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Effects of early-stage funding decisions to the performance of Finnish Born Global start-ups

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ABSTRACT

The purpose of this study is to analyze the impact that different early-stage funding decisions had on the performance of Finnish Born Global startups founded between 2009-2015 that were selected to the Young Innovative Company funding program. The theoretical framework is conducted from Born Global literature and more general startup funding literature. The Born Global part discusses the general characteristics of Born Global firms and typical early struggles that rapid internationalization causes. The startup funding part presents the different funding options that are available for startups including equity and non-equity options and prior research of the effects of equity funding on firm growth and performance. The common theme in previous studies that cover equity funding and its effect on start-ups is that equity funding accelerates growth and performance. The theoretical framework combines Born Global and startup funding literature and hypotheses are formed based on prevailing knowledge in the area that value added benefits of equity funding would push Born Global firms into higher performance and internationalization. The formed 12 hypotheses assume that private equity funded Born Global firms would exhibit significantly higher scores on chosen performance metrics.

The empirical part of the study is done as a quantitative study of the effects that different types of non-governmental funding had on the growth of 66 Finnish Born Global firms that were selected to the YIC program. To test the generated hypotheses this study utilizes non-parametric tests Mann-Whitney U test and Kruskal-Wallis H test to test statistical significance in four performance metrics absolute sales growth, average annual sales rate, employment growth, and foreign subsidiaries. The conducted statistical analysis supports 4 of the 12 hypotheses and additionally from the conducted descriptive statistics as well as from a small case study into Wolt the conclusion is that Venture Capital funded firms are more likely to exhibit higher employment growth as well as general positive outliers because of the higher risk tolerance and larger investments into growth in the early stages.

KEYWORDS: Born Global, start-up, internationalization, equity funding, international business, venture capital, angel investor

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1. INTRODUCTION

1.1 Background for the study

Small businesses are significant part of economy in Finland and all around the world. In 2018 small and medium-sized enterprises generated 58.1% of the total turnover in Finland and they had over 40% share of the GDP. Of all companies in Finland 98.5% are considered micro or small enterprises, which employ less than 50 employees. These enterprises employed 44.7% of workforce in Finland in 2018 and through (2001-2018) small enterprises have created over 150 000 new jobs, while big enterprises (over 250 employees) have lost close to 3000 jobs in that time. In general policy makes and entrepreneurship scholars agree that especially high-tech start-ups are a driving force of economic growth, structural change and job creation (Engel, 2002). Therefore, starting new businesses and getting them through the initial struggles is vital for building well-being. (Yrittäjät, 2020)

More and more new businesses especially technology-based ventures in open economies aim for rapid internationalization as the world has become increasingly borderless. Companies that adopt fast internationalization as their growth strategy and aim straight for the international markets from their inception are called Born Globals. These entrepreneurial ventures seek competitive advantage early on by using resources and focusing sales on multiple countries, which differs greatly from the traditional model of domestic growth and internationalization after the firm has matured. (McDougall et al., 1994.)

The label "Born Global" was first introduced by Michael Rennie in 1993 and since then it has progressively become more researched subject in the business publications. Early research on Born Globals has been directed towards examining entrepreneurial decision-making, and resource related factors e.g. (McDougall et al., 1994), (Sarasvathy et al., 2013), (Nummela et al., 2014). Another highly reviewed area has been mapping out phases of growth and survival of Born Globals e.g. (Gabrielsson and Gabrielsson 2013), (Trudgen and Freeman 2014), (Zhou et al., 2007). These studies map out the typical growth paths and pitfalls of a Born Globals and often highlight the importance of personal entrepreneurial networks in the beginning phase of a Born Global.

One of the most important aspects that factors into the success or failure of any start-up including a Born Global is securing financing in the early phase of their operations (Engel, 2002). Since large majority of young firms especially high-tech start-ups that have global aspirations are not able to generate enough cash flow early on, they need to seek out external funding. Choosing between different equity and non-equity funding options is often one of the biggest decisions that entrepreneurs have to make in the early stage of their start-up.

Traditionally an important source of funding for start-ups in Finland has been governmental venture capital, grants, and loans from TEKES nowadays known as Business Finland. On top of providing straight financial support Business Finland also have specialised programs for start-ups. One of these programs is Young Innovative Company funding program, which purpose is to accelerate the global growth of young, ambitious, rapidly growing start-ups in Finland (Business Finland YIC, 2021). Companies selected to this program must meet multiple preconditions including age and ownership restrictions as well as proof of a strong business model that aims for rapid international growth (Business Finland YIC, 2021). Thus, companies selected to this program exhibit clear Born Global mindset and are therefore used as the sample of this research.

Even though governmental funding and different programs are still hugely important for Finnish start-ups, venture capital investments have shifted in the last ten years more and more towards independent venture capital (Business Finland, 2020). Governmental venture capital from Business Finland is still a major source of funding in Finland totalling €169 million in funding in 2019 but in the same year business angels along with Finnish and foreign venture capital funds invested a total of €511 million into Finnish start-ups and growth companies. (Business Finland, 2020). In fact, 2019 was a big year for Finnish venture capital industry overall as they ranked first in Europe in VC investments in relation to the GDP (Business Finland, 2020).

The recent COVID-19 pandemic has had its effect on venture funding. Global venture funding suffered 6 percent drop in the first half of 2020 (January-June) compared to same monthly period in 2019. China and Spain were hit the hardest and both recorded their lowest venture funding first-half numbers in the past five years. However, the global decline was not as bad as expected and, in some funding, hot spots (Australia, Belgium, Brazil, France, India, Indonesia, Israel, Massachusetts and New Zealand) overall venture funding continued to thrive. (Crunchbase, 2020)

1.2 Research gap and objectives of the study

Even though there are extensive amounts of literature available covering the basic Born Global concept, constraining factors relating to their early success such as resource scarcity is often just mentioned and not elaborated further. One of the biggest factors relating to the growth and surviving of a Born Global is securing funding early on and empirical research on different funding options and how they affect to the growth and internationalization of Born Globals is still insufficiently research area in Born Global literature especially when the scope is on Finnish Born Globals. Additionally, most of the conducted studies on start-up performance does not account for governmental support into the equation, which is significant accelerator especially for Finnish and European start-ups.

Since equity funding and especially independent venture capital and angel funding often involves having access to the financiers' networks, contacts, and knowledge on top of financial resources, it should have significant measurable effect on the performance of Born Globals. Somewhat recent Business Finland (2019) study on angel funding found that angel investments have positive impact on employment and short-term profitability of Finnish start-ups, and firms that received angel funding were more likely to survive compared to non-angel funded firms. That study suggests further research into equity funding and especially into venture capital, which was not accounted for in that study.

This thesis focuses on exploring both venture capitals' and business angels' effect on Born Global performance by measuring the performance of 66 Finnish Born Globals that have been selected for the Young Innovative Companies program. The objective is to find out through statistical analysis how funding especially equity and VC funding affect the sales performance, employment growth, and internationalization of Finnish Born Global firms, when the firms have received similar governmental support. Furthermore, after the statistical analysis a brief case study into Wolt Enterprises Oy which was one of the most notable positive performers, gives an insight about the impacts that early-stage equity funding had on their success. The research question of this thesis is:

"How does different funding choices affect the performance of Finnish Born Global start-ups?"

This thesis has also theoretical and empirical objectives in order to produce an answer to the overarching research question. The theoretical objective of this study is to create theoretical framework from literature review about Born Global and start-up funding literature from which hypotheses can be formed. The empirical objective is to test the formed hypotheses by measuring numerous performance metrics of the selected companies which are divided into groups based on their early-stage funding decisions.

1.3 Delimitations

This research is limited to Finnish start-ups that have been founded between 2009-2015 and have been accepted into Young Innovative Company funding program. The theoretical framework focuses on available Born Global literature and general start-up funding literature and the referred previous statistical studies are mostly from Europe.

The statistical analysis in this thesis takes only into account the chosen numerical performance metrics of absolute sales growth, average annual sales growth, employment, and foreign subsidiaries in assessing the impact of funding choices to firm performance on a five-year period and not any qualitative factors such as decision-making skills of the entrepreneurs or unpredictable events that might have had significant effect on the performance. Furthermore, long-term impacts after five years are not included in this thesis.

1.4 Definitions and abbreviations

Angel Investor: "High-net-worth individual who invest in and support start-up companies in their early stages of growth (Lange, Leleux and Surlemont, 2003, p.1)."

Average Annual Growth Rate (AAGR): "Average annual growth rate measures the average growth over a series of equally spaced time periods, and it is used to determine long-term trends (Hayes, 2021)."

Bank Affiliated Venture Capital (BVC): "Bank affiliated venture capitals are venture capital firms that are subsidiaries of a bank that invest in start-ups to increase their parent banks' lending opportunities." (Sun and Uchida, 2016)

Born Global (BG): "Most radical manifestation of international new venture, which derives significant competitive advantage from extensive coordination among multiple organizational activities, the locations of which are geographically unlimited (Oviatt and McDougall, 1994, p.59)."

Corporate Venture Capital (CVC): Corporate venture capital funds are vehicles constituted by a corporation with the purpose of investing a defined amount of capital with the purpose of generating financial and, above all, strategic benefits for the organization (Shibata, 2020)."

Governmental Venture Capital (GVC): “Governmental venture capital aims to foster the development of private venture capital industry and alleviate the equity capital gap of young innovative firms. (Colombo et al., 2014).“

Independent Venture Capital (IVC): “Independent venture capital funds are organizations formed by General Partners who manage the fund and raise third-party capital to invest, rendering to a predefined investment thesis (Shibata, 2020).”

International New Venture (INV): “Business organization that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries (Oviatt and McDougall, 1994, p.49).”

Venture Capital (VC): “Investment by specialized venture capital organization in high-growth, high-risk, often high-technology firms that need capital to finance product development or growth and must, by the nature of their business, obtain capital in the form of equity rather than debt (Black and Gilson, 1998).”

1.5 Structure of the thesis

This thesis consists of five main chapters. After the introduction and goal setting this thesis moves into literature revew which covers Born Global literature and general start-up funding literature as well as relevant previous studies from which theoretical frame of reference and hypotheses can be formed. The research method chapter presents arguments for used methodogical techniques and decisions as well as sample selection and data collection. Chapters four presents the results from various statistical analyses including descreptive statistics and non-parametric tests. Lastly chapter five discusses the empirical findings and presents a brief case study into one of the positive outlier firms Wolt as well as concludes the study and offers suggestions for future research.

2. LITERATURE REVIEW

2.1 Defining a Born Global company

The definition of a “Born Global” is still relatively loose, as there are many varying definitions in previous studies (Table 1). Additionally, researchers have defined Born Globals in more general terms such as Tanev (2012) “a new venture that acts to satisfy a global niche from day one” and Danik & Kowalik (2013) “enterprises which start being active internationally from inception and later instantly seek to derive significant competitive advantage from the export to multiple countries”. Furthermore, some researchers e.g., Gabrielsson et al., (2008) have argued that the mechanistic definition, which focuses on raw numbers misses the point, and that the global vision of the founder is the main factor that defines a Born Global.

Table 1. Born Global definitions (Adapted from Mandl and Celikel-Esser 2013).

Publication	Maximum time before starting international activity	Minimum share of foreign sales as % of total sales	Minimum number of markets exported
Rennie (1993)	2 years	75 % (at the age of 14 years)	Multiple
Knight & Cavusgil (1996)	2 years	25 %	n.a
Luostarinen & Gabrielsson (2006)	n.a	>50 %	n.a
Zhou et al. (2007)	3 years	20 %	Multiple
Sanchez & Rodriguez (2008)	7 years	25 %	n.a
Sundqvist et al. (2010)	3 years	25 %	3 continents

All in all, looking at the previous studies and definitions that focus on numbers, a firm can be roughly defined as Born Global if they start their international activity within 3 years of founding and their foreign sales cover at least 25 % of all sales. Furthermore, these firms often do business in at least one foreign continent and in multiple foreign countries (Mandl & Celikel-Esser 2013). Born Globals are highly product oriented, and their biggest competitive advantages are high quality and product differentiation. Product or service of these start-ups is usually directed towards niche markets, but whereas normal start-ups usually start gradually from their own country, Born Globals start international activities almost immediately (Rennie, 1993). This is because start-ups with niche strategy that want to benefit from first-mover advantages need to internationalize fast in order to maximize the size of their market (Gilbert et al., 2006 pp. 943).

Staying innovative is extremely crucial to Born Globals to gain advantage over their more mature competitors who have more resources and experience. (Knight & Cavusgil, 2004). The innovation must extend to both technological and non-technological areas of value creation. The commercialisation of new products often requires developing new marketing strategies. In many cases the firm must innovate, adapt, or reinvent its marketing strategies to different local markets to compete in multiple foreign countries (Zijdemans & Tanev, 2014). Other variables that affect the progress of Born Global are financing, product strategies, networks, operation and market strategies and organisational learning (Gabrielsson et al., 2008).

2.1.1 The phases of Born Global growth

The growth of a Born Global company goes through different phases which may include survival crises, withdrawing from markets and regrouping. In fact, it is almost an anomaly that firm can navigate in a highly dynamic global business environment without having to rethink and adjust its organizational practices and initial ideas. The survival of a young firm usually comes down to how the crises are solved and mismanagement can easily lead to termination of its activities. (Gabrielsson & Gabrielsson, 2013)

The global growth of sustainable Born Global can be seen as three phase process (Gabrielsson et al., 2008). The three distinctive phases are: introductory, growth & resource accumulation, and break-out. In the introductory stage, where the company might not even yet sell its products, the most critical objectives are developing networks and resources along with creating early product awareness to the consumers in order to create a market for the product (Gabrielsson et al., 2008).

At the introductory phase, the organizational structure is usually almost non-existent, and the organizational behaviour is informal. The firm also resembles a typical start-up where the organisational values reflect the characteristics and values of its founders (Bridge & Cromie 1998). Founders of Born Globals often have a global vision from the start, which pushes these start-ups to employ global growth strategy (Gabrielsson et al., 2008). Since at this stage the managerial decision-making is focused on few key people, their decision-making skills mainly direct the course of the company. If the founders fail to secure the required sales channels, managerial expertise, resources, and capabilities moving into actual commercial breakthrough is not possible and the survival of the firm can be at stake (Gabrielsson & Gabrielsson 2013).

In order to make strategic decisions entrepreneurs need to collect and allocate resources to their endeavour, which often is the greatest challenge in the early phases of new ventures. Often entrepreneurs need to use different type of decision-making compared to established firms, because of their resource scarcity. Two decision-making modes that has been heavily linked to international new ventures are effectuation and entrepreneurial bricolage, which both explain how successful entrepreneurs are able to adapt their initial plans quickly and apply combination of available resources to solve problems and create something new (Seynard et al., 2009).

Born Globals can benefit greatly if its core personnel have international experience, relations and networks. Networks especially play a crucial role in the early stages of Born Globals and the biggest advantage from networks is knowledge sharing. Networks are main source of market information which gives companies better knowledge about foreign customer needs, competition, and overall business environment (Zhou et al., 2007).

Market information plays a central role in decision-making, and it enables companies to make better decisions, especially in highly uncertain environments where Born Globals operate (Peljhan et al., 2014). Previous studies Freeman et al., (2006), Zhou et al., (2007) and Peljhan et al., (2014) have demonstrated that high quality information network is essential for Born Globals. It provides an important source for business opportunities and innovative ideas (Peljhan et al., 2014). Networks and relations also enable unique opportunities for strategic partnerships which can offer possibilities for diverse foreign market entry. (Freeman et al., 2006).

Building networks often also means attracting early investors, who can preferably offer valuable knowledge on top of financial resources. The amount of capital and knowledge that a Born Global is able to secure from external investors affects the selection of operation and market expansion strategies (Gabrielsson et al., 2008). The early shareholders are also often the force which sets the expectations for the Born Globals growth and expansion (Moen & SØrheim, 2008).

