, decreased by -9.8% from the 287,000 Euros of 2021 to 259,200 Euros in 2022. Regarding the average ticket invested by angel investors within each funding round, the 2022 average was 32,400 Euros, a drop compared to 2021, but still notably higher than in previous years.

EBAN uses Dealroom.co's database[14] to illustrate the sectors in which startups received the most investment from angel investors. Data on around 1500 early-stage investments ("seed" and "angel" rounds) done in Europe in 2022 was used to create the charts in fig. 2.4. In terms of Euros invested, the "Fintech", "Enterprise Software", and "Health" sectors took the lead in 2022 with respectively 18%, 14% and 14% of all investments.

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[14]Dealroom helps professional investors, corporates and local governments to discover and track innovative tech companies.
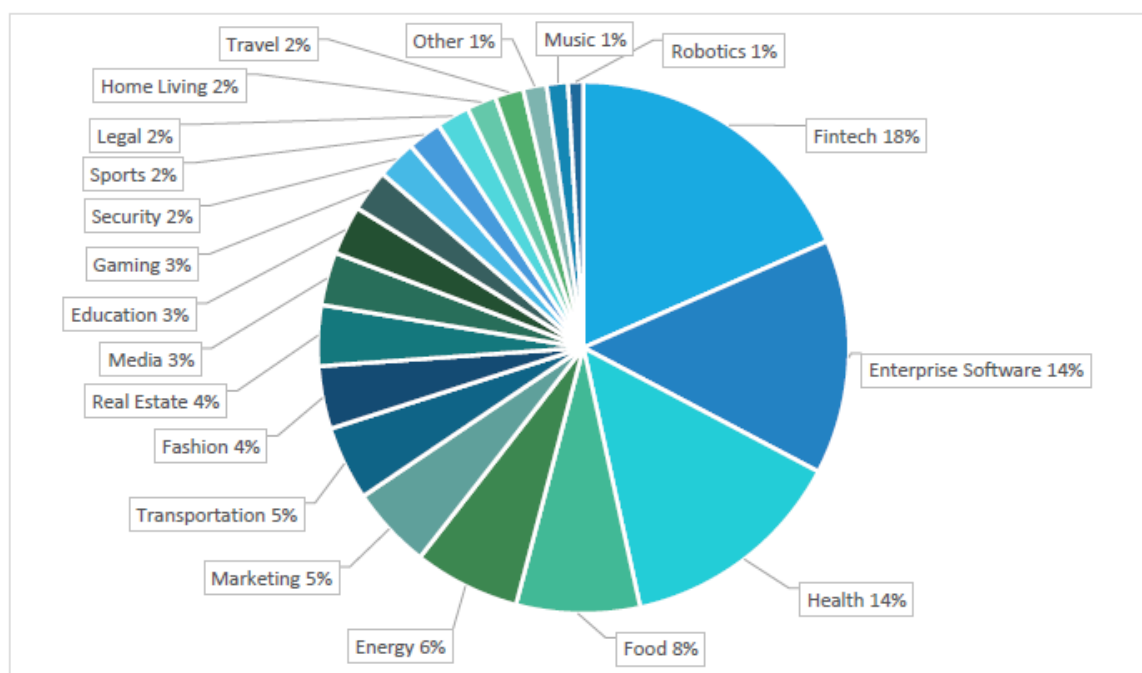
Figure 2.4. Sector Distribution of Investments in 2022, Total Amount Invested %

In this edition of the Statistics Compendium, a survey was conducted with 28 Business Angel Networks, which are made up of over 3,000 people from 25 countries across Europe, to gain a qualitative understanding of the gender balance within the business angel investment ecosystems. On average the respondents reported that 13% of their members were women, which remains a low proportion and indicates that more should be done to encourage and facilitate women's involvement in the business angel ecosystem in Europe.

2.1.1 Italian Market

In order to analyze the Italian Business Angel Market I considerate the *IBAN* Survey 2022[15] that is one of the most important network in Italy. The 2022 sample consists of 304 observations, divided between individual Business Angel responses, aggregate responses (from BAN and Clubs of Angel) and public information.

According to the Survey the number of direct investments made by individuals or groups of Business Angels amounts to 75 with a total invested of 83,098 Euro. Instead, the total amount

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[15]The IBAN Association annually carries out the Survey that records the extent and role of Angel investing in Italy. The scientific supervision is by Prof. Vincenzo Capizzi (University of Eastern Piedmont and SDA Bocconi). The Survey, carried out in the first months of 2023, is promoted with the aim of analyzing the Italian market, both from the point of view of the investments made in 2022 and from that of the characteristics of the Business Angels. Data collection is structured through the dissemination of a specific online questionnaire, through the SurveyMonkey platform.

of investment rounds that Business Angels made in syndication with Venture Capital funds was 1,540,000 Euro with a total of 153 transactions. Finally, the number of investments that only BA have made through crowdfunding considering users who have invested at least 5000 in a single investment or a minimum of 1000 in three is 123 with a total amount of 58,719 Euro.

Regarding the characteristics of Italian Business Angels, the typical Business Angel is a man, lives in Northern Italy (45%), generally has a past as manager (45%) and dedicated mainly to the angel investing (64%). The 75% of Business Angels sample analyzed is affiliated with IBAN or one its territorial BANS, or an Investor Club. Almost all is in possession of a Master's Degree and these 27% have achieved postgraduate degrees. Talking about professions: 64% of BAs do that as profession, 18% is a manager, 9% an entrepreneur and 9% a freelancer.

One of the most interesting trends monitored concerns the increase of the component women among the Business Angels that in 2022 reaches the 27% scoring a net detachment of values from previous years 14% in 2021 and 11% in 2020 and 2019 (fig. 2.5).
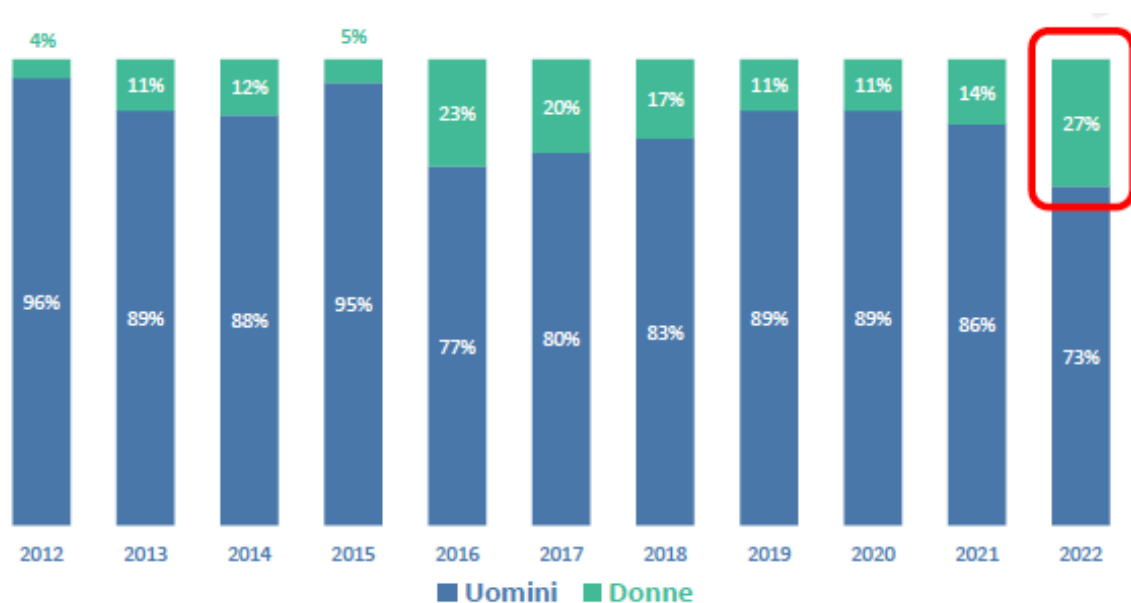

Figure 2.5. Angel distribution between women and men %, from 2012 to 2022.

The Business Angel has at its disposal assets between 500 thousand and 2 million Euro, of which about 12% dedicated to angel investing transactions (stable value compared to 2021 for a portfolio of about 9 companies (value increased compared to 2021). But, in the 2022, the 55 of the sample declares to want to increase in the next years the quota of assets dedicated to investment in startups and 36 states that he wants it keep constant.

The average ticket of investments made by Angel in 2022 increases compared to 2021 contin-

uing the recovery trend compared to 2020 48 of the amounts invested for each target company is over 500,000 Euro, with 17% of the investments that go beyond the 2 million Euro (15% in 2021) and the 31% of ticket between the 500,000 and the 2,000,000 Euro (42% in 2021).

Italian Business Angels also in 2022 prefer investments on the national territory. In this area they monitor a trend in growth, in fact, from 45% in 2020 and 55% in 2021; in 2022 64% declares its preference for investments in Italy. The 27% of respondents say they have no preferences for the country where the funded startup (29% operates in 2021) and the remaining 9% declares to prefer investments in Europe. Only 27% of the Business Angels declares to have preferences for a certain sector in screening phase of the projects.

Inside post-investment phase, more than 60% of Business Angels claims to have a degree of involvement in the daily life of startups medium, high or very high (with many visits to company), the remaining 36% instead declares to have a low involvement or very low (with few and sporadic visits to the company). In 2022 the sample is therefore divided into two distinct types by Business Angels. Indeed, to traditional Business Angels that adopt a hands-on approach to investments, are joined by more passive investors who take on the role of founders only. Finally, the Business Angels declare that the main resources that provided the funded startups are primarily related to strategic skills and secondly to the relational network and financial knowledge, in addition to capital, see fig. 2.6.
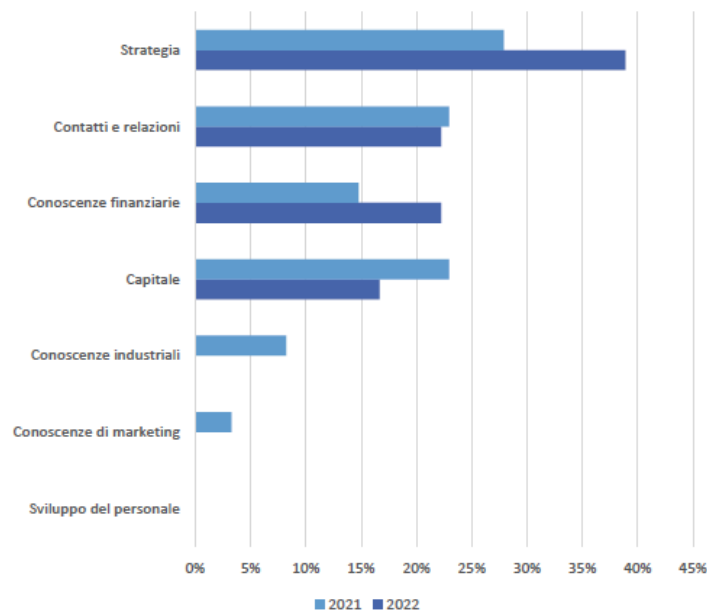

Figure 2.6. Business Angels' main resources that provided to the funded startups.

Now I want to move the focus to the type of investment. In 2022, the Business Angels privileged companies in the startup phase (52%) over those in the seed phase, whose percentage, however, rises from 41% in 2021 to 48%. The seed investment confirms the important role in the Business Angels portfolio of investments in the very early stages of business project development. The chart below (fig. 2.7) shows the change in the last six years of the percentage of investments of Business Angels in seed and startups. Despite the percentage values remain higher this year for companies in the startup phase, it is confirmed by the exponential trend line (dashed line in the graph), the reversal of the trend since 2018 in favor of Seed investments that in 2022 is approaching the point of turnaround.
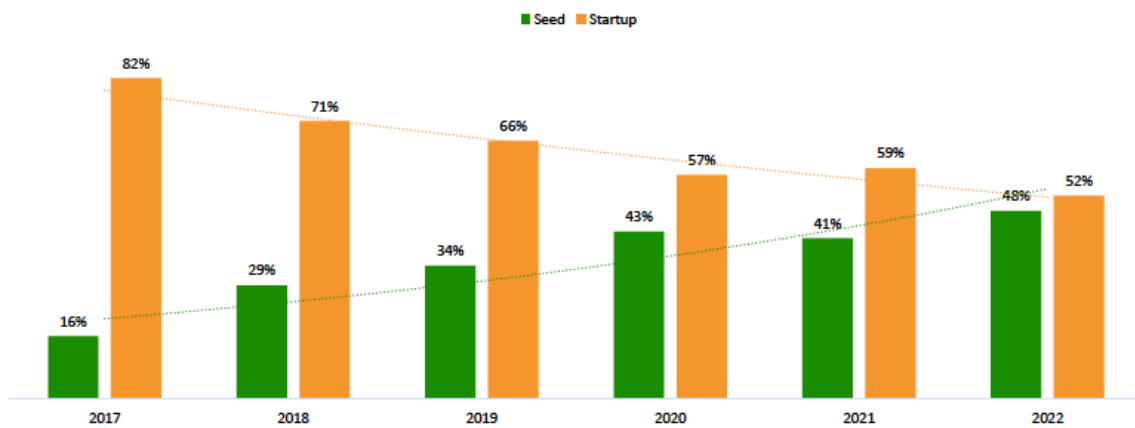

Figure 2.7. Change in the last six years of the percentage of investments of Business Angels in seed and startups.

The sector of greatest interest for Business Angels is also this year the ICT (web app, mobile, software), on which focus the 47% of the investments made (value up from 36% of 2021 and 30% of 2020). Within this group of operations, the trend change observed already in 2021 compared to previous years is confirmed, with a greater interest of Business Angels for startups offering technology services aimed at businesses (Enterprise Technologies, 61.76% of ICT operations), compared to those concerning services aimed at private individuals. This sector in 2022 is followed by that of the Other Services (11%) including Edutech and Profile Development Services professional, Healthcare (9%) confirming the strong interest over the last five years by investors towards startups in the context of health, and Food 8% which sees Foodtech and Agritech in addition to food-service (see fig. 2.8).
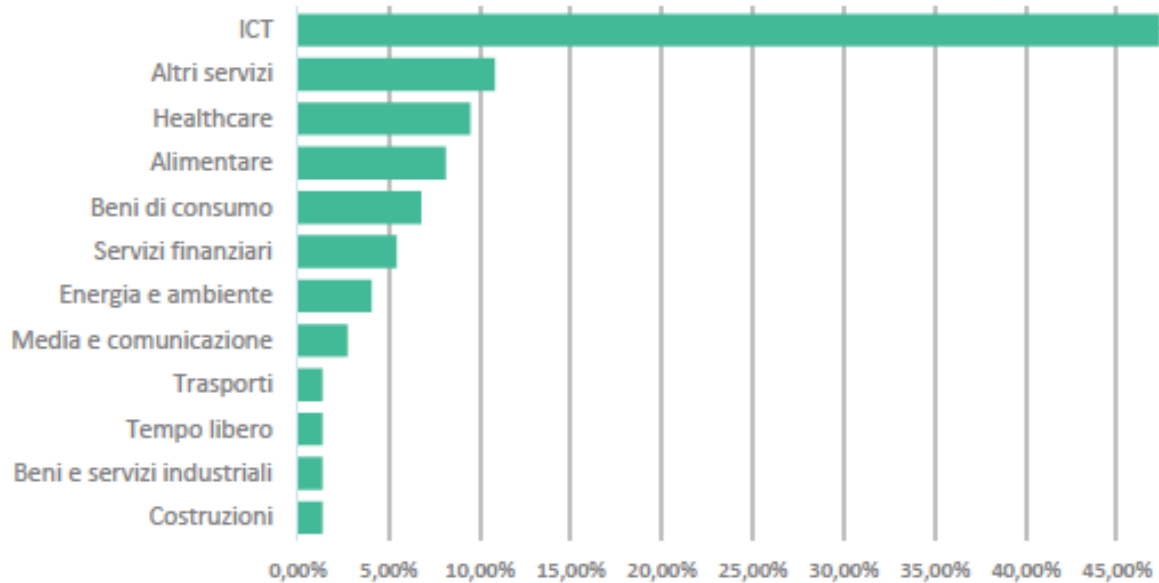
Figure 2.8. Sectoral distribution of targets.

