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Selection Criteria of VCs and Business Angels with  
respect to Italian Innovative firms

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## Abstract (English Version)

New Technology Based Firms (NTBFs) play a role of pivotal importance in modern economic environments. Their relevance, largely investigated in the academic landscape, is not confined to the mere dissemination of technological innovation they can trigger, but it is linked to the creation of new jobs opportunities and, in general, to the fostering of economic growth. For these reasons, governmental bodies started to devote their attention towards these firms, designing both direct and indirect measures aimed at preserving and incentivizing their development.

Despite this, their intrinsically young and often unexperienced nature causes *Information Asymmetries* to arise between NTBFs and other market participants, making the process of raising external financing a particularly challenging task, eventually compromising their survival and growth. In this regard, a viable option to fill this *Funding Gap* is to resort to *Alternative Financing* solutions provided by, among the others, Venture Capital (VC) funds and Business Angels (BA).

VC funds are an heterogenous class of investors, that present differences in terms of governance structures, typology of contributions and, most notably, *Investment Strategies*. In the light of these differences, past literature agrees on the definition of a common taxonomy, categorizing these funds into *Independent VCs*, *Corporate VCs*, *Governmental VCs* and *Bank VCs*.

The purpose of this dissertation is to further investigate whether it is possible to identify different *Selection Criteria* and, in turn, *Investment Strategies* applied by different VC funds when analyzing and selecting investments in Italian NTBFs. In particular, our analysis aimed at establishing whether Selection Criteria can be inferred from accounting measures and intellectual capital of Italian NTBFs. Moreover, our study innovatively includes the category of Business Angels, underlining possible differences between *Independent Business Angels (BAs)* and *Business Angels associated with a Network (BANs)*.

The conduction of such meticulous research was organized in five main phases: first, the review of past studies on the aforementioned research topic; second, the

construction of a complete, reliable and disaggregated micro-level database comprising the totality of capital increases effected by Italian NTBFs in 2020; third, the implementation of an econometric analysis to answer our research questions; fourth, the interpretation and discussion of the results obtained through the analysis; fifth, a critical evaluation of the research performed. We conclude that different investors adopt different selection criteria, therefore effectively reflecting heterogenous investment practices.

## Abstract (Italian Version)

Le New Technology Based Firms (NTBFs) rivestono un ruolo di fondamentale importanza nei contesti economici odierni. La loro rilevanza, ampiamente indagata nel panorama accademico, non si limita alla mera disseminazione di innovazioni tecnologiche, ma è legata anche alla nascita di nuove opportunità di lavoro e, in generale, alla stimolazione della crescita economica. Per queste ragioni, molti governi hanno iniziato a rivolgere la loro attenzione a queste imprese, formulando misure dirette e indirette con il fine di preservarne ed incentivarne lo sviluppo.

Ciononostante, la loro natura intrinsecamente giovane e spesso inesperta comporta il verificarsi di *Information Asymmetries* tra le NTBFs e gli investitori, rendendo il processo di raccolta di finanziamenti esterni un processo particolarmente impegnativo, che finisce per compromettere la loro sopravvivenza e crescita. A tal proposito, una valida soluzione per colmare questo *Funding Gap* è quella di ricorrere a soluzioni di finanziamento alternativo, che sono fornite, tra gli altri, da fondi di Venture Capital (VC) e dai Business Angels (BA).

I fondi di Venture Capital sono una specie di investitori eterogenea, la quale presenta differenze in termini di strutture di governance, tipologie di contributi e, soprattutto, strategie di investimento. Alla luce di queste differenze, la letteratura pregressa concorda sulla definizione di una tassonomia comune, categorizzando questi fondi in *Independent VCs*, *Corporate VCs*, *Governmental VCs* and *Bank VCs*.

Lo scopo di questa tesi è quello di esaminare se sia possibile identificare diversi criteri di selezione e, di conseguenza, diverse strategie di investimento applicate dalle varie tipologie di VC nel processo di scelta delle NTBFs Italiane. In particolare, la nostra analisi mira a stabilire se tali criteri possano essere desunti da misure contabili e dal capitale intellettuale delle imprese Italiane. Inoltre, il nostro studio include in modo del tutto innovativo anche la categoria dei Business Angels, sottolineando le possibili differenze tra i *Business Angels Indipendenti (BA)* e i *Business Angels associati a un network (BAN)*.

La realizzazione di uno studio così meticoloso è stata articolata in cinque fasi principali: in primo luogo, la revisione degli studi passati sul suddetto tema di ricerca; in secondo luogo, la costruzione di un database completo, attendibile e dettagliato che comprendesse tutti gli aumenti di capitale effettuati dalle NTBFs in Italia nel 2020; in terzo luogo, l'implementazione di un'analisi econometrica volta a rispondere alle nostre domande di ricerca; in quarto luogo, l'interpretazione e la discussione dei risultati ottenuti attraverso l'analisi; in quinto luogo, una valutazione critica del lavoro svolto. A conclusione dello studio, possiamo dire che le diverse categorie di investitori adottano diversi criteri di selezione, dunque riflettendo pratiche di investimento eterogenee.

# Table of Contents

Abstract (English Version) .....	3
Abstract (Italian Version) .....	5
Chapter 1: Introduction .....	12
1.1. A general definition of NTBFs .....	12
1.1.1 Public intervention for NTBFs .....	15
1.2 The Italian definition of NTBF .....	16
1.2.1 Public intervention for Italian NTBFs .....	18
1.3 The funding gap .....	19
1.4 Alternative Finance to fill the gap.....	22
1.4.1 VC and PE funds .....	23
1.4.2 Business Angels.....	28
1.4.3 Crowdfunding.....	29
1.5 A focus on Public Initiatives, BANs and Crowdfunding in Italy .....	31
1.6 Overview of the Italian NTBFs' landscape.....	34
Chapter 2: Literature Review .....	38
2.1 The focus of the analysis, a preliminary overview.....	39
2.1.1 Investor selecting the NTBF .....	40
2.1.2 NTBF selecting the Investor.....	42
2.2 VCs evaluating the Business of the NTBF.....	43
2.3 VCs evaluating the Intellectual Capital of the NTBF .....	51
2.3.1 Entrepreneurs and Management team: the Human Capital .....	52
2.4 BAs and BANs evaluating NTBFs .....	53
2.4.1 Network dynamics .....	58
2.5 Differences between Business Angels and Venture Capitalists.....	59
2.6. Gender effects on informal venture finance .....	61

2.6.1 Financing gap between male and female entrepreneurs .....	61
2.6.2 Males and females Business Angels.....	63
2.6.3 Covid-19 and gender implications.....	64
2.7 Gaps in the literature and Research Questions.....	65
2.7.1 Gaps in the literature.....	65
2.7.2 Research Questions.....	65
Chapter 3: Methodology .....	67
3.1 Construction of the Database .....	67
3.1.1 The structure of the database .....	69
3.1.2 The process followed to construct the database .....	78
3.1.2.1 The rationale to collect Investees' data.....	79
3.1.2.2 The rationale to collect Deals' data .....	80
3.1.2.3 The rationale to collect Investors' data.....	83
3.1.2.4 The Categorization of Legal Entities .....	84
3.1.2.5 Distinction between Classic Business Angels and Network Business Angels .....	86
3.1.3 Critical Considerations and Possible limitations .....	87
3.2. The Econometric Analysis .....	88
3.2.1 Probit Regression Model .....	91
3.2.2 The Variables of the model .....	92
3.2.3 The implementation of the model.....	97
3.2.3.1 Considerations and refinement of the models.....	98
Chapter 4: Results of the study .....	100
4.1 Descriptive Statistics .....	100
4.1.1 General Consideration about the investee NTBFs .....	100
4.1.2 Investors Analysis.....	102
4.1.3 Business Angel Analysis .....	105



4.1.4 Geographical Analysis.....	107
4.1.5 Industry Analysis.....	112
4.2 Econometric Models .....	114
4.2.1 Model 1: Different selection criteria based on financial data.....	114
4.2.2 Model 2: Different selection criteria based on Human Capital .....	120
4.3.2.1 Model 3: merging of Model 1 and Model 2 .....	123
Chapter 5: Conclusion and Further Improvements .....	126
References.....	133

# List of Tables

Table 1 - Technology Intensity by Sector.....	13
Table 2 - Characteristics of a NTBF.....	15
Table 3 - Resume of Investment Strategies for each Investor type .....	30
Table 4 - Main Italian GVCs .....	32
Table 5 - NTBFs' Distribution by Region in Italy .....	35
Table 6 - Main differences between BAs and VCs.....	61
Table 7 - Resume of Variables included in the database .....	77
Table 8 - Resume of Investee collected data and sources.....	79
Table 9 - Resume of Deals' collected data and sources .....	83
Table 10 - Resume of Investors' collected data and sources.....	86
Table 11 - The binary variable in the Probit model.....	91
Table 12 - Resume of the Variables.....	96
Table 13 - Number of transactions per category of investors .....	103
Table 14 - Number of investors who subscribes at least one funding .....	103
Table 15 - Differences in BAs' amount invested, 2020 .....	106
Table 16 - Descriptive analysis of investments by region (Startups), 2020 .....	109
Table 17 - Descriptive analysis of investments by region (SMEs), 2020.....	110
Table 18 - Descriptive analysis of investments by region (Aggregate).....	111
Table 19 - Number of SMEs and Startups divided by sectors.....	113
Table 20 - Total number of observations in the econometric model .....	116
Table 21 - Selection criteria on Accounting figures .....	117
Table 22 - Correlation among independent variables .....	119
Table 23 - Selection criteria on human capital factors .....	121
Table 24 - Econometric analysis with both financial and human capital indicators .	124

# List of Figures

Figure 1 - Stages of Entrepreneurial firm development and investor category per stage .....	20
Figure 2 - The governance structure of an IVC .....	23
Figure 3 - Number of Innovative Startups and SMEs in Italy, 2018 – 2021 .....	34
Figure 4 - Percentage of Innovative Startups guided by Women and Young in Italy .....	35
Figure 5 - Number of Investments directed to Innovative Startups in Italy, 2017 - 2019.....	36
Figure 6 - Number of Investments directed to Innovative SMEs in Italy, 2017 – 2019 .....	37
Figure 7 - Total amount of capital collected through Crowdfunding campaigns, 2017 - 2020.....	37
Figure 8 - Three stages of an effective literature review process .....	38
Figure 9 - Thematic clusters of the assessment criteria applied by equity investors (Ferrati & Muffatto, 2021).....	41
Figure 10 - Model of BAs involvement in angel-group activities .....	57
Figure 11 - Gender success' variables .....	63
Figure 12 - Number of Notarial Acts analyzed.....	69
Figure 13 - Breakdown of Deals' typology .....	76
Figure 14 - Initial number of Acts vs Acts concerning capital increases .....	79
Figure 15 - OLS Regression Model .....	90
Figure 16 - Probit Regression Model.....	90
Figure 17 - Capital invested in 2020 in SMEs and Start-ups (m€).....	101
Figure 18 - Average invested quantity by type of investor (k€) .....	101
Figure 19 - Breakdown of equity-issue categories in Start-ups.....	104
Figure 20 - Breakdown of equity-issue categories in SMEs.....	104
Figure 21 - Sample of stakeholders involved in the econometric model.....	116

# Chapter 1: Introduction

## 1.1. A general definition of NTBFs

In the last years, New Technology Based Firms (NTBFs) have acquired a remarkable importance in the academic landscape. Their centrality in modern economic environments is not only related to the dissemination of technological innovation and industrial booming they can lead to (Freitag et al., 2019), but also to a potential source of job creation and, in general, of economic growth (Tarillon, 2022).

Nevertheless, up to now, there is not a unique definition related to NTBFs, and their recognition can vary according to the geographical location. In this regard, the very first definition was given in 1977 by Little, who describes them as any kind of independent organization whose purpose is to exploit an invention or a technological innovation (Miguel & Aldeano, 2006). With the advent of the Internet bubble and the consequent rise of new technologies and firms, this definition of NTBF did not take long in finding new particularizations. New meanings and attributes were associated with New Technologies Based Firms, identifying them as firms often (i) of a small size, (ii) with a few employees, (iii) producing high value-added products and/or services and (iv) originating, developing and updating their technologies through relationships with Universities and/or Research centers (Simón Elorz, 2003).

According to these first two definitions, it might seem obvious that the word “New” refers to the adoption of a New Technology, but in reality such association is not straightforward as it looks. The term “New”, in fact, can be in some cases not related to the technology applied, but it may be restricted to New firms able to develop New industries (Shearman C & Burrell G, 1989). In contrast with this definition given by Shearman and Burrell, for the purpose of our study we decided to resort to a wider and technology-centric definition of the NTBFs, marrying the leitmotif of the framework proposed by the European Innovation Monitoring System (EIMS) and recurring to more recent studies.

In this regard, the delimitation and categorization of a New Technology Based Firm pivots around three main pillars (Antonio et al., 2015):

1. Independent nature of the firm;
2. Technology-based Strategy;
3. New or recently created firm

The first pillar defines how the principal shareholder of the social capital is mainly composed by the entrepreneurial team of the venture (Fontes & Coombs, 1999). This concept clearly points out how these NTBFs are independent businesses, therefore do not operate as a part or a subsidiary of another company. Such consideration suggests how the potentiality of the venture and its attractiveness on the market heavily relies on the personal skills and capabilities of the entrepreneurs guiding the business (Colombo & Grilli, 2010).

If the recognition of the first pillar can be considered as a pretty straightforward task, the same cannot be stated for what concerns the second one. Indeed, the categorization of a firm as a Technology-based one can be biased by subjective or blurred considerations – e.g. if a firm has technology-based processes but no technology-based products can it be recognized as NTBF or not? In this direction, previous studies have tried to leverage on pre-defined deterministic frameworks, therefore trying to standardize the allocation process and reduce subjectivity issues. (Almus & Nerlinger, 1999), for example, tried to distinguish technology-based firms by considering the level of “Technology Intensity” associated with the sector in which they operate, to do so, their idea has been to consider the categorization performed by the Organization for Economic Cooperation and Development (OECD), that estimates the Technology Intensity on the basis of the intensity of Research and Development expenses registered in the sector under analysis:

**Table 1 - Technology Intensity by Sector**

<i>High Technology-based Industries</i>	<i>Code</i>
Aircraft and Spacecraft	353
Office, accounting and computing machinery	30
Radio, TV and communications equipment	32
Pharmaceuticals	2423
Medical, precision and optical instruments	33

<i>Medium-High Technology based Industries</i>	<i>Code</i>
Electrical machinery and apparatus	31
Motor vehicles, trailer and semi-trailers	34
Chemicals excluding pharmaceuticals	24 excl. 2423
Railroad equipment and transport equipment	352 + 359
Machinery and equipment	29
<i>Medium-Low Technology based Industries</i>	<i>Code</i>
Building and repairing of ships and boats	351
Rubber and plastics products	25
Coke, refined petroleum products and nuclear fuel	23
Other non-metallic mineral products	26
Basic metals and fabricated metal products	27-28
<i>Low Technology based Industries</i>	<i>Code</i>
Manufacturing; Recycling	36-37
Wood, pulp, paper, printing and publishing	20-22
Food products, beverages and tobacco	15-16
Textiles, leather and footwear	17-19

*Source: OECD, Almus and Nerlinger, 1999*

Nevertheless, we consider this approach to be a non-resolutive one, in fact, if on the one hand, the introduction of a rigid and schematic framework eliminates the risk of subjective allocations, on the other hand some criticalities can still be pointed out: first, these guidelines may be time-variant; second, some firms could be operating in more than one or hybrid sectors, therefore a rigid allocation into a single cluster may bring to misleading conclusions.

In light of these considerations, our idea is to adopt a wider and less rigid way of classification of Technology-based firms, defining them as all those companies applying inventions, technological advances, or significant innovations to either internal processes, in developed products or both simultaneously (Antonio et al., 2015).

Lastly, for what concerns the pillar number three, the attribute of “New or recently created firm” can be quantified considering the age of the venture to be lower than 25 years old (Colombo & Grilli, 2005; Little, 1977). In this regard, this attribute, if

combined with the presence of a Technology-based strategy, recalls the military rationale expressed by the Schumpeterian “creative destruction” for which the entrance of a newly built and innovative firm into an economic system can foster a dynamic efficiency in the shape of radical innovations (Schumpeter, 1934).

**Table 2 - Characteristics of a NTBF**

<i>Requirements</i>	<i>Description</i>
Independent Nature	Independent businesses, do not operate as a part or a subsidiary of another company
Technology-based	Companies applying inventions, technological advances, or innovations to internal processes, in developed products or both
New or recently built	Younger than 25 years old

### **1.1.1 Public intervention for NTBFs**

As pointed out the beginning of the previous section, the NTBFs could potentially bring along a wide range of benefits to the macro-economic landscape in which they operate, for these reasons, in the past decades, also governmental bodies devoted their attention to this kind of organizations, aiming at preserving and incentivizing the raising and development of these realities with the purpose of fostering technological, social and economic benefits. As a consequence, many governments in various part of the world enacted specific legislative policies – as favorable legal and fiscal legislations – with the aim of protecting and eventually energizing the engine of NTBFs (Leleux and Surlemont, 2003).

In particular, governments can opt for the so called “direct” measures, as Public Investment programs; or for more “indirect” measures, as indeed the design of specific legal and fiscal policies (Cumming & Johan, 2018). While the former practices will be further detailed in the following sections, it is worth mentioning here some examples concerning the latter. In the US, for instance, the government has designed the bankruptcy process in order not to discourage the entrepreneur, facilitating its reorganization for eventual other ventures. Similarly, in France and Belgium, in case of a bankruptcy, the creditor might be allowed to postpone the payment of its debt, this again to incentivize and create appealing landscapes for potential entrepreneurs. But in

this regard, one of the most promising examples is constituted by the Science Parks, these parks are basically organizations whose scope is to provide promising NTBFs with assets, knowledge, networks or in general other favorable conditions in order to facilitate and eventually test their growth potential (Hobbs et al., 2017).

For instance, a particularly famous typology of Science Park can be recognized in the so-called Regulatory Sandbox for FinTech ventures. In this case, the policy maker selects some promising NTBFs and allow them to operate in a protected environment with ad hoc regulations, allowing in this way the firm to test its Business Idea with the possibility to benefit from a relieved legal pressure, and having at the same time feedback on potential different legal frameworks (Chen, 2022).

## **1.2 The Italian definition of NTBF**

When addressing the Italian definition of New Technology Based Firms, it is necessary to underline the distinction between Innovative Startups and Innovative SMEs (In Italian: Piccole e Medie imprese innovative), in fact, the Italian legal framework defines clear requisites that a firm must respect in order to be categorized as either Innovative Startup or Innovative SME.

### **Innovative Startups**

For what concerns the first definition, the Italian Decree-Law Number 179/2012, article 15, comma 2, states that an organization can be formally recognized as a Startup, only if it meets all the following requisites:

- The firm is new, or it has been constituted no more than 5 years ago;
- The firm is located in Italy, or it is located in another into another country belonging to the European Economic Area (EAA) but its operative headquarter is located in Italy;
- The firm generates yearly revenues below 5M€;
- The firm is not listed on any public market, therefore, it is privately owned;
- The firm is not distributing and have not distributed dividends;
- The firm is exclusively or prevalently focused on the development, production and commercialization of products or services with a high Technology-based value;



- The firm is not the result of a fusion, scission or sale of pre-existing portions of other firms.

In addition to this, the Startup can be formally considered as Innovative if it meets at least **one** of the following three requisites:

- *Requisite 1:* The Startup's Research and Development expenses are at least the 15% of the maximum between the total costs and the total production value;
- *Requisite 2:* The Startup has a highly qualified team composed by at least 2/3 of people owning a Master of Science or by 1/3 of people completing or having completed a PhD or researchers with more than 3 years of experience in certified research activities;
- *Requisite 3:* The Startup owns at least a patent, a license or a proprietary software.

### **Innovative SMEs**

Concerning the latter, the definition of a SME has been introduced in the Italian legal system by the Decree-Law number 3/2015, article 4. In this regard, an organization can be formally recognized as a SME, only if it meets all the following requisites:

- The firm is located in Italy, or it is located in another into another country belonging to the European Economic Area (EAA) but its operative headquarter is located in Italy;
- The firm is not listed on any public market, therefore, it is privately owned;
- The firm has obtained the certification relative to the last Financial Statement;
- The firm is not simultaneously registered as an Innovative Startup.

If on the one hand, the number of requisites to be recognized as a SME is lower than the ones needed to be recognized as a Startup, on the other hand the number of requisites to obtain the “Innovative” definition is higher. In fact, the SME can be formally considered as Innovative if it meets at least **two** of the following three requisites:

- *Requisite 1:* The SME's Research and Development expenses are at least the 3% of the maximum between the total costs and the total production value;

- *Requisite 2*: The SME has a highly qualified team composed by at least 1/3 of people owning a Master of Science or by 1/5 of people completing or having completed a PhD or researchers with more than 3 years of experience in certified research activities;
- *Requisite 3*: The SME owns at least a patent, a license or a proprietary software.

### **1.2.1 Public intervention for Italian NTBFs**

In line with the considerations produced in the section 1.1.1., also the Italian government has been implementing some measures in order to foster and protect the rise of Innovative Startups and SMEs. In this sense, Italian policy makers have been adopting both “direct” and “indirect” approaches, but once again, being the former further detailed and investigated in the section 1.5 we will now give an overview of the most relevant regulatory incentives that the Italian government has enacted to incentivize the development of NTBFs.

- **Fiscal Incentives for Investors selecting NTBFs**: This measure is not straightly directed to NTBFs, but it is intended for their potential investors. The law, introduced with the “Legge di Bilancio, 2017” guarantees for Physical Individuals a reduction on the IRPEF<sup>1</sup> equal to the 30% of the capital invested up to a maximum of 1M€; for Legal Entities, instead, it offers a reduction on the IRES<sup>2</sup> equal to the 30% of the capital invested up to a maximum of 1.8M€. The reduction is conditional to a holding period of the shares of minimum 3 years.
- **Simplified and cost-free access to the “Fondo di Garanzia per le PMI”**: Through this measure, Italian NTBFs benefit of a simplified and eventually costless access to the “Fondo di Garanzia per le PMI”, the fund can cover up to the 80% of the debt that the NTBF has contracted with respect to a bank, up to a maximum value of 5M€.
- **Postponement of deadline to reconstruct share capital**: In case a NTBF registers an amount of losses such that the value of Share Capital is reduced of more than

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<sup>1</sup> IRPEF stands for “Imposta sul Reddito delle Persone Fisiche”, namely the taxation applied to People’s incomes

<sup>2</sup> IRES stands for “Imposta sul Reddito delle Società”, namely the taxation applied to Legal Entities’ incomes

1/3. The time window to reconstruct it is extended from “within the next financial year” to “within the next two financial years”.

The aforementioned measures are indistinctly valid for both Innovative SMEs and Startups. In addition to them, it is worth considering other two important measures exclusively designed for Innovative Startups:

- “Fail Fast” decree: In case of failure of an Innovative Startup, the firm can rely on less heavy and impacting procedures to conclude the activity, thus limiting the onerousness of the bankruptcy.
- “Smart & Start” decree: This measure implies the provision of an interest free financing for those ventures presenting forecasted expenses ranging between 0.1 M€ and 1.5 M€. The financing covers the 80% of the eligible expenditures, this percentage can increase to 90% if the Startup is exclusively run by Women or entrepreneurs younger than 35 years old.

### **1.3 The funding gap**

If on the one hand it has been clearly pointed out the importance and the potentiality embedded with NTBFs, the process with which they can collect capital to sustainably run their business is a much more controversial topic.

In this sense, wanting to perform a first superficial distinction, NTBFs can resort to two different sources of financing: Internal and External sources (Waleczek et al., 2018).

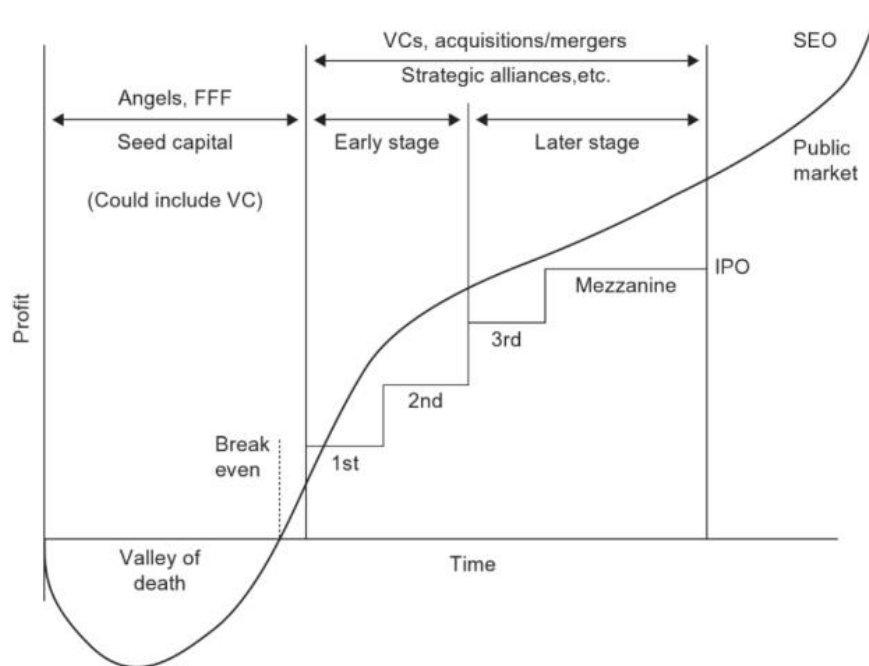
#### **Internal Financing**

When addressing the internal sources of financing, NTBFs can usually resort to two main typologies of funding. The first one is related to the provision of capital from the so called “Love Money” or FFF Investors, in this circumstance the financial resources are provided by either Friends, Family, or “Fools”, in the first two cases, the investment is not supported by any financial or strategic rationale, but it is simply driven by the personal interrelationship between the Investor and the Entrepreneur (Austin J et al., 2006), conversely, with “Fools” we refer to unexperienced Investors attempting their investment in the venture.

A second possible source of internal financing is linked with the process of Bootstrapping, this practice basically consists of an efficient exploitation of existing

resources from the entrepreneur to overcome resource scarcity, this is order to creatively acquire new resources at minimal costs (Grichnik et al., 2014), therefore decreasing the costs of these resources and limiting the dependence from external actors (Venkataraman, 2003). The bootstrapping process, as the general definition implies, is usually adopted from NTBFs with respect to financial resources, with the aim of efficiently optimizing internal funds without needing to resort to external, and therefore costlier, ones.

Usually these two internal sources are adopted by the entrepreneurs to sustain the early stages of the Venture’s lifecycle (Waleczek et al., 2018), such phase is particularly critical for the development of the firm since it also corresponds to the phase of lowest profitability and highest risk for the NTBF – i.e. “Valley of Death” (Cumming & Johan, 2013; Wilson et al., 2018). Additionally, considering the intrinsic nature of the financing, it is immediate to understand how the amount of capital that can be retrieved from these streams is particularly exiguous and therefore it cannot guarantee a prolonged sustainment of the business. In light of these considerations, sooner or later it is of vital importance for the NTBF to recur to external sources of financing.