After the business is created and the needed resources gathered the firm enters in the second phase, which is characterized as further development of its own capabilities and resource gathering (Gabrielsson et al., 2008). As a Born Global learns from its partners, channels, networks and early customers, the amount of time which it spends in the second phase depends on the preparedness for globalisation and willingness to take risks (Gabrielsson et al., 2008). At this stage, potential Born Globals also have to make the decision if they even are going to break out globally or stay as more of a minor player in a larger network (Gabrielsson et al., 2008).

If the Born Global decides to go into the breakout phase, Born Globals need to leverage their organisational learning and experience from global customers in order to successfully operate in multiple foreign markets (Gabrielsson et al., 2008). The organisational learning and planning done in the second phase is in crucial role determining the success or failure of the global conquest. The main objective is to target multiple foreign markets as quickly as possible which means that the customers are geographically dispersed and the Born Global has to face significant challenges in newness, foreignness and outsidership (Yener et al., 2014).

The terms foreignness and outsidership refers to the lack of knowledge of the foreign business environment. The liability of foreignness covers the psychic distance which include factors such as local laws and language barriers which can cause multitude of problems for firms entering the market first time (Yener et al., 2014). The degree of psychic distance differs between different markets, which means that there can be significant geographical differences when competing against local businesses in different markets. The liability of foreignness is time sensitive, which means that if the “outsider” firm manages to keep their position, the liability of foreignness gradually becomes less of an effecting force (Zaheer & Mosakowski, 1997).

Since Born Globals have to endure additional costs which arise from unfamiliarity of multiple foreign markets, it further emphasises the need for organisational learning and adaptation compared to less internationally intensive start-ups. Because of the high uncertainty and tough environment, many of the first internationalization attempts fail, which means the company has to be well prepared to deal with losses and be able to adapt its operations. (Trudgen & Freeman, 2014)

2.1.2 Rapid internationalization and entry modes

If the firm decides to adopt Born Global vision and internationalize rapidly, the internationalization strategy differs significantly from traditional models of gradual expansion. The traditional literature on firm internationalization focuses mainly on large mature organizations and one of the most used models to explain firm's internationalization is the Uppsala -model. The model was introduced by Johanson and Vahlne in 1977 and it describes the internationalization as a gradual step by step process. First the given firm starts from domestic market and tries to grow and gain the needed experience before moving to foreign markets. In the second phase the firm establishes an export operation via an intermediary such as independent distributor. As the firm starts to gain foothold in the foreign market the next step is to establish a sales subsidiary to cut the middleman. In the last stage, the firm can establish a production unit in the foreign market as they now have the required experience and knowledge. The Uppsala model also suggest starting international operations from culturally and geographically close countries and move to more demanding areas only after that.

However, the business landscape has changed remarkably in the last couple of decades, which has enabled faster and more scattered internationalization. Born Globals originated initially in countries that had too small of a domestic market for their niche products thus early internationalization was prerequisite for company's survival (Knight & Cavusgil, 2004). Early internationalization and global breakout have become more and more viable because of the changes in global business environment, which has removed barriers from foreign trade and entry. One of the biggest barriers used to be different tariffs and non-tariffs which were designed to complicate foreign entry, which are becoming increasingly rare due the integration of the world. (Trudgen & Freeman, 2014)

Two other notable trends in global business environment that have enabled rapid internationalization are globalization and technological advances. Both trends have significantly lowered costs caused by internationalization, which has enabled businesses to adopt early internationalization. Globalization can be perceived as homogenization of consumer preferences which has simplified product development and positioning as companies does not have to necessarily adjust their product for every foreign market. Technological advances have also reduced business transaction costs and facilitated international growth. Biggest technological advances from the perspective of Born Global businesses have been in information and communication technologies, production methods and in transportation and international logistics. (Knight & Cavusgil 2004)

The advances in information and communication technologies have revolutionized the way companies conduct their business. Especially the high integration between enterprises, consumers and suppliers made possible by internet, has facilitated the rapid internationalization of young firms (Brasil et al., 2013). The barriers of communication between firms and consumers have reduced all over the world, which has made getting global visibility easier for small businesses and the improved logistics have enabled fast and reliable deliveries. Internet has also in itself become important sales channel for firms because of its cost effectiveness. Internet has reduced greatly the minimum transaction size at which direct sales to consumer are efficient because the cost of a single transaction has dropped significantly (Gabrielsson & Gabrielsson, 2011).

Traditionally entry modes are divided into two categories of low- vs high-involvement/commitment modes of entry (Agarwal & Ramaswami, 1992; Zahra et al., 2000; Blomstermo, 2003, as cited in Efrat & Shoham, 2013). Typically Born Globals are forced to compensate the lack of financial resources by developing other capabilities such as knowledge development, which makes Born Globals very dependent on their knowledge and unique know-how to gain competitive advantage thus knowledge exposure or dissemination represents a big threat (Efrat & Shoham, 2013).

Former studies such as Maignan and Lucas (1997) presents that firms that face high level of dissemination risk, lean towards high-commitment entry modes, because they can maintain better control of their core capabilities and reduce the risk of exposure by not sharing their knowledge with firms acting as business partners. Furthermore, firms own capabilities and size often guides the decision in entry modes as firms with great technological competencies are more likely to choose high involvement entry modes which are characterized by high levels of ownership and control (Datta, et al., 2002). However, the high-commitment entry modes mean also much more financial investment which conflicts with the fact that most Born Globals operate with relatively small financial resources early on, which creates the need for external funding if the firm deicides to go with the high involvement route.

Because of the technological advances and change in global business environment, direct exporting has become easier and more viable option. Exporting combines the relatively high control and low financial commitment, both of which are beneficial for start-ups, thus it is often seen as the superior entry mode for Born Globals (Coviello, 2015; Zander et al., 2015). The biggest downside to exporting is that it does not really provide any local information and the company is seen as an outsider, which means that the firm is in a disadvantage when competing against locally established firms (Agarwal & Ramaswami, 1992). This means that the product of the Born Global have to stand out and preferably create a whole new niche market where the local firms have not yet settled.

Some Born Globals decide to use other entry modes such as joint ventures by forming strategic alliances (Freeman et al., 2006), especially in stable large markets where the potential risk of other firms exploiting their knowledge is not that relevant (Efrat & Shoham, 2013). Furthermore especially, in high technology B2B markets, it is common for Born Globals to use multi-channel sales strategies. What this often means is that they use combination of internet and partnerships with MNCs to provide a certain product (Gabrielsson & Gabrielsson, 2010). The downside of partnerships with more established

MNCs is that the Born Globals breakthrough may end up suffering if they are too dependent on the bigger firm (Gabrielsson et al., 2008). However, when properly applied, the use of internet based multiple sales channels can reduce the liability of foreignness and newness (Kotha et al., 2001; Gabrielsson & Gabrielsson, 2010).

Ultimately entry mode decisions are mostly connected to the specific business that the Born Global does, meaning that e.g., B2B software firms are likely to employ similar entry modes within that group but the fact that entering new markets has become easier and cheaper has opened new opportunities in internationalization and the global break-out is more and more viable strategy for firms that would have stayed more locally grounded in previous times.

Entry mode decisions are often reflected in the balance sheets and performance metrics. In general, any venture that internationalizes through exporting or licensing modes of entry sees an increase in sales or market share growth before increase in employment growth. Vice versa ventures using foreign direct investments or join ventures are more likely to see employment increase before seeing increase in sales at least in that target country. (Drover et al., 2017)

To sum up, in modern knowledge-based economies Born Globals have an increasingly important role in creating new jobs, advanced innovations, and productivity growth (Colombo et al., 2014). The biggest challenges in the early internationalization and growth of Born Globals are associated with financial constraints and choosing the right entry modes, sales channels, and partners to deal with. The personal networks (Freeman et al., 2006, Zhou et al., 2007 and Peljhan et al., 2014), and overall knowledge of the entrepreneur are often the most critical aspects that either lead to success or failure when choosing the right channels, entry modes and partners in the internationalization process.

Since entrepreneurs more often than not lack both reputation and proven track record, the risks associated to those new ventures are heightened (Gilbert et al., 2006 pp:932).

The two resources that are found to be most clearly related to new venture growth are financial and human capital (Gilbert et al., 2006 pp:932). Access to sufficient financial capital provides flexibility needed to pursue firm's strategic long-term objectives rather than focusing on short term gains, and by getting additional knowledge the firm increases its chances of making right strategic decisions.

2.2 External funding of Born Globals

As mentioned before Born Globals lack of financial resources and knowledge are often considered to be the biggest constraints of their initial growth. Entrepreneurs have multiple different options when it comes to early financing. In situations where rapid internationalization is not the priority and in less technologically advanced industries, most of the early capital often comes from entrepreneurs' personal sources including personal funds and loans from family or friends. However, when fast internationalization is the goal and especially if a firm decides to opt for high commitment entry modes which require much more early investments and carry higher risks, external sources of capital such as banks and equity investors become more relevant. (Gilbert et al., 2006 p:933)

Additionally, since some high technology-oriented start-ups may have high research and development activities at the beginning, they have no way to finance their operations and growth internally for the first few years. Thus, external funding is needed, and the following sections discusses the different forms of external funding that are available for Born Globals and start-ups in general.

2.2.1 Debt financing

Debt financing is the most common way of financing for companies especially larger well-established businesses, and it involves borrowing money from banks, financial institutions or private lenders and paying it back with interest at the end of agreed period (The Economic Times, 2021). The biggest upside of debt financing compared to equity financing is that the loanee does not have to lose any percentage of the ownership in the company (The Economic Times, 2021). Most of the debt financing comes from banks and bank loans can be either secured or unsecured. Secured loans are backed up with collateral such as property, equipment, and stocks. If the loanee cannot pay the loan the bank has a legal claim on the collateral, which makes this type of loan riskier for the loanee and safer for the loaner. Conversely unsecured loan means loaning without collateral which is riskier for the loaner. Getting unsecured loans depends largely on the credit score and proof of income, which early-stage start-ups usually do not have. Additionally, unsecured loans usually carry much higher interest rates and the borrowing limits are smaller, which make them usually only a short-term option for start-ups (Fundbox, 2021).

Since start up investing has a lot of risk involved and early-stage start-ups usually do not have many tangible assets, it can be hard to secure a high sum long-term loan unless the founder or promoter of the company is willing to put their own assets as collateral of the loan. This usually makes relying solely on debt financing unviable especially for new entrepreneurs and thus it is often used more as a secondary financing option for start-ups. (Nordic Law, 2017)

2.2.2 Venture Capital

Venture capital in traditional sense refers to investment by specialized venture capital organizations also known as venture capital funds in growth firms that seek funding in equity rather than debt (Black & Gilson, 1998). Venture capital has different forms most noticeably independent/private venture capital and governmental venture capital. Traditionally independent venture capital has been more prevalent in USA and vice versa in Europe governmental venture capital has had a bigger role in star-up funding. The origins of venture capital industry extend to mid-40s when the first true venture capital firm American Research and Development was established in 1946. This venture capital firm made high-risk investments in promising emerging technology companies that were involved in technologies developed for World War 2 (Black & Gilson, 1998). Venture capital has developed through the years as a crucial channel for capital to SMEs that often have difficulty attracting financing (Gompers & Lerner, 2001). Venture capital thus solves a crucial problem in market economies where entrepreneurs with good business ideas with no money can find financing from investors that have the money but no business ideas (Gompers & Lerner, 2001; Kaplan & Strömberg, 2001).

External equity investments should not be seen as supplant to traditional bank-centred financing instruments but rather it aides a specific types of SMEs (Kraemer-Eis et al., 2016). Especially for high technology start-ups and Born Globals, which typically possess few tangible assets and have high-risk and high reward attached to their operations, venture capital is often recognized as fundamental (Bertoni et al., 2015; Kraemer-Eis et al., 2016). Venture capital organizations fund these high upside operations by purchasing equity or equity-linked stakes while the young firms are privately held (Gompers & Lerner, 2001). On top of funding, Venture Capitals often provide additional value by coaching and mentoring investee firms as well as providing network contacts (Bertoni & Tykvova, 2012).

Venture capitalists also have an important role in decreasing information asymmetries between start-ups and their future financiers by performing due diligence and assessing the quality of the small businesses (Kraemer-Eis et al., 2016). Because of the high costs involved in performing due diligence on small companies, it is often more economical for investors to focus on larger companies that have information more readily available.

Over the years venture capital industry has grown into significant sector in the US and the value of capital investments in the US alone accounted for 107.8 billion dollars in 2019 (Statista, 2020). In USA California has been by far the biggest VC hub historically. Even the recent COVID-19 pandemic had a little effect on the VC funding numbers of California which in the first half of 2020 almost matched its record half year 2019 of 36.1

billion dollars (Crunchbase, 2020). European VC investments have been on a much lower scale historically compared to US. In the last five years there has been a steady 25 percent year-over-year growth and in 2019 the VC investments in Europe totalled 36.05 billion dollars, which still was less than California's first half of 2019 alone (Teare & Kunthara, 2020).

Even though Europe's venture capital investing has taken big steps in the last 20 years and is starting to look somewhat similar to USA, there are still some noticeable differences in independent venture capital investing behaviour between Europe and USA. European independent venture capitals are less willing to invest in high-risk seed stage companies and focus more on 3–5-year-old companies whereas in the USA independent venture capitals are often specialized in very young seed stage companies. In Europe this early-stage investment gap is filled by governmental venture capital which has a much bigger share of the early-stage investing compared to USA. (Bertoni et al., 2015)

In Finland the role of governmental venture capital in the early-stage start-up funding has been always large compared to independent venture capital. Business Finland formerly Tekes and Finpro is the main funder of small and middle-sized companies in Finland. They support research, product development and business development of small companies by giving grants and loans as well as offering contacts, networks, and know-how (Business Finland, 2021). On top of investing straight to early-stage companies they also develop Finland's independent venture capital market by investing into independent venture capital funds which invest in early-stage companies (Business Finland Venture Capital, 2021).

The relationships between governmental venture capital and private venture capital in start-up funding have been studied extensively. The common finding of many studies is that firms that received both governmental support and private investing perform better in different business operations compared to firms that only received one or the other (Kraemer-Eis et al., 2016; Bertoni & Tykvova, 2012; Brander et al., 2015). One of the biggest benefactors of the syndicates between private and governmental venture capital is innovation especially when the private investor is the more involved party (Bertoni & Tykvova, 2012). This is due to more performance-sensitive contracts between private investors and their portfolio firms, which incentivises private investors to provide optimal amount of financial and non-financial resources, which accelerates innovation (Bertoni & Tykvova, 2012). Collaboration between governmental venture capital and private venture capital also yields more future investments for the business that is being funded by both (Brander et al., 2015). Furthermore, this additional investment accounts for better chance of surviving and better performance as there is a positive association between successful exits and using mixed funding from governmental and private sources (Brander et al., 2015).

Exits in funding terminology refers to the exit from the investment for the venture capitalists and there are three basic types of exits: initial public offering (IPO), trade sale and write-off. Initial public offering means offering of the corporate stock to the public and it is usually the most sought-after exit since it allows highest profits for the venture capitalists (Bottazzi & Da Rin, 2002). In fact, some papers have studied the effects of VC funding and IPOs e.g., Nahata, 2008 found out that backing by higher reputation VCs is related to more favorable exits in case of IPOs where starting share prices of VC backed companies are frequently higher compared to non-VC backed companies. Trade sale refers to selling the start-up to another company usually to a competitor and it is preferred option when the start-up is having trouble competing in the marketplace or the stock market is having a downturn (Bottazzi & Da Rin, 2002). Last and the worst-case exit is a write off, which means that the funded company has failed, and the venture capitalists must take a loss and write off the investment from their assets (Bottazzi & Da Rin, 2002). Most start-ups and venture investments end up as fails and thus it is important to find the most optimal funding structure, which enables better chance of success for the start-up and its investors.

