The Survival of Accelerated Startups:

A qualitative comparative analysis of Kiuas business accelerator

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Master's thesis in Information Systems

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Abstract

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Abstract: This thesis analyzes the impact of Kiuas business accelerator on startup survival. The study assessed previous research that has used fuzzy set qualitative comparative analysis (fsQCA) to analyze business incubator and accelerator programs' impact on firm survival. The analysis showed that companies with low-profit margins located outside the Helsinki region survive more often than other accelerated companies. Furthermore, large-sized and non-SaaS business-to-business companies were also identified among sufficient conditions. Finally, this thesis discovered that adding financial information to the fsQCA can yield meaningful results, which previous research has not used in a similar way.
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List of Acronyms

csQCA	Crisp Set Qualitative Comparative Analysis
fsQCA	Fuzzy Set Qualitative Comparative Analysis
mvQCA	Multi-Value Qualitative Comparative Analysis
QCA	Qualitative Comparative Analysis
R&D	Research and Development
RC	Research Question
RBV	Resource-Based View
VC	Venture Capital
YC	Y-combinator

1 Introduction

Founding a viable business is hard. The startup journey, which many enthusiastic entrepreneurs embark on, is affected by several factors, such as the founding team's professional experience, prior entrepreneurial experience, and access to capital. (Blank, 2021) To support the development of nascent businesses, business accelerators offer support for startups by stimulating and supporting entrepreneurial activity.

Accelerator programs have their roots in business incubators. Incubators are the first generation of business support programs from the 1950s found in the US. The public sector established incubators to stimulate local economic growth and entrepreneurial activity, and since then, business incubators have iterated and developed throughout time. In 2005, the first business accelerator program named Y-combinator was launched in the US. Since then, new accelerator programs have spread globally at a fast speed. The number of accelerators has grown in Europe during the past few years, gaining notable support from the public sector to foster the collaboration between policymakers and the accelerator practitioners. (Del Sarto et al., 2020, p. 4) The rapid growth of accelerator programs globally has also fostered the rise of startup communities in Finland. There are over 40 incubator and accelerator programs in Finland, and one of the most prominent programs is the Kiuas business accelerator.

Despite the common assumption that business accelerators boost the survival rate of the participating companies, there is seemingly little academic research on the subject. Therefore, this thesis will explore the current academic literature on business incubators and accelerators impacting the survival of participating startup companies. The research will focus on companies that have participated in the Kiuas business accelerator and analyze what type of alumni companies have acquired improved survival rates.

1.1 Thesis structure

This thesis has the following structure. The first chapter introduces the main points of the thesis, and the second chapter lays the theoretical ground for the thesis. The second chapter begins by discussing startup survival, then moving on to discuss business incubators and accelerators programs globally and accelerator programs in Finland. The final topic is analyzing the current literature on how startup accelerators impact the participant companies' survival rate, which is the main point of interest in this thesis.

The third chapter focuses on methodology. This chapter gives a thorough description of fuzzy set qualitative comparative analysis, the data analysis tool used in this thesis, and how the steps have been taken to analyze the sample in this thesis. The fourth chapter explores the findings of the analysis, and the fifth chapter provides a detailed discussion of the findings. Finally, the sixth chapter delivers final comments on the thesis and provides suggestions for further research.

1.2 Research questions

The main interest of the thesis lies in analyzing what type of configurations can be found in the presently active companies that have participated in the Kiuas business accelerator program. The selection of research questions for this thesis has considered the past literature and the available data of the alumni companies from the previous Kiuas accelerator programs. Therefore, the thesis' research questions (RQ) are the following:

RQ1: Which configurations have been identified in the previous literature among the accelerated companies that have survived?

RQ2: Which configurations can be found among Kiuas alumni companies that are active today?

In this case, the so-called “accelerated” companies are primarily companies that have participated in a business accelerator program, but possibly in an incubator program.

1.3 Motivation for the thesis topic

Business accelerator programs and startup hubs have attracted much attention. In Finland, there have recently been published books about experiences in the startup social environments (e.g., Helaniemi et al., 2018). The fascination around the startup lifestyle has inspired entrepreneurial-minded people to join startup communities and create companies. In the capital region of Finland, one of the most notable startup hubs is the Aalto Entrepreneurship Society, which is where Kiuas was founded. (www.kiuas.com) Later on, Kiuas would become a private entity, which is the birthplace of Kiuas business accelerator.

