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**Venture Capital Reputation and its impact on portfolio firm's growth and
post-IPO performance**

Supervisor: Prof. Benedetta Montanaro

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ABSTRACT

Venture Capitals are financial intermediaries that appear as a solution to many of the problem entrepreneurs face when undertaking new ventures. These financial actors also play a vital role for the functioning of government strategies on fostering innovation on certain geographic areas and industries. VC backing could be a driving force of success for portfolio firms, even though they also came with a series of drawbacks.

However, VC market is heterogenous, there are several types of VCs, operating in different industries, with different sizes, with different specialization degree, and numerous other factors that make them differ among each other. Moreover, it has been seen by partitioners and studied by scholars that VC services to entrepreneurial firms are superior when VC reputation is high, are in general VC reputation is expected to extend and intensify the benefits that VC bring to portfolio firms. This work explores the literature on regards to the previous authors and works that are valuable to understand the role of VC reputation. Specifically, we dig deeper into the effect of reputation of venture capitals on the growth and post-IPO performance literature.

The work is divided into several sections, each of which provides valuable insights into the venture capital industry. The first section introduces the concept of venture capital and its different phases and typologies. It also discusses the role of information asymmetries in the entrepreneurial ecosystem and how they affect the ability of VCs to identify and invest in promising startups.

The second section focuses on the importance of measuring venture capital reputation and the different proxies and methodologies used by researchers to do so. It also highlights the contributions of several authors to the measurement of venture capital reputation and the limitations of the available data sources.

The third section presents the VICO5.0 database, a robust repository of venture capital activity in Europe that registers the evolution of companies since 1988. It provides a comprehensive view of the VC landscape dynamics, covering a wide range of variables, including company characteristics, investment details, investor profiles, accounting data, and information on mergers, acquisitions, and IPOs.

In this section I present descriptive statistics on venture capital reputation measures studied in the third part using VICO5.0. It highlights the insights and ideas of the authors mentioned in the previous sections regarding the measurement of venture capital reputation. The statistics provide a comprehensive view of the VC landscape dynamics, including the distribution of investments, the characteristics of portfolio companies, and the performance of exits. Also, it is presented a series of limitations of the analysis using VICO5.0, as some of the variables could present a larger percentage of missing information, making the result unreliable. I present a list of most reputable investors according to these measures proposed and tested against empirical data from authors mentioned.

Key words: Venture Capital (VC), Entrepreneurial firms, VC heterogeneity, VC reputation, growth, performance.

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1. INTRODUCTION

Innovation has been considered a force of economic growth, many economists, practitioners and Governments have focused their studies and efforts on how to create policies to enhance the benefits of innovation on the economy and to avoid the factors that prevents innovation to fully take place in the economic system. From the point of view of economics, historically has been studied from different approaches, like the Smith's approach which considers the incremental improvements on production thanks to division of labor and technological innovation (*An Inquiry into the Nature and Causes of the Wealth of Nations, 1776*).

There are exogenous and endogenous models, the neo-classical theory on economics, considers innovation as an exogenous factor, derived by factors that triggers innovation, like technology, which is considered exogenous.

There is Schumpeter models Mark I and Mark II which considers innovation as an endogenous factor (*The theory of economic development", Schumpeter 1912*). Schumpeter Mark I theory considers innovation as something brought by new firms, there is a distinction between Invention and Innovation. The first is a materialization of an idea, it could be physical (e.g. the Typewriter) or non-physical (e.g. The internet as the materialization of political forces between U.S and the USSR but not implying yet any commercial transaction). The second implies a commercial transaction. In this theory, invention comes from both economic and non-economic forces, while innovation comes mainly by economic forces. However, something important introduced by this theory could be considering intrinsic motivations of the Schumpeterian Entrepreneur as a force driving the creation of inventions which ultimately drives innovation. It is also described the Dynamic Efficiency, as a result of innovation considered as a dynamic and continuous process, entrepreneurs need to constantly compete against imitators, which have

incentives to engage in imitation when expectation on large profits are important.

Entrepreneurs engage on balancing the cost to innovate against the expectation of profits, Government and Policy Makers play an important role on protecting innovation.

In the framework of Schumpeter, we also find the Schumpeter Mark II theory, innovation is considered endogenous to firms, however, firms are not homogeneous, there are different types, sizes, and broad range of characteristics that could make them more or less prone to engage in innovation. He theorizes that size of the firm could play an important role. Big firms have financial strength, and large non-financial resources, such as labs, regulatory knowledge, human resources capability, industry knowledge and relationships, however they lack of flexibility and runs the risk of cannibalizing their own products by introducing innovation. Small firms, are very flexible, creative and they run lower risks of product cannibalization, but they face very important obstacles, such as where to find the financial and non-financial resources to engage on R&D, and depending on the type of investor they get, they could run other risks, like technology miss appropriation risk, bankruptcy or lack of liquidity.

Why Policy makers support innovation?

Policy makers strive to incentivize the innovation on the entrepreneurial system cause it ultimately it benefits, which is beneficial for the final consumer and the society in general. It urges the firms to be efficient, allocation of resources is better and smart, increases quality of products and services among other benefits.

Through different economic models on competition could be seen the importance for the general economy the existence of competition in the market, which is the ultimate reason why policy makers encourage innovation. On the Bertrand model, a firm setting lower prices

captures more market share, even if this behavior leads to the so-called Bertrand Paradox, where price is equal to marginal cost and firm's profits are zero, this attempt to explain competition leads to consumers getting lower prices¹. A further *Bertrand model* relaxing assumption on *non-homogeneous* goods, leads to firms sharing profits, however competing on differentiating their products, which in turn needs R&D to support innovation. The extension to the *Cournot model* relaxing equal production technology leads to the firm with lower costs producing more and earning more profits, this supports the idea of innovation supporting the creation of new organizational schemes, systems, and internal resources that could help firm decreasing costs. In this case we see innovation as a source of competitive advantage on costs. On the *Von Stackelberg model*, a sequential game competition model based on quantities we see how the firms getting the market first, make largest profits. This could explain firms engaging on a rush to first get their products to the market.

Firms' incentives to innovation derive from the possibilities of reaching larger profits to make their competition in the market affective and efficient. The development of competitive advantage can be studied on the side of costs and on the side of the demand faced by the company. Firm may reduce their costs as a result of engaging on R&D to change or streamline their cost structure, we refer to process innovation. On the side of the consumer demand, we refer to product innovation.

¹ However, this result relies on certain assumptions: Capacity constraints, non-homogeneous goods, diverse cost functions and repeated games. Depending on which assumptions are relaxed, we obtain different results. On real life, products are not perfect substitutes, then we could say that setting a larger price is not resulting on demand of a product decreasing to zero, however it could result on a lower demand, competition on price could be still very important for firms depending on their product differentiation.

However, firms face numerous challenges when it comes to engaging in innovation, even if the firms have strong incentives to innovate, they also have very sound reasons to firms underinvest in innovation. Starting from information asymmetries, explained later on in this report, which causes several problems before and after a transaction occurs, in this case before and after firm invest on innovation. Firms face moral hazard, and monitoring their innovation projects is hard, and attracting external finance is difficult for very young and innovative companies, here the adverse selection problem arises.

Firms are also exposed to several risks when engaging in innovation, as the risk of imitation by competition, if firms are large and they already have a product portfolio, engaging in innovation for creating new products may cannibalize their other products. We also see from economics, that positive externalities tend to be underprovided, as the agent generating the externality cannot fully benefit from what it is creating, however this agent is bearing all the cost. We can see this outcome materialized on the fact that the benefits from innovation are larger for the whole ecosystem than to the agent creating this innovation.

Governments supports innovation not just because it is beneficial from the theoretical point of view of encouraging the competition in the markets and making markets more efficient, but governments are facing many challenges from year to year, from digital disruption² to climate change and new emerging threats, like COVID on 2019-2020, and are constantly looking for innovation trends to cope with all this challenges. The OECD on its 2023 report on Global Trends in Government Innovation points four primary innovation trends:

1. **New forms of accountability for a new era of government:** They focus on the transparency of governments on new technologies, and they base it on a study case of on the United Kingdom's Algorithmic Transparency Recording Standard and Amsterdam's Sensor Register regulation and map.
2. **Re-orienting Care Systems:** On an effort to support and enhance systems taking care of citizens health, governments are leveraging on new technologies to revolutionize healthcare, based on case studies from Bogotá Care Blocks in Colombia, *“which provide integrated support to women careers and their families, as well as a Mental Health Café in Australia and the AI-powered Tucuvi virtual nurse in Spain.”* OECD (Global Trends in Government Innovation, 2023)
3. **New methods for preserving identities and strengthening equity.** Innovative approaches to engaging with Indigenous peoples, safeguarding cultural heritage and enabling families and communities for equitable outcomes and enhanced wellbeing. This trend is supported by case studies on Ethical Deliveries, an alternative to private sector delivery platforms in Bologna, Italy, as well as efforts to support citizenship, participation and access to justice for Indigenous Maxakali communities in Brazil and the Empowered Families Initiative in Singapore.
4. **New ways of engaging citizens and residents.** Evolving upon and strengthening public engagement practices, while also empowering people to have a stronger role in re-imagining and seeing new norms for physical and environments. This trend is supported by case studies on permanent Deliberative Committees in the Brussels, Belgium Regional

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Parliament, as well as the creative #FreetownTheTreeTown initiative to promote the planting and caring for trees in the capital of Sierra Leone.

2. THE FUNDING GAP ON THE ENTREPRENEURIAL ECOSYSTEM

In the ever-evolving landscape of entrepreneurship, startups represent the driving force of innovation and economic growth. Central to the success of these startups is the support and investment provided by venture capital firms. As the heartbeat of the entrepreneurial ecosystem, venture capital not only injects much-needed capital into fledgling businesses but also brings with it a reputation that can profoundly influence the destiny of these ventures

However, before specifically introducing the deeply the role of venture capitals, it would be needed to talk about the entrepreneurial ecosystem and the type of investors that entrepreneurs may find in the path of funding their innovations. While the entrepreneurial world seems plenty of potential, the investor's side and the economy itself pose a series of serious challenges to investors, we may say that there is a valley of dead that entrepreneurs face, that represents the disparity between the financial needs of startups and the available capital from various investors. This disparity is powered mostly due to the so-called information asymmetries.

The outcome of the information asymmetries is the under provision of resources by investors, however, entrepreneurs with brilliant ideas still need investors to fund their projects as there is a number of resources that the entrepreneur typically is not able to provide (*Evans and Jovanovic, 1989*). Beyond the information asymmetries, there are a couple of other reasons why new firms with brilliant ideas are not able to get funding or struggle to get it. When companies are too new, they lack of relationships among not only investors, but also commercial relationships, with partners and clients. This results on uncertainty on relationships that lead to an obstacle on getting funding, this companies has not reached a level of trust with partners that could help them achieve goals, this has been described as the so-called "liability of newness" (*Stinchcombe, 1965*). It is also difficult for an investor to determine the value of a very new company, is there is not a past track of

records that could provide reliable information on their value (*Carpenter and Petersen, 2002*).

Many newly created companies are developing their core business model around technologies that could be very new, so new that their way of functioning is still untested on the market. This situation of untested business model is much more relevant when it involves high tech innovations, in fact, it is hard to understand what would be the profitability of this kind of projects, investors and partners would face high uncertainty, this is true for technology-based business models (*Kortum and Lerner, 2000; Shane, 2001*).

Investors, on their attempt to invest on a new venture would face the need of valuing intangible assets as most of this companies does not own physical assets and they rely much more intangibles: trademarks, service marks, package designs, noncompetition agreements, patented and unpatented technology, supplier or customer contracts, customer lists, and noncontractual customer relationships (*Officer et al., 2009; Lim et al., 2018*).

Intangible assets represent a significant component of the U.S economy. Peters and Taylor (2017), estimated that estimate that intangible assets constitute about half of total assets during 1975–2011 for a typical US Compustat firm, there is no doubt that many of these assets could be very valuable, and crucial for firms competitive advantage, however still there is enough opacity to make it difficult to verify, liquidate, and generally are not useful as collateral for future borrowing (*Crouzet and Eberly, 2019; Falato et al., 2022*).

Valuing this intangible asset could be challenging and there have been many scholars contributing to studying the role of intangibles in acquisitions, such as Higgins and Rodriguez, 2006; Sevilir and Tian, 2012; Phillips and Zhdanov, 2013; Bena and Li, 2014; Celik et al., 2021. Others, studying their valuation effect con corporate policies such as Eisfeldt and Papanikolaou, 2013; Dell'Ariccia et al., 2021; Li et al., 2018; Sun and Xiaolan, 2019, and enhanced valuation methods such as Ewens et al., 2022, who attempts to measure intangible assets using market prices, or Haskel and Westlake,

2018, who describes the paradigm of “capitalism without capital” and how it “shows that the growing importance of intangible assets has also played a role in some of the big economic changes of the last decade”.

Another aspect that prevents new companies with promising talent and ideas is the knowledge misappropriation. It has been said how relationships among firms is one of the aspects lacking on newly created companies, however, firm alliances support the mechanism of creating value for firms stakeholders. (*Deeds and Hill 1996; Eisenhardt and Schoonhoven 1996; Shan et al. 1994*).

It is also described in the literature how newly created firms, especially those firms with high technology at its basis often called, new technology-based firms (NTBF's) in the literature, often lack the internal resources and capabilities to transform their innovative technological knowledge into successful new products and services (Colombo and Piva, 2019). Entrepreneurial ventures may leverage on the alliances created with partners, especially larger companies already operating in the market who own the resources that small new competitors may need in order to develop their technology, which in turn could also be a valuable opportunity to develop competitive advantage for the larger company involved in the alliance. Thus, helping both entrepreneurs and existing competitors generating value, or creating “synergistic gains” (*Colombo et al. 2006*). *G. Colombo, Luca Grilli and Evila Piva*, on their work titled “*In search of complementary assets: The determinants of alliance formation of high-tech start-ups*” described how this synergistic gains are created on the basis of *Technological agreements*, that may include Joint development agreements, research joint ventures, technology transfer and technology sharing agreements, and *commercial agreements* which may include licenses, joint distribution agreements and customer-supplier relations among others.

Still, in the market exists barriers to get financing or to get this alliances, The financial constraint of newly born firms depends on their intrinsic characteristics that increase the information asymmetries with potential investors (*e.g., Amit et al., 1998*).

However, from *Teece (1986)* conceptual framework, it is also exhibited that this alliances could be two folded, and there are incentives on both sides either to overestimate the potential of the new innovation (ex-ante, information asymmetry problem) or to conceal firm's intentions or interests and take ownership over the technology leaving the entrepreneur without its core business (ex-post, moral hazard problem).

G. Colombo, Luca Grilli and Evila Piva also describes a distinction between exploratives alliances and exploitative alliances. With the former being the “*use more intensely partners' existing assets and capabilities through a division of tasks, with each partner specializing in the task in which it has a relative advantage*” and the latter are alliances aiming at finding new opportunities and build new capabilities (*Koza and Lewin, 1998*). In their study through econometric models, is concluded that there is a value creation that supports the formation of exploitative commercial alliances, and how this is more likely to happen on smaller new companies than on larger ones, given that. Larger NTBF's are more likely to own complementary assets. This also suggest that larger NTBF's are less likely to experiment a knowledge misappropriation risk as their need to partner to develop their technology is lower, this also comes with lower exploitative commercial alliances as a result, NTBFs' size is sufficient to make a go-it-alone commercialization strategy viable, inducements to exploitative commercial alliances vanish (*Colombo et al, 2006*).

The purpose of this section would not be to describe extensively on the assets sharing among partners but to expose some of the literature supporting the idea of new startups needing partners to develop their technology but also the hazard that this comes with. This framework described by G.

Colombo, Luca Grilli and Evila Piva, in their work mentioned before, Teece in this work “Profiting from technological innovation: implications for integration, collaboration, licensing and public policy”, and other authors not mentioned before but still providing a comprehensive view of this matter such as Rothaermel in 2002 on his work titled “Technological discontinuities and interfirm cooperation: what determines a start-up’s attractiveness as alliance partner?”; Hsu on 2006 on his work “Venture Capitalists and cooperative Start-up commercialization strategy”; help us to grasp the importance on alliances but also to highlight that alongside with the difficulty on valuing intangible assets and information asymmetries to be described later on, technology misappropriation risk and all the ins and outs that must be considered when engaging on alliances, may pose several reasons why financial funding gap exists. It will be seen later in this work, how technology misappropriation risk is larger in the case the investor is a corporate venture capital

3. INFORMATION ASYMMETRIES AND ITS EFFECT ON THE ENTREPRENEURIAL ECOSYSTEM

Information asymmetry refers to a situation where one party involved in a transaction possesses more or superior information than the other. In such scenarios, the imbalance of knowledge can lead to various challenges and consequences, mostly described as market imperfections or market failures, thus, influencing decision-making processes, market dynamics, and overall outcome often to the detriment of one of the parties involved.

Information asymmetries are much more pronounced on financial markets, for instance, *“lenders would benefit of knowing the true characteristics of borrowers. But moral hazard hampers the direct transfer of information between market participants. Borrowers cannot be expected to be entirely straightforward about their characteristics, nor entrepreneurs about their projects, since there may be substantial rewards for exaggerating positive qualities. And verification of true characteristics by outside parties may be costly or impossible”* (Leland and Pyle, 1977). This is a typical example of what would be an ex post information asymmetry problem.

The adverse selection problem arises as a prominent facet of information asymmetry, where one party involved in a transaction possesses private information that is not known by the other party. These characteristics increase the investors' information asymmetries in the pre-investment phase (Akerlof, 1978).

In situations characterized by adverse selection, the party with superior information has a significant advantage in making decisions that may not align with the best interests of the less informed party. This issue arises in the pre-contractual phase. z . George Akerlof, in 1978, described in his work “The market for “lemons”: Quality uncertainty and the market mechanism. In *Uncertainty in*

economics”, the interactions between buyers and sellers and how this asymmetry in accessing information creates a situation that results in the tendency to a “*reduction in the average quality of goods and also in the size of the market.*” . This author also showed how this problem is relevant for the insurance industry in this work. For instance, individuals characterized by riskier behaviors could be more inclined to acquire insurance policies to cover risks, however are also inclined to conceal the risky attitude towards insurance companies risk profile review, initially this may create to underestimate the premium that insurance would charge to this individual.

A solution to the adverse selection would be the so called “signalling”, although it requires most of the times interpretation, it has the effect of reducing uncertainty among sellers and buyers. *Spencer, M, 1973*, analyzed the role of signals on the labour market on his seminal paper “Job market signaling”. Although conclusion of this paper leaves some open questions for discussions, it poses a good solution for the problem exposed by *Akerlof in 1978*. Later on, we see in real markets how it has the power to change expectations towards an specific assets and change assets prices in stock markets, for instance when new information is available, when companies make new deals with new partners characterized for being considered as high quality, when new CEO's are appointed, among others. We can also see screening process and due diligence in lenders analyzing whether or not extend a credit to a borrower as a process or reducing information asymmetries, for example, in the mortgage industry, lenders want to make sure borrowers has certain characteristics that could help to understand if borrower is the borrower is a low risk or high risk “investment”.

Typically, the US mortgage industry, there are financial products that require more or less intensive due diligence, at the interest rate charged to the borrower is related to how intensive this product has been. It could be found for instance financial products supported by Freddie Mac and Fannie Mae institutions, for which underwriters must follow strictly their guidelines on income, credit, assets

and collateral verifications, that could lead to the possibility to charge less interest rate to a borrower. On the other hand, there are “non-qualified mortgage” products, that do not follow this guideline, and offer alternative possibilities of analyzing borrower's creditworthiness that however, lead to less restrictive requirements to extending a credit, for example no income verification, bank statements cash flow analysis, among others, that result in larger interest rates charged, due to the larger uncertainty on the borrower's credit worthiness.

Examples of adverse selection problem could be found in the financial market could be found in the securities market, for instance on *stock markets*: investors trying to understand what companies are good quality investments and what companies are bad quality investments. On the bonds market: what bonds are good quality, what bonds are bad quality. Solution lies as mentioned on signaling, and guidelines and standards supported by government policies to ensure transparency: standard procedures to list companies, standard accounting practices, enforcement of rules, on stocks, having the supervisory body exchange. On firms doing IPO's, having prominent underwriters represented by highly reputable banks could be considered as a signal as these underwriters charge larger fees that only good quality companies can pay for it.

On the *Credit Market*, lenders cannot distinguish low risk borrowers from risky borrowers. So, they raise the interest rate, as a consequence, low risk borrowers with low-risk projects leave the market, and only very risky customers stay. Thus, for potentially profitable projects, the risk of not being financed is high. From a social surplus point of view, this is worrying considering the impact of entrepreneurial ventures on the markets' dynamic efficiency (*Audretsch, 1995*).