More of a modern type of equity funding that has emerged in the last decade is crowdfunding. Internet based equity crowdfunding works in a way where large volume of investors contributes small amounts for fragments of firm ownership (Vulkan et al., 2016). This type of equity funding lacks the value-added benefits of more closely involved equity funding models of VC and angel funding but can generate significant amounts of money in relatively short period of time.

2.2.3 Angel funding

Angel capital also known as informal venture capital is a pool of risk equity, which comes from high-net-worth individual investors. Collectively informal capital is many times larger compared to formal capital and informal capital is the most-often-used source of external equity for entrepreneurial firms. It is not only a fundamental source of funding for high-potential ventures, but angels same as Venture Capital funds provide guidance for start-ups in areas such as management, networks, recruiting etc. (Lange et al., 2003)

In fact, angel investors are very similar compared to Venture Capitals, the biggest difference being that angel investors directly invest their own money whereas VCs invest through an investment firm. It is also very common that angel investors eventually end up founding Venture Capital firms with other angel investors and expanding their operations that way. The biggest difference between angel and VC investors often is the financial capability to invest as VCs are more likely to be able to gather more resources. (Lerner et al., 2015, p.3)

Business angels come from various backgrounds but in general they seem to have some common traits and career paths. They are often well-educated, and they typically have had their own successful business ventures as entrepreneurs before becoming angels. This makes them excellent mentors for new entrepreneurs as they have experience how to run companies successfully and they can provide connections that would not otherwise be there. Business angels have on average 470 000 available for investment.

The median is very similar and only very few investors declared themselves able to allocate more than $2 million to investments. (San Jose et al., 2005)

2.3 Summary of the theoretical framework

This chapter presents the theoretical framework of this thesis based on the revied literature in previous chapters. The main theoretical aspects are summarized, and an overall theoretical frame of reference is derived and from there hypotheses are formed in order to answer the research objective and question of this thesis. As presented in the previous chapters, Born Globals are becoming more and more common in the global start-up environment. The continued progress of technology has progressed the ease of doing business and exporting across borders, which have made going global early a viable and profitable strategy. The biggest obstacles facing Born Globals are the initial resource and knowledge deficiencies, which prevent and deaccelerate growth and internationalization. Equity investments offer a solution to both of these problems and alleviate financial risks for the entrepreneurs. Independent venture capital funds and angel investors provide quick access to capital, complementary assets, industry knowledge and customer access, which otherwise would take years to accumulate through experimental learning and traditional models of growth (Drover et al., 2017).

Many studies have researched the connection between firm performance and financing options (Table 2). The common conclusion of studies focusing on venture capital and start-ups have been that venture backed firms achieve higher growth rates compared to other financing options (Engel, 2002; Peneder, 2010; Cumming et al., 2017). Engel's (2002) study, which examines German venture backed start-ups concluded that venture backed firms achieve significantly higher growth rates due to venture capital investor's ability to push these firms to a faster growth compared to other investors. Similarly, Peneder's (2010) study on Austrian venture backed start-ups found out that on average venture financed firms grow faster in terms of sales revenue and employment compared to other firms.

On top of raw growth numbers VC involvement also affects positively innovation and formation of networks. Venture capital backed firms are on average more innovative due to venture capital investors preference to invest in firms with above average levels of innovation (Peneder, 2010). In terms of network building, certification effects of VC ties appear to enhance the formation of alliance networks among VC portfolio companies (Gu & Lu, 2014).

Table 2. Equity funding impact on start-ups

Publication	Sample	Result
Engel, D. (2002). The Impact of Venture Capital on Firm Growth: An Empirical Investigation.	Total of 1074 German firms founded between 1991-1998	"Venture backed firms achieved 170 per cent points higher growth rates."
Peneder, M. (2010). The Impact of Venture Capital on Innovation Behaviour and Firm Growth.	Total of over 33000 Austrian firms, although the main result from the model IV only consists of 209 firms.	"VC financing increased the growth of sales revenue of the firms in question by 70 per cent, compared to the reference value of the control group."
Kraus et al., (2016). Drivers of internationalization success: a conjoint choice experiment on German SME managers.	Set of 2244 internationalization decisions by German SME managers.	"Financing is the most important factor for internationalization, and SMEs that finance their international endeavors with equity are considered to be more successful than SMEs that rely on debt."
Bronzini et al., (2017). Venture Capitalists at Work: What Are the Effects on the Firms They Finance?	Total of 359 Italian startups founded between 2004-2014.	"Firms financed by VCs experience a faster growth in size and become more innovative compared with other startups."
Cumming et al., (2017). Governmental and independent venture capital investments in	Total of 609 European companies that entered	"IVC-backed companies have a higher likelihood to

Europe: A firm level performance analysis.	the VICO dataset between 1984-2004.	reach a positive exit than solely GVC-backed ones.”
Bonini et al., (2019). The Performance of angel-backed companies.	Sample of 111 angel backed new ventures who received investments between 2008-2012.	“Performance and probability of survival of investee companies are positively affected by the presence of angel syndicates and the hands-on involvement of business-angels.”
Business Finland (2019). Business angel investment, public innovation funding and firm growth.	Sample of 34628 Finnish firms that were active in 2013-2014.	“Angel-funded firms perform better in terms of employment and short-term profitability than the nonfunded control firms.”

It is important to note that in these studies the type of venture capital investors that are under the scope are financial corporations also known as independent venture capital funds that specialize in startup funding. Other types of venture capital funding namely corporate venture capital which refers to non-financial corporations’ equity investments into startups are less studied as standalone. The main reason for this is that corporate venture capitals invest typically in the later larger funding rounds and less in the first funding rounds of the startup phase (Gompers & Lerner, 2002).

Start-up equity funding by individual venture capital funds and angel investors can happen in different phases of the company’s life span. Early-stage funding which happens from the outset is called seed funding. It is the first equity funding stage and represents the first official raised capital by the company. Like the name suggest seed funding can be seen as an analogy for planting a tree where the seeds growth is supported by giving it additional resources. These resources are often used to finance the first steps of the start-up including product development, building of infrastructure and market research. (Kovner, Lerner & Scharfstein, 2010).

The amount of seed funding varies significantly depending on various aspects but in general first seed rounds tend to produce anywhere from tens of thousands up to couple of millions. Industry plays a big role in determining how much capital is needed from the seed rounds. The more complex the product is the more R&D is needed thus requiring more investment whereas in some industries the product or service can be close to complete from the get-go requiring much smaller investments. The experience and networks of the entrepreneurs also have a big impact on how much the seeds rounds will provide. Entrepreneurs that have proven track record of successful ventures or have established ties to equity investors are much more likely to obtain the needed resources from seed rounds (Kovner, Lerner & Scharfstein, 2010).

After establishing themselves as a company and developing solid track record companies may opt for further funding in order to develop the business model to support long term profitability. It's typical for seed stage startups to have high potential ideas and excited customers but the company have not yet been able to fully profit from that, which have led them needing additional funding (Reiff, 2021). These additional funding rounds are called Series A, B, C, D, E, …. Further funding rounds typically raise more money compared to seed rounds and the investors are more often traditional venture capital firms (Reiff, 2021). In these rounds the company is typically over the development stage and looking to strengthen the product and talent pool of the company in order to expand to new markets and potentially develop new products taking the company to the next level (Reiff, 2021). Since the invested amounts and associated risks are higher in this stage the investors look for not only great ideas but some track record of consistent performance and strong business strategy which can support long term growth (Reiff, 2021). Further funding can also be used to acquire other companies at which point the company is often out of the startup phase and starting to resemble a middle-sized multinational.

The figure 1 illustrates the premise for the effect that equity funding has on the performance of Born Globals. Value-added benefits of equity funding such as access to know-how, contacts, networks and industry expertise are assumed to have significant positive impact on the performance of Born Globals especially since these resources are often seen as the biggest barriers of their initial growth. Both venture capital and angel investors provide largely the same benefits but according to studies e.g., (Bottazzi & Da Rin, 2001; Lerner et al., 2015) Venture Capitals are more likely to be able to raise more funding and offer better access to wider networks and industrial know-how.

Naturally funding itself is only a small aspect that impacts overall performance of Born Globals. Further theories that have been developed to explain and predict startup performance include industry organization economics, resource-based view and network theory, which all look and predict firm performance from different angles (Miloud et al., 2012). Additionally, Mostafiz et al., (2020) study on previous Born Global literature presents a holistic model for Born Global firm success where organizational learning, networking, marketing, R&D and innovation are the main capabilities that ultimately affect the performance of Born Globals. What equity funding can in best case scenarios offer on top of financial aspects is to further improve these firm capabilities through value added benefits.

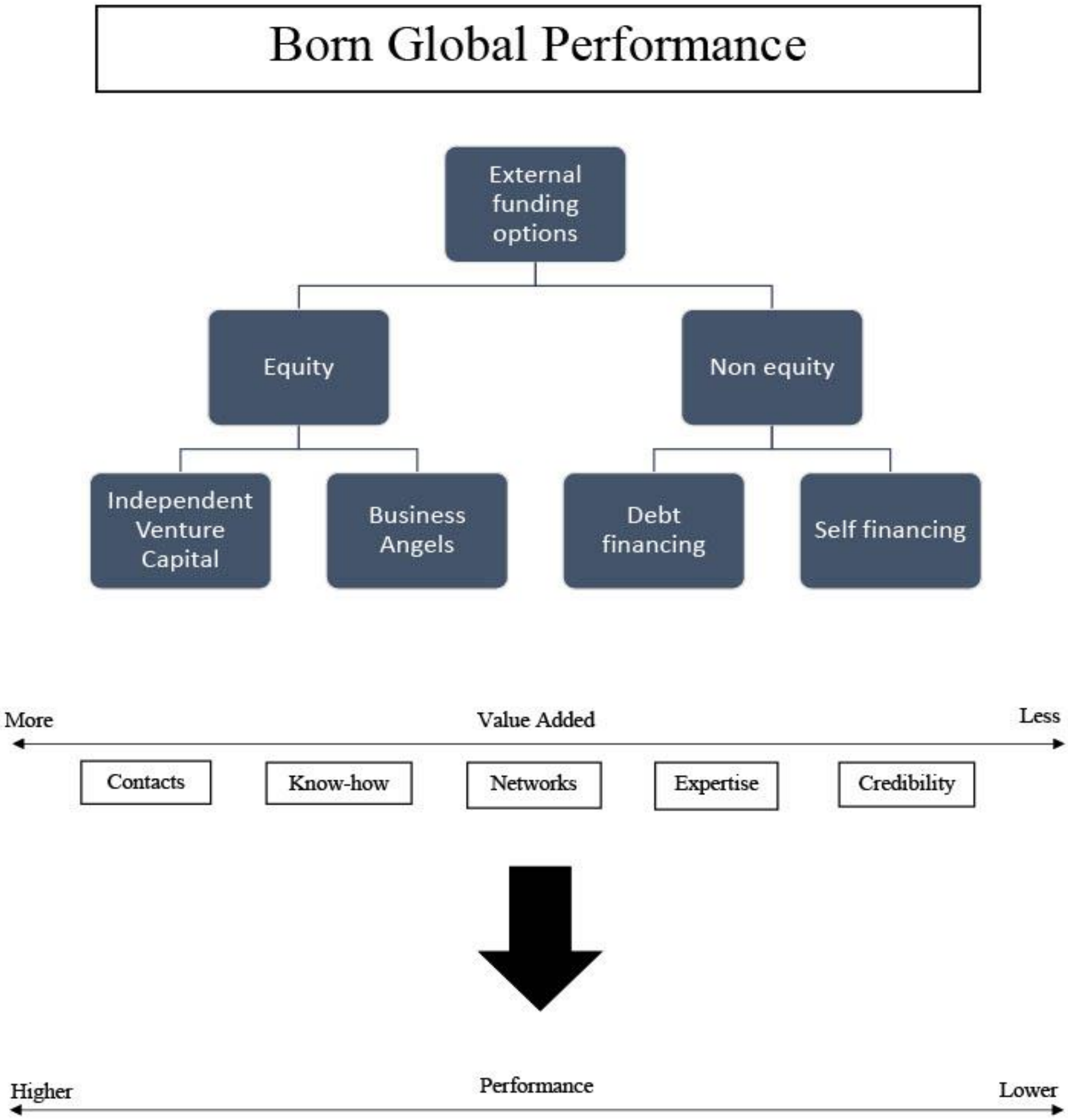

Figure 1. Summary of the theoretical framework

2.4 Hypotheses

In the upcoming statistical analysis, the following hypotheses are tested by using quantitative methods to assess if there are significant differences in performance metrics between firms differentiated by their early-stage funding decisions. The sample firms are divided into groups of VC and angel funded, only VC funded, only angel funded, and non-equity funded based on if and what type of equity funding they gathered in their first three years of operations. From the derived theoretical framework, it is theorized that early equity and especially VC funding should significantly accelerate Born Global performance, so the hypotheses are as follows:

Hypothesis 1: Firms that received equity funding should exhibit higher absolute sales growth over 5-year period compared to non-equity funded firms.

Hypothesis 2: Firms that received equity funding should have higher average annual sales growth rates over 5-year period compared to non-equity funded firms.

Hypothesis 3: Firms that received equity funding should have higher employment growth over 5-year period compared to non-equity funded firms.

Hypothesis 4: Firms that received equity funding should have established more foreign subsidiaries by the end of their fifth year compared to non-equity funded firms.

Hypothesis 5: Firms that received VC funding should have higher absolute sales growth compared to non-VC backed firms over 5-year period.

Hypothesis 6: Firms that received VC funding should have higher average annual sales growths over 5-year period compared to firms that did not receive VC funding.

Hypothesis 7: Firms that received VC funding should have higher employment growth over 5-year period than non-VC backed firms.

Hypothesis 8: Firms that received VC funding should have established more foreign subsidiaries by the end of their fifth year compared to non-VC backed firms.

Hypothesis 9: Firms that received both VC and angel funding should exhibit higher absolute sales growth over 5-year period compared to rest of the firms.

Hypothesis 10: Firms that received both VC and angel funding should exhibit higher average annual growth rates over 5-year period compared to rest of the firms.

Hypothesis 11: Firms that received both VC and angel funding should exhibit higher employment growth over 5-year period compared to rest of the firms.

Hypothesis 12: Firms that received both VC and angel funding should have established more foreign subsidiaries by the end of their fifth year compared to rest of the firms.

For the sake of clarity these hypotheses can be divided into 3 groups. Hypotheses H1, H2, H3, H4 examines equity vs no equity. Hypotheses H5, H6, H7, H8 examines VC vs no VC. Hypotheses H9, H10, H11, H12 examine firms that received both VC and angel funding vs rest of the firms.

3. RESEARCH METHOD

This chapter explains the methodological decisions and research techniques which are used to generate an answer to the hypotheses and ultimately to the overarching research question.

3.1 Methodological philosophy and choices

The research philosophy can be explained through development of knowledge and nature of that knowledge displayed as research onion (figure 2). Depending on what is the researched phenomenon different research philosophies, strategies and methods are appropriate (Saunders et al., 2007, p.102). As this research uses proven numerical quantitative data and tries to verify theory through statistical analysis, the closest philosophy of this research is positivism. Positivism is a view that whatever exists can be verified through scientific methods e.g., statistical analysis and logical proof. According to positivism only observable, measurable and empirically verifiable facts can be declared knowledge (Saunders et al., 2007, p.103).