Regarding the region which has benefited most of investment by Business Angels Italian, was the Lombardy (as well as over the years previous), followed by Piedmont and Lazio. The graph (fig. 2.9) shows the distribution of investments over the years from 2016 to 2022 with reference to the four main regions according to number of investments.
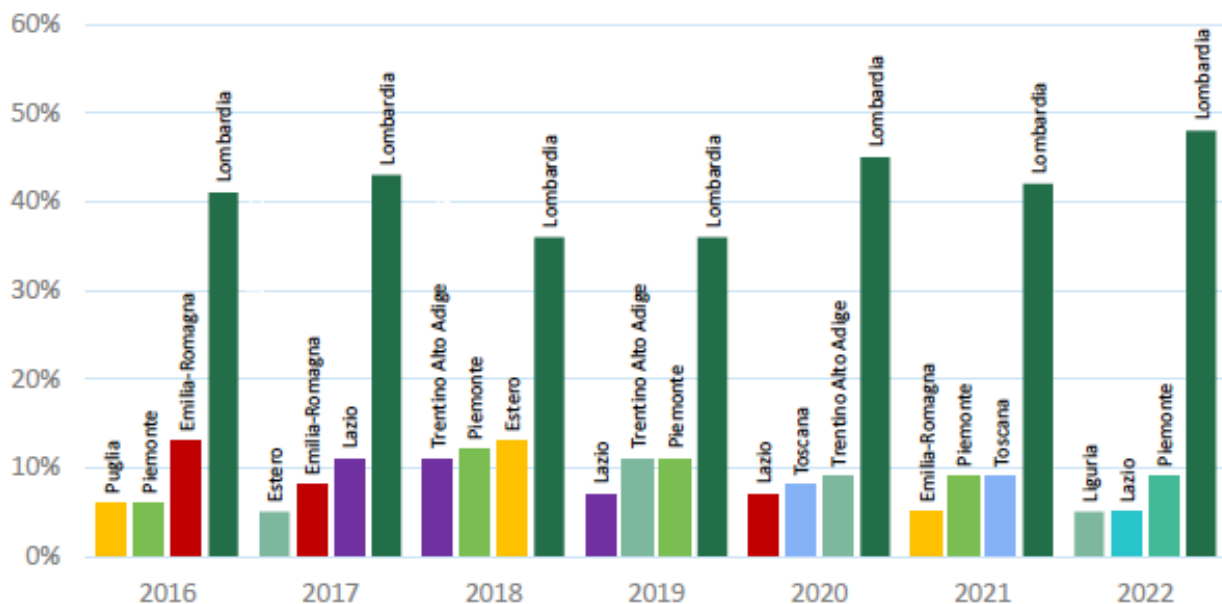

Figure 2.9. Distribution of investments over the years from 2016 to 2022 with reference to the four main regions according to number of investments.

In the 2022 the gap between North and South remained unchanged, with the 73% of the investments made which it financed located in the regions of northern Italy (70% in 2020) and

in particular in Lombardy (48%) and Piedmont (9%).

In the Survey was made a deepening inherent to my thesis, the Business Angels' investments through the ECF platforms. The 62% of the total companies financed only by Business Angel in 2022 were funded through crowdfunding platforms (55% in 2021 on comparable data). Crowdfunding continues to grow and remains a channel attractive to research to the possibilities of investment and as a method of syndication. The total amount invested through Crowdfunding by the BA is increased in absolute terms (+80%), rising to 41% of the total (from 26% in 2021 excluding investments in unions with Venture Capital). Increases the average investment of subscription of BAs to each campaign, amounting to about 24,400 Euro (9,000 Euros in 2021). The graph (fig. 2.10) shows the total amount invested through CF and the average number of BA to Campaign for the years 2016 to 2022, considering users who have invested at least 5,000 in a single investment or a minimum of 1,000 in three. In the last five-year investment of Business Angels through ECF platforms have grown every year. Including the 2022 leap, growth averaged 37% per year.
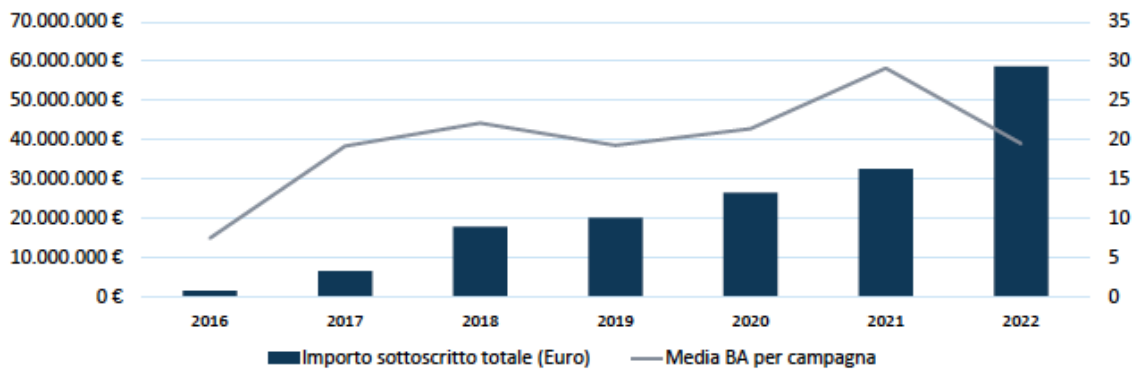

Figure 2.10. BA investment performance through Equity Crowdfunding platforms.

2.2 Crowdfunding: Global Market

The Crowdfunding market has experienced an incredible worldwide growth over the last decade. The 2nd Global Alternative Finance Market Benchmarking Report drafted by the *Cambridge Centre for Alternative Finance*[16] (CCAF) give an overview on the alternative finance and in particular, on the Crowdfunding. According to the report, 'alternative finance' includes digital finance activities that have emerged outside of the incumbent banking systems and traditional capital markets and occur online. In particular, these online alternative finance ecosystem comprises of various lending, investment, and non-investment models that enable individuals, businesses, and other entities to raise funds via an online digital marketplace. The different alternative finance business models could be grouped in the following way (fig. 2.11):

Category	Business Model	Stakeholders
P2P/Marketplace Lending[1]	Consumer Lending	Individuals or institutional funders provide a loan to a consumer borrower, commonly ascribed to off-balance sheet lending.
	Business Lending	Individuals or institutional funders provide a loan to a business borrower, commonly ascribed to off-balance sheet lending.
	Property Lending	Individuals or institutional funders provide a loan, secured against a property, to a consumer or business borrower, commonly ascribed to off-balance sheet lending.
Balance Sheet Lending[2]	Consumer Lending	The platform entity provides a loan directly to a consumer borrower, ascribed to on-balance sheet non-bank lending.
	Business Lending	The platform entity provides a loan directly to the business borrower, ascribed to on-balance sheet non-bank lending.
	Property Lending	The platform entity provides a loan, secured against a property, directly to a consumer or business borrower, ascribed to on-balance sheet non-bank lending.
Invoice Trading[3]	Invoice Trading	Individuals or institutional funders purchase invoices or receivables from a business at a discount.
Securities	Debt-based Securities	Individuals or institutional funders purchase debt-based securities, typically a bond or debenture, at a fixed interest rate.
	Mini- bonds[4]	Individuals or institutions purchase securities from companies in the form of an unsecured bond which is 'mini' because the issue size is much smaller than the minimum issue amount needed for a bond issued in institutional capital markets.
	Consumer Purchase Finance/ BNPL	A buy now/pay later payment facilitator or Store Credit solution,

Figure 2.11. Alternative finance business models.

Since 2015, online alternative finance actors have provided financing to individuals and businesses across the globe in a myriad of ways. However, market development followed very different paths in China and the rest of the world in a manner which severely distorts reality when data is aggregated together on a global level. Here, while the rest of the world follow

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[16]The Cambridge Centre for Alternative Finance is a research institute established in 2015 as a part of Cambridge Judge Business School, University of Cambridge, United Kingdom. The center's research focuses on financial channels and instruments that emerge outside traditional financial ecosystems. Their website is dedicated to CCAF's digital tools – a set of interactive data visualizations that provide timely Fintech market data to enable the work and practice of market participants, policymakers and regulators.

a steady and gradual growth trajectory, China has experienced a quick and dramatic cycle of boom and bust (see fig. 2.12).
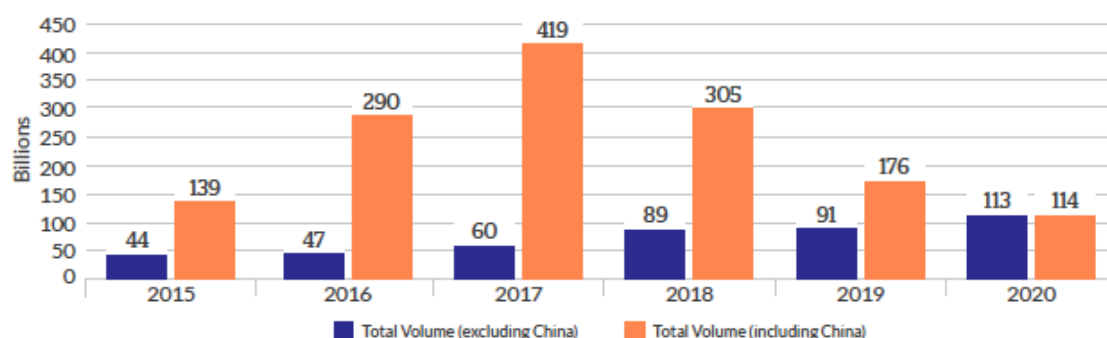

Figure 2.12. Total Global Alternative Finance Volume 2015 - 2020, USD.

China dominated the global online alternative finance market up until 2018. However, local market developments and regulatory changes have led to a considerable decline in volumes and its global market share. In 2019, the Chinese market accounted for 48% of the global volume, and in 2020 for only 1%. Accordingly, when Chinese volumes are included in our global analysis, total global market volume has notably decreased, falling 42% in 2019 and a further 35% in 2020 – from $304.5 billion in 2018 to $176 billion in 2019 and $114 billion in 2020. If the Chinese market is excluded from the analysis, it emerges that global online alternative finance market has grown consistently over the past three years. Global volumes (excluding China) rose by 3% from $89 billion in 2018 to $91 billion in 2019. And in 2020, despite COVID-19, the global market volume rose a further 24% year-on-year to reach $113 billion.

According to fig. 2.13, in 2020, the largest regional alternative market was the United States and Canada ($73.93 billion) with the US being the largest national market with $73.62 billion, which accounted for 65% of global online alternative finance market volume. This is followed by the UK ($12.64 billion), Europe excluding the UK ($10.12 billion), the Asia Pacific excluding China ($8.90 billion), LAC ($5.27 billion), SSA ($1.22 billion), China ($1.16 billion) and MENA ($0.59 billion).
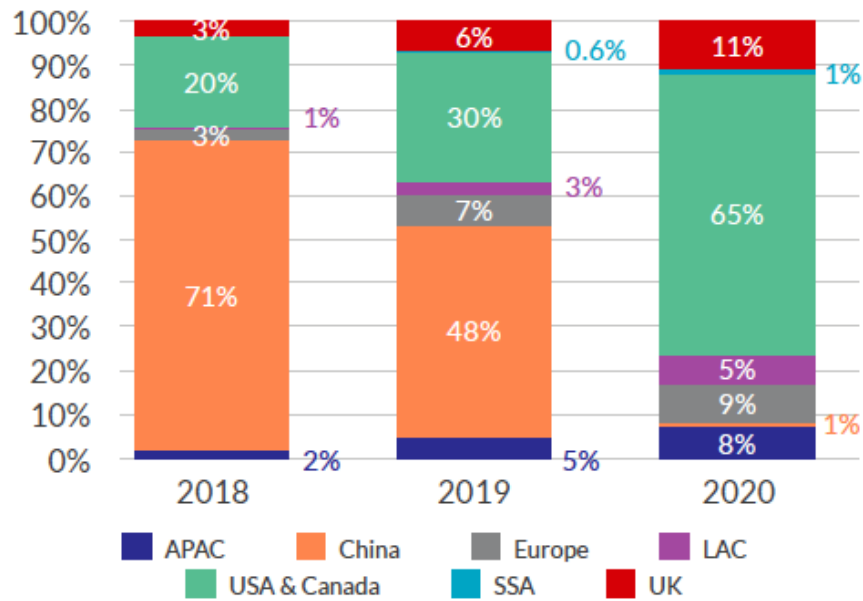
Figure 2.13. Market Share of Alternative Finance Activity by Region.

The following figures represent the geographical distribution of surveyed platforms by CCAF in 2020 and the amounts of funds raised through alternative finance platforms (fig. 2.15). In details, fig. 2.14 is referred to 1,660 observations from 703 firms where the higher number of platforms are located in the United States, United Kingdom, China, Brazil, India, Germany, France, Italy and Australia. Also, fig. 2.15 illustrates that the same countries, in particular US are which that has a higher amounts of transactions in term of volume in the World.
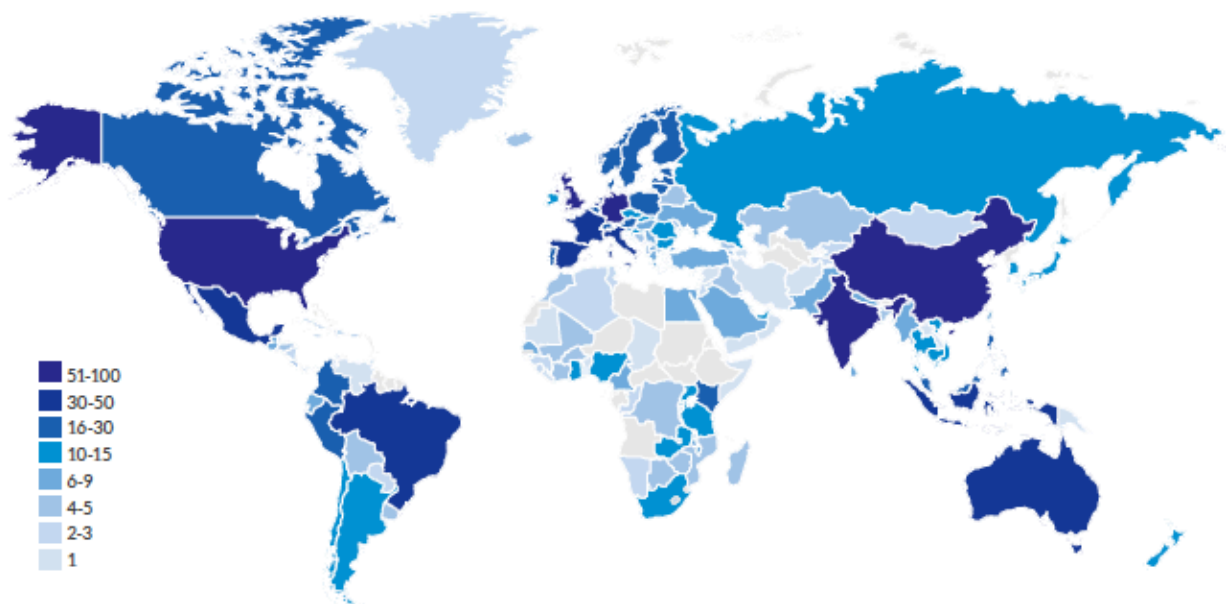
Figure 2.14. The Geographical Distribution of Surveyed Platforms (2020).
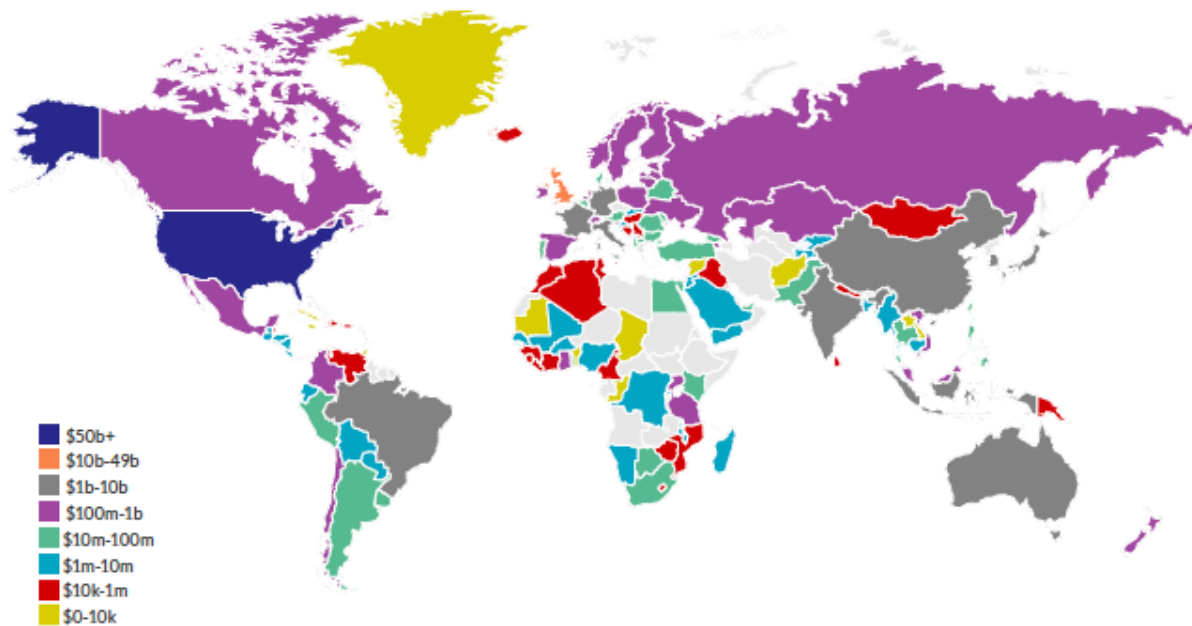
Figure 2.15. Comparative Market Volumes of Alternative Finance Transactions, 2020 (in USD).

As with previous years, online alternative funding for businesses overwhelmingly stemmed from Debt-based models, with $32.8 billion of debt finance raised in 2019 (or 96% of all business funding) and $49.6 billion raised in 2020 (94%). Equity-based models contributed $1.5 billion in 2019 and $2.2 billion in 2020 (3% in 2019 and 4% in 2020). Non-investment models accounted for $533 million in 2019 and $744 million in 2020 (see fig. 2.16).

Figure 2.16. Breakdown of Business Financing by Category.