**Figure 1 - Stages of Entrepreneurial firm development and investor category per stage**

## **External Financing**

Analogously with the previous case, also in terms of External Financing is possible to perform a substantial differentiation, which is Equity financing vs Debt financing. In this regard, NTBFs particularly thrive in collecting sufficient amounts of financial resources to run their businesses and this is mainly attributable to capital market imperfections (Carpenter et al., 2002).

These market inefficiencies are primarily due to problems of Information Asymmetries between the Investee firm and the Investor, asymmetries that can be present both before the investment – i.e. Ex-Ante information asymmetries – and after the investment – i.e. Ex-Post information asymmetries.

In the former case, being the NTBF a newly built venture, it is often characterized by a (i) lack of financial records and a (ii) possible lack of a final product/service to commercialize, for these reasons the potential investors do not have enough information to properly evaluate the business opportunity. In case of debt financing, for instance, such uneven information level may result in very high and detrimental interest rates. In general, the main consequence of ex-ante information asymmetries is the problem of Adverse Selection, for which potential investors do not dispose of the needed amount of information to distinguish between a good and a bad investment opportunity, in this sense, a possible way to reduce the impact of this undesirable scenario is the so-called signaling practice. Signals mainly consist in a costly action which incorporates a message, proving the high-quality of business opportunity (Islam et al., 2018). A signal must be costly, otherwise it is not a signal; moreover, it must cost more for bad ventures than for good ones, otherwise no distinction would be possible. An example of signal can be the degree, which proves the level of education of a worker, or the ownership of a patent.

Considering now the ex-post information asymmetries, they are related with hidden action issues and therefore to the problem of Moral Hazard, basically this occurs when the party with more information about its actions or intentions has a tendency or incentive to behave inappropriately from the perspective of the party with less information. For example, once having received external financing, the entrepreneur might care less about the goodness of its actions and decisions, since the risk is transferred to the counterparty providing the capital. In such cases, banks try to limit

the impact of this phenomenon by requiring a collateral securing the loan they provided, nevertheless, it must be noted how by definition NTBFs are not in possess of valuable assets that might be used in quality of collateral.

To recollect the previous considerations, it is clear how the nature of NTBFs implies the insurgence of Information asymmetries between the firm and the potential investors, as a consequence, these phenomena may result in a general reluctance of Investors to select these kinds of firms that, instead, require a noticeable number of financial resources to sustain their newly built businesses. In light of this, the market is characterized by a financing gap, namely a gap between the amount of capital that would be invested under conditions of well-informed and competitive markets and the amount of capital actually invested (Wilson et al., 2018), which heavily compromises the survival and growth possibilities of NTBFs.

#### **1.4 Alternative Finance to fill the gap**

A possible solution that could help overcoming this controversial financing gap is constituted by the set of instruments falling under the category of Alternative Financing options. Also in this case, previous studies investigating the topic can help us identifying the most proper definition of such instruments.

- Alternative finance refers to the financial channels and instruments which, in recent years, have emerged outside the traditional financial system represented by banks and capital markets, (Chambers et al., 2019);
- Alternative financing channels are defined as all the nonmarket, non-bank sources, including internal finance (e.g., retained earnings) and alternative, external finance (Allen et al., 2012);
- Alternative finance refers to financial channels, processes, and instruments that have emerged outside of the traditional finance system such as regulated banks and capital markets<sup>3</sup>.

What clearly emerges from these definitions, is that with Alternative Finance (AF), we refer to all those (i) external sources of financing that (ii) encompass both Equity and

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<sup>3</sup> Definition of "Cambridge Judge Business School: Cambridge Centre for Alternative Finance"

Debt instruments and that rely on (iii) alternative markets with respect to the traditional banks and capital markets.

Even if the identification of the specific alternative streams might be subject to the different geographic location and might comprehend a wide range of possible instruments, we decided, in accordance with the conduction of our study, to focus this section on three main AF solutions, (1) Venture Capital and Private Equity Funds, (2) Business Angels Investments and (3) Crowdfunding Platforms.

### 1.4.1 VC and PE funds

Venture Capital and Private Equity funds are defined as professional financial intermediaries investing Equity capital in organizations (Cumming & Johan, 2013). Their primary objective is to actively foster the growth of the firm they entered, in order to increase its value and therefore exit their investment realizing a substantial profit. In terms of governance structure, these organizations are usually established following a limited partnership logic: the fund raises money from external investors – i.e. The “Limited Partners” (LP) – which might be Institutional investors, as Banks, Pension Funds or Companies, then these money are managed and Invested on by the Fund Managers – i.e. The “General Partners” (GP).

The GPs are in charge of composing the portfolio of companies to invest in and are often employed in its daily monitoring.

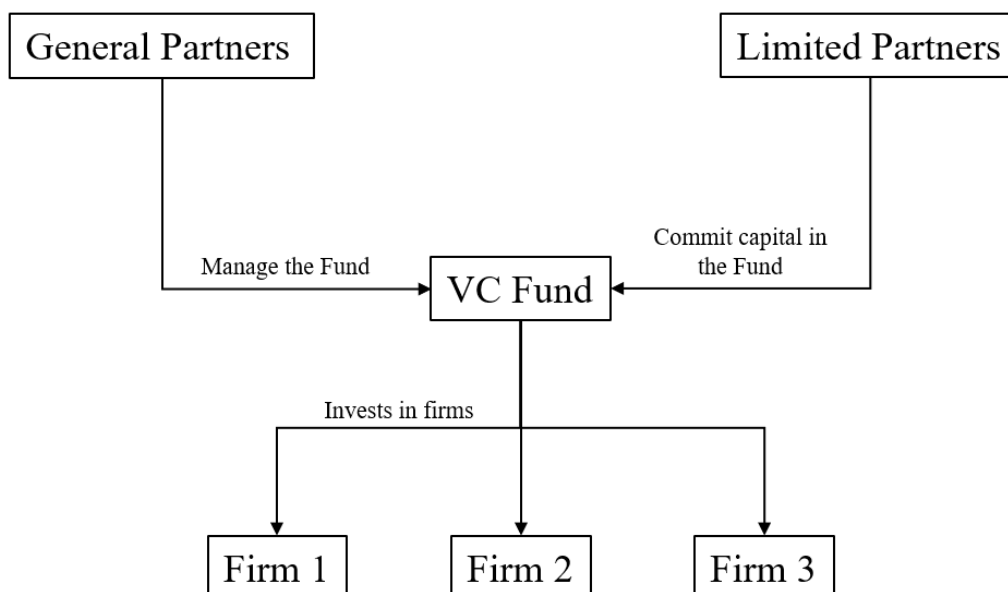


Figure 2 - The governance structure of an IVC

Once having selected their target(s), these funds do not just limit themselves to provide financial resources, but they are actively involved in the running of the Business by making available their skills, their knowledge, their network of relationships and assets. This suggests how with this direct involvement, it is possible to reduce the aforementioned problem underlying the financing gap, namely the Moral Hazard issue.

Through these coaching and monitoring activities, the goal of the GPs is to increase the value associated with the Investee, this in order to exit their investment, realize a profit and therefore remunerate both the LP and the GP itself. The extension of the period for which the shares are held is subjective, and it may vary according to the specific fund, for example, younger funds usually tend to accelerate the exit in order to rapidly register successful records and attract other LPs.

In particular, the exit process can follow different paths, as:

- IPO: the company is taken public with an Initial Public Offering it and accesses a Public Stock Exchange. The fund can realize the exit selling its shares on the market;
- Trade Sale: the fund stake is sold with a private offer, to a bidding company (M&A), or to another institutional investor which could even be another fund;
- Buy Back: the fund stake is sold back to the Entrepreneur;
- Write off: the exit occurs because of the firm's failure.

Even if they present similar governance structures and a common general *modus operandi*, VCs and PEs still present some substantial differences. In the first instance, the amount of capital they manage is different: VC funds usually deal with a committed capital which can range from 50M€ to more than 100M€; conversely, PE funds are set up with way greater resources, eventually managing 10B€.

But the most important and relevant difference concerns the stage of development of the firm in which they invest (Cumming & Johan, 2013): VC activities usually comprehends also investments in early-stage firms with a relevant growth potential (as NTBFs are); PE, instead, are mainly involved in later-stage deals, often targeting also distressed and critical realities not characterized by an evident growth potential. Being the purpose of our study mainly focused on the investment received by NTBFs, our



attention will be here prevalently devoted on the description of the VC investment category.

In particular, a commonly and widely shared taxonomy, categorizes the different Venture Capitalists according to four main clusters: (1) Independent Venture Capital (IVC); (2) Corporate Venture Capital (CVC); (3) Government Venture Capital (GVC) and (4) Bank Venture Capital (BVC).

- Independent Venture Capital: this category of Investors encompasses exactly the governance structure and the objectives detailed above. Here we are talking about private and therefore independent organizations that raise financial resources from the LP with the goal of investing them into promising young Ventures in order to coach them and exit to generate a profit. As this definition suggests, it is clear how the primary and central concern of these organizations is to pursue mere financial objectives. If on the one hand we have mentioned how their direct involvement implies a possible resolution of the Moral Hazard, on the other hand the two parties might have contrasting views on how to run the business, giving raise to the Principal-Agent issue. The entrepreneur, for instance, might be willing to pursue and sustain a gradual growth of the business in order to lay the foundations for a durably profitable business; conversely, the VC is usually characterized by a sense of rush, trying to maximize the firm's value in the shortest amount of time.

In view of all these considerations, it is possible to conclude how the selection strategy of an IVC is mainly driven by the desire to realize high financial profits. To this, we can counterpose the dual willingness of the firm to be selected by an IVC which might bring value adding resources and competencies.

- Corporate Venture Capital: with corporate venture capital activities, instead, we refer to all those minority equity investments performed by non-financial corporations in privately held ventures. According to this definition, and considering how the investor is a traditional enterprise, the Governance structure and the objectives are usually different from the ones defined above. First of all, in terms of governance organization, we can identify 3 main traditional structures:

1. CVC as a Limited Partner: here the investing company turns to a professional IVC and commits a certain amount of money. In this case the CVC invests in an “Indirect” way.
2. Wholly Owned Subsidiary: here the investing firm sets up a separate but completely owned organization – i.e. the CVC fund. In this case the investing firm acts as the unique Limited Partner of the fund and hires some Funds’ Managers in quality of General Partners. This governance model is almost identical to the IVC one, with the only difference that the committed capital comes from the parent organization. In this regard, some explanatory examples are CapitalG, owned from Google and Intel Capital, owned from Intel.
3. Direct Investment: here the firm directly invests in the venture with the intermediation of neither an IVC nor a wholly owned subsidiary. Usually, the corporation runs the investment managing it from a specific Business Unit.

For what concerns strategical objectives, Corporate Venture Capital are not mainly concerned in obtaining financial returns, their goal is usually to absorb and eventually integrate some value-adding assets or competencies of the targeted firm. For instance, an enterprise willing to obtain a patent or willing to implement a particular technology owned by a Venture might set up an investment with the scope of acquiring these assets. In light of these predominant strategic objectives, it is worth mentioning three potential criticalities associated with CVC activities:

1. Misappropriation risks: the NTBFs might be reluctant in receiving the investment from a CVC because of the fear that it could “steal” and take possess in a misconduct way of its assets. Such risk is particularly present in those landscapes, as the European one, where IP regimes are very weak.

In this sense, when possible, NTBFs might recur to Social<sup>4</sup> or Timing<sup>5</sup> defenses.

2. Internal Principal-Agent problems: in traditional IVC funds the remuneration of Fund Managers is based on carried interests, it means that basically their salary is defined as a percentage of the capital gain generated by the portfolio they control. Such remuneration system allows, not without any controversy, to align the objectives of the single manager with the objectives of the whole fund's strategy. Conversely to this case, when we refer to CVCs, being their objectives mainly concerning matters of strategical nature, a carried interest remuneration system would not guarantee this alignment. As a consequence, the firms setting up the investment fund might require to design a proper incentive system to push the fund managers' objectives in line with the corporate strategic goal.
  3. Integration difficulties: considering once again how CVCs are primarily concerned with the absorption and integration of strategical assets, another important issue to be considered is how to effectively integrate these factors with the parent organization. In a Direct Investment governance this issue is limited since the parent firm directly interacts with the investee firm, but when the investment is intermediated by a Wholly Owned Subsidiary, the contact and integration between the two parties is not exempted by remarkable difficulties.
- Government Venture Capital: For what concerns Governmental Venture Capital activities, here we refer to those Direct measures through which governmental bodies try to incentivize and nurture the dynamic, social and economical growth of the country, eventually trying to alleviate the impact of the financing gap by crowding-in other sources of investment (Kiriata, 2017). By definition, GVCs are funds set up and financed by public sources in order to pursue the aforementioned goals. In this sense, it is immediate to understand how these

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<sup>4</sup> Social defenses refer to the possibility for the Investee to denounce the misbehavior of the CVC thus ruining its reputation on the VC market. Such defense is particularly effective in dense VC landscapes as the US ones.

<sup>5</sup> Timing defenses refer to the possibility for the Investee to resort to other sources of financing and postpone the receiving of the CVC investment to the period in which the risk is lower. This practice in Europe is not widely adopted since NTBFs do not have many alternative sources.

kinds of investments are driven by neither financial nor strategic objectives, as a matter of fact, GVC pursue “social” objectives, directing its investments to potentially highly beneficial firms for the country. Nevertheless, the level of contribution that these programs can guarantee to the markets in which they operate has been object of controversial debates: if on the one hand the governments hope to alimnt the VC investments and increase the overall capital provided to NTBFs – i.e. Crowding-in - on the other hand there have been various academic studies proving them to trigger the exact opposite phenomenon – i.e. Crowding-out. Such considerations will be further detailed in Chapter 2.

- **Bank Venture Capital:** Lastly, Bank Venture Capital funds refers to those VC funds set up and managed by Banks. If at first it might seem unusual to see a financial institution to invest into a NTBFs adopting equity financing rather than debt financing, the reason for these practices relies on the strategical objectives they pursue. When financing a firm through a BVC fund, the bank tries to establish a strict relationship with the Venture, with the hope that if the firm successfully manages to grow and validate its business model, it will turn to the financial products and services offered by the bank itself. For instance, the bank might benefit from eventual demand for loans, advisory services and others. In this case, conversely with the benefits provided by other forms of VCs, the BVC neither dispose of high managerial skills to guide the growth nor is particularly interested to enhance this growth, since its main purpose is just to push the Investee firm towards its products’ offering.

### **1.4.2 Business Angels**

Shifting now the focus from Legal Entities to Individual Investors, another very prominent source of external financing for NTBFs is constituted by the so-called Business Angels (BA), also known as Angel Investors.

BAs are high wealthy individuals, usually former entrepreneurs or professionals, who invest their own money in promising NTBFs in which they have no direct connection, in exchange for ownership equity, acting alone or through semiformal networks (BAN)

(Tenca et al., 2018). As this definition suggests, these Individuals are not driven by an interpersonal connection with the entrepreneur, but they enter the Venture with the intent of obtaining a personal remuneration. The Business Angels, in addition, do not play a passive role when entering the investment, but they put at disposal, similarly to IVCs, their capabilities, knowledge and network in order to foster the firm's growth. In particular, the two most relevant contributions they provide to Invested firms are (i) the facilitation to access other fundings (Sørheim, 2005) and (ii) the fulfilment of knowledge and experience gaps (Amatucci & Sohl, 2004).

In the past years, at both regional, national or even continental level, Business Angels started to organize themselves into semi-informal organizations (also referred as Networks, Clubs or Groups). The objectives of such organizations range from increasing the deal flow by sharing presentation pitches from potential entrepreneurs to performing joint due-diligence work on potential investment opportunities, ultimately reducing transaction costs (Mason, 2006; Sohl, 2007; Paul and Whittam, 2010; Gregson et al., 2013; Lahti and Keinonen, 2016).

If compared with "traditional" Angel Investors, usually the affiliation with a Network generates valuable information and risk reduction that ultimately increase the amount of capital that angels invest in new ventures. These factors causally affect angels' portfolios by reducing the individual stake in each company while expanding the relative size of their portfolios devoted to early-stage investments (Bonini et al., 2018).

Nonetheless, independently from the association to a Network or not, the main objective driving their investment activities remains the pursuing of a capital gain, mixed with their willingness to get in touch with talented entrepreneurs and discover promising technologies.

### **1.4.3 Crowdfunding**

To conclude, another powerful solution to which NTBFs can resort relies on the launch of a Crowdfunding campaign. Crowdfunding can be considered as the intersection between two concepts (Mollick, 2014): (i) Microfinance, which is related to the provision of a limited amount of financing; together with (ii) Crowdsourcing, which implies an open call to the crowd which can autonomously decide if and how to contribute to the increase. These campaigns are launched on dedicated Crowdfunding platforms, where the entrepreneurs can present their idea and their projections to the

public that, in response, can decide whether to contribute or not. In exchange of their contribution, the Investors usually receive back different typologies of compensations (Beier & Wagner, 2015; Burtch et al., 2013):

- **Donation-based Crowdfunding:** It is the only case in which the Investor does not receive any reward. Usually, these kinds of contributors are driven by personal or psychological matters, overlooking a possible financial reward;
- **Reward-based Crowdfunding:** Here the crowdfunders receive a compensation in the shape of a physical object. It may be a product, a gadget, a service or even a symbolic reward chosen from a list;
- **Equity-based Crowdfunding:** It is for sure the most widely adopted type of campaign. Here the firm’s backers receive shares of the NTBF’s risk capital, in some rare cases, they may also possess some voting rights in the organization;
- **Lending-based Crowdfunding:** Here the provision of capital takes the form of a personal lending. The investors provide a certain amount of money to the firm but with the expectation of obtaining a reimbursement and an interest after a certain time horizon.

As a result, Crowdfunding significantly alleviates entrepreneurs’ reliance on traditional funding avenues (Mollick, 2014), eventually allowing NTBFs to reduce the financing gap they usually face, nevertheless, the amount that can be raised through these open calls is exiguous if compared to more structured streams as the ones coming from IVCs.

However, the advantages are not strictly related to financial matters, in fact, another remarkable advantage coming from these campaigns is the possibility to directly interact with potential customers, thus receiving pragmatic feedback on the product or service that the firm is developing.

The following table recollects the main Investor categories identified and described in section 1.4., reporting for each one of them the main objectives driving their investment practices:

**Table 3 - Resume of Investment Strategies for each Investor type**

<i>Investor Category</i>	<i>Objective</i>	<i>Investment Practice</i>
IVC	Financial	Invest in young firms; Coaching them; Increase their value; Realize a profit in the exit

CVC	Strategic	Target firms with a strategic potential, knowledge, patents, technologies or capital; Integrating these factors in the parent company to foster innovation
GVC	Social	Fill the gaps of the market; Target sectors and firms potentially beneficial for the society; Create job opportunities; Incentivize economic growth
BVC	Strategic	Establish a strict relationship with the NTBF; Encourage a demand for its financial product or services
BAs and BANs	Financial	Invest in young firms; Coaching them; Realize a personal remuneration through dividends and Capital Gains

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### **1.5 A focus on Public Initiatives, BANs and Crowdfunding in Italy**

The following section will further detail (i) how the Italian government is putting in place direct measures to sustain the NTBFs landscape; (ii) which are the most important Italian Business Angels associations and (iii) how the process of Crowdfunding is regulated and promoted.

#### **Public Initiatives**

For what concerns the first of these three bullet points, the direct involvement of the government can be recognized in the set-up of regionally constituted GVC funds, the so-called “Finanziarie Regionali”. These funds, in accordance with the general definition of GVCs, are nothing else than financial organizations supporting the definition, development and implementation of investment policies aimed at sustaining the growth of the regional, and in turn national, economic system. Their rise began in the late ‘50s and today it is possible to count 18 funds, almost one for each Italian region.

As it is expressed by the A.N.F.I.R. (“Associazione Nazionale Finanziarie Regionali”), they primarily target NTBFs, with the scope of offering incentives to the firms, both proposing financing resources and tangible or intangible assets in order to guide the business’ growth. In terms of Governance structure, the capital committed to the fund is predominantly provided by Regional governments, public bodies and national banks, with the former usually owning a percentage of ownership not lower than 50%. The

following table resumes the list of Italian GVC funds associated with the A.N.F.I.R., indicating the regional location that they mainly support:

**Table 4 - Main Italian GVCs**

<i>Name of the Fund</i>	<i>Targeted Region</i>
Fidi Toscana	Toscana
Filse	Liguria
FinAosta	Valle D'Aosta
FinCalabria	Calabria
Friulia Finanziaria FVG	Friuli Venezia Giulia
Gepafin	Umbria
IRFIS	Sicilia
Lazio Innova	Lazio
Trentino Sviluppo	Trentino Alto Adige
FinLombarda	Lombardia
FinMolise S.p.A.	Molise
FinPiemonte	Piemonte
FIRA	Abruzzo
Puglia Sviluppo	Puglia
SFIRS	Sardegna
Sviluppo Campania	Campania
Sviluppo Basilicata	Basilicata
Veneto Sviluppo	Veneto

In addition to these governmentally owned funds, another Italian financial institution promoting the economic growth of the country is represented by “Cassa Depositi e Prestiti” (CDP), that is a financial organization owned at 83% by the ministry of economy and finance (MEF). CDP has the goal of supporting the growth of Italian economic landscape by providing capital resources and advisory services to Italian firms, in particular, the branch “CDP Venture Capital SGR” owns and manages a portfolio of 9 different VC funds directed to the fostering of the growth of national NTBFs.



Particularly referring to last years, both regional GVCs and CDP's initiatives play a role of vital importance in contrasting the challenging hazards that the outbreak of the Covid-19 pandemic is putting in front of the Italian economic and entrepreneurial system. In this regard, the possibility to crowd-in private sources of financing that might help alleviating the funding gap subjecting NTBFs assumes an even more precious meaning. Among the other initiatives, for example, CDP launched the "AccelerORA!" program, cooperating and syndicating investments with private players in order to support ventures facing difficulties due to the pandemic.

### **BANs**

For what concerns Italian Business Angels associations, the national landscape in the last years assisted to the rise of various BA aggregations. In particular, the very first association was born in 1999 and takes the name of "Italian Business Angel Network" (IBAN), this is probably the most famous and largest Italian club of BAs, which promotes the contact and the sharing of opportunities between different investors. Subsequently, other similar organizations started to originate, possible examples in this sense are the Italian "Angels for Growth" (IAG) as well as the "Club degli Investitori". Also in this case, in accordance with their previous definition, these group of BAs are nothing else that aggregations of informal investors cooperating and jointly evaluating business opportunities, with the purpose of supporting the firms' growth and recording a personal remuneration from the Investment.

### **Equity Crowdfunding**

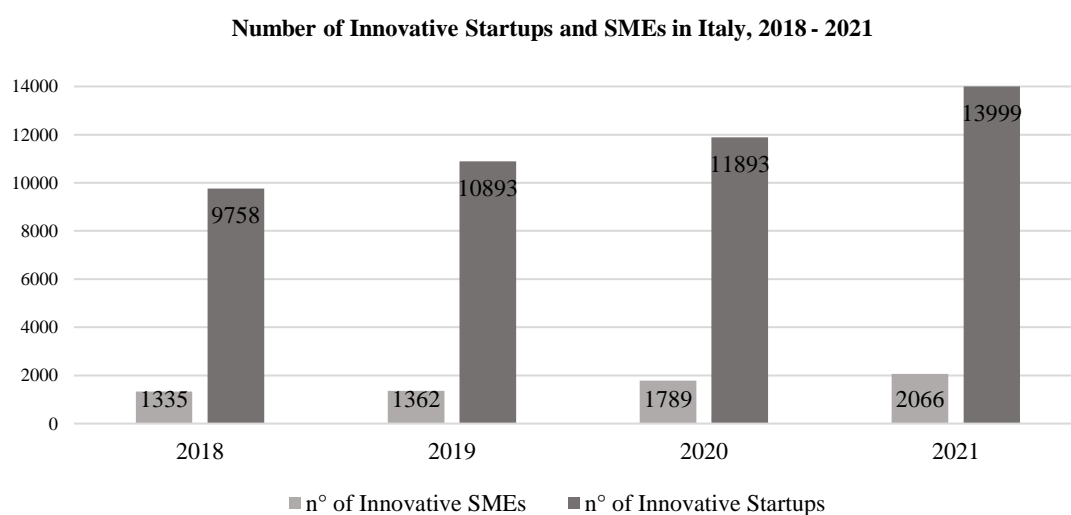
Lastly, we can here pass to illustrate the Equity Crowdfunding possibilities for Italian firms. In this regard, the very first introduction of this AF practice dates to 2013, when the CONSOB ("Commissione Nazionale per le Società e la Borsa") deliberated a primary regulatory framework governing the collection of equity capital on on-line platforms.

In the first instance, this possibility was exclusively reserved to Innovative Startups, therefore leaving other typologies of firms outside of the equation. Nevertheless, a legislative integration in 2015 opened this possibility also to Innovative SMEs, therefore allowing the opportunity for the totality of Italian NTBFs to resort to Equity Crowdfunding practices.

## 1.6 Overview of the Italian NTBFs' landscape

The following section will provide the reader with some relevant snapshots describing the Italian environment, disclosing potential interesting trends concerning the NTBFs as well as some figures related to the national Alternative Finance markets.