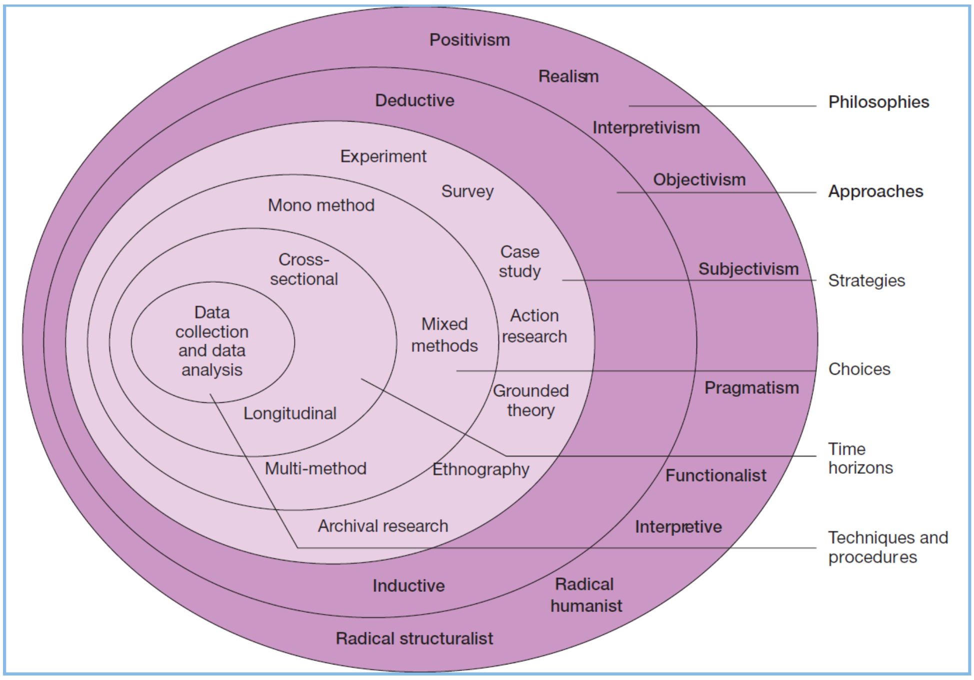

Figure 2. Research onion (Saunders et al., 2007, p:102)

This research uses mono method which is quantitative analysis from secondary data. It can be defined as deductive since the purpose of the study is to test hypotheses derived from existing literature and theories and find out if there are causal relationships between dependent and independent variables (Saunders et al., 2007). Deductive approach, which is the dominant research approach in natural sciences, first develops a theory and then tests it by using suitable testing methods (Saunders et al., 2007, p.117). Deduction tries to search and explain causal relationships between variables e.g., in this study fundings effect on performance of Finnish Born Globals. Furthermore, in order for positivism and deduction to be appropriate approach, the researcher should be unattached to what is being observed and the facts should be measurable quantitatively (Saunders et al., 2007, p.118). This study can be further categorized as correlational research which observes what is going on without directly interfering with it.

Five sequential stages in deductive approach are: 1. Formulating a hypothesis or hypotheses from theory, which can be tested (Chapter 2.4.). 2. Explanation of the concepts and variables that are being measured (Chapter 3.4). 3. Testing the hypothesis/hypotheses (Chapter 4.). 4. Analyzing the outcome of the testing either confirming or indicate the need for modification (Chapter 5.). 5. Modifying the theory or formulation of further hypotheses and repeating the steps if needed (Chapter 5.). (Robson, 2002)

3.2 Sample

The sample consists of 66 Finnish startups that have at least five years of financial data and been founded between 2009 and 2015 having their first full fiscal year at the earliest 2010 or latest 2016. All firms in the sample are either B2B software or B2C firms that have been selected to the Business Finland Young Innovative Company funding program (YIC). The YIC program is formed to assist the most ambitious, rapidly growing Finnish startups, that seek global growth. To qualify the startup must have been in operations less than five years and classified as a small company. Additionally, the firm must have a clear plan to grow in international markets and a scalable business model that enables fast international growth. Thus, firms accepted to this program often already have international activities and a global mindset, which makes them either already a Born Global or at the very least a Born Global prospect. (Business Finland YIC, 2021)

The reasoning behind choosing startups that have qualified to the YIC program is to have a sample which firstly presents a reliable set of firms that are employing a global growth strategy and secondly account for external help in terms of financial and non-financial that Business Finland provides. Multiple studies have examined the positive influence of governmental allowances and support to the new venture growth e.g., Dahlqvist et al., 2000. Since all of the firms selected to the sample are in the same governmental program it puts them in an equal playing field, which leaves the variable of other external funding as the main financial difference between them.

The reason for limiting the sample to firms that have been founded between 2009-2015 is to have at least five years of financial data and to have a somewhat similar economic situation between the firms in their first five years. In Finland, the 2010s was economically a century of slow growth following the 2007-2008 economic crisis. The interest rates stayed very low the whole century and the economic landscape in general was quite static 2010-2019 before the COVID-19 outbreak. In the screening and data gathering process some of the firms founded between 2009-2015 were eliminated from the sample because of either unclear records or their first fiscal year was over two years after founding date.

3.3 Data collection

The data is collected from various secondary sources. The sample firms are first selected from the Business Finland YIC list of accepted startups. The financial statements and founding dates of the firms are then searched from the Bureau van Dijk's Orbis database, which receives its data from original documents.

The equity funding data is from multiple different sources including but not limited to Crunchbase, Pitchbook, Dealroom, Owler, Orbis, official press releases, news articles and company websites. The data is cross-examined and from there firms are divided into groups of VC backed, angel backed, VC and angel backed, and not equity backed.

3.4 Research variables

Following test variables are used to test the hypotheses (Table 3).

Table 3. Description of research variables

Variable	Description	Type of data
External funding	Presence of professional external equity investor in the first three years of company's operations.	Binary variable (Independent variable)
Type of external funding	Categorization into groups of VC, angel funding, VC+angel funding, and no external equity investment.	Nominal variable (Independent variable)
Absolute sales growth	Sales revenue of the 5th year of operations.	Ratio variable (Dependent variable)
Average annual sales growth	Average annual sales growth rate over first five years.	Ratio variable (Dependent variable)

Number of employees	The size of the company by the end of fifth year of operations	Ratio variable (Dependent variable)
Number of foreign subsidiaries	Scope of internationalization at the end of fifth year of operations	Ratio variable (Dependent variable)

Sales growth provides data about how revenues of a venture change year by year thus it indicates how well customers are accepting the product, as a result, sales are the most commonly used indicator of new venture growth (Gilbert et al., 2006 pp:930). In new venture literature most studies use sales growth over 3- or 5-year period to assess performance (Gilbert et al., 2006 pp:935). In this case especially, five-year examination period made the most sense because most of the VC and or angel backed firms acquired their first external investments somewhere between 1-3 years old, which means that the potential boost from those investments should have had enough time to have an influence on performance at five-year mark. Additionally moving the examination period further ahead into 6-8 years would have decreased the sample too much. This study uses both absolute sales growth from forming as well as average year-to year sales growth over 5-year period in order to inspect sales performance from slightly different angles.

Another commonly used performance indicator is employment growth. Growth in employment indicates that change has occurred in the organizational composition and or strategy of the firm, which demonstrates overall progression (Gilbert et al., 2006 pp:930). Employment growth indicates increase in business activities and expansion of firm’s operations since start-ups generally require more specific expertise and highly skilled employees compared to more mature firms that have entered expansion stage who are starting to accumulate more lower skilled workers (Gilbert et al., 2006 pp:932).

Thus, comparing employment growth between similar types of firms, indicates how fast those new ventures are moving through their growth phases.

To measure internationalization, number of countries where the firm has foreign subsidiaries is used as a metric. The number of foreign subsidiaries is a structural indicator which gives information about the scope of internationalization (Dörrenbächer, 2000). Since opening fully owned foreign subsidiaries is a considerable high involvement investment, it indicates willingness to grow and commit to a specific foreign market in order to strengthen firm's position. In international new venture studies that measure firm performance, multitude of other internationalization metrics can be used, and the main metric is often international sales but since that data was not available it was not used in this study.

Other commonly used indicators when looking at firm performance are profitability and valuation. However, in this study those indicators are not used because the scope of the study is in the first 5 years and during that time most Born Globals are still in the growth phase. Traditionally used key profitability ratios are not really applicable in the fast-evolving industries where Born Globals operate because using profitability as a metric to measure performance would most likely present results that would significantly undervalue firms that are growing rapidly and have massive potential but are still making losses because of large investments. Similarly, valuation of new ventures is extremely complex area because the factors impacting valuation goes beyond financial considerations from balance sheets (Miloud et al., 2014). Valuation is impacted by future potential as well as industry characteristics, firm characteristics and other qualitative factors which are difficult to quantify (Miloud et al., 2014).

3.5 Statistical methods

In order to analyze statistical significance between the groups in performance metrics, statistical tests are needed. This statistical analysis utilizes nonparametric tests Mann-Whitney U test and Kruskall-Wallis H test, which are conducted in IBM SPSS Statistics 26 software. The reasoning behind using nonparametric tests is to have tests which does not require normally distributed populations.

3.5.1 Mann-Whitney U test

The Mann-Whitney U test investigates whether there is a statistically significant difference between two independent populations. The analysis in the Mann-Whitney U test is carried out by ranks rather than the actual data values, which eliminates the effect of outliers and examines if there is a clear trend where one groups has significantly more high scores (Field, 2012 pp:219).

This study uses 90% confidence level or p<0,10. If the calculated asymptotic significance is under the threshold value (0,10), it means there is enough variation between the groups so that the probability of the initial prediction being right is at least 90%. On the other hand, if the significance is over the threshold value of 0,10, the probability is not high enough in order that the hypothesis could be accepted. Usually in statistical analysis the confidence interval is set either 90% or 95% depending on the field and sample size. The 90% confidence threshold is commonly used in statistical analysis when looking at relatively small sample sizes. Mann-Whitney test has use in virtually every field and it is frequently used in business, healthcare and psychology to compare distributions of two groups. (Field, 2012)

The equation to calculate the test statistic U is as follows:

$$U = n_1 n_2 + \frac{n_1\,(n_1 + 1)}{2} - R_1$$

U = Test statistic

n_1 = Sample size of group 1

n_2 = Sample size of group 2

R = Group 1 sum of ranks

(Field, 2012 pp:221)

From which the z score can be calculated using the equation:

$$z = (U_1 + 0{,}5) - (\frac{U_1 + U_2}{2}) / \sqrt{\frac{n_1 n_2 (n_1 + n_2 + 1)}{12}}$$

In order for the results to be comparable to other studies, it is important to measure size of the observed effect i.e., effect size (Field, 2012 pp:227). Effect size r is calculated from the z score and size of the sample N and it is as follows:

$$r = \frac{z}{\sqrt{N}}$$

The value r indicates how strong the relationship is between two variables and the standard thresholds for small, medium and large effect sizes are <0,3 small, 0,3-0,5 medium and >0,5 large (Field, 2012 pp:227).

Important thing to note is that nonparametric tests in general have less statistical power compared to their parametric equivalents. With Mann-Whitney there is increased chance of type II error, which means: "There is more chance of accepting that there is no difference between groups when in reality difference exists" (Field, 2000, p:3). Additionally, with the Mann-Whitney test and statistics in general there is never 100% certainty that any hypothesis is correct even if there is significant support, so the only possibility is to calculate the probability of the proposed hypothesis being fitting. (Field, 2012)

In order for the Mann-Whitney test to be valid for the studied phenomenon, four basic assumptions should be met. First dependent variable should be measured at ordinal or continuous level. Second there should be two categorial independent groups, which make up the independent variable. Third the observations should be independent meaning there are not participants that are in multiple groups. Fourth the two variables are not normally distributed. (Laerd Statistics, 2018)

3.5.2 Kruskal-Wallis H test

Kruskal-Wallis H test is a non-parametric alternative to the 1-way ANOVA test as well as an extension to the Mann-Whitney U test. It has the same basic principle of analyzing if means of independent groups are equivalent, but it allows comparison of more than two groups. This test is useful in this study because companies are dived into 4 different independent groups. Kruskal-Wallis H test has the same assumptions as Mann-Whitney U test and same confidence intervals of 90% ($p<0,10$). If at least one of the groups is noticeably different from others the resulted p value will be under the $p<0,10$ threshold, which means there is significant statistical difference between some of the groups, which can be then further interpreted from the results. (Field, 2012 pp:236-240)

The equation for the Kruskal-Wallis H test is as follows:

$$H = \left[\frac{12}{n(n+1)}\sum\frac{R_i^2}{n_i}\right] - 3(n+1)$$

H = Test statistic

n = Sum of all samples

n_i = Sum of samples in particular group

R_i = Sum of ranks in particular group

3.6 Credibility of research, validity, and reliability

Reliability means producing findings that are consistent, when using similar data collection techniques and analysis. Reliability of findings can be assessed by examining three questions: 1. Does the methods produce the same results on different occasions? 2. Can other observers reach the same observations? 3. Is there enough transparency in the sensemaking from the raw data? (Saunders et al., 2007)

Validity refers to examining if the findings are about what they appear to be and are used measures correct for examining certain phenomena. For example, is there actually causal relationship between variables or can the results be explained by other external factors, such as time of the study or mood of the people that are included? (Saunders et al., 2007)

Since this study utilizes solely numerical data from balance sheets and annual reports of companies, participant error is nullified. Additionally, the measures of sales growth and employment growth are two of the most common indicators that measure firm performance, which is the purpose of this study. The reasoning for used non-parametric tests is mostly due to non-normal distributions and selected tests are common in tests that utilizes numerical data.

Reliability of the study can always be questioned because of the probability of human error in data collection but the chance of error has been decreased by doing multiple revision rounds and rerunning the statistical tests. The balance sheet data as well as some of the funding data is from Orbis database, which is Bureau van Dijk’s company, and they get their data from original documents. As long as the categorization of the selected firms is done correctly the results from this study should be able to be replicated.

4. EMPIRICAL ANALYSIS

This chapter first displays the descriptive general statistics of the sample and then displays the results from the conducted statistical analyses. In order to test the hypotheses statistical tests of Mann-Whitney U test and Kruskal-Wallis H test are used, which are presented in the previous chapter. The threshold for probability is set at $p<0,10$ (90% confidence level), meaning that if the test produces asymptotic significance levels of <0,10 the hypothesis is accepted.

4.1 Descriptive Statistics

The total number of firms that were selected for the sample is 66. Of those 66 firms only 3 ended up declaring bankruptcy after their fifth year and the average age of the rest 63 firms at the time of the analysis was 8.0 years. The oldest firms were formed in late 2009 their first full fiscal year being 2010 and the youngest firms were formed in early 2016.

The sample firms averaged 6 030 788€ in sales revenue in their fifth year of operations, their average year by year sales growth was 487,52% and they had on average 33,43 employees by the end of their fifth year. The fifth-year sales revenue ranged from 97 612 000€ to 53 000€ and the median was 992 500€. In terms of employment the largest firm employed 312 people and the smallest only 3 people, while the median was 14 people. In terms of foreign subsidiaries 16 of the 66 firms had established at least one foreign subsidiary by the end of their fifth year and the most countries by a single firm was 10.

4.2 Statistical analysis

The statistical analysis is divided into three sub-chapters which inspects performance metrics in equity funding versus no equity, Venture Capital funding versus no Venture Capital funding, and VC & Angel concurrent funding versus other arrangements.

4.2.1 Equity funding

The first four hypotheses H1, H2, H3, H4 suggested that start-ups that received any type of equity funding would exhibit significantly higher absolute sales growth, average annual growth rates, employment and larger scale internationalization compared to non-equity funded counterparts. Of the 66 firms selected for the sample 50 were equity funded and 16 were not funded by independent equity by their third year. The equity funded firms averaged 7 476 800€ in their fifth-year sales compared to non-equity firms that averaged 1 512 000€. From the non-equity funded firms the biggest fifth year score was 4 539 000€ and from the equity funded group 97 612 000€. In fact, the equity funded group had total of 8 firms that managed over 10 million in fifth year revenue.