A first solution to this would be compensations to the lender in case the borrower cannot pay, this can be obtained with insurance. A second solution would be pledge, a collateral that borrowers use

to back/secure the loans, collaterals could be any asset with observable value, such as securities, physical assets. There are still loans that cannot be secured with collaterals, such as credit lines/credit cards, this is why these instruments bear a higher interest rate. A third solution would be a net worth as a collateral, the net worth is the owners stake in a firm. If a firm defaults the lender could have a claim against this firm's net worth. Besides, their products are surrounded by uncertainty and, many of them, possess a considerable component of intangible or firm-specific assets that are difficult to pledge as collaterals (*Almeida and Campello, 2007; Berger and Udell, 1998; Carpenter and Petersen, 2002a; Denis, 2004*)

We see in the VC market, how this option is not suitable for entrepreneurs most of the times, as mentioned before is the net worth of the startups is highly uncertain, and depend on the valuation of the intangible assets, that could be subjective. Entrepreneurs must of the time use they equity in physical assets such as houses, cars, factories, etc. as pledge to back loans. Another alternative would be to require borrowers to invest their resources to. On the mortgage industry, lenders are not allowed to lend the whole appraised value of the project. In case a borrower aims to buy a property, the so-called LTV (loan to value) forces borrowers to pay at least a percentage of the value of the property. LTVs vary depending on the type of program, and it is expected to observe a reduce of the interest rate (as borrower could be considered less risky) as the LTV decreases, or conversely as equity percentage of the borrower in the property increases.

Moral Hazard problem refers to a situation that happens after a transaction is consummated, it is described as an ex- post information asymmetry problem, and is related to the difficulty on monitoring the counterparties' behaviors, the inception of this problem lies in the miss alignment of interests, one subordinated counterparty has incentives to act motivated on his private interest,

which causes detriment to the relationship among the two counterparties as they both have different interests.

Jensen and Meckling, (1976) defined agency relationship as to a contract under which one or more individual, named the "Principal", engage with another person names the "Agent" to perform some service on their behalf, this task involves delegating some decision-making authority to the agent. It is also interesting that this authors mention "it is impossible for the principal or the agent at zero cost to ensure that the agent will make optimal decisions form the principal's viewpoint". This implies that as agent is better off by acting on his/her interests, incentives must be applied to deviate or the align agent's interests to principal interests. This is problem arises as the principal cannot observe agent's actions and therefore cannot judge whether a poor outcome was intentional or just a result of many other variables.

The agent (the entrepreneur) may decide to pursue riskier projects compared to those they had previously stated, put in lower efforts than the optimal level or favor personal interests rather than the company's ones (*Jensen and Meckling, 1976*). Different objectives between agents and principals (*Folta and Janey, 2004*) creates a situation in which principals face the need of monitoring the actions of the agent, as the latter may can benefit from the upside and not bear the downside, principals are not able to monitor agent's actions (*Arrow, 1985*).

Some examples, that we may find of this information asymmetry problem in the financial market could be for instance on securities market and on credit market. On *securities market*, if an investor buys a company stock, how this investor knows if the funds gotten by the company will be used in a way that is the best according to the investor's interests? It is more likely that the company manager

will use this fund in a way that is most advantageous to him. The separation of ownership creates this problem.

A possible solution would be to align interests using stock options for executives that provides lucrative payoffs if a firm's price rise above a certain level. A problem arising out of this is that manager would have incentive to increase companies' price as stock in the short run, a payment scheme could be designed, giving rewards linked to the stock prices linked to short, medium- and long-term goals. Specifically, in the *VC market*, both VC's and entrepreneurs could be considered as investors. However, they both have different incentives, entrepreneurs could be much more long term oriented, they take decisions maximizing long term value, they are also influenced by passion, and their actions are not always oriented at maximizing stocks. Conversely, VC's want to exit the investment making profits either by doing a Trade sale or by engaging on an IPO, and therefore their efforts are characterized by a shorter period of time, more concentrated on decisions to increase stock prices.

This problem is more severe if VC is new in the market, in this case they are on a rush to build reputation Gompers (1996), *Nahata (2008)*, which in turn will give them the opportunity to have further investments. The design of the contract between the two would be a solution to this problem, this will be seen later on.

On the *credit market* we may see how the moral hazard problem arises, borrowers know more than the lender about the way the funds disbursed will be used and the effort that will be putted into the project in which the funds will be invested. Owners of the borrower (if we say the borrower is a company), are residuals to the profit, so they know what remains after paying debts, this encourages them to take risky investments. People with risky projects are attracted to get debt financing, because they get the full benefit in the case projects results are successful (good state of nature),

they get all from the upside, while they do not bear all the costs, the downside loss is limited, and the maximum that will be paid is the value of the collateral. Lenders lose all what remains after getting the collateral.

This situation has been described by Stiglitz and Weiss in 1982, in their work titled "*Credit rationing in markets with imperfect information. The American economic review*", borrowers have incentive to replace their low risk projects with high-risk projects as they represent larger profits, however this situation is detrimental to the lenders, as lenders are not pursuing high risk projects.

A solution to this would be for instance restrictive covenants, which limit the risk that borrower can take, maintaining a certain level of net worth, a minimum credit rating, a minimum credit balance/debt, minimum levels of debt/EBITDA or Debt/Equity. For individuals, an example taken from the mortgage industry tells us, how mortgage guidelines state that borrowers cannot have mortgage late payments in the past, it could be considered to certainly extend the level of riskiness of the borrower, however it is not a perfect measure as it is also influenced by external factors happening in the market, for instance in 2020 Coronavirus triggered a world economic declining situation that led to many companies and individuals going bankrupt.

As mentioned before, startups face many challenges when it comes to information asymmetries, they face moral hazard and adverse selection, they face liability of newness, untested business model and technology, besides, most of the startups are not covered by financial analysts and credit ratings, so their level of risk or quality of assets is unknown. Entrepreneurs, in order to get financing, need to incur in actions to decrease this lack of information that the market and investors have on them. Nevertheless, they also face what Arrow, in 1962 described as a "paradox of disclosure", and adapted for the startup ecosystem. Startups need to have investors understating the true value of their assets, this requires revealing information and details about their business, and by

this, they receive fundings. However, in the other side, they face the risk of proprietary secret's disclosure (*Ueda, 2004*). .

The many situations surrounding the entrepreneurial financing create some consequences for the entrepreneurs/startups, *Tommaso, M, (2019)* gathers a group of consequences identified for several scholars: Information asymmetry poses a substantial challenge for new ventures, escalating the cost of external capital and surpassing internal capital, thereby imposing financial constraints on these firms (*Carpenter and Petersen, 2002b; Colombo and Grilli, 2007*). The current financial system appears insufficient to meet the financial needs of new technology-based firms (NTBFs), resulting in underinvestment due to pronounced market imperfections (*Holtz-Eakin, Joulfaian, and Rosen, 1994*). The founders' struggles to secure external capital have cascading negative effects on growth, survival, and innovation (*Schulman, Cooper, & Brophy, 1993; Harhoff and Korting, 1998; Carpenter and Petersen, 2002b; Hall, 2002; Denis, 2004; Hajivassiliou and Savignac, 2008; Savignac, 2008*). Consequently, potentially promising ideas or projects may encounter difficulties in securing funding or obtaining the necessary amount, leading to a risk of being crowded out from the market or the abandonment of profitable initiatives (*Fluck, Holtz-Eakin, and Rosen, 1998*). This underscores the critical impact of information asymmetry on the financial viability and innovation potential of new ventures.

4. STARTUP'S FINANCING SOURCES

Dushnitsky, 2011, describes an ecosystem of different type of investors that may enter into the Startups business as investors. Actors such as Angel investors, government, private equity, and others, each one with different objectives, interests and motivations could be interested on investing on entrepreneurial ventures. At the very beginning, Entrepreneurs could tap on family and friends to get funds to develop their ideas. It could be interesting to see if entrepreneurs' family and friends actually believe on the entrepreneur's abilities and knowledge. This option could be considered suitable on the pre-seed stage, where the entrepreneurial team still is testing ideas, working on minimum viable products, configuring the team. It is also interesting to see that family and friends not only could provide financial resources, but also, they involvement could also directly and indirectly improves a new venture's access to debt financing. (Jess H et al, 2011)

During this stage, entrepreneurs work on their hypothesis under which the business model would rely, if they could prove them true. During this stage, startups could also bootstrap their strategy, this means they could use their own money and resources to operate and growth their business, they could be considered as organic growth. The disadvantage of this option is that growing with this strategy could take years. This could also bring some benefits, such as reducing operation costs by using resources at low cost, this is due to managers striving to reduce operation costs to make business profitable and therefore using internal resources as offices, partners, employers, among others in the best possible manner (*Baker & Nelson, 2005*), managers are more creative on using resource. Interestingly, this focus could be lost when managers have wide access to financial resources.

Bootstrapping, also help entrepreneurs to master the management of the cash flows, they maximize their net working capital by having clients paying in advance and agreeing to pay later on to

suppliers, thus, having enough resources to cover day to day expenses, this is especially important if we take into account that startups are entities burning cash all days.

Winborg & Landstrom, 2000, considers different types of bootstrappers. *Delaying bootstrappers* work with the idea of maximizing the networking capital, meaning maximizing payables account, or having contractual provisions with suppliers allowing them to have payment due dates further away in time. This bootstrappers also optimize the amount invested on stocks and inventories (startups need liquidity, therefore, they strive to minimize inventories, as this account represents less liquidity, however this also depends on the operation value drivers, for instance, a very good delivery time could be a must for the market, this impacts on the inventory level making it harder to maximize liquidity). Minimizing receivables account has to do with *Minimizing bootstrappers*, and it would be the opposite idea of delaying payments to suppliers. This time, the idea would be to have clients paying the earliest possible. For instance, in crowdfunding uses this idea, in which entrepreneurs get financing even before being able to develop the products. Reward basis crowdfunding is a way of doing bootstrapping, because on reward based crowdfunding entrepreneurs promise to deliver the product or service later in the future.

There are also bootstrappers oriented on *relationships*, it is called relationship-oriented way of doing bootstrapping because entrepreneurs use social capital to make joint use of resources, for instance sharing offices of other institutions or firms (partners), this is the so called "*shared economy*" applied to the entrepreneurial ecosystem.

There are also bootstrappers more oriented on getting subsidies from the government. As part of the government policies to incentivize investment on certain areas of the economy, entrepreneurs get financing valuable for developing their business. This is done through governmental entities, which in turn help other actors (such as the venture capitals), to decrease the screening costs.

Lastly, entrepreneurs use funds from folks, family, friends and internal cashflows. It has mentioned before that startups are organizations constantly burning cash, an example could be a Biotech Company having a lot of costs and not being able to develop a Vaccine or a medical solution after many years. Still, there could be found, startups in the market able to generate some cash. Startup re invest this cashflows to grow operations.

Engaging in Bootstrapping could have a positive signaling effect, because if entrepreneurs are bootstrapping the company means they are deciding to not use external financing, then they are financing with their own money. They are investing on their own risks and this shows commitment, it is a signal of quality as they would not invest in the company if they know it is a bad quality company. This is related with the idea of lenders having borrowers investing a percentage in the project to make them also bear part of the downside in case the project fails. However, this is considering entrepreneurs are completely rational, which in turn is not the case, entrepreneurs could not be driven by purely rational fact.

Additionally, agency costs disappear, as the investor of the company is also the owner of the company. Finally, the financing structure of the company, make them safer investment from the stand point of the Debt to Equity, volatility is reduced. Also, the company is not pushed to pay interests, and entrepreneurs are not restrained to invest on safer projects, they have the flexibility to undertake risky investments when is needed.

There are also, some ideas why bootstrapping could not be a suitable option in all the cases and it the pends on company specific factors. It has been mentioned that startups bootstrapping their operations, would need to be more efficient, resulting in being more creative for using the scarce resources. This is a time-consuming activity and there is an opportunity cost. This resource could be

used by owners in more profitable ways, such as finding better/more suppliers, better/more customers, new internal systems, planning strategies to enter other markets. Startups using this strategy also lose the benefits that other investors may offer, such as coaching from venture capitals (we will see this later on), or the signaling effect from having prominent investors on board. Having no investors could also be a negative signal, by conveying a wrong message that the business model is not good enough to attract investors.

There is also an opportunity cost on cash flows from operations reinvested to grow operations, then there is no cash available to be invested on more profitable ways. It is also difficult for bootstrappers to access better professionals and managers, prominent venture capitals, lenders, underwriters attract better professionals and managers, however, startups engaging in bootstrapping does not have this partners/investor, then they struggle to get high quality resources.

Typical *Pre-Seed* investment could range from a couple of dozens of thousands of dollars \$100,000 – \$200,000. In the *Seed Stage* startups try to validate their business model by taking their products and services to the first clients, however in this stage there is still development of ideas, products, services, technologies, methodologies, etc. There is strong usage of funds towards patenting and protecting innovations. In this stage, startups face much more costs than before, such as salaries, patents, property and machinery/equipment renting, in this stage entrepreneurs may tap on other financing opportunities more suitable for the current situation. Accelerators, Crowdfunding and angel investors becomes an option. At this point the valuation of the startup could be a couple of millions of dollars.

Beyond the consequences of moral hazard and adverse selection problem on debt financing for companies in general, (e.g. Credit rationing), literature highlight debt financing as crucial factor for startups, empirical analysis shows that the core risk management is to have a dynamic financing

ratio between equity and debt as well as varied equity cost of capital, lending rate and investment horizon based on the age, technology, and financial soundness (*Suk & Hyo Seob, 2022*). Still we have a research gap on many segments, *Cassar, 2004* reported a limited understanding on the fintech financing, including debt financing. In the last years there has been a larger coverage of studies on this topic, but still more specific studies are needed, such as on dynamics of leverage and implications for debt policies and debt specialization (*Colla et al., 2013*), debt maturity (*Scherr and Hulburt, 2001*) and debt granularity (*Choi et al., 2014*).

Even though information asymmetries theory presents very sound reasons why debt financing could be very restrained for startups, on practice there could be seen how debt financing is still an important financing source for startups. On the US, debt accounts for something near the 55% of the capital of small businesses, showed study from *Robb & Robinson* in 2014. The author of the present report has collected some interesting researches showing why and how debt financing is very important for startups and the reasoning behind their results.

In Europe, *Vanacker & Manigart, 2010* reported that 45% of financial events studied were debt increases, where financial events considered were increase of retained earnings, increase of financial debt and increase of external equity in more than 5%. Increase retained earnings means they finance operations with own money. This results means that still debt is a very important source of financing. In spite of that, startups sometimes claim: they do not get funds from banks the money they need, or they are incapable of getting any funds from bank independently of the price they will pay for that. This means that startups would be willing to pay more interests but in spite of that they are not getting the whole amount of money they need (credit rationing).

Literature on debt financing could be to some extent contradictory as some authors mention the constraints of new small firms on getting debt and at the same time other scholars study how in fact debt financing is crucial at least for certain startups of some markets. Such as, *Cassar, 2004*, who

uses a tobit regression model to examine how the characteristics of fintech start-ups of the UK from 2010 to 2015 affect the types of financing used in the first three years after incorporation. From the empirical analysis, this study demonstrate that unregulated FinTech start-ups are more likely to be financed with long-term debt. The structure of the asset, the owner characteristics and specific Fintech activity influence the funding source. Moreover, "FinTech start-ups backed by equity investors receive less long-term debt funding than their peers". They conclude saying that managers of fintech has especial knowledge and understanding on debt financing that provide them with the ability having valuable insights into ways of meaning their firms.

It is also worth to mention that debt could be both backed by firms assets or owners assets, in the latter the debt is obtained in the name of the owner and literature also reports a relation of this with the level of revenues and survival time. Rebel A & Tatyana S, 2017, found that it is more likely to for a startup to survive three years after business inception year, if the firm is using debt since this year, moreover, they could achieve higher revenues over the same period of time. The traditional explanation for this would be the startup being less constrained due to having more cash available when having debt, it allow these companies to grow faster than peers who cannot access this financing (see, e.g., King and Levine, 1993a, 1993b; Rajan and Zingales, 1998). They also found that not only the debt amount matters but also the type of debt because this results were not obtained when the debt is held in the name of the business owner. First of all, with business loan applications better quality firms self-select to signal their quality to prospective lenders and initiate credit record and reputation buildings Rebel A & Tatyana S, 2017, secondly, explains that in the case of debt in the name of owner, creditors do not necessarily evaluate, select, and monitor the business venture, on the other hand, this is what exactly happens when the loans are backed by the business itself. The conclude highlighting the importance of this results for policymakers who could extend more financial resources through lending programs that could support good prospects that will potentially lead to the creation of more jobs and faster economic growth.

We will see these and other scholars actually supporting the idea that debt financing is still very important for startups and is something that actually can be seen in practice, *Cumming, 2005, Robb and Robinson, 2014* mention startups rely on debt financing to a greater extent than often recognized. *Bo Zhu et al, 2023*, mention some reason why in the market we see a larger use of debt financing than what the classical theory on information asymmetry would predict. Accepting new shareholders such as in the case of venture capital, would mean to accepting being diluted, startups get more debt in order to avoid this situation, so they can retain ownership and control. Also, planning and budgeting is easier with regular interest payments as it is much more predictable than forecasting returns on equity investments. This interest payments can be tax deductible, incrementing the cash flow for the company. Moreover, debt financing offers more flexibility as it can be structured in various ways such as different debt terms or lines of credits.

The understanding of the author of this report is that even though in practice startups accessing to debt financing are seen extensively, there is a credit rationing that are specific to each industry. For example, *Jaroslawa, et al, 2021*, exposes some determinants for the logistics market, *Bo Zhu et al, 2023*, does the same for startups in the blue economy (fisheries, and aquaculture, later on extended to shipping, tourism and renewable energy, *Graziano et al., 2022*). In the later, for instance, it is being mentioned, that companies in this segment face some constraints, such as high R&D costs, lack of access to funding and lack of awareness and understanding of the ocean-related issues among investors and customers. Later on, mentions the climate and ocean-related disruptions to have a negative link with debt financing. This shows a motivation not to get debt financing, but is interesting to see that it is industry specific. The fact that is industry specific, implies that further research is needed on each industry to determine the factors that drive companies to get debt financing and industry - specific reasoning on why are not getting it. The role of policy makers is crucial, as there should be efforts oriented to specific industries. *Bo Zhu et al, 2023*, proposes that policymakers should consider providing financial support to blue-startups through several

mechanisms including debts, when triggering facts occur, such as on periods of higher climatic disruptions. Research gap, should be filled with specific studies on determinants for specific industries.

For the reasons exposed above, we could place debt financing for startups as an option available in the very beginning if entrepreneurs provide collaterals, otherwise it becomes available later on, when company is able to provide some kind of assurance to debt and pay it with cash flows. However, the amount of debt available could be couple of dozens of thousands of dollars, as debt is very expensive, it could put the venture into risk very rapidly, however the financial resources needed to escalate operations are much larger than what a lender could be able to offer. Venture capitals stand in sight of startups as entities able to help them solution many of the financial needs. But non only financially, also from the managerial, relational, specialization and professionalization point of view, and lastly from the opportunity to escalate operations enormously. However, this would come at a very high cost as venture capital means a highly dilutive instrument and contractual provisions could be very restrictive for the entrepreneurs stand point.

5. VENTURE CAPITAL INVESTMENT PHASES AND TYPOLOGIES

Paul A. Gompers, in its book “The Rise and Fall of Venture Capital” from 1994, described the history of the history of VCs in United States. The next few pages will describe a brief history of VCs, motivated and inspired by his work. Venture Capitals are entities composed by individual professional investors, and exist in the market to take risks. Could be considered as funds that invest on risky projects, the VC is also financed by other funds itself. A common miss conception is to believe that only high-tech small companies are the target of venture capitals, however it could be sent in the market how there are both high tech companies that received venture capital support such as Geotech, Microsoft or Lotus, and low-tech companies such as Staples and Federal Express who also were backed by VC's. It has been found how Venture Capitals seems to be helpful for companies going public. Paul. A Gompers, 1994, showed 962 backed by Venture Capital went public. See Table 1.

Table 1. Impact of Venture Capital-backed Companies, 1993

Company	Sales (\$mil)	Employees (000s)	Equity Market Value (\$mil)
Apple Computer	7,977	14,910	3,576
Au Bon Pain	123	1,250	223
Biogen	149	415	1,110
Chiron	217	2,179	2,171
Cirrus	354	1,353	885
CML Group	645	5,608	697
Compaq Computer	7,191	13,010	9,978
Conner Peripherals	2,151	9,097	774
Cray Computer	352	383	50
Data General	1,077	6,500	271
Digital Equipment	14,371	94,600	3,223
Evans & Sutherland	142	1,100	132
Federal Express	7,808	95,000	4,206
Genentech	650	2,510	3,189
Intel	8,782	29,500	27,082
Lotus Development	981	4,738	2,705
Micropolis	382	2,298	99
Microsoft	3,573	14,430	15,117
Oribital Sciences	190	1,123	315
Quantum	1,167	2,455	695
Raychem	1,385	10,772	1,581
Seagate	3,043	43,000	1,648
Staples	883	7,539	1,063
Starbucks	163	4,585	866
Stratus Computer	514	2,610	723
Sun Microsystems	4,308	13,300	2,009
Tandem Computer	2,030	9,963	1,368
Teledyne	2,492	21,000	997
Teradyne	555	4,500	891
Wellfleet	180	738	784
Totals	3,227	41,148	88,428

Table 1. On the Impact of Venture Capital on Companies going Public. Exhibit taken from “The Rise and Fall of Venture Capital” by Paul A. Gompers, 1994. The 1994 Newcomen Prize Essay

Table 1 not only shows the number of companies going public backed by VC's, but also shows the high number of people employed (more than \$410,000), the considerable total Equity market value, and annual sales, showing how important they were for the economy, all this powered by Venture Capitals. But why venture capitals are so important for Startup financing and for the whole economy?