First of all, thanks to the parliamentary annual reports on Italian NTBFs, it has been possible to trace the cardinality's evolution of Innovative Startups and SMEs in the country. What firstly emerges from this analysis is that Italian entrepreneurs seem not to have feared the impact of the pandemic outbreak, since both the number of Innovative Startups and the number of Innovative SMEs tended to grow both from 2019 to 2020 and from 2020 to 2021<sup>6</sup>:

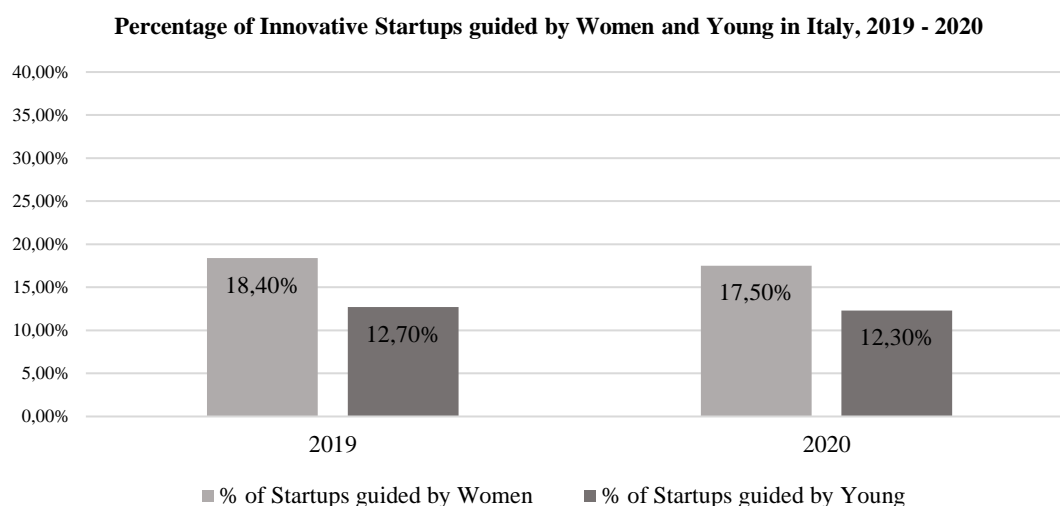


**Figure 3 - Number of Innovative Startups and SMEs in Italy, 2018 – 2021**

Nevertheless, the covid-19 seems to have negatively impacted the incidence of Young and Women entrepreneurs in the Italian landscape. As a matter of fact, both the percentages of Innovative Startups guided by young, and women entrepreneurs slightly dropped in 2020:

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<sup>6</sup> 2021 numerosity refers to the first three quarters of the year



**Figure 4 - Percentage of Innovative Startups guided by Women and Young in Italy**

Resorting once again to the Italian parliamentary annual reports, it is possible to observe an heterogeneous distribution of NTBFs in the country for the years 2019 and 2020. In particular, the majority of Innovative SMEs and Startups is based in the North-Western region of the Country, with a remarkably high density of firms concentrated in Lombardy:

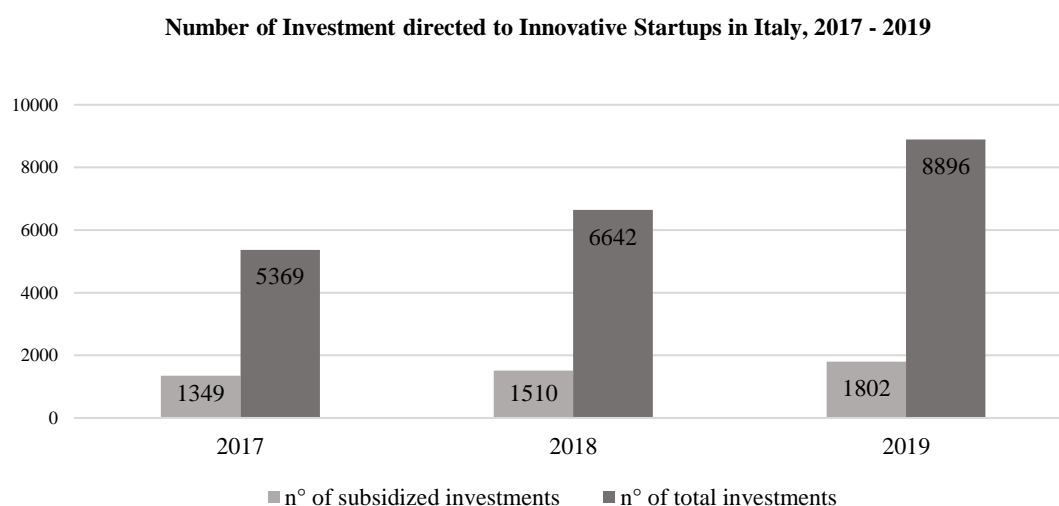
**Table 5 - NTBFs' Distribution by Region in Italy**

<i>Region</i>	<i>2019</i>		<i>2020</i>	
	<i>% Startups</i>	<i>% SMEs</i>	<i>% Startups</i>	<i>% SMEs</i>
Piemonte	5.6	8.3	5.5	7.3
Valle d'Aosta	0.2	0.4	0.2	0.4
Lombardia	26.9	29.2	27.1	28.2
Liguria	1.7	2.5	1.6	2.0
<i>Total North-West</i>	<i>34.4</i>	<i>40.5</i>	<i>34.3</i>	<i>38.0</i>
Trentino Alto Adige	2.4	2.1	2.4	2.1
Veneto	8.2	6.3	8.1	5.6
FVG	2.1	2.1	2.1	2.0
Emilia Romagna	8.5	9.8	7.9	9.5
<i>Total North-East</i>	<i>21.3</i>	<i>20.3</i>	<i>20.5</i>	<i>19.1</i>
Toscana	3.9	5.0	4.5	5.3
Umbria	1.7	1.2	1.6	1.2
Marche	3.2	4.1	2.9	4.5
Lazio	11.3	8.2	11.7	10.1
<i>Total Center</i>	<i>20.0</i>	<i>18.5</i>	<i>20.7</i>	<i>21.2</i>
Abruzzo	2.0	1.8	1.8	1.6
Molise	0.7	0.1	0.6	0.2
Campania	8.3	6.8	8.8	8.0

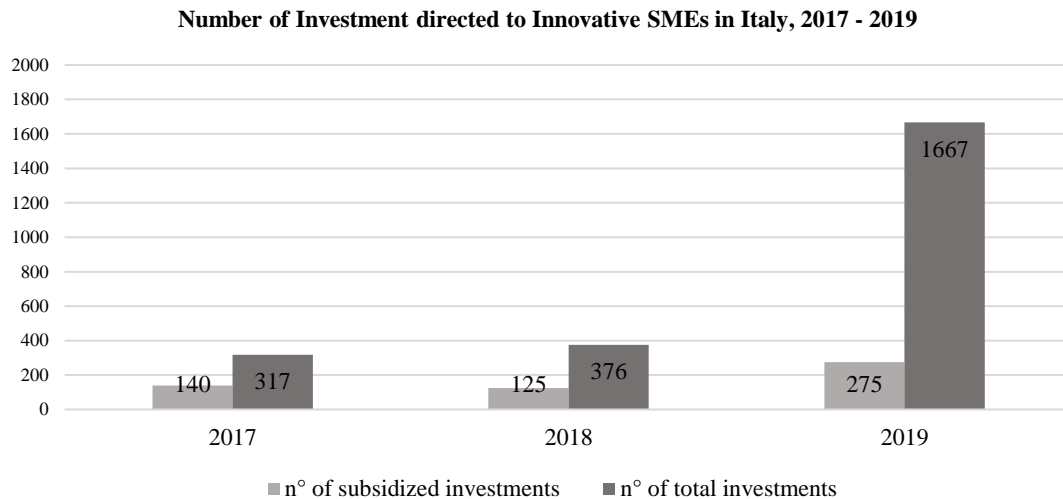
Puglia	4.0	5.9	4.2	5.5
Basilicata	1.0	0.4	0.9	0.5
Calabria	2.4	1.8	2.1	2.2
Sicilia	4.7	3.1	4.6	3.2
Sardegna	1.2	0.8	1.3	0.5
<i>Total South</i>	<i>24.2</i>	<i>20.7</i>	<i>24.5</i>	<i>21.7</i>
<b><i>Total Italy</i></b>	<b><i>100.0</i></b>	<b><i>100.0</i></b>	<b><i>100.0</i></b>	<b><i>100.0</i></b>

Furtherly entering more in detail, the city that registers the highest number of NTBFs is Milan, followed by Rome, Naples (only in terms of Startups) and Turin (only in terms of SMEs).

Passing now to give some considerations on the contribution given by public entities, the introduction of the fiscal incentive introduced by the “Legge di Bilancio, 2017” (see section 1.2.1.) did not hesitate in bringing the desired results. Right after the introduction of the incentive, Italian NTBFs assisted to a rising number of subsidized investments as well as an increase of the total number of investments received, in particular, an outstanding result is disclosable for Innovative SMEs in the shifting between 2018 and 2019:

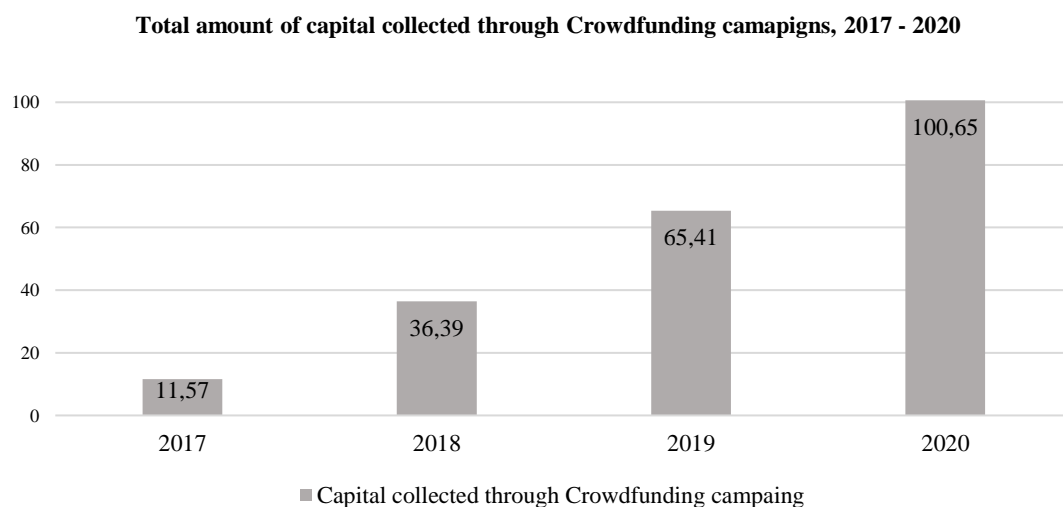


**Figure 5 - Number of Investments directed to Innovative Startups in Italy, 2017 - 2019**



**Figure 6 - Number of Investments directed to Innovative SMEs in Italy, 2017 – 2019**

Lastly, it is worth mentioning the increasing relevant contribution of Equity Crowdfunding platforms on the capital collected by NTBFs in Italy. The following data, that has been retrieved from the annual report redacted by the Crowd investing Observatory of the Politecnico di Milano’s School of Management, underline how the capital collected through on-line portals has remarkably increased over time, touching its record value in 2020 with a total collection of more than 100 M€. Record that, nevertheless, is expected to be exceeded again in 2021:

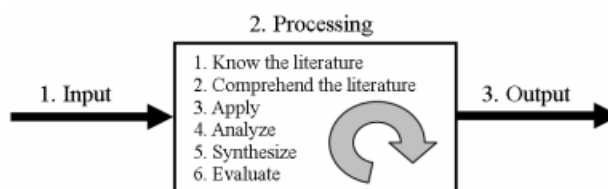


**Figure 7 - Total amount of capital collected through Crowdfunding campaigns, 2017 - 2020**

## Chapter 2: Literature Review

The conduction of a meticulous review of precedent academic researches constitutes a pivotal phase of any modern study. As a matter of fact, the past literature analysis allows to identify which characteristics have been already investigated and which level of detail has been reached, in this way, it is dually possible to visualize eventual uninvestigated matters – i.e. the so-called research gaps – and ideally give a contribution in that direction. In this regard, we could re-formulate its meaning as the “usage of already existing ideas in the literature in order to justify the approach adopted for the topic under analysis, additionally demonstrating that the research effectively contributes to producing something new” (Hart, 1998). Nevertheless, this process does not follow a random approach, but it should rely on a solid and systematic methodology governed by rigor, consistency, clarity and brevity (Hart, 1998).

For these reasons, a solid literature review should follow a properly designed three-step approach, composed of (i) the selection of the inputs (the academic studies to analyze), (ii) their processing (the set of activities performed in order to evaluate their contributions) and (iii) their translation into outputs (the visualization of the research gaps), (Levy, 2006).



**Figure 8 - Three stages of an effective literature review process**

Therefore, in accordance with this principle, our review process followed exactly these 3 phases. In particular, the idea has been to focus our efforts on the Alternative Finance solutions to which NTBFs can resort in order to access external sources of Equity

financing, particularly investigating the different peculiarities of the Investors in terms of Investment strategies and therefore selection criteria.

For these reasons, the following section will be divided into three main sub-parts: a first one detailing the studies concerning how different typologies of Investors select their targets on the basis of the accounting figures they produce; a second one investigating the selection criteria that different Investors have when considering factors related to the managerial team and, in general, to the intellectual potential of the firm; and a third one further exploring the differences between the Classic Business Angels (BA), and those Business Angels associated with a Network (BAN).

At the end of the chapter, there will be underlined the eventual literature gaps that have been identified during the review process, finally proposing the research questions that this study aims at investigating.

## **2.1 The focus of the analysis, a preliminary overview**

As it has been pointed out in Chapter one, New Technology Based Firms play a role of pivotal importance in the economic growth of the country, fostering the introduction of innovative technologies as well as, among the others, favoring the rise of new job opportunities. Despite this, these realities cannot solidly rely on internal sources of financing as the ones provided by FFF or Bootstrapping practices, and inevitably need to recur to external actors in order to scale their business.

Nevertheless, when referring to external sources of financing, these realities particularly thrive in finding a proper and sustainable way to finance their operations, since their young and unexperienced nature implies *Information Asymmetries* both in the Investor's selection process – ex-ante Information Asymmetries – and after the eventual Investment – ex-post information asymmetries (Glucksman, 2020). For what concerns the former, they are linked with the concept of *Adverse Selection* issues, according to which the entrepreneur is highly informed on the characteristics of the business, its risk level and its potentiality, while, on the other hand, the Investor does not have this kind of information and has limited resources to restore them. The result is that the Investor fails in identifying and distinguishing good business opportunities, therefore being discouraged to commits its financial resources into the venture.

Passing now to the latter, namely ex-post Information Asymmetries, they are linked with *Moral Hazard* issues, according to which there is the risk that the Entrepreneur will misbehave right after having received the investment, eventually decreasing its commitment.

In light of these criticalities affecting their growth opportunities, a promising solution might be constituted by the options falling under the categorization of Alternative Financing, namely the set of (i) external sources of financing, (ii) encompassing both equity and debt instruments and (iii) relying on alternative markets with respect to the traditional banks and capital ones (Chambers et al., 2019; Allen et al., 2012).

### **2.1.1 Investor selecting the NTBF**

At this point of the research, it is necessary to point out how the primary purpose of the analysis has been focused on Equity sources of financing, therefore further investigating the activities of the different typologies of Venture Capital (VCs) and Business Angels (BAs) that have been underlined in Section 1, leaving outside of the equation the pure debt or hybrid financing instruments. The aforementioned Equity investors play a crucial role for the Investee NTBFs, not only because they inject substantial financial resources, but because they also provide the firm with a vitally important range of additional resources (both tangibles and intangibles) as well as value adding services (Lee et al., 2001). In this regard, the relevance of the contribution that these actors give can be underlined considering how VC-backed firms usually present higher survival rates if compared with non-VC-backed ones (Kunkel and Hofer 1991; Sandberg 1986; Timmons 1994).

Conversely, for VCs and BAs, NTBFs constitute very appealing targets to pursue the different objectives they want to achieve. Independently of whether their goal is purely financial or driven by strategical considerations, NTBFs have a technological and intrinsic nature that may put the Investor in the condition to fully achieve its aims. Nevertheless, for the problems already underlined in this section, the process of evaluating a NTBF is particularly challenging due to their highly uncertain and risky business activities (Ferrati F & Muffatto M, 2021). For this reason, independently from the objectives they aim at pursuing, the eventual selection/rejection process is the result of a laborious and meticulous analysis considering a wide range of different factors:



Investment assessment criteria 208 (100.0%)	Venture specific factors 158 (76.0%)	Characteristics of the entrepreneur and/or the management team 71 (34.1%)	Entrepreneur personality	20	(9.6%)
			Entrepreneur experience and background	13	(6.3%)
			Entrepreneur expertise and skills	8	(3.8%)
			Entrepreneur motivations	8	(3.8%)
			Entrepreneur commitment	4	(1.9%)
			Entrepreneur reputation	2	(1.0%)
			Entrepreneur demographics	2	(1.0%)
			Entrepreneur / investor fit	3	(1.4%)
			Team	7	(3.4%)
			Venture network and affiliations	4	(1.9%)
	Characteristics of the product / service 27 (13.0%)	Product / service development	5	(2.4%)	
		Product / service innovation	4	(1.9%)	
		Product / service advantages	5	(2.4%)	
		Products / services portfolio	2	(1.0%)	
		Product / service economics	3	(1.4%)	
		Operations	8	(3.8%)	
	Characteristics of the market 23 (11.1%)	Market and customers	14	(6.7%)	
		Competition	6	(2.9%)	
		Market access and development	3	(1.4%)	
Venture financials 14 (6.7%)	Venture financial indicators	6	(2.9%)		
	Venture access to finance	3	(1.4%)		
	Costs	5	(2.4%)		
Business model 2 (1.0%)	Business model and strategy	2	(1.0%)		
	Proposal 11 (5.3%)	Quality of the proposal	11	(5.3%)	
Venture's other factors 11 (4.8%)	Venture's other specific factors	10	(4.8%)		
	Investors related factors 25 (12.0%)	Investor screening focus	5	(2.4%)	
Expected return on investment		9	(4.3%)		
Investment synergies		4	(1.9%)		
Contractual terms		7	(3.4%)		
Investor's other factors 6 (2.9%)	Investor's other specific factors	6	(2.9%)		
	Environmental factors 7 (3.4%)	International factors	2	(1.0%)	
National and ecosystem factors		5	(2.4%)		
Risk assessment factors 12 (5.8%)	Risk factors 12 (5.8%)	Market risks	5	(2.4%)	
		Agency risks	2	(1.0%)	
		Country and Ecosystem risks	5	(2.4%)	

**Figure 9 - Thematic clusters of the assessment criteria applied by equity investors (Ferrati & Muffatto, 2021)**

The analysis conducted by Ferrati and Muffatto, for instance, evidences how the valuation of an entrepreneurial firm from an equity investor passes through a set of heterogeneous factors, ranging from (i) the characteristic of the investee, (ii) characteristic of the Investor itself, (iii) the characteristic of the environment and (iv) risk assessment factors. In this regard it is immediate to observe the higher importance of the first category, that according to the study, has a predominant weight if compared with the others.

### **2.1.2 NTBF selecting the Investor**

If on the one hand it is obvious and logical to think how the Investor carefully evaluates the possible targets where to commit its financial and non-financial resources, the vice versa might seem an unusual line of reasoning. Nevertheless, as a matter of fact, Investee do select the Investors from which receive support (Smith G, 1999).

In fact, the Investee NTBF not only evaluates the amount of financial resources that the Investor may provide to the business, but it parallelly examines the potential benefits and/or drawbacks that the specific investor might imply. In this regard, the very first evaluation that is performed by the firm concerns the fit and the quality of the value-added resources and services that the Investor is introducing into the firm, in fact, as we mentioned above, the additional importance of VC and BA investors is the provision of new resources and capabilities of the firm, in this sense an entrepreneur will tend to avoid those Investors providing a low contribution, trying instead to send signals and attract more prominent actors. In addition to this, it is here worth mentioning how the *Information Asymmetries* issues are not only suffered by Investors, but they are a two-sided phenomenon (Glucksman, 2020), therefore also Investee firms, being not perfectly aware of VC practices, will try to retrieve more information for what concerns VC's behaviors and reliance (Drover et al., 2014).

A common problem regarding VCs' unreliable behaviors is represented by the *Misappropriation Risks*, usually they refer to Corporate Venture Capital (CVC) – that is, minority equity investments made by established firms in young privately held ventures (Dushnitsky, 2012) – and they concern the risk that the new venture's knowledge or technology will be misappropriated or imitated by the parent firm, thus leaving the NTBF's entrepreneurs empty-handed (Colombo & Shafi, 2016). As already mentioned in Chapter 1, usually NTBFs can resort to three typologies of defenses in

order to contrast these threats: the first one is to be safeguarded by a properly designed IP regime (Dushnitsky & Shaver, 2009); the second one refers to *Timing Defenses*<sup>7</sup> (Katila et al., 2008); while the last one refers to *Social Defenses*<sup>8</sup> (Hallen et al., 2014). Although being effective defensive measures in the US, European NTBFs proved not to adopt them: as a matter of fact, they frequently form ties with same industry CVCs, which are the most valuable, but also the most dangerous partners; they seem not to adopt timing defenses, since the opportunity costs of timing are much higher than in the US due to the European VC landscape peculiarities; and they lastly seem not to resort to Social defenses, since the density level of VC European markets is lower than US one, meaning that a lower social protection can be granted (Colombo & Shafi, 2016).

The introductory review here presented under the section 2.1 provided us with some preliminary considerations, that are:

- Equity Investors usually select NTBFs on the basis of (MacMillan, Siegel and Narasimha 1985):
  - The Business, i.e. the Horse;
  - The Entrepreneur characteristics, i.e. the Joker;
  - The characteristics of the market, i.e. the Race Track.
- NTBFs usually select Investors on the basis of their:
  - Affinity;
  - Behavioral Reliance

For the purpose of our study, we decided to confine the direction of the further academic review, and consequently of our methodology, to the first bullet point, specifically funneling our efforts on the investment strategies adopted by Investors when evaluating the Horse and the Jocker.

## **2.2 VCs evaluating the Business of the NTBF**

In this section we will go through the different investment strategies and therefore selection criteria that the different typologies of VCs, namely IVC, CVC, GVC and

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<sup>7</sup> Timing defenses refer to the possibility for the Investee to resort to other sources of financing and postpone the receiving of the CVC investment to the period in which the risk is lower.

<sup>8</sup> Social defenses refer to the possibility for the Investee to denounce the misbehavior of the CVC thus ruining its reputation on the VC market.

BVC adopt when evaluating the business potentiality of the NTBF under analysis. In particular, we will present here the main results that past academic researches have been underlining with respect to these Alternative Financing actors, recalling the main organizational peculiarities distinguishing each of them:

- **IVC**

Independent Venture Capital investors can be defined as private and therefore independent organizations that raise financial resources with the goal of investing them into promising young Ventures in order to coach them and exit to generate a profit. Usually, these types of funds present a GP-LP governance structure, in which General Partners collect the capital coming from Limited Partners and invest them on their behalf.

As it is immediately disclosable from this definition and in accordance with previous academical studies, IVCs seek for purely financial gains (Hellmann, 2002), as a result, they are often not interested in any strategical or social implication that their selection might have. Indeed, one of the most important factors that it is evaluated when considering a possible target is the potential scalability, eventually even international scalability, of the business (Moritz et al., 2022).

In addition to this, it is appropriate to perform a further distinction between less established IVCs and more established ones. As a matter of fact, IVC funds heavily rely on the capital committed by the Limited Partners, nevertheless, similarly to what we mentioned before for the selection process between Investor and Investee, it is equally difficult for the GPs to attract LPs in committing their resources in the fund. This issue is particularly relevant for younger funds that, not disposing of a track record of previous successful exits, cannot signal their quality to upstream Investors.

For these reasons, if compared with other categories of VCs, IVCs are usually characterized by a sense of rush, trying to maximize the firm's value in the shortest amount of time in order to rapidly realize a successful exit and create a track record to present to LPs. In accordance with this consideration, IVCs proved to give a higher short-term contribution to their Investee, therefore trying to maximize their value in a shorter time horizon and proved to have a smaller

holding period if compared with other typologies of investors (Colombo & Murtinu, 2017). In particular, the selection from an IVC, usually implies for the Investee firm an outstanding sales growth, factor that can be considered as an indicator of business success for entrepreneurial firms (Weinzimmer et al., 1998) and is positively related to the likelihood of an IPO (Chemmanur et al., 2010, 2011; Puri and Zarutskie, 2012).

- **CVC**

Conversely from the IVC definition, a Corporate Venture Capital can be defined as established, and often incumbent, firms executing minority equity investments in young privately held ventures. Usually, these types of funds can follow three main typologies of governance structures: (i) Acting as the LP of another Fund; (ii) Setting a Wholly Owned Subsidiary; (iii) Operating through direct investments made from specific Business Units. In this sense, the Parent company might face higher or lower integration difficulties or remuneration issues depending on the chosen structure.

Nevertheless, the main peculiarity distinguishing Corporate Venture Capitals from Independent ones, is that often they are not interested in pursuing a mere financial goal, but they are usually driven by the desire of acquiring complementary assets or competencies to integrate them and eventually foster an open innovation (Pinkow & Iversen, 2020). Even if in some cases some financial goals could be present (Dushnitsky & Shaver, 2009), their strategies prevalently aim at opening a window on technology (Block and MacMillan, 1993; Chesbrough, 2002; Keil, 2002; Dushnitsky and Lenox, 2005; Wadhwa and Kotha, 2006; Benson and Ziedonis, 2008), for instance Chesbrough and Tucci (2004) even exclude investments that are made for purely financial reasons in their conceptual understanding of CVC.

Similarly to IVCs, also CVCs do not provide just financial resources, they support the Investee firm with the provision of non-financial assets to support the growth of the business, nevertheless, another important difference between the two relies on the time horizon characterizing the investment strategy (Pinkow & Iversen, 2020), in fact, we have already mentioned how the desire of generating a track record makes the IVC a hasty investor, in the case of a CVC this is no longer true, the CVC has no Limited Partners to convince – since

the funds are provided by the organization itself – and it is more focused on establishing a long-lasting relationship with the Investee. Such considerations find an empirical validation in the fact that CVCs imply a long-term increase of sales growth which is almost three times the growth they provide in the short term, all this with a negligible impact on the variation of the payroll expenses (Colombo & Murtinu, 2017).

This latter evidence is in line with the view that CVCs create a symbiotic relationship with their portfolio firms (Gompers and Lerner, 2000; Ivanov and Xie, 2010). Because CVC-backed firms benefit from knowledge transfer and a skilled labor force (e.g., researchers, CVC fund managers) coming from the parent company, they can increase their sales value without any substantial increase in payroll expenses.

Lastly, it is worth mentioning in this section how CVC activities are closely related to the concept of *Ambidexterity*, which can be defined as the ability of an organization to perform both exploration and exploitation, referring to the abilities to compete in new technologies and markets and to compete in mature technologies and markets, respectively (O'Reilly & Tushman, 2013).

- **GVC**

For what concerns Governmental Venture Capital activities, here we refer to those Direct measures through which governmental bodies try to nurture the dynamic, social and economic growth of the country, eventually trying to alleviate the impact of the financing gap by crowding-in other sources of investment (Kiriata, 2017).

In accordance with this definition, GVCs are funds set up and financed by public sources in order to pursue the aforementioned goals, therefore presenting a governance structure in which Public Bodies act in the shape of Limited Partners. In light of this, it is immediate to understand how these kinds of investments are driven by neither financial nor strategic objectives, indeed GVCs prevalently pursue “social” objectives, aiming at, among the others, financing uninvested realities characterized by a higher level of information asymmetries and uncertainty (Brander et al., 2015; Colombo et al., 2016); and at giving money to create jobs and support specific geographical areas or industries (Lerner, 2002).

If on the one hand the general strategic direction followed by GVCs is now clear, there are limited researches detailing how the broader set of objectives of GVC programs actually affects investment selection process, process that often considers investments that might not be as satisfactory in terms of return for risk, since they are supposed to generate significant social payoffs or localized public benefits. In fact, we lack a deep understanding of how GVC managers can consistently screen investment proposals with fund objectives (Colombo et al., 2016), and one of the few contributions in this direction highlights how patents have significantly positive value as a signaling mechanism in the GVC environment (Uzuegbunam et al., 2017).

Similarly to CVCs, GVC do not feel the pressure to execute an early exit (Colombo, D'Adda, et al., 2016), therefore they usually try to establish a long lasting relationship with the investee with the aim to promote a gradual and consistent growth of the reality. Among the objectives of these Governmental direct programs, one of the most important is not only to foster the growth of uninvested businesses, but also to incentivize other investors to do the same, therefore trying to increase the overall contribution given by other categories of investors (i.e. Crowding-in phenomena).

Nevertheless, the level of contribution that these programs can guarantee to the markets has been object of controversial debates and the effectiveness of these public policies might depend on their peculiarities as well as the intrinsic attributes of the location in which they are implemented.