2.2.1 European Market

As one can observe in fig. 2.17, from 2013 to 2019 the European online alternative finance market volume (including the UK) grew consistently from $1.5 billion in 2013 to $23.2 billion in 2019. However, 2020 saw a drop in overall market volume to $22.6 billion, representing the first decrease in market volume since 2013.
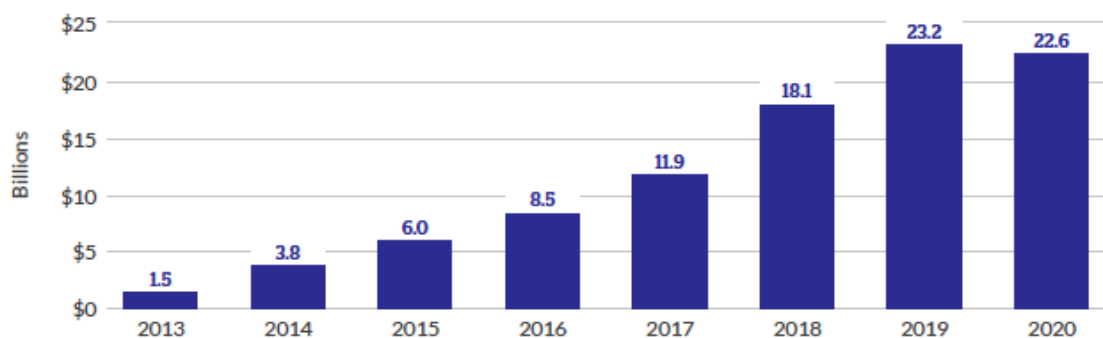
Figure 2.17. European Online Alternative Finance Market Volumes 2013-2020, USD (Including UK).
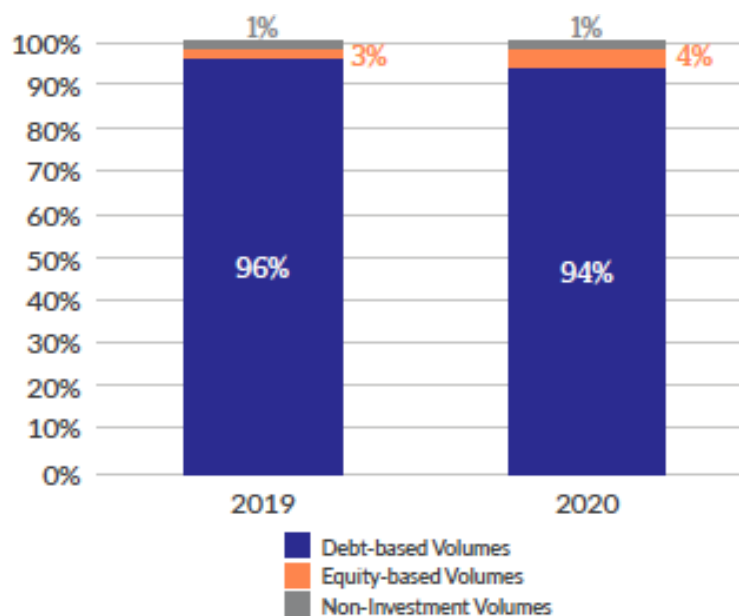
The United Kingdom (UK) remained the main contributor to the European alternative finance volume, though accounting for a smaller market share over time. The UK accounted for 56% of the European market in terms of volume. The UK online alternative finance industry reported consistent annual growth in market volume over the past five years, growing from $4.9 billion in 2015 to $12.6 billion in 2020 and, despite the challenges brought by COVID-19 and other factors, the UK online alternative finance market grew from $11 billion in 2019 to $12.6 billion in 2020. When excluding the UK (fig. 2.18), European market volumes declined more substantively from 2019 to 2020, reporting a $2.3 billion reduction, from $12.2 billion in 2019 to $9.9 billion in 2020.
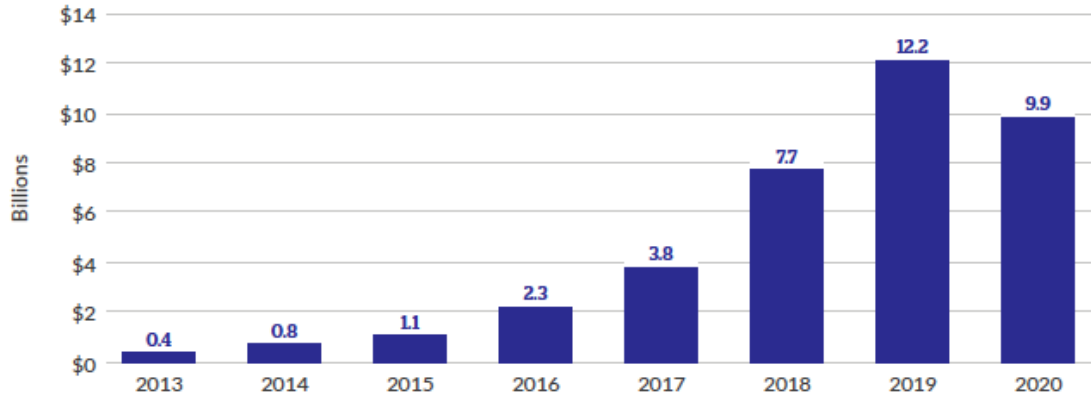
Figure 2.18. European Online Alternative Finance Market Volumes 2013-2020, USD (Excluding UK).

When considering market volume at a country level (fig. 2.19), some countries bucked the overall European trend and grew between 2019 and 2020. These included Germany ($1.42 billion to $1.48 billion), France ($1.32 billion to $1.66 billion) and Italy ($1.55 billion to $1.86 billion).

Figure 2.19. Regional Alternative Finance Volumes 2018-2020, USD.

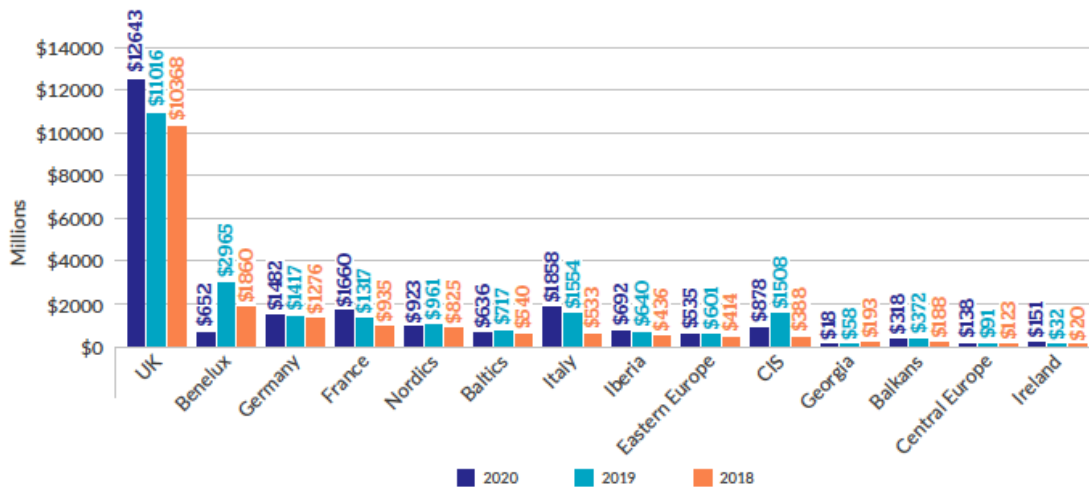## 2.2.2 Italian Market

In the last part of this chapter, I am going to analyze the Italian Crowdfunding market and in order to do that, one of the biggest source that treats the world of Crowdfunding is the *Osservatori Digital innovation della School of Management del Politecnico di Milano*[17] which recurrently produces 'The Italian Crowdinvesting Report[18]'. In particular, the 8th Report provides an overview of the Italian market as of June 30, 2023. Under the Observatory's lens, therefore, two different classes of portals:

- the authorized online collection portals by Consob, which may place shares risk capital of SMEs, minibonds and units of UCITS investing in SMEs;

- social lending portals, which convey loans from individuals to natural or legal persons, that they distinguish in portals 'crowd' and portals 'non crowd' (in the case collect online resources from investors retail).

In the fig. 2.20 one can note that the last 12 months have seen for the first time a contraction of the market compared the previous year, although very slight, with 343.99 million Euro collected (-1%). The result leads to a historical cumulative value of 1.24 billion Euro (excluding platforms which collect exclusively or predominantly not from the Internet). In detail, the annual collection for equity crowdfunding amounted to 86.64 million Euro for non-real estate projects (with a significant decrease in the first half 2023) plus 56.42 million Euro for those real estate (which instead grow). The minibonds placed on the portals amount to 20.82 million Euro, in clear decrease. Lending portals contribute in the last year with 24.76 million Euro lent to individuals and 39.36 million Euro to companies through general portals (increasing compared to last year), more 115.79 millions Euro from real estate portals (good increase in the last 12 months).

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[17]The Digital Innovation Observatories of the School of Management of the Politecnico di Milano were founded in 1999 with the aim of creating culture in all the main areas of Digital Innovation. Today they are a qualified reference point on Digital Innovation in Italy that integrates Research, Communication and Continuous Updating activities. A team of almost 100 Professors, Researchers and Analysts is engaged in research activities on almost 50 different Observatories that address all the key issues of Digital Innovation in Enterprises and Public Administration.

[18]The Crowdinvesting Observatory studies that subset of crowdfunding where individual persons (but also institutional and professional investors) can, through an enabling internet platform, directly participate in an appeal for resources for a project, either by providing a loan (lending-based model) or by subscribing to shares in the risk capital of a company (equity-based model).
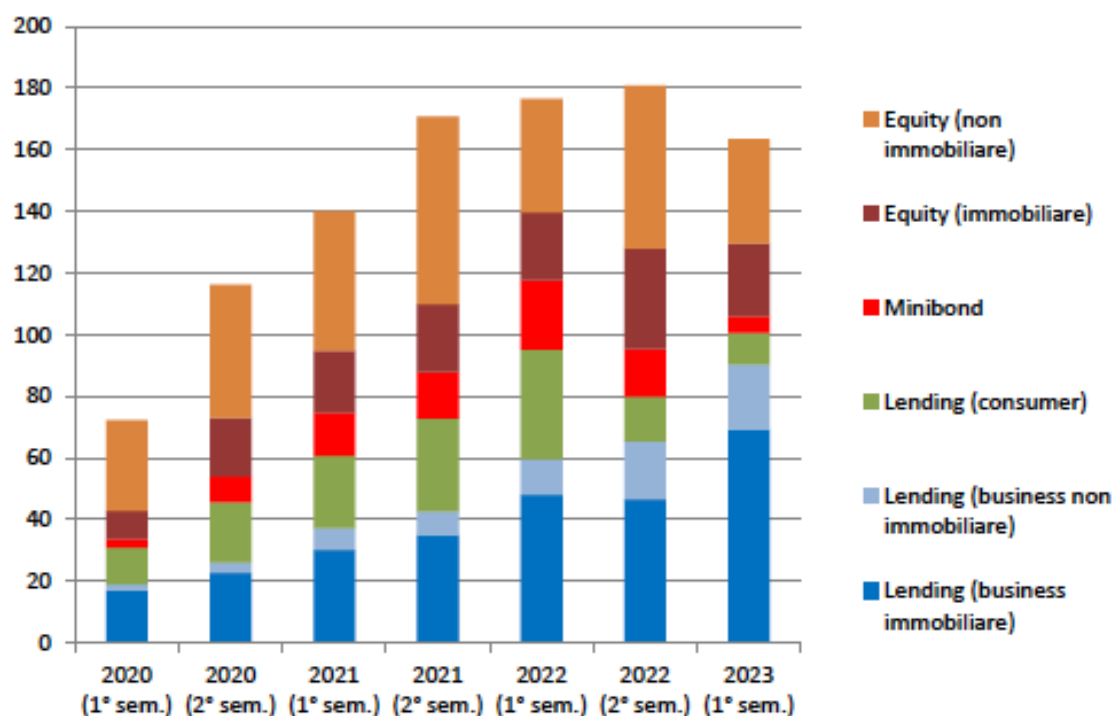
Figure 2.20. Total volumes of crowdinvesting in Italy: the flow of funds raised in each semester. Data in million Euro.

The dataset that I am going to use in my thesis contains equity crowdfunding campaigns, so now I am going to analyze this type of crowdfunding, knowing however that the analysis of the report was done on all types.

On 30 June 2023 in Italy 48 portals of equity crowdfunding, down from 51 last year. Figure 2.21 shows the number of total campaigns for the collection of capital shares risk presented by authorized online platforms from entry into force of the legislation until 30 June 2023. There are 1,268 placements, of which 989 closed positively, 233 closed without reaching the minimum target (without therefore any final collection) and 46 that were still in progress (many of which had already reached the minimum success threshold). The total capital raised in the campaigns closed positively amounted to 571.68 million Euro.
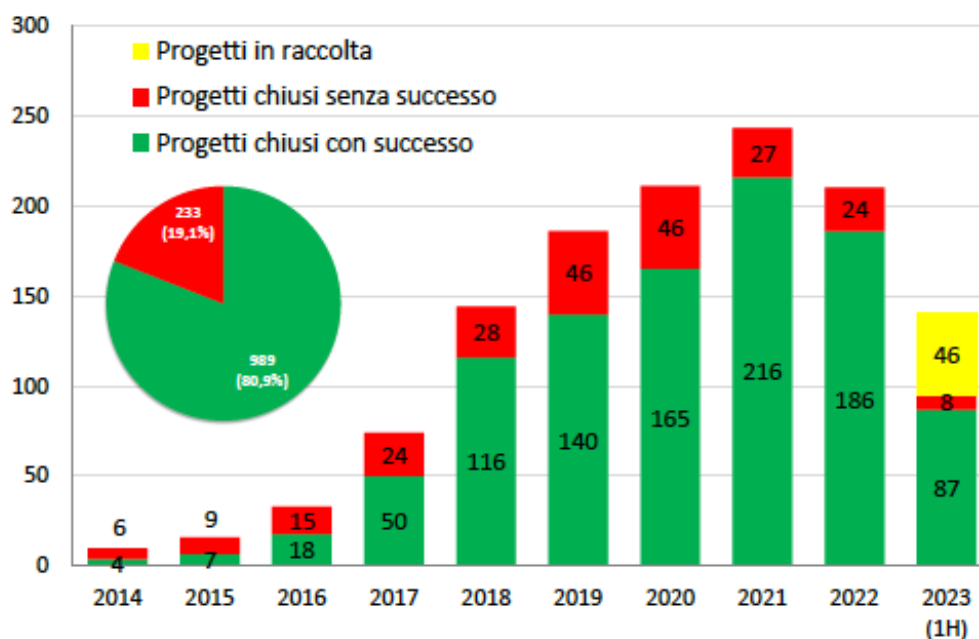
Figure 2.21. Temporal distribution of 1,268 equity crowdfunding campaigns in Italy, by the date of conclusion.

Regarding the geographical distribution, the fig. 2.22 illustrates that in the first place there is Lombardy, with 457 companies (41.2% of the total), then Emilia Romagna with 115 companies (10.3%) and Lazio with 102 companies (9.2%). In the South, Campania is still in the lead with 36 issuers (3.2%).
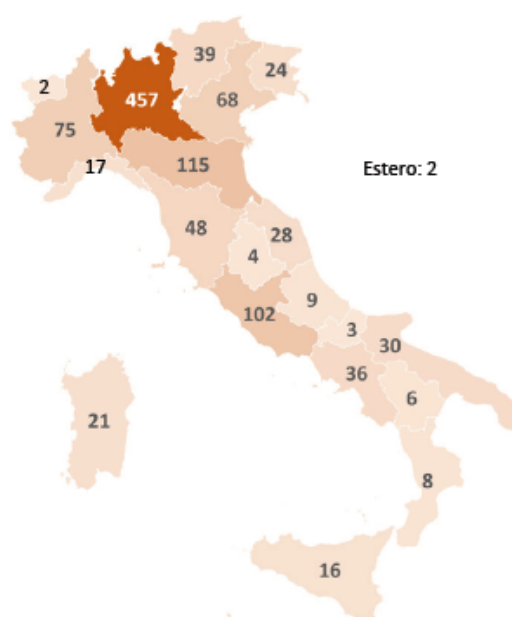
Figure 2.22. Geographical location of the 1,110 companies involved in an equity crowdfunding campaign on platforms authorized by Consob until June 30, 2023.