We can see how in the history, the conception of Venture Capital started more than 150 years ago, *Lample, 1989*, highlighted how Graham Bell, 1874 was needing funds to continue his studies on the telephone, later on he received funds from two important Boston attorneys who put the capital and later on build the Bell Telephone Co.

The market for risk capital remained largely unorganized and fragmented until the first three decades of the 20th century, members of the Rockefeller, Bessemer and Whitney families hired professional managers to seek out investment in promising young companies (*Paul A. Gompers, 1994*). Companies funded by the ARD (American Research and Development), the first venture capital in the US, were considered as family members (Secton and Kasarda, 1991). George F. Doriot, considered the ARD's mission was not only to provide funds for companies' growth and development, but also to provide value in other ways to this companies, this is why the ARD had a team of professionals in different areas who provided "industry expertise" and "management expertise" (*Paul A. Gompers, 1994*), we will see later on that this is one of the key benefits of VC backing.

First VC investment, could be considered done on 1947, but the ARD to a company working towards the research on X-ray technology and its usage on the treatment of cancer. They know this was a very risky investment, it was even though that this company, named High Voltage Engineering Company, probably would not have made any money, said Compton's (*Lample, 1989*).

ARD invested \$200,000, High Voltage Engineering Company, then invested \$70,000 in 1957 on the "Digital Equipment Company", it is also important to mention that the philosophy of operating the ARD by Doriot, help the fund to really finance very good and risky projects, even though they were not even near to be profitable companies at the time of investment. It has been said that Doriot's focus was not on the profits, but on the concern of company suffering in the long run due to shortage of investments on research and development. This could be considered something near altruism philosophy, however, this lead to a the DEC, increasing value up \$355 million, almost half of the money earned by the ARD in 26 of existence, everyone wanted to replicate this investment (*Paul A. Gompers, 1994*).

The success of the ARD, motivated to imitate what the ARD did, in the 70's started ventures to search and invest on potentially highly profitable companies. This time with new features, funded companies had access to consultancy by experts in finance, law, accounting, and experts in the industry itself. They also had the idea of appointing industry experts as company presidents, or CEO's, in fact, a former Intel manager, to be Apple's president (Kotkin, 1984). We also see how Valentine, Marketing director at National Semiconductor, invested in Apple, but had not enough money to complete the funds needed, and brought to the company additional \$600,000 by syndication the investment with other venture capitalists. This are common strategies that we see on modern VC's. The investment was worth \$271 million in 1980, when apple went public (*Paul A. Gompers, 1994*)

Paul A. Gompers, 1994, also emphasized how there was a boom of VCs in the 80's and how the number of IPO's seemed to increase. See Figure 1 shows how funds inflow into venture capitals, which highlights the interest of many more investors on this investment segment, powered through the investment vehicle. Figure 2. This will be supported by scholars later on supporting this idea with empirical studies on the field.

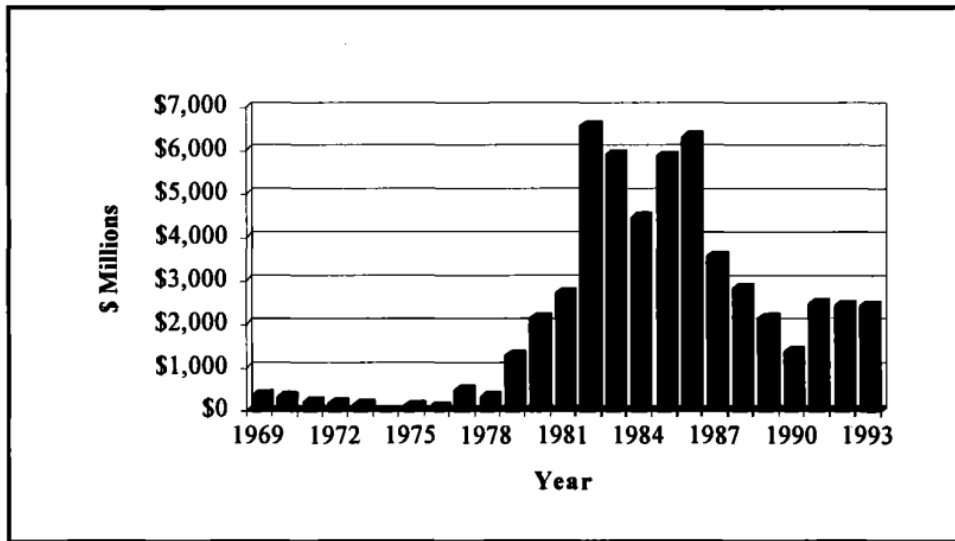


Figure 1 Funds raised by VC's from 1969 to 1993

Exhibit taken from "The Rise and Fall of Venture Capital" by Paul A. Gompers, 1994. The 1994 Newcomen Prize Essay. Reported date from DollarData from Venture Economics.

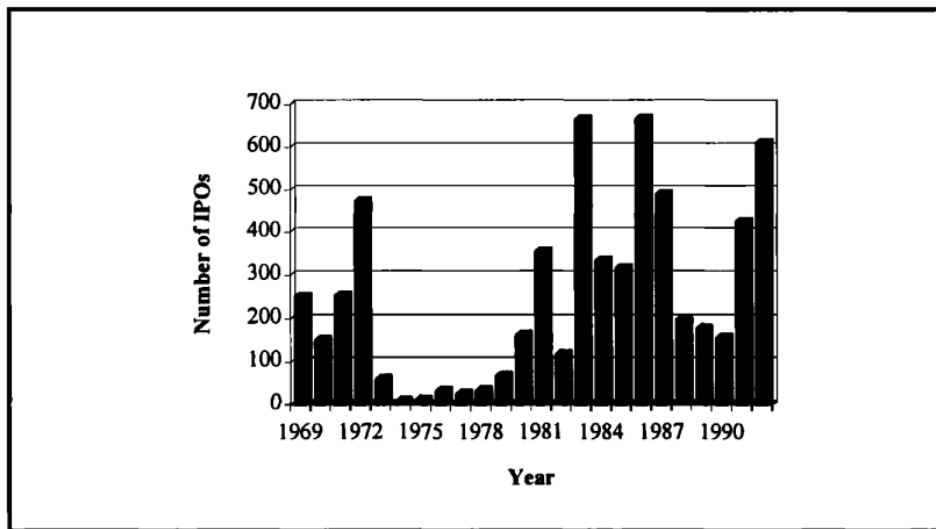


Figure 2 Number of IPO's from 1969 to 1993

Exhibit taken from "The Rise and Fall of Venture Capital" by Paul A. Gompers, 1994. The 1994 Newcomen Prize Essay. Reported date from DollarData from Venture Economics.

Venture capitals pool money from investors, these are called limited partners. Limited partners could be Government Funds, mutual funds, pension funds, insurance funds, sovereign wealth funds, family offices and private individuals, corporate investors, banks and academic institutions. General Partners (managers), will payback limited partners the invested capital plus a percentage of

the capital gains on shares sold to the market. General partners earn annual management fees, this fee cover costs like offices, salaries, operation costs, startup screening costs, among other.

However, general partners salary es by far the smallest component of their remuneration as what is most important for them is the so called carried interest. It could by typically 20%, this means that when the venture capital exits the investment, General Partners keep the 20% of the capital gains. If investment is not successful, then general partners do not make any money, therefore, the carried interest could be used as a alignment of interest device, that assures limited partners that funds committed will be used in the best possible way, otherwise is not profitable for general partners.

There are also catch-up provisions and priority returns that help better protect the interests of both general partners and limited partners. Priority returns is an insurance to limited partners, it is also a signal of quality from the general partners as they are paying in advance the capital gains that limited partners will receive in the future, this could be a bad deal for the general partners as the money remaining after paying the priority returns could be small, this scheme will be suitable if a catch-up provision exists, allowing general partners to earn a percentage of the capital gain (not a percentage of what remains after paying priority returns, this is the difference), and what remains, is then distributed to limited partners.

It has been said Venture Capitals, may in fact, help startups create value and escalate operations, overcoming the difficulties on startups getting financing, due to the information asymmetries (Chan, 1983; Amit et, 1998). Tyzoon T, & Albert V. Bruno, 1884, described a model involving a series of steps that venture capitals may follow when considering an investment, first a *deal origination* phase, where managers receive investment prospects. Second, a *deal screening* phase where the managers determine if the prospect meet the guidelines fixed by internal policies. Third, a *deal evaluation* phase is performed, here the managers of the fund will determine whether the investment if profitable or not, a deeper a analysis on the industry and business model of the prospect is

performed to determine a perception of the risk and expected return on the basis of a weighting of several characteristics (Tyzoon T, & Albert V. Bruno, 1984). Fourth, comes the *Deal Structuring*, where a negotiation is performed between the entrepreneurs and VC managers, the price of the shares, contractual covenants, and other contractual provisions that VC might need to make the deal profitable. Fifth, *Post Investment* activities, this would involve all the activities the VC needs to do to monitor and assist the startup. See Figure 3.

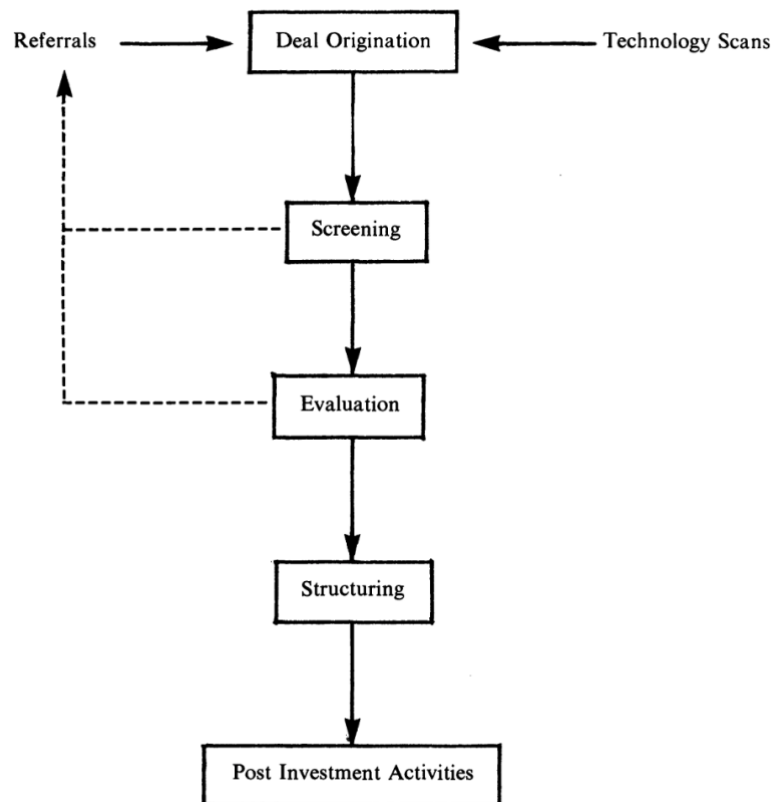


Figure 3. Phases of the investment decision process for VC. Taken from *A Model of Venture Capitalist Investment Activity*, Tyzoon T. Tyebjee and Albert V, Bruno. *Management Science* Vol. 30, No 9, September 1984.

Tyzoon and Albert, also described a referral activity performed during the screening and evaluation phase, where among venture capitals there is the need of co-investments that make necessary bring to the board other venture capitals and investors to make the investment suitable.

Venture Capital Pre-Investment Phase

During the pre-investment phase, the fund is mostly focused on getting referrals, investment prospects and performing the deal origination and deal screening. The main idea is to maximize the likelihood of a successful exit (*Sahlman, 1990*), for Shane, 2003, this means to venture capital would need to consider valuable opportunities, screening costs are highly considerable and crucial, as being capable of judging rapidly how valuable an investment is and how risky it is highly depends on the expertise of managers. For manager this is a time-consuming activity, and in order to make it worthy, salaries must be high, due to the opportunity cost. *Shane and Cable, 2002* mentions the preferred way the VC's get investment prospect is through referrals, in fact this is aligned with the idea VCs would engage in activities that could help them to minimize the screening costs. If VCs get referral, there are screening cost already bore by partner investors. On the Deal Screening, managers will determine if the prospect actually meet the guidelines of the VCs, that dictate what investment should be considered and what should not (*Zacharakisn and Meyer, 2000*). Some of the parameters we might find, defining what could be considered, would be investment location, the industry, the geographical location, among others. It is important to note, that some VCs are constrained to invest on specific areas or industries when limited partners are government agencies, literature reports that when engaging on this type of investment is on the interest of government agencies (to push economy to grow on certain areas or industries), it is better that government agencies syndicate with independent venture capitals. This may create the constrain of investing in the areas or industries in which the government agency is interested in, as government pursue social returns rather than profits. The VC evaluates the investment after having a pitch with entrepreneurs and getting to know the team, this is important as in the pitch, there are unseen factors that raise up, as the perceived level if passion of entrepreneurs, then VCs perform a due diligence and verify the truthfulness of the information provided by the entrepreneurs.

Finally, once the VCs determine the investment if worthy, a negotiation is performed with the entrepreneurs to define the price and percentage of stake that the VC would get, for this, the parties

must agree on the valuation of the assets of the startup, also the covenants, rights and provisions for the parties are discussed. Normally, VCs will tend to postpone valuation for decreasing the level of risk, of course this would come with the risk of being diluted on later funding rounds, however it is seen in the market that funds needed by the startups will be staged, as the VC's does not have enough information to properly judge the value of the startup, the commit on provide further financial resources when more information is available. This will be based upon defining milestones with the entrepreneurs that will trigger more financial resources injected to the startups (De Clercq, 2006). Typical milestones depend on the industry, but we could find for instance the conclusion of a minimum viable product, the validation of key performance measures of minimum viable product, getting patents on new technologies, getting the first clients or reaching a certain level or revenues. If we remember startups are on the looks for a breakeven point, where it stops being cash a burning organization, or unprofitable to become profitable.

Venture Capital Post-Investment Phase

It has been highlighted how VC's help overcoming information asymmetries, we could see the from the monitoring stand point. One of the key aspects of venture capitals is the monitoring they perform on their investments, *Sapienza and Gupta, 1994*, mentions monitoring is necessary because VCs need to help redirect startups efforts towards the reduction of uncertainty that surrounds the startup, and also to reduce agency costs. *Gifford, 1997*, highlights the fund will get profits linked to the performance of the startups in which the VC invested; therefore they need to provide the monitoring (beyond monitoring, there are value adding services that VCs provide in order to help the startup increasing its performance, we will see this later on). VCs are also on a rush to a lower or larger extent to get further financial resources from their investors to invest in more companies, but for this reputation is a key variable, new VCs, will rush on building this reputation, *Gompers (1996)*, *Nahata (2008)*. Monitoring will help VCs understand if the managers are acting in such a

way that the value of the company is increases in the mid-term, however one of the most important differences on the VC's interests and entrepreneurs' interests is the short term and long-term orientation. While VC may decide to increase the value in the short-run or mid-run, entrepreneurs may want to increase the value of the company in the long run. VCs may try to use monitoring to decrease the probability entrepreneurs are too much long term oriented.

Venture capital also provide value-adding services. This section will be based on the ideas posted by Leslie Pratch, on his textbook titled "*Value-Added Investing: A Framework for Early-Stage Venture Capital Firms*", published in The Journal of Private Equity in 2005. Typically, entrepreneurs are oriented to the technicalities of the business, there could be experts on a certain technology, or very specific part of the business, but they lack of managerial skills and l. Great strategy has little value if the company lacks the core competencies and leadership to execute (Pratch, 2005). A strong management team in place during the early stage of a venture s growth can make the difference between a 2X and a 5X multiple in the pricing of a Series B round (Pratch, 2005). One fo the key value adding services from the VC is to appoint reputable managers and experts on certain areas, for example appointing a reputable sales professional or marketing professional to help building a strong strategy, a marketing professional would strengthen the business model on understanding the competitors and channels to convey products and advertising.

Pratch, 2005 also mentions the role of VC appointing reputable C-level managers, to which the startup by themself does not have access, for instance a CTO brought to the company to help articulate the technology to address market needs or to push technology into the market. Helping the company find a capable CEO is one of the most important value-adding functions a venture capitalist can provide a portfolio companies (Pratch, 2005). This author mentions that hiring an experienced, well-respected CEO "substantially improve the pricing on the series B round. This is supported by the literature on the signaling theory, specifically on how it being a costly investment

may help investors differentiate a good quality company from a bad quality company, this increasing the valuation, as only good quality companies could be able to afford a reputable CEO, provided that a reputable CEO's opportunity costs are very high. In case of the company having a CEO with poor experience, the VC will provide him with coaching.

VCs also may bring a board of advisors, and enhance the recruiting process by attracting experienced engineers/managers and talents that the startup could not be able to attract without the help of the VC. The hiring process is a crucial role to help the team getting stronger, this process is driven by the need of finding professionals that not only have the technical and managerial knowledge but also have the resiliency to deploy these skills in conditions of high stress (Pratch, 2005). At the same time, literature shows the importance of matching the organizational culture with internal leader's personalities (Pratch and Jacobowitz, 1998; Pratch and Levinson, 2001)

VCs may help startups to become stronger and reduce the risk by bringing customers. Typically startups develop products that are so new (based on new technologies, untested in the market) that customers could be scared to try them. The reputation of the VC plays a key role, functioning as a provider of assurance and increasing customer's trust. But also VC brings key partners, such as consultancy, providers among others, that also help decreasing the risk perception of the customers, ultimately also bringing new customers. A highly reputable corporate partner may introduce the company to the heads of a potential customer, that situation would be not likely to happen without a key partner, because there is no trust or credibility attained to the small salesforce of the startup. From the customers point of view, the perceived risk of a startup is lower if there an already existing relationship with a key partner already operating in the market and whose solely presence in a deal would make customer confident on startup delivering the product or service as promised. The cost that the partner would bear in the case the startup does not deliver would be very high, therefore it could be considered as an efficient signal.

There is also ingoing feedback from the market when VC uses key partners to get new customers, as they provide an opinion on the startup products, helping validating product technology, channels, prices, among others, thus, also helping to draw new strategies on how to reinforce the product, technology and its key performances (Pratch, 2005). This could be considered as a virtuous circle, as this helps the startups actually addressing the very specific needs of new customers, tailoring products and creating a market niche.

From the point of view of a syndicated investment, potential benefits are larger, startups would have access to a wider set of professionals, consultants, customers and investors. If there are VC from foreign countries, they may help the startup on their internationalization strategy. The risk of information leakage is lower, and the VC's may also share risks and costs.

Venture Capital Exit Phase

VCs exit phase consist on transferring the ownership of the VC's stake of the company and trade them for a superior price, typically VC would look for a 10x. A successful exit could be an IPO or a trade sale, these two could be considered good quality signals. There could be also buy-backs and write off, both of them bad signals for the startup.

Black & Gibson, 1998, highlights some of the reasons why exits are needed for the venture capital beyond making profits. First limited partners need to understand and evaluate VC abilities, in order to understand to which managers, extend the resources. Second, limited partners need to understand the risk profile of the venture capitals. Third, limited partners need to withdraw financial resources from the investment in order to allocate future resources in a better way. This is also supported by

(Gompers, 1996), there is the need to benchmark the skills of the managers to compare risks and returns of different investment managers against each other.

Some authors, as *Black & Gibson, 1998*, considered IPOs are the best way entrepreneurs and VC can benefit for higher valuations, at least for companies going public before 1998. IPOs are the only way to create a floating stock to be traded in stock exchange, the company sells part of the equity capital to the public. There are traded *Primary shares*, that allow to raise new shares, and new financial resources to the company and *Secondary shares*, already existing shares. The best way for managers and entrepreneurs to engage on an IPO would be when the company is being successful, indeed, the frequency in which a venture has a portfolio company going public is a measure of venture capitalists' performance (Gompers, 1996). At this point there is a trade of between liquidity and needs to monitor the venture (Coffee, 1991), as the previous monitoring by the venture capital is now performed by the stock market analysts.

Now, in the last years there have been an effort by scholars to understand the effect of IPOs on portfolio firms beyond what has been exposed by scholars prior to the 2000's.