In this regard, one of the first studies conducted on the Canadian VC landscape proved the ineffectiveness of the investment program sponsored by the National government, pointing out the emergence of (undesired) Crowding-out phenomena rather than Crowding-in ones (D.J. Cumming & MacIntosh, 2006). Passing to the European landscape, different studies brought to completely opposite conclusions: a very first research conducted on European companies operating in the time window 1990-1996 suggested the effectiveness of GVC programs, underlining their capability to attract other typologies of investors (Leleux and Surlémount, 2003). On the completely opposite end, a similar study covering the years 1990-2003, suggested a total ineffectiveness of European public policies, underlining Substitution and Crowding-out phenomena (Armour & Cumming, 2006).

Unfortunately for policymakers and other academics, the literature on the topic of whether or not government venture capital crowds out private venture capital does not appear to be improving over time. In particular, there has emerged a misunderstanding about what data are needed to assess whether or not government venture capital crowds out private venture capital. And further, related to this work on topic, there appear to be inconsistencies across datasets used by the same authors (Cumming & Johan, 2018).

- **BVC**

Bank Venture Capital funds refers to those VC funds set up, financed and managed by Banks. If at first it might seem unusual to see a financial institution to invest into a NTBFs adopting equity financing rather than debt financing, the reason for these practices relies on the strategical objectives they pursue. When financing a firm through a BVC fund, the bank is not interested in generating any capital gain, but it just tries to establish a close relationship with the Venture, with the hope that in the future it will turn to the financial products and services offered by the bank itself (Bottazzi et al., 2008), for instance Hellmann, Lindsay, and Puri (2008) document that banks cross-sell services to firms that receive their venture funding.

In particular, through the screening of loans and monitoring, banks obtain private information about their clients, which can be valuable in other transactions. Likewise, banks could use information generated during past banking relationships to make private equity investment decisions (Fang et al., 2013). In this way the banks can benefit from these information synergies in order to reduce the Information Asymmetries characterizing these kinds of investment opportunities.

Similarly with CVCs and GVCs, Bank-affiliated funds do not feel the pressure of an early exit, in fact, their strategic objectives imply the establishment of a long-lasting relationship with the Investee, with the goal of retaining the firm for an eventual future cross and up selling. Moreover, being backed by a financial institution, BVCs usually suffer from lower financial constraints, being able to provide the target with higher and repeated rounds of financing.

On the other hand, conversely from IVCs and CVCs, the non-financial contribution that they are able to guarantee is limited. In the first instance this



is attributable to the fact that they do not dispose of suitable assets that might be integrated in the Venture, and then it must be cited how they do not express a particular willingness to foster an outstanding growth of the business since, again, their only strategic goal is to promote a future lending and not to generate a capital gain.

- **Syndicated Deals**

Despite having different investment objectives, it is common practice to observe in the VC landscape the syndication between more Investors. For instance, the syndication might occur between the VC of a same Investor category, e.g. IVC with IVC, or it might occur between heterogeneous players, e.g. IVC with CVC or IVC with GVC.

When they occur, usually the amount of capital is provided by a syndicate composed of several investors, with one VC investor acting as the leader who injects the greatest amount of capital and takes care of monitoring and coaching. Concerning this macro-concept, the question that may naturally occur is why and which are the advantages for a VC to enter in a syndicated deal, in this regard the extant literature advocated several reasons for these co-conducted practices. First of all, one the main advantages is to reduce the *Information Asymmetries* in the screening process through a cross-referencing between different VCs, thus allowing them to receive a “Second opinion” on the goodness of the opportunity (Lerner, 1994). Another relevant advantage recalls the concepts of economies of scale and economies of scope, indeed syndication allows Investors to overcome capital constraints and exploit complementary resources, skills, networks and expertise of other VCs to conduct the selection process (Bygrave, 1987). Concerning risk advantages, by relying on the screenings executed by other parties, VCs manage to reduce the efforts they spend in the single transaction, being able to increase the size of their portfolio, fostering in this way a wide diversification and therefore reducing the overall risk they face (Lerner, 1994). The benefits of a syndicated deal are not just confined to the Investors, but they can produce positive effects also on the Investee, for instance the backing from a VC syndication may signal to the market the quality of the firm, also influencing the likelihood of a successful exit (Tian, 2012).

Nevertheless, the extent of the contribution given by syndication of VCs to the targeted firm's performances depends on the nature of the syndication as well as on the fund acting as a leader. For example, the aforementioned study conducted by Colombo and Murtinu (2015), evidences how, conversely from the non-syndicated cases (IVC investing alone and CVC investing alone), the syndication between IVCs and CVCs do not bring along any improvement in terms of Total Factor Productivity (TFP) for the Investee firm, the reason for such result may be found recalling how different objectives of IVCs and CVCs may engender substantial agency costs (Chemmanur et al., 2014).

Instead, when the syndication is performed between IVCs and GVCs, it is possible to observe - at least in the European environment – a positive effect on the growth of the NTBF, but this is true exclusively in the circumstance in which the IVC leads the deal (Grilli & Murtinu, 2012). This finding is perfectly in accordance with the ones provided by Brander et al. (2012), who found that performance of syndicated-backed firms increases if GVC investors have a minority position rather than when they are leaders.

Therefore, in accordance with the considerations provided in Chapter 1, this preliminary review of academic studies confirms how the heterogeneity among VC investors parallelly implies a heterogeneity in terms of investment strategies. Nevertheless, understanding how these investment strategies find a concrete and empirical application when a particular type of VC is evaluating the accounting figures of a potential Investee is a much more complex task.

What is widely pointed out is the importance that financial accounting has, from the standpoint of an investor, in valuing a prospective investment (Raghunandan et al., 2012). One of the objectives of financial statements, indeed, is “to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions about providing resources to the entity”.

J.R.M. Hand's study of 2005 proves how the relevance of financial information increases as the firm matures, while the non-financial information becomes less relevant as the firm progresses. So, according to Hand (2005), non-financial information acts purely as a substitute for financial data, when the latter is not available.

Subsequently, it also emerged from complementary studies that financial statements are important when it comes to the evaluation of equities of early-stage companies (Armstrong et al., 2006). Hence, the analysis and evaluation of financial statements is a very important step of the investment's selection by the VC, but more than this it is important to prospect these figures in the future, also trying to perform their combination with data coming from other sources (Smith & Cordina, 2014).

Despite this, the majority of previous academic research studies focused the attention on understanding which accounting measures positively or negatively impact on the valuation of the firm. For example, a higher incidence of R&D costs is proven to be positively correlated with higher pre-money valuations (Armstrong et al., 2006). Or again a higher sales or employment growth bring along higher firms' valuations. For these reasons, up to the date of the production of this research, we can state that the impact of specific accounting measures on the investment selection criteria of VCs has been rarely debated, with an attention which mainly concerned the ventures' pre-money values. In addition, when such studies were redacted, they primarily investigated the sole category of IVCs, leaving apart considerations on other VC typologies.

### **2.3 VCs evaluating the Intellectual Capital of the NTBF**

As it is already evident at this point of our study. One of the main criticalities affecting the relationship between VCs and NTBFs is the *Adverse Selection* issue, for which the Investor is unable to distinguish and therefore select good business opportunities from bad ones. In this regard, one of the possible solutions to which Entrepreneurs might resort relies in the concept of *Signal*, which is nothing else than a costly action which incorporates a message, proving the high-quality of business opportunity (Islam et al., 2018). Most common signals that NTBFs can provide are (i) the quality and the level of education of the entrepreneurs and the management team as well as the (ii) ownership of proprietary patents or licenses.

As a matter of fact, as already proven by Ferrati & Muffatto<sup>9</sup> (2021), when evaluating the potentiality of the Investee, Investors not only consider its accounting figures, but they heavily base their analysis on the quality of the Human Capital, evaluating factors

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<sup>9</sup> It refers to the result of their study presented in Figure 9 under section 2.1

such as the Entrepreneur Personality, the Entrepreneur past experiences and Background, also spending a relevant attention in considering the whole Managerial team running the business.

The following subsection will further detail the importance of human capital and in general of the Intellectual potentiality of the firm with respect to the selection/rejection decisions implemented by the different categories of investors.

### **2.3.1 Entrepreneurs and Management team: the Human Capital**

If on the first section we focused our attention on the business of the NTBF and the different investment strategies of Investors, it is now necessary to shift the attention toward what we previously defined the Jockey, namely the Entrepreneur and in general the Human Capital of the firm.

As a matter of fact, we considered how it is particularly challenging for investors to assess the quality of the new firm's technology, indeed it is natural to consider how the entrepreneurial team possesses more information about the quality of the technology than any outside investor (Shane and Stuart, 2002). For example, the entrepreneur may attempt to 'oversell' the merits and viability of the venture in order to secure more favorable financing terms, eventually generating information asymmetries that may hinder the establishment of an investor/firm relationship.

Faced with high uncertainty and a limited amount of information in assessing NTBFs potential, VCs need to rely on those characteristics of the firm that are observable. In this regard, the selection is not just confined to financial measures but also to variables described by the team underlying the firm.

The existing literature widely investigated the importance of the managerial and entrepreneurial team in the selection process of the VCs, previous studies, in fact, confirm how the composition of the team might help signaling the quality of the business, therefore influencing the VCs' valuation (MacMillan, Siegel and Narasimha, 1985).

In particular, there are several attributes that VCs want to identify in managers, first they must show personal integrity, and second, they must have performed well in prior jobs, in fact, usually the track record is not just associated with the current company in which they operate (Fried & Hirsch, 1994). If this is true for more traditional VC funds,

this conclusion does not hold in the selection criteria adopted by Public Investors, the results of the study conducted from Uzuegbunam et al. (2017), for instance, suggests that prior high-value entrepreneurs experiences do not inspire significant attention in the GVC setting.

## 2.4 BAs and BANs evaluating NTBFs

Business Angels are individuals who invest their own resources in the Equity Capital market. Their objective is not only to bring financial support to the company they want to invest in, but also to contribute with their own experience and know-how. Therefore, BAs' motivation is not exclusively financial, and this enables to best sustain the growth of highly innovative companies.

In return for the investment, the angel investor gets a percentage of equity becoming a partner in the company.

The Social Innovation Monitor (SIM) has offered a definition of BAs according to their impact orientation by identifying three categories:

- **Profit-oriented angels:** they do not prioritize investments in companies with significant social impact and therefore do not have any in their portfolio. They represent the part of the sample mainly interested in remuneration.
- **Hybrid angels:** high social impact companies are not always the main target of the investment; however, they have an interest in the topic and have at most 50% of such companies in their portfolio.
- **Impact-oriented angels:** they attach significant weight to investments in companies with a significant social impact and have at least 50% of companies of this type in their portfolio and are more committed than the others to providing managerial as well as financial support.

The majority of Hybrid and Impact oriented Angels are **Impact First Angels** as they declared to invest in undercapitalized sectors or to accept lower than market returns in favor of higher returns in terms of social impact.

Furthermore, most Profit oriented, Hybrid and Impact oriented Angels are members of a Business Angel Group (BAG) or Business Angel Network (BAN).

- **Business Angel Groups** are defined as organizations that bring together business angels with similar interests and willingness to make joint investments in innovative enterprises. Examples are the 'Club degli Investitori' and 'Italian Angels for Growth' (IAG);
- **Business Angel Networks** are defined as communities that foster the development of entrepreneurial initiatives by connecting investors and entrepreneurs seeking funding. IBAN (Italian Business Angels Network) is the Italian national BAN.

These Business Angels associations are proof of how the angels' market is evolving from a fragmented activity market to a more organized one in which individuals cooperate and co-invest.

Angel investor organizations (AIOs) differ in terms of variety of services provided, size and internal structure. When discussing services, in this case, we refer to collaborations between different entrepreneurs and investment selection activities alongside the search for new opportunities and due diligence.

As mentioned above, one of the main advantages of these groups is to enable members to invest collectively by sharing value-added activities along the entire investment cycle, from deal research to due diligence, monitoring and exit, all activities that can hardly be carried out all together by individual angels.

Indeed, AIOs help to increase market supply, to lower transaction costs and reduce the equity gap for early-stage ventures.

In the light of the context just described, the literature has brought evidence that the success of a Business Angels association depends on several factors such as the training of its members, their involvement in the proposed activities, their knowledge and on the group strategy (Bonnet, Capizzi, Cohen, Petit, Wirtz, 2021).

Earlier we talked about Human Capital in relation to how this makes an NTBF more or less attractive to an investor who wants to maximize his return. Indeed, a good

management set-up signals a more advantageous opportunity by reducing information asymmetries between the company and the investor.

In contrast, we now want to bring information on Human Capital from the opposite point of view, thus defining the human capital characteristics that increase the likelihood of a successful BAN and ensure added value to the target company.

The education and experience of the members of a group or network of investors, as well as their time availability, are decisive variables in investment decisions as they positively influence the likelihood of a company to be financed by the group. Indeed, it is no coincidence that members with a high level of entrepreneurial background participate more actively in group management and in the definition of investment strategies and tend to assign higher shares of the post-investment added value to NTBFs they invest in (Butticè et al. 2021).

Therefore, since activities such as selecting investment opportunities, monitoring, performing due diligence, negotiating contracts with entrepreneurs and exits require time, experience and investment skills, a key challenge for angel associations is to ensure the long-term involvement of qualified members in order to build know-how and leverage synergies.

Belonging to a BAN is therefore an advantage for NTBFs because it allows them to receive higher funding as the investor can diversify holdings by spreading investment risks or co-invest and thus having more disposable assets.

Thus, depending on the time spent, previous experience and investment capabilities of BAs, their propensity to actively participate in group activities adapts. This relationship is described below by the figure showing all the hypotheses formulated in the article "What drives the active involvement in business angel groups?".

**H1.** “BAs’ professional retirement status is positively related to BAs’ active involvement in various angel-group activities”.

**H2a.** “BAs’ human capital derived from previous entrepreneurial experience is positively related to BAs’ active involvement in investment-related activities”.

**H2b.** “BAs’ human capital derived from previous significant top management experience (CEO) is positively related to BAs’ active involvement in group management activities”.

**H3.** “BAs’ human capital developed through investment experience is positively related to involvement in investment-related activities”.

**H4a.** “A predictive decision-making style positively affects BAs’ involvement in group management activities”.

**H4b.** “A control-oriented decision-making style positively affects BAs’ involvement in investment-related activities”.

**H5.** “BAs who are strongly committed financially to their angel group are more actively involved in various angel group activities”.

**H6a.** “BAs whose objective for joining an angel group is to learn from more experienced angels are more actively involved in various angel group activities”.

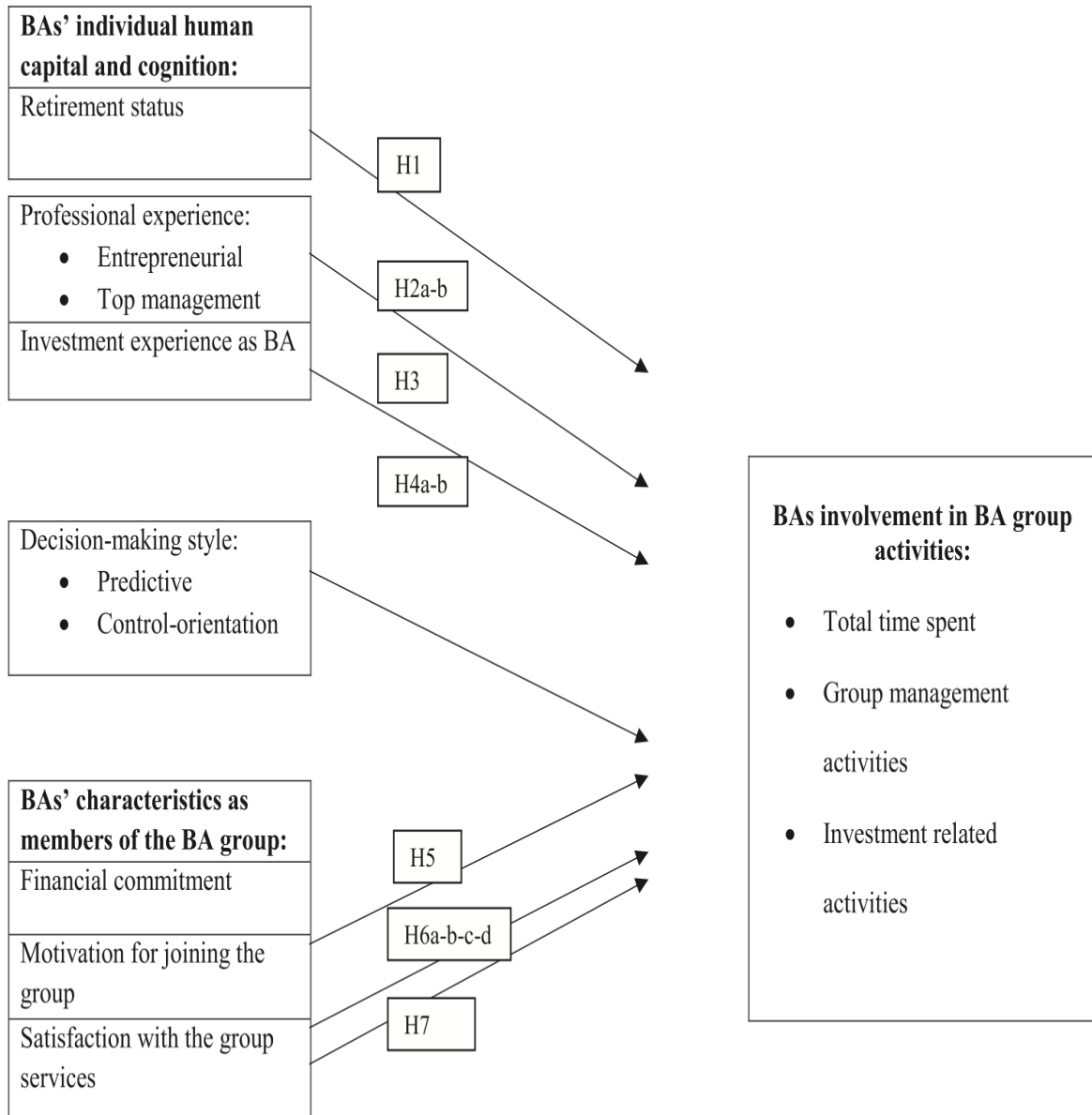
**H6b.** “BAs whose objective for joining an angel group is to enlarge their personal contacts network are more actively involved in various angel group activities”.

**H6c.** “BAs whose objective for joining an angel group is to access to more good quality investment opportunities are more actively involved in investment-related activities”.

**H6d.** “BAs whose objective for joining an angel group is to contribute to the local economic development are less actively involved in investment-related activities”.

**H7.** “BAs who are satisfied with the activities and actions performed by their angel group are more actively involved in various angel group activities”.





**Figure 10 - Model of BAs involvement in angel-group activities**

**(Bonnet, Capizzi, Cohen, Petit, Wirtz, 2021)**

### 2.4.1 Network dynamics

Membership also increases the number of investments that the target NTBF receives because, when the investment decision made by a central BA in the network becomes common knowledge, other investors who do not have better information to rely on, will interpret this move as a certification of the quality of the firm, and the probability of the Startup to receive more investments increase. This behavior describes the network dynamics of BA groups as internal relationships facilitate the flow of information within the group and, depending on the geographic location of the BAs involved, can influence the likelihood of the firm being financed.

The network geographical position is an important variable to enable the **certification effect** works. Indeed, if the network is in proximity of the NTBF target, the central BA access higher quality information since information asymmetries decreased and BAs are better off in screening and evaluating start-ups, providing post-investment support and monitoring (Harrison et al., 2010; Harrison, 2017).

However, by allowing a deeper understanding of the context, geographical proximity overlaps with the advantages of network centrality and makes the certification effect weaker.

Thus:

“The effect of having attracted a central BA on the probability of a company being funded weakens when the BA is also geographically proximate to the company.” (Butticè, Croce, Ughetto, 2020).

Moreover, even concerning the number of relationship that an individual can manage within a group, there is a limit over than he receives redundant information becoming unable to overcome information asymmetries. This led, eventually, to a negative marginal value of a new connection (Uzzi, 1997).

It follows that when a BA is *too* central, he/she may undertake suboptimal investment decisions and the other members of the group may no longer perceive the investment decision of the central BA as certification of the startup quality.

Thus:

“The association between attracting a central BA and the probability that the company is funded is inverse U-shaped, with the highest probability of the company being funded at intermediate levels of centrality.” (Butticè, Croce, Ughetto, 2020).

## **2.5 Differences between Business Angels and Venture Capitalists**

There are significant differences between angel and venture capital funding in terms of both the characteristics of the investors themselves and the terms of their investments.

The 5 key differences concern:

### **1. The identity of the investor**

Angel investors are individuals looking to invest their own funds, while Venture Capitalist investors are firms that gather money from groups of investors into a combined fund to finance emerging businesses. Because of the differences in the nature of money being invested, there is also a different tolerance for risk among the two categories. Angels who are investing their own money may be more risk averse, while funds that are investing strangers' money might be more willing to take on higher levels of risk.

### **2. The stage of the company**

Angels seek to invest in startups and seed-stage companies that have just started to engage in technical development and market research.

On the contrary, venture capitalists rarely support startups unless there are special circumstances. They invest more often in early stage and later stage businesses that are slightly more established, following them through the growth phases and into IPOs or mergers.

Moreover, Venture capitalists neglect small start-ups because the financial intervention is too modest to justify the related costs. The Business Angel, on the other hand, being an expert in the field, is able to carry out due diligence

quickly and at an obviously low cost, thus favoring the bottom-up creation of new start-ups.

### **3. The Investment Amount**

The amount invested by the two different categories of investors represents one of the main differences. Given that BAs are individuals investing only their own funds, most of their investments are significantly below EUR 1 million, and typically in the 10.000€-500.000€ range. Venture capital firms, instead, have a lot more funds to invest as they pool money from a large number of investors, thus, their investment is higher than 500.000€.

### **4. The level of contribution and involvement**

There are also significant differences in how these investors contribute to the business and how involved they intend to be. Angel investors frequently have industry experience but very rarely want to have any sort of direct involvement in the running of the business. Venture capitalists, instead, are the complete opposite. They typically expect to have a high level of involvement in the business's decision-making even demanding a seat on the board of directors.

### **5. The length of the investment**

Venture capitalists tend to be invested for a lot longer than angel investors. Angels are commonly invested for a period of two to five years before exiting the investment. In contrast, venture capitalists typically stay invested for at least 10 years before getting out.

As can be seen, the two types of investors are complementary and not competitive as one would expect. While it is true that each of them invests in a different phase of the NTBF's life, it is also true that business angels often decide to work together with venture capital funds in the next phase, the earl one.

**Table 6 - Main differences between BAs and VCs**

<i>Business Angel</i>	<i>Venture Capitalist</i>
Physical Individual	Found
Seed; Early stage	Early stage; Later stage
Modest amounts invested	High amounts invested
Short/Medium-term investments	Long-term investments
Informal Managerial Support	Board of Directors membership

## **2.6. Gender effects on informal venture finance**

### **2.6.1 Financing gap between male and female entrepreneurs**

The literature has brought evidence that women often found their own businesses driven by a lower intrinsic entrepreneurial motivation than male founders (Calderon et al., 2017) however, for first impressions, the personal traits, characteristics and skills of founding teams are crucial factors for pursuing entrepreneurial choices, due diligence and actual investments.

Female traits are often unconsciously attributed to more socio-emotional careers, while masculine traits are more associated with status-based careers, such as entrepreneurship or other high social status professions (Eddleston & Powell, 2008). Indeed, the ideal entrepreneur is characterized by traits such as boldness or aggressive risk-taking, which are usually traits more associated with men (Baughn et al., 2006).

In addition, Marlow et al. (2008) emphasized the importance of contextual variables, such as the sector in which the business is conducted, suggesting that women are adversely affected by competing in mature sectors such as services and not in faster growing ones such as technology.

Therefore, women might be judged unsuitable to become partners by business angels based only on their gender and not on their actual skills (Balachandra et al., 2019). As a result, female-led enterprises obtain less funding through new sources of financing such as BAs or VCs.

However, in early-stage investing, the entrepreneurs' personal traits play greater roles than in the later phases of investing and it means that business angels focus more on personalities than private equity firms (Mason et al., 2016).

This gender gap in early-stage investment prevents many female entrepreneurs from exploiting their full potential (Brush et al., 2017; Harrison & Mason, 2007) and, as a result, limits the number of new ventures and their success, *ceteris paribus*, compared to new ventures run by men (Laguía et al., 2018). Indeed, the lack of adequate access to capital and resources makes even the most promising ideas obsolete, preventing their development and implementation (Arvanitis & Stucki, 2014).

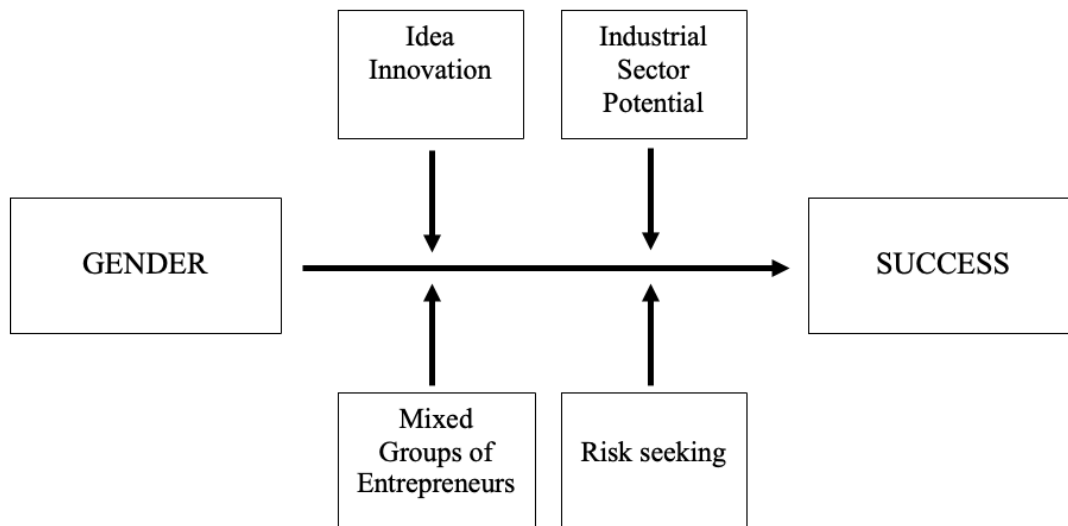
The presumed discrimination of women in entrepreneurship has repercussions for society and economies as a whole because if women cannot leverage their potential, they will not be able to contribute to add value (Brindley, 2005; Looi, 2020). Therefore, the reduction of entrepreneurial opportunities may lead to economic and social inefficiencies for potential founders as well as for the environment and society.

Furthermore, women entrepreneurs tend to underestimate their capabilities and businesses potential and, consequently, of company valuations (Kirkwood, 2009). Indeed, the lower level of confidence of women damages their financing, as they become willing to sell the same share of capital at a lower price. Consequently, they need to raise more capital regardless of their performance (Raghuvanshi et al., 2017).

As previously discussed, personal relationships between entrepreneurs and investors are a crucial variable in the venture capital market as they reduce market asymmetries and could generate a crowding-in effect for investments. In this respect, a group of entrepreneurs offers substantial advantages over a single entrepreneur, as teams composed of males and females together cover a broader spectrum of different personalities, characteristics and skills. Therefore, groups of entrepreneurs are more likely to connect with investors on a personal level and, if business angels establish links with one of the team members, the chances of the whole group to close the deal increase as does the possibility of exploiting synergies (Hohl1, Bican1, Guderian1 and Riar, 2021).