At the end of the analysis is important to highlight the ATECO[19] sector of the companies involved. The figure 2.23 underlines that the dominant status is of innovative startups, even if many sectors are still represented: 415 companies under the code J and 185 traceable to the code M. Manufacturing activities (code C) do not disfigure with 140 issuers. In the last year the proportions are fairly stable; one can note an increase in construction (code F) and a good decline in manufacturing. It highlights a group of companies that the Register of Companies was still inactive, because they were established a few months ago and therefore without an ATECO code still associated.
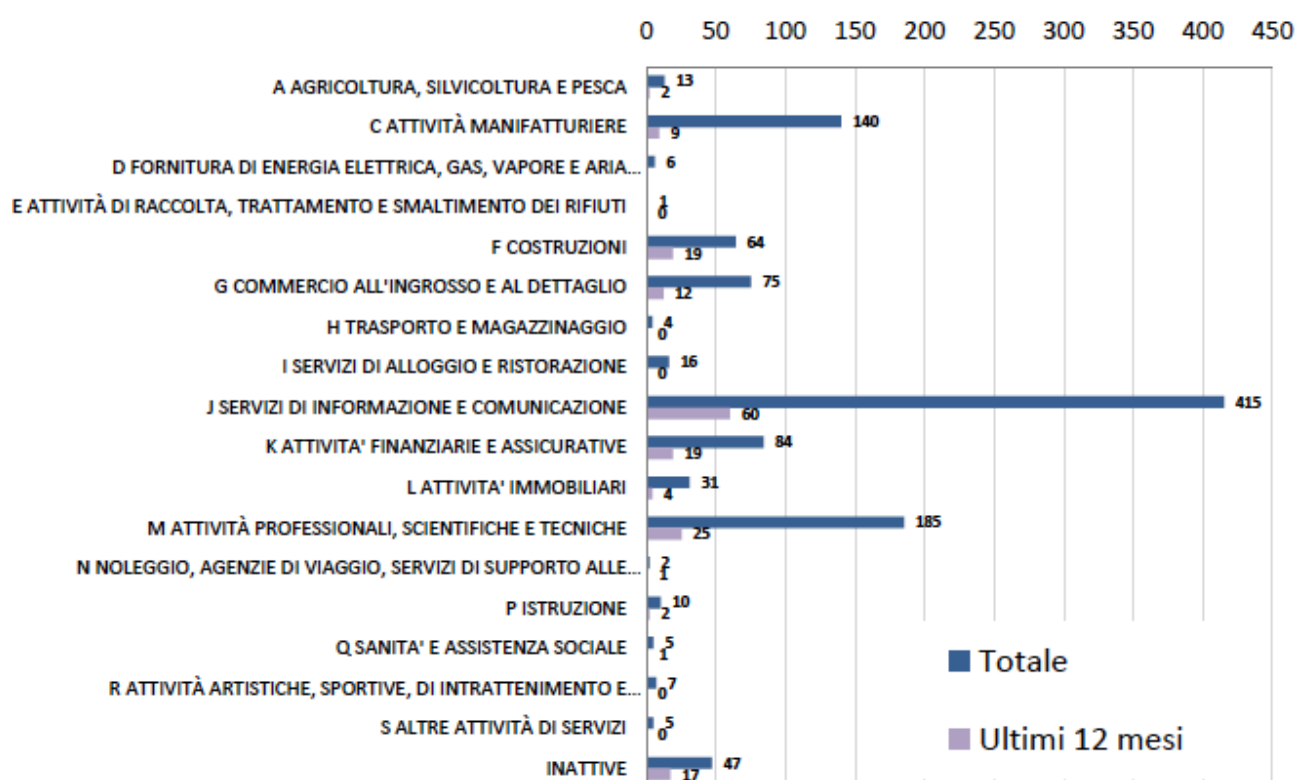
Figure 2.23. ATECO classification of the 1,110 companies involved in an equity crowdfunding campaign on platforms authorized by Consob until June 30, 2023.

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[19]The Ateco Code represents the classification of economic activities and is a type of classification adopted by the ISTAT. The section are: A-Agriculture, forestry and fishing; B-Mining and quarrying; C–Manufacturing; D-Electricity, gas, steam, and air conditioning supply; E-Water supply, sewerage, waste management, and remediation activities; F–Construction; G-Wholesale and retail trade; repair of motor vehicles and motorcycles; H-Transportation and storage; I-Accommodation and food service activities; J-Information and communication; K-Financial and insurance activities; L-Real estate activities; M-Professional, scientific, and technical activities; N-Administrative and support service activities; O-Public administration and defense; compulsory social security; P–Education; Q-Human health and social work activities; R-Arts, entertainment, and recreation; S - Other service activities; T-Activities of households as employers; undifferentiated goods and services-producing activities of households for own use; U-Activities of extraterritorial organizations and bodies.

Chapter 3

Research questions and hypotheses

Due to the progress in technology and the continuous evolution of investment strategies, the entrepreneurial finance sector has undergone substantial changes in the recent years. Conventional financing models have been significantly disrupted by the advent of crowdfunding and peer-to-peer lending, providing entrepreneurs with new opportunities and tools. The importance of startups has been recognized by governments and institutions, leading to the establishment of an ecosystem that favors entrepreneurial finance.

Crowdfunding platforms, empowered by the connectivity of the digital era, have created new avenues for accessing capital. This enables entrepreneurs and startups to gather funds from a diverse network of investors, often spanning across different regions of the world. This change has relaxed the constraints traditionally associated with funding sources, democratizing access to capital and providing entrepreneurs with a more direct channel to engage with potential supporters.

Furthermore, there has been a significant increase in investments by business angels, indicating a growing interest among individual investors in supporting startups and emerging businesses. This surge in investments has been driven by various factors, including the search for investment opportunities outside traditional financial markets, a desire to participate in innovation, and an increasing awareness of the opportunities offered by the startup sector. The rise of vibrant entrepreneurial ecosystems in many regions around the world has also contributed to catalyzing the interest of business angels, providing them with a broad pool of promising projects to invest in. This phenomenon reflects a broader trend toward a dynamic entrepreneurial ecosystem and the growing importance of venture capital in the global economy.

Research done so far covers various mechanisms and investing strategies of the different Business Angels and crowdfunding in this industry, but there is limited exploration of co-investments and interactions between them.

In my analysis I am going to explore the impact of the collaborative financing efforts between Business Angels and crowdfunding on a company; if there is an improvement in company's performance given the cooperation of these two actors of entrepreneurial finance during the lifecycle of the company.

Specifically, my focus is on understanding whether the involvement of BAs among the backers leads companies along a distinct trajectory compared to crowdfunding campaigns solely supported by a crowd of non-professional investors. In detail, I would like to understand whether the participation of a BA in a BA group has an influence on the crowdfunding campaign and on the performance of the startups in the long run. My aim is also to discover if the educational background and working experience of these professional investors influence the choice and company development in the future.

In this chapter I am going to formulate various hypotheses divided into two macro groups. The first one concerns the impact of BAs on the success of the crowdfunding campaign, during the first round of investment. While the second macro group concerns the impact they have on the company's performance in the long term, as a result of the second round of investment.

3.1 First Investment Round: BAs and Crowdfunding campaigns' result

The first aspect I am going to analyse in detail is the result of a crowdfunding campaign: if the presence of a BA changes its outcome.

Crowdfunding is dominated by high information asymmetry, leading to selection issues because project backers are usually less sophisticated and inexperienced investors (Bonini S. and Capizzi V., 2019). For this reason, I might think that having a more experienced investor like a Business Angel within the company compared to the usual investors who invest on those platforms could make a crowdfunding campaign more successful. These individuals with great expertise and knowledge carry a significant degree of credibility in the entrepreneurial world that could be a signal to prospective investors. Also, the participation of a Business Angel can

reduce the perceived risk for other investors.

BAs generally invest a greater amount of money than the average crowd investor, so high-contribution pledges in a campaign positively influence the subsequent amount pledged by investors in the same campaign. (Wang W., Mahmood A., Sismeiro C. and Vulkan N., 2019). The presence of a reputable initial investor can make the investment opportunity more appealing to others. This positive signalling effect is one of the reasons behind the greater number of backers participating to the campaign, thereby increasing the overall funding pool accumulated and bringing the campaign to the desired success.

The question that I would like to answer for this part of the analysis is the following: *"Does the presence of a professional Business Angel among the backers has a significant impact on the performance of a Crowdfunding campaign?"*

This leads to the formulation of the first hypothesis:

H1: The presence of Business Angels as investors has a positive impact on the performance of a Crowdfunding campaign.

Investments performed by Business Angels often are done in groups. For this reason, the decision to invest in a certain campaign is made using more efficient methods thanks to the sharing of information among the BAs in the group. (Bonini S., Capizzi V., Valletta M. and Zocchi P., 2018). As said before, the signaling effect influences positively the success of a campaign, therefore given that BAs belonging to a group are more credible and professional, this effect will ensure that the positive impact is greater compared to individual BAs. The presence of multiple successful BAs in a group can contribute to the accumulation of overall credibility. If some members of the group have already been successful in previous investments, this can positively reflect on the entire group, increasing the trust of other investors. As Butticè, Croce and Ughetto (2018) found, the decision made by BA to invest in a certain ECF campaign, especially if the BA has a certain level of centrality within the group, could also attract other BAs, allowing for even greater collected amounts. Moreover, investment decisions made as a group can be perceived as the result of more in-depth evaluation and collaborative discussions. This can contribute to a higher level of trust from other investors compared to decisions made individually. The presence of a group of BAs can represent a form of risk diversification. Since there are multiple investors involved, the perceived risk by other potential investors may decrease, as the financial burden is distributed among multiple participants.

So, it led me to a more detailed hypothesis than the first:

H2: The presence of Business Angels belonging to Angel Groups as investors has a higher positive impact than individual BAs on the performance of a Crowdfunding campaign.

Continuing with the analysis, the following two hypotheses regard the educational background and working experience of Business Angels. The educational background and working experience of a BA can contribute to their credibility and reputation in the entrepreneurial world. A positive reputation can attract the attention of other investors and increase the trust of entrepreneurs seeking funding. A BA with a strong educational background and work experiences in a specific industry may possess greater expertise and knowledge of that industry that can positively influence the success of a crowdfunding campaign for a company operating in that sector, as the BA will be better able to assess the investment opportunity. The working experiences of a BA may have contributed to building an extensive network of contacts in the business world. A robust network can be crucial for the success of a campaign, facilitating access to potential investors, business partners and sources. Early support by experts for crowdfunded cultural projects exerts a positive certification effect, significantly increasing the chances for campaign success and the number of future backers of a project (Petit A. and Wirtz P., 2022). Consequentially I expect that Business Angels' educational background and their managerial, technical, professional or entrepreneurial job experiences would influence the crowdfunding campaigns' outcome. So, I formulated the following hypotheses that need to be investigated and tested:

H3: The educational background of the Business Angels investing in a campaign influences the performance of a Crowdfunding campaign.

H4: The managerial, technical, professional or entrepreneurial working experience of Business Angels investing in a campaign further influences the performance of a Crowdfunding campaign.

3.2 Second Investment Round: BAs' impact on the performance of the startups in the long run

Now I am going to formulate hypotheses about the future of the undertakings after the first investment round.

So, the second research question is: *"Does the presence of a professional Business Angel among the backers in the first investment round has a significant impact on the performance of the company in the long run?"*

BAs are not only investors who fund the company, they don't just bring money, they also come with an immense amount of knowledge, real-world experience, and a network of valuable connections (Croce A., Ughetto E., Bonini S. and Capizzi V., 2020). They provide know-how, giving a lot of help to the entrepreneurs of the startup in the phases following the crowdfunding campaign. This aid could be useful above all if the company decides to participate in others investment rounds. There is considerable agreement among the various studies that the entrepreneur/management team is the most important factor and the growth potential of the market and product/service attributes are ranked second and third, respectively, but are considerably less important (Tenca F., Croce A. and Ughetto E., 2018).

Furthermore, BAs use several different decision-making criteria throughout their investment process so their ability to select high-quality investment opportunities plays a particular role, in particular they influence the probability of obtaining VC (Capizzi V., Croce A. and Tenca F., 2021). For this reasons, my analysis continues by analyzing the impact of BAs in the long run, particularly near the second investment round.

In this case, I could think that having a BA in the board of the company can impact the performance in the long term. If the second round pre-Money valuation is high, the probability of success of the subsequent investment rounds increases. Butticè, Di Pietro and Tenca (2020) in their research found that a successful equity crowdfunding campaign facilitates the attraction of subsequent VC financing or other types of funding, as a result of the signalling theory that recognizes crowdfunding and angel investors as a mechanism through which new ventures can signal their value by whom has invested in the firm.

Capizzi, Croce and Tenca (2021) deal with BAs' selectivity, as measured by their rejection rate and found that it is positively related with the probability of receiving follow-on VC

financing. The rejection rate is informative for the VC investment decision or other subsequent investors.

This leads of the formulation of the following research hypothesis:

H5: The presence of Business Angels as investors has a positive impact on the performance of the company after the first investment round.

Moreover, in the same research mentioned previously, they deal with BAs' affiliation to an angel network. This characteristic is positively related with the probability of raising follow-on VC financing (Capizzi V., Croce A. and Tenca F., 2021). A group of Business Angels can bring a wide range of diverse skills and experiences. Each member can contribute with industry-specific knowledge, managerial skills, network connections, and entrepreneurial expertise. This diversity can provide the startup with a broader range of resources and skills, enhancing overall management capabilities. The largest network of BA in groups compared to individual BAs can open up opportunities for strategic partnerships, potential clients, and additional resources. The connections of group members can be leveraged to accelerate growth and improve the visibility of the startup increasing the performance of the company. Diversification of skills, resources, and networks in a group can reduce the risk of failure. While an individual BA may have limitations, a group can provide a broader range of resources that help the startup overcome challenges and adapt to changing market conditions. The presence of a group may mean greater availability of long-term strategic support. Group BAs may be more likely to actively engage in managing the startup, offering consultancy, and contributing to strategic decisions to enhance overall business performance over time. A group of BAs may be able to provide a higher overall amount of funding compared to a single BA. This can enable the startup to execute more ambitious growth plans, make significant investments in research and development, or face financial challenges with greater flexibility.

For these reasons I hypothesize that:

H6: The presence of Business Angels belonging to Angel Groups as investors has a higher positive impact than individual BAs on the performance of the company after the first investment round.

About the educational background and working experience the results of the existing research indicate significant differences in terms of characteristics of the BAs; companies financed by BAs with higher education (Master's degree) have a significantly higher probability of re-

ceiving follow-on financing by VC. The same result holds when the focus is on entrepreneurial and investing experience; more experienced BAs seem to increase the probability of follow-on VC financing in the same company (Capizzi V., Croce A. and Tenca F., 2021).

Contributions from expert backers, whether specialized in the same creative industry as a given project or not, trigger additional contributions and improve the success probability of a funding campaign (Petit A. and Wirtz P., 2020)

As I said previously, they act as company advisors and mentors to growing entrepreneurs and further increasing their businesses' successes possibilities. So, it's possible that a company with an expert BA might perform better in the long run.

Related to this result, I could formulate the last two hypotheses:

H7: The Educational Background of the Business Angels investing in a campaign has an impact on the company in the long run.

H8: The managerial, technical, professional or entrepreneurial working experience of Business Angels investing in a campaign further impacts the performance of the company in the long run.

In the following chapter, I am going to describe the available sample data, specifying the main variables and methodology used in order to confirm all the hypotheses presented in this chapter.

Chapter 4

Sample Data and Methodology

The previous chapters served as a basis to get to the main part of my thesis, which is to analyze the impact of the presence of a BA among the investors on the performance of startups financed through ECF campaigns, both considering the success of the campaign and the performance of the company in the long run.

I started with a literature review and I analysed the previous academics researcher to understand how to move in the entrepreneurial finance landscape (Chapter 1). Then I did an investigation on the BAs and crowdfunding markets to get a better understanding of the environment and the context in which I am going to implement my research (Chapter 2). Subsequently, I drafted my hypotheses regarding the research I would like to do, which are the path I would like to explore (Chapter 3). Finally, I will analyse the available data and verify if the results are in line with my hypotheses and expectations (Chapter 5). The thoughtful interpretation of the results will lead me to the identification of a potential policy and managerial implications that can give some meaningful insights for the investors during their investment decision making process (Chapter 6).

Before going into the analysis of the variable and then, in the most important part regarding the demonstrations of the hypotheses, I am going to present the datasets used and explain the methodology and techniques I am going to perform.

4.1 Datasets

To perform my empirical analysis, I identified and collected data on the successful ECF campaigns launched on all the active Italian platforms from 2014 to 2020. The primary data source is the *Osservatori Digital innovation della School of Management del Politecnico di Milano.* The dataset comprises 340 observations (the number of observations may differ for each variable present in the dataset) and more than 500 variables, some of them added by me to better perform the research. The ECF campaigns were taken from various crowdfunding platforms. The variables regard the ECF campaign itself, characteristics of the companies, an overview of the educational background and working experience of the founders and the investors. The data includes information about each campaign, providing what was the target capital, the share of capital offered to the investors and the amount effectively collected. About the campaign, starting data, duration, type of shares, the ECF platform used and other related details are recorded. It also contains the characteristics of the startups participating in the campaign: their size, industry, some key numbers from the balance sheet and income statement, such as total assets, tangible assets, debts, equity, turnover, operational costs, profit or loss and some financial indicators as the leverage ratio or profitability ratio. Moreover, the dataset includes information about the investors with a close look at the individual profiles of the BAs who participated.

To gather more information regarding the educational background and work experience of the BAs, I also utilized *LinkedIn.* Firstly, I identified the names of BAs associated with the campaigns and subsequently verified their identity by cross-referencing the information in the dataset with their *LinkedIn* profiles, where available. I was particularly interested in their educational background, including the colleges and universities they attended, as well as the type of degree each of them held. Additionally, I researched their work experience, both past and current job positions. Specifically, I categorized their job positions into managerial, entrepreneurial, technical, or if they were professional investors.