The author of this master's thesis is the founder of Fennet Ltd, and the company has attended the Kiuas business accelerator spring batch 2022. The spark for writing about this topic was to assess what type of companies survive after the acceleration phase to boost the chances of survival for Fennet. In addition to personal interest, this thesis follows the suggestions by Mas-Verdú et al. (2015) and studies the impact of business accelerators on company survival in a somewhat geographically novel location, namely Finland.

2. Theoretical background

This section will describe the prior research regarding the survival of startup companies that have attended business incubator and accelerator programs. This section will begin by exploring the broader topic of startup survival, then explore the literature about business accelerators and incubators and assess their differences. The accelerator and incubator programs in Finland will also be covered. Finally, this section concludes by assessing prior studies regarding the impact of accelerator programs on the attending companies' survival rate. As mentioned earlier, the first research question examines which configurations have been found in prior articles to influence the survival rate of participating companies.

2.1 Startup survival

There has been extensive research on the topic of firm survival. According to Del Sarto et al. (2021, p. 4), there are two main literature strands on company survival: one strand concerns the external factors and the other the internal factors. The first strand examines how external factors, such as macroeconomic growth, interest rates, and unemployment rate, affect startup survival. The second strand, internal factors, explores how research and development (R&D), advertising, export activity, and human capital impact firm survival. Internal factors concern such components as the team members' personal characteristics, education level, the founder's prior experience in founding and leading a startup, and the ability to evaluate possible risks and opportunities. Startup founders with previous business experience have higher chances of creating a viable business than inexperienced entrepreneurs; experienced founders have a better understanding of the entrepreneurial processes as well as the phases in a startup's life cycle. Furthermore, prior studies show that the team's education level correlates with a startup's survival ability. Entrepreneurs with a high education level tend to have more extensive social capital and better access to financial resources.

According to previous research, firms that made investments in R&D have a higher chance of survival, especially among firms that did not make patents than those that did. Furthermore, R&D activities have been found to lower the exit risk. Distinguishing products from competitors' products is essential for startups' business viability. An effective way to differentiate one's products from competitors is by advertising, which has positive spillover

effects on other areas in the company. Startups that invest in advertisements have better survival chances compared with non-advertising counterparts. (Del Sarto et al., 2021, p. 5-6)

Previous research has discovered that internationalization affects startup survival rate positively by allowing businesses to gain knowledge beyond the domestic area and attain helpful insight. International trade gives companies knowledge that would otherwise be unattainable. This is the so-called learning by exporting mechanism, which occurs through interaction with foreign agents. When businesses trade, for example, in emerging markets, they improve the chances of survival compared with the companies that strictly do business in the domestic market. There is also evidence that startups benefit from international activity during economic downturns and recessions due to the diversification of resources and smaller dependency on the domestic market cycle. (Del Sarto et al., 2021, p.6)

Del Sarto et al. (2021, p. 6-7) mention that firm survival correlates with the firm's ability to develop employees' skills that the competitors cannot imitate. Employee skill level is a part of a company's human capital, which includes education level, business experience, maturity, ability to solve problems, and contacts. Furthermore, firms with high levels of human capital can better attract skilled employees. Not only does the level of human capital influence a startup's chances of survival, but a company's ability to harness and combine the internal resources. The interconnectedness of internal resources has an amplifying effect within the company, creating unique knowledge inimitable to competitors. An effective interplay of internal resources gives a company a higher performance, competitive edge, and better chances of survival.

The paper by Van Praag (2003) uses duration analysis to examine the survival of small businesses owned by young white business owners in the U.S. The paper distinguishes companies according to whether they have done voluntary or involuntary exits. This definition means that the longer a business owner can prevent an involuntary exit, the more successful they are. According to Van Praag, out of approximately 100 startups, only half can survive the first three years after founding the business. Therefore, policymakers ought to support the founding of new businesses and strive to minimize the risk of involuntary business. For these reasons, Van Praag states (2003, p. 1) that it is crucial to understand the drivers behind business survival. In the paper, Van Praag examines the individual factors affecting business survival by measuring how long the founder remains in the company. To

distinguish between successful and failed businesses, success was measured according to the duration in business. However, measuring merely duration is lacking, as many successful business exits are voluntary. Therefore, the author opted to distinguish between compulsory and voluntary exits, as they are a more accurate definition of lack of success (i.e., failure).