Recent literature shows how IPOs have an effect on long term performance of the companies, when they have been previously backed by VCs. Que & Zhang, 2019 studied the relationship among Pre-IPO growth, venture capital, and the long run performance after IPOs. And have found a positive correlation between these two variables, for VC backed firms. Also, literature reports the positive effect of venture capital financing on Total Factor Productivity (TFP), and also increasing the probability of a successful exit, but there is also a relation between the IPOs and level of TFP found on the literature, (Chemmanur et al, 2011), shows how the probability of an exit through an IPO increases the average level of TFP prior to each year and TFP growth (but not in the case of acquisitions), and literature also suggest this increase is larger when the exit is being done through

IPO than through trade sales. (Bayar and Chemmanur, 2010). Firm size is also related with the probability of a successful exit, either through an IPO or M&A, however, young firms are more likely to exit through an IPO.

Trade sales, are reported by literature as the most common route (Relander et al., 1994). The bigger drawback of this option would be entrepreneurs potentially losing all ownership and control; however, this highly depend on preferences and entrepreneur's objectives. The opportunity to benefit from a larger valuation would be also to be considered. Most of M&A, due to the difficulty on making the two firms compatible to the system and resources of the acquirer.

Another two options not considered successful exit are possible, buy-backs, would be the repurchase of the shares by the entrepreneurs, this could be seen as a very bad signal, and write-offs, which simply means considering the investment dead that writing them off the venture capital assets.

Heterogeneity of Venture Capitals

Independent venture capital, often denoted as IVC, represents a specialized realm within the financial landscape where investment experts focus on fostering the growth of newly created entrepreneurial firms exhibiting significant potential for expansion, often with a potentially profitable new use to breakthrough high-tech innovations and promising talented team. These professionals act as funds for institutional investors, steering entrepreneurs toward lucrative exits and ensuring positive returns (Hellman and Puri, 2000). IVCs wield their influence by providing strategic counsel, channeling their business acumen toward commercial innovation rather than technical prowess (Katila and Chen, 2008). IVCs are characterized to establish a formalized product development process, tailored to their disposition highlight their commitment to professionalizing

management practices (Hochberg, Ljungqvist, and Lu, 2007). Operating under a stringent timeline, typically a decade, IVCs are driven by a sense of urgency, emphasizing rhythm and milestone-driven schedules to deliver tangible results. Typically, IVCs enter as investors to entrepreneurial firms prior to other types of CVC, due to the lower risk of knowledge misappropriation risk. IVC's differ from CVCs and GVCs on their governance and objectives, while CVCs objectives could be more strategic and GVCs pursue social returns, IVCs are on the market to get pure financial results. This creates create different implications to rewards scheme, and governance schemes.

For corporate venture capitals (CVC), the quest for strategic advantages is they main investment philosophy. Targets are influenced by geographical and industry-specific conditions, these to aspects are key for CVCs, as they will need to reduce agency costs by monitoring the entrepreneurs and pursue strategic objectives, selecting the right industry factors favorable for the parent company (Bertoni et al., 2015a). CVCs also use investment in new industries and countries to start analyzing new market opportunities for the parent company. (Gupta and Sapienza, 1992; Mayer et al., 2005).

The success of these strategic decisions is contingent upon achieving equilibrium, reached by both strategic and technological fit. Strategic fit, characterized by aligned objectives that mitigate the risk of misappropriation, establishes a foundational synergy crucial for a mutually beneficial relationship (Katila et al., 2008). Complementing this strategic alignment is technological fit, where the integration of core technologies within the dyad justifies the inflow of CVC funding. This strategic is developed within the complex organizational hierarchy of CVCs, where there is a very well-defined process of decision making (Hallen et al., 2014), which also depends on the governance structure, however most of the times the decision making is simpler than in the IVC case. CVC, are composed by team's experts on both investment and technology for the area of domain and industry of the parent company (Wadhwa and Kotha, 2006)

One key point when talking about CVC, would be talking about misappropriation risk, suffered by the entrepreneurs, on contexts of low regulation to protect innovation this risk increases, essentially, entrepreneur's most important partner is also the one in the better position of taking all entrepreneurs knowledge. The level of the risk varies according to the type of CVC governance, or how independent is the CVC to the parent company, also the type of innovation or expansion that the parent company is planning. For instance, unrelated diversification through a CVC characterized of being highly independent from the parent company would mean a lower risk for the entrepreneurs

Government Venture Capitals (GVC), are funds that manage governments resources to be destined towards fostering innovations on certain geographical areas and industries for the countries' interests, often are instruments of public policy. The main goal is a GVC is the social return, developing products and services to the use of the community (for instance, finding enhanced construction methodologies for highways, the main benefit for the community is the reduction of traffic times and transportation times). GVCs main targets are firms that develop services and products that are valuable for the community, but, are not as profitable enough to be a target for a private investor, to this extend, GVCs articulate investments towards this type of firms also with the objective to turn it into a profitable investment and attract private investors that could inject more funds.

6. VENTURE CAPITAL REPUTATION AND PORTFOLIO FIRM'S PERFORMANCE

For *Bygrave and Timmons (1992)*, it is much more important whose money startups get than how much startup get and how much they pay for it. From the startup point of view, receiving an offer from a reputable investor is much more attractive than to get an offer from a low reputable investor. In fact, *Hsu (2004)* has shown it is three times more likely that a startup would accept an offer from a high reputable VC than from a low reputable VC, also mentioning is a good deal for the VC, as they can use their reputation to increase their bargaining power and get lower valuations.

VC's past performance as measure of reputation has been discussed on, literature shows that VC's that have already achieved good performances in the past, are able to raise more funds from limited partners. *Hochberg, Ljungqvist, and Vissing-Jorgensen (2008)*, provided empirical evidence suggesting that both additional raised funds and size of the raised funds are more likely to happen (or grow in case of the size of the raised funds) conditionally on the return increase of the previous fund with the same VC. This evidence suggests that when VCs are successful, are able to raise larger follow-on investments.

Meggison and Weiss (1991) define VC reputation using the market share of the amount of funds raised by the VC over the prior five-year rolling window, therefore, they consider that the relevant information to consider today's reputation, which is also something that could be considered to some extent subjective, could be measure according to the past information up to 5 years. It is thought the measure is a good proxy of the reputation, as the VC would not be able to raise more financial resources to invest un further startups if the past performance has been weak or not so good. In the opposite case, limited partners would be willing to invest more funds. *Chemmanur et al (2011)*, also used the market share as a measure of the reputation, but this team using the market share of the market capitalization of the IPO exits for the first trading day of the VC's portfolio firms over the

five-year rolling window. Some authors like Chemmanur et al (2011), used IPO information to measure reputation (see Ivanov, Krishnan, Masulis, and Singh 2010 and Nahata , 2008).

Reputation of financial intermediaries and investors are a very important resources used by companies, specially by those companies lacking of credible and adequate information needed to certify their quality, therefore reputation of the companies' associates is used as certifiers of the companies' own quality (Nahata, 2008). There are bodies of research in auditing, investment banking³ and Venture capital that monitor the implications of the reputation on financial services on public firms on short-term and long-term, however there is a lack of coverage on studying the implications for firms' performance on the short and long term for private companies (Nahata, 2008). This author mentions that Venture Capital reputation, is a special case and opportunity to study the effect of reputation on private companies, as startups need to rely a lot on this resource to certify quality, as there is a high degree of opacity and cannot signal quality easily.

There have been some authors covering VC reputation effect, however, still for public companies, Lerner (1994a), Gompers (1996), and Krishnan, Masulis, and Singh (2006) studied the effect on IPO's on VC backed companies conditional on VC reputation. Megginson and Weiss (1991), Lee

3 There is a good coverage of financial intermediaries reputation for public markets, such as Beatty (1989), Feltham, Hughes, and Simunic (1991), Hogan (1997), Menon and Williams (1991), and Michaely and Shaw (1995) that study the effect of financial auditor reputation on public firms performances. Beatty and Ritter (1986), Carter and Manaster (1990), Carter, Dark, and Singh (1998), Titman and Trueman (1986), McLaughlin, Safieddine, and Vasudevan (2000) does a similar work, bus this time on investment banking reputation.

and Wahal (2004), and Li and Masulis (2006) studied the impact of the certification provided by VC on IPOs. Reputation could be defined on the basis of past success, when VC has a good performance, however authors like *Gompers and Lerner (1999)*, attributed reputation to other measures as the VC's age and size, as found that older and larger VC's may benefit from larger profits.

Some early authors theorized about the possible implications of high or low reputation of VCs, for instance, Lerner (1994a) thought that certain VCs could appear to be particularly proficient when engaging in IPOs through their portfolio firms on market peaks. Other scholars, studied the way VC build reputation, and ex-post information asymmetries are larger between portfolio companies and low reputable VC. In fact, new VCs are on a rush to build this reputation, and so tend to take companies to IPOs before high reputation VC would, Gompers (1996) this could explain the larger profits at IPO by high reputable VCs. Nahata (2008) explains that in order to build reputation on a highly networked context where there is repeated need for funds, VCs must be active long-term players. Having a strong reputation is a valuable resource that may be used to raise more funds from investors, but this is not the only benefit, as building relationships is one of the most important activities of VC managers, a good reputation may grant the VC to access entrepreneurs, lawyers, investment bankers, auditors, and other companies offering valuable services to VCs, which ultimately are superior services offered to the portfolio companies (Sahlman, 1990). This also relates to what Megginson and Weiss (1991) and Krishnan, Masulis, and Singh (2006) mentioned, VCs create reputation mainly by creating visibility, they do this through the IPOs, however, it is not going public by itself, what builds the reputation, but enjoying continuing success (or continuing visibility) through IPOs. Gompers and Lerner (1999a) also showed that highly reputable VC compensation is more sensitive to VC performance, this means that highly reputable VC are able to raise less costly and larger number of financial resources from investors.

Literature has reported several ways of computing the reputation of VCs, that compress the age of the company, the number of investment rounds, the amount of investments, and VC centrality Gompers (1996), Hochberg, Ljungqvist, and Lu (2007), Sorensen (2007) and Lerner (1994a). Other authors later on proposed other measure that seemed to be more correlated with the actual portfolio firms' performances, for instance Nahata (2008), proposed the cumulative IPO market share, which was defined as the cumulative IPO market capitalization of all VC backed portfolio firms as of a certain date over all the IPO market capitalization of all VC backed portfolio firms. However, Krishnan, et al (2011) observed this measure seems to show a strong bias towards younger firms, and that this measure does not adjust for the length of a VCs active life. The measure used by Krishnan, et al (2011) is the past market share of complete venture-backed IPOs, and this market share is based upon a 3-year moving window. Although Krishnan, et al (2011) seems to be a better measure of the VC reputation, it is based upon different samples and the dependent variables are not the same. While Krishnan, et al (2011) uses a wider sample on time to study post-IPO performance, Nahata (2008) focuses on VC exits unclosing IPOs to study the performance at IPO itself, does not consider a wider time frame.

Hochberg, Ljungqvist, and Lu (2007) goes deeper on measuring high reputation VC network of relationships, measured through the centrality in the network, and studies how it relates to portfolio firms' probability of having a successful trade sale or IPO. Sorensen (2007) measured how superior screening and value-addition services offered by highly reputable VC may impact likelihood of having successful IPOs or trade sales. Finally, we see how there could be potentially many areas of improvement just for startups having highly reputable investors on board, this empower startups on many areas, however it will come at a cost, we could think that highly reputable investors may have better deals, so are able to ask for larger shares of portfolio firms at a lower prices, or could be also reasonable to think this reputable investors place stricter covenant's and contractual provisions to portfolio firms, or, from the point of view of limited partners is more costly to make deals with

reputable general partners. Hsu (2004) analyzes the costs that portfolio firms face specially when affiliating to highly reputable VCs.

Nahata, 2008, mentions that these variables are not enough, and that a robust model would require to control for additional VC-specific factors, like syndication, industry competition, investment environment and exit conditions. This author addressed the question on the selection bias, and he tries to answer the question on whether highly reputable VCs actually add incremental value to the portfolio firms, or they simply have access to the most promising investments opportunities.

Nahata, 2008, developed a series of model to control for these additional variables, and used two measures of VC reputation. The first one introduced by *Gompers and Lerner (1999b)*, they mention IPOs are the best of the exit methods, VC requires experience and expertise to help taking a private company public, moreover it creates visibility of the VC in the industry and a sort of "hype" around VC's name, to this regard, this author uses the cumulative market capitalization of IPO's⁴ and normalized it using the aggregate market value of all VC backed companies that engaged on IPOs in the same calendar year. Nahata, 2008, also used the VC's share of investment in the industry, and exposed two ideas why this is a good measure of VCs reputation. First, a higher share denotes trust from limited partners to a specific VF fund, and assuming limited partners are fully rational, larger limited partners would seek for the most reputable investors. Second, as showed by Hsu (2004) highly reputable VC have less need on "competing on price", which means they can offer even less valuations in comparison to other less reputable VCs and capture more demand of funds from the industry, this solely powered by its high reputation.

⁴ Prior literature on reputation seemed to be more focused on the reputation of financial intermediaries but specially on auditors and legal firms, *Beatty (1989)* and *Beatty and Welch (1996)* use similar measures to rank these firms.

Nahata, 2008, found that reputable VCs are more likely to lead portfolio companies to a successful exit. This author also found that reputable VCs are not only more likely to take portfolio companies to a successful exit, but also are able to do it faster, or accelerate this process more than low reputable VCs. Also mentions that when the sample is restricted only to successful exits, a monotonic pattern emerges: *“Thus, a monotonic pattern emerges in which top brand VCs are more likely to be associated with IPOs, followed by medium brand VCs with acquisitions, and the least reputable VCs with unsuccessful exits. Since IPOs, on average, fetch the highest returns to the venture investors followed by acquisitions, this pattern is anticipated as the best VCs are expected to both select and nurture their portfolio companies toward the most successful exit”*. Another dimension studied by this author, is the asset productivity. It is the ratio between the sales and the book value of assets. It considers the ability or efficiency of firms on converting or leveraging on its assets to produce revenues. He found that this efficiency dynamic is better at startups backed by reputable VCs measured at time of IPO. Finally, he, test its initial assumptions on the capacity of the measures of reputation to predict portfolio companies' performances finding that, while share of aggregate investment of VCs on venture capital industry is not a good predictor to portfolio firms' performance, the capitalization share of VC backed investments efficiently captures the experience and expertise on screening and monitoring.

There are several authors as well, highlighting the drawbacks of VC reputation, especially when this reputation is used in a bad way, such as creating high dependence to the VC, putting at risk the innovation in the long run due to reduced efforts on internal developments (Zhu and Li, 2011). There is also reported a negative impact on resources cashflows (Hernandez et al. 2015; Pahnke et al. 2015), information leakage risk (Dushnitsky and Shaver 2010; Pahnke et al. 2015).

In the following sections we will revise some of the literature supporting the idea on how the reputation of venture capitals backing startups is used as a special resource and how it affects

startup's growth, chances on successful exit, innovation, resource allocation, internal activities, among others. We will also revise VICO 5.0 data to get insights on to which extend literature is supported by real market data.

Vc Reputation And Porfolio Firm's Efficiency And Growth

It could be expected that firm's efficiency is increased when they receive VC backing as mentioned before, however there is a distinction on low reputable and high reputable VCs, literature reports that there is evidence supporting the idea that VCs with high reputation have better monitoring capabilities, and the increase in TPF is larger for startups backed by highly reputed VCs (later on it will be seen the literature related to TPF in Europe). Literature attribute larger increases in TPF to VC's monitoring capabilities. Chemmanur et al, (2011) research also shows that highly reputed VC selects investments characterized by startups with lower TPF before time of investing, low reputed VCs select startups with larger TPF (nonetheless, in relation to non-VC backed companies, both VCs with larger and lower reputation will select startups with larger TPF on average, (Chemmanur et al, 2011), this is due to a lower capacity of lower reputed VC to carry on monitoring. And that this is due to the higher reputation VC having experience and expertise on the management of entrepreneurial companies and teams, and also this superior monitoring relies on the ability of highly reputable VCs on providing extra-financial services to startups that ultimately result on greater efficient and performance gains.

This TPF growth is significantly larger for highly reputable VC backed startups, and Chemannur et al, found it to be statistically significant, on average being 10% larger for highly reputable VC backed startups. This also suggests the fact that highly reputed VCs may have better screening capabilities, and find the right companies that are not performing good (from the point of view of TPF) but however, are still good investment opportunities, Chemmanur et al, (2011) suggests that a

larger increase in TPF growth could be at least partly attributed to highly reputable VC having screening technologies. However, this would require further studies. This author's idea on this is that *“low-reputation VCs screen firms with higher levels of initial TFP (averaged across five years prior to receiving financing) compared with high-reputation VCs”*

In relation with the previous idea, this author, demonstrated that, entrepreneurs would accept lower valuations at negotiations only if the VC provides superior monitoring and management that would increase ventures performance. That is that case of venture being backed by high reputation.

Therefore, we could also think that there is a relation on VC reputation, and monitoring and management. In fact, we could say that VC monitoring capabilities signal the reputation of the VC.

We may see the increase in efficiency from two sides, from sales side and costs side. The overall effect of VC backing on efficiency is on the sales side. In fact, it has been found by this author that high reputable VC would invest in companies that already has a good level of sales, larger than the level of sales in which low reputable VC invests, on average the difference being approximately 2% (this could be considered a selection effect), meaning VCs not only capable to build strong companies but also capable to select the right companies. The growth of the sales is larger for highly reputable VC backed firms than for low reputable VC backed firms, this means that both the efficiencies arising for sales growth and costs decrease is larger for highly reputable VC backed firms. This author attributes this to a better product market performance. Chemmanur et al, (2011), found that the increase on firms' sales is larger on highly reputed VC on about 2.5% more in comparison to low reputable VC backed companies.

When we consider specially the highly reputable VC investors, there is a larger impact on costs, in fact, these companies benefit from lower increases in productions costs compared to low reputable VC backed firms. In fact, Chemmanur et al, (2011) suggests this is also due to better monitoring by

this companies, that could lead to more efficient production, the increase in production costs is on average 1.5% in the first four years and around 7.5% in the fifth and after, this numbers are statistically and economically significant. This author also mentions that both highly reputable VC and low reputable VC select companies with lower production costs and establish that improvements on TPF and efficiency reached by highly reputable VC backed firms comes from better production technology.

If we think on growth as the amount in funds reinvested in the company itself that lead to larger assets, we could the say the reinvestment of profits is larger in the case of highly reputably VC backed companies compared to lower reputable VC backed companies, as the former companies may benefit from larger profits, on average it has been found that profits in these companies increase approximately 35% more than on low reputation VC backed companies. And this is also related to what Gompers and Lerner (1999), though about older and larger VC getting larger profits. According to Chemmanur et al, (2011)., post-financing Total Factor Productivity (TFP) growth exhibits a significant increase for firms backed by high-reputation VCs, indicating their superior ability to enhance productivity through effective monitoring. The study reveals that the net impact of monitoring is both statistically and economically substantial, with an average 10% higher TFP growth observed in firms funded by high-reputation VCs compared to those backed by low-reputation VCs

In contrast, the productivity gains in firms supported by high-reputation VCs largely stem from the monitoring activities of these VCs, as highlighted by Chemmanur et al, (2011), which suggests that the extensive experience and expertise of high-reputation VCs in managing entrepreneurial firms enable them to provide additional non-financial services, contributing to improved operational efficiency and overall performance of the invested firms (Chemmanur et al, 2011)

Also, when considering organic growth through investment of profits, Nahata (2008), has found that revenues for startups backed by reputable VCs are more likely to grow thanks to a larger asset productivity, found to be positively correlated and statistically significant at time of IPO, which means that portfolio companies backed by reputable investors has more available resources coming from past profits to be reinvested towards the growth in assets of the company. Nahata (2008) attributes this larger efficiency capability of these portfolio companies to the superior value-added services offered by reputable VCs that leads to create a virtuous cycle that leads to better efficiency in this dimension.

Although Croce et al. (2010) did not explicitly control for venture capital (VC) reputation in their analysis, it is valuable to bring their study into this report, as it provides valuable insights into VC-backed firms' performance. Literature supports the idea that the benefits derived from VC investments may be more significant as the reputation of venture capital firms increases.

The relationship between venture capital and firm performance has been a subject of extensive research, with scholars investigating various dimensions of this dynamic. Wright and Robbie (1998) found that, on average, VC-backed firms experience faster growth, patent more, and are more likely to go public than their non-VC-backed counterparts. Gompers and Lerner (2001) highlighted the ongoing research question regarding the causality of the impact of VC on firm performance. They suggested that the superior performance of VC-backed firms might be attributed to the screening ability of VC investors.

Amit et al. (1998) and Chan (1983) emphasized the crucial role of VCs in the screening process, acting as agents better equipped to address information asymmetry problems, particularly in unlisted firms. Tyebjee and Bruno (1984) further supported the idea of VCs selectively investing in higher-quality firms. However, Gifford (1997) cautioned that VC financing may lead to a higher

percentage of failures compared to alternative investments, introducing the concept of survivorship bias in evaluating the success of VC-backed firms.