Another addition and check made to the initial dataset was made using another database called *Orbis Bureau Van Dijk.* I used it to identify different type of investors: individual BAs, BA group members and serial entrepreneurs who participated in an exit in the past. The filters adopted are the following: i) shareholder, ii) current & previous role, iii) individual, iv) Italian residence and Italian nationality and v) company status inactive/unknown. The scope

of the search was to extract all the individuals who had a role of shareholder of companies that now are inactive. Behind there is the idea that if the individual was a shareholder of a company that is inactive then one may think that the company had an exit or made an M&A, it therefore received a large sum of money, making it a possible BA. The result is a list of 1,579,868 individuals (some are duplicates) that met the criteria. After that, the individuals have been checked using *Zephyr Bureau Van Dijk*[20] in order to match the previous shareholders with individuals that had an exit with IPO or M&A.

The final result is the increased dataset explained previously. This large dataset is useful to better understand the dynamics surrounding the companies during the ECF and its subsequent development phase.

4.2   Methodology adopted

In order to verify my hypotheses using the dataset illustrated before, I am going to implement the following steps:

1. Descriptive statistics

2. Multiple Regression models

The first one give to me an overview on the data: insights on the crowdfunding campaign, on the company, the educational background and working experience of founders and investors. Instead, the second one is used to identify and describe the relations between the variables, with the aim to obtain the factors that vehicle the success of the crowdfunding campaign and the post-performance of the company. To implement the two steps, I used *Stata*[21].

4.2.1   Descriptive statistics

Descriptive statistics or descriptive analysis is a branch of statistics that focuses on the description and organization of collected data. This initial phase of data analysis is essential for

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[20]Zephyr contains information on M&A, IPO, Private Equity and Venture Capital transactions and related Rumour from around the world, with historical series and no limit to deal size.

[21]Stata is a general-purpose statistical software package developed by StataCorp for data manipulation, visualization, statistics, and automated reporting. It is used by researchers in many fields, including biomedicine, economics, epidemiology, and sociology.

gaining a clear and concise understanding of the key features within a dataset. The primary objective of descriptive analysis is to effectively present key information contained in the data, making trends, patterns and salient characteristics more accessible. By manipulating past data, it draws on insights and makes them more meaningful. Descriptive analysis is often the first step in exploring a dataset and can provide an initial overview of fundamental characteristics without resorting to more complex statistical inferences. This methodology is particularly useful in decision-making processes, presenting preliminary results and identifying any patterns or anomalies in the data. For my purpose I am going to use a measures of Central Tendency (mean), measures of Dispersion (standard deviation, minimum and maximum), absolute and relative frequencies.

The goal of this phase is to get a complete view of the different aspects related to the variables in the dataset. In doing so, my objective is to gather useful insights into how these factors interact with each other. This understanding forms the basis for the next step, the multivariate analysis.

4.2.2 Multiple Regression models

After the first analysis I built some multiple regression models to test my hypotheses. Multiple regression (extension of simple linear regression) is a statistical method used to explore the relationship between a dependent variable and two or more independent variables. In simpler terms, it helps us understand how multiple factors may collectively influence a particular outcome. The dependent variable is the outcome or response variable that you are trying to predict or explain, while the independent variables are the factors that you believe have an impact on the dependent variable.

The multiple regression model is expressed as:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + \varepsilon \tag{4.1}$$

where Y is the dependent variable. β_0 is the y-intercept, representing the predicted value of Y when all independent variables are zero. β_1, β_2 and β_n are the coefficients, indicating the change in Y for a one-unit change in the corresponding independent variable, with $E(\varepsilon) = 0$. X_1, X_2 and X_n are the independent variables. The last component, ε, is the error term,

representing the unexplained variation in Y. This error may arise due to unaccounted variables or random influences.

The multiple regression models aims to estimate the coefficients (β) that minimize the difference between the observed values of the dependent variable and the values predicted by the model. This statistical technique is valuable for understanding the complex relationships between multiple variables and making predictions based on those relationships.

Another model used in the following chapter, in particular to analyse the performance of the company post-campaign, is the Logistic regression model (or logit model). Logistic regression analysis is used to investigate the relationship between binary or ordinal response probability and explanatory variables. In simpler terms, logistic regression is employed when the variable to be predicted can take only two values, such as "success" or "failure," "1" or "0," "positive" or "negative"; although the independent variables can each be a binary variable (two classes, coded by an indicator variable) or a continuous variable (any real value).

In the following tables (tab. 4.1 and 4.2) I am going to illustrate what are the variables[22] used as dependent and which as independent.

Variable	Description
Raccolto	N: collected amount of money during the ECF campaign.
SuccSecondRound	D: 1 if the company has had a successful second funding round and 0 otherwise.
Vpremoney_2round	N: pre-money valuation before the second funding round.

Table 4.1. Dependent Variables used in the regression models.

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[22]If it is a numeric variable there will be the letter **N**, if it is a dummy variable there will be the letter **D**.

Variable	Description
BA	D: 1 if there was at least one BA as investors in the ECF campaign , 0 otherwise.
Ind_BA	D: 1 if there was at least one individual BA as investors in the ECF campaign , 0 otherwise.
BAG_member	D: 1 if there was at least one BA, who is part of BA Group, as investors in the ECF campaign , 0 otherwise.
SerialEntrepreneur_exit	D: 1 if there was at least one Serial Entrepreneur, who did an exit, as investors in the ECF campaign , 0 otherwise.
avg_InvExperience	N: average years of working experience of the investors.
avg_InvExperience_SameAteco	N: average investors working experience in the Same ATECO as the company.
Vpremoney	N: pre-money valuation before the first crowdfunding campaign.
Vpremoney_2round	N: pre-money valuation before the second funding round.
timing_to_SuccSecondRound	N: number of years between the first and second investment round
Targetcapital	N: amount of capital that the company needs to achieve order to carry out its business.
LeverageRatio	N: company leverage ratio before the ECF campaign.
Quotaofferta	N: percentage share of capital given to the investors in exchange for the target capital requested.
CompanyAge	N: age of the company at the time of the ECF campaign.
TotalassetsthEUR	N: company total assets value (in thousands of Euro) before the ECF campaign.
VCPre	D: 1 if the company obtained fundings from a VC before the ECF campaign, 0 otherwise.
d_year_2018	D: 1 if the ECF campaign took place in 2018, 0 otherwise
d_year_2019	D: 1 if the ECF campaign took place in 2019, 0 otherwise
d_year_2020	D: 1 if the ECF campaign took place in 2020, 0 otherwise
d_other_years	D: 1 if the company belongs to an years different from those used in the model, 0 otherwise.
C_Manifacturing	D: 1 if the company belongs to the Manufacturing sector,0 otherwise.
J_Inf_Comm	D: 1 if the company belongs to the Information and Communication sector,0 otherwise.
G_Trade	D: 1 if the company belongs to the Trade sector,0 otherwise.
K_Fin_Ins	D: 1 if the company belongs to the Financial and Insurance sector,0 otherwise.
M_Prof_Sc_Tech	D: 1 if the company belongs to the Professional, Scientific and Technical sector,0 otherwise.
d_other_sectors	D: 1 if the company belongs to an industry sector different from those used in the model, 0 otherwise.
CrowdFundMe	D: 1 if the ECF campaign has been accomplished through the portal CrowdFundMe, 0 otherwise.
MamaCrowd	D: 1 if the ECF campaign has been accomplished through the portal MamaCrowd, 0 otherwise.
d_Lombardia	D: 1 if the company based in Lombardia, 0 otherwise.
d_EmiliaRomagna	D: 1 if the company based in Emilia Romagna, 0 otherwise.
d_Molise	D: 1 if the company based in Molise, 0 otherwise.
d_Piemonte	D: 1 if the company based in Piemonte, 0 otherwise.
d_FriuliVG	D: 1 if the company based in Friuli Venezia Giulia, 0 otherwise.
d_other_reg	D: 1 if the company based in a region different from those used in the model, 0 otherwise.
d_DegreeSectorBMBusiness	D: 1 if there is at least one BA with Bachelor or Master Business degree among the investors, 0 otherwise.
d_DegreeSectorBMHumanities	D: 1 if there is at least one BA with Bachelor or Master Humanistic degree among the investors, 0 otherwise.
d_DegreeSectorBMTechnical	D: 1 if there is at least one BAs with Bachelor or Master Technical degree among the investors, 0 otherwise.
d_WorkingExperienceDuringEntr	D: 1 if there is at least one BA among the investors who is an entrepreneur, 0 otherwise.
d_WorkingExperienceDuringMana	D: 1 if there is at least one BA among the investors who is a manager, 0 otherwise.
d_WorkingExperienceDuringProf	D: 1 if there is at least one BA among the investors who is a professional investor, 0 otherwise.
d_WorkingExperienceDuringTech	D: 1 if there is at least one BA among the investors who is a technician, 0 otherwise.
d_WorkingExperiencePastEntr	D: 1 if there is at least one BA among the investors who was an entrepreneur before the ECF campaign, 0 otherwise.
d_WorkingExperiencePastMana	D: 1 if there is at least one BA among the investors who was a manager before the ECF campaign, 0 otherwise.
d_WorkingExperiencePastProf	D: 1 if there is at least one BA among the investors who was a professional investor before the ECF campaign, 0 otherwise.
d_WorkingExperiencePastTech	D: 1 if there is at least one BA among the investors who was a technician before the ECF campaign, 0 otherwise.

Table 4.2. Independent Variables used in the regression models.

Chapter 5

Empirical Results

In this chapter I am going to illustrate some summary statistics about crowd-investors, business angels and invested companies to better understand their characteristics. Then I am going to perform a multivariate analysis on the chosen variables in order to analyze their impact on the success of the ECF campaign and the subsequent growth of the company in term of performance.

In past research the co-investments between different types of players, such as BA and VC or new funding options, for example startup incubators, accelerators, science and technology parks, university-affiliated seed funds and in particular crowdfunding have been little studied. Hence, within this chapter and leveraging the methodologies outlined in the preceding section, my objective is to investigate how the synergy between BAs and ECF campaign influences a company. I seek to determine whether this interaction results in enhanced outcomes for ECF campaigns and positively impacts the overall performance of the company throughout its lifecycle.

5.1 Descriptive Statistics

In the tab. 5.1 are illustrated key statistics for the most important variables in the dataset used to have an overview of the data.

The average number of investors in a campaign was 80 with a minimum of 2 and a maximum of 720. Between them only 10% was women, the minimum case of presence of women was 0 instead the maximum 62%. Investors had on average a little less than 3 years of investment experience, with a minimum of 0 and a maximum of 21 years. The average age of the investors was 45 years, going from 32 to about 65 years.

Before the crowdfunding campaign, the average pre-money company valuation stood at 2,926,193 Euro: the lowest valuation was 1,000 Euro, while the highest reached 43,500,000 Euro. Before the second round of investment, the average pre-money company value was 3,711,804 Euro. The lowest value was 106,250 Euro and the highest value was 44,500,000 Euro. The increase in value of the companies before the first investment round and before the second one could be attributed to help from some investors, in particular those with more expertise and knowledge about the management of a company (for example the BAs).

The equity share offered was on average of 8.5%, with a range from 0.50% to 99%. Instead, the average target capital was 164,860 Euros, going from 30,000 Euro to 2,200,000 Euro for the more innovative and technological companies. The campaigns raised on average 351,028 Euro, with a minimum of 40,000 Euro and a maximum of 7,615,250 Euro.

The age of the companies, on average, were 3 years. The youngest company had just been founded in same year of the campaign while the oldest had been established for 31 years.

In the table one can see also other characteristics of the companies such as some items of the balance sheet and the income statement and also financial indicators.

Variable	N	mean	sd	min	max
BA	340	.4823529	.5004249	0	1
Ind_BA	340	.4147059	.4933973	0	1
BAG_member	340	.2147059	.4112233	0	1
SerialEntrepreneur_exit	274	.0583942	.2349163	0	1
Num_investor	277	79.87004	87.40032	2	730
perc_wom	340	.1030871	.087788	0	.6206896
avg_InvExperience	340	2.722223	2.759505	0	21.33333
avg_inv_age	340	45.14945	4.721177	32	64.875
Vpremoney	323	2926193	4113351	1000	4.35e+07
Vpremoney_2round	326	3711804	4836763	106250	4.45e+07
Quotaofferta	323	.0848754	.116805	.0049751	.99
Targetcapital	340	164860.7	200367.1	30000	2200000
Raccolto	340	351028.3	631287.2	40000	7615250
SuccSecondRound	340	.2617647	.4402431	0	1
VCPre	340	.0264706	.1607666	0	1
CompanyAge	340	3.082353	3.358472	0	31
TotalassetsthEUR	323	1.84e+14	1.17e+15	859	9.94e+15
TangiblesthEUR	323	3.15e+14	1.62e+15	0	9.77e+15
EBITDAthEUR	278	-5.17e+13	1.87e+15	-9.90e+15	9.21e+15
CashflowthEUR	279	-1.26e+14	2.12e+15	-9.98e+15	9.15e+15
CashthEUR	317	3.61e+14	1.70e+15	1	9.88e+15
Netincometh	232	-2.44e+14	2.18e+15	-9.55e+15	9.46e+15
Turnoverth	323	4.07e+14	1.81e+15	0	9.63e+15
LeverageRatio	322	1.48e+10	2.06e+11	0	3.68e+12
ProfitabilityRatio	232	-1.59e+10	2.09e+11	-3.18e+12	6.52e+10
d_DegreeBachelorMaster	340	.2617647	.4402431	0	1
d_DegreeSectorBMBusiness	340	.1558824	.3632784	0	1
d_DegreeSectorBMHumanities	340	.0323529	.1771964	0	1
d_DegreeSectorBMTechnical	340	.1558824	.3632784	0	1
d_WorkingExperienceDuringEntr	340	.1117647	.3155411	0	1
d_WorkingExperienceDuringMana	340	.2382353	.4266317	0	1
d_WorkingExperienceDuringProf	340	.1	.3004422	0	1
d_WorkingExperienceDuringTech	340	.0411765	.198991	0	1
d_WorkingExperiencePastEntr	340	.1088235	.3118767	0	1
d_WorkingExperiencePastMana	340	.2529412	.4353382	0	1
d_WorkingExperiencePastProf	340	.0794118	.2707789	0	1
d_WorkingExperiencePastTech	340	.0941176	.2924227	0	1

Table 5.1. Descriptive statistics on sample data (observations (N), mean, standard deviation, minimum and maximum values) .

5.1.1 Crowdfunding platforms and Companies: key statistics

The ECF campaigns in my datasets were taken from various Crowdfunding platforms, they can be seen in details in the tab. 5.2 where can be observed the distribution of the variable *Crowdfunding_platform*. The platforms where there are more observations are MamaCrowd (76), CrowdFundMe (75) and to a lesser extent BacktoWork24 (49). The sum of observations in these three platforms equals about 59% of the total. Probably these platforms became more famous between entrepreneurs and investors, leading to a higher number of campaigns launched on them.

Crowdfunding_platform	Freq.	Percent	Cum.
200 Crowd	30	8.82	8.82
Action Crowd	1	0.29	9.12
BacktoWork24	49	14.41	23.53
Cofyp	1	0.29	23.82
CrowdFundMe	75	22.06	45.88
CrowdInvest Italia	1	0.29	46.18
Doorway	6	1.76	47.94
Ecomill	4	1.18	49.12
Fundera	2	0.59	49.71
LifeSeeder	1	0.29	50.00
Lita.co	2	0.59	50.59
MamaCrowd	76	22.35	72.94
MyBestInvest	1	0.29	73.24
Next Equity	5	1.47	74.71
OPStart	42	12.35	87.06
StarsUp	19	5.59	92.65
The Best Equity	1	0.29	92.94
Unica Seed	1	0.29	93.24
WeAreStarting	23	6.76	100.00
Total	340	100.00	

Table 5.2. Variable distribution of the Crowdfunding platforms.

In the following table (tab. 5.3) is exhibited the distribution of the variable *years_ECF* that collects the years in which the ECF campaigns took place and utilized in my research. As it can be seen in the table, the years in which the greater number of campaigns started go from 2018 and 2020 (about 82% of the total campaigns).

years_ECF	Freq.	Percent	Cum.
2014	3	0.88	0.88
2015	5	1.47	2.35
2016	11	3.24	5.59
2017	41	12.06	17.65
2018	82	24.12	41.76
2019	97	28.53	70.29
2020	101	29.71	100.00
Total	340	100.00	

Table 5.3. Variable distribution of ECF campaigns' years.

Now my focus is shifting to the characteristics of the companies present in the platforms previously analyzed.

In the tab. 5.4 the distribution of the variable *Regions* can be observed. The region that has the higher number of Crowdfunding campaigns is Lombardia (133 campaigns representing almost 40% of the sample). The reason is that Lombardia has enjoyed the most significant benefits from crowdfunding industry thanks to its robust economic ecosystem and favorable entrepreneurial environment. Lombardia is a place where innovation and business development thrive, offering several key factors that attract crowd-investors and also BAs' attention such as access to capital, infrastructure, resources and many others. Lombardia is still a magnet for investors because of its favorable conditions for startups and the potential for substantial returns, despite all these factors. The annual Survey21 by *IBAN* - Italian Business Angels Network 2023 confirms this result. Furthermore, it can be noticed that the most of the campaigns are located in the north of Italy (Emilia Romagna, Piemonte, Veneto and Trentino Alto Adige) and in Lazio (25 observations).