Thus, although certain traits associated with masculinity, such as high risk tolerance, are preferred by business angels, female risk-seekers have the same chances as male risk-seekers to raise money, regardless of their gender, but since these traits are more

present in males, it follows that women are discriminated against because of their gender, even if the truth is that gender is irrelevant to investors (Balachandra et al., 2019).



**Figure 11 - Gender success' variables**

### **2.6.2 Males and females Business Angels**

Females account for a minority of business angels. This can affect the supply of funds available to female entrepreneurs as capital providers often follow unconscious patterns to prefer investing in companies with founders that have the same sex since people of the same gender share more personality characteristics

However, in an industry in which men outnumber women it disadvantages female entrepreneurs seeking investment from business angels and makes them more risk averse. (Harrison & Mason, 2007).

The evidence that females have a higher fear of failure in starting a new business than males lead women to invest larger amounts in someone else's business.

As a result, Blease and Sohl (2008) find evidence that females gravitate towards less risky later-stage investment that typically entails larger investment. Thus, greater risk

aversion among females will reduce their propensity to become informal finance investors (which instead invest in early stages) but increase the amount they invest. Hence, females increase opportunities for exit and follow-on investments expanding the venture capital market. As a complementary effect, the number of female BAs also increases, because when competition among VCs increases, VC investors try to reduce it by raising the financing of female start-ups, which attracts more informal female investors. (Burke, Stel, Hartog, Ichou, 2013)

### **2.6.3 Covid-19 and gender implications**

The Covid-19 pandemic has put a strain on small businesses due to the short-term pressure on cash flow from reduced activity and the long-term risk to growth, which has increased due to the uncertainty of the situation.

In times when entrepreneurs need liquidity urgently, as in this case, access to sources of finance is crucial for business survival. These elements can highlight the barriers that may arise during economic crises such as COVID-19, as banks come under stress and alternative financial investments become a more viable option for entrepreneurs. However, venture capitalists, expecting a high return on their investments, may be reluctant to take on the risks of a new business in such situations.

In the described context, it is common for women to reduce their entrepreneurial activities, as they are less risk-averse than their male counterparts and thus, their likelihood of obtaining third-party financing decreases. Therefore, females cannot take advantage of the benefits that equity funding brings to businesses embarking on new activities. In fact, self-financing and/or informal external financing, which may involve taking a lower financial risk, (Leitch et al., 2018) are the preferred choices for women in uncertain contexts, making the role of friends and family as a more important source of informal financing (Bartik et al., 2020).

Furthermore, based on the sectoral concentration of women's businesses, most projects are in the fashion, dance or food sectors, which, during the lockdown and restrictions of the pandemic, were the most affected businesses. Male entrepreneurs, on the other hand, are mainly concentrated in the technology, games and comics sectors, which resulted prosperous. Consequently, women's choice of more mature sectors has placed an even greater burden on them in the context of the COVID-19 pandemic, because



digital and technology companies have been less affected by the closures than traditional ones.

With every economic crisis, however, there are always new opportunities that, in this case, from the investors' point of view lie in the market's need for money and professional advice such as that offered by BAs and VCs (Villaseca, Navío, 2020).

## **2.7 Gaps in the literature and Research Questions**

### **2.7.1 Gaps in the literature**

Up to the date of production of this research, we can state that the impact of specific accounting measures on VC investment selection criteria has rarely been discussed, focusing mainly on pre-money values of companies. Moreover, when such studies have been compiled, they have mainly examined only the IVC category, neglecting to consider other VC typologies.

Furthermore, the current literature does not even delve into the differences between the investments issued by Business Angel Networks (BANs) and non-networked BAs, nor whether and how the activities of BANs change during financial crisis compared to those of the individual BAs previously described by the literature. Therefore, further research with both quantitative and qualitative analyses on changes in relationships/trust within the network, the amount and volume of investments and the growth effects of NTBFs financed by these types of investors would be appreciated.

### **2.7.2 Research Questions**

Based on the literature review, we decided to focus our analysis on the crucial factors that different equity investors consider when deciding to bet on NTBFs. The initial hypothesis was therefore that, depending on the strategic objective pursued, equity investors make investment decisions according to different financial indicators of the target company.

Therefore, in order to obtain empirical evidence on the existence of different factors influencing investors' decision-making process, we defined the first research question:

*Q1: "In the Italian VC market, do different types of investors adopt different selection criteria when evaluating the target's accounting data?"*

Considering then the high level of asymmetric information the venture capital market suffers from when investing in new and uncertain ventures, we defined a second hypothesis: more professional and risk-averse entrepreneurs signal higher quality ventures and contribute in reducing asymmetries among investors.

For this reason, we wanted to investigate further whether and which characteristics of entrepreneurs could increase the returns of venture capitalists. So, we asked ourselves:

*Q2: "In the Italian VC market, do different types of investors adopt different selection criteria when assessing the target's human and intellectual capital?"*

Moreover, as the literature shows, the activities of business angels are gaining in importance over the years. Therefore, following the pattern of the previous questions, we wanted to thoroughly investigate the role of angel networks compared to the independent angel. Hence,

*Q3: "Focusing on Physical Investors: is it possible to point out any differences between the criteria adopted by independent (individual) Business Angels and those adopted by BAs associated with a network?"*

## **Chapter 3: Methodology**

In order to investigate the research questions presented in Chapter 2, our work consisted of a two-step procedure. In the first instance, we focused our efforts on the construction of a reliable database comprehensive of every equity capital increase registered by Italian SMEs and Startups in 2020. Then, once this first step was completed, we proceeded in the elaboration and implementation of the econometric models for the evaluation of the study.

In this chapter will be detailed the processes and the steps that have been followed in order to perform each one of these two phases, detailing the main strengths and criticalities affecting our work.

### **3.1 Construction of the Database**

Previous studies on VC landscapes mainly built the set of observations by relying on publicly available databases. In this sense, we decided to opt for a different, for sure more laborious, but also more reliable and complete approach, such decision was driven by two considerations: (i) First of all, these public databases are usually characterized by a high level of aggregation of information, this feature would not have allowed us to reach a high level of detail and reliability as our research questions would have required to. (ii) In addition to this first criticality, it must be mentioned how delimiting the spectrum of the analysis only to the Italian landscape, no exhaustive databases were available with respect to such a small and specific market.

Conscious of these impeding factors, we decided to undertake the building of a micro-level database from scratch, with the aim of reporting not only all the investment deals registered by Italian NTBFs in 2020, but also a wide range of specific information about each of them. Following this approach, we knew that the energy spent in such a rigorous and resource-intensive method would have allowed us to dispose of a complete, reliable, precise and disaggregated set of data through which it has been possible to conduct a meticulous analysis on the Italian VC landscape.

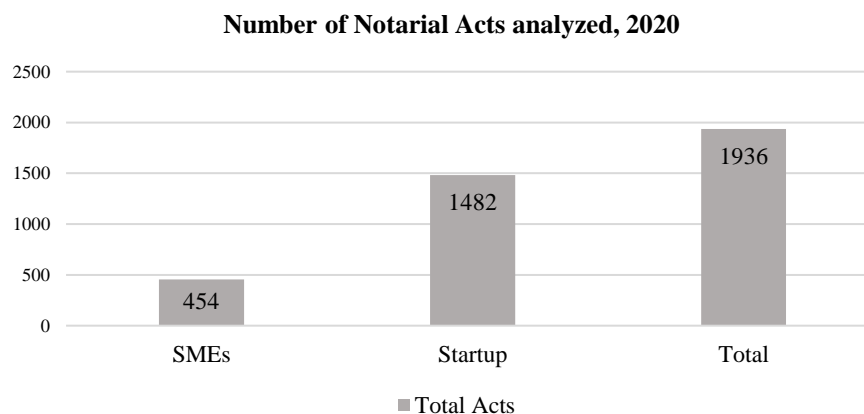
If on the one hand the direction to follow was clear, on the other hand it was necessary to define which was the most appropriate path to follow in order to lay the foundation of our research study. First of all, it was necessary to identify the specific deals underwritten in Italy in 2020; then for each of them it was necessary to collect the information concerning the actors involved in the capital increase as well as the characteristics of the operation itself. The first idea could have been to look for these information on publicly available sources – as Newspapers, Websites and Press Releases of VCs and NTBFs - but it is immediate to note how this would not have been a satisfactory path: in this way we could have missed a wide spectrum of deals as well as the relative data, in fact, there is no reason to assume that the characteristics of all the equity increase happened in Italy in 2020 are satisfyingly reported and meticulously detailed on public sources. This means that, by following this path, we would have collected an incomplete number of deals characterized by an unsatisfactory level of completeness and reliability on information.

In order to solve this issue, resorting to the Italian Civil Law was a pivotal decision for our study. In this regard, the article 2481 states that in the instance where a Shareholders' meeting of an Italian firm is willing to register a capital increase, the terms and characteristics of the transaction must be officially reported and described into a Notarial Act. In addition, the article 2436 establishes that any Statutory Amendment – and therefore also any Capital Increase – must be deposited by the Notary, if in compliance with the law, into the official registers of the Italian Chamber of Commerce within a period of 30 days.

As a natural consequence, we immediately understood how by having access to these official registers – and in turn to the Notarial Acts they contain - we would have been able to observe (i) the totality of deals completed in Italy in 2020 and (ii) a complete and precise range of details concerning them, finally eliminating the imperfections that a research on public sources would have bared. Nevertheless, these documents may report and describe sensible personal information of the entities involved, this is the reason why these registers are not publicly available and accessible, as a consequence, the first step of the process was to contact Infocamere – is the official association managing the National IT system and aggregating the information coming from the different Chambers of Commerce among the country – in order to require the access to

the centralized register reporting every possible Notarial Act of NTBFs underwritten and deposited in 2020.

The answer to our question was affirmative and Infocamere provided us with the set of each Notarial Act of Italian SMEs and Startups deposited to the Chamber of Commerce in 2020. In total, we had a list of 1936 Acts: 454 regarding innovative SMEs and 1482 regarding innovative Startups.



**Figure 12 - Number of Notarial Acts analyzed**

### **3.1.1 The structure of the database**

As already mentioned before, the intent of our database construction has been to create a dataset characterized by a high degree of detail, specificity and disaggregation. For this reason, in defining the information to extrapolate from the Notarial Acts, we did not limit to report just the firm receiving the investment and the relative amount, but we included a wider list of attributes covering (i) the Investee NTBF, (ii) the Investor and (iii) the Deal itself.

In this phase, a consistent extrapolation of data has been possible through the combined exploitation of different sources of information, in this regard, for example, a pivotal role has been played by AIDA, a centralized database reporting all the accounting data and financial figures of the totality of firms operating in Italy. Thanks to this supportive tool, a larger set of variables, that was not reported in the Notarial Documents, was included as attributes of the database.

## **Investee**

For what concerns the Investee category, we decided to include in the database the following variables:

- Name
- Italian Univocal Identification Code (P.Iva)
- Location of the operative center (Title of the Province)
- Typology of NTBF: SME or Startup
- ATECO 2007 Code

This was just the initial and fundamental group of attributes considered for the Investee firm when analyzing the Notarial Acts. In fact, as it will be detailed in the following sections, being these firms the focal point of our analysis, we inevitably enriched this list with other descriptive and financial variables.

## **Investor**

Passing now to the Investors' group, it is worth mentioning that, as specified in the previous sections, they are an heterogenous category, they can be either single individuals or structured organizations – specifically “Legal Entities” - and for this reason the attributes we considered in this phase were designed in order to incorporate and comprehend these differences.

- **Business Angels**

The investor category that recurred more frequently during the data collection was inevitably the one of Business Angels, namely Individual Investors. In the notarial acts, when a capital increase is being underwritten by a Person, typically there are reported some personal data such as the Name of the subject and its Surname. In other less frequent cases, instead, are reported some other additional data of the subject such as the National Fiscal Code (Codice Fiscale) or the Birth Date.

On this basis, the idea was to register in the database three attributes:

- Name and Surname of the Subject
- National Fiscal Code (Codice Fiscale)

Since the first two were usually included in the Act, report them was usually a simple straightforward task, but the same conclusion cannot be stated for the National Fiscal Code.

In fact, when this information was not available on the Notarial Document, the process consisted of looking for it on AIDA by searching for the specific Individual in the Shareholder's list of the Investee Firm. Nevertheless, also on AIDA this information was not always readily available, if this was the case, the last viable alternative was to search for it on Telemaco, the Italian Chamber of Commerce IT System. Resorting to this three-step process resulted in a noticeably solid approach that, at the end of the construction, allowed us to track and report the totality of the Fiscal Codes of those Individuals who contributed to any capital increase.

- **Business Angels belonging to a Network**

As it is immediately understandable, they constitute a sub-category of the "Normal" Business Angels, for this reason the set of attributes included in the database to describe them was exactly analogous to those mentioned just above:

- Name and Surname
- National Identification Number (Codice Fiscale)

These first two categories mentioned just above cover the group of Individual Entities, the other cluster of possible investors is constituted by Legal Entities. As mentioned by the Section 2 of the Italian Civil Code, the Legal Entities are recognized as a unitary institution having a legal capacity which is distinct from the ones of the Physical Entities constituting it. In this macro-category can be collocated our IVCs, CVCs, GVCs and BVCs. Since in front of the Law they all fall into a same category, we were able to define a unitary set of attributes for all of them, knowing that reporting a specific type of information would have been possible independently from if the Investor was an Independent, Corporate, Government or Bank Venture Capital.

- **IVC, CVC, GVC and BVC**

To follow a homogenous approach with respect to the one adopted for the Investee firms, we initially decided to include the same range of attributes, so:

- Name
- Italian Univocal Identification Code (P.Iva)

- Location of the operative center (Title of the Province)
- ATECO 2007 Code

Also in this circumstance, not all the required attributes were easily disclosable on the Notarial Acts. The most common information reported are the Name of the organization and the relative Italian Univocal Identification Code, this suggests once again how the remaining two, namely the Location of the operative center and the ATECO 2007 Code needed to be collected separately by looking on AIDA.

But this was not enough, a fundamental information we decided to include was the:

- Specific typology of Investor (IVC, CVC, GVC, BVC)

This was a very sophisticated step of the data collection, in fact the distinction among the different categories is not a straightforward task since the collocation of a Legal Entity into one of these 4 categories is not mandated by any official code or specification. Considering the possible risk of unreliability due to a subjectivity in the collocation process, also in this case we adopted a multifaceted approach with the aim of clustering each Legal Entity in the most suitable group. This process combined different sources as (i) the ATECO 2007 Code, (ii) the full Name of the Entity and (iii) public official sources of the Legal Entity such as their websites. The details of how this approach has been specifically implemented will be further explained in the section 3.1.2.

Nevertheless, when reading and analyzing the Act, another possible circumstance was to come across the launch of a Crowdfunding campaign to collect equity capital. Despite the type of investors involved in these kinds of operations are the same ones described above, identify all the entities who contributed to the single campaigns would have added another layer of complexity to our research, for this reason these kinds of data have been reported aggregately, as if the whole amount has been underwritten in a pooled manner.

- **Crowdfunding**

As a result, the variables included in the database for what concerns Crowdfunding campaigns were:



- Name of the Crowdfunding Platform
- Total amount of capital collected through the campaign

## **Deals**

After having collected and registered the specific data of the actors involved in both the sides of the transaction, the simultaneous step was to report a set of information regarding the Deal itself. In this case we did not limit our efforts to report only the amount invested by the single investor, but also in this case we reached a much deeper level of detail, uniquely including and calculating additional information that no other database would have been able to include.

The advantage of having resorted to the analysis of Notarial Acts relies in the possibility to have access to the precise terms of the transaction between the two parties. For instance, it was often possible to find registered not only the amount of Nominal Capital invested, but also the eventual relative amount of Premium Capital. In fact, when an investor is willing to become a Shareholder of a company by injecting a determined amount of Social Capital, it may be required to pay an additional price reflecting the spread between the “Market” value of the shares and their Nominal Value. When talking about unlisted firms, as Italian NTBFs usually are, this Premium price is not an official and pre-determined amount, but it is produced as a result of the negotiations with the potential Investor on the basis of the perceived value that the firm, and so its shares, bear at the moment of the subscription. This very peculiar information, when available on the Notarial Act, allowed us to measure and include in the Database an interesting measure that would not have been possible to observe if pursuing the path of public sources: the Pre-Money Evaluation of the Investee Firm.

The Pre-Money Evaluation represents the Equity Value – namely the firms’ value available to owners and shareholders – associated with a specific firm in the moment right precedent to the round of financing. In accordance with what has been said above for the Premium Amount, the Equity Value is of fundamental importance for the Investee and the Investor, it reflects the total value associated with the observed firm and it determines (i) the value of the shares and (ii) the relative amount that the Investor should pay to buy them. When referring to listed companies, the Equity Value is directly reflected by the Market Capitalization of the firm, therefore:

$$\text{Equity Value} = \text{Mkt. Cap} = \# \text{ Shares Outstanding} \cdot \text{Market Value of Shares}$$

(3.1)

In turn, the amount to be paid in order to acquire a stake of a listed firm is deterministically defined by this measure.

On the other hand, when the focus of the deal is a Non-Listed firm – again, as NTBFs in Italy usually are – the market value of shares is not officially defined, but it is often produced on the basis of the evaluation of financial performances, assets or intangibles and mediated by the negotiations between the two parties. Usually, this amount is kept private by both the Investor and Investee and it is therefore very rare to easily disclose such information on public sources.

In our case, the eventual availability of the Premium Amount paid by the investor allowed us to restore a proxy of the Pre-Money Evaluation agreed in phase of underwriting, once again confirming the uniqueness of the level of detail reached by our micro-level database. The procedure, parameters and the calculations adopted in order to estimate it will be further detailed in the section 3.1.2.

To ulteriorly detail the Deal under analysis, we decided to include as attribute of the database the Typology of the Capital Increase. In this regard, it is possible to categorize the capital increases considering 5 main clusters: Right Issue (RI); Private Placement (PP); Contribution in Kind (IK); Public Offering (PO) and Script Issue (SI).

- **Right Issue**

In this circumstance, the right to subscribe the capital increase is offered to the existing shareholders. In particular, they have the right to subscribe an amount which is proportional to the stake they already own. In case one or more shareholders decide to reject this possibility and not to exert their rights, the unsubscribed amount can be offered and eventually underwritten by either (i) other shareholders willing to increase their stake or (ii) third parties.

- **Private Placement**

In this case, the capital increase is not subscribed by already existing shareholders, but the shares are offered to external third parties willing to enter

into the company. Usually, this kind of capital increase can be performed immediately after a Right Issue, in fact, in case one, some or even every shareholder is not interested in exerting its subscription right, this can be offered and eventually reallocated to external entities. In this instance, two cases can be distinguished:

- The shareholders' have already agreed and have already identified the specific external actor(s) to which the right will be offered. This case is straightforward: the external investors are clearly identified and they have a finite time horizon to complete the transaction and enter in the firm's shareholders' group.
- They still have not identified the investors. In this case the rights remain pending until a predetermined date and any entity willing to invest in the firm can try to exert them. In such circumstance, it is defined the total maximum amount of the capital increase, with the breakdown of the Nominal Amount and the Premium Amount to be paid in case of exertion of the right, if no investors decide to subscribe the increase in the available time window, then the capital increase expires and the rights decade.

- **Contribution in Kind**

This is a particular typology of capital increase. In this case the investor – which may be an already existing shareholder or a third party – receives a certain stake of the Investee firm in exchange of the contribution it gives when entering in the organization. The contribution can be tangible (as given by assets, patents, licenses) or intangible (as given by Know-How and competencies). Therefore, it reflects the logic of a traditional capital increase with the difference that the stake is not acquired through money but through a specific contribution.

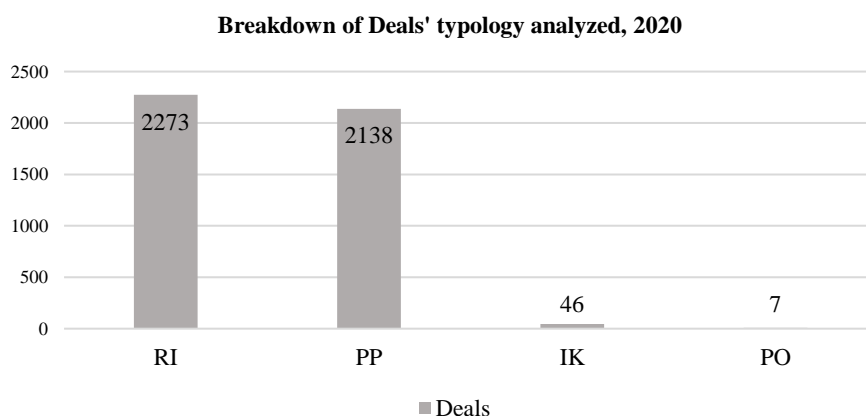
- **Public Offering**

The Public Offering follows a logic similar to the Private Placement, the only difference is that in this case the shares are offered and traded on a Public Stock Exchange.

- **Script Issue**

The script issue does not involve the flow of additional capital in the firm. Basically, in this case a certain amount of capital stored into capital reserves – as Premium Capital Reserves - is converted into Shareholder’s Equity Capital and the relative amount is distributed proportionally to the shares owned by existing shareholders. This practice can be used in order to reconstruct the Share Capital in case of significant losses, or it can be used as a strategic mean to signal to potential investors the level of confidence that the shareholders have in the business they invested in (e.g. Converting the Capital Reserves into share capital is a pretty straightforward and “easy” task, while the vice versa is not. For this reason, when the shareholders use the Reserves to execute the capital increase, this can be read as a signal of the confidence they hold with respect to the venture they invested in).

Nevertheless, being this case a mere accounting matter for which the value of reserves is converted into share capital but without registering any effective capital increase, we decided not to report these kinds of deals into the database, thus focusing the attention only on “costly” deals rather than “cost-free” ones.



**Figure 13 - Breakdown of Deals' typology**

In addition to these attributes, we also decided to include other parameters as the Amount of Share capital of the firm right after the deal, the consequent Stake acquired by the Investor through the subscription and the Reason driving the Capital Increase.

Therefore, to recap the set of attributes adopted to describe the Deal, they are:

- Date of the Deal
- Reason driving the Capital Increase
- Nominal Amount Invested
- Premium Amount Invested
- Share Capital right after the Deal
- Stake acquired through the subscription
- Pre-Money Evaluation
- Typology of Capital Increase (RI, PP, IK)

**Table 7 - Resume of Variables included in the database**

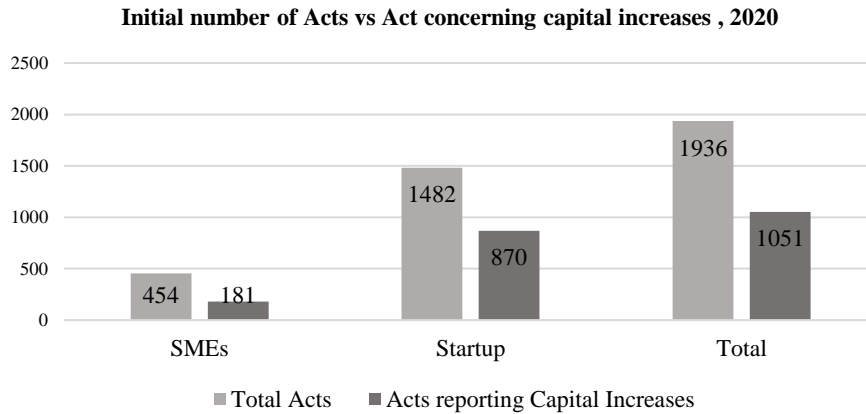
<b>Category</b>	<b>Attribute</b>	<b>Comments</b>
Investee	Name	
	Italian Univocal Identification Code	P.Iva
	Location of the operative center	Title of the Province
	Typology of NTBF	SME or Startup
	ATECO 2007 Code	
Investor	Name	
	Italian Univocal Identification Code	P.Iva or Fiscal Code
	Location of the operative center	Only for Legal Entities
	ATECO 2007 Code	Only for Legal Entities
	Typology of Investor	BA, BAN, IVC, CVC, GVC, BVC, CFP
Deal	Date of the Deal	
	Reason for the Capital Increase	
	Nominal Amount Invested	
	Premium Amount Invested	
	Share Capital after deal	
	Stake acquired	
	Pre-Money Evaluation	
	Typology of Capital Increase	RI, PP, IK

### **3.1.2 The process followed to construct the database**

After having defined the set of attributes to be included for each category, the subsequent step was to actually collect, interpret and eventually calculate these variables in order to report them into the database. Needing to read, analyze and interpret a set of 1936 Notarial Acts one by one, this process revealed itself to be remarkably dispendious, employing our daily efforts for a period of approximately 5 months. Nevertheless, as already mentioned before, this was the only viable way that would have allowed us to dispose of a solid and reliable set of observation for the conduction of our study. As such, the construction of the database followed a precise and meticulous rationale that implied the usage of combined resources: some of the data were directly retrieved from the Notarial Documents, but when this was not possible, they were eventually collected from other sources as the AIDA centralized database, Telemaco official documents or publicly available websites and press releases. Moreover, a double check of the information retrieved on the Acts was always performed on AIDA, this in order to increase again the level of consistency and solidity of the data reported.

When analyzing a Notarial Act, the very preliminary check to be performed was to understand whether the information reported on the Document were falling inside the perimeter of Capital Increase activities or not, if so, it was also necessary to distinguish whether the deal was effectively of interest according to our research study. In this regard, documents reporting (i) mere statutory amendments, (ii) Script Issues and (iii) Stock Options plans were considered out of the scope of our analysis and therefore not detailed in our dataset. We derived such conclusion considering that (i) only report a modification of the firms' statute, therefore often not reporting a capital increase; (ii) are not, as explained in section 3.1.1., increases bringing along new capital inflows; (iii) are special typologies of capital increases mainly employed for managers' remunerations and therefore falling out the purposes of our studies.

As a result, out of the analysis of 1936 Notarial Acts, 1051 concerned traditional Capital Increases: 181 coming from Innovative SMEs and 870 from Innovative Startups.



**Figure 14 - Initial number of Acts vs Acts concerning capital increases**

In accordance with this filtering process, we then proceeded in registering the parameters implementing the following methodologies.

### 3.1.2.1 The rationale to collect Investees' data

Being the Investee the pivotal subject of a capital increase, the majority of its attributes are detailed directly on the Notarial Act, this makes the collection of its information a straightforward process. In particular, the Name, the Italian Univocal Identification Code, the Location of its operative center and the Typology of NTBF were always reported on the document, while the ATECO 2007 was always retrieved by looking for it on AIDA.

**Table 8 - Resume of Investee collected data and sources**

Category	Attribute	Source
Investee	Name	Act
	Italian Univocal Identification Code	Act
	Location of the operative center	Act
	Typology of NTBF	Act
	ATECO 2007 Code	AIDA

### 3.1.2.2 The rationale to collect Deals' data

For what concerns the Deals' category, the collection process was much more complex. The Date of the Deal and the Reason for the Increase were always easily disclosable on the Notarial Document; on the other hand, the rest of the attributes required much more laborious collection processes.