Van Praag (2003, p. 2 - 6) studied a sample of young males who had become self-employed between 1985 and 1989. The data for this study was derived from a survey conducted in 1979. Current research suggests that person-specific factors that might positively affect business success include:

- Prior experience.
- The young age of the founder (depending on the level of relevant business knowledge)
- The business will be more successful the more capital the founder has.
- Founders that have been drawn by the motivation to self-employment are more likely to succeed than founders that have been pushed to self-employment as a last resort.
- Highly educated business founders have better performance than their less-educated counterparts.

Van Praag (2003, p. 6-9) utilized the ordinary least squares regression model to analyze the sample. The study analyzed how the selected individual-specific factors (i.e., age, experience, financial variables, and motivation to start a business) affect business survival. The results for age show that the older the business founder is, the longer the business will likely last; forced exits happen more likely for younger business founders. The analysis estimated that the optimal age for a founder is 32, but these findings are questionable, as the finding only considered the age group of 20 to 32. The results for experience reveal that having prior experience in the same sector and occupation as the business venture yields better chances of survival. However, prior experience in self-employment did not increase the duration of a business venture. General work experience influenced voluntary exits positively, which might be because of more available work options that could outweigh the option of self-employment.

The financial variable shows that founders who begin with their own capital have as high a chance of survival as those beginning with a loan. The results regarding motivations to start a

business reveal that pull factors yield better chances of survival than push factors. However, founders who were unemployed when beginning their business venture turned out to have significantly lower chances of survival than individuals employed when founding their business. (Van Praag, 2003, p. 11)

Yang et al. (2017, p. 800) examined the relationship between internal resources and firm survival with a resource-based view (RBV). The purpose of RBV is to examine how resource combinations affect firm performance. The RBV theory views companies as a bundle of resources, and it can be used for assessing the impact of combined resources on a company. Individual resources would not be able to have the same impact if they would operate in isolation from the other resources. Thus, the combined impact is more significant than the isolated effect, and the answer behind the impact of combined resources lies in the interconnectedness of the resources. Yang et al. (2017, p. 803) are interested in examining the combined effect of resources on firm survival, as it is a strategically relevant resource for firm survival.

In prior research, firm survival has been analyzed from both internal and external approaches. The analyzed external factors that have been used in prior research include the heterogeneity of industry and different factors in the market. The internal factors include financial and technological resources, such as R&D, employees, and human capital. However, Yang et al. (2017) note that there exists a discrepancy in the research. For example, both positive and negative impacts of human capital have been found on firm survival. Furthermore, the authors remark that there is little research on the combined effects of internal resources on firm survival of technologically based companies.

Yang et al. (2017, p. 800-801) examined how combinations of internal resources such as R&D, internal finance, and scientifically skilled employees influence the survival of high-tech startups. Their study was conducted on high-tech startups in the startup zone in Beijing. The literature on RBV emphasizes that a company's internal resources and degree of resource-interconnectedness form a company's competitive advantage. In this context, resources comprise all internal assets, knowledge, and skills the firm possesses. Yang et al. (2017, p. 801-802) analyze with RBV how R&D, scientifically skilled employees, and financial resources affect firm survival. The literature suggests that for high-tech firms to survive in the fluctuating and highly competitive market, they have to utilize their R&D

resources fully. Companies that invest intensively in R&D show lower exit rates than firms that do not invest in in-house R&D, which is especially true for companies in the technological sector. However, the R&D intensity displays an inverted U-shaped curve, meaning that the benefit of R&D on firm survival will turn downwards when too much capital is invested in R&D. Highly-skilled employees might be a key asset for the survival of high-tech startups. The human capital possessed by employees is tacit and thus difficult to imitate by competitors.

The literature suggests that high-tech startups benefit from hiring staff with experience from high-tech sectors, such as engineers and scientists, who consequently transmit their know-how into new products and services. However, there is a discrepancy in the research about the effect of highly-skilled employees on firm survival. Some research suggests that firms that hire highly-skilled employees have lower exit rates, whereas some researchers argue that the employees' industrial experience negatively affects the firm's performance and survival. This trend, however, turns positive as the level of human capital increases. Regarding the financial variable, access to capital (e.g., debt, equity) correlates with the success of startups. The research shows that companies prefer to use internal financing over external when making new investments, as internal investments can prolong a firm's lifespan, as internal investment helps cover unexpected losses. Firms with sizable internal finance are more likely to survive than companies without such assets. (Yang et al., 2017, p. 802)

RBV analyzes the data by determining and assessing dependent and independent variables. In the paper by Yang et al. (2017, p. 806), firm survival is the dependent variable, and R&D, scientifically skilled employees, and internal financial resources are independent variables. The combined use of internal resources is turned into a dummy variable, and the analysis also contains control variables (e.g., age, size) to attain unbiased estimates. The results show that R&D and scientifically skilled employees positively influence firm survival. The combined effect of internal financial resources and scientifically skilled employees also benefited firm survival. This positive correlation might be due to scientifically skilled employees amplifying the effects of R&D and financial resources.