Even though the difference in sales revenue between groups is notable when looking at the average, based on the performed Mann-Whitney U test no significant statistical difference was perceived between equity funding group (MR=33,56) and non-equity funded group (MR=33,31) and the null hypothesis could not be rejected U=397,000, z=-0.045, p=0,964, r=0,006 (Table 4, Figure 3). This is a result of equity funded group having much more spread inside the group between the firms having most of the highest and lowest scoring firms of the whole sample whereas the non-equity funded group is much more compact around the actual mean resulting in non-significant result.

Table 4. Mann-Whitney U test hypothesis 1

Independent-Samples Mann-Whitney U Test Summary

Total N	66
Mann-Whitney U	397,000
Wilcoxon W	533,000
Test Statistic	397,000
Standard Error	66,833
Standardized Test Statistic	-,045
Asymptotic Sig.(2-sided test)	,964

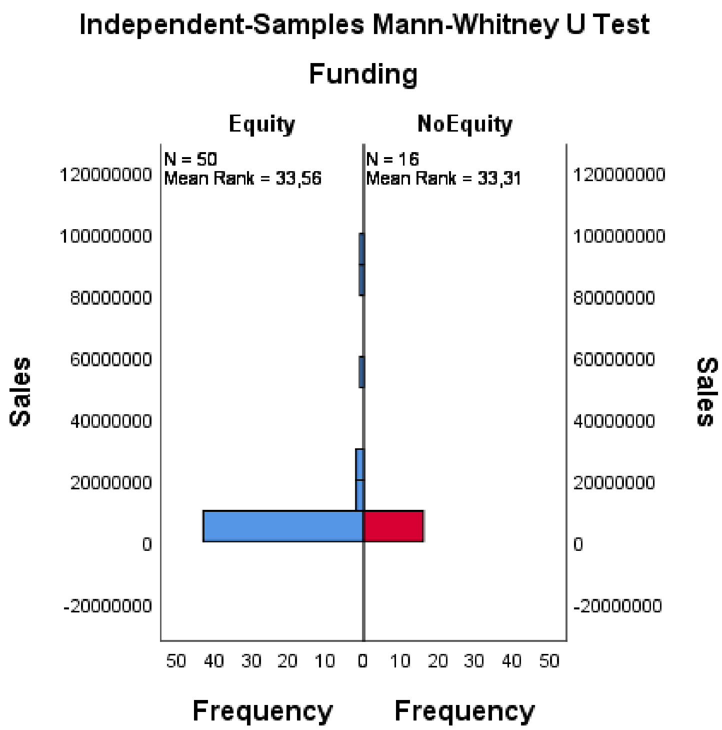

Figure 3. Mann-Whitney U test hypothesis 1

In terms of year-to-year average sales growth over 5-year period equity funded firms averaged 557,85% and non-equity funded firms averaged 268,14% average yearly growth. By conducted Mann-Whitney U test no significant difference was perceived between the equity funded group (MR=35,34) and non-equity funded group (MR=27,75) U=308,000, z=-1,377, p=0,169, r=-0,169 (Table 5, Figure 4).

Table 5. Mann-Whitney U test hypothesis 2

Independent-Samples Mann-Whitney U Test Summary

Total N	66
Mann-Whitney U	308,000
Wilcoxon W	444,000
Test Statistic	308,000
Standard Error	66,833
Standardized Test Statistic	-1,377
Asymptotic Sig.(2-sided test)	,169

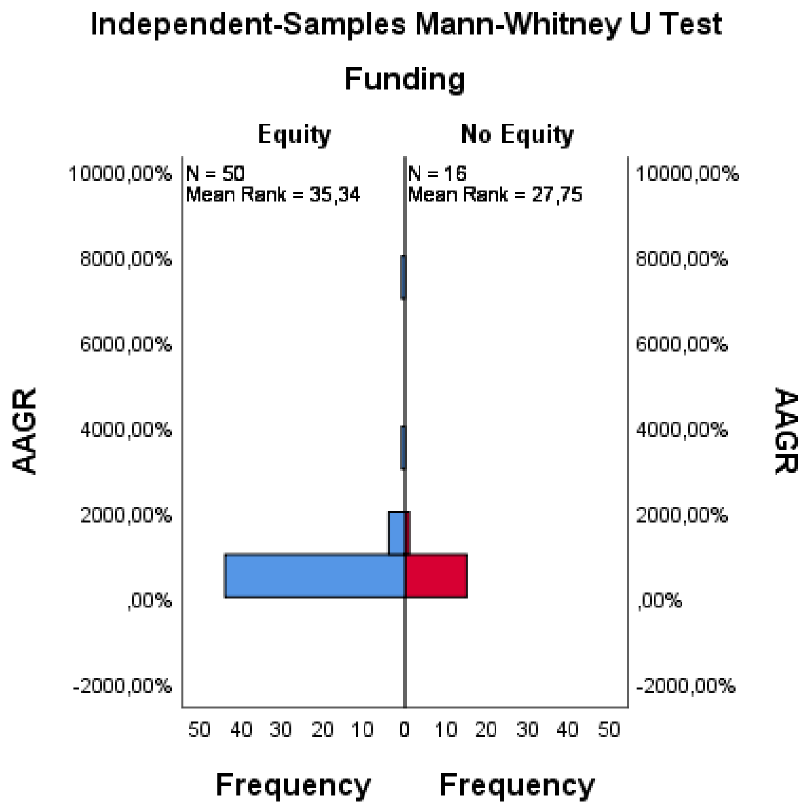

Figure 4. Mann-Whitney U test hypothesis 2

In employment equity funded firms averaged 39,4 employees by the end of their fifth year awhile non-equity funded firms averaged 12.6 employees. The big difference is mostly due to five equity funded firms that all employed over 100 people in their fifth year of operations compared to largest non-equity firm, which had only 27 employees. According to conducted Mann-Whitney U test there is significant difference between the equity funded group (MR=31,48) and non-equity funded group (MR=22,65), U=203,500, z=-1,661, p=0,097, r=0,218 and the hypothesis is accepted (Table 6, Figure 5).

Additional note: Some of the firms, which are in the sample had no employment data available, so those firms were subtracted from the employment analysis.

Table 6. Mann-Whitney U test hypothesis 3

Independent-Samples Mann-Whitney U Test Summary

Total N	58
Mann-Whitney U	203,500
Wilcoxon W	294,500
Test Statistic	203,500
Standard Error	53,570
Standardized Test Statistic	-1,661
Asymptotic Sig.(2-sided test)	,097

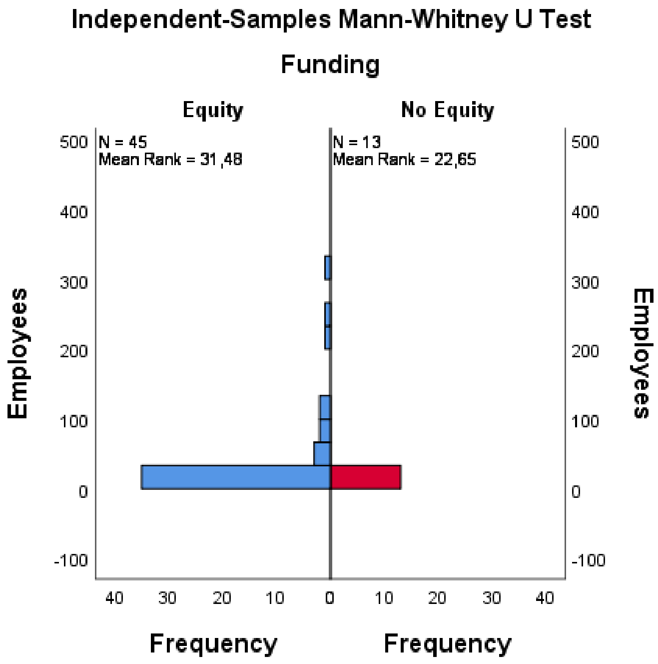

Figure 5. Mann-Whitney U test hypothesis 3

The fourth hypothesis presumed that equity funded firms would have established larger scale internationalization by the end of year 5 in terms of establishing foreign subsidiaries. The equity funded group had 13 firms that had at least one foreign subsidiary while non-equity group had 3 firms. Since the equity funded group is three times larger the percentage ends up being somewhat close between the groups and the there was no statistical significance perceived U=365,500, z=-0,687, p=0,492, r=0,085 (Table 7, Figure 6).

Table 7. Mann-Whitney U test hypothesis 4

Independent-Samples Mann-Whitney U Test Summary

Total N	66
Mann-Whitney U	365,500
Wilcoxon W	501,500
Test Statistic	365,500
Standard Error	50,188

Standardized Test Statistic	-,687
Asymptotic Sig.(2-sided test)	,492

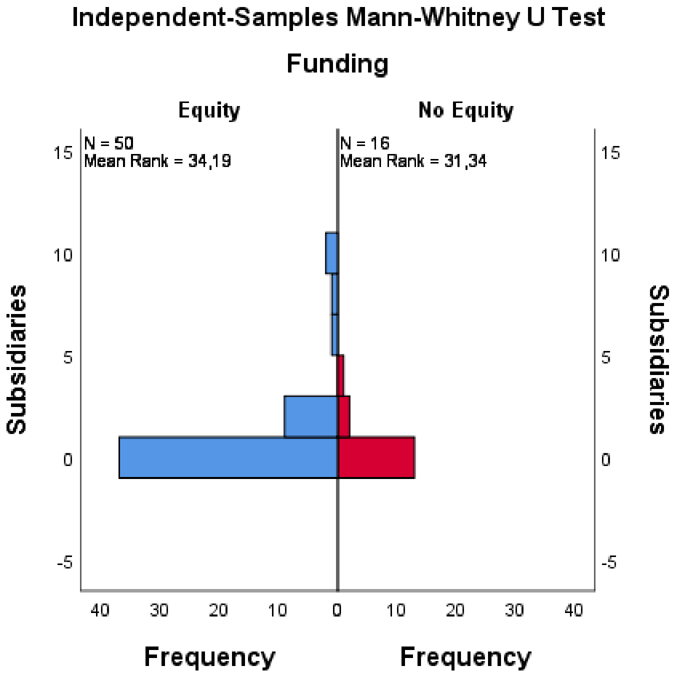

Figure 6. Mann-Whitney U test hypothesis 4

To conclude of the four equity funding hypotheses the null hypotheses was rejected only in the employment category as it was the only one that received statistical significance. However, it is important to note that the significance level of 0,097 is extremely close to the significance threshold of 0,10 and the effect size is considered small r<0,3.

4.2.2 Venture Capital funding

The next three hypotheses (H5, H6, H7, H8) assumed that VC funded firms would exhibit higher performance metrics compared to firms that did not receive VC funding. In the sample there are 47 firms that received VC funding by their third year, and they averaged 7 893 957€ in 5th year sales whereas 19 non-VC funded firms averaged 1 421 895€ in 5th year sales. Similar to equity vs non equity even though the difference in average sales figures is notable, when analyzing through Mann-Whitney U-test U=460 000, z=0,191, p=0,848, r=0,024 (Table 8, Figure 7), there is no statistical significance between the VC funded group (MR=33,79) and non VC funded group (MR=32,79) that would point to a clear trend of higher sales in one group. Figure 7 also shows that VC funded firms were the only ones in the sample that managed over €20 million in sales revenue in their fifth year highest two being almost €100 million.

Table 8. Mann-Whitney U test hypothesis 5

Independent-Samples Mann-Whitney U Test Summary

Total N	66
Mann-Whitney U	460,000
Wilcoxon W	1588,000
Test Statistic	460,000
Standard Error	70,611
Standardized Test Statistic	,191
Asymptotic Sig.(2-sided test)	,848

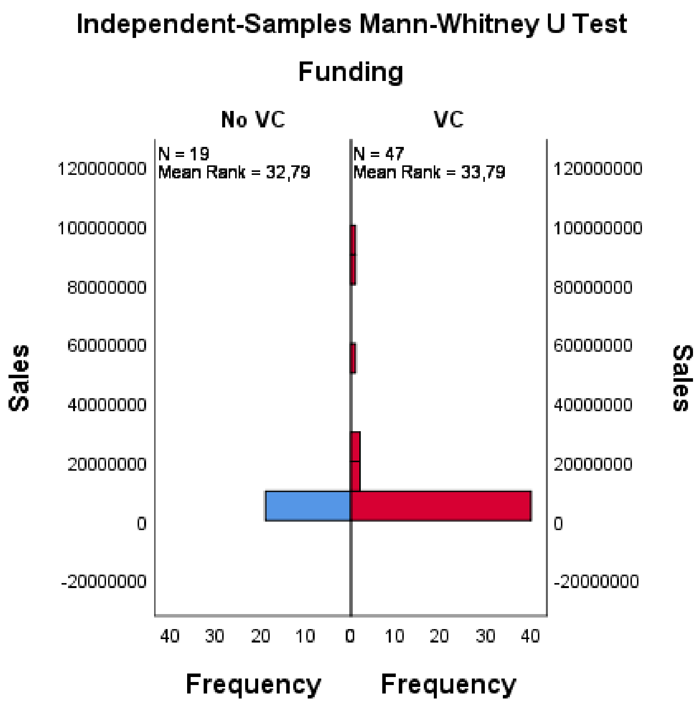

Figure 7. Mann-Whitney U test hypothesis 5

In terms of average annual sales growth percentage, the VC funded firms averaged 576,30% compared to non-VC counterparts 268,25%. Conducted Mann-Whitney test revealed that no significant statistical difference was perceived between the two groups U=533,000, z=1,225, p=0,221, r=0,151 (Table 9, Figure 8).

Table 9. Mann-Whitney U test hypothesis 6

Independent-Samples Mann-Whitney U Test Summary

Total N	66
Mann-Whitney U	533,000
Wilcoxon W	1661,000
Test Statistic	533,000
Standard Error	70,611
Standardized Test Statistic	1,225
Asymptotic Sig.(2-sided test)	,221

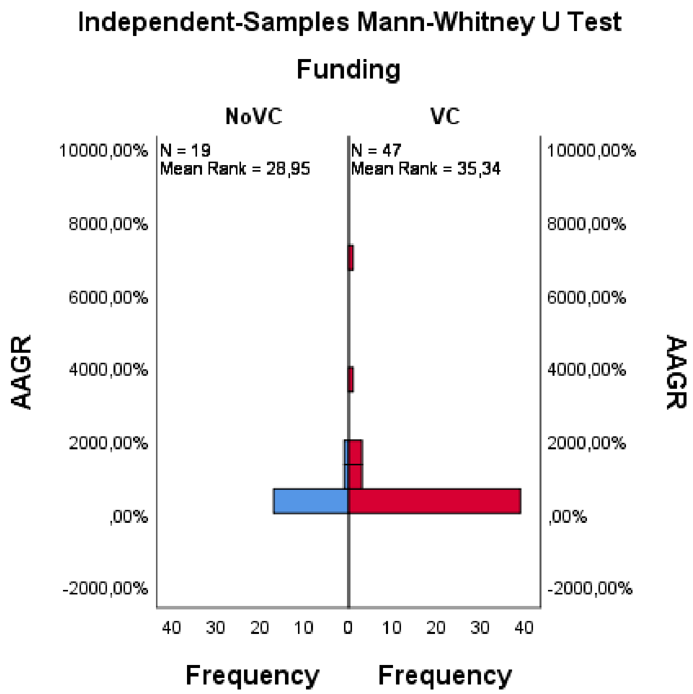

Figure 8. Mann-Whitney U test hypothesis 6

In employment VC funded firms averaged 41,3 employees compared to non-VC backed firms that averaged 12,8 employees by the end of the fifth year. According to conducted Mann-Whitney test U=431,000, z=1,655, p=0,098, r=0,217 there is statistical significance between the VC funded group (MR=31,76) and non-VC backed group (MR=23,56) so the hypothesis 7 is accepted (Table 10, Figure 9).