#### Nominal Amount Invested

In the first instance, we have to distinguish three scenarios:

1. The Notarial Act specifies who are the Investors willing to subscribe the Increase, the relative amount they want to subscribe AND states that the subscription has been already completed
2. The Notarial Act specifies who are the Investors willing to subscribe the Increase, but does not specify the relative amount they want to subscribe OR whether the subscription has been already completed
3. The Notarial Act does not specify who are the Investors willing to subscribe the Increase

Scenario 1 was the most straightforward case, in that circumstance we just limited ourselves in double checking on AIDA the information reported on the act, if no discrepancies were detected, we proceeded registering the amount.

Scenario 2 was moderately more complex: in this case the Act was reporting the data of the Investor(s), but there was no evidence stating whether the Increase effectively took place or not and to which extent. Registering the data without a further investigation would have probably led us to inconsistent results, risking to register capital increases that did not take place in reality. To solve this issue, the only viable way was to map the changings in the Shareholders' structure of the Investee firm on AIDA in order to check (i) if the Investor was effectively part of the Shareholders' group and (ii) the eventual amount it had effectively invested in the Deal under analysis. Nevertheless, AIDA does not report the single amounts invested by the different shareholders, but it limits itself to provide the percentages of ownership that every investor holds, for this reason, we adopted the following approach to trace the Nominal amount injected by a single entity:

$$N = SCa \cdot POa - SCb \cdot POb \quad (3.2)$$



$SC_b =$  *Share Capital of Investee right before the Deal*

$SC_a =$  *Share Capital of Investee right after the Deal*

$PO_b =$  *Percentage of Ownership owned by Investor right before the Deal*

$PO_a =$  *Percentage of Ownership owned by Investor right after the Deal*

$N =$  *Nominal Amount Invested*

By following this approach, we have been able to reliably observe whether the Investor was effectively investing in the considered financing round and which was the Nominal Amount invested.

Lastly, Scenario 3 was much more complex: this last circumstance represents the case in which a capital increase is deliberated without targeting any investor, here the Notarial Act only reports come clauses, as the maximum amount that can be Invested by a single Entity, but no specific Entity is reported. Once again, in order to restore the Nominal Amounts invested in the financing round, we adopted exactly the same formulas presented in Scenario 2, with the only difference that they have not been applied only to the potential Investors specified into the Act but to the totality of Shareholders owning a stake of the Investee firm in the period of the financing round. Despite being a dispendious procedure, it allowed us once again to register data with a high level of solidity and reliability.

### **Premium Amount Invested**

The Premium Amount, if present, was disclosable only from the Notarial Act. In the cases represented by Scenarios 2 and 3, there were often reported the maximum total Nominal Amount to be raised and the respective maximum total Premium Amount to be paid by the Investor, this means that when the formula **3.1** provided us with the Nominal Amount invested, the Premium could have been proportionally computed as:

$$P = N \cdot \frac{P_{max}}{N_{max}} \quad (3.3)$$

$N_{max} =$  *Maximum Nominal Amount*

$P_{max} =$  *Maximum Premium Amount*

$P =$  *Premium Amount Paid*

$N = \text{Nominal Amount Invested}$

### **Share Capital after the Deal and Stake Acquired**

The amount relative to the Share Capital right after the Deal was either reported on the Notarial Act or available on AIDA. For what concerns the Stake Acquired, namely the percentage of ownership that the Investor was acquiring through the transaction, it has been computed as:

$$PO = \frac{N}{SCa} \quad (3.4)$$

$N = \text{Nominal Amount Invested}$

$SCa = \text{Share Capital of Investee right after the Deal}$

$PO = \text{Percentage of Ownership Acquired}$

### **Pre-Money Evaluation**

The amount relative to the Pre-Money evaluation was not available either on the Act or on AIDA, nevertheless, its calculation and estimation has been possible resorting to the Premium Amount paid and adopting the following formula:

$$\text{Pre - Money Evaluation} = \frac{N+P}{PO} - (N + P) \quad (3.5)$$

$N = \text{Nominal Amount Invested}$

$P = \text{Premium Amount Paid}$

$PO = \text{Percentage of Ownership Acquired}$

The rationale underlying the formula is to consider the total amount invested in the Deal and the respective stake purchased, this in order to derive the Equity Value relative to the 100% of the Investee. Wanting to observe this value right before the transaction, to this value is subtracted the total amount invested.

## Typology of Capital Increase

The categorization of the Deals according to the taxonomy illustrated in section 3.1.1. has been possible by following a two-step approach. The first phase consisted of understanding, by reading the Notarial Act, whether the Investor was purchasing the shares in exchange for money or for its contribution, if the latter was the case, then the Deal would have been classified as a Contribution in Kind (IK). On the contrary, if the purchase was being completed through monetary capital, a second investigation was necessary in order to assess whether we were dealing with a Right Issue (RI) or a Private Placement (PP). To do so, the procedure was standard, the idea was to check once again on AIDA the historical Shareholders' structure of the Investee firm: if the Investor under analysis was already present before the moment of the Capital Increase then we were facing a Right Issue, on the other hand if the Investor was not present in the list before the date of the Deal, it meant we were facing a Private Placement.

**Table 9 - Resume of Deals' collected data and sources**

<b>Category</b>	<b>Attribute</b>	<b>Source</b>
Deal	Date of the Deal	Act
	Reason for the Capital Increase	Act
	Nominal Amount Invested	AIDA + Calculations
	Premium Amount Invested	Act + Calculations
	Share Capital after deal	Act + AIDA
	Stake acquired	Calculations
	Pre-Money Evaluation	Calculations
	Typology of Capital Increase	AIDA + Interpretation

### 3.1.2.3 The rationale to collect Investors' data

Being the Investors' category composed of two different classes, namely Individuals and Legal Entities, the procedures and sources adopted to collect their information depended on this taxonomy.

- **Business Angels (Individuals)**

When the Investor under analysis was an Individual, the complete name of the Person has been collected either directly on the Notarial Act (if the Investor was already identified when redacting the Document – Scenario 1 and 2) or on AIDA (if the Act was not reporting the needed information – Scenario 3). On the other hand, as anticipated in section 3.1.1., the procedure to collect its Fiscal Code was a bit more elaborated: if it was not available on the Act, the process consisted of looking for it on AIDA by searching for the specific Individual in the Shareholder’s list of the Investee Firm. Nevertheless, also on AIDA this information was not always readily available, if this was the case, the last viable alternative was to search for it on Telemaco, the Italian Chamber of Commerce IT System.

- **Legal Entities**

When the Investor under analysis was a Legal Entity, once again the Name, the Italian Univocal Identification Code and the Location of the operative center have been retrieved either directly from the Document or from AIDA depending on the Scenario we were dealing with. Lastly, similarly with the Investee category, the ATECO 2007 Code has been always collected by looking for it on AIDA.

#### **3.1.2.4 The Categorization of Legal Entities**

As already anticipated in section 3.1.1., the most important and sophisticated phase of the collection process concerning Investors’ attributes consisted of the categorization of the different legal entities into the most suitable Investors’ group. Since the focus of this research study is exactly to detail and reconstruct the selection practices of the different clusters of Investors, a non-reliable, subjective or slacker allocation into these clusters might have led us to misleading conclusions.

In order to avoid these undesirable circumstances, we decided to follow a dispendious and laborious multi-faceted approach, cross-referencing different rationales and sources in order to minimize the possibility to come up with a non-conforming categorization, thus granting a higher degree of reliability of data. In particular, the approach implemented in this phase required the adoption of (i) the ATECO 2007 Code,

(ii) the full Name of the Entity and (iii) public sources of the Legal Entities such as their official websites.

A very first categorization of the Investor was performed by looking at its full Name, in this regard, the presence of certain particular words or acronyms in certain cases suggested us a possible categorization, for instance, the acronym SGR (In Italian “Societa di Gestione del Risparmio”) indicates, according to the Bank of Italy definition, a company specialized in Asset Management activities, suggesting to allocate it into the cluster of Independent VCs. Another example can be constituted by the words “Foundation” or “Social Foundation”, which suggests how the Investor might base its strategic goals on social objectives and therefore being suitable with the GVC category.

Nevertheless, it is immediate to understand how, if taken in an exclusive way, a categorization based on the name is particularly weak and unreliable. For this reason, a second and third levels of detail were needed. In this sense, the adoption of a categorization based on the ATECO 2007 Code noticeably increased its reliability. The idea was to categorize as IVCs those companies reporting as ATECO 2007 Code:

- 64.20 – Performs activities assimilable to Holding Companies
- 66.30 – Fund Management Companies

Then, to categorize as “on hold” those companies having very generic and not explanatory codes such as:

- 70.22 – Strategic Consultancy, other administrative consultancy and business planning
- 70.10 – Holding Companies engaged in activities of management (Operating Holding)

Then to categorize as BVCs, those entities reporting:

- Any Code starting with 64 except for the code 64.20

Lastly, as CVCs:

- Any other ATECO 2007 Code not included in any of the previous lists

After having performed this middle-end screening, the categorization reached a deeper and more solid level of detail by considering (i) all the Investors for which there was a

discrepancy between the Name and the relative ATECO 2007 Code, and (ii) all the Investors categorized as “on hold” and looking for each one of them information on public sources as official websites or business reports that could have helped us in defining a proper allocation.

At this point, the categorization of the GVCs was lastly performed by considering those companies:

- Containing the standard official definition of Italian regional GVC in its name, which is “Finanziaria Regionale”
- Controlled by governmental bodies such as “Cassa Depositi e Prestiti – CDP” or “Ministero dell’Economia e delle Finanze – MEF”
- That from the screening of discrepant or “on hold” companies proved to reflect the strategy of a GVC

As a result, at the end of this multiple-step procedure, we were confident of having produced a reliable categorization of Investors avoiding possible lacks or subjective misinterpretation of data.

**Table 10 - Resume of Investors' collected data and sources**

<b>Category</b>	<b>Attribute</b>	<b>Source</b>
Investor	Name	Act + AIDA
	Italian Univocal Identification Code	Act + AIDA
	Location of the operative center	Act + AIDA
	ATECO 2007 Code	AIDA
	Typology of Investor	Name + AIDA + Interpretation

### **3.1.2.5 Distinction between Classic Business Angels and Network Business Angels**

Another fundamental activity that we needed to perform in order to investigate our research questions was to elaborate a procedure capable of letting us distinguish between “Classic” Business Angels and the Business Angels associated with a network. This was a particularly trivial part of the work, in fact, on the sources we had at disposal

– again, the Notarial Acts, AIDA, Telemaco and Public Sources – all the Business Angels were presented as simple Individuals and there was no piece of information that could have been exploited in order to detect the linkage of an Individual to a structured network or association of Business Angels.

Consequently, the only possible solution was to enlarge the pool of resources at our disposal. In this regard, the idea has been to (i) consider the three largest Business Angels Network actively operating in Italy: “Italian Business Angel Network – IBAN”; “Italian Angels for Growth – IAG” and “Club degli Investitori”, (ii) access to the list of Business Angels associated to them and (iii) check who, among the Investors identified in our database, was also member of one of these associations.

Once again, in order to increase the level of reliability of the distinction, we additionally performed a strained research on LinkedIn, obtaining as output the list of all the Users declaring to be associated with a BA network, also in this case we performed a cross-referencing activity between this list and our database in order to check eventual new correspondences, but no additional observations emerged.

### **3.1.3 Critical Considerations and Possible limitations**

Once we reached the end on this particularly long and resource-intensive construction. The result was, as desired, a detailed and solid micro-level database registering all the Equity Capital increases directed to Italian Innovative SMEs and Startups in 2020, constituting a unique set of data rarely reproduced in other similar studies.

The integrity of the data is attributable to the repeated and combined verification of the collected data on different sources, such approach allowed us to build a final database of more than 4,400 Deals, for which we were capable to know very precise and rarely reported information such as the Premium Amount paid, a proxy of the Pre-Money Evaluation or the exact Name, Fiscal Code and Association of a Business Angel. Thanks to this redundant approach, we are also confident of having reduced or eventually eliminated errors and inconsistencies we could have produced otherwise.

At the same time, we must also cite some possible limitations of this construction process that, in one way or another, could undermine the solidity of the results of our study. In this sense, being the focal point of the research, it is fundamental to underline

once again the importance of the categorization of Investors, although having followed a multi-step approach, there are still some reasons to believe that we could have performed some misleading allocations, is reasonable to assume that a Legal Entity described with a specific ATECO 2007 Code might have an investment strategy not strictly associated to its nature, or that it might follow a mix of different approaches. Nevertheless, considering the vastity of our dataset, we expect these potential misallocations to provoke a marginal and negligible distortion on the final results of the study.

Another possible criticality concerns the group composed by Business Angels. We included in this cluster any Investor being a Physical Individual, but it is immediate to point out how we could have categorized as Angel Investors also those People acting in quality of Friends or Family of the Entrepreneur running the business. In this regard, further differentiating the cluster would have produced even more sophisticated conclusions, but it is unrealistic trying to know, map and register the typology of relationship that the Investor has with the Investee.

### **3.2 The Econometric Analysis**

Having completed the construction of the database allowed us to dispose of a remarkably numerous set of observations on the Italian VC market in 2020, the natural subsequent step was to exploit these observations in order to conduct econometric analysis with the goal of providing significant answers to the questions identified during the literature review.

In this regard, it is worth recalling which are these research questions investigated through this study in order to better clarify how the econometric analyses have been conducted:

*Q1. In the Italian VC market, do the different typologies of investors adopt different selection criteria when evaluating the accounting figures of the target?*

*Q2. In the Italian VC market, do the different typologies of investors adopt different selection criteria when evaluating the human and intellectual capital of the target?*



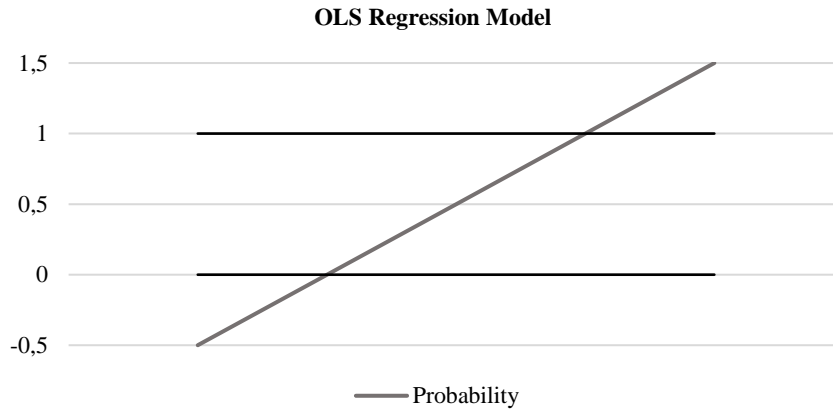
*Q3. Focusing the attention on Individual Investors: is it possible to identify any differences between the criteria adopted by Independent Business Angels and the ones adopted by BAs associated with a network?*

As they point out once again, the research study aims at evaluating which are the different sets of accounting, human and intellectual measures that the different categories of investors evaluate when selecting their targets. Said in other words, the idea is to assess if are disclosable and eventually detail which are the eventual different investment practices that the different Investors adopted in the Italian market in 2020.

In order to derive the econometric models that have been implemented to investigate the aforementioned questions, the very first idea has been to resort to common competing risk models usually adopted in medical/biological studies: their rationale is to evaluate different competing factors associated to the patients, such as genetic factors, life habits or demographic parameters, in order to estimate if and how they impact the likelihood of the occurrence of the disease under analysis.

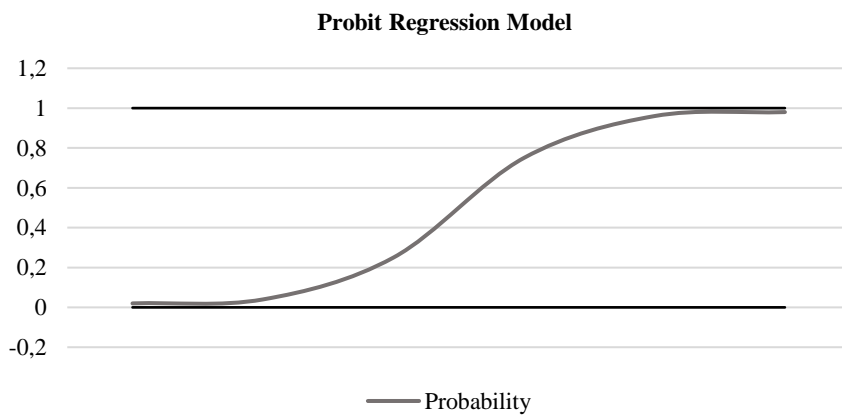
On the basis of this line of reasoning, our idea has been to pivot around this approach, applying it to our research field. In this regard, the set of observations becomes the group of Investee firms, while the risk competing factors are no more the personal data of the patients, but they become the accounting, human and intellectual measures of the NTBFs. As a result, the rationale of the model becomes to estimate if and how these factors impact the likelihood of the occurrence of an investment from a given Investor category.

Entering now more in the detail of the specific econometric models, at very first glance it might seem reasonable to adopt a simple OLS Linear Regression and evaluate with which magnitude the competing factors impact on the likelihood of getting the investment from the observed cluster of Investors, but it must be observed that the dependent variable, namely the likelihood to be selected by the Investor, represents a probabilistic value, thus requiring values in between 0 and 1. Conversely, being the OLS regression described by a linear relationship, it might produce as outputs some inconsistent and misleading results as probabilities either greater than 1 or below 0.



**Figure 15 - OLS Regression Model**

In light of this observation, we understood how in following this rationale we would have needed a model based on a non-linear relationship, for this reason, we decided to opt for the family of Probit regression models.



**Figure 16 - Probit Regression Model**

Exactly in accordance with the desired methodology, a Probit model measures if and how the set of competing factors taken as inputs has an impact on the probability for the Investee firm to receive the investment from the Investor under analysis, therefore, it constitutes a proper fit for the purpose of our study.

The following section will further detail which are the typologies of econometrics models that have been adopted to investigate the three research questions, describing more in detail the characteristics of the models adopted as well as all the variables that have been included.

### 3.2.1 Probit Regression Model

The Probit regression model considers as dependent variable a binary outcome where the value 1 is associated with a positive outcome while 0 is associated with the opposite, and therefore negative, scenario. Let's assume that the dependent variable is  $y$  and it is relative to the selection performed by an Independent Venture Capital - the IVC has been taken for the purpose of explaining the rationale, the exact same reasonings can be applied in the same manner with all the other investors' categories.

$$y = \{0; 1\} \quad (3.6)$$

**Table 11 - The binary variable in the Probit model**

<b>Dependent Variable</b>	<b>Value</b>	<b>Scenario</b>	<b>Application to the study</b>
$y$	0	Negative	The NTBF has not been selected by any IVC
	1	Positive	The NTBF has been selected by an IVC

Then, it considers as independent variables a set of observable measures, let's assume they can be collected in a single vector as:

$$X = (x_1, x_2, x_3, \dots x_n) \quad (3.7)$$

At this point, by evaluating the group of observations we have built, the model tries to estimate a set of Beta coefficients describing if any of these extensive variables influences in a significant way the probability that the investor - which in this example is the IVC - will select a NTBF. Differently from what it is possible to do in an OLS Regression model, in the case of a Probit analysis, we cannot measure the magnitude and the greatness of the relationship, this means we can only determine if it is present and whether it is positive or negative. Having for instance a significant Beta coefficient equal to 3 or equal to 0.5 does not allow us to give any conclusion regarding the magnitude of the impact, we could only conclude that the impact exists and it is positive, meaning that if the independent variable considered increases, this increases the probability for the NTBF to be selected by the IVC, but we are unable to measure the increase of this probability.

The level of significance of the Beta coefficient estimated through the model can be assessed by performing the so-called *test z*. Such test implies the observation of a probabilistic value (the p-value) indicating which is the probability that each Beta coefficient is equal to 0, this means that the lower this probability is, the more significant the estimated coefficient is. For the purpose of our study, have been considered as significant those coefficients characterized by a p-value lower than 0.1.

### **3.2.2 The Variables of the model**

Once having defined the regression model underlying the econometric analysis, it is necessary to define the set of variables to be considered for its implementation.

#### **Dependent Variables**

For what concerns dependent variables, as the name suggests, they represent the variables whose measure depends on the impact and value of the independent variables. In the case of an econometric model, they are those variables for which the model produces the relationship describing the expected outcomes. As already pointed out above, in the case of a Probit regression model, the dependent variables are described by binary values.

For the purpose of our study, they are:

- *invIVC*: binary variable indicating if the observed firm has received at least one investment by an Independent Venture Capital in 2020
- *invCVC*: binary variable indicating if the observed firm has received at least one investment by a Corporate Venture Capital in 2020
- *invGVC*: binary variable indicating if the observed firm has received at least one investment by a Government Venture Capital in 2020
- *invBA*: binary variable indicating if the observed firm has received at least one investment by an Independent Business Angel in 2020
- *invBAN*: binary variable indicating if the observed firm has received at least one investment by a Business Angel associated with a Network in 2020

For all these variables, in accordance with the definition of Probit model, the value 1 indicates the receiving of the investment (positive outcome), while 0 has the opposite meaning.

## Independent Variables

The independent variables constitute the set of parameters that it is presumable can bring an impact on the value of the dependent ones. In our case they will be those Investee's accounting, human and intellectual measures that we expect might influence the probability for the firm to be selected by the Investor category under investigation.

For the purpose of our study, being the analysis differentiated in two subsequent steps, they can be clustered into two different subgroups: (i) Descriptive and Accounting variables; (ii) Human and Intellectual capital variables.

- Descriptive and Accounting variables
  - *PST*: Categorical variable describing if the targeted firm operates in the Primary, Secondary or Tertiary sector. The variable assumes value equal to 1 if the firm is active in the Primary sector, 2 if it is active in the Secondary one and 3 if it operates in the Tertiary.
  - *CSN*: Categorical variable describing if the targeted firm has the operative center located in Northern, Central or Southern Italy. The variable assumes value equal to 1 if the Investee firm is located in Southern Italy, 2 if it is located in Central Italy and 3 if it is located in Northern Italy.
  - *LN\_AGE*: Variable indicating the natural logarithm of the age of the Investee with respect to the moment in which the capital increase has been executed. It has been computed as the natural logarithm of the difference between the year 2020 and the year of constitution of the NTBF (disclosable from AIDA). Here the rationale is to evaluate whether the age of the Investee impacts the likelihood of being selected by the different investors.
  - *ROA*: Variable measuring the Return on total Assets that the Investee firm has been able to generate in 2019. This variable has been chosen in order to include in the analysis a measure of the firm's overall profitability and to assess if it influences the likelihood of being selected by the different investors. In this sense, the ROA has been preferred to the ROE because the latter could bring along results influenced by the capital structure of the firm.
  - *LN\_IA*: Variable measuring the natural logarithm of the overall value associated with Intangible Assets of the Investee firm in 2019. This variable has been chosen in order to include in the analysis a measure of the firm's

strategic potential and to assess if it influences the likelihood of being selected by the different investors.

- *LN\_REV*: Variable measuring the natural logarithm of the Revenues that the Investee firm has been able to generate in 2019. This variable has been chosen in order to include in the analysis a measure of the firm's size and to assess if it influences the likelihood of being selected by the different investors.
- *QRAT*: Variable measuring the Quick Ratio of the Investee firm in 2019. This variable has been chosen in order to include in the analysis a measure of the firm's short-term liquidity position and to assess if it influences the likelihood of being selected by the different investors.

For what concerns extensive variables as the *Revenues*, the *Intangible Assets* and the *Age* of the Investee, the choice of measuring the Natural Logarithm of the value instead of the value itself has been made in order to limit the impact of circumscribed outliers that could have led us into distorted results.

Moreover, it is worth noting how all the accounting measures as *ROA*, *LN\_IA*, *LN\_REV* and *QRAT*, have been lagged of one year, therefore collected with respect to the year 2019. Such decision has been driven by the consideration that when an Investor is evaluating the accounting performances of a potential target, it will resort to its most recent financial figures, in this regard it is reasonable to think that, having the Investors under analysis completed the deal in 2020, they would not have yet available the financial data of the target for that year, thus basing their selection on the data of 2019.

- Human and Intellectual capital variables
  - *WmnP*: Dummy variable indicating whether the administrative offices and the shareholders' group of the Investee firm is prevalently composed by Women. The variable assumes value equal to 1 if the presence of women is higher than 50%, while 0 otherwise.
  - *YthP*: Dummy variable indicating whether the administrative offices and the shareholders' group of the Investee firm is prevalently composed by Youth with an age inferior to 35 years. The variable assumes value equal to 1 if the presence of youths is higher than 50%, while 0 otherwise.

- *FgnP*: Dummy variable indicating whether the administrative offices and the shareholders' group of the Investee firm is prevalently composed by Foreigners. The variable assumes value equal to 1 if the presence of foreigners is higher than 50%, while 0 otherwise.
- *R1*: Dummy variable indicating whether the Innovative Startup's Research and Development expenses are at least the 15% of the maximum between the costs and the total production value, for the Innovative SMEs the threshold is 3%. The variable assumes value equal to 1 if this requirement is met, 0 otherwise.
- *R2*: Dummy variable indicating whether the Innovative Startup's management team is composed at least by 2/3 of people owning a Master of Science or by 1/3 of people completing or having completed a PhD or researchers with more than 3 years of experience in certified research activities. For the Innovative SMEs the thresholds reduce respectively to 1/3 and 1/5. The variable assumes value equal to 1 if this requirement is met, 0 otherwise.
- *R3*: Dummy variable indicating whether the NTBF owns at least a patent, license or proprietary software. The variable assumes value equal to 1 if this requirement is met, 0 otherwise.

The rationale behind the selection of these variables is to understand and assess whether the composition of both the Shareholders' group and the management team, as well as the value of intellectual capital owned by the Investee firm have an impact on the probability of being selected by the different categories of investors.

This information has been retrieved from the databases published by "Registro delle Imprese" which reports these parameters for the totality of Italian Innovative SMEs and Startups.

**Table 12 - Resume of the Variables**

<b>Typology</b>	<b>Variable</b>	<b>Description</b>
Independent	<i>invIVC</i>	Binary variable indicating if the observed firm has received at least one investment by an IVC in 2020
	<i>invCVC</i>	Binary variable indicating if the observed firm has received at least one investment by a CVC in 2020
	<i>invGVC</i>	Binary variable indicating if the observed firm has received at least one investment by a GVC in 2020
	<i>InvBA</i>	Binary variable indicating if the observed firm has received at least one investment by a BA in 2020
	<i>InvBAN</i>	Binary variable indicating if the observed firm has received at least one investment by a BA associated with a network in 2020
Dependent (Descriptive & Accounting)	<i>PST</i>	Categorical variable indicating in which sector the Investee operates
	<i>CSN</i>	Categorical variable indicating where the Investee is located
	<i>LN_AGE</i>	Variable describing the ln of the age of the investee
	<i>ROA</i>	Variable describing the ROA of the investee in 2019
	<i>LN_IA</i>	Variable describing the ln of Intangibles of the investee in 2019
	<i>LN_REV</i>	Variable describing the ln of Revenues of the investee in 2019
	<i>QRAT</i>	Variable describing the Quick Ratio of the investee in 2019
Dependent (Human & Intellectual)	<i>WmnP</i>	Dummy variable indicating the prevalence of women
	<i>YthP</i>	Dummy variable indicating the prevalence of youth
	<i>FgnP</i>	Dummy variable indicating the prevalence of foreigners
	<i>R1</i>	Dummy variable indicating if Requisite 1 is met
	<i>R2</i>	Dummy variable indicating if Requisite 2 is met
	<i>R3</i>	Dummy variable indicating if Requisite 3 is met



### 3.2.3 The implementation of the model

The last step of this phase was to finally construct and implement the Probit models on the basis of the dependent and independent variables defined above, this in order to verify whether the likelihood of being selected by a specific Investors' category was influenced by the set of descriptive, accounting, human and intellectual variables.