On the other hand, the authors also found combinations that have a decreasing effect. The amplifying effect of scientifically-skilled employees on financial resources was higher in companies where the scientifically skilled staff had scarce R&D resources. Furthermore, the

marginal benefit will decrease when the accumulation of scientifically skilled employees surpasses the optimal threshold. (Yang et al., 2017, p. 818)

Table 1 List of Internal factors affecting firm survival rate according to previous research

TITLE OF THE PAPER	FACTOR 1	FACTOR 2	FACTOR 3	FACTOR 4
Del Sarto, N., Di Minin, A., Ferrigno, G., & Piccaluga, A. (2021). Born global and well educated: start-up survival through fuzzy set analysis. Small Business Economics, 56 (4), 1405-1423.	Startup founders with prior entrepreneurial experience have better chances of creating a viable business	Higher education level correlates with higher chances of survival	Investment in R&D improve chances of survival	Investment in advertising improves chances of survival
Van Praag, C. M. (2003). Business survival and success of young small business owners. Small business economics, 21(1), 1-17.	Prior entrepreneurial experience in a relevant field affects business survival positively	Older business founders (up to the age of 32) tend to build longer-lasting businesses than younger founders	Own starting capital compared with a loan does not improve survival rate	Founders who are employed have better chances of survival than unemployed founders
Yang, C., Bossink, B., & Peverelli, P. (2017). High-tech start-up firm survival originating from a combined use of internal resources. Small Business Economics, 49 (4), 799-824.	Companies in the technology sector that invest significantly in R&D show lower exit rates than their low-investing counterparts	Highly-skilled employees positively affect a company's chances of survival	R&D and scientifically skilled employees combined positively influence firm survival	The combined effect of internal financial resources and scientifically skilled employees benefit firm survival

Table 2 List of External factors affecting firm survival rate according to previous research

TITLE OF THE PAPER	FACTOR 1
Del Sarto, N., Di Minin, A., Ferrigno, G., & Piccaluga, A. (2021). Born global and well educated: start-up survival through fuzzy set analysis. Small Business Economics, 56 (4), 1405-1423.	International trade improves chances of survival
Van Praag, C. M. (2003). Business survival and success of young small business owners. Small business economics, 21(1), 1-17.	None
Yang, C., Bossink, B., & Peverelli, P. (2017). High-tech start-up firm survival originating from a combined use of internal resources. Small Business Economics, 49 (4), 799-824.	The heterogeneity of the industry

To clarify the different types of internal and external factors that have been identified in the recent research, Table 1 and Table 2 include all the internal and external factors found in the literature review affecting startup survival. The factors listed in the tables are selected from the articles mentioned in this chapter.

2.2 Business accelerators and incubators

Entrepreneurship is strongly connected to economic growth. The public sector fosters entrepreneurial activity with incubator programs and the private sector with accelerator programs. Both programs accelerate firm creation and, consequently, economic growth. Researchers are interested in how firm creation positively impacts innovation and employment, and thus incubator and accelerator programs have caught the researchers' attention. (Peters et al., 2004) To better understand how these programs impact firm growth, this section will analyze the definitions of business incubators and accelerators, compare their way of operating, and assess their historical background.

2.2.1 Business incubators

The first business incubator program was introduced in the United States in the 1950s, and incubators became widespread internationally in the 1980s. (Bruneel et al., 2012, p. 110 - 112) The driving force was the concept of offering a shared workspace for multiple companies, thus concentrating the business activity in one location. Until recent times, the offering of workspace has been found until recent times to be one of the most valuable value propositions incubators have to offer. In the 1990s, business incubators expanded their services to offer business support and, later, access to an extensive professional network.