Regions	Freq.	Percent	Cum.
Abruzzo	3	0.88	0.88
Basilicata	1	0.29	1.18
Calabria	4	1.18	2.35
Campania	7	2.06	4.41
Emilia Romagna	30	8.82	13.24
Friuli VG	8	2.35	15.59
Lazio	25	7.35	22.94
Liguria	8	2.35	25.29
Lombardia	133	39.12	64.41
Marche	12	3.53	67.94
Molise	2	0.59	68.53
Piemonte	28	8.24	76.76
Puglia	14	4.12	80.88
Sardegna	9	2.65	83.53
Sicilia	7	2.06	85.59
Toscana	11	3.24	88.82
Trentino AA	14	4.12	92.94
Umbria	2	0.59	93.53
Valle d'Aosta	2	0.59	94.12
Veneto	20	5.88	100.00
Total	340	100.00	

Table 5.4. Regions in which companies are situated.

The next table (tab. 5.5) shows the distribution of the main sectors of investment based on the ATECO 2007 classification. One can note that the main sectors of investment were *C - Manufacturing, J - Information and communication and M - Professional, scientific, and technical activities*, which represent about 80% of the total.

ATECO	Freq.	Percent	Cum.
A	2	0.59	0.59
C	57	16.76	17.35
D	3	0.88	18.24
F	3	0.88	19.12
G	28	8.24	27.35
I	3	0.88	28.24
J	152	44.71	72.94
K	18	5.29	78.24
L	2	0.59	78.82
M	62	18.24	97.06
P	3	0.88	97.94
Q	3	0.88	98.82
R	2	0.59	99.41
S	2	0.59	100.00
Total	340	100.00	

Table 5.5. Distribution of the variable ATECO sector.

The variables in the tab. 5.6 represent the target capital that companies have promised to collect in order to define their campaigns a success and the equity stake offered to investors. The companies have a target capital ranging from 30,000 Euro to 2,200,000 Euro (mean value is equal to 165,000 Euro). The ownership offered to the investors is on average of 8.5% and has a standard deviation of 11.7%, going from 0.5% to 99%.

	N	mean	sd	min	max
Targetcapital	340	164860.7	200367.1	30000	2200000
Quotaofferta	323	.0848754	.116805	.0049751	.99

Table 5.6. Summary statistics of variables *Targetcapital* and *Quotaofferta*.

The considered companies' value before ECF goes from 1,000 Euro to a value greater than 40 million Euro. It can be observed that the ECF campaigns increased the value of the considered companies being that the average company value before was 2,926,193 Euro and after reached 3,084,130 Euro; the minimum value became 81,000 Euro!

	N	mean	sd	min	max
Vpremoney	323	2926193	4113351	1000	4.35e+07
Vpostmoney	323	3084130	4180537	81000	4.45e+07

Table 5.7. Summary statistics of variables *Vpremoney* and *Vpostmoney*.

5.1.2   Companies' Founders: key statistics

In this section I am going to describe the characteristics of the companies' founders. Tab. 5.8 exhibits the distribution of the variable *NumberOfFounders* that collects the number of founders of the companies present in the dataset. Almost 98% of the teams are composed by 3 or less members. In particular, the companies founded by a sole individual represents 42.61% of the total while 41.55% have a team of two founders and 13.73% is composed by three individuals. The maximum number of founders is 5.

NumberOfFounders	Freq.	Percent	Cum.
1	121	42.61	42.61
2	118	41.55	84.15
3	39	13.73	97.89
4	4	1.41	99.30
5	2	0.70	100.00
Total	284	100.00	

Table 5.8. Distribution of the variable that represents the founders' teams' composition.

In tab. 5.9 is displayed the distribution of the variable *CEOFounders* which is the number of CEO founders. The 87.59% is characterized by having only one of the founders with the role of CEO.

CEOFounders	Freq.	Percent	Cum.
0	21	7.45	7.45
1	247	87.59	95.04
2	14	4.96	100.00
Total	282	100.00	

Table 5.9. Distribution of the variable that represents the number of CEO founders.

Tab. 5.10 contains the distribution of the variable *Founders_SerialEntr*. As one can observe, most companies in the datasets have zero or one founder that is a serial entrepreneur (88.32%).

Founders_SerialEntr	Freq.	Percent	Cum.
0	126	45.99	45.99
1	116	42.34	88.32
2	24	8.76	97.08
3	7	2.55	99.64
5	1	0.36	100.00
Total	274	100.00	

Table 5.10. Distribution of the variable that represents the number of founders that are serial entrepreneur.

In the following two tables are analyzed the educational background of the founders, in particular if they are undergraduate or they have a Master's degree. One can notice in tab. 5.11 that 75 companies do not have any undergraduates (28.20% of the total) while the remaining 71.80% of teams comprise at least one undergraduate member within their composition.

Analyzing the results of the second table (tab. 5.12), the highest percentage (48.87%) of the teams have one founder with a Master's degree and the largest number of founders in each company with this degree is three.

Undergraduate	Freq.	Percent	Cum.
0	75	28.20	28.20
1	111	41.73	69.92
2	65	24.44	94.36
3	14	5.26	99.62
4	1	0.38	100.00
Total	266	100.00	

Table 5.11. Distribution of the variable that represents the number of undergraduates in each team of founders.

Founders_Master_Degree	Freq.	Percent	Cum.
0	78	29.32	29.32
1	130	48.87	78.20
2	47	17.67	95.86
3	11	4.14	100.00
Total	266	100.00	

Table 5.12. Distribution of the variable that represents the number of founders with a master's degree in each team.

5.1.3 Business Angels: key statistics

The last part of my descriptive analysis concerns the Business Angels that invested in the 340 undertakings. In tab. 5.13, I show an overview of the distribution of the variable *BA* that represents if a company has at least one BA as investor or not. The number of campaigns with at least one BA are 164 (48.24%).

BA	Freq.	Percent	Cum.
0	176	51.76	51.76
1	164	48.24	100.00
Total	340	100.00	

Table 5.13. Number of campaigns with at least one BA investor.

In the following three tables I go into details of the BAs. In particular tab. 5.14 provides the number of campaigns with at least one individual BA (41.47%). Instead, tab. 5.15 illustrates the number of campaigns with at least one BAG member (21.47%). The last table, tab. 5.16, contains the number of campaigns with at least one serial entrepreneur who participated in an exit in the past (only 5.84%).

Ind_BA	Freq.	Percent	Cum.
0	199	58.53	58.53
1	141	41.47	100.00
Total	340	100.00	

Table 5.14. Number of campaigns with at least one individual BA.

BAG_member	Freq.	Percent	Cum.
0	267	78.53	78.53
1	73	21.47	100.00
Total	340	100.00	

Table 5.15. Number of campaigns with at least one BAG member.

SerialEntrepreneur_exit	Freq.	Percent	Cum.
0	258	94.16	94.16
1	16	5.84	100.00
Total	274	100.00	

Table 5.16. Number of campaigns with at least one serial entrepreneur who participated in an exit in the past.

Then, I illustrated the differences in term of average invested amount, number of campaigns, age and women of different players in the ECF campaigns. Tab. 5.17 contains the differences between a BA investor and crowd-investor. One can see that the amount invested on average is higher for BA, almost triple. The number of campaigns on average is almost double for the BA. BA investors are older than crowd-investors. The percentage of women is quite similar.

	BA = 1	BA = 0
Invested amount in ECF (EUR)	11,368.08	3,314.155
Total number of campaigns	7.11	4.92
Age	51.52	43.92
Women	0.08	0.11

Table 5.17. Differences on average between BA and crowd-investors in ECF campaigns.

Indeed, tab. 5.18 contains the differences between investors that are individual BAs and BAs belonging to a group. The major differences regard the number of campaigns: on average the individual BA's ones are five times larger and the percentage of women, the women in BAG are 16%, while individual BA one are 4%.

	Ind_BA	BAG_member
Invested amount in ECF (EUR)	11,623.50	10,960.32
Total number of campaigns	10.03	2.43
Age	51.01	52.32
Women	0.04	0.16

Table 5.18. Differences on average between individual BA and member of BA groups in ECF campaigns.

Now I am going to go in deep of the educational background of the BAs. In tab. 5.19the distribution of the variable *n_DegreeBachelorMaster*, which contains the number of BAs possessing a Bachelor's or Master's degree within each respective company, can be observed. Specifically, this table allows us to discern the number of individuals holding such degrees within each campaign: 26.18% of companies has at least one BA with the degrees. Furthermore, I was impressed by one particular campaign which has the presence of an impressive 34 BAs holding this degrees.

n_DegreeBachelorMaster	Freq.	Percent	Cum.
0	251	73.82	73.82
1	53	15.59	89.41
2	19	5.59	95
3	11	3.24	98.24
6	2	0.59	98.83
9	1	0.29	99.12
15	1	0.29	99.41
25	1	0.29	99.70
34	1	0.29	100.00
Total	340	100.00	

Table 5.19. Number of BAs that invested in each company having a Bachelor's or a Master's degree.

Finally, I am going to investigate the work experience of the previous BAs, in particular whether they have a managerial, entrepreneurial, technical or professional experience.

Tab. 5.20 shows a summary of the distribution of the variable *n_WorkingExperiencePastMana*

which represents the number of BA investors that have a prior managerial work experience. A quarter of the companies (25.29% exactly) has at least one BA investor with managerial experience prior to the start of the ECF campaign.

n_WorkingExperiencePastMana	Freq.	Percent	Cum.
0	254	74.71	74.71
1	52	15.29	90.00
2	22	6.47	96.47
3	6	1.76	98.24
6	2	0.59	98.82
8	1	0.29	99.12
14	1	0.29	99.41
27	1	0.29	99.71
35	1	0.29	100.00
Total	340	100.00	

Table 5.20. Number of BA with prior Managerial working experience.

Tab. 5.21 provides the distribution for the variable *n_WorkingExperiencePastEntr* which represents the number of Business Angels with past entrepreneurial work experience. It is noticed that 10.88% of the companies examined featured at least one BA investor who has entrepreneurial work experience before the begin of the crowdfunding campaign.

n_WorkingExperiencePastEntr	Freq.	Percent	Cum.
0	303	89.12	89.12
1	24	7.06	96.18
2	6	1.76	97.94
3	3	0.88	98.82
4	2	0.59	99.41
8	2	0.59	100.00
Total	340	100.00	

Table 5.21. Number of BA with prior Entrepreneurial working experience.

In tab. 5.22, I exhibit the distribution of the variable *n_WorkingExperiencePastTech* which

represents the number of BAs having prior technical work experience. Only 9.41% of the companies had at least one BA investor with prior technical experience before the crowdfunding campaigns.

n_WorkingExperiencePastTech	Freq.	Percent	Cum.
0	308	90.59	90.59
1	27	7.94	98.53
2	3	0.88	99.42
4	1	0.29	99.71
5	1	0.29	100.00
Total	340	100.00	

Table 5.22. Number of BA with prior Technical working experience.

At the end, tab. 5.23 demonstrates that 7.94% of the companies in the dataset contains at least one BA investor who has a professional work experience in investments prior to the start of the crowdfunding campaign.

n_WorkingExperiencePastProf	Freq.	Percent	Cum.
0	313	92.06	92.06
1	21	6.18	98.24
2	2	0.59	98.82
3	1	0.29	99.12
4	1	0.29	99.41
5	1	0.29	99.71
6	1	0.29	100.00
Total	92	100.00	

Table 5.23. Number of BA with prior Professional working experience in investments.

5.2   Multiple Regressions Models

In this section I am going to analyze in details how the independent variables[23] influence the dependent one[24] using, as explained in the previous chapter, the multiple regression models, which are useful to test my hypotheses. Regression models allow us to examine the relations between campaign, company characteristics, founders experience and investors background explained by the variables in tab. 4.1 and tab. 4.2.

In order to better understand the following tables I am going to point out some features. The most important one is the statistical significance of the coefficients, which means that there is evidence to suggest that the coefficient has a real and meaningful impact on the dependent variable in the model and not due to chance. To measure it, in Statistics, the hypothesis test is used. In Stata, when you fit a multiple regression model, the typical hypothesis tests for the overall significance of the model and the individual coefficients are performed using an F-test and t-tests, respectively. If the p-value[25] is below a predetermined significance level indicates that the coefficient is statistically significant or rather a meaningful and non-random effect on the dependent variable. It indicates the probability of obtaining a result as extreme as, or more extreme than, the one observed, assuming that the null hypothesis is true.

The second metric of a regression model is the R-squared[26] (R^2) which is statistical measure that represents the proportion of the variance in the dependent variable that is predictable from the independent variables in a regression model. It is a key metric in regression analysis, providing insights into the goodness of fit of the model. In summary, R^2 is a measure of how well the independent variables in a regression model explain the variability in the dependent variable.

It is important to say that before choosing the fitted independent variables I computed

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[23]Independent variables: *BA, Ind_BA, BAG_member, SerialEntrepreneur_exit, avg_InvExperience, avg_InvExperience_SameAteco, timing_to_SuccSecondRound, Targetcapital, LeverageRatio, Quotaofferta, CompanyAge, d_DegreeSectorBMBusiness, d_DegreeSectorBMHumanities, d_DegreeSectorBMTechnical, d_WorkingExperienceDuringEntr, d_WorkingExperienceDuringMana, d_WorkingExperienceDuringProf, d_WorkingExperienceDuringTech, d_WorkingExperiencePastEntr, d_WorkingExperiencePastMana, d_WorkingExperiencePastProf and d_WorkingExperiencePastTech.*

[24]Dependent variables: *log_Raccolto, SuccSecondRound* and *log_Vpremoney_2round.*

[25]Stata provides three levels of significance of the coefficients p<0.01 (***), p<0.05 (**) and p<0.1 (*).

[26]R^2 ranges from 0 to 1: 0 indicates that the model does not explain any of the variability in the dependent variable, while 1 implies that the model perfectly explains the variability in the dependent. R^2 can be interpreted as the proportion of the variance in the dependent variable that is captured by the independent variables in the model. For example, if $R^2 = 0.70$ it means that 70% of the variance in the dependent variable is explained by the independent variables, and the remaining 30% is unexplained.

the correlation[27] between them. Calculating the correlation between independent variables in a regression is useful for identifying the presence of multicollinearity. Multicollinearity occurs when two or more independent variables in the regression model are highly correlated with each other. This situation can cause several issues in data analysis and the interpretation of regression results.

Furthermore, I want to clarify that, as one will see in the next models, some variables have been transformed using logarithmic transformation. Logarithmic transformations are used for many reasons, which now I am going to explain. Handling Heteroscedasticity: logarithmic transformation is often used when there is a suspicion of heteroscedasticity in the data. Heteroscedasticity occurs when the variance of regression errors changes with the levels of independent variables. Transforming variables through the logarithm can reduce the impact of larger deviations, helping to stabilize the variance of residuals. Linearizing Non-linear Relationships: in many cases, relationships between variables may be non-linear. Logarithmic transformation can be used to linearize these relationships, making the use of linear regression models more appropriate. For example, if there is an exponential relationship, the logarithmic transformation can turn it into a linear one. Reducing Sensitivity to Outliers: it can reduce the sensitivity of estimators to outliers, as extreme values have less impact on logarithmic scales compared to linear scales. And normalization of Skewed Distributions: if the distributions of variables are highly skewed, logarithmic transformation can help normalize them, making hypothesis tests more robust and improving the fit of regression models.

The last thing that I want to say is that in all models, in addition to the main independent variables, I included several control variables[28]: the size of the companies ($log\_TotalassetsthEUR$), previous Venture Capital investments ($VCPre$), the years of campaign (d_year_2018, d_year_2019, d_year_2020 and d_other_years), the industry sectors of companies (J_Inf_Comm, G_Trade, $C\_Manifacturing$, K_Fin_Ins, $M\_Prof\_Sc\_Tech$, and $d\_other\_sectors$), the ECF platforms ($CrowdFundMe$ and $MamaCrowd$) and the regions where the companies are situated (d_Molise, $d\_EmiliaRomagna$, $d\_Lombardia$, $d\_Piemonte$, $d\_FriuliVG$ and d_other_reg).

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[27]The *pwcorr* command in Stata is used to calculate correlations between variables in the presence of panel data, where each unit has multiple observations over time.

[28]In the context of regression models, control variables are independent variables added to the model to reduce the risk of confounding and improve the precision of estimates for the coefficients of the variables of interest. The goal is to isolate the effect of the independent variable of interest by controlling or adjusting for other factors that may influence the dependent variable. I chose variables with a larger percentage of observations and variables that guarantee heterogeneity.

Having made these clarifications, I can go in deep into the specific models used to gain a better comprehension of the factors that determine the success of the crowdfunding campaign and the subsequent growth of the businesses involved.

5.2.1 Regression Models 1: Collected Amount

The first series of implemented models are those that have as dependent variable the variable *log_Raccolto*, which, as explained in the previous chapter, refers to the logarithm of the collected amount of money during the ECF campaign. I used it in order to answer to the first research question testing the first macro group of hypotheses, i.e. that regarding the first investment round and the impact of professional BAs as investors on the ECF campaign. The regression models allow to better understand how some different factors might affect the amount of money collected during the campaign, hence the success of the campaign itself.

I performed five regression models: a principal model, a model specifying different types of BA (individual BA, BAG member or serial entrepreneur), a model with the addition of educational background, a model with the addition of working experience and a model with the addition of both educational background and working experience.

A consideration that I can make is that watching the R-squared value in the tab. 5.24 the models are a good fit for the data allowing to understand the relationships between the variables: the range of value goes from 0.686 to 0.704 that means that the models explains approximately from 68.6% to 70.4% of the variability in the dependent variable. This is a good indication that the implemented models are efficient and useful in understanding the relationship between the variables utilized.