The agency costs theory, as proposed by Jensen and Meckling (1976), highlight the importance of close supervision (monitoring) of portfolio firms after the investment event. This monitoring, according to Admati and Pfleiderer (1994) and Lerner (1995), helps VC managers detect potential problems, reduce agency costs, and enhance portfolio firm performance. The agency perspective, however, often neglects the coaching function of VCs, as noted by Colombo and Grilli (2010), which goes beyond pure monitoring. This coaching function allows VCs to contribute to the bundle of resources possessed by portfolio firms, including financial and managerial resources (Sørensen, 2007).

The resource-based view, an essential addition to the agency perspective, recognizes that access to resources and capabilities is a key driver of firm performance (Ireland et al., 2003). Meuleman et al. (2009) highlighted the complementarity of these two perspectives in the VC/private equity literature.

As we transition to Croce et al.'s (2010) work, their exploration of the impact of VC on European entrepreneurial firms in high-tech industries is particularly relevant. Their study introduces the idea that VC can be a valid tool for improving the performance of European entrepreneurial firms, acknowledging the challenging business environment that often hinders VC investors' success in developing and exiting such firms.

Turning the attention to the specific variables involved in the study by Croce et al. (2010), their research focuses on a sample of 696 entrepreneurial firms, with 267 of them receiving VC backing. The main focus of this research was to study the effect of venture capital backing with productivity

growth. Croce et al. (2010) distinguishes between the financial and non-financial benefits of entrepreneurs being backed by VCs, and how these benefits are the fuel that brings up the performance (Croce et al. (2010) measures productivity) of VC- backed firms. Financially, VC provides a significant capital injection (Gompers & Lerner, 1999), offering risk capital that stimulates innovation and business expansion (Sahlman, 1990). It creates liquidity opportunities, fostering a dynamic ecosystem (Cumming & Johan, 2008). On the non-financial side, VC firms engage in screening and selection processes (Gorman & Sahlman, 1989), offering monitoring, guidance, and mentorship to enhance strategic planning (Hellmann & Puri, 2000; Ucbasaran et al., 2009). Furthermore, VC facilitates networking, connecting firms with valuable resources (Bottazzi et al., 2008). Together, these contributions underscore the multifaceted support that venture capital provides, shaping the success of entrepreneurial ventures. The non-financial benefits, that compose non-value-added services are expected to be superior in case of entrepreneurial firms being backed by more reputable VC investors (Nahata, 2008 and Chemannur et al, 2011)

Croce et al. (2010) measures productivity growth using several indicators, focusing on both total factor productivity (TFP) and partial productivity measures. TFP is a comprehensive measure that considers the efficiency in the use of all inputs, providing an overall assessment of a firm's productivity. The partial productivity measures, on the other hand, focus on specific input factors, such as capital and labor, to capture the impact of VC on these individual components. These productivity measures allow researchers to evaluate the impact of VC on different facets of a firm's operations. By examining TFP growth, capital productivity growth, and labor productivity growth, the study provides a nuanced understanding of how VC influences the overall efficiency and performance of entrepreneurial firms. Croce et al. (2010) formulated fourth hypothesis to guide the analysis:

Hypothesis 1: it questions the screening effect, positing that the productivity growth of VC-backed firms is significantly higher than that of non-VC-backed ones before the first VC round.

Hypothesis 2: focuses on the value-adding effect, suggesting that the productivity growth of VC-backed firms is significantly higher than that of non-VC-backed ones in the holding period.

Hypothesis 3: explores the persistence of this effect, stating that the productivity growth of VC-backed firms is not expected to decrease after VCs' exit.

Hypothesis 4: Digs deeper into the time sensitivity of the value-adding effect, proposing that the productivity growth of VC-backed firms is significantly higher than that of non-VC-backed ones in the first two years after the first VC round.

The results of the study indicate that VC-backed firms do not exhibit significantly different productivity growth before the first VC round, dismissing the screening effect reported in the literature, for instance through Chemmanur et al, (2011), reporting evidence of selection effect on US VCs (however, this author in fact controlled for VC reputation, the meaning of the results supports positive selection effect). Croce et al. (2010) attributes this to a key difference of the US VC Market and European VC market, as most of the literature reporting positive screening effect are from the US. The European VC market is much less developed than the US VC market as mentioned by Hege et al., 2003. However, there is a significant increase in productivity growth after the first VC round, supporting the existence of a value-adding effect. In fact, Croce et al. (2010) found that the positive impact of the value adding services over the TFP is larger in the first two years after the first VC round. This study significantly complemented the existing literature on VC and its effect on firms' performance by offering a comprehensive analysis of its impact on European high-tech entrepreneurial firms. Unlike prior research, it employs a large-scale, multi-country approach, and distinguishes between the financial contributions and non-financial contributions of VC. Croce et al. (2010) introduces the concept of an "imprinting effect," demonstrating that VC-backed firms maintain enhanced productivity even after VC exit. Despite its contributions, Croce et al. (2010)

acknowledges certain limitations, opening the space for further studies on the field. The focus on six European countries raises questions about the generalizability of results to other regions. Comparative studies between the U.S. and European VC industries, as well as investigations into the impact of different types of VCs, are suggested as avenues for future research (Tykvova, 2006). The study also invites further exploration into the specific sources of the positive effects of VC endorsement on productivity growth.

It has been seen how venture capital may lead to better performances, and may impact positively on the TPF as shown by Croce et al. (2010), VCs also help the startups to overcome information asymmetries, and provide monitoring, coaching and additional resources that without the venture capital backing, it would be not only difficult but also near impossible for the startup to get them by themselves. Now, these benefits are expected to be more intensive if venture capital reputation is high (Reuer et al., 2012; Ragozzino & Blevins, 2016; Wu & Reuer, 2021). Literature supports the idea that chances to exit performances, ventures growth and ventures level of innovation could be larger if the VC backing the startup, is a reputable investor. Nahata, (2008) shows it is faster for startup to engage on a successful IPO when VC is highly reputable, also they may benefit from higher valuations at TPO (Gulati & Higgins, 2003; Pollock et al., 2010). Literature also reports a better price performance (lower underpricing at IPO) at IPO. After IPO, is also expected for the startup to have better long-run performance if VC backing the company is a reputable investor (Krishnan, Ivanov, Masulis & Singh, 2011; Lee, Pollock & Jin, 2011). This will be covered in the next section dedicated to VC reputation and IPO.

Vc Reputation And Probability Ot Succesful Exit

The intersection of VC reputation and the performance of VC investments, particularly through Initial Public Offerings and acquisitions, has been a focal point for various researchers. A synthesis

of findings from multiple studies reveals the dynamics of VC reputation and its implications for exit strategies.

The financial landscape for venture capitalists is intricately tied to the choices of exit strategies. Cumming and MacIntosh (2003) and Cochrane (2005) highlights the significance of IPOs and acquisitions as pivotal avenues for venture capitalists to maximize financial benefits from their portfolio companies. These exit strategies become crucial mechanisms for unlocking value and realizing profits as literature reports that IPOs are the best opportunity for VCs to materialize larger returns Cumming and MacIntosh, 2003; Cochrane, 2005).

Chemmanur et al, (2011). delve into the preferences of reputable VCs, investigating whether they lean towards taking companies public over selling them to potential acquirers. Additionally, the study explores the impact of VC reputation on the asset productivity of portfolio companies. This line of inquiry not only enlarge the understanding of the decision-making processes of reputable VCs but also provides light on the potential long-term effects of VC involvement on the efficiency of portfolio firms.

Meggison and Weiss (1991) contribute by highlighting the certification role of venture backing in the financing of IPOs, by specifically addressing how venture capitals reduce information asymmetry problem on the entrepreneurial market. Sorensen (2007) extends this narrative by demonstrating that companies funded by more experienced VCs are more likely to go public. This dual perspective provides a comprehensive understanding of the factors influencing the financing and subsequent public offerings of companies under the guidance of venture capitalists.

Efficiency improvements emerge as a key determinant of exit probabilities. Chemmanur et al, (2011) find an association between VC financing and the probability of a successful exit, whether

through an IPO or an acquisition. The study suggests that firms with higher levels of efficiency improvements are more likely to exit through an IPO, emphasizing the importance of operational excellence in shaping exit outcomes. This effect is linked to both Total Factor Productivity (TFP) growth and prior average TFP, highlighting the enduring influence of VC reputation on the success of exit strategies.

Literature also reports the relation between VC's reputation and other exits strategies, such as mergers and acquisitions. Salma B.A and Maher K., (2020) contribute a distinctive perspective studying how reputation is build and whether reputation increase to VCs engaging in IPOs is larger or lower to reputation increases due to VCs engaging in mergers and acquisitions. Their findings suggest that the reputation increase from IPOs is comparable to that from mergers and acquisitions. This study also reveals that low-reputation VC firms may prioritize reputation building over larger profits from exits, showcasing the nuanced considerations at play.

Reputation plays a substantial role in the venture capital landscape. Reputable venture capital firms often attract high-quality startups seeking not just financial backing but also strategic guidance, networks, and financial services, as seen before on this report, superior value-added services from VCs powered by its reputation (track record of successful investments) nurture innovative companies, which in turn find themselves on a better position to engage on an IPO or a trade sale. The involvement of a renowned venture capital firm signals the quality of the startup, creating confidence in other potential investors. Early studies of this certification effect were carried out by authors like James (1990), Blackwell, Marr, and Spivey (1990), and Barry, Muscarella, Peavy, and Vetsuypens (1991), who developed models to study the dynamics on how the information asymmetries are reduced due to the presence of "third party specialist". DeAngelo (1981), Beatty and Ritter (1986), Titman and Trueman (1986), then examined how investment bankers and

auditors help to decrease the information asymmetry problem on IPOs, the implications for VCs would be similar to the results found for investment bankers and auditors.

During the 90's, literature did not report an effort to study this matter, preceded by scholars like Kreps and Wilson (1982) and Shapiro (1983) who stated that reputation gives potential customers valuable information used to make purchases and offering competitive advantages, there were a gap in the literature on the reputation as an asset and its implications specially for venture capitals.

As a motivation to study the relationship among VC's reputation and IPO performances, is that IPO-performance is considered as a robust measure of reputation, not only to VC, but also to other several financial intermediaries, as reported before. The best opportunity for venture capitals in general to get largest financial benefits or profit out from the portfolio companies y by engaging on exits to these investments through Initial Public Offerings (Cumming and MacIntosh, 2003; Cochrane, 2005). In fact, IPOs, more than acquisitions. Therefore, measures considering IPOs are considered related to VC's success. Literature reports that IPOs valuations are larger than other exits method's valuation such as trade sales, by 22% (Brau, Francis and Kohers (3003)). For instance, companies considered reputable in the market such as like Kleiner Perkins had 10 IPOs from 1983 to 1987 (Cumming and MacIntosh, 2003). Moreover, repeated IPOs give the opportunity to reputable VCs to get larger bargaining power against investors and negotiate better terms, as well as opening new investment opportunities not available before (Hsu, 2004). There is also virtuous cycle involved on repeated portfolio firms IPO's and post-IPO VC involvement on the access to further investments, as there is a superior post-IPO performance as will be explained later on, that attracts investors and entrepreneurs with promising projects to work with highly reputable investors , which enables reputable VCs to be more selective and facility future success (Krishnan et al, 2011),

Later on, Megginson and Weiss, (1991) used matched pairs methodology, taking a set of VC backed IPOs, size and industry and a set of qualitatively equivalent set of non-VC backed companies to study whether the presence VC creates a certification effect for portfolio companies. This author showed that the presence of venture capitals on IPOs, "*maximizes the fraction of proceeds of the IPO, net of underpricing and direct costs, which accrues to the issuing firm*". Megginson and Weiss (1991) reported that VC backing results on lower underpricing at IPO, and lower underwriter fees. VC backed companies are also able to attract more reputable auditors and underwriters than non-VC backed companies. This author also showed in his results, that institutional investors are much more interested on this type of issuers and that these VC backed companies are more likely to go public through an IPO at a younger age compared with non-VC backed companies.

Although Megginson and Weiss (1991) do not go deep on reputation of the venture capital as a source of something that could be a magnifier of this certification effect, they in fact mention valuable insights on reputation related to the network of relationships, the investment and the value-added services.

They put in the scope of their analysis that there are three criteria to actually check if a certification is actually "believable". First, The VC has the "skin in the game" and they must risk their reputation, which they would loose if they certify as fair price to an asset that in fact is overvalued. In this sense, we may hypothesize that reputation of VCs increases not only the more they get portfolio companies doing IPO's, but if institutional investors are attracted to work with reputable VC, is because this at least most of the times reputable VC's came up with undervalued portfolio companies, this would be a certification of superior screening and monitoring, further studies could be performed to determine if the volume of undervalued assets is corelated with a measure of VC reputation.

Second exposed by Megginson and Weiss, the value of the reputation the VCs are putting into risk must be greater to the “*largest one-time wealth transfer or side payment which could be obtained by certifying falsely*”, this criterion comes from Sahlman (1988, 1990) which also provides valuable insights on how venture capitalists build reputation, and what reputable VC get⁵. Sahlman documents that this condition holds for reputable VCs, as reputable VCs are able to achieve very good returns, which are related to age and historical performance of the VC and size of investments. Reputable VCs are able to establish profitable follow-on rounds, have a better flow of deals with entrepreneurs and last important mechanism through which they certify the high quality of a venture would be not to sell the 100% of VC's stake in portfolio firms, but to keep part of their holdings after the IPO's. Further studies would be need to determine the difference in the mechanism of keeping shares by high reputable and low reputable VCs, as the cost of putting into risk reputation could mark a break point where it is no more profitable for low reputation VCs to keep portfolio companies shares after IPO. Although literature seems to have a gap on this issue, especially to understand how these dynamics change depending on industries and geo-location, there are some authors presenting results worth to mention. Krishnan, et al (2011) who documented a larger involvement of high reputable VCs to portfolio companies even after IPO, and there is a positive long-run performance associated as well with high reputation VC post-IPO involvement. Krishnan, et al (2011) studies the mechanisms through which this occurs (e.g trough VCs that hold stocks beyond the usual 180-day lock-up period, as stated by Field and Hanka, in 200).

⁵ he does not mention “reputable” VCs, however from its work, it could be interpreted he referred to this segment of VCs when he mentions some key aspects and words, such as the “historical performance”, the “size of investments”, the venture's ability to establish “profitable follow-on rounds”, moreover he mentions he studied this characteristics for “successful” VCs.

A third criteria exposed by Megginson and Weiss, that also help to understand from the literature a key characteristic of reputable VCs, the cost of the value-added services. These services must be costly for the portfolio firm to obtain, and it could be profitable to have these costs only for good quality startups. Additionally, these value-added services are only present on highly reputable VCs, which in turn, are costly also for them, this include, financial, legal, technical advisory that is costly and difficult to obtain, this cost makes sense to exist only when a deal involves reputable VC and good quality portfolio firm.

Finally, argues that successful venture capitals are more valuable where potential growth is larger, which is also where larger profits can be extracted, this happens to be where greater information asymmetry and uncertainty occurs, which is more likely to happen at young entrepreneurial firms than to happen on older. We could hypothesize there are more IPOs for younger companies than for older companies, in fact, as Mull (1990), documented that the focus of venture capitals is to concentrate their investments efforts on rapidly growing industries and VC backed are able to grow faster than non-VC backed. It is expected that highly reputable VC has a more aggressive behavior towards this type of investment.

Krishnan, et al (2011) used the market share of “completed venture-backed IPO's⁶”, to study the effect of VC reputation in explaining long-run performance of venture-backed firms going public. It is important that at least initially, this author used the measure which other author found positively correlated with probability of successful exit, Megginson and Weiss (1991) used this measure to study underwriters' reputation, Beatty (1989) and Beatty and Welch (1996) used this measure to

⁶ Krishnan, et al (2011) before reporting results on his analysis, found that big venture capitals, such as Kleiner Perkins and Sequoia Capital, and JP. Morgan Partners, have IPO market shares of more than 1% each year. It is also important to highlight how the reputation works for other types o

study legal and auditor's reputation, Nahata (2008) also used this measure to study the probability of VC backed companies going public. However, Krishnan, et al (2011) argues that using the cumulative IPO market share creates a strong bias towards young VC firms, which does not adjust for the length of a VC's active life. Krishnan uses a 3-year moving window prior to IPOs to compute market share. Krishnan enlarged the study made up by Nahata, by focusing on post-IPO issuer performance and its causes. This study was motivated due to the idea of younger VCs having strong incentives to build a reputation taking firms public earlier than they should (Gompers, 1996), moreover, just studying the correlation of VC reputation with IPO frequency does not take into account this behavior from young VCs, in other hand is it also important to examine how well these firms perform after the IPO, this behavior has been studied in 2004 by Lee and Wahal, which they have called "Grandstanding".

¹Krishnan, et al (2011) before reporting results on his analysis, found that big venture capitals, such as Kleiner Perkins and Sequoia Capital, and JP. Morgan Partners, have IPO market shares of more than 1% each year. It is also important to highlight how the reputation works for other types of financial intermediaries, as rough measure of the level of fragmentation of their market. For instance, reputable underwriters have 90% of the market share, compressed on around 10 companies, taken from Thomson Financials' SDC Global New Issues League Tables. This shows a larger fragmentation of the VC market in comparison to the underwriting market, suggesting both large concentration and bargaining power of the underwriting market towards a VC that leads to larger profits for banks and lenders, who ultimately are at the back end of the Underwriting.

Krishnan found that in syndicates, the reputation of the VCs is better captured when using the reputation of the lead VC of the syndicate, following in and Lin and Smith (1998) and Hochberg, Ljungqvist, and Lu (2007) who defines the lead VC based on the date of IPO to the Investor of the syndicate having the largest venture investment. Krishnan showed that lead VCs are more likely

to hold portfolio firm shares after the IPO, but not also on the shares side, but also on keeping some seats in the board of directors. Krishnan used four measures to study the its correlation with the VC's reputation:

1. Return on assets (ROA)
2. Market to book ratio
3. Long-run exchange listing survival
4. Long run abnormal stock returns

ROA is included in the analysis as it provides an overall understanding of firm's profitability for shareholders and other investors. It provides an overall assessment on how efficiently the assets is being used, . Market to book ratio, could be considered a good proxy of Tobins' Q, which give an insight on the intrinsic value of the financial asset, as the market price / over the book value, in this case of one share for instance. The long-run exchange listing survival, on Krishnan's model is a dummy variable, it takes 1 when a company is able to survive 3 years listed in the stock exchange or similar⁷ and 0 otherwise, for companies listed that went bankrupt, or went private specifically for financial distress reasons. Krishnan mentions that this third measure gives robustness to the analysis, as it accounts for pre-IPO accounting misbehaviors that allow entrepreneurs and investors to increase the demand for the firms shares at IPO by manipulating the accounting, for instance by busting pre-IPO earnings, or reducing costs by reducing pre-IPO investments, at the cost of reducing profits in the medium or long run. For instance, there is a big chance of company delisting if there are negative earnings news on the market that reveals a different history at post-IPO that was not known in the pre-IPO, Teoh, Welch, and Wong (1998). Therefore, Krishnan considers that in case there is a company that could be considered as reputable, initially, but there is unknown

⁷ Also taken into consideration for the analysis, cases in which there is merger or acquisition by a listed firm therefore the company remains listed.

manipulation on accounting, a three-year window would allow to “screen” VC-backed companies out of the pool of portfolio firms that could be in fact considered backed by reputable VCs. As highly reputable VCs have better screening and monitoring, they would discourage firms with weak long-term prospect and specially would not considering firms boosting short-term performance at the cost of long-term performance. The fourth measure used by Krishnan, is the long run abnormal stock returns, used also by Brav and Gompers (1997), it is considered as a better measure of long-term performance by Fama and French (1992) as it is less affected by skewness.

Krishnan et al, (2011) found that his measure to reputation of VCs is positively correlated with the four proposed measures of performance. However, the superior performance was attributable to two possible factors, the first is the superior VC selectivity, and the second would be a superior post-TPO nurturing portfolio firms. These scholars found that more reputable VCs select better quality investments, consistent with the idea of selection effect, and with Sørensen (2007). Krishnan et al, (2011) conclude that reputable VCs have superior advisory and monitoring additionally to the better screening capabilities, due to the positive association of highly reputable VCs after controlling for VC selectivity.

As mentioned before, some author may argue that the measure used by Krishnan, et al (2011) could be better than the measure that Nahata (2008) but they are carrying on different analysis, as it is based upon different samples and dependent variables. However, it is also arguable the fact that Krishnan measure seems to capture better the meaning of a Venture Capital reputation over time, and not just on a single point in time, moreover it avoids the bias towards younger VC firms.