There is a lack of a standard definition for business incubators. According to the extensive research on business incubators by Hacket and Dilts (2004, p. 57), an incubator program is a value-adding intervention system that seeks to provide the participating companies with added value by offering shared office space, monitoring, strategic support, and business assistance. Bruneel et al. (2012, p. 111) propose that business incubators are location-based enterprises that offer their participants a set of different services, including office space, access to a network, and business support. At the end of incubation programs, the aim is to produce graduating companies that are viable in the business market that also contribute to regional development and create profit-oriented technological products. According to Del Sarto et al. (2020, p.1), an incubator must offer at least four of the five following services: investment services, networking possibility, office support, process support, or physical resources. By participating in a business incubator program, a startup can boost its chances of becoming a viable business.

The problem that often faces new companies is the lack of experience and managerial skills to lead the new company in a competitive environment. Nascent firms often change their behavior by using a learning-by-doing approach, steered with the help of procedures and rules. This is a slow-paced process, which is necessary for the survival of new companies. At the same time, inexperience and lack of knowledge often make recruiting new and relevant workforce challenging. The founders have to use strategies that enable quick learning and fast decision-making, consequently improving the company's performance and development. The business support services are a crucial element in the training resources offered in business incubators. This includes one-to-one sessions conducted by coaches with the participants

aiming to accelerate the participant's skill development, either free or with a charge. The coaching sessions impact the participant's graduation process by impacting the company's development. Coaching is usually included in the incubator programs, and they have been found beneficial for the participant's performance. The network access offered in incubators gives tenants a chance to connect with potential customers, technology suppliers, and investors. According to the literature, networking is the most significant factor in impactful incubator programs, and access to networks is crucial for the participant's development. By gaining access to networks, participant companies gain support in overcoming resource scarcity, including lack of capital, experience, and other capabilities necessary for growth. (Bruneel et al., 2012)

As incubator programs build a contact network with business angles and investors over time, the startups do not need to spend additional time searching for investor capital, thus accelerating their growth process. The business angels tend to manage the company to a certain degree to secure their investment, and by coaching the team, the startup is more quickly turned into a mature, professional business. Furthermore, business angels usually have access to specialized networks that allow the startup to hold the knowledge that is typically out of reach for nascent companies, such as technology support, patent advice, and strategy development. Specific consultancy is also usually out of reach for startups, as the high fees often exceed the startup's budget limit. By forming joint-ventures with other organizations, the companies can gain hold of new valuable knowledge and skills. By networking and contacting other companies, startups gain a stronger reputation, which correlates positively with their survival chances. (Bruneel et al., 2012)

Selection criteria and exit policy are among the most critical features in business incubator management functionalities. Incubators selecting tenants from a specific population can create high economies of scale more often, adding more value for the participating companies. The organization's age is yet another significant factor. Whereas young companies need to actively mold their routines and organizational structure, incumbents with already established structures typically find it challenging to change existing practices. Age fluctuation indicates that business incubators need to implement support mechanisms most fitting for the target organization's age and size to stimulate development. The exit policy considers the tenant companies' turnover, aiming for reasonable levels.

The tenant company's timely graduation is another essential characteristic. According to Bruneel et al. (2012, p. 112 - 113), the recommended graduation time should be kept within three years, a somewhat cautious time window. The graduation rate is hastened, among others, by incrementally raising the rental rates. As business incubators operate in politically influenced surroundings, they must show success to gain public support in the form of subsidies. This enforces compliance with industry and the government views of how the incubator programs ought to operate. In other words, incubators must both satisfy the participating companies and the policymakers in order to yield a successful operation.

Regarding the generational variances, the third generation business incubators select younger and smaller companies. The incubation process is shorter than the first and second-generation business incubators, suggesting that third-generation incubators are more focused on starting up the business with a graduation time that lasts notably shorter than three years. Companies' turnover in the first and second-generation business incubator programs is lower. This might be due to the fact that most of the tenant companies in the first-generation incubators tend to be small and show little drive for growth; only a small number seek external funding or investor capital. Furthermore, tenant companies from the second generation usually enter at a later stage in development, are larger, and stay longer in the program. They also indicate having growth ambitions as they seek external funding. The first and second-generation business incubators select fewer companies, which is why they show less innovation than third-generation incubators. (Bruneel et al., 2012, p. 118) Only third-generation incubators seem to be able to generate new companies. They select younger companies and make them finish in a quick graduation time, sustaining a reasonable turnover in the business incubator and hosting a vast number of companies. Bruneel et al. (2012) note that the first and second-generation incubator programs seem to be mainly interested in renting out the property rather than creating new companies, which might explain their selection of more established businesses as tenants. The authors comment that the incubator selection and exit policies should be synchronized with their objectives. Otherwise, the incubator programs cannot fulfill the supporting and boosting role for the participating companies.