The focus starts with the independent variable *BA*. It is a dummy variable, so takes value of 1 when at least one BA is present as investor, while 0 if is absent. One can notice in the second column of the table that it has a significant (presence of stars) and positive impact on the dependent variable. The meaning of this result is that the presence of a BA give a positive impact on the success of the crowdfunding campaign. This outcome support my first hypothesis ($H1$): the presence of Business Angels as investors has a positive impact on the performance of a crowdfunding campaign. BAs provide financial and non-financial support and credibility. Their participation attracts more investors bringing more funding for the campaign.

Considering other independent variables, one can observe that the variable *log_Targetcapital*

has a significant and positive impact on the collected amount during the campaign. This may be due to the fact that if an investor sees that the company has greater expectations so want a large target capital, it could think that the project is innovative and technological and would like to invest in it. Another explanation of the high target capital is that the company is already developed at managerial and business plan level, consequently an investor is more inclined to invest. This means more money is raised overall.

Also the variable $VCPre$ has a significant and positive impact on the variable $log\_Raccolto$ because it means that the company has already received funding from a venture capitalist and it can be seen as a form of validation and credibility. Investors may perceive the company as less risky or more promising if professional institutions have already invested in it. This may attract the attention of potential investors in the crowdfunding campaign, who might be more inclined to support a company that has already gained institutional investor backing. I can also say that a startup that has previously received funding from venture capitalists may have had access to additional resources and expertise. This can positively influence their ability to execute a well-structured crowdfunding campaign with effective communication and a compelling project presentation. All this leads to more capital raising from investors.

The second model includes variables referring to different types of BA: Ind_BA, BAG_member and $SerialEntrepreneur\_exit$. Observing the results in the third column of the table, the attention falls on the variable referred to the presence or not of a BA belonging to a group. This variable has a positive and significant impact on the dependent variable. This impact in this model is higher than the impact of an individual BA. This result support my second hypothesis ($H2$): the presence of Business Angels belonging to Angel Groups has a higher positive impact than individual BAs on the performance of a Crowdfunding campaign. BAs, especially those part of a group, often have a vast network of contacts in the business world. This network can be leveraged to increase the visibility of the campaign, attract additional investors and gain support from other industry professionals. Furthermore, the presence of a well-known BA belonging to a respected group can enhance the credibility of the crowdfunding campaign. Investors may feel more confident in contributing if they see experienced and successful individuals supporting the project. In summary, the participation of a BA belonging to a group can bring a range of benefits, including experience, a network of contacts, credibility and strategic support, significantly contributing to the success of a crowdfunding campaign.

The third model comprises educational background of the BA, so I am going to test

the third hypothesis ($H3$). I added three dummy variables: $d\_DegreeSectorBMBusiness$, $d\_DegreeSectorBMHumanities$ and $d\_DegreeSectorBMTechnical$ which, in order, indicates the presence of a BA with a a Bachelor or Master's Business degree, Humanistic one and Technical one. Only the variable regarding the Business degree has a significant impact, in particular positively, on the amount of money raised during a ECF campaign. The reason behind this result can be found by the fact that could improve the management and decision-making processes of the company, making it more attractive to investors. BA with a Business degree brings a combination of financial knowledge, strategic thinking, networking skills and business development expertise that can positively impact the success of a crowdfunding campaign. Their multidimensional skill set can enhance the overall viability and appeal of the project to potential backers and investors which can increase the amount of money raised during the campaign.

In the following model, instead of the variables regarding the educational background, I added the variables concerning investors' working experience during the campaign with the aim of testing the last hypothesis regarding the success of the ECF campaign ($H4$). The variables are: $d\_WorkingExperienceDuringEntr$, $d\_WorkingExperienceDuringMana$, $d\_WorkingExperienceDuringProf$ and $d\_WorkingExperienceDuringTech$. The first observation is about the variable $d\_WorkingExperienceDuringMana$, in particular it has a significant and positive impact on the amount collected during the campaign. The result comes from the skills of a manager. Managerial skills often include effective organizational leadership. A BA with managerial skills can help structure the crowdfunding campaign, set clear goals and ensure efficient coordination among team members, leading to a more successful execution. Managers are often trained in project management, which involves planning, execution and monitoring of projects. This expertise is valuable in overseeing the various aspects of a crowdfunding campaign, ensuring tasks are completed on time and within budget. Another skill of a manager is the resource allocation, helping the startup allocate resources effectively, ensuring that funds are used efficiently. BAs with managerial experience provide also leadership, risk mitigation and strategic decision-making capabilities enhancing the overall management of the campaign, making it more attractive to potential backers.

One can observe that also the variable $d\_WorkingExperienceDuringTech$ has a significant and positive impact on the success of the campaign. BAs with technical skills can contribute to the development and improvement of the product or service being offered by the company

in the crowdfunding campaign. A BA with technical expertise can provide valuable insights to enhance the product's functionality, design or performance, making it more appealing to other investors. They ensure the quality and reliability of the product or service. so can contribute to quality assurance processes, assuring backers that the project is being developed with attention to detail and high standards.

The last model (5) includes both educational background and working experience variables. Taking into account the work experiences, I obtained the same result as before (Model 4), adding also the impact of the variable $d\_WorkingExperienceDuringProf$ that is even positive. Professional investors among the others are a signal for other potential backers because they often have diversified investment portfolios so the decision to participate to that project is worthy of consideration. The participation of a professional investor can enhance the market credibility of the crowdfunding campaign. It signals to the broader market that the project has undergone rigorous scrutiny and has gained the support of a seasoned investor, potentially attracting more attention and backing.

	(1) log_Raccolto	(2) log_Raccolto	(3) log_Raccolto	(4) log_Raccolto	(5) log_Raccolto
BA	0.260** (2.79)	-0.024 (-0.19)	0.194 (1.68)	0.181 (1.75)	0.188 (1.73)
log_avg_InvExperience	0.0469 (1.04)	0.0571 (1.49)	0.0496 (0.92)	0.0562 (1.03)	0.0567 (1.05)
log_Vpremoney	0.166 (1.89)	0.117 (1.04)	0.154 (1.82)	0.148 (1.73)	0.154 (1.80)
log_Targetcapital	0.628*** (4.98)	0.598*** (5.58)	0.630*** (5.69)	0.642*** (5.59)	0.640*** (5.65)
LeverageRatio	7.84e-14*** (4.00)	8.53e-14** (3.01)	7.87e-14** (3.50)	8.17e-14** (3.29)	8.46e-14** (3.20)
Quotaofferta	0.898 (1.65)	0.987 (1.30)	0.824 (1.63)	0.820 (1.50)	0.869 (1.61)
log_CompanyAge	0.0159 (0.18)	0.0505 (0.77)	0.0282 (0.34)	0.0321 (0.38)	0.0339 (0.40)
log_TotalassetsthEUR	-0.00548** (-3.45)	-0.00676** (-2.52)	-0.00620** (-2.77)	-0.00452** (-2.49)	-0.00354** (-3.36)
VCPre	0.286** (2.79)	0.321** (2.53)	0.221** (2.51)	0.223** (2.47)	0.254** (2.69)
d_year_2018	-0.00336 (-0.03)	-0.0342 (-0.44)	-0.0113 (-0.11)	-0.00639 (-0.07)	-0.00403 (-0.04)
d_year_2019	0.129 (1.34)	0.137 (1.66)	0.128 (1.42)	0.152 (1.64)	0.153 (1.58)
d_year_2020	0.246** (2.46)	0.253** (3.26)	0.239** (2.57)	0.256** (2.63)	0.250** (2.47)
J_Inf_Comm	-0.307 (-1.87)	0.272 (1.00)	-0.193 (-0.66)	-0.257 (-1.34)	-0.305 (-1.68)
C_Manifacturing	-0.230 (-1.30)	0.335 (1.20)	-0.112 (-0.41)	-0.188 (-1.06)	-0.234 (-1.37)
G_Trade	-0.335* (-2.18)	0.276 (0.97)	-0.229 (-1.12)	-0.322* (-2.39)	-0.366** (-2.86)
M_Prof_Sc_Tech	-0.280 (-1.90)	0.249 (1.01)	-0.193 (-0.82)	-0.276 (-1.63)	-0.317* (-2.12)
d_other_sectors	-0.327 (-1.37)	0.178 (0.54)	-0.189 (-0.49)	-0.283 (-1.00)	-0.340 (-1.17)
CrowdFundMe	0.192 (1.94)	0.238* (2.13)	0.189 (1.82)	0.182 (1.72)	0.174 (1.52)
MamaCrowd	0.224* (2.03)	0.288** (2.85)	0.178 (1.69)	0.161 (1.62)	0.164 (1.70)

	(1) log_Raccolto	(2) log_Raccolto	(3) log_Raccolto	(4) log_Raccolto	(5) log_Raccolto
d_EmiliaRomagna	-0.283 (-0.97)	0 (.)	-0.276 (-0.96)	-0.261 (-0.92)	-0.215 (-0.82)
d_Molise	0 (.)	0.352 (1.25)	0 (.)	0 (.)	0 (.)
d_Lombardia	-0.390 (-1.15)	-0.0783 (-0.53)	-0.354 (-1.03)	-0.343 (-1.02)	-0.305 (-0.97)
d_Piemonte	-0.393 (-1.28)	-0.0890 (-0.75)	-0.339 (-1.10)	-0.321 (-1.05)	-0.269 (-0.94)
d_other_reg	-0.434 (-1.31)	-0.112 (-0.80)	-0.402 (-1.20)	-0.409 (-1.24)	-0.373 (-1.20)
Ind_BA		0.184 (1.50)			
BAG_member		0.256** (3.19)			
SerialEntrepreneur_exit		0.114 (0.57)			
d_DegreeSectorBMBusiness			0.180** (2.71)		-0.0702 (-0.74)
d_DegreeSectorBMHumanities			0.163 (1.36)		-0.116 (-0.79)
d_DegreeSectorBMTechnical			0.121 (0.85)		-0.234 (-0.92)
d_WorkingExperienceDuringEntr				-0.0507 (-0.53)	0.0212 (0.12)
d_WorkingExperienceDuringMana				0.199** (3.69)	0.337** (3.56)
d_WorkingExperienceDuringProf				0.112 (1.28)	0.164** (3.17)
d_WorkingExperienceDuringTech				0.292** (2.54)	0.344* (2.39)
_cons	2.808* (2.23)	2.900** (2.48)	2.822* (2.38)	2.785* (2.40)	2.719* (2.18)
N	308	251	308	308	308
R^2	0.686	0.701	0.694	0.701	0.704

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.24. Regression Models 1: Collected Amount of campaign.

5.2.2 Regression Models 2: Successful 2nd Round

The second series of implemented models are those that have as dependent variable the variable *SuccSecondRound*, as explained in the previous chapter, it is a dummy variable equals to 1 if the company has had a successful second funding round and 0 if not. I used this variable in order to answer to the second research question testing the second macro group of hypotheses, i.e. the impact of professional BAs as investors on the performance of the company post the crowdfunding campaign.

Because of the binary variable I had to execute a different regression model respect to the previous one, called logistic regression model[29]. Basically, I want to figure out the determinants that influence a second successful funding round of a company after its crowdfunding campaign. The following tale (tab. 5.25) contains the results of all the models.

In all of these the variable BA has a significant and positive impact on the successful funding round after the crowdfunding campaign. The motivation behind the outcome could be that BAs are specialized in analyzing business data. During the first ECF campaign, a BA can collect and analyze data that provides detailed insights into the investment performance. During the first campaign, a BA might identify inefficiencies or areas where processes can be optimized, can suggest changes or adjustments to the initial strategy to maximize results, making it efficient and reduce costs, enabling greater profitability in the second investment round. This suggests that a BA has a positive impact on the long run performance of the companies ($H5$).

Another variable with a positive impact is $log\_Vpremoney\_2round$ and the coefficient is significant in all the models. It simply indicates the estimated value of the company considered before the second investment round and consequently its potential economic growth.

Instead, the variable $log\_Targetcapital$ has a negative and significant impact on the success of the second campaign. This may be due to the fact that if the investor sees that the company asks a high amount of capital also in the second round, could think that the resources collected in the previous campaign were allocated incorrectly and inefficiently, thereby will no longer have the incentive to invest in it.

The variable *Quotaofferta* has a positive and significant impact on success of the second round of investment. It reflects the equity stake offered during the crowdfunding campaign to the investors. When this amount is higher, it means that people have already acquired a large

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[29]The definition of logit model is explained at the end of Chapter 4.

share in the company. If the shares offered in the first campaign were successful, the market price of the shares might increase. This increase can positively influence the perception of value among investors during the second campaign, encouraging their participation considering the growth of the value. A higher equity stake offered in the first round could attract institutional investors which in some cases are contrary to the entrance of new investors in the second round.

In the second model of the series I added the variables regarding the educational background of the BA investors ($H7$). One can observe that the Business and Technical degrees have a negative impact on the second campaign. One can think that the presence of a BA with a technical and economic background may lead investors to question the neutrality of the analysis conducted during the first campaign. They may wonder if the analysis was influenced by the BA's personal skills and preferences. If the BA's presence as an investor is negatively perceived by other investors or the community, it could harm the reputation of the company and affect the success of the subsequent investment campaign.

The third model comprising both the educational backgrounds and the working experience of the BAs as investors. However, we have not identified any variable that has a significant impact on the successful funding round after the crowdfunding campaign.

The last column (Model 4) only includes the working experience of BAs ($H8$). Only the variable $d\_WorkingExperienceDuringMana$ has negative impact on the successful funding round after the crowdfunding campaign. The only reason that comes to mind for this could be that the participation of manager as investor in the campaign could raise concerns about transparency and neutrality potentially negatively affecting investors' perception in the second investment campaign because they may think he will become the campaign manager himself.

	(1) SuccSecondRound	(2) SuccSecondRound	(3) SuccSecondRound	(4) SuccSecondRound
BA	0.857* (1.87)	1.105*** (2.71)	1.124** (2.29)	1.085** (2.22)
log_avg_InvExperience_SameAteco	0.00160 (0.01)	0.00116 (0.00)	-0.0358 (-0.17)	-0.0200 (-0.10)
log_Vpremoney_2round	1.804*** (4.84)	1.834** (2.48)	1.911*** (4.90)	1.937*** (5.03)
log_Targetcapital	-1.547*** (-3.35)	-1.537*** (-2.64)	-1.600*** (-3.35)	-1.634*** (-3.46)
LeverageRatio	1.20e-11 (1.62)	1.18e-11* (1.76)	1.28e-11* (1.69)	1.19e-11 (1.59)
Quotaofferta	15.56*** (3.10)	14.95* (1.91)	15.52*** (3.02)	15.90*** (3.08)
log_CompanyAge	0.168 (0.50)	0.142 (0.35)	0.0840 (0.24)	0.0958 (0.28)
log_TotalassetsthEUR	-0.282** (-2.16)	-0.278 (-1.45)	-0.285** (-2.06)	-0.296** (-2.17)
VCPre	0.480 (0.50)	0.722* (1.65)	0.891 (0.86)	0.808 (0.78)
d_year_2018	-0.708 (-1.19)	-0.702* (-1.83)	-0.693 (-1.09)	-0.746 (-1.18)
d_year_2019	-2.174*** (-3.29)	-2.319*** (-7.37)	-2.363*** (-3.40)	-2.362*** (-3.44)
d_year_2020	-1.903*** (-2.91)	-2.097*** (-6.91)	-2.125*** (-3.03)	-2.050*** (-3.01)
J_Inf_Comm	-1.558 (-1.20)	-1.754 (-1.60)	-1.592 (-1.16)	-1.764 (-1.30)
C_Manifacturing	-0.359 (-0.30)	-0.507 (-0.63)	-0.318 (-0.25)	-0.477 (-0.37)
G_Trade	-1.069 (-0.89)	-1.088 (-1.48)	-0.863 (-0.66)	-1.048 (-0.81)
M_Prof_Sc_Tech	-1.291 (-1.01)	-1.283 (-1.30)	-1.131 (-0.83)	-1.383 (-1.03)
CrowdFundMe	-0.609 (-1.22)	-0.711 (-1.54)	-0.662 (-1.26)	-0.651 (-1.25)
MamaCrowd	-1.331** (-2.31)	-1.223** (-2.00)	-1.211** (-2.05)	-1.220** (-2.08)
d_EmiliaRomagna	-0.636 (-0.79)	-0.398 (-1.18)	-0.405 (-0.46)	-0.514 (-0.62)
d_Molise	3.335** (2.14)	3.336* (1.82)	3.554** (2.23)	3.812** (2.40)
d_Lombardia	0.395 (0.99)	0.368 (1.03)	0.263 (0.63)	0.291 (0.71)
d_Piemonte	-0.387 (-0.44)	-0.432 (-0.65)	-0.619 (-0.66)	-0.653 (-0.72)

	(1) SuccSecondRound	(2) SuccSecondRound	(3) SuccSecondRound	(4) SuccSecondRound
d_DegreeSectorBMBusiness		-0.316** (-2.21)	-0.164 (-0.16)	
d_DegreeSectorBMHumanities		0 (.)	0 (.)	
d_DegreeSectorBMTechnical		-0.897* (-1.78)	-1.136 (-0.87)	
d_WorkingExperienceDuringEntr			1.052 (1.11)	0.436 (0.51)
d_WorkingExperienceDuringMana			-0.583 (-0.48)	-1.166* (-1.94)
d_WorkingExperienceDuringProf			0.956 (1.13)	0.553 (0.72)
d_WorkingExperienceDuringTech			-0.403 (-0.36)	-0.523 (-0.50)
_cons	-5.493 (-1.39)	-5.756 (-1.20)	-6.196 (-1.54)	-5.889 (-1.49)
N	259	251	251	259

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.25. Regression Models 2: Successful 2nd Round.