Table 10. Mann-Whitney U test hypothesis 7

Independent-Samples Mann-Whitney U Test Summary

Total N	58
Mann-Whitney U	431,000
Wilcoxon W	1334,000
Test Statistic	431,000
Standard Error	57,416
Standardized Test Statistic	1,655
Asymptotic Sig.(2-sided test)	,098

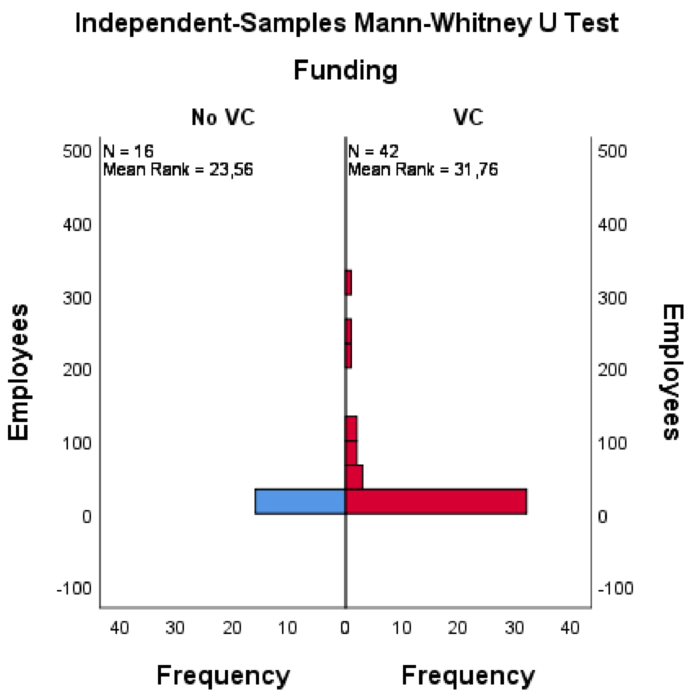

Figure 9. Mann-Whitney U test hypothesis 7

In foreign subsidiaries there were 13 VC funded firms that had established at least one foreign subsidiary at the end of their fifth year and 3 non-VC funded firms. However, there was no statistical significance perceived U=505,000, z=1,103, p=0,270, r=0,135 between VC (MR=34,74) and non-VC (MR=30,42) funded firms (Table 11, Figure 10).

Table 11. Mann-Whitney U test hypothesis 8

Independent-Samples Mann-Whitney U Test Summary

Total N	66
Mann-Whitney U	505,000
Wilcoxon W	1633,000
Test Statistic	505,000
Standard Error	53,024
Standardized Test Statistic	1,103
Asymptotic Sig.(2-sided test)	,270

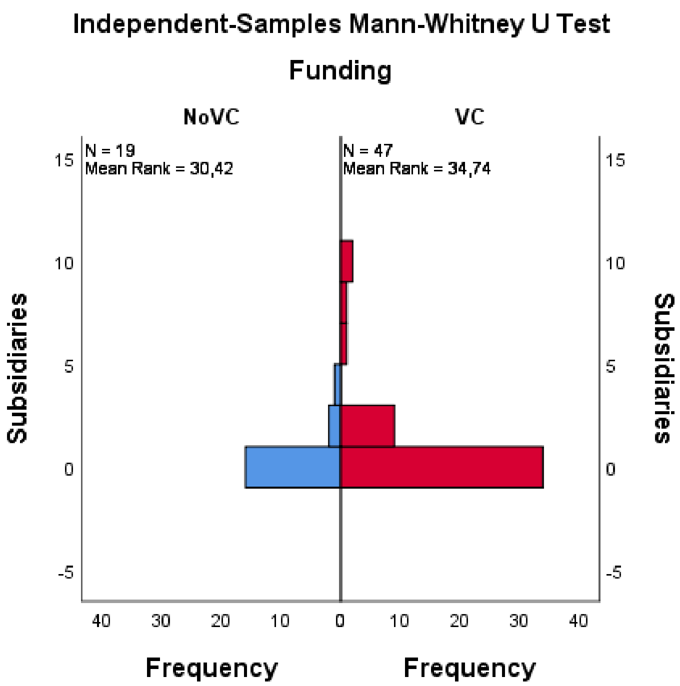

Figure 10. Mann Whitney U test hypothesis 8

The VC statistical analysis ended up overlapping with the equity funding quite a lot and similarly with the equity funding hypotheses, only in employment the hypothesis received support.

4.2.3 VC and angel funding combined

Hypotheses H9, H10, H11, H12 examined the effect that combined early-stage VC and angel funding would have on the performance of the sample firms, and the assumption was that it would lead to higher performance compared rest of the firms. First all 4 groups were compared to each other to find out if there are clear differences between one or more of the groups in any of the metrics. In order to find out if there is statistical significance between the 4 groups of firms based on their funding, Kruskal-Wallis H test was performed on all four metrics. In absolute sales growth there was not significant difference between the groups H(3)=0,303, p=0,960 (Table 12, Figure 11).

Table 12. Kruskal-Wallis test absolute sales growth

Independent-Samples Kruskal-Wallis Test Summary

Total N	66
Test Statistic	,303[a,b]
Degree Of Freedom	3
Asymptotic Sig.(2-sided test)	,960

a. The test statistic is adjusted for ties.

b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.

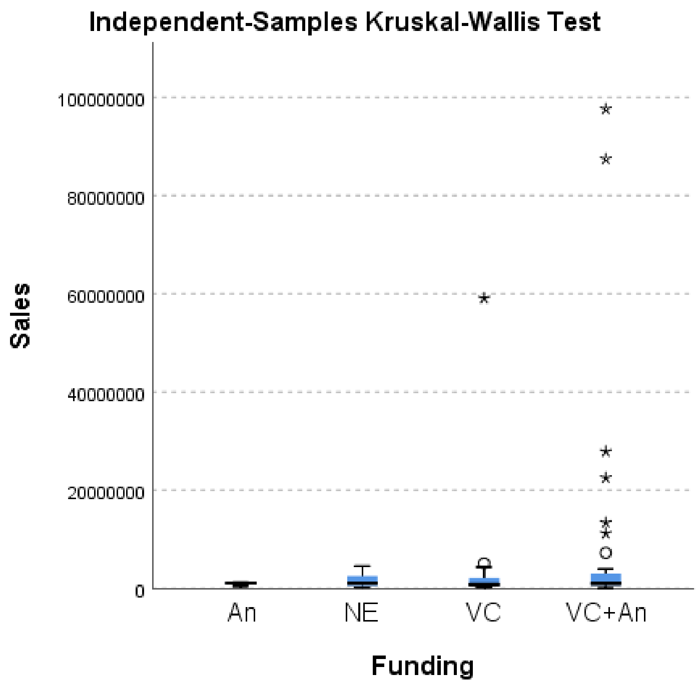

Figure 11. Kruskal-Wallis H test absolute sales growth

Unlike in absolute sales growth, in average annual growth rate there was significant difference between the groups H(3)=6,462, p=0,091 (Table 13, Figure 12). Post hoc pairwise comparison (Table 14) shows that VC and angel funded firms displayed significantly higher average annual growth rates when compared to solely VC funded (H=-12,837, p=0,033) or non-equity funded (H=-11,687, p=0,047) firms.

Table 13. Kruskal-Wallis test average annual growth rate

Independent-Samples Kruskal-Wallis Test Summary

Total N	66
Test Statistic	6,462[a]
Degree Of Freedom	3
Asymptotic Sig.(2-sided test)	,091

a. The test statistic is adjusted for ties.

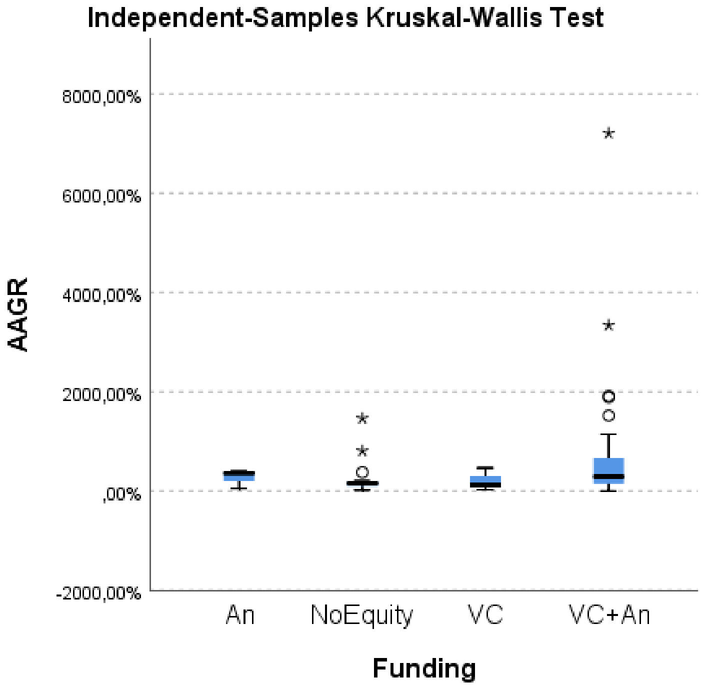

Figure 12. Kruskal-Wallis H test average annual growth rate

Table 14. Post hoc pairwise comparisons

Pairwise Comparisons of Funding

Sample 1-Sample 2	Test Statistic	Std. Error	Std. Test Statistic	Sig.	Adj. Sig.[a]
VC-NoEquity	1,150	6,899	,167	,868	1,000
VC-An	8,733	12,141	,719	,472	1,000
VC-VC+An	-12,837	6,007	-2,137	,033	,196
NoEquity-An	7,583	12,077	,628	,530	1,000
NoEquity-VC+An	-11,687	5,878	-1,988	,047	,281
An-VC+An	-4,104	11,591	-,354	,723	1,000

Each row tests the null hypothesis that the Sample 1 and Sample 2 distributions are the same.
Asymptotic significances (2-sided tests) are displayed. The significance level is ,10.
a. Significance values have been adjusted by the Bonferroni correction for multiple tests.

Further conducted Mann-Whitney U test U=333,000, z=2,122, p=0,034, r=0,310 (Table 15, Figure 13) also collaborates with the Kruskal-Wallis H test as VC and angel funded (MR=26,91) group has significantly higher average annual growth rates compared to solely VC funded (MR=17,80) firms U=333,000, z=2,122, p=0,034, r=0,310.

Table 15. Post hoc Mann-Whitney U test 1

Independent-Samples Mann-Whitney U Test Summary

Total N	47
Mann-Whitney U	333,000
Wilcoxon W	861,000
Test Statistic	333,000
Standard Error	43,818
Standardized Test Statistic	2,122
Asymptotic Sig.(2-sided test)	,034

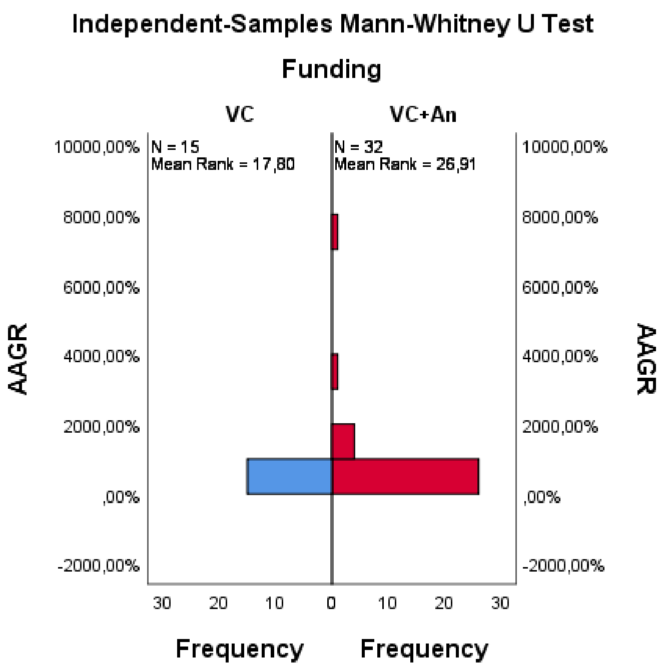

Figure 13. Post hoc Mann-Whitney U test 1

Similarly, when VC and angel funded firms are compared to non-equity funded firms in Mann-Whitney U test, there is significant difference between the groups U=348,00, z=2,012, p=0,044, r=0,290 (Table 16, Figure 14).

Table 16. Post hoc Mann-Whitney U test 2

Independent-Samples Mann-Whitney U Test Summary

Total N	48
Mann-Whitney U	348,000
Wilcoxon W	876,000
Test Statistic	348,000
Standard Error	45,724
Standardized Test Statistic	2,012
Asymptotic Sig.(2-sided test)	,044

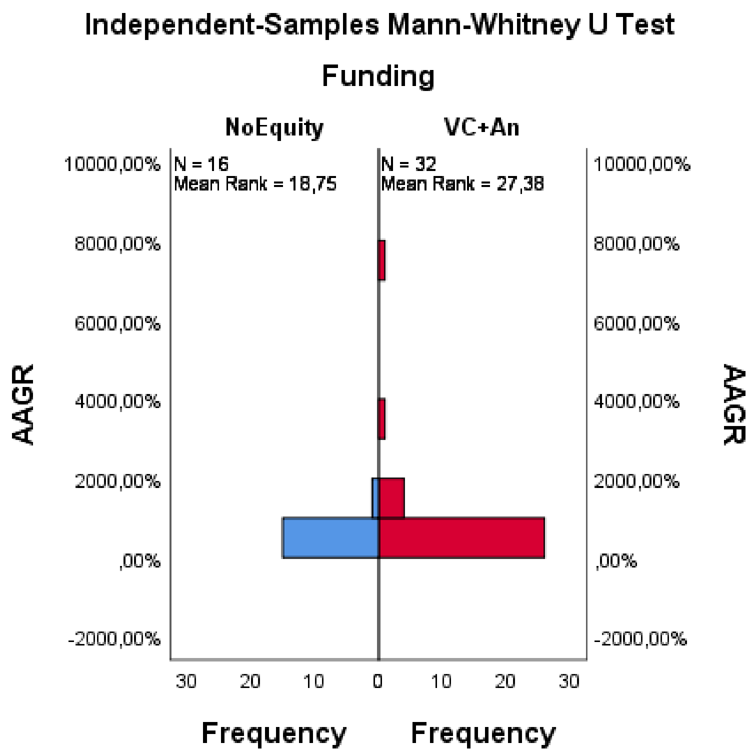

Figure 14. Post hoc Mann-Whitney U test 2

In employment even though VC and angel funded group had by far the biggest positive outliers, the differences between the 4 groups were not statistically significant by conducted Kruskal-Wallis H test H(3)=2,981, p=0,395 (Table 17, Figure 15).

Table 17. Kruskal-Wallis H test employment

Independent-Samples Kruskal-Wallis Test Summary

Total N	58
Test Statistic	2,981[a,b]
Degree Of Freedom	3
Asymptotic Sig.(2-sided test)	,395

a. The test statistic is adjusted for ties.

b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.