Interestingly, the third generation tenants are unlikely to turn out profitable as incubator programs select nascent companies with less developed business processes and organizational structures. Because young companies seldom become profitable, they are oftentimes unable to fund the incubator programs, making incubators reliable on public funding or taking equity

from the participating companies. The first and second-generation incubators, however, have a lesser need to offer business support services as they select larger and established companies with more advanced functions. Researchers recommend that companies select the incubator program according to their fellow tenants. For example, if a potential applicant is looking for a vibrant surrounding, they should select a third-generation incubator program. By selecting a program where other tenants have similar problems, the participant will more likely discover collaboration and mutual exchange. (Bruneel et al., 2012, p. 118-119)

2.2.2 Business accelerators

In recent years, a new business incubation model has emerged due to technological advancements and the wake of e-commerce, namely business accelerators. Business accelerator programs emerged in the wake of the first business accelerator program, Y-combinator (YC), in 2005. (Del Sarto et al., 2020, p. 2) Accelerators have roots in the early 2000s when the VC company CMGI bought a large volume of shares in promising new internet companies, but the startup accelerator's predominant model stems from YC. (Kim and Wagman, 2014, p. 520 - 521) Business accelerators were a reaction to the growing number of startups and the rise of the digital economy, which has entailed the fast production of digital products at ever-cheaper prices to bring the product to the market. (Del Sarto et al., 2020, p. 2) Business accelerators have a quite spectacular impact on the entrepreneurial domain. For example, the paper by Bone et al. (2019) estimates that accelerator programs support annually approximately 3,660 new businesses annually in the UK. In 2016, more than 3000 accelerators were noted on a global scale that provided funding for over 7000 startups. (Crișan et al., 2021)

This new model has caught worldwide attention because of the extraordinary success of famous accelerated startups, such as Airbnb, Dropbox, and Reddit. In contrast to business incubator programs, accelerators are short business programs that usually select a distinctive candidate group from the same cohort. While business incubators offer services for not-for-profit organizations, accelerators select for-profit enterprises that seek to bring significant return on investment for their investors. (Del Sarto et al., 2020, p. 1-2)

The story behind Airbnb is one example of how a company's trajectory has been radically turned around by participating in an accelerator program. Airbnb had three designers on the co-founder team, and the investors deemed the market too small to be profitable. Being desperate to gain profit, Airbnb began selling cereal on their website but managed only to make a meager income. The turnaround happened when the founders met with Paul Graham, the founder of YC, at a dinner during which the founders of Airbnb decided to apply for YC. Graham considered the idea to be terrible, but he liked the founders of Airbnb and decided to select Airbnb to YC. By participating in YC, Airbnb founders were able to attract increasing amounts of investment in their product, making the company viable and, over time, becoming one of the most valued YC companies to date. This case demonstrates the impact of accelerator programs on a company's growth by joining together the founders and the investors. (Miller & Bound, 2011)

A common definition of a business accelerator is a cohort based-program with a fixed start and ending date that offers mentorship, education, and a demonstration day for presenting the idea to a vast audience of investors and media. (Del Sarto et al., 2020, p.1-2) One of the main differences between accelerator and incubator programs is the program length; incubators can last from several months to years (Bruneel et al., 2012), whereas accelerator programs only last for weeks. (Miller and Bound, 2011) According to Crișan et al. (2021, p. 85), accelerators can be seen as vehicles driving entrepreneurial climate growth for revitalizing industries and regions. The academic literature on accelerators has formed into two main branches. The first branch examines from a qualitative perspective the characteristics of accelerator programs. The second branch analyses accelerators that select startups, and the literature reports findings of positive impact in terms of human capital, acquired investment, and valuation, on accelerated startups. (Del Sarto et al., 2020, p.2)

Accelerators aim at building a sustainable business model. According to Miller and Bound (2011, p. 24-25), the typical way to generate profit is to gather investor money invested in the accelerator program. The accelerator itself works as a fund that invests some money to upkeep the program and into the participating startups. The startups, in return, give some of their equity to the program. The aim is that some of the investments in the startups will turn out profitable. The legal structure of accelerators varies between regions and countries. Some accelerators are not for profit, for example, investing the profits from the last batch into the new cohort. In some programs, the investors hope to yield a significant return on investment.