Krishnan's measure is also analyzed against the classical measures to reputation (but untested against empirical evidence):

1. VC age proposed by Gompers (1996). Hsu (2004) also suggest that the investment experience is captured by the VC age.
2. Frequency, measured as the number of IPOs over a three-year period. This measure, could be tightly related to the probability of future VC fund raising, as the could frequency could be related to a repeated involvement on IPOs and therefore a larger reputation, then there should be a link between the two. In fact, Gompers (1996) found a positive correlation between the two measures.
3. Capital under management proposed by Gompers and Lerner (1999), based on capital commitments of the limited partners on the year prior to IPO.
4. Nahatas' measure on cumulative IPO market share. Krishnan found that Nahata's measure was the measure that up to the date correlated better to firms post IPO performance, in fact demonstrated that IPO market share is the only measure that consistently correlates with firms' performance.

Krishnan et al (2011), also considered 4 alternative measures of post-IPO performance found in the literature:

1. Probability of subsequent acquisition
2. Expected acquisition takeover premium
3. Used 2 forward-looking proxies of long-term firms' growth. ($R\&D/CAPEX$ and $(R\&D + CAPEX) / TOTAL\ ASSETS$)

Krishnan et al (2011), found no correlation between VC reputation and this fourth alternative measures of post-IPO performance. This author also analyzes the relation between VC reputation and corporate governance and involvement post-IPO. As mentioned before, some VCs tend to hold equity stakes after IPOs, this author studied the variables involved in this decision and found that more reputable VCs tend to hold seats in the board of directors in portfolio firms from the day of

IPO up to 3 years after IPO. Krishnan et al (2011), also found that highly reputable VCs employ better corporate governance structures, finding lower number of cases in which there is a dual CEO-COB (chairman of the board) and CEO-founders, as these two corporate governance structures are found to weaken the board discipline over the CEO. It has been found that even after IPO, there is a correlation between VC involvement in the board of directors, and specifically a correlation between VC shareholdings and directorship and portfolio firms post-IPO performance in the same 3-year post-IPO period.

This literature, reports the usage of corporate governance data to study the effect of the corporate governance structure over post-IPO the long run performances of VC-backed firms. Krishnan et al (2011), studies several features:

1. VC shareholdings: Captures the decision of lead VC keeping holdings in the three-year period post-IPO.
2. VC directorships: Captures the decision of lead VC on having directors on the board of directors in the three-year period post-IPO.
3. Dual CEO- COBs: Captures the decision of portfolio company having holds in the chairmanship.
4. CEO-founders: Captures the decision on whether found is also CEO or not.
5. Staggered boards: Also called classified boards, consist on having different classes of directors, each one with different service terms.

Krishnan et al (2011), found statistical and economical significance for the reputation measure over the changes in long run performance indicators as shown in table No.2. There is a positive correlation of IPO market share as a measure of reputation with return on Return on Assets, Market to book ratio, survival and return, specifically, this measure accounts for a 26%, 14%, 24%, changes

respectively in long run measures. Moreover, it increases the chances of survival after 3 years for 30%. In the analysis it is also included some additional variables to control, namely VC age, VC syndicate size and VC network Centrality, following Hechberg et al (2007). Krishnan et al (2011) explanation on larger returns correlation after controlling for issue characteristics, is that stock market could be inefficient at understanding the benefits and firms going public having reputable VCs backing them, and a second possible explanation would be that VC's continue to invest on risky projects in the post-IPO period. This literature also shows how more reputable VCs, are associated with IPO firms having larger involvement in research and development. Krishnan et al (2011), also demonstrated through their econometric model that controlling for VC reputation is "more informative than simply controlling for the existence of a VC investor". This has important implications as the particular characteristics of the VC could explain more the post-IPO performance than simply relying on the fact that there is a VC backing the company. This is something new brought by Kishnan et al, as most of the previous literature did not present a model controlling for VC reputation.

Panel A. Issuer Long-Run Performance and IPO Market Share, Controlling for Issue Characteristics

	Dependent Variable			
	ROA	M/B	Survival	Return
IPO Market Share	0.27*** (3.42)	0.96** (2.07)	0.33** (1.97)	2.04*** (4.02)
VC Backed	-0.19 (-1.44)	0.98 (1.53)	-0.03 (-0.13)	0.90 (1.19)
Underwriter Reputation	0.03** (2.26)	0.09 (1.16)	0.19*** (3.99)	0.20*** (2.58)
Ln Offer Size	-0.03 (-0.48)	-0.47** (-2.14)	0.13 (1.07)	-0.16 (-0.82)
Ln Issuer Age	0.04 (1.10)	-0.22** (-2.12)	0.30*** (4.53)	0.16 (1.30)
Issuer Market Cap	-0.04 (-0.45)	0.01** (2.38)	0.01 (0.66)	0.02 (0.98)
Issuer M/B	-0.04 (-1.39)	0.01 (1.12)	0.01 (0.74)	0.15 (1.45)
Price Revision	0.56*** (3.03)	-0.51 (-0.87)	0.40 (1.15)	0.44 (0.68)
Underpricing	-0.03 (-0.43)	-0.02 (-1.01)	0.02 (0.18)	0.02 (0.40)

Table 2. Results on the econometric model used by Krisnan et al, 2011. To study the ffect of reputation over long-run performance indicators of VC backed companies post-IPO.

Krishnan et al (2011), also examined the association of VC's reputation with the probability of having successful IPO in the future. They showed a significant positive association among the two variables, specifically when the VC reputation is modelled using the VC backed IPOs market share. This result is consistent with Nahata (2008), who measures the VC reputation based on all successful IPOs of VC backed firms.

In Krishnan et al (2011) research, there is also included an analysis to explore the relationship between Venture Capital reputation and governance characteristics of portfolio firms, specifically investigating whether this connection can elucidate the superior post-IPO performance of issuers backed by more reputable VC firms. The theoretical underpinning draws from studies such as Shleifer and Vishny (1986), Burkart, Gromb, and Panunzi (1997), and empirical work like Cronqvist and Fahlenbrach (2009), which collectively suggest the crucial role of large blockholders, including VCs, in effectively monitoring top management and positively impacting firm performance.

Krishnan et al (2011), delves into five post-IPO issuer governance characteristics, namely lead VC shareholdings, lead VC directorships, CEO-COBs, CEO-Founders, and staggered boards. These characteristics are meticulously measured at the IPO date and for the subsequent three years. The analysis entails categorizing VCs into quartiles based on the VC reputation measure, IPO Market Share.

In the univariate analysis (see table No. 3), Krishnan et al, (2011) observes that more reputable VCs hold shares and directorships in a significantly higher proportion of issuers they back, both at the IPO date and over the next three years. Furthermore, more reputable VCs are associated with significantly lower proportions of firms having CEO-Founders and CEO-COBs during the IPO and

over the subsequent three years. This is due to the fact that this corporate governance structure reduces the power of the CEO, which in turn most of the cases is appointed by the VC, which ultimately appears to have less control

Panel A. Univariate Analysis

	<u>Date of Governance Measure</u>	<u>Top Quartile IPO Market Share</u>	<u>Bottom Quartile IPO Market Share</u>
VC Shareholdings	IPO year	100%	92% ^b
	1 year after IPO	94%	85% ^b
	2 years after IPO	79%	71% ^b
	3 years after IPO	71%	63% ^b
VC Directorships	IPO year	96%	83% ^c
	1 year after IPO	93%	78% ^c
	2 years after IPO	86%	77% ^b
	3 years after IPO	77%	68% ^b
CEO-COB	IPO year	44%	50% ^a
	1 year after IPO	44%	48% ^a
	2 years after IPO	40%	47% ^b
	3 years after IPO	36%	41% ^a
CEO-Founder	IPO year	39%	48% ^b
	1 year after IPO	38%	45% ^b
	2 years after IPO	33%	40% ^b
	3 years after IPO	28%	34% ^a
Staggered Board	IPO year	56%	55%
	1 year after IPO	69%	69%
	2 years after IPO	72%	70%
	3 years after IPO	75%	71%

Table No 3. Results on the univariate analysis used by Krishnan et al, 2011 to study the effect of reputation, Governance Structures and decisions and the its relation with long-term VC backed firm performance.

Krishnan et al (2011), also presents a multivariate regression analysis (Table No. 4), this author, employs a “Heckman 2-step selection procedure” to control for differences in issuer characteristics and VC selectivity. The results indicate that a VC's continued participation in its portfolio firms after they go public is the only significant difference in corporate governance between firms backed by more and less reputable VCs. This finding aligns with prior research by Cronqvist and Fahlenbrach (2009), emphasizing the ongoing impact of VCs on corporate governance and, subsequently, long-term firm performance.

Panel B. Multivariate Analysis

<u>Key Explanatory Variable</u>	<u>Dependent Variable</u>				
	<u>VC Shareholdings</u>	<u>VC Directorships</u>	<u>CEO-COB</u>	<u>CEO-Founder</u>	<u>Staggered Board</u>
IPO year	0.28** (2.17)	0.31*** (2.95)	-0.27* (-1.65)	-0.26* (-1.71)	-0.17 (-0.55)
IPO Market Share					
1 year after IPO	0.37** (2.19)	0.23** (2.44)	-0.23 (-1.07)	-0.21 (-1.30)	-0.18 (-0.41)
2 years after IPO	0.12** (2.23)	0.24** (2.49)	-0.27 (-1.41)	-0.22 (-1.56)	-0.03 (-0.03)
3 years after IPO	0.17** (2.27)	0.23** (2.20)	-0.22 (-1.09)	-0.22 (-1.47)	-0.15 (-0.49)

Table No 4. Results on the multivariate analysis used by Krishnan et al, 2011 to study the effect of reputation, Governance Structures and decisions and the its relation with long-term VC backed firm performance.

It is emphasized that more reputable VCs continue to hold shareholdings and directorships in their portfolio firms even after the firms go public. This finding is supported by the univariate analysis (Table No. 4) which data indicates that more reputable VCs hold shares and directorships in a significantly higher proportion of issuers they back, not only at the IPO date but also over the following three years. Specifically, the research highlights that VCs in the highest reputation quartile hold directorships in 96% of issuers they back at the IPO date, a figure statistically significant and higher than the 83% held by VCs in the lowest reputation quartile. Furthermore, over the next three years after the IPO, VCs in the highest reputation quartile maintain a significantly higher proportion of directorships in the firms they back compared to VCs in the lowest reputation quartile.

The above idea is further substantiated in the multivariate regression analysis (Table No. 5) which reinforces this observation. It suggests that a VC's continued participation in its portfolio firms after they go public is the only significant difference in corporate governance between firms backed by more and less reputable VCs. This aligns with the findings in Table No. 4, indicating that the

superior post-IPO performance associated with more reputable VCs is linked to their sustained involvement through shareholdings and directorships.

The best opportunity for venture capitals in general to get largest financial benefits or profit out from the portfolio companies is by engaging on exits to these investments through Initial Public Offerings or Acquisitions. (Cumming and MacIntosh, 2003; Cochrane, 2005).

7. VICO 5.0 DESCRIPTIVE STATISTICS ON VENTURE CAPITAL REPUTATION MEASURES

The VICO5.0 database is a robust repository of venture capital (VC) activity in Europe, it registers the evolution of companies since 1988. Sourced from a combination of prominent data outlets, including Thompson Eikon, Bureau van Dijk Zephyr, Crunchbase, and Bureau van Dijk Orbis. VICO5 meticulously captures information on 37,863 companies involved in 54,910 VC investment deals. Notably, it extends its reach to cover 27 European Union countries, the United Kingdom, and Israel, providing a comprehensive view of VC landscape dynamics.

Key variables encompassed in VICO5.0 include company characteristics, investment details such as investment dates, and amounts, investor profiles, accounting data, and information on mergers, acquisitions, and IPOs. While this database offers invaluable insights, it is crucial to acknowledge its limitations. The reliance on secondary data sources introduces potential discrepancies, and the coverage may not capture every nuance of the dynamic VC environment. Researchers and users must navigate these limitations judiciously for accurate interpretation and application of the dataset.

In this analysis will be done to show descriptive statistics using VICO5.0 to highlight some of the ideas and insights of some of the authors mention in this report on regards to the measurement of the reputation of venture capitals. To report the results, I will take into account the 75th percentile and display for some of them an analysis for the fifty most reputable investors according to the specific measure.

VICO5.0 shows a total of 97984 investments done by a total of 12015 investors, many of which are Venture Capitals, exactly 8880 VCs, registered a total of 71077 investments (VICO5.0 has a total of 1014 investor types labelled as "others" and missing label, and a total of 2801 Business Angels).

The following variables of interest has been extracted and combined for the present analysis (see Table No. 5)

VICO5.0 Variable	Number of observations
InvestmentDate	7177
CompanyID	7177
CompanyNUTS3Name	7177
NACERev2corcodesdes	7177
FirstInvestmentYear	7177
CompanyNation	7177
TotalEquityInvested_round_thEUR	53320
InvestorID	7177
InvestorName	7177
InvestorType	7177
InvestorNation	7177
IPO_dummy	10064
IPODate	2344
IPODealvaluethEUR	10064
Acquisition_dummy	10064
AcqDate	8278
AcqDealvaluethEUR	10064

Table No 5. Variables of Interest extracted from VIO5.0 database. Number of observations are screened to show only those that actually belongs to VC. Investor types.

Table No.6 and Figure No. 4 shows the distribution of companies among countries, and Figure No. 5 shows the distribution of companies by industry. Companies are not equally spreaded around Europe with a major concentration in a few countries. The results of an analysis using VICO5.0 could be meaningful to these countries and probably lack of data would suggest results most be revised, to check if they can be extrapolated to these zones.

Portfolio Company nation	Count
United Kingdom	9624
France	6129
Germany	4562
Spain	2282
Sweden	2172
Israel	2159
Netherlands	1665
Finland	1367
Italy	1146
Ireland	1036
Denmark	883
Belgium	873
Poland	776
Hungary	523

Portfolio Company nation	Count
Austria	520
Portugal	495
Bulgaria	245
Estonia	215
Czech Republic	196
Latvia	178
Lithuania	146
Greece	129
Romania	123
Luxembourg	122
Slovakia	85
Cyprus	70
Croatia	67
Slovenia	47
Malta	28

Table No 6. Distribution of companies registered in VICO5.0 database by Nation.

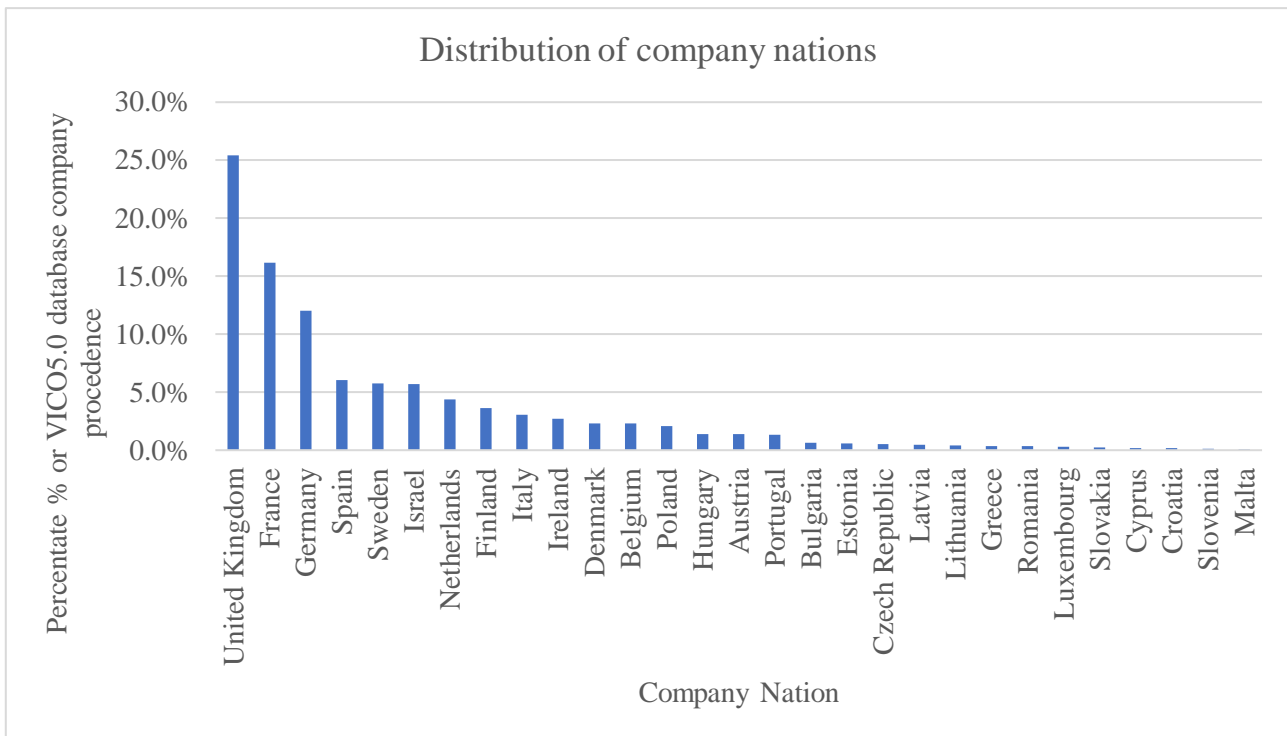


Figure No. 4. Distribution of companies registered in VICO5.0 database by Nation.

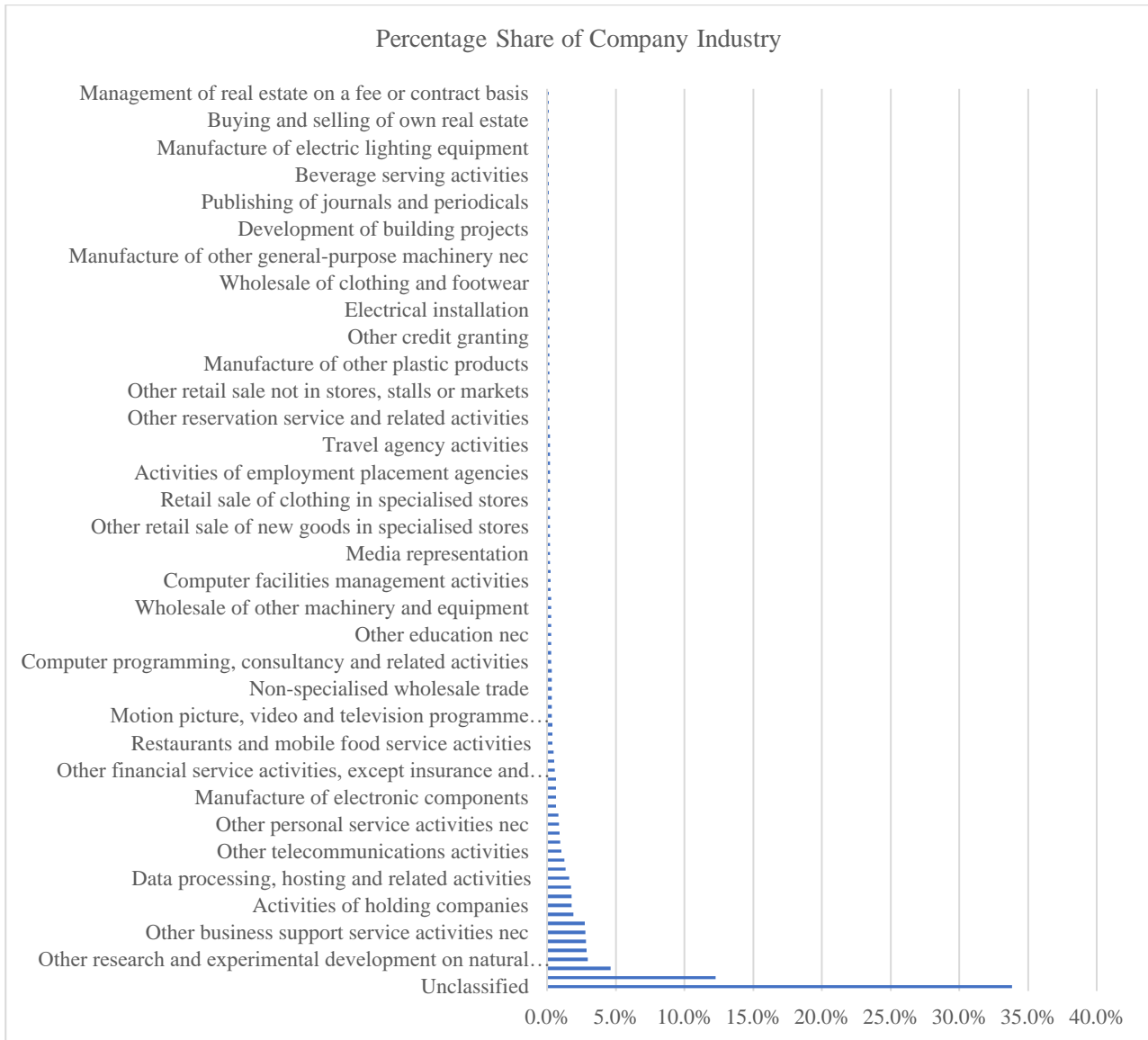


Figure No. 5. Distribution of companies registered in VICO5.0 database by industry.