In order to be consistent with the structure of the first two research questions, the econometric analysis has been divided into two parts, a first one evaluating the impact of Descriptive & Accounting independent variables, and the second one evaluating the impact of Human and Intellectual capital independent variables. As a result, the Probit models are expressed by the following equations:

#### Models for Descriptive & Accounting measures

$$\begin{aligned} invIVC = a + b_1PST + b_2CSN + b_3LN_{AGE} + b_4ROA + b_5LN_{IA} \\ + b_6LN_{REV} + b_7QRAT \end{aligned}$$

$$\begin{aligned} invCVC = a + b_1PST + b_2CSN + b_3LN_{AGE} + b_4ROA + b_5LN_{IA} \\ + b_6LN_{REV} + b_7QRAT \end{aligned}$$

$$\begin{aligned} invGVC = a + b_1PST + b_2CSN + b_3LN_{AGE} + b_4ROA + b_5LN_{IA} \\ + b_6LN_{REV} + b_7QRAT \end{aligned}$$

$$\begin{aligned} invBA = a + b_1PST + b_2CSN + b_3LN_{AGE} + b_4ROA + b_5LN_{IA} \\ + b_6LN_{REV} + b_7QRAT \end{aligned}$$

$$\begin{aligned} invBAN = a + b_1PST + b_2CSN + b_3LN_{AGE} + b_4ROA + b_5LN_{IA} \\ + b_6LN_{REV} + b_7QRAT \end{aligned}$$

#### Model for Human & Intellectual Capital measures

$$invIVC = a + b_1WmnP + b_2YthP + b_3FgnP + b_4R1 + b_5R2 + b_6R3$$

$$invCVC = a + b_1WmnP + b_2YthP + b_3FgnP + b_4R1 + b_5R2 + b_6R3$$

$$invGVC = a + b_1WmnP + b_2YthP + b_3FgnP + b_4R1 + b_5R2 + b_6R3$$

$$invBA = a + b_1WmnP + b_2YthP + b_3FgnP + b_4R1 + b_5R2 + b_6R3$$

$$invBAN = a + b_1WmnP + b_2YthP + b_3FgnP + b_4R1 + b_5R2 + b_6R3$$

### 3.2.3.1 Considerations and refinement of the models

When a competing model, and therefore in our case a Probit model, is being implemented, the statistical significance of the results is drafted by conducting a comparison between the independent variables of the observations characterized by a positive outcome – i.e. Being selected by an IVC – and the variables of those observations characterized by a negative outcome – i.e. Not being selected by an IVC.

In the case of the conduction of our study, when we focus the attention on a particular investor category, for instance the IVC one, the “control group” of observations with a negative outcome is constituted by all those firms that were not selected by an IVC but that have been selected by other categories such as CVC, GVC or Business Angels. This consideration suggests how in each model the control set could be characterized by a certain internal degree of heterogeneity, as well as a certain degree of uneven matching between the positive and negative outcomes.

In light of these considerations, we finally decided to pivot around the idea of a simple Probit model thus passing to a more sophisticated regression model: the Multi-Variate Probit regression.

The idea standing behind this model is to collect the different regression equations, which in our case were one for each investor category, and consider them in a unitary and systematic manner, thus comprehensively taking into account the possible correlations between the specific practices of the different Investors.

As a result, this decision allowed us to shift from a set of 10 independent Probit models (5 for the first set of independent variables and 5 for the second) to a set of 2 Multi-Variate Probit models, thus keeping the same rationale of a normal Probit regression but allowing to (i) decrease the overall number of models to be implemented and (ii) to take into account the correlation between the different investor practices therefore contrasting the aforementioned degrees of heterogeneities.

The results of the Multi-Variate Probit models will be further detailed and commented in section 4.

## **Chapter 4: Results of the study**

The following chapter details the results obtained from two different typologies of analyses: The Descriptive analysis of the data included in the database, and the Econometric analysis aimed at answering our research questions.

The two analyses were performed on the developed database comprising 1,051 NTBFs and 4,478 investors (divided between Physical Individuals and Legal Entities) registered in Italy in 2020.

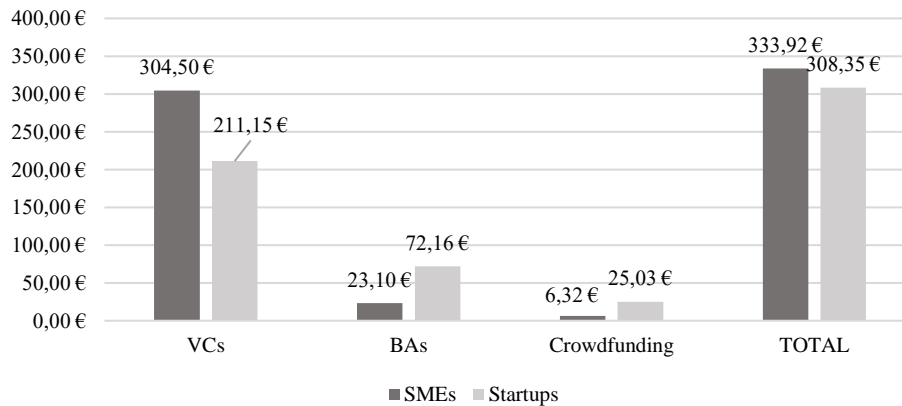
In the former investigation, we considered all the NTBFs paid-in issues recorded in the dataset dividing SMEs and Start-ups to see the difference of each type specifically, while, in the Econometric studies we took into account 944 NTBFs (net of companies repeating to participate in more than one operation) without separating the two categories because, in this case, the focus was on the side of investors and mainly, on what are the different factors that each of them considers when taking an investment decision.

### **4.1 Descriptive Statistics**

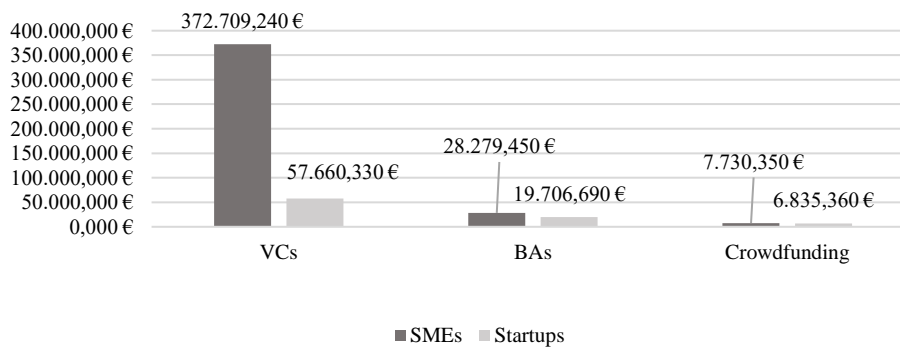
#### **4.1.1 General Consideration about the investee NTBFs**

The dataset includes information about the 181 SMEs and 870 Start-ups which received paid-in issues in 2020, representing the 40% of SMEs and 59% of Start-ups analyzed.

Despite 2020 being the year of the Covid-19 pandemic, the number of Start-ups increased compared to 2019. Moreover, many Start-ups continued to grow, both in terms of hiring new resources and revenues. However, the capital invested in 2020 by Venture Capital Investors and Business Angels remains in line with that of previous year and accounts to approximately EUR 642 million.



**Figure 17 - Capital invested in 2020 in SMEs and Start-ups (m€)**



**Figure 18 - Average invested quantity by type of investor (k€)**

First, we looked at the amount of capital injected by each actor in SMEs and Startups and noted that although the number of deals was higher in Startups (3662 vs. 817), the total amount invested in SMEs was slightly higher. This highlights that both Nominal Values and Premiums employed into SMEs were significantly larger than Startups.

In fact, even considering the average values of invested capital, SMEs register greater amounts. We conducted the analysis by considering BAs separately from the other categories of Venture Capitalists finding that VCs in SMEs invest on average amounts that are 6.46 times higher than in Startups.

Furthermore, although there is also a gap between the amounts invested by BAs, this is smaller and reflects how, in SMEs, BAs invest on average only 1.44 times more than in Startups. Also, the average amount invested through crowdfunding portals is larger in SMEs, but even in this case the gap is narrowed (just 1.13 times higher than Startups).

Thus, the outcome reflects that, despite the much lower number of registered transactions, it was mainly the presence of VCs that brought a greater amount of capital into SMEs compared to Startups. In fact, this result highlights an important feature already emerged in the literature: Venture Capitalists, unlike informal investors, finance their investments through funds they rely on, allowing them to employ larger amounts of capital.

An example is represented by the launch of the CDP Ventures Capital fund which played an important role as it made EUR 1 billion available for investments in Italian innovative Startups and SMEs.

During the year of analysis, CDP Venture Capital investments targeted SMEs the most, investing EUR 370,000 more than in Startups.

In general, as we will see subsequently, VCs find themselves investing larger amounts of capital in SMEs as these are often involved in more complex operations and at more advanced stages of life compared to Startups.

#### **4.1.2 Investors Analysis**

Another interesting factor concerns the number of deals subscribed by the different types of investors. In both SMEs and Startups most deals are underwritten by Physical Individuals while, concerning VC investors, there is a predominance of IVC transactions in SMEs and CVC transactions in Startups.

Looking at the overall result (aggregating SMEs and Startups), the largest number of deals in 2020 is reached by CVCs followed in second place by IVCs.

The increasing number of deals underwritten by CVCs spur innovation and help the innovative ecosystem in Italy to growth, as in this case consolidated companies provide not only the necessary economic resources but also strategic know-how. Indeed, the possibility of exploiting these synergies becomes even more useful for business, especially in a period like the one analyzed, affected by the uncertainty of the Covid-19 pandemic. In fact, as confirmed by the Open Innovation and Corporate Venture Capital Observatory, the aim is, on the one hand, to introduce innovation and talent into established companies and, on the other hand, to create growth opportunities for emerging companies.

The total number of deals underwritten by different type of investors are showed below.

**Table 13 - Number of transactions per category of investors**

<i>Category of Investor</i>	<i>Number of Deals</i>
Physical Individuals	3195
CVC	553
IVC	482
GVC	54
BVC	11
CFP	76
NULL	122
Total	4479
Of which foreign investors	137

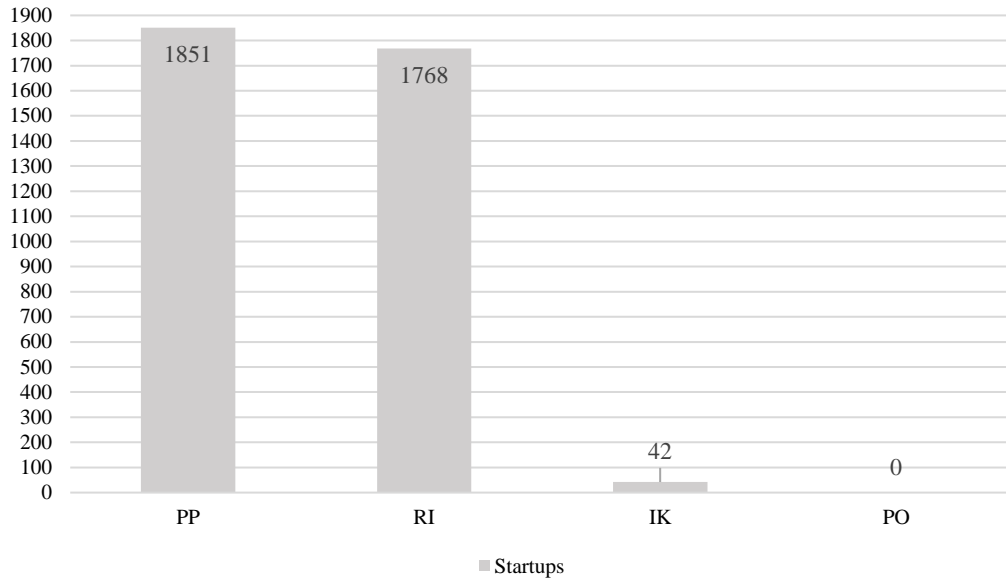
Even considering the number of investors who have subscribed at least one funding, there is a majority of CVC transactions in 2020:

**Table 14 - Number of investors who subscribes at least one funding**

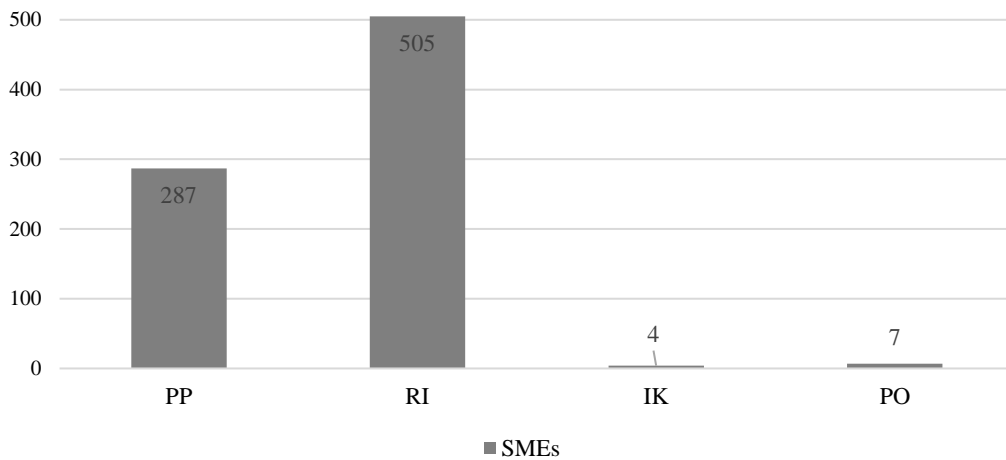
<i>Category of Investor</i>	<i>Number of Investors</i>
Physical Individuals	3131
CVC	346
IVC	278
GVC	18
BVC	9
CFP	22
NULL	67
Total	3871

Then, we proceeded into more detail analyzing deals by dividing them into four potential Equity-issue categories, as already mentioned in Chapter 3:

- Private Placement (PP)
- Right Issue (RI)
- In-Kind contribution (IK)
- Public Offering (PO)



**Figure 19 - Breakdown of equity-issue categories in Startups**



**Figure 20 - Breakdown of equity-issue categories in SMEs**

The graphs show that Startups have a higher number of Private Placements followed by Right issues, while, on the contrary, SMEs are characterized by more Right Issue deals than Private Placement ones.

Moreover, the gap between the two different Equity-issue categories (PP and RI) is greater for SMEs which record a difference of 27% compared to the 2% for Startups.



This result is rather in line with the definition of SMEs and innovative Startups since being Startups younger than SMEs, they are more attractive for new external investors.

Another interesting result can be observed by the number of Public Offerings registered from the two different types of NTBFs. While Startups have no Public Offerings recorded, SMEs count 7 representing the 1% of registered deals. The result is not very significant due to the decrease that complex operations suffer because of the pandemic which made entrepreneur refrain from these riskier transactions.

However, Public Offerings are likely to be more frequent for SMEs as they may have been on the market for longer and, consequently, are better known and more stable, facing lower risks and a higher probability of raising profitable investments.

Moreover, according to the strategic objectives pursued, IPOs are the strongest drivers of later stage venture capital investing while they have no effect on early-stage investing (BAs). In fact, the main risk faced by venture capitalists is the risk of not getting their money back. Thus, IPOs as an exit mechanism is extremely important to the development of a venture capital industry since it is the most attractive option to liquidate a fund.

In addition, exit is also essential for the entrepreneur, as it provides a financial incentive for managers who receive stock compensation and offers managers a buyout option on control of the firm, as venture capitalists leave control at the time of the IPO. (ŽBlack and Gilson, 1998).

Thus, on the demand side, the existence of an exit gives entrepreneurs an additional incentive to start a company while on the supply side, the effect is the same as large investors are more willing to supply funds to venture capital firms if they feel that they will receive higher return of their investment (Jeng, Wells, 2000).

#### **4.1.3 Business Angel Analysis**

Afterwards, we wanted to go into details of the investments made by Business Angels. First, we found it interesting to look at the differences between the Business Angels with a network and those independent.

IBAN (Italian Business Angels Network) is the main Italian association that coordinates and develops investment activity by informal investors in the venture capital of small enterprises and start-ups looking for promising projects.

Networks also offer numerous investment opportunities with reduced due diligence costs, allowing members to diversify their investment portfolio by sector and/or geographic area.

To classify the BAs in a network, we intersected the ID codes of the physical investors registered in our dataset with those registered by IBAN.

As a result of this merging of data, we could see that the number of BAs belonging to a network is very low. In fact, in SMEs, there are only 4 out of 450 BAs registered from the intersection with IBAN while in Startups we counted 39 out of 2580 individuals belonging to the network (450 and 2580 are the total Physical Individuals net of repetitions recorded in our database).

Furthermore, all BAs represent the 61% of investors in SMEs and the 85% of start-ups' investors. Among them, the 0.89% of BAs targeting SMEs and the 1.45% of BAs targeting startups belong to a network.

Then, we continued the analysis by investigating the amounts invested by the two different categories of BAs. To avoid distorted results, this study excludes outliers.

**Table 15 - Differences in BAs' amount invested, 2020**

	<b>SMEs</b>	<b>Start-ups</b>
Total investment from independent BAs	10.572.529,61 €	63.555.459,04 €
Total investment from BANs	79.658,57 €	944.027,63 €
Avg. investment per independent BA	24.193,43 €	23.670,56 €
Avg. Investment per BAN	19.914,64 €	24.205,84 €
Total BAs investment	10.652.188,18 €	64.499.486,66 €

The capital invested by all BAs in 2020 (i.e. by all physical individuals in the dataset) is approximately 75 million euros, but most of this share was invested in Startups (approximately 64 million) as the latter are more open to external investors and have a tendentially higher growth potential and degree of innovation.

We therefore analyzed the average amount of capital invested by BAs with and without a network finding that while in SMEs there is more capital injected by independent business angels than by the network angels, in start-ups, on the contrary, it is slightly higher the capital injected by BANs.

As a matter of fact, belonging to a network usually represents an advantage for both the investor and the target company, since the diversification of the portfolio allowed by the network decreases the risk of the investment, therefore, the amount invested increases. Moreover, within networks, the choice of the investment project is made more accurately by exploiting the synergies of professional participants.

Indeed, the results show that SMEs received slightly lower investments' amount from BAs with network. This happened because they invest in early stages, thus, above all in start-ups. In fact, the number of BANs registered in SMEs from the cross-reference with IBAN's dataset counts only 4.

#### **4.1.4 Geographical Analysis**

We found it interesting to assess the geographical distribution of alternative investments to understand whether and how the market structure is changing.

For the geographical analysis, we first extrapolated the number of deals and invested capital by province and then aggregated this data by region.

As already mentioned, we also separated the analysis between SMEs and Startups. The overall figures remain almost in line with those of previous years, with Lombardy in first place in terms of number of deals, investee companies and capital injected.

Looking at the number of deals and investees, start-ups recorded 3662 deals and 790 companies involved in transactions while SMEs count 817 deals and 167 involved enterprises.

Then, according to the amount of capital invested in start-ups, Lombardy ranks first (with around EUR 141 million covering the 46% of capital injected), Veneto second (covering the 20% of capital injected) and Lazio third (covering the 6% of capital injected). Valle d'Aosta, on the other hand, ranks last in terms of both the number of investee companies and fundings.

While for startups there is a clear polarization in northern Italy in terms of the amount of capital received, for SMEs, on the other hand, observations are more heterogeneous. In fact, even if Lombardy always ranks first (with 65% of total invested capital), Sicily ranks second (12% of invested capital) and Tuscany third (4% of invested capital). This growth of Sicily in the ranking is due to the activation of public funds to support even southern Italy businesses. Whereas, in last place there are Basilicata, Marche and Molise for not having registered any investment in 2020.

**Table 16 - Descriptive analysis of investments by region (Startups), 2020**

<b>Region</b>	<b># Deals</b>	<b># Investees</b>	<b>Capital Injected</b>	<b>% of Total</b>
Lombardia	1547	288	140.742.242,40 €	45,64%
Veneto	230	63	61.613.155,16 €	19,98%
Lazio	300	79	17.819.703,33 €	5,78%
Piemonte	345	80	16.457.196,16 €	5,34%
Emilia-Romagna	180	59	14.783.804,87 €	4,79%
Liguria	182	23	12.583.227,85 €	4,08%
Toscana	233	36	7.197.339,46 €	2,33%
Puglia	78	24	6.916.344,43 €	2,24%
FVG	91	29	6.885.717,02 €	2,23%
Calabria	55	10	6.450.130,17 €	2,09%
Sicilia	49	14	3.453.841,27 €	1,12%
Abruzzo	56	8	3.121.983,26 €	1,01%
Trentino	78	18	3.055.261,87 €	0,99%
Umbria	20	9	1.828.726,60 €	0,59%
Marche	24	11	1.702.710,95 €	0,55%
Campania	86	22	1.666.765,28 €	0,54%
Sardegna	91	10	1.321.409,94 €	0,43%
Molise	11	3	418.590,92 €	0,14%
Basilicata	5	3	325.000,00 €	0,11%
Valle d'Aosta	1	1	6.000,00 €	0,002%
<b>Total</b>	<b>3662</b>	<b>790</b>	<b>308.349.150,95 €</b>	<b>100%</b>

**Table 17 - Descriptive analysis of investments by region (SMEs), 2020**

<b>Region</b>	<b># Deals</b>	<b># Investees</b>	<b>Capital Injected</b>	<b>% of Total</b>
Lombardia	422	74	217.781.910,07 €	65,22%
Piemonte	43	12	11.111.009,82 €	3,33%
Emilia-Romagna	76	15	11.205.494,59 €	3,36%
Lazio	33	11	6.975.317,39 €	2,09%
Sardegna	12	2	2.539.173,72 €	0,76%
Liguria	26	3	1.335.216,42 €	0,40%
Campania	19	6	1.082.567,10 €	0,32%
Sicilia	33	4	40.370.880,61 €	12,09%
Valle d'Aosta	2	1	600.000,00 €	0,18%
Trentino	12	6	3.658.515,71 €	1,10%
FVG	29	6	6.265.353,42 €	1,88%
Toscana	29	8	14.874.476,61 €	4,45%
Abruzzo	35	3	8.966.733,15 €	2,69%
Calabria	15	2	309.640,01 €	0,09%
Veneto	19	7	2.160.160,72 €	0,65%
Puglia	11	6	3.687.007,38 €	1,10%
Umbria	1	1	1.000.000,00 €	0,30%
Basilicata	0	0	0,00 €	0%
Marche	0	0	0,00 €	0%
Molise	0	0	0,00 €	0%
<b>Total</b>	<b>817</b>	<b>167</b>	<b>333.923.456,72 €</b>	<b>100%</b>

Even for the aggregate results defining the distribution of all NTBFs receiving fundings in 2020, the employed capital in Lombardy is still the highest in the ranking of regions (56%) followed by Veneto (10%) and Sicily in third place (7%).

Instead, focusing on the aggregate results of the number of companies invested, Lombardy is in first place with 362 invested companies and then, Piedmont with 92 invested companies followed by Lazio recording 90 invested companies.

In 2019, the rank was similar, but with Emilia Romagna in second place instead of Piedmont.

However, while in 2020 the percentage of invested companies in Lombardy decreased by 4.5% even maintaining the first place, the same percentage increased in Piedmont by 3.9 % and in Lazio by 1.8% compared to 2019.

**Table 18 - Descriptive analysis of investments by region (Aggregate)**

<b>Region</b>	<b># Deals</b>	<b># Investees</b>	<b>Capital Injected</b>	<b>% of Total</b>
Lombardia	1969	362	358.524.152,47 €	55,82%
Piemonte	388	92	27.568.205,98 €	4,29%
Emilia-Romagna	256	74	25.989.299,47 €	4,05%
Lazio	333	90	24.795.020,72 €	3,86%
Sardegna	103	12	3.860.583,66 €	0,60%
Liguria	208	26	13.918.444,27 €	2,17%
Campania	105	28	2.749.332,38 €	0,43%
Sicilia	82	18	43.824.721,88 €	6,82%
Valle d'Aosta	3	2	606.000,00 €	0,09%
Trentino	90	24	6.713.777,57 €	1,05%
FVG	120	35	13.151.070,44 €	2,05%
Toscana	262	44	22.071.816,08 €	3,44%

Abruzzo	91	11	12.088.716,40 €	1,88%
Calabria	70	12	6.759.770,19 €	1,05%
Veneto	249	70	63.773.315,88 €	9,93%
Puglia	89	30	10.603.351,81 €	1,65%
Umbria	21	10	2.828.726,60 €	0,44%
Basilicata	5	3	325.000,00 €	0,05%
Marche	24	11	1.702.710,95 €	0,27%
Molise	11	3	418.590,92 €	0,07%
<b>Total</b>	<b>4479</b>	<b>957</b>	<b>642.272.607,67 €</b>	<b>100,00%</b>

Thus, in line with the AIFI 2020 report, venture capital activity in Southern Italy increased compared to the previous year thanks to the support of *Fondo Imprese Sud* and *Fondo Acceleratori* managed by CDP Venture Capital SGR which aim is to anchor investments in less attractive areas of the country to boost the market potential. In fact, this public-private collaboration can lead to faster innovation in the whole country.

#### 4.1.5 Industry Analysis

As reported in Chapter 3, among the parameters defined in the constructed database, we also reported the ATECO code of all NTBFs that received a paid-in issue. Thus, since the ATECO code represents the classification of economic activities, we wanted to have a look at the breakdown of our sample into the industrial sectors: *Primary*, *Secondary*, *Tertiary* and *Quaternary*.

- *Primary Sector*: is the economic sector of basic production, it includes agriculture.
- *Secondary Sector*: is the economic sector of the production of material goods. It includes industry, construction and handicrafts.
- *Tertiary Sector*: is the service sector and includes trade, banking, transport, education, culture and health.



- *Quaternary Sector*: the term ‘quaternary’ was recently coined to better distinguish between economic activities previously included in the tertiary sector. The quaternary sector includes all service enterprises with high added value and technology. In general, service enterprises that base their core business on know-how and intellectual services such as research and development (R&D), training, consulting and ICT (information and communication technology) are included in the quaternary.

Companies belonging to the quaternary sector usually have high return on investment margins and play an important role in technological progress and in the research and application of technological innovations.

The share of the quaternary sector, indeed, makes it possible to determine the degree of economic development of a country and its future prospects.

More specifically, we defined the industrial division considering the following constraints:

- The Primary sector includes all companies with an ATECO code greater than or equal to 10000 and less than or equal to 90000.
- The Secondary sector includes companies with an ATECO code greater than 90000 and less than or equal to 330000.
- The Tertiary sector includes companies with an ATECO code between 330000 and 1000000 but different from 620100, 620200, 620901 and 620909 because these latter codes define the Quaternary sector.