5.2.3 Regression Models 3: Value Pre-Money 2nd Round

The last series of implemented models are those that have the variable $log\_Vpremoney\_2round$ as dependent one (tab. 5.26), as explained in the previous chapter, refers to the logarithm of the pre-money valuation before the second funding round. This variable indicates the growth and development of the company following the guidance and the support of BAs. The regression models (using the multiple regression model) allows to better understand how some different factors might affect the pre-money valuation of the company before the second investment round, so the impact on the performance in the long run. Also these models allow to test the second macro group of hypotheses, especially those not yet checked.

Watching the R-squared value of the table I can say that are a good fit for the data allowing to understand the relationships between the variables. All the values are near the 0.60 so they explains approximately the 60% of the variability in the dependent variable. They are not high as in tab. 5.24 but they are still useful in understanding the relationship between the variables used.

For all six mode the variable BA has a negative impact on the successful funding round after the crowdfunding campaign, but, as one can observe, the coefficients are not significant in this case.

The variables $log\_TargetCapital$ instead, has a significant and positive impact on the value of the company. The logic behind this is that the higher the target capital, higher the valuation of the company, given the more complex investment requirements.

The interpretation of the negative impact of the variable $Quotaofferta$ could be that if the company offered a larger equity share in the ECF campaign, the ownership could be more fragmented and, so is less easy to invest in this company as a good portion of the equity of the company is already acquired.

In the second model, as in the first series of multiple regression models, I added the variables Ind_BA, BAG_member and $SerialEntrepreneur\_exit$. My focus is only on the variable representing the BA participating in a BA group in order to test the hypothesis $H6$. The result illustrated in the table is that this type of BA influences positively and with a greater level of significance the value of the company before the second investment round, in other words the performance of the company in the long run. Moreover, one can see that the impact is higher respect to a individual BA, which is negative. Belonging to a BA group provides access to a

network of colleagues who can share experiences, knowledge and best practices. This exchange of information can enhance the analytical capabilities of the entire group and positively influence the overall performance of the company. BA groups often promote continuous professional development through training, workshops and knowledge-sharing sessions. A well-trained and updated BA can contribute to better data and information analysis, leading to more informed decisions and more effective long-term strategies for the company.

Differently to the previous set of models (tab. 5.25), the educational background, in particular this regarding the Technical degree, has a positive and significant impact on the pre-money valuation before the second round of investment (Model 3: only educational background variable and Model 4: both education and work experience). The presence of a BA as an investor with a Technical degree can bring significant benefits to the long term performance of the company, facilitating better integration of technologies, improving the quality of analyses and promoting cross-functional collaboration ($H7$).

For the last two model, I added to the basic model variables concerning the working experience during and past the ECF campaign. I had a significant result with the variables that take into consideration the managerial experience: $d\_WorkingExperienceDuringMana$ and $d\_WorkingExperiencePastMana$. They influence positively the dependent variable, ergo the performance of the startup in the long term. An experienced manager is skilled in risk management. When a BA with managerial experience invests, can bring advanced risk awareness and the ability to mitigate risks, thereby contributing to more effective management of corporate investments in the long term. Managerial experience often translates into leadership skills and the ability to positively influence change within an organization. The presence of a BA with such skills can contribute to greater corporate cohesion and a work environment that supports long-term objectives. My analysis's final hypothesis was tested here ($H8$).

	(1) log_Vpremoney_2round_v2	(2) log_Vpremoney_2round_v2	(3) log_Vpremoney_2round_v2	(4) log_Vpremoney_2round_v2	(5) log_Vpremoney_2round_v2	(6) log_Vpremoney_2round_v2
BA	-0.0318 (-0.27)	-0.0414 (-0.23)	-0.0799 (-0.56)	-0.0859 (-0.58)	-0.0796 (-0.54)	-0.0787 (-0.54)
log_avg_InvExperience	0.00744 (0.09)	-0.0976 (-1.50)	0.0124 (0.15)	0.00701 (0.08)	0.0116 (0.14)	0.0179 (0.21)
log_Targetcapital	0.826*** (11.42)	0.848*** (14.21)	0.823*** (10.10)	0.823*** (9.94)	0.823*** (10.13)	0.823*** (9.89)
LeverageRatio	-1.59e-13*** (-4.35)	-1.91e-13*** (-4.78)	-4.97e-14 (-1.37)	-4.94e-14 (-1.50)	-4.49e-14 (-1.35)	-4.43e-14 (-1.18)
Quotaofferta	-4.722*** (-4.87)	-6.188*** (-3.96)	-4.734*** (-4.55)	-4.752*** (-4.57)	-4.734*** (-4.56)	-4.726*** (-4.56)
log_CompanyAge	0.0693 (1.44)	0.0472 (0.91)	0.0622 (1.03)	0.0636 (1.03)	0.0689 (1.16)	0.0668 (1.21)
log_timing_to_SuccSecondRound	0.499*** (3.80)	0.528** (3.33)				
log_TotalassetsthEUR	-0.00534 (-0.65)	-0.00383 (-0.53)	-0.0133 (-1.37)	-0.0125 (-1.09)	-0.0110 (-0.94)	-0.0124 (-1.15)
VCPre	0.201 (0.69)	0.168 (0.63)	0.211 (0.80)	0.208 (0.71)	0.255 (0.84)	0.285 (1.08)
d_year_2018	0.0903 (0.94)	0.193** (3.14)	0.0963 (0.85)	0.108 (1.00)	0.0996 (0.91)	0.0795 (0.65)
d_year_2019	0.159 (1.76)	0.214* (1.95)	0.0686 (0.67)	0.0746 (0.69)	0.0727 (0.67)	0.0637 (0.57)
d_year_2020	0.202* (2.25)	0.318** (3.02)	0.112 (1.17)	0.121 (1.17)	0.117 (1.10)	0.107 (0.97)
J_Inf_Comm	-0.648 (-0.53)	-2.827* (-2.02)	-0.436 (-0.40)	-0.422 (-0.38)	-0.494 (-0.44)	-0.472 (-0.42)
C_Manifacturing	-0.659 (-0.57)	-2.907* (-2.27)	-0.347 (-0.34)	-0.333 (-0.32)	-0.402 (-0.38)	-0.377 (-0.36)
G_Trade	-0.564 (-0.47)	-2.815* (-2.19)	-0.310 (-0.30)	-0.304 (-0.29)	-0.383 (-0.36)	-0.354 (-0.33)
M_Prof_Sc_Tech	-0.523 (-0.42)	-2.810* (-2.05)	-0.287 (-0.26)	-0.269 (-0.23)	-0.339 (-0.29)	-0.329 (-0.28)
d_other_sectors	-0.942 (-0.84)	-3.179** (-2.56)	-0.542 (-0.56)	-0.525 (-0.52)	-0.606 (-0.61)	-0.594 (-0.60)
CrowdFundMe	0.144 (1.15)	0.202 (1.65)	0.174 (1.14)	0.175 (1.11)	0.168 (1.05)	0.166 (1.02)
MamaCrowd	0.0677 (0.66)	0.102 (1.00)	0.00345 (0.03)	0.00863 (0.06)	0.00975 (0.07)	0.00655 (0.05)
d_EmiliaRomagna	1.237 (1.22)	0 (.)	0.852 (1.23)	0.863 (1.33)	0.881 (1.44)	0.827 (1.19)
d_Molise	0 (.)	-1.425 (-1.59)	0 (.)	0 (.)	0 (.)	0 (.)
d_Lombardia	1.252 (1.26)	-0.0311 (-0.66)	0.940 (1.39)	0.969 (1.54)	0.994 (1.68)	0.929 (1.37)
d_Piemonte	0.915 (0.91)	-0.293 (-1.64)	0.586 (0.84)	0.625 (0.96)	0.661 (1.07)	0.584 (0.82)
d_other_reg	1.138 (1.14)	-0.0778 (-1.01)	0.795 (1.16)	0.830 (1.28)	0.851 (1.39)	0.781 (1.11)
Ind_BA		-0.253* (-1.95)				
BAG_member		0.209*** (4.19)				
SerialEntrepreneur_exit		0.0125 (0.12)				
d_DegreeSectorBMBusiness			0.135 (1.53)	0.114 (0.67)		
d_DegreeSectorBMHumanities			-0.178 (-1.28)	-0.148 (-1.56)		
d_DegreeSectorBMTechnical			0.245** (2.90)	0.221* (2.12)		
d_WorkingExperienceDuringEntr				-0.00327 (-0.03)	0.0263 (0.29)	
d_WorkingExperienceDuringMana				0.0915 (0.59)	0.247*** (5.06)	
d_WorkingExperienceDuringProf				-0.0562 (-0.39)	-0.0418 (-0.28)	
d_WorkingExperienceDuringTech				-0.176 (-0.95)	-0.130 (-0.82)	
d_WorkingExperiencePastEntr						0.108 (0.68)
d_WorkingExperiencePastMana						0.164* (2.37)
d_WorkingExperiencePastProf						-0.0525 (-0.42)
d_WorkingExperiencePastTech						0.0476 (0.47)
_cons	4.625** (2.49)	8.002*** (5.74)	4.996** (3.10)	4.933** (3.06)	4.951** (2.97)	5.028** (2.98)
N	308	251	308	308	308	308
R^2	0.611	0.625	0.573	0.574	0.571	0.570

t statistics in parentheses
* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5.26. Regression Models 3: Value Pre Money 2nd Round.

Chapter 6

Managerial and Policy Implications

Over the years, there have been significant transformations in the entrepreneurial world, which have been marked by a substantial change in investment dynamics. In the past, various types of investors, such as Business Angels, Venture Capitalists and Institutional investors, operated independently, each with their own approach and investment objectives. However, now this world has experienced a notable shift toward increased cooperation among all the investors. Several important factors have fueled this new dynamic, including the rapid advancement of technology, the globalization of markets and the increasing complexity of entrepreneurial challenges. Investors of different kinds have started recognizing the advantages deriving from collaboration and the exchange of resources, expertise and knowledge.

In my thesis I analyzed the co-investment between BAs and crowd-investors. Previously, startups mainly were funding from one investment source, but now there is a growing trend towards collaboration among multiple investors. This new mode of cooperation offers numerous benefits for both entrepreneurs and investors. In fact, given the results of my analysis, I found out that the presence of a BA among the investors in a ECF campaign can have a positive impact on the campaign itself, but also on the performance of the company in the long run. Entrepreneurs can benefit from diversified sources of funding, reducing their dependence on a single investor and increasing flexibility in financial management. On the other hand, investors can share risks and opportunities, gain access to innovative projects and take advantage of the specialized skills of other industry players. To enhance and take advantage of these benefits, the companies in the crowdfunding platforms should make a clear effort to reach out the BAs.

After the campaign is done, it's important to stay connected with the BAs because they can

keep providing support and connections that help the company grow. To make it easier for ECF campaigns to involve BAs, one could create events that connect them. Sharing success stories and showing how BAs and campaigns can work together for a long time can be convincing. Also, teaching BAs about the benefits of investing through crowdfunding could be helpful. Showing how BAs can have a positive impact on campaigns and companies can attract more of them. This is because showing the good results of their involvement can be persuasive.

To incentivize BAs' investments in crowdfunding, policies can be designed to create a favorable environment and stimulate investors participation, for example, through tax incentives or other types of benefits. Investment tax credits for BAs participating in crowdfunding could be introduced, encouraging involvement through tax advantages. Also the reduction or elimination of taxes on capital gains made by investors through crowdfunding, incentivizing increased interest in investing in startups.

Another potential policy could involve implementing training and financial education programs for potential BAs, providing information on opportunities and risks associated with crowdfunding investments. This could lead to increased trust and more productive partnerships. Additionally, regulators could promote transparency and clarity in crowdfunding campaigns to ensure that investors are adequately informed about the risks and opportunities. After the introduction of new policies, the authority can implement effective monitoring systems to assess the impact of adopted policies and make necessary adjustments to enhance incentive effectiveness.

Conclusions and Suggestions for future research

My thesis analyzed quantitatively the investments of Business Angels in equity crowdfunding campaigns, in particular in two different ways: first, how BAs influence the result of the campaign; second, what is the impact of BAs on a company's performance in the long run. In details, my objective was to determine if the presence of BAs as investors influences companies in a different manner than equity crowdfunding campaigns that are solely invested by non-professional investors. I also added some characteristics of the BAs such as the educational background and working experience in order to understand what are the effects on the research.

I started presenting the available dataset, containing information about the crowdfunding campaign, the companies, their founders and the investors to have an overall view on the data. For the first part of my analysis, I obtained that the presence of BAs has a positive impact on the performance of ECF campaign ($H1$), they provide financial and non-financial support and credibility. Their participation attracts more investors bringing more funding for the campaign. Other variables impact positively, such as target capital chosen and the pre-money valuation. The first incentives investors giving them high expectations while the second makes the campaign more appealing to potential backers, leading to increased funding. Going in deep, I found that the presence of BAs belonging to angel groups has a higher positive impact than individual BAs on the performance of a crowdfunding campaign ($H2$). Experience, network of contacts, credibility and strategic support are all benefits that a BA belonging to a group can provide, which can play a significant role in a crowdfunding campaign's success. For what concerns the investors' educational background ($H3$), only the variable regarding the Business degree impacts positively crowdfunding campaign success. The reason behind this result can be found by the fact that the BA could improve the management and decision-making processes

of the business, making it more attractive to investors.

The last step of this part highlights the fact that the presence of managers, technicians and professional investors among BAs positively impacts the success of the campaign ($H4$). They have the potential to enhance crowdfunding platforms by guiding the audience towards the most promising businesses. Their advanced and professional research methods contribute to effective signalling, attracting more backers to join the campaign, ultimately resulting in higher total funds raised during the campaign.

As regards the second part of the analysis, I found out for the first hypothesis ($H5$) the same result as in the first part, means that the presence of BAs as investors in a ECF campaign influences positively the performance of the company in the long run. BAs not only have a positive impact on the outcome of the campaign, but also on the growth and development of the company after the campaign itself. The presence of a BA positively influences a company's post-crowdfunding performance due to their financial support, strategic guidance, industry networks and expertise, which collectively contribute to enhanced growth, credibility and long term success. Moreover, if a BA belongs to a BA group the positive impact is higher than an individual one ($H6$). Finally, the educational background and working experience influence the performance. In particular, if the BA has a Technical degree influences negatively the success of the second investment round but positively the pre-money valuation before this round; so in order to test my hypothesis ($H7$), the result that I take into account is the second, i.e. positive impact. In fact, logically, the technician facilitates better the integration of technologies, improves the quality of analyses and promotes cross-functional collaboration, bringing significant benefits to the long term performance of the company. Regarding the working experience ($H8$), I obtained two opposite results, but for the same reason of the education, I can think and the result confirms it, that a BA with managerial experience influences positively the performance of the company in the long run because managerial experience often translates into leadership skills and the ability to positively influence change within an organization. A BA with managerial skills plays a crucial role in optimizing the structure and success of a equity crowdfunding campaign. Drawing on project management expertise, these individuals contribute to clear goal-setting, efficient team coordination and timely task completion. Their proficiency in resource allocation ensures effective fund utilization for startups. Additionally, their leadership, risk mitigation and strategic decision-making abilities enhance overall campaign management, making it more attractive to potential backers and increasing the likelihood of success.

In accordance with these results and assumptions tested, one may think that the relation among different investors, in my case BA and crowd-investors, can enhance the startup ecosystem both in the short and long term, maintaining BA connections because is important for the future development and growth of the company.

My analysis opens up numerous avenues of additional research regarding the collaboration of BAs and crowdfunding. In particular, one can use a larger and more detail dataset[30] to have more generalizable results. One can make the analysis for campaign and investor of other Country to compare the results and understand if the education impact differently on companies. The research could be expanded to the collaboration between other sources of funding, such as Venture Capitalists[31], to understand the impact on companies in different stages of life. A possible area for future research could focus on the comparative analysis of different forms of BAs organizations, such as BA groups and BA networks. One interesting finding from my research is that BAs working in groups appear to have a bigger impact than individual investors. Thus, future studies could look into these networks to see how their structure and make-up affect the decisions they make about investing and how successful the startups they support become. Another area worth exploring is how the experiences of BAs affect the startups they invest in. Their choices of where to invest and the help they provide to startups could be influenced by their skills, knowledge of specific industries and personal networks. Lastly, it would be helpful to see if the policies that encourage BAs to invest, like tax incentives from governments and financial institutions, are actually effective. This could involve looking at things like tax breaks and credits and how they impact economic innovation.

My research has the potential to serve as a foundation for extensive exploration into the complexities shaping the world of Entrepreneurial Finance. This could emerge as a valuable resource for policymakers and stakeholders navigating the dynamic landscape of Entrepreneurial Finance.

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[30]In my dataset many observations are missing because of a lack of information.

[31]In my analysis there is the presence of the variable $VCPre$ but the future studies should be more detailed.

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