Data shows investors big interest on new technological entrepreneurial firms, as a big percentage of the companies are concentrated around industries that require strong technological component, as technological and computer services and biotech. There is also a limitation on this data as roughly 33.8% of the companies does not have any industry assigned.

Figure No. 6. Shows the distribution of Investors by Nation. As it could be seen, there is a big influence of US investors on European companies. This could introduce bias in the reputation analysis for instance when using the IPO capitalization share per VC. It will be seen later on that

US VC reputation might be larger than European investors, therefore, accounting just for VICO5,0 data on US European investments would not take into account the investments that US VC firms do in other parts of the world, therefore reputation measure to this extend would have a limitation.

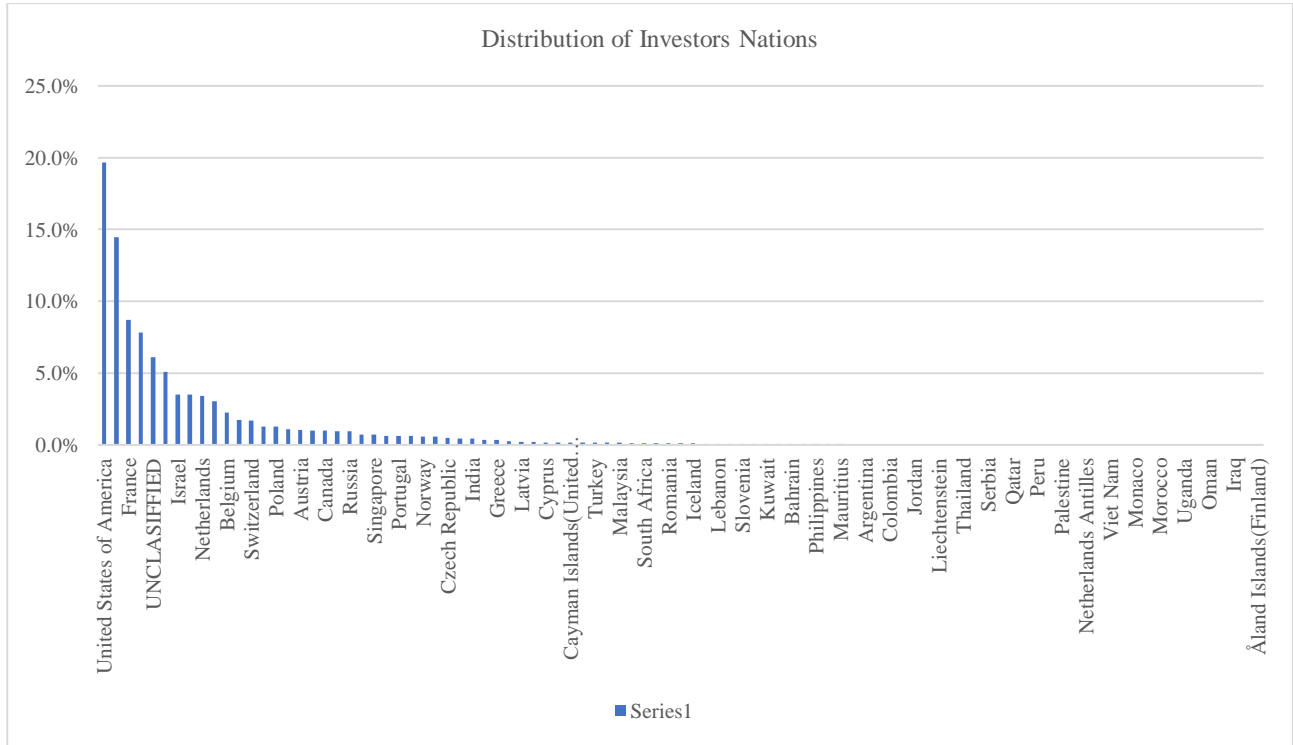


Figure No. 6. Distribution of Investors registered in VICO5.0 database by Nation

Investors types differ among both typology and distribution, as seen in Figure No. 7 and Table No. 7. We can see that out of the total 12015 investors, more than 68% are venture capitals, for which the major participation in the sample is from IVC, for a 46,6% of the total sample. The less frequent of are UVC and BVC. This is expected as Venture Capitals sponsored by banks or VC as bank affiliates or subsidiaries are less frequent in the market. Normally bank comes at a later stage when the probability of successful exit increases, and therefore the backed companies convert into potential clients for which the bank may offer underwriting and consultancy other services.

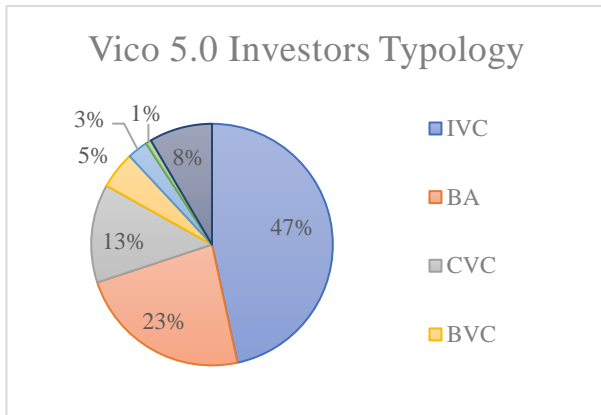


Figure No. 7. Distribution of Investors Type.

Investor Type	Number
IVC	5601
BA	2801
CVC	1583
BVC	597
GVC	328
UVC	91
unclassified + "others"	1014

Table No. 7 Distribution of Investors Type.

As expected, the biggest percentage of investors type is concentrated among those investors that are more able to support new entrepreneurial firms at very early stages, such as Business Angels and Independent venture capital. Corporate Venture capital and Bank affiliated venture capitals may come later on. CVCs are more prompt to make investments when there is a lower uncertainty regarding the technology and the strategic fit with the parent company and Bank affiliated venture capitalists are more interested on offering financial services that could be valuable for the issuing firm, so this comes also when uncertainty among different aspects of the portfolio firm is lower, such as the valuation of the company itself, the quality or the technology for instance.

There is also a big number percentage of investors for which VICO5.0 does not display any type of information. Meaning that there are investments that we do not really know where it comes from.

In the next sections we will analyze and discuss the main measures of reputation proposed by several authors, all of them already presented in this report.

1st Reputation Measure: Number Of Investments Per VC:

Sørensen (2007), proposed VC age as a reputation measure that is aim to be correlated with the industry experience in (in fact he uses the cumulative number of investment rounds, in this analysis I have used the number of investments independently from the portfolio company). This measure has been also used by other scholars: Lerner (1994a), Gompers (1996), Hochberg, Ljungqvist, and Lu (2007).

It is worth to mention that the distribution of number of investment investments per investor is very much biased towards one investment, in fact, more than the 75% of investors (VCs) invest less than 4 times. We could consider this type of investors as less reputable if we use the number of investments as a measure reputation, according to the literature we have shown in this report, the number of investments shows VC's involvement on repeated relations which in case of being successful, opens up more investment opportunities and valuable relations. The upper 25% of the the VCs engaging the most on repeated investments display a larger variability even visually, (see distribution of number of investments for the most reputable 25% VCs according to the number of investments in Figure No. 7). Most reputable companies in this sense according to the VICO5.0 database are those that had more than 5 investments in the 20-year period covered by the data base. When analyzing the top 25% investors with a larger number of investments in the 20-year, we see a range from 4 investments to 922 investments (a larger variability than the percentile 75th downwards).

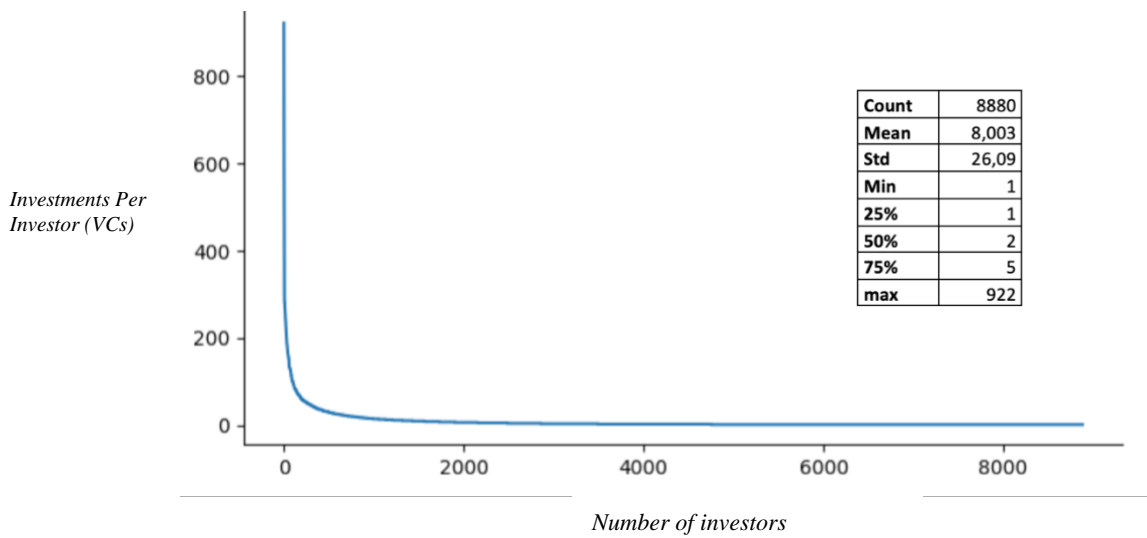


Figure No. 8. Distribution of Number of investments per VC

If we consider the number of investments made by each VC that ended up in a successful exit (only taken into account IPO's, during the last five years prior to the year of measurement of the reputation, which is 2018), we find that that the most reputable VCs had number of investments in the order of magnitude of 5 investments to 33 investments (see Figure No. 8). To this extend, the three most reputable came up to be investors such as Bpi Groupe and Sofinnova Partners from France and Novo from Denmark. Companies in this top, came to be also in the list of over 75th

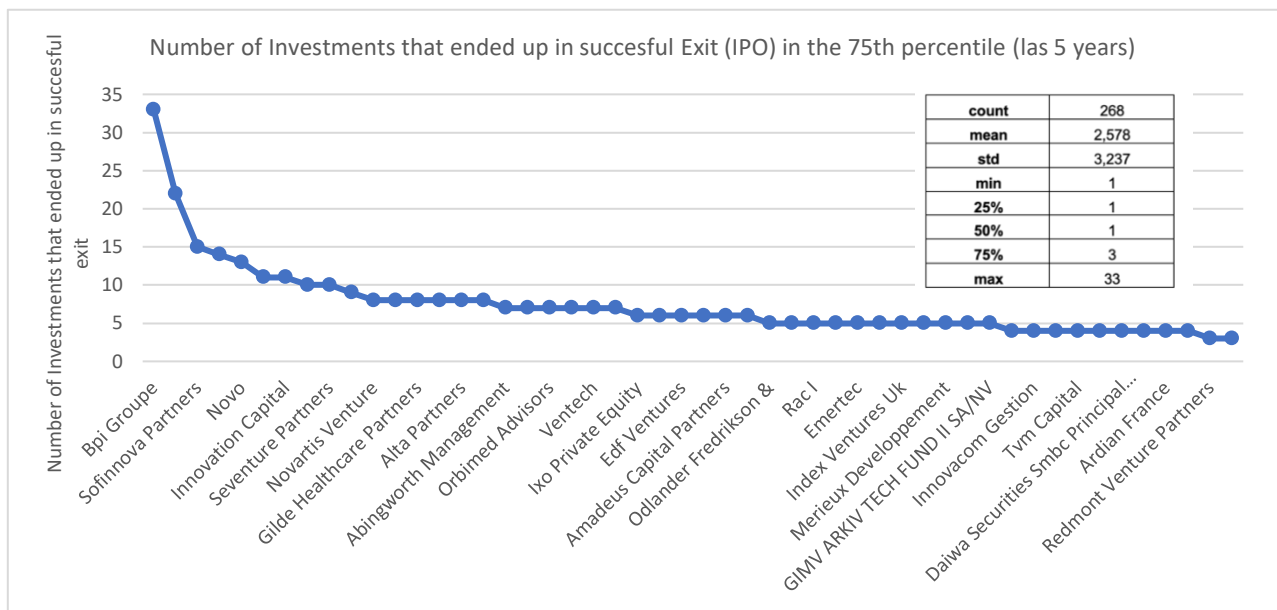


Figure No. 9. Distribution of Number of investments per VC over a 5-year period

percentile of companies with the largest number of investments over the 20-year period (Figure No. 9).

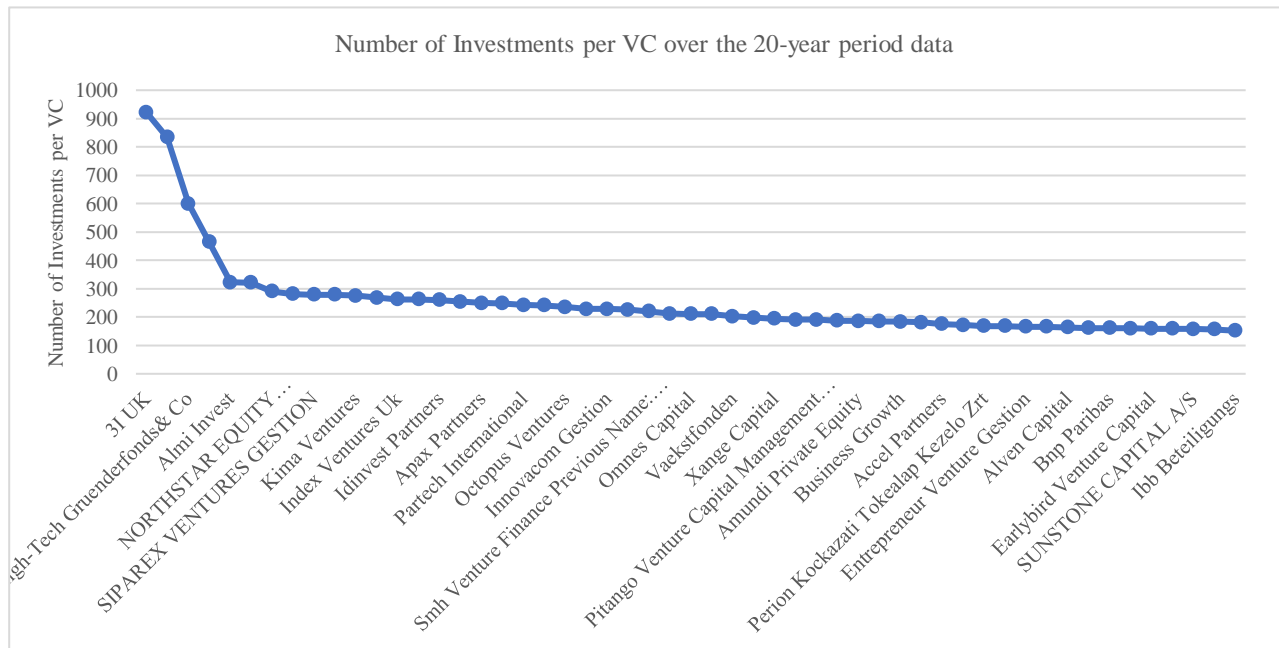


Figure No. 10. Distribution of Number of investments per VC over a 20-year period.

However, data suggest that there is large variation on the places each VC has reached according to these two measures. On the first one we are using just a 5-year period, and in the second one we are using 20-year period data, moreover linking the first one with successful exits. We would expect that if the number of investments would capture the reputation over the years, the number of IPOs for the companies on that top, should be larger over the five-year period, however the data does not seem to support so, further analysis should be conducted to confirm. However, what could be seen in the previous data is that the analysis is sensitive on the period selected, and the suggest that the reputation of VCs changes year to year. This has been commented by authors like Krishnan (2008) and Hochberg, Ljungqvist and Lu, (2007). In fact, the former uses a 3-year period, and the later uses a 5-year rolling period. It is also Interesting to highlight that there is a group of investors that display a different behavior than the remaining investors. We can see in the previous graph that the first 4 investors, actually have invested on a range of 300 to 900, which is much more spreaded than the remaining investors in the top 25% of the data. For instance, investors such as 31UK, had more

than 900 investments in the 20 year-period, but less than 3 IPOs from 2013 to 2018, which suggest either a decrease of investment activity in that period and/or before, or a decrease in the investment performance (in relation to successful exits)

Total successful investments on average on all the 20-year investment period came up to be 21%, lower than the 34% found by Nahata (2008) and the 41,8% found by Cochrane (2005). Which means roughly 1 out 5 investment is successful in general for investements done in European countries.

2nd Reputation Measure: Vc Age, Measured From The First Investment Year

Nahata (2008), commented that age could display a positive correlation with the other measures of VC reputation (such as connectedness/centrality, number of syndicated investments and IPO market share) . He measured the age for VCs that backed companies with succesful exits and those that did not have successful exits. Finding that the average age for VCs engaging in successful investments are on average 13,46 years old while 12,2 years old would be the age of VC backing unsuccessful companies. This author did this study with the purpose of determining if the age would be a predictor of reputation, finding the age difference being statistically significant, meaning that we could consider older VCs with better successful exit opportunity.

In report, we take the overall data without making distinction on successful and unsuccessful exit and we rely to this extent on previous literature, such as Nahata's findings, and we find that the mean age is 9,17 years (see table No. 7)

	Measure
count	8.881
mean	9,17
std	6,64
min	0
25%	3,23
50%	7,55
75%	15,81
max	20,997

Table No 7. Summary Statistics for VC age.

One of the main limitations of this analysis is the inability to judge whether an investment represented a successful or unsuccessful exit. Nahata (2008) also used post IPO information to judge if the exit was actually successful, and once of the criteria is the ROA. For VICO5.0 it would be not possible to rely on accounting information for most of accounting figures as they have a big percentage of missing information.

3rd Reputation Measure: Cummulative IPO Market Share

A portfolio companies is considered to be successful if either they are acquired or they go public Gompers and Lerner (1000a), Sørensen (2007), and it has been also used as a proxy for VC returns, Hochberg, Ljungqvist, and Lu (2007). It has been discussed by some authors that have selected IPO related parameters to measure VC reputation. Nahata (2008) used both the cumulative market capitalization of portfolio companies backed by the VC normalized by the total market capitalization of IPO for VC backed companies, and the total investments in the entrepreneurial market. Krishnan (2011) used the market capitalization just for the IPOs up to 3 years before the measurement of the measurement date. Due to the amount of data, I have selected to measure the IPO cumulative market capitalization using IPO date from 2013 to 2015.

There are 3431 companies that went on IPOs in all the VICO5.0 database, companies backed by all type of investors present in VICO5.0 (VC type, BAs, others and missing values). We would be interested on just considering those backed by VCs. Out of the 37863 companies in the data base only 3431 went public or acquired. VCs made a total of 71077 investments in a total of 32832 companies in the 20 years long period covered by the database.

I have screened the investments that ended on IPOs or Acquisition, out of the 37863 companies in the data base only 3431 went public and/or acquired (9,06% exited successfully, Nahata (2008) , showed a total of 25% of his sample exit successfully, and Hochberg, Ljungqvist, and Lu (2007) found a 26%, a further analysis could be performed to study this difference), and out of the total 3431 exits, only 675 were IPOs, meaning that 19,67% of exits were IPOs , and only 2,0559% of the total companies receiving investment from any type of investor actually went through an IPO. Just taking into account the IPOs of portfolio companies that were backed by VC's, a total of 657 companies were backed by VCs, meaning 97.33% of the IPOs (*just take companies backed by VCs... we can erase this by Benedetta Advise*) registered for issuing companies backed by VCs, specifically through a total of 2529 investment done by 834 VCs (at least 1 investment per VC). This result is expected as the VC is the type of investor that is most likely to help portfolio company to escalate operations, which is needed to take a company to a stage in which an IPO is plausible. Figure No. 9 shows the companies that went public through an IPO and the distribution of the number of investments received. Figure No. 10 shows the distribution on the number of times a VC invested on the same company which later on went public. The average investments per VC on the same company is around 3 and the average number of investments received by companies that went public is around 10. This suggest that there is a probability that syndicated investments occur, in fact, later on we will see that there is a considerable number of syndicated investments. It is also

important to mention that the previous comment stands for the top 25% of observations, as the most of the data shows very low number investments and funds received by portfolio companies.