As the accelerator programs invest in one way or another in the participating startups, the accelerator's business model is to stimulate rapid growth. Thus, only companies deemed to have chances for high scalability either grow rapidly or fail fast, which minimizes misspent resources. As incubators charge a rent, they do not obtain any equity from the attending startups, and the programs support startups that will not likely scale fast, consequently making such incubators less competitive than accelerators. (Bone et al., 2019)

The main benefits that accelerator programs offer include funding, business advice, access to capital, validation, pressure, and peer support. The funding mainly helps the team cover their living expenses and focus entirely on developing the business. Accelerator programs have a vast network with professionals in their respective industries, which provides help for the founders to get feedback on their products from the experienced founders and steer the startup in the right direction. (Miller & Bound, 2011) Accelerators help to speed up the process of either acquisition or quitting. Startups boost launching and entrepreneurial orientation, which can be attributed to the mentorship offered by the business accelerator. Mentorship has been found to enhance the success rate of startups. The success rate is defined as gaining access to investors and attracting funding. Furthermore, accelerator managers typically have relevant knowledge (e.g., product development, service development, strategic focus, managerial skills, industry expertise) and vast networks at their disposal, which can provide value to the startups. (Del Sarto et al., 2020, p. 3)

According to Miller and Bound (2011, p.31), the seed investment typically offered in accelerators ranges from $10K to $50K, varying between 5-7% in exchange for equity. The accelerator programs aim to increase the startups' knowledge fast to enhance their skills. This creates a competitive environment that helps the startups to grow and mature. The two existing accelerator types in the literature are private accelerators and corporate accelerators. Corporate accelerators have the purpose of fostering collaboration between large corporations and startups to obtain knowledge and technologies. Business accelerators provide a profound opportunity for startups to widen networks and gain access to venture capital. (Del Sarto et al., 2020, p. 2) According to Kim and Wangman (2014), compared with non-accelerated startups, startups in the accelerator portfolio tend to have a higher valuation. The common source of capital for startups with promising future outlooks has been venture capital (VC) companies. Lately, the trend among VC companies has been focusing on later-stage investment to select business ventures that exceed a certain monetary threshold (e.g., over $4

million investments). Kim and Wagman (2014) describe startup accelerators as a novel form of combining business support and investor financing to begin nascent business ventures.

According to the paper by Miller and Bound (2011, p. 8-10), accelerators have nearly solely been upheld by private investors with an almost exclusive focus on the mobile and web sector. The application process is open yet highly competitive. The application process is very short with minuscule paperwork, and the managers lay the main focus on the team working in the company and the business idea. The selected companies usually receive pre-seed capital in exchange for equity, mainly for covering the founders' living expenses during and a bit after the program. As startups are too large of a project for one person to handle, the selection targets teams instead of individuals, but the teams usually are not bigger than four people; bigger teams would require larger investments. Accelerators offer support for the duration of the program, typically three to six months, combined with intensive mentoring and a high-pressure environment to drive rapid development.

Seasoned entrepreneurs, investors, and other professionals comprise the core mentorship in the accelerators. The mentors interact with the companies either one-to-one or in sessions. Mentors push the mentored companies by giving honest feedback on the current strengths and weaknesses and potentially offering a chance for long-term cooperation, for example, as a member of the advisory board. High-quality mentors are the supporting pillars in successful accelerator programs. Thus high-quality startups are required to attract high-quality mentors. Accelerators educate founders ranging from tax advice to striking pitch performances, and the programs culminate in a demo day where investors gather to see what has been accomplished during the program. This is a unique chance for the founders to attract venture capital and launch their product with wide media coverage. Accelerators tend to be cohort-based; similar companies are selected to offer peer support and to create mutual learning. Cohort-based programs also benefit the management team by taking the weight off their shoulders to attract investors and relevant professionals to join the program. Shared working spaces are usually offered, but the sessions tend to be limited to one or two meetings per week. (Miller and Bound, 2011)

During the program, the participants can exchange ideas and receive meaningful support in problem-solving. This makes the alumni network a critical factor in accelerators, and it explains the necessity of selecting high-quality companies. The initial investment and

stringent deadlines offer founders the perfect opportunity to entirely focus on bringing their idea into a concrete, viable product. Furthermore, when companies are selected for the accelerator programs, this gives a prominent validation, as each company considered for the program is reviewed by a group of professionals. As raising money is one of the most significant hurdles for first-time entrepreneurs, the validation received from an accelerator program helps to convince potential investors about the company's likelihood of succeeding. However, despite the validation received from being selected for the program, investors still tend to keep the number of paying customers as the most prominent validation indicator. (Miller & Bound, 2011)