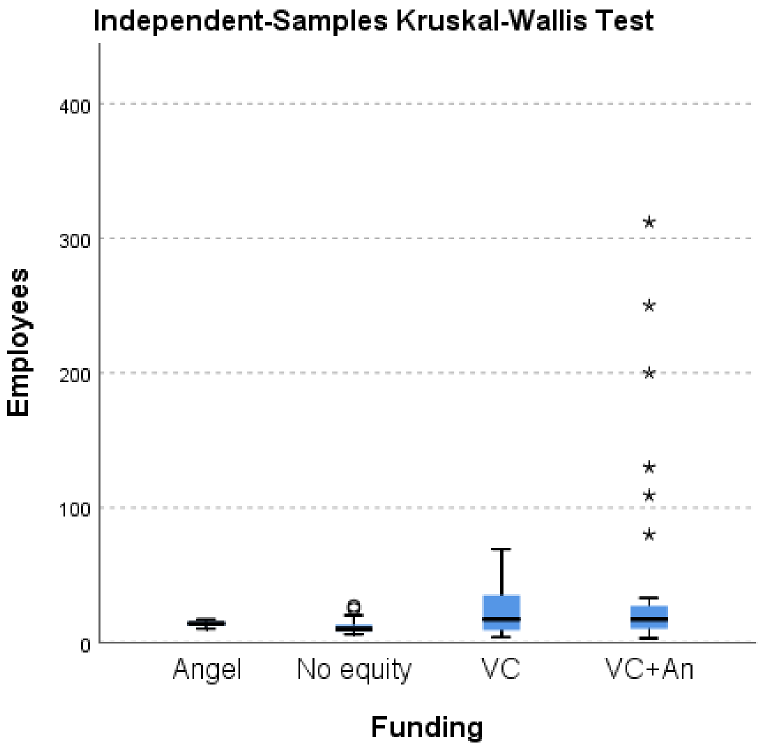

Figure 15. Kruskal-Wallis test employment

Lastly the four groups were compared to each other in internationalization using foreign subsidiaries as a measure. The VC and angel backed group had percentually the most firms that had established foreign subsidiaries 34% vs 13%, 0% & 19%. However, because of the large majority of the sample firms having no foreign subsidiaries and sample sizes being so small there was no statistical significance perceived between the groups by conducted Kruskal-Wallis H test H(3)=4,366, p=0,225 (Table 18, Figure 16**).**

Table 18. Kruskal Wallis H test subsidiaries

Independent-Samples Kruskal-Wallis Test Summary

Total N	66
Test Statistic	4,366[a,b]
Degree Of Freedom	3
Asymptotic Sig.(2-sided test)	,225

a. The test statistic is adjusted for ties.

b. Multiple comparisons are not performed because the overall test does not show significant differences across samples.

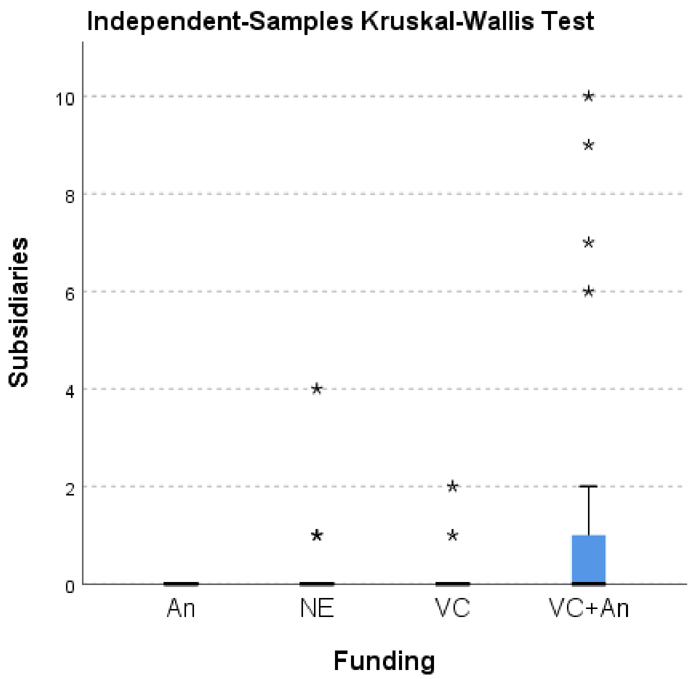

Figure 16. Kruskal-Wallis H test subsidiaries

Secondly Firms that received both VC and angel funding were compared to rest of the firms as a two-group comparison. VC & angel funded group averaged 9 121 156€ in fifth year sales while rest of the firms averaged 3 122 206€. In terms of year-to-year sales growth VC and Angel funded firms averaged 758,52% and the other group averaged 232,65% yearly sales growth. According to conducted Mann-Whitney test U=580,000, z=0,462, p=0,644, r=0,057 (Table 19, Figure 17) there is no significant difference absolute sales growth between the two groups.

Table 19. Mann-Whitney U test hypothesis 9

Independent-Samples Mann-Whitney U Test Summary

Total N	66
Mann-Whitney U	580,000
Wilcoxon W	1108,000
Test Statistic	580,000
Standard Error	77,940
Standardized Test Statistic	,462
Asymptotic Sig.(2-sided test)	,644

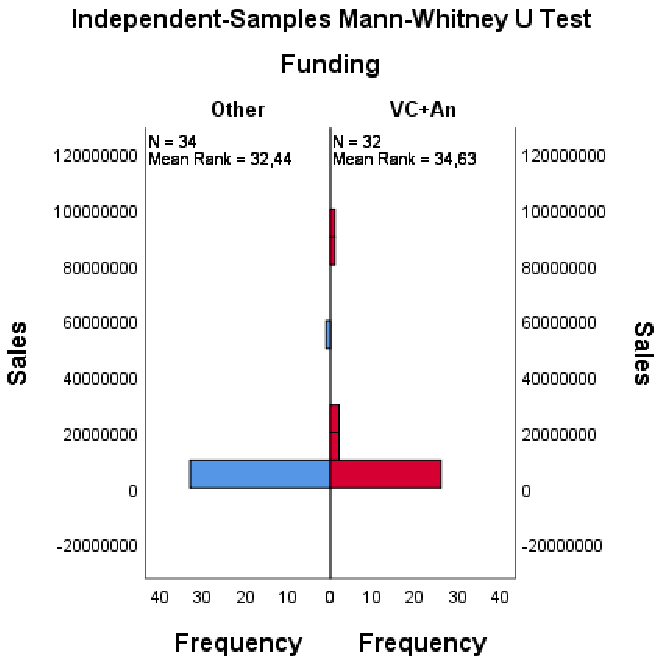

Figure 17. Mann-Whitney U test hypothesis 9

However, when analyzing year by year average sales growth rates for the first 5 years, companies that received both VC and angel funding (MR=39,44) performed statistically significantly better compared to the other group (MR=27,91) U=734,000, z=2,438, p=0,015, r=0,300 (Table 20, Figure 18). This coincides, with the previous Kruskal-Wallis H test and the received p value of 0,015 and medium effect size r=0,300 depict strong significance.

Table 20. Mann-Whitney U test hypothesis 10

Independent-Samples Mann-Whitney U Test Summary

Total N	66
Mann-Whitney U	734,000
Wilcoxon W	1262,000
Test Statistic	734,000
Standard Error	77,940
Standardized Test Statistic	2,438
Asymptotic Sig.(2-sided test)	,015

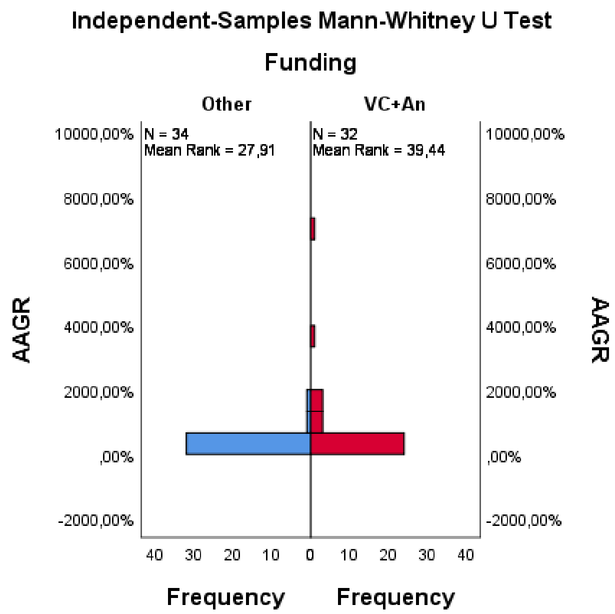

Figure 18. Mann-Whitney U test hypothesis 10

In employment firms that received both VC and angel funding averaged 49,0 employees by the fifth year compared to the other group which averaged 17,9. By conducted Mann-Whitney U test there was not significant difference between the VC and angel funded group (MR=32,12) and rest of the firms (MR=26,88) U=496,500, z=1,183, p=0,237, r=0,155 (Table 21, Figure 19).

Table 21. Mann-Whitney U test hypothesis 11

Independent-Samples Mann-Whitney U Test Summary

Total N	58
Mann-Whitney U	496,500
Wilcoxon W	931,500
Test Statistic	496,500
Standard Error	64,231
Standardized Test Statistic	1,183
Asymptotic Sig.(2-sided test)	,237

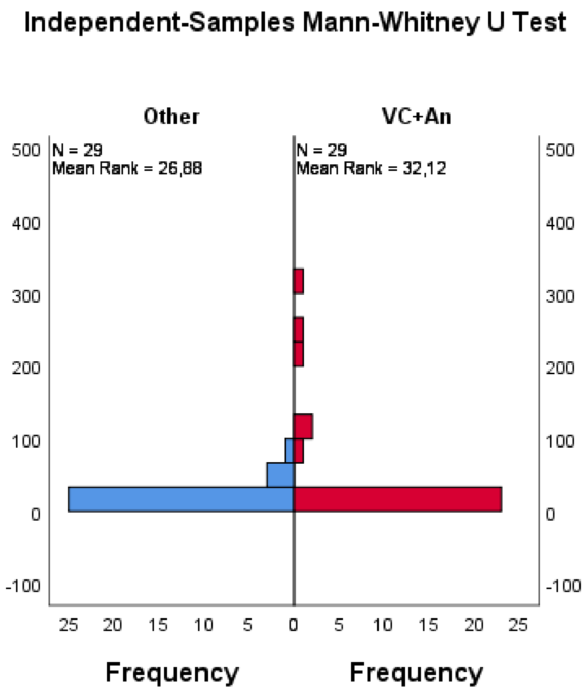

Figure 19. Mann-Whitney U test hypothesis 11

In foreign subsidiaries VC and angel funded group had 11 of 32 firms that had at least one foreign subsidiary compared to 5 of 34 in the other group, and in total numbers the VC and angel backed group had 42 subsidiaries while the other group had only 9. According to conducted Mann-Whitney U test there is significant difference between the groups U=660,000, z=1,982, p=0,047, r=0,244 (Table 22, Figure 20).

Table 22. Mann-Whitney U test hypothesis 12

Independent-Samples Mann-Whitney U Test Summary

Total N	66
Mann-Whitney U	660,000
Wilcoxon W	1188,000
Test Statistic	660,000
Standard Error	58,528
Standardized Test Statistic	1,982
Asymptotic Sig.(2-sided test)	,047

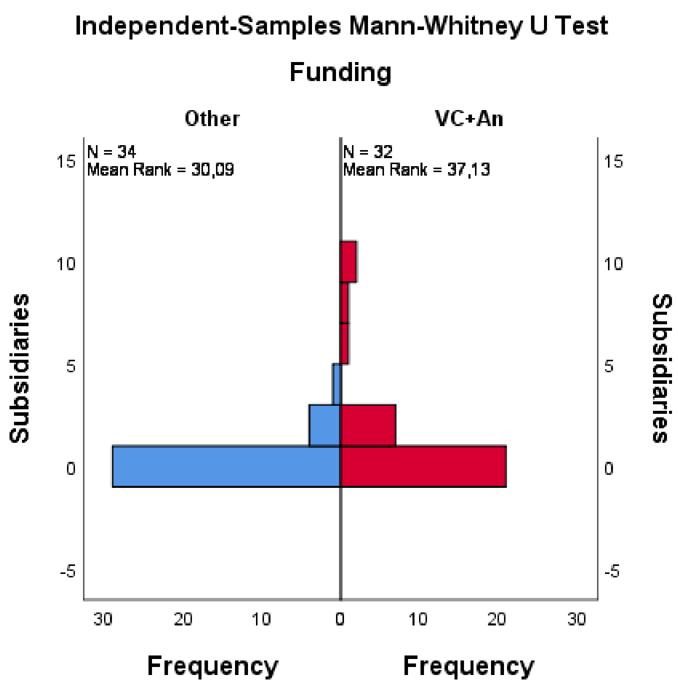

Figure 20. Mann-Whitney U test hypothesis 12

In the last set of hypotheses which examined combined VC and angel funding, in the average annual growth (H10) and internationalization (H12) the hypotheses were accepted as there was statistically significant difference between the groups. In average annual growth specifically, the difference was notable both in conducted Kruskal-Wallis H and Mann-Whitney U tests. Additionally, the effect size of average annual growth rate analysis was 0,300 which is at the medium effect size threshold. In terms of foreign subsidiaries even though there was no significance in the 4-group comparison, the VC and angel funded group had significantly higher percentual share of firms that had established foreign subsidiaries as well as bigger share of the total subsidiaries. The conducted Mann-Whitney U test in a 2-group comparison showed significant difference between VC and angel funded firms versus rest of the firms.

4.3 Limitations of the statistical analysis

This study uses quantitative analysis, which attempts to find patterns between funding decisions and firm performance. It assumes that the relatively small 66 firm sample represents entire population of comparable firms sufficiently but not exactly. The used $p<0,10$ acts as the threshold for statistical significance but hypotheses that were rejected could still be accurate for the whole population. Likewise, the accepted hypotheses could still be invalid in a larger sample of comparable firms. Additionally, the results can be inaccurate due to measurement and labelling errors since the data was collected from multiple secondary sources.

5. DISCUSSION & CONCLUSIONS

This chapter discusses the findings and implications of conducted statistical analysis and presents a brief case study into Wolt Oy in order to highlight the most notable impacts that equity funding had on their performance. Table 23 summarizes the hypotheses as well as the results from the analyses.

Table 23. Summary of the hypotheses

Hypothesis	Result
H1: Firms that received equity funding should exhibit higher absolute sales growth over 5-year period compared to non-equity funded firms.	Reject U=397,000, z=-0.045, p=0,964, r=0,006
H2: Firms that received equity funding should have higher average annual sales growth rates over 5-year period compared to non-equity funded firms.	Reject U=308,000, z=-1,377, p=0,169, r=-0,169
H3: Firms that received equity funding should have higher employment growth over 5-year period compared to non-equity funded firms.	Accept U=203,500, z=-1,661, p=0,097, r=0,218
H4: Firms that received equity funding should have established more foreign subsidiaries by the end of their fifth year compared to non-equity funded firms.	Reject U=365,500, z=-0,687, p=0,492, r=0,085.
H5: Firms that received VC funding should have higher absolute sales growth compared to non-VC backed firms over 5-year period.	Reject U=460 000, z=0,191, p=0,848, r=0,024
H6: Firms that received VC funding should have higher average annual sales growths over 5-year period compared to firms that did not receive VC funding.	Reject U=533,000, z=1,225, p=0,221, r=0,151
H7: Firms that received VC funding should have higher employment growth over 5-year period than non-VC backed firms.	Accept U=431,000, z=1,655, p=0,098, r=0,217
H8: Firms that received VC funding should have established more foreign subsidiaries by the end of their fifth year compared to non-VC backed firms.	Reject U=505,000, z=1,103, p=0,270, r=0,135
H9: Firms that received both VC and angel funding should exhibit higher absolute sales growth over 5-year period compared to rest of the firms.	Reject U=580,000, z=0,462, p=0,644, r=0,057
H10: Firms that received both VC and angel funding should exhibit higher average annual growth rates over 5-year period compared to rest of the firms.	Accept U=734,000, z=2,438, p=0,015, r=0,300

H11: Firms that received both VC and angel funding should exhibit higher employment growth over 5-year period compared to rest of the firms.	Reject U=496,500, z=1,183, p=0,237, r=0,155
H12: Firms that received both VC and angel funding should have established more foreign subsidiaries by the end of their fifth year compared to rest of the firms.	Accept U=660,000, z=1,982, p=0,047, r=0,244

The 66 sample firms were divided into 4 groups depending on their early-stage financing, The groups were 1. VC & angel funded Born Globals, 2. Only VC funded Born Globals, 3. Only angel funded Born Globals, 4. Born Globals that did not receive VC or angel funding. The groups were compared to each other as well as combined in some of the statistical analyses to measure performance.