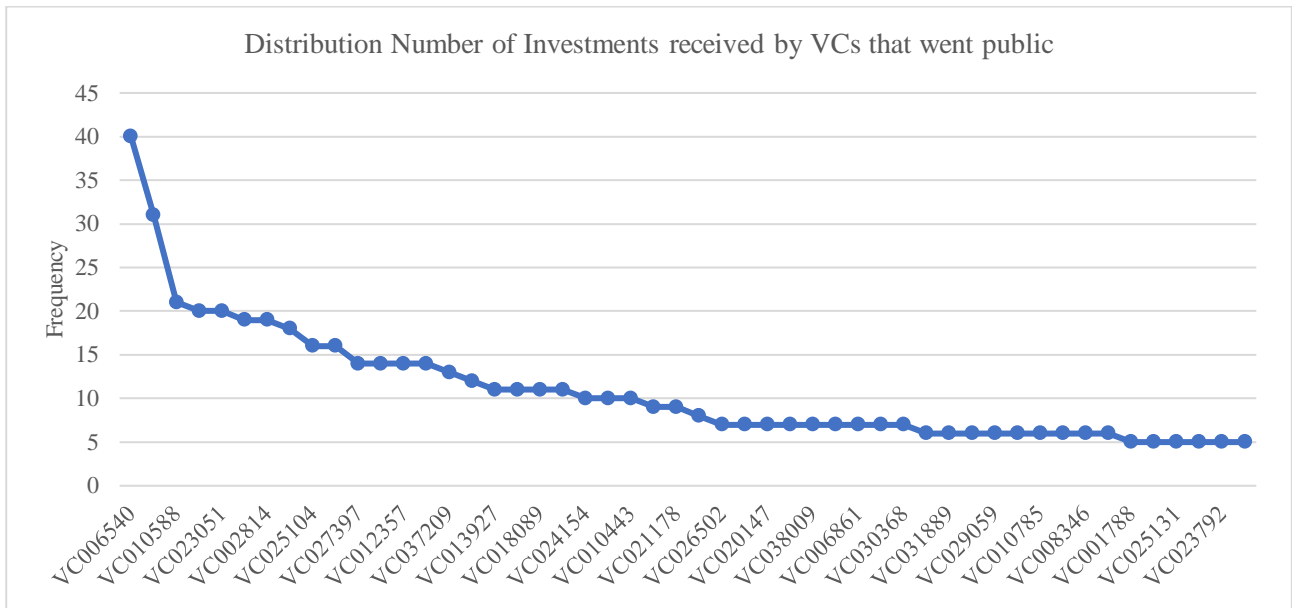


Figure No. 11. Distribution of Number of investments received per company (only companies that went public after investment)

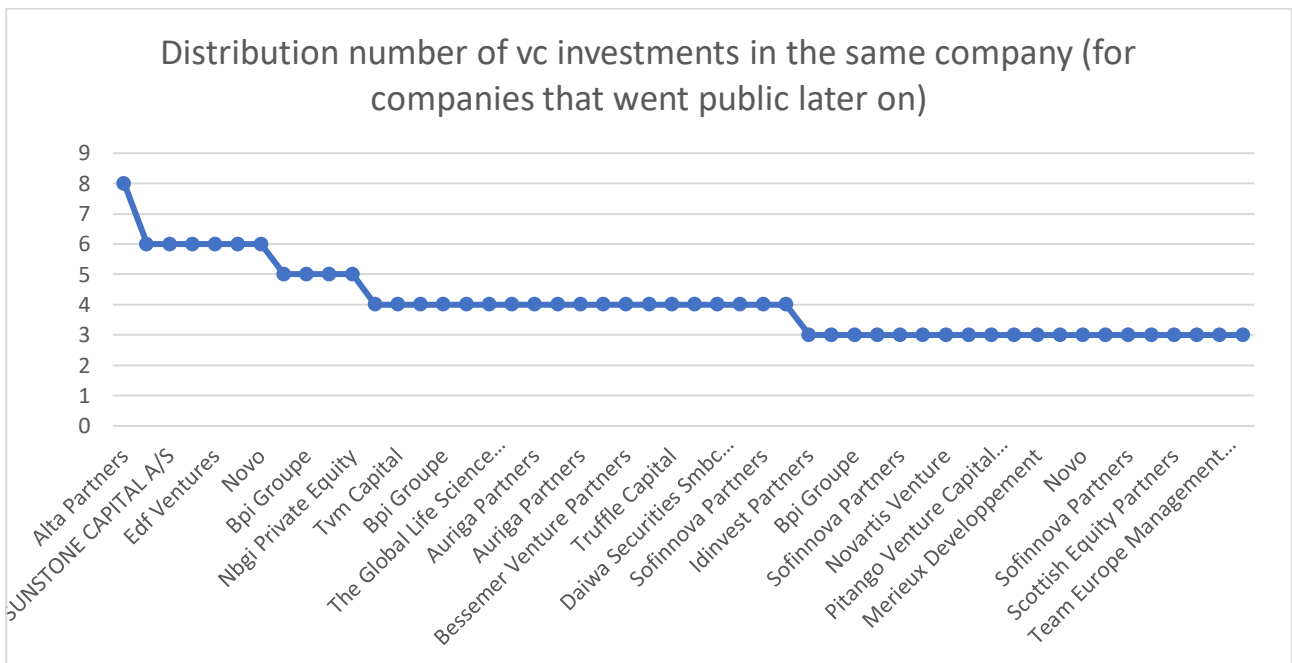


Figure No. 12. Distribution of Number of investments done per VC to a single company that went public after investment

This also suggest that if we compute the cumulative company capitalization at IPO (share), the value theoretically should be low, even for high reputable VC's, due to low number of investments in the same company in relation to the number of IPOs in the 5-year period. Figure Number 11 shows the cumulative 5-year IPO share for the VCs on the upper 25% of the data.

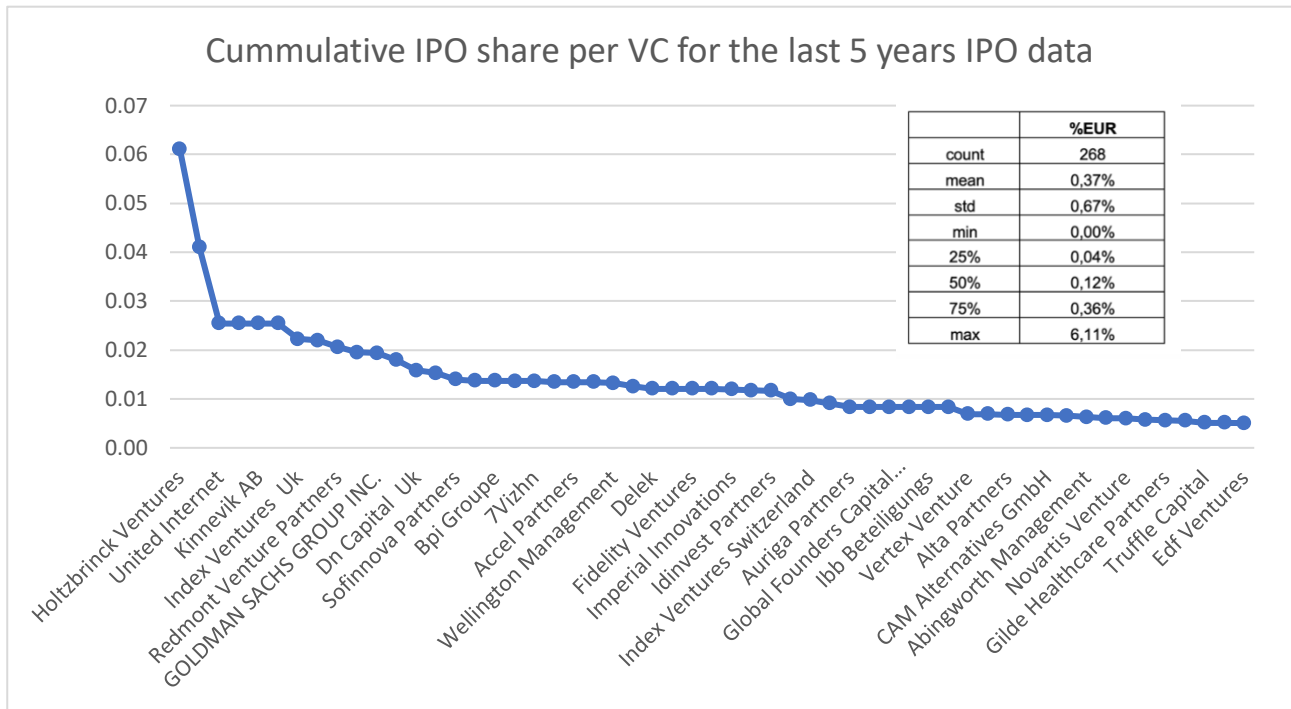


Figure No. 13 Distribution of cumulative IPO share per VC.

One important aspect to be taken into consideration is the bias introduced by the existence of US investors in the data base. Most reputable US investors are recognized to be worldwide investors and therefore the information on VICO5.0 would not include data from US investors in other countries different that those of Europe. Therefore, the reputation computed in this section, does not include the investments they do in other countries. We could suspect that cumulative IPO share would be larger if we take these other investments (it would be needed extremal from VICO 5.0 data). Further analysis should be conducted to control for the bias introduced by existence of US investors in the data base.

Nahata (2008), also introduced an analysis to come up with successful and unsuccessful IPO's, which consisted in studying the likelihood of successful VC exit using logit and hazard models, asset productivity of portfolio companies. Due to the large percentage of missing values on sales and total asset variables, computing the successful exits using this information would lead to a lower reliability on the results. Further analysis should be conducted in order to compute the IPO share backed companies by investor likewise have been computed in the previous analysis.

4rd Reputation Measure: VC relationships

Hochberg, Ljungqvist and Lu, (2007) assesses VC syndication by examining the number of relationships each VC establishes over a 5-year rolling basis. Syndication, in this context, refers to collaborative investment efforts where multiple VCs jointly invest in a specific portfolio company. The count of unique VCs with whom each lead VC collaborates during this period serves as a quantitative measure of syndication activity. To offer a normalized perspective, this count is adjusted by the potential maximum number of relationships that could have existed during those 5 years (Hochberg, Ljungqvist and Lu, (2007)). This normalization ensures that the VC connectedness metric accurately reflects the relative extent of syndication activity, accounting for variations in the opportunities for collaboration that might arise over the specified period.

Hochberg, Ljungqvist and Lu, (2007) highlights the significance of syndication in the VC landscape, suggesting that VCs actively engaging in syndication are likely to have better access to deal flow, diverse investment opportunities, and a more extensive network of information.

For the purpose of the present report the spirit of the analysis of Hochberg, Ljungqvist and Lu, (2007) will be kept, computing in how many syndicated investments each investor participated and take that as a measure of connectedness/centrality of the venture capital. The information to be used will be the base on the last 5 years of information prior to the measurement of the reputation date, which is 2018. Figure No. 12 shows the number of syndicated investments for each VC.

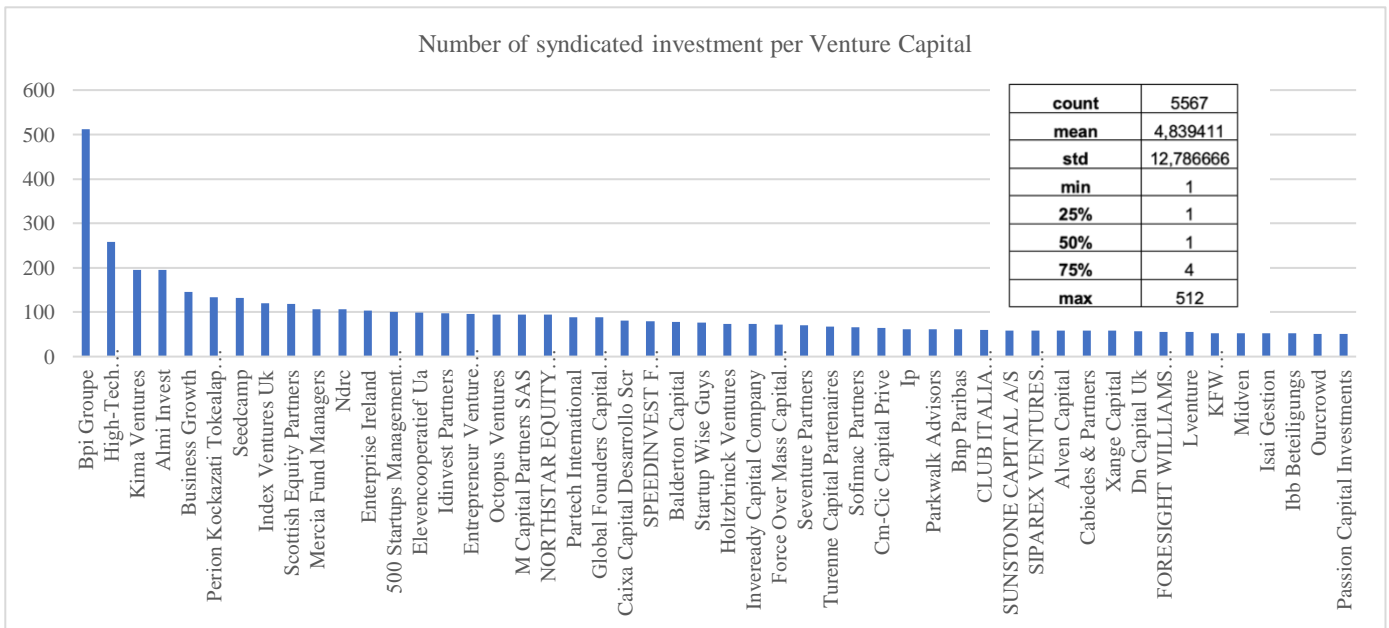


Figure No. 14 Distribution Number of Syndicated investments per VC in the 5-year rolling period

To make this comparison we could normalize the results using different criteria Hochberg, Ljungqvist and Lu, (2007) and Nahata (2008) uses the maximum number of relationships the VC could have in the same 5-year rolling period. We will normalize the variable using the number of investments done per VC in the 5-year rolling period. Figure No. 13 shows the number of syndicated investments per VC normalized; therefore, it shows the percentage of total VC investments that were syndicated.

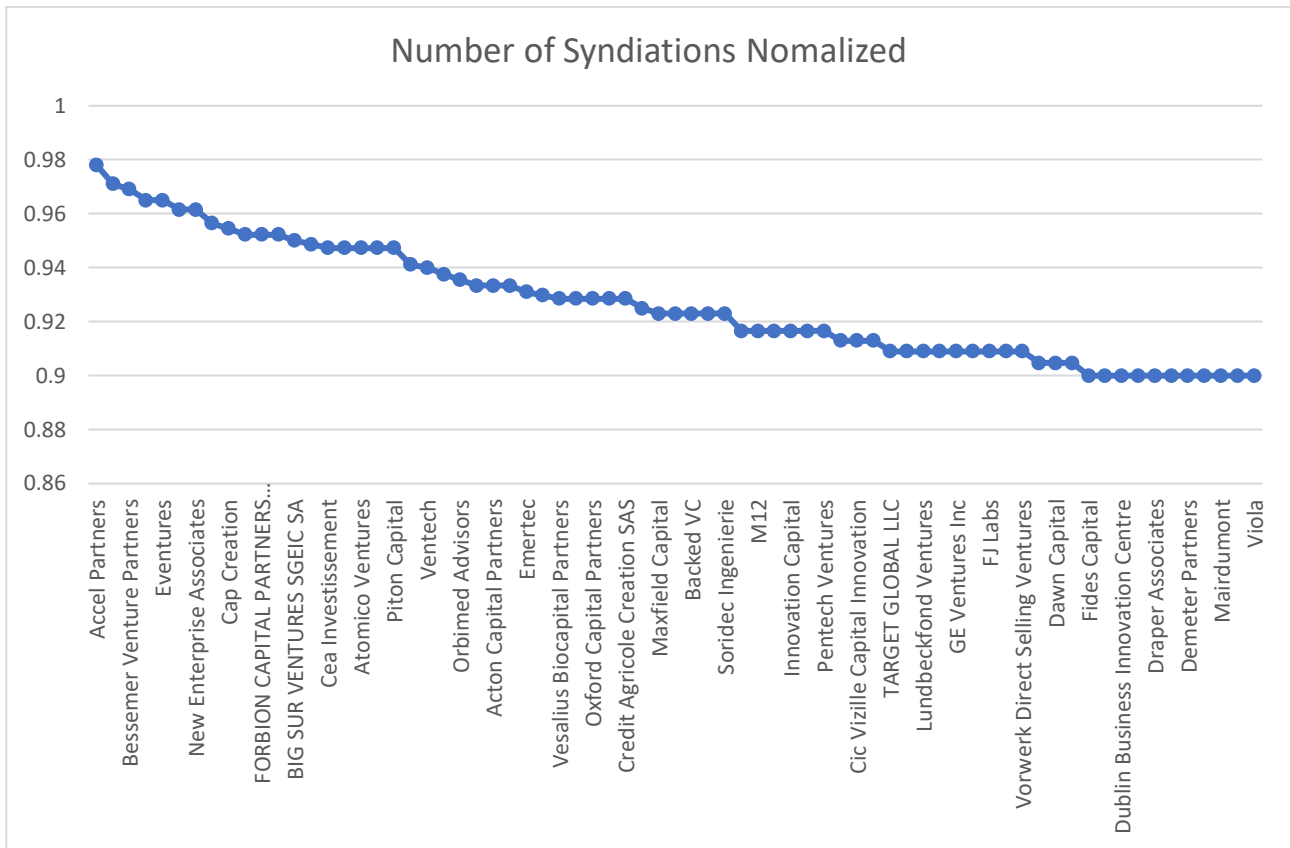


Figure No. 15 Distribution Number of Syndicated normalized by the number investments per VC in the 5-year rolling period

We could see that there is a normalizing the variable give a more comprehensive understanding of companies' reputation as it would be a fair comparison, the number of relationships will depend among other variables on the size and age of investors, not all investors have the same possibilities to create new relationships and translate them in syndicated investments. A limitation to this analysis using the presented normalization also introduces a bias towards companies that made a lower number of investments and all of them were syndicated, there is a large percentage of VC that invested one time, in syndication, which would give a measure of 100%. The data has been cleaned to display the investors in the top 25%, with its normalized measure, however data suggest that this bias still occurs inside of the top 25%.

8. CONCLUSION

Measuring venture capital reputation is a complex and multifaceted task that requires a deep understanding of the industry and its dynamics. Reputation is a crucial factor in the venture capital ecosystem, as it affects the ability of VCs to attract and retain limited partners, as well as the quality of the deals they can access and the terms they can negotiate with entrepreneurs. Understanding reputation also help practitioners the importance of engaging on certain activities that raise up the probability of getting ongoing follow-on rounds of financing for instance in the case of IVC. IT also helps mangers of VC funds to allocate their resources in a smarter fashion, so a probability of successful investments increases, finally strengthening the market positioning and competitive advantage of the VC.

Several authors have made significant contributions to the measurement of venture capital reputation, using different proxies and methodologies. Megginson and Weiss (1991) and Nahata (2008) used the market share of funds raised and invested by VCs as a measure of reputation, while Chemmanur et al. (2011) used the market share of the market capitalization of IPO exits. Krishnan et al (2011), helped to understand the role of VC reputation on long term performance of the entrepreneurial firm. Other authors, such as Beatty (1989) and Beatty and Welch (1996), focused on the reputation of financial intermediaries such as auditors and legal firms.

The VICO5.0 database provides a valuable resource for researchers and practitioners interested in studying the dynamics of the venture capital industry. It covers a wide range of variables, including company characteristics, investment details, investor profiles, accounting data, and information on mergers, acquisitions, and IPOs. However, it is important to acknowledge its limitations, such as the reliance on secondary data sources and the potential discrepancies that may arise from them.

Additionally, there is still a big work to be done when it comes to the completeness of accounting data and investors data, which would unlock the possibility of enlarging researches on reputation of VCs in Europe testing for instance the performance of the portfolio companies in the pos-IPO stage and compare results with Krishnan et al (2011) results, which basically are a proof of a treatment effect from VCs.

The descriptive statistics presented in this report using VICO5.0 highlight some of the insights and ideas of the authors mentioned in this report regarding the measurement of venture capital reputation. The 75th percentile was used to report the results, providing a comprehensive view of the VC landscape dynamics. It has been found that companies investing in Europe seems to be younger in comparison with the sample data of investors studied by Nahata in 2008. Moreover, although there are limitations on the measure to reputation using the cumulative IPO share by VC due to the existence of a big percentage of investors from united states, who also invest in other parts of the world, data seems to show that the average cumulative IPO share is lower than in United States, however, it is not possible to say that this measure is lower for European investors, as it investors from VICO5.0 database are also from other continents. Further studied could be conducted to control on the analysis, excluding all investors not coming from Europe, and then draw conclusion about the behavior of reputation variables for European investors.

There is also a challenge on understanding the financing on startups for certain market segments (e.g., on the logistics market, there is a research gap that motivated the work of Jaroslaw Korpysa, Marcin, Halicki, and Andreas Uphaus in 2021) as there could be industry specific factors that could drive investments in very different ways, also making reputation of investors to rely on other factors. Most of the literature focus on general variables to compute the reputation of VCs, such as IPO information, generalities of investment information, syndication and relationships information, but

none of this information accounts for industry specific factors, for example the type of relationship, specific industry experience of fund's managers, among others.

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