**Table 19 - Number of SMEs and Startups divided by sectors**

<b>Sector</b>	<b># of Startups</b>	<b># of SMEs</b>
<i>Primary</i>	7	1
<i>Secondary</i>	136	34
<i>Tertiary</i>	332	84
<i>Quaternary</i>	315	48
<b>Total</b>	<b>790</b>	<b>167</b>

The tables show the number of investee companies for each economic sector and show that for both Startups and SMEs, the predominant sectors are the Tertiary and the Quaternary. They cover the 42% and 40% respectively in Startups and 50% and 29% in SMEs.

As can be seen, there is a strong attractiveness of the quaternary sector that is the one related to ICT services that enable the realization of the increasingly in-demand Fintech services and faster technological innovation even more in demand with the outbreak of the Covid-19 pandemic.

In fact, it was also thanks to the activities of this sector that the venture capital market did not come to a standstill during the pandemic. While the primary, secondary and to some extent the tertiary sector declined with the restrictions due to Covid-19, the quaternary sector counterbalanced this trend by growing, thus allowing venture capital investments to bring a total capital stock in line with that of the previous year.

## **4.2 Econometric Models**

The first section of this econometric analysis relates to the Multi-Variate Probit regression described in Chapter 3, with the presence of a particular typology of investor as the binary dependent variable. The next section, on the other hand, represents the analysis on human capital and the impact we assume it has on investor selection criteria.

### **4.2.1 Model 1: Different selection criteria based on financial data**

The purpose of the first Econometric Model is to answer the first research question:

*Q1: In the Italian VC market, do the different typologies of investors adopt different selection criteria when evaluating the accounting figures of the target?*

To investigate the research question, we retrieved the financial data of interest from AIDA's multiple search in order to define the independent variables described in Section 3 (PST, CSN, LN\_AGE, ROA, LN\_IA, LN\_REV, QRAT) and looked for a relationship with the dependent variables also described in the aforementioned section (invIVC, invCVC, invGVC, invBA, invBAN).

We excluded Bank Venture Capital (BVC) and Crowdfunding investments (CFP) from the analysis as their numerosity was too low compared to the total, thus the results of their analysis would not be sufficiently reliable.

To perform the analysis, we considered 944 NTBFs, that is the total number of registered companies but net of repetitions. In addition, the objectives and selection criteria considered by the different types of investors were defined in order to see whether and to what extent they are met:

- **IVC:** They pursue Financial Objectives by investing in early-stage companies, coaching them, increasing their value, and making a profit in the exit phase.
- **CVC:** They pursue Strategic Objectives focusing on companies with strategic potential, knowledge, patents, technology, capital; and integrating these factors into the parent company to foster innovation.
- **GVC:** They pursue Social Objectives by filling market gaps, targeting sectors and companies potentially useful to society, creating job opportunities and stimulating economic growth.
- **BA:** It refers to the independent Business Angels. Their objective are primarily financial ones, in fact, in return of financial resources, the independent angel investor gets a percentage of equity becoming a partner in the company.
- **BAN:** It refers to the Business Angel belonging to a network. They pursue a Strategic Objective by providing not only capital but also knowledge or contacts because he knows the sector in which he is investing and is motivated by personal and direct knowledge to believe that the market will respond positively to his economic initiative. Nevertheless, similarly with Independent BAs, the financial goal is present.

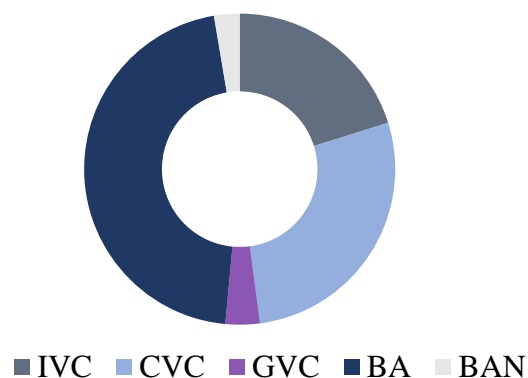
Due to some missing financial data of companies in the database, the number of observations dropped from 944 to 680 companies when we ran the model on Stata.

Thus, the composition of the observed dataset is composed as described below.

**Table 20 - Total number of observations in the econometric model**

Investors Typology	# of Targeted Firms	Total Number of obs.
IVC	198	680
CVC	272	
GVC	35	
BA	450	
BAN	26	

It is worth noting how the values in the second column do not sum to 680 since it could happen that the same firm has been selected by more investor categories.



**Figure 21 - Sample of stakeholders involved in the econometric model**

The dependent variables described were represented with a binary variable having value 1 if the target company had received an investment from the investor under analysis and 0 otherwise.

All financial data downloaded for the analysis refer to the year 2019, as it is assumed that when investing in 2020 investors look at the previous year's values to get an idea of the good investment probability to be expected.

We considered as good P values all those less than or equal to 10%<sup>10</sup>, so whenever this condition is fulfilled, it means that there is a significant correlation between the dependent variable and the independent ones.

**Table 21 - Selection criteria on Accounting figures**

<i>Multivariate Probit 1</i>		
<b>Variable</b>	<b><math>\beta</math></b>	<b>P value</b>
<i>invIVC</i>		
<i>PST</i>	0.2019273	0.130
<i>CSN</i>	0.0725035	0.363
<i>ROA</i>	-0.0024865	0.003***
<i>LN_AGE</i>	0.0074946	0.950
<i>LN_IA</i>	0.1682853	0.000***
<i>LN_REV</i>	0.0305651	0.186
<i>QRAT</i>	0.0871083	0.002***
<i>invCVC</i>		
<i>PST</i>	0.1514089	0.224
<i>CSN</i>	0.1062649	0.148
<i>ROA</i>	0.0002591	0.785
<i>LN_AGE</i>	0.0093755	0.934
<i>LN_IA</i>	0.1001136	0.000***
<i>LN_REV</i>	0.0031148	0.887
<i>QRAT</i>	-0.0151686	0.563
<i>invGVC</i>		
<i>PST</i>	0.1557699	0.470
<i>CSN</i>	-0.0975208	0.401
<i>ROA</i>	-0.0019354	0.095*
<i>LN_AGE</i>	-0.0325235	0.860
<i>LN_IA</i>	0.0849269	0.050*

<sup>10</sup> In particular, we marked with \* P-values below 10%, with \*\* P-values below 5% and with \*\*\* P-values below 1%

<i>LN_REV</i>	0.0085501	0.802
<i>QRAT</i>	0.0565376	0.161
<hr/>		
<b><i>invBA</i></b>		
<i>PST</i>	0.1160735	0.361
<i>CSN</i>	-0.0543772	0.482
<i>ROA</i>	0.0031557	0.006***
<i>LN_AGE</i>	-0.0729774	0.527
<i>LN_IA</i>	-0.0644008	0.016**
<i>LN_REV</i>	-0.051262	0.025**
<i>QRAT</i>	-0.0176529	0.517
<hr/>		
<b><i>invBAN</i></b>		
<i>PST</i>	0.6202222	0.072*
<i>CSN</i>	-0.0884898	0.471
<i>ROA</i>	0.0008699	0.705
<i>LN_AGE</i>	0.1211382	0.567
<i>LN_IA</i>	0.0063299	0.896
<i>LN_REV</i>	-0.0882879	0.032**
<i>QRAT</i>	0.0240752	0.591
<hr/>		
Number of obs	680	
Wald chi2(35)	124.86	
Prob > chi2	0	
<hr/>		

**Table 22 - Correlation among independent variables**

	PST	CSN	ROA	LN_ETA	LN_IA	LN_REV	QRAT
PST	1.0000						
CSN	-0.0610	1.0000					
ROA	-0.0554	-0.0787	1.0000				
LN_ETA	-0.0528	-0.0063	-0.0135	1.0000			
LN_IA	-0.0982	0.0503	0.0379	0.4735	1.0000		
LN_REV	-0.0298	0.0486	0.1311	0.4899	0.3035	1.0000	
QRAT	0.0735	0.0119	0.0706	-0.0746	-0.0846	-0.1034	1.0000

From the reported results we can infer which of the previously defined selection criteria were met in the Italian venture capital market in 2020.

Thus, answering the first research question:

- **IVCs:** According to our model, they tend to select firms with a lower ROA but with higher Liquidity and Intangible Assets. The latter, if considered as a proxy of the value of Knowledge and Patents, represents a signal of competitive advantage, both because they significantly affect the value of a firm and because they are frequently the subject of negotiation.

These results are consistent with the fact that IVC investors tend to select firms characterized by a poor level of profitability (reflected by low ROA), but still with a potential source of income to pursue their financial objectives (reflected by high Intangible Assets) and with a good level of liquidity (high Quick ratio). In our opinion, this is a good fit for an IVC investor that can therefore enter the investment with a reasonable amount of capital and, through a proper coaching and an efficient managing, transform the venture potentiality into solid profitability, thus increasing its value and registering a consistent profit from the exit.

- **CVCs:** According to our model, they tend to select companies with a higher level of Intangible Assets. Again, this suggests and confirms how these investors are driven by the desire to absorb strategic assets and competencies from the investee to boost innovation rather than to pursue financial goals.
- **GVCs:** According to our model, they tend to select companies with a lower level of ROA but high Intangible Assets. This can be read as their intent to fill the market gap targeting unprofitable realities presumably operating in

uninvested landscapes but with a strategic potential in order to help small companies with good potential to attract investors. Nevertheless, no conclusions can be drafted in terms of which are the geographical targets of public initiatives.

- **BAs:** According to our model, they tend to select companies that, although having low revenues and intangible assets, are characterized by a higher ROA reflecting the enterprise's ability to obtain and realize an income stream from its activity. This confirms their willingness to obtain remuneration through dividends.
- **BANs:** According to our model, they tend to select companies with lower Revenues that belongs to the tertiary sector. It is the main sector in Italy accounting on average the 70% of GDP over last decade (differently from individuals, they are more interested in the economic sector of companies).

#### **4.2.2 Model 2: Different selection criteria based on Human Capital**

Then, we performed this second model to answer our second research question:

*Q2: In the Italian VC market, do the different typologies of investors adopt different selection criteria when evaluating the human and intellectual capital of the target?*

For this type of analysis, we considered the same dependent variables as above, but in relation to new independent variables, already described in Chapter 3 (WmnP, YthP, FgnP, R1, R2, R3).

Again, we ran the model starting from 944 total observations but, due to some missing data on the human capital of some companies, this number was reduced to 871.

Once again, we considered there to be a significant relationship between the variables if and only if P Value was less than or equal to 10%.



**Table 23 - Selection criteria on human capital factors**

<i>Multivariate probit 2</i>		
<b>Variable</b>	<b><math>\beta</math></b>	<b>P value</b>
<i>InvIVC</i>		
<i>R1</i>	0.4333726	0.000***
<i>R2</i>	0.2469225	0.022**
<i>R3</i>	0.4888127	0.000***
<i>WmnP</i>	-0.3889461	0.008***
<i>YthP</i>	-0.0609063	0.373
<i>FgnP</i>	0.3485323	0.051*
<i>invCVC</i>		
<i>R1</i>	0.0194943	0.862
<i>R2</i>	-0.0376765	0.716
<i>R3</i>	0.0385033	0.707
<i>WmnP</i>	-0.4125837	0.001***
<i>YthP</i>	-0.2219993	0.001***
<i>FgnP</i>	-0.3314815	0.144
<i>invGVC</i>		
<i>R1</i>	-0.0995642	0.592
<i>R2</i>	0.0563425	0.750
<i>R3</i>	0.0592897	0.733
<i>WmnP</i>	-0.0777187	0.679
<i>YthP</i>	0.0480355	0.643
<i>FgnP</i>	-2.958048	0.965
<i>invBA</i>		
<i>R1</i>	-0.1468473	0.201
<i>R2</i>	-0.2856427	0.007***
<i>R3</i>	-0.4310257	0.000***
<i>WmnP</i>	0.369548	0.008***
<i>YthP</i>	0.1517474	0.030***
<i>FgnP</i>	0.7735451	0.058**
<i>invBAN</i>		
<i>R1</i>	0.0212409	0.924
<i>R2</i>	-0.0773462	0.710
<i>R3</i>	-0.1243708	0.534
<i>WmnP</i>	0.0719537	0.659
<i>YthP</i>	0.0498775	0.646
<i>FgnP</i>	-0.0539129	0.892
Number of Observations	871	
Wald chi2 (30)	103.77	
Prob > chi2	0	

The results show a weakness in the venture capital market that may be causing a slight friction to innovation. In fact, both IVC and CVC investors have a significant but negative correlation with the presence of women in the target company, thus investing in male-dominated companies. Furthermore, CVCs also have a negative correlation with the number of young people, so the greater the presence of young people, the lower their tendency to invest in those enterprises, despite the fact that young people present a greater potential for innovation.

On the other hand, we can see that IVCs target companies with a higher presence of foreigners, aiming at multiculturalism and open market innovation, probably trying to attract foreign investors as well.

Business Angels, on the other hand, are surprisingly attracted to companies with higher numbers of both women, young people and foreigners (positive and significant correlation).

Another result is defined by the relationship of the independent variables with the binary variables R1, R2 and R3, which indicate whether or not the following characteristics are met:

1. Research and development expenses are at least 15% (for startups) or 3% (for SMEs) of the maximum between costs and production value.
2. In startups 2/3 (1/3 for SMEs) of the team is composed by people with a Master of Science degree or by 1/3 (1/5 for SMEs) of people that hold a PhD or published research studies.
3. NTBFs have at least a license or a patent.

As the positive and highly significant correlation shows, these three factors are relevant for IVCs, while they do not appear to be criteria of choice in targeting the company to invest in for CVCs. For what concerns Independent BAs, they seem to be interested in firms lacking a highly qualified managerial team as well as firms not in possess of any proprietary patent or license.

Regarding the investments preferences of GVCs and Business Angels belonging to a network, on the other hand, there were no significant results for any of the variables considered.

From the study of the econometric models obtained, we also decided to furtherly focus our attention on a third question to unearth other possible differences between the BAs of a network and independent BAs.

*Q3: Focusing the attention on Physical Investors: is it possible to disclose any difference between the criteria adopted by Independent Business Angels and the ones adopted by BAs associated with a network?*

Differently from Independent BAs, the ones associated with a Network tend to select firms of the Tertiary Sector with lower revenues. While, in terms of Human-Intellectual Capital, there is no evidence suggesting that they have defined selection criteria.

Whereas, as we have previously seen, individuals mostly pursue a financial goal. This again demonstrates a substantial difference between the two categories: whereas business angels in a network offer additional services to financing by providing their entrepreneurial and managerial skills (active angels); independent business angels may offer fewer additional services in addition to financing (passive angels) therefore, rather than targeting companies with low revenues to also attempt a structural improvement of the business, passive angels prefer safer investments and therefore they also look at promising financial parameters in terms of profitability.

#### **4.3.2.1 Model 3: merging of Model 1 and Model 2**

In order to do a robustness check on the results obtained in the two previous models, we also decided to carry out a single analysis taking into account both financial and human capital indicators.

In this way, only those companies for which all terms are non-zero will actually be taken into account; this is why the number of observations obtained is smaller than before (618 observations).

**Table 24 - Econometric analysis with both financial and human capital indicators**

<i>Multivariate probit 3</i>		
<b>Variable</b>	<b><math>\beta</math></b>	<b>P value</b>
<i>invIVC</i>		
<i>PST</i>	0.2243263	0.116
<i>CSN</i>	0.0231244	0.784
<i>LN_AGE</i>	-0.1132642	0.457
<i>LN_IA</i>	0.1559991	0.000***
<i>LN_REV</i>	0.0443645	0.076*
<i>QRAT</i>	0.0929961	0.001***
<i>ROA</i>	-0.0046746	0.000***
<i>R1</i>	0.1058356	0.511
<i>R2</i>	0.0613943	0.672
<i>R3</i>	0.2288131	0.124
<i>WmnP</i>	-0.4234008	0.048**
<i>YthP</i>	-0.1073818	0.256
<i>FgnP</i>	0.3782879	0.077*
<i>invCVC</i>		
<i>PST</i>	0.116815	0.381
<i>CSN</i>	0.0771163	0.324
<i>LN_AGE</i>	0.0278066	0.845
<i>LN_IA</i>	0.096061	0.001***
<i>LN_REV</i>	0.0136782	0.559
<i>QRAT</i>	-0.0143288	0.601
<i>ROA</i>	-0.0009954	0.416
<i>R1</i>	-0.2342489	0.120
<i>R2</i>	-0.0709645	0.604
<i>R3</i>	-0.181184	0.198
<i>WmnP</i>	-0.4025432	0.014**
<i>YthP</i>	-0.24007	0.006***
<i>FgnP</i>	-0.298197	0.246
<i>invGVC</i>		
<i>PST</i>	0.1239959	0.583
<i>CSN</i>	-0.0967855	0.427
<i>LN_AGE</i>	0.3306723	0.168
<i>LN_IA</i>	0.1127272	0.019**
<i>LN_REV</i>	0.0155973	0.669
<i>QRAT</i>	0.0720171	0.087*
<i>ROA</i>	-0.0031665	0.052*
<i>R1</i>	-0.4246866	0.112
<i>R2</i>	-0.301747	0.210
<i>R3</i>	-0.3561787	0.155
<i>WmnP</i>	-0.4800692	0.267
<i>YthP</i>	0.1180086	0.367
<i>FgnP</i>	-3.598472	0.984

<i>invBA</i>		
<i>PST</i>	0.1130947	0.412
<i>CSN</i>	-0.0163065	0.845
<i>LN_AGE</i>	0.131691	0.372
<i>LN_IA</i>	-0.0756489	0.011**
<i>LN_REV</i>	-0.0520779	0.035**
<i>QRAT</i>	-0.0169075	0.560
<i>ROA</i>	0.0040145	0.003***
<i>R1</i>	0.0282707	0.856
<i>R2</i>	-0.374231	0.008***
<i>R3</i>	-0.2429857	0.092*
<i>WmnP</i>	0.5169717	0.024**
<i>YthP</i>	0.0521066	0.551
<i>FgnP</i>	4.652789	0.964
<i>invBAN</i>		
<i>PST</i>	0.6955871	0.071*
<i>CSN</i>	-0.056868	0.671
<i>LN_AGE</i>	0.1441511	0.610
<i>LN_IA</i>	0.0017521	0.973
<i>LN_REV</i>	-0.0955764	0.031**
<i>QRAT</i>	0.0305051	0.517
<i>ROA</i>	0.0003928	0.867
<i>R1</i>	0.2425344	0.433
<i>R2</i>	-0.1621251	0.561
<i>R3</i>	0.0537605	0.845
<i>WmnP</i>	0.1918563	0.351
<i>YthP</i>	0.040499	0.773
<i>FgnP</i>	0.1853714	0.623
<i>Number of Observations</i>	618	
<i>Wald chi2 (30)</i>	171.45	
<i>Prob &gt; chi2</i>	0	

What we could see from this third model is that the results previously obtained in models 1 and 2 are not contradicted by the combined analysis.

Despite some small variations due mostly to changes in sample size, the selection criteria of the different types of investors remain coherent with the ones inferred with the first two models.

## **Chapter 5: Conclusion and Further Improvements**

The objective of our study was to investigate the characteristics of the Venture Capital market in 2020 seeing whether different venture capitalists reflect various investment strategies when selecting businesses to finance.

Specifically, we looked at the selection criteria of each type of investor then differentiating independent business angels from those belonging to a network.

With regard to target companies, we examined in detail both financial indicators such as profitability, strategic potential, company size and financial position, as well as qualitative factors describing industry sector, geographical distribution in Italy, age and team composition.

To achieve this goal, the database was built starting from 1936 notarial documents (454 for SMEs and 1482 for start-ups) to record deal data on paid-in capital injections made in 2020 in Italy. At this stage of the analysis, all the information on target companies and investors involved in the deal were therefore recorded.

The topic of analysis was of particular interest given the historical period to which it refers to, as the influence of the Covid-19 pandemic on the alternative investment market may have defined not only changes in the number of investments made and the amount invested, but also in the market structure, defining new selection criteria and a different managerial composition of NTBFs.

This historical period is marked by a very fast technological innovation that has allowed the venture capital market not to stop its activity. This was possible thanks both to the monetary and fiscal policies that continued to incentivize investments in Italy, and to the increasingly high attractiveness of the sector.

Hence, the investments did not stop, and the credit lines kept working defining new opportunities.

We investigated the context just described through the development of two multivariate probit regressions, in which the dependent variable was the presence of a venture capitalist in the capital increase transaction.

The descriptive analyses first showed that innovative Startups receive proportionally lower investments and, on average, lower amounts than innovative SMEs, as the latter are also involved in more complex transactions (such as IPOs).

For the same reason, we found that the number of BAs belonging to a network is lower in SMEs because these investors focus on investments that show high strategic potential in the early stage of a company's life, whereas SMEs are often involved in more complex transactions during their maturity phase.

Thus, in SMEs, the average amount invested by BANs is smaller than the one invested by independent individuals. While, on the contrary, in innovative Startups, there is a greater number of both individuals and BAs with a network and, in this case, the latter invest on average more than the former because the investment opportunities in the early stage and the level of potential innovation are greater.

As far as the sectoral analysis is concerned, there was confirmation of the fact that the tertiary sector continues to be the most targeted, together with the quaternary sector (ICT) which is growing rapidly thanks to the disruptive technologies that have entered the market in the last period.

Geographically, Lombardy, and specifically Milan, remains the city with the highest number of deals and the highest capital injected in both SMEs and Startups. The market is generally polarized at north, but the VC activity in Lazio is rising, in fact, it registers both an increasing number of transactions and invested capital.

Although the number of deals continues to be higher in Northern Italy, SMEs located in Sicily and Tuscany received higher amounts of capital than in previous years. However, the number of transactions recorded is still too low to conclude that the market is expanding in that direction (but this cannot be ruled out).

Another important consideration made on the basis of the descriptive statistics was about the growing number of CVC transactions, which in the year of analysis even surpassed those of IVCs, which have historically represented the majority for several years.

This significant change was facilitated by a number of important initiatives such as the operations of Fondo Imprese Sud and Fondo Acceleratori, both managed by CDP venture capital SGR, which increased the number of transactions in Italy by starting to invest EUR 412,000 of the billion allocated for investments in innovative SMEs and Startups.

Moreover, the market for innovative Startups and SMEs is characterized by an information asymmetry that determines how and to what extent companies are able to access financing and scale-up in the market.

Alternative investments help reduce this asymmetry as they are led by capable investors, who, although with distinct objectives, reduce the risk of uncertainty by assessing investment projects in detail before investing.

Hence, the figure of the Business Angel in a network is gradually gaining ground as the presence of several investors who communicate with each other by exchanging opinions makes the investment assessment even more detailed and enables the creation of a diversified portfolio of investments with uncorrelated returns that reduces the risk of default.

With the econometric models developed with the multivariate probit, we thus answered three theory questions we had previously asked ourselves.

*Q1: In the Italian VC market, do the different typologies of investors adopt different selection criteria when evaluating the accounting figures of the target?*

Yes, they do. There is in fact evidence that IVCs prefer to select companies with low ROA but high intangible assets and better short-term liquidity; CVCs mainly look at high intangible assets to ensure there is strategic potential to stimulate the growth; GVCs seek low ROA and higher Intangibles and BANs are mainly interested in investing in smaller companies belonging to the tertiary sector. Finally, BAs are looking for smaller companies with a lower-level intangibles but a high ROA to obtain a personal remuneration.



*Q2: In the Italian VC market, do the different typologies of investors adopt different selection criteria when evaluating the human and intellectual capital of the target?*

Yes, they do. IVCs are unlikely to select companies with a prevalence of Women in the management team but they are attracted by the presence of foreigners, probably because of the market-opening opportunities that could arise. In addition, this category of investors is interested in companies that invest sufficiently in Research and Development, have highly qualified personnel and own at least one license or patent.

Therefore, there is a positive relationship between management education, management team's international experience, number of patents and the likelihood of receiving financing from these VCs.

Similarly, CVCs are unlikely to select firms with a prevalence of either Women or Young Entrepreneurs; BAs are likely to select NTBFs with a prevalence of either Women, Young and Foreign entrepreneurs but even if not highly qualified and without a registered license/patent. While, for GVCs and BANs is not possible to disclose any tendency.

These structural factors act as quality signals that companies can send to the less informed party, the VCs, to reduce the information asymmetry in the market by trying to match the business idea with the investment decision.

*Q3: Focusing the attention on Physical Investors: is it possible to identify any differences between the criteria adopted by Independent Business Angels (Individuals) and the ones adopted by BAs associated with a network?*

Yes, it is. BAs in a network are mainly interested in investing in the Tertiary sector and in lower revenues realities in order to give more opportunities to those companies that are excluded from financing due to the flight-to-quality<sup>11</sup> effect. This is because thanks to their in-depth knowledge, the BAs of a network can reduce the volatility of the investment, and thus the risk.

Instead, BAs are looking for low revenues and intangibles but high ROA that indicates higher profitability in order to meet their financial target.

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<sup>11</sup> Uncertainty in the financial or international markets usually causes a herd-like behavior where investors cutting back on the more volatile investments for conservative ones.

Whereas, in terms of Human-Intellectual Capital, while there is no evidence suggesting that BAs with Network have particular selection criteria, Individuals are likely to select NTBFs with a prevalence of Women, Young people and Foreigners but without registered license/patent.

Although business angels and formal venture capitalists both participate in equity investment activities, they differ substantially.

The first difference concerns the amount of capital invested as business angels, by investing their own capital, commit smaller amounts than venture capitalists who are instead backed by funds engaged by others. The second difference concerns the motivation for investment. Whereas venture capitalists invest primarily to obtain financial returns, in contrast, business angels are also driven by the entrepreneurial interest to collaborate with talented individuals, discover new and promising technologies and cooperate with other angels (Haines, Madill and Riding 2003; Morrisette 2007; Ibrahim 2008; Hsu et al. 2014).

The third difference is that, due to the limited publicity angels attract, the transaction flow generated by them is much more limited than that of formal investors (Mustilli and Gangi 1999; Paul, Whittam and Wyper 2007; Shane 2008; Kerr, Lerner and Schoar 2011). Another difference is that business angels do not have diversification strategies, nor do they engage in multiple investments simultaneously, but this barrier, as well as that of limited visibility, is beginning to be broken down by the presence of BANs (Business Angel Networks).

Although the analyses carried out yielded interesting results, the model suffers from some limitations. First among them is the non-exclusion of Friends, Family and Fools (the so-called FFF money) from what we have defined as independent Business Angels as this could lead to a distortion of the data obtained. Furthermore, it would have been better to also exclude founding partners from this category of investors.

A further limitation was to have data on human capital referring to 2022 instead of 2020. Although we would not have expected such different figures for 2020, it would have brought a higher level of precision to the analysis, but unfortunately this information could not be found.

The analysis could also be enriched with future research studying the impact of Covid-19 and the war in Ukraine in the years following the outbreak of these disasters.

It would be interesting to observe how the venture capital market will respond to the macroeconomic situation ahead as technological innovation continues to increase in a context where tight fiscal and monetary policies will not support investment activities anymore.

Another possible future investigation could be a deal analysis for successful and unsuccessful NTBFs. Thus, no longer evaluating the criteria that venture capitalists use to decide whether to fund NTBFs, but understanding which investor characteristics increase the likelihood of success of the NTBF invested.



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