5.1 Equity funding hypotheses H1, H2, H3 & H4

Previous studies that have examined the connection between private equity investments and firm performance from the last 10 years e.g., (Meles et al., 2014; Battistin et al., 2017; Peneder, 2010) have produced results that have indicted positive effect on sales and employment compared to non-equity funded counterparts. Looking at the descriptive statistics and pure averages of the sample, equity funded firms performed notably better. The equity funded group had 8 firms that had over 10 million in fifth year sales revenue while the largest from the non-equity group had just under 5 million. However, when looking at the mean ranks of the groups, the equity funded groups scored only slightly better 33,51 vs. 33,31 and thus the Mann-Whitney U test did not find significant difference between the groups. In average annual sales growth rate, the difference was more notable in mean ranks 35,34 vs. 27,75 but not significant enough that the hypothesis could be accepted p=0,169.

Hypothesis 3 examined employment and likewise with sales, the equity group had clear positive outliers which affected the average significantly. However, unlike in sales the conducted Mann-Whitney U test found significant difference between the groups p=0,097, r=0,218. Even though the hypothesis was accepted the relative closeness to the 0,10 threshold and small effect size of 0,218 does not indicate extremely strong significance. Lastly in internationalization there was no significant difference perceived, even though again the equity funded group had the notable outliers. That largely was the theme in all equity versus non equity comparisons, where the equity funded group had few clear outliers that outperformed rest of the sample firms by a large margin but since large majority of the firms in both groups had similar scores, the Mann-Whitney test only found significant difference in employment therefore H3 was accepted and H1, H2 & H4 rejected.

5.2 Venture Capital funding hypotheses H5, H6, H7 & H8

Likewise with overall equity funding, venture capital funding has been linked to higher start-up performance by multiple studies e.g., Engel, 2002; Peneder, 2010; Cumming et al., 2017. Similarly, some studies e.g., Puri & Zaruski, 2012 report that VC-backed firms achieve higher levels of revenue growth but not necessarily higher levels of profitability and are more likely to survive for 5 years as opposed to non-VC-backed firms. In the statistical analysis since VC funded firms ended up overlapping a lot with equity funded firms the results were similar to the equity funding statistical analysis. The VC funded group had the clear positive outliers, but significant difference was only perceived in employment p=0,098, r=0,217 so the H7 was accepted and H5, H6, H8 rejected.

5.3 VC and angel funding combined hypotheses H9, H10, H11 & H12

The third set of hypotheses H9, H10, H11, H12 assumed that Born Globals that had been able to attract both VC and angel funding in their first three years would exhibit higher performance metrics at fifth year mark compared to the rest of the sample firms, who were only able to either attract one type of equity funding or no equity funding at all. When all 4 groups were measured to each other in all of the performance metrics, according to conducted Kruskal-Wallis tests the only metric where there was significant difference between groups was in average annual sales growth. The significant difference was between VC & angel funded firms versus only VC funded firms as well as VC & angel funded firms versus non-equity funded firms (Table 14). Similarly, when VC & angel funded firms were measured against rest of the firms in a two-group comparison there was significant difference between the groups U=734,000, z=2,438, p=0,015, r=0,300 (Table 20) so the hypothesis 10 was accepted.

Even though in absolute sales growth and employment the VC and angel backed firms averaged almost three times bigger totals compared to the rest of the firms, the conducted Mann-Whitney U tests did not find significant difference between the groups. However, in foreign subsidiaries the VC & angel funded group performed significantly better U=660,000, z=1,982, p=0,047, r=0,244 (Table 22) and the hypothesis 12 was accepted.

Looking at the analysis as a whole it would seem that equity funding in general enables more investments into expansion, which shows in higher employment growth compared to non-equity funded firms. Similarly, when examined through foreign expansion, firms that received early-stage VC and angel funding were able to establish more foreign subsidiaries compared to rest of the firms, which makes sense since they were on average able to generate more resources from those early funding rounds than firms that had no equity funding or only one type of equity funding. This also correlates with previously discussed entry mode decision effects on employment growth, where firms that use high commitment entry modes such as direct foreign investments usually see higher employment growth compared to less intensive modes such as exporting or licensing (Drover, 2017).

In terms of performance in sales the only hypothesis which received support was H10 which was average annual sales growth in VC & angel funded firms compared to the rest of the firms, which was somewhat surprising because in absolute sales growth there was no significant difference perceived. One simple explanation could be that firms that were included in the VC and angel funded group had on average smaller first year sales compared to rest of the firms, which would also explain why they needed more early-stage equity funding. Still when looking at average absolute sales growth, VC and angel funded firms (9 121 156€) were clearly ahead of rest of the firms (3 122 206€). Furthermore, when analyzing through descriptive statistics namely averages, all the conducted hypotheses were on the right tracks and the performance in averages supported previous studies. This was largely because the group which were funded in their first three years by VC and angel investors simultaneously had by far the two biggest positive outliers Swappie and Wolt.

5.4 Case Wolt

Wolt is an interesting story because it perfectly encapsulates a successful Born Global journey. The firm was founded in 2014 and in November 2021 it was sold for roughly 7 billion euros. Wolt has a very typical Born Global journey where they started from Finnish market but quickly realized that they had to internationalize because Finland was too small of a market for them (Lappalainen, 2021). Wolt was able to internationalize fast and effectively across Europe and into Asia in three years and by the end of their fifth year they were in operation in 23 countries and over 80% of their sales came from abroad (Raeste, 2020). They were also able to adapt their product quickly when it became clear that there was much more potential in creating their own distribution network on top of their initial idea which was to only create an application which would help people order food on advance (Raeste, 2020). This ability to be flexible and be able to change course quickly and use disposable tools to create something new is commonly known in behavioral studies as entrepreneurial bricolage (Baker & Nelson, 2005).

During their first full year they managed to get funding from Lifeline Ventures as well as from multiple angel investors totaling €2,4 million (Raeste, 2020). Over the years Wolt has had multiple additional funding rounds totaling up to 800 million euros, while the founders have not invested any of their own money (Mäntylä, 2021). This enabled the founders to take bigger risks and focus on sales growth and geographical expansion rather than focusing on making the firm profitable as soon as possible (Mäntylä, 2021). In their expansion Wolt used wholly owned subsidiaries in the foreign countries, which is a high-commitment entry mode that requires sizable investments, which is usually not typical for Born Globals, but it was necessary because of the nature of their business model.

Some of the early investors pointed out in Raeste's HS news article that they did not necessarily think that the initial business idea was anything too spectacular at first but rather they had confidence in the founders, which coincides with previous studies e.g., Beckman et al., 2007 where team makeup and capabilities were found to be in significant role in attracting VC funding. After they got their first VC and angel funding and they developed their business idea further, more and more investors became interested as they saw the potential. In the Raeste's article there is also a mention that the rapid growth and internationalization was prerequisite for the VC investments meaning the VC investors expected their investments to be used in growth and expansions over anything else.

In an interview conducted by Elina Lappalainen in Kasvun Rakentajat Podcast (2020) one of the founders of Wolt Miki Kuusi spoke about how their growth strategy was influenced by one of the early VC investors EQT Ventures senior advisor Kees Koolen, who became board member of Wolt after the investment in 2016. Koolen who co-founded Booking.com and was involved in building Uber, advised Wolt and Kuusi specifically and familiarized them with an internationalization strategy called blitz scaling.

Blitz scaling in short means aiming for hyper growth by focusing on speed and growth over profitability and even product development in order to seize a market and become market leader as fast as possible (Sullivan, 2016). When in traditional internationalization the focus is on planning carefully in order to minimize mistakes, in blitz scaling the idea is to plan fast and correct and learn from mistakes as they arise and develop product in the process of internationalization (Sullivan, 2016). Probably the most notable blitz scaling firm in the past century has been Uber, which has expanded rapidly into new markets without necessarily respecting the laws and traditions of those countries and cultures which has generated lot of controversy. Koolen being at the center of some of these firms who first used blitz scaling and having learned from those companies' mistakes, was able to advice Wolt on how to use more of a sustainable version of blitz scaling (Lappalainen, 2020).

Wolt used sort of a hybrid strategy of traditional internationalization and blitz scaling in their expansion, where they first couple of years expanded gradually to neighboring markets and developed their product until it was on solid ground. After they had learned from those first expansions, they were able to use those experiences and adopt more rapid expansion strategy at their third year. Still Wolt is probably the best example of Finnish firm that has used blitz scaling in their internationalization even though their speed and scope is not anywhere close to their international counterparts who has used more radical version of that strategy. (Lappalainen, 2020)

Thus, Wolt has lot of common characteristics when looking at the biggest Born Globals of past century most notably Airbnb and Uber. All these companies have not yet made profit for the duration of their time even though they have had hundreds of millions in annual sales. In case of Wolt their losses have increased every year of their operations while their sales have significantly risen every year. This makes valuating the company extremely tricky because on top of the increasing losses they do not have much of collateral or tangible assets but rather their whole wealth is built on equity funding (Raeste, 2020). In the end though Doordash did purchase Wolt for 7 billion, which highlights the massive valuation based on annual growth and future potential made mostly possible by huge early equity investments.

5.5 Conclusions and suggestions for future research

The research question of this thesis was "***How does different funding choices affect the performance of Finnish Born Global start-ups?***" In the constructed theoretical framework, the assumption was that value added benefits of equity funding would push Born Globals into better performance when looking at sales and growth compared to non-equity funded counterparts. The conducted statistical analysis and further brief case study into Wolt suggests that VC funded firms are able to grow faster compared to rest of the firms in terms of employment. The biggest positive effect that equity funding and especially VC funding seems to have is that it enables these start-ups to take bigger risks and aim for rapid growth and foreign expansion without worrying about being profitable early on.

Since VC investors look for high growth potential and expect high growth after investing, it pushes those start-ups to take risks and focus on expansion, which when done successfully manifests in fast sales and employment growth. Additionally, these VC funded firms are on average able to utilize higher commitment entry modes because they can simply gather more capital from funding rounds and invest more money in foreign operations which further adds to the growth potential compared to non-equity and solely angel funded firms.

On top of the hypotheses that received statistical significance, the descriptive statistics reveal that VC funded start-ups had the clear positive outliers when it comes to growth and internationalization metrics. Of the collected 66 firm sample the first 9 ranked by fifth year sales were all VC funded start-ups and similarly by average annual growth top 5 were VC funded. In employment top 12 were VC funded and in internationalization the only firms 4 out of 66 that had established subsidiaries in at least 5 different foreign markets were all VC funded.

This would suggest that VC funded firms are more likely to have these positive outliers compared to firms that are funded by loans or cash flow, or solely by angel investors. Of course, not every VC funded Born Global venture is successful and sometimes no matter how much money is put into the project it eventually fails, but those that become the biggest success stories usually have similar growth paths.

Nevertheless, it is safe to assume that the discussed value-added benefits of equity funding had at least some added positive impact on those outlier firms that were funded by VC. Especially the added network benefits and certification factor of early VC funding enables them to get more equity funding in later stages, which often leads to compounding positive effects in growth (Elo et al., 2021). In Wolt's case the early involvement of well-known VC and angel investors not only saved Wolt from bankruptcy but also brought along massive later stage investments from the biggest VC funds in the world.

Thus, in terms of managerial implications the results from this study would suggest that acquiring Venture Capital funding early on is recommendable if the purpose of the start-up is to aim for fast growth and expansion. On top of aforementioned network and certification benefits, by simply getting adequate funding the founders if they are the main decision makers can focus on making the best possible expected value decisions rather than let external financial pressures sway their decisions. If the start-up is mostly funded by loans and collateral, common situation is that the founder has to weigh their own situation into the equation when making decisions about investments into expansion, which leads to lessened risk tolerance and potentially missed opportunities. Obviously, the increased risk taking can have its own downsides and in entrepreneurial theory that is often referred as moral hazard. Moral hazard in short explains the potential for entrepreneur's lowering effort as his ownership of the company decreases (Mishra & Zachary, 2014). This is exactly why after investing into any company the equity investor has incentive to not only monitor the situation but to offer every possible resource available which often helps the company reach its full potential.

This study extends to the previous research on Born Globals and particularly equity fundings role in their growth. Born Globals are becoming increasingly common in Finnish start-up scene, and it is not a reach to forecast that some if not most of the next big start-up success stories are going to be Born Globals. Further higher scale research into optimizing Born Global performance as well as studies covering more strategic aspects is needed in order to help build sustainable companies out of these rapidly internationalizing innovative start-ups.

To improve the understanding of mechanisms behind building stable companies out of Born Globals after their growth phase, further interesting study could be to investigate if there is a connection between early years profitability or lack thereof and long-term success especially when the time frame is longer for example 8 or 10 years. In another words, does early-stage high risk-taking and aggressive investing in expansion yield better results on average in the long run when compared to less riskier approaches in Born Globals. If the results from that analysis would favour high risk-taking and rapid expansion, equity investment's role in the early phases of Born Globals would be potentially even more reinforced.

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APPENDICES

APPENDIX 1: List of sample firms

VC & Angel funded

BrandBastion Oy

Cabforce Oy

CALLSTATS I/O Oy

Casambi Technologies Oy

Cocouz Oy

Digital workforce Services Oyj

Epic Foods Oy

Freska Finland Oy

Futureplay Oy

Futures Platform Oy

Grand Cru Oy

Hostaway Oy

Kommeet Oy (Smilee)

OURA Health Oy

P2S Media Group Oy

Qon Oy

Recolor Oy (Sumoing)

Shark Punch Oy (Matchmade)

Small Giant Games Oy

Smarp Oy

Smartly.io Solutions Oy

Supercell Oy

Swappie Oy

Talentadore Oy

Thinglink Oy

TrademarkNow Oy

Treamer Oy

Uplause Oy

Walkbase Oy

Wolt Enterprises Oy

Yepzon Oy

Youredi Oy

Solely Angel funded

Bluugo Oy

eHaven Oy

Framery Oy

Solely VC funded

AddSearch Oy

Arilyn Oy (Robust North)

Ceruus Oy

Emmy Clothing Company Oy

GameRefinery Oy

GetJenny Oy

IndoorAtlas Oy

Kampiki Solutions OY

Liveto Group Oy

MariaDB Corporation Ab

Netmedi Oy

Seriously Digital Entertainment Oy

Utopia Analytics Oy

Verto Analytics Oy

Videoly Oy

Non-equity funded

A.S.Helsingo OY Ab

BilleBeino Clothing and Accessories Oy

Dear Lucy Oy

Eye Caramba Oy

Midaxo Oy

MOST Digital Oy

Oy Slurp Ab

ParkMan Oy

Piceasoft Oy

Pole Bicycle Company Oy

Quuppa Oy

Rye Rye Oy (Kyrö Distillery Company)

Sniffie Software Oy

Superplus Games Oy

Trustmary Group Oy

Vainu. io Software Oy

Appendix 2: Descriptive statistics

	Average	Median	Min	Max
Absolute Sales growth	6 030 788	992 500	53 000	97 612 000
Average annual sales growth	487,62%	203,21%	-2,25%	7207,43%
Employment	33,43	14	3	312
Number of foreign countries where fully owned subsidiaries	0,77	0	0	10