Roshan et al. (2018, p. 1-6) have studied early-stage mobile app startups that have utilized accelerator facilities to develop and publish games. As the nascent gaming companies have to face rigorous market competition, startups offer a way for young entrepreneurs to adapt to the market competition. The authors note that the literature on accelerator programs' impact on startups is scarce. Some research has been done, such as macro-level analyses, but the studies lack an in-depth understanding of how the participants utilize the facilities and resources offered by accelerators to enhance their development and gain a stronger market position. The authors applied the grounded theory method to conduct their data analysis and theorizing, which consists of coding the data. The study aimed to examine how the participating mobile game developing startups utilized the accelerator's facilities. The study detected six categories: resources, startup capabilities, game design activities, market-related activities, accelerator facilities, and experimenting activities.

Roshan et al. (2018, p. 11- 12) note that the accelerator increases startups' resource base by providing seed funding and access to a network. The added resources gave participants more time to invest in the game design and improve the game quality by sharing experiences with other participating companies. Furthermore, due to increased resources, the startups may invest more time in market-related tasks, such as promoting their game, contacting reviewers, and collaborating with peer entrepreneurs to boost their venture further. In short, increased resources allow the game developers to invest deeper focus into the game development instead of participating in work besides the main project to finance the game project. AppCampus, a seed-accelerator program that game developers attended, included deadlines for the participants, facilitating a disciplined and organized program. Through the accelerator, each participant is quickly introduced to market-related operations, defining strategies for

future business expansion and utilizing analytical tools in their game to enhance performance. As the increased resources released more time for game design, the game design was improved, and the improved design would likely attract more downloads. Attendance in an accelerator program included a vetting process. The vetting gave the selected startups more credibility before investors, as professionals have already analyzed the companies. As the programs provide the participants access to a network, they could gain access to featuring their work in the store and promoting the work in shows and various markets.

The proliferation of accelerator programs has been affected by the rise of lean e-commerce startups. The shrinking costs of technology, quick strategies for customer acquisition, and new ways of monetization are three prominent reasons dynamic, talented, and tech-savvy teams can develop digital products quickly and publish them to the market. Gone are the days when using hardware required physical work. The rise of open-source software has enabled coders around the world to exchange ideas, get help and receive feedback on their code. Co-working spaces have reduced the need to pay for office space. Advertising costs for specific customer groups, such as with Google ads, have due to lower costs coming at the hands of the majority of entrepreneurs, something which was only available for large corporations in the past. Furthermore, the direct monetization channels through App Stores, online payment, and shopping carts have enabled them to quickly monetize the product. As for many startups, time is the scarcest resource; many nascent companies have adopted the lean startup methodology. The idea for the lean startup was developed by Steve Blank and Eric Ries around the 2000s. The three pillars of lean methodology focus on the customer instead of the product, build with frequent feedback and pivot if the product does not gather sufficient positive response. (Miller & Bound, 2011, p. 21-23)

In their paper, Miller and Bound (2011) mention such notable accelerator programs as YC, Techstars, Seedcamp, The difference Engine, and Startup Bootcamp. YC is located in Silicon Valley, and it has locally become an institution. Their distinctive features are dinners for teams, office hours, and an alumni network. The staggering results of YC are perhaps the most notable feature, with 94.4 percent of the participating companies receiving follow-on capital after the program. Techstars was established in 2007 in Manhattan, New York. They offer a 12-week program when companies have to move to the Techstars office and focus on developing their ventures. Techstars focuses particularly on providing mentorship with the underlying belief that the startups need to attract at least five mentors to be successful. The

program also demands constant pitch practice so that founders have delivered their pitch up to hundreds of times by the demo day. Another renowned program is Seedcamp, an accelerator established in London in 2007. Seedcamp has a different approach from YC and Techstars; the founders of Seedcamp aim to improve the acquisition of early-stage investment and make Europe as attractive a location for founding tech startups as the US. (Miller and Bound, 2011)

The Difference engine was established in Sunderland and Middlesbrough in 2009. The accelerator was funded by public money, something unusual in those times, aiming to attract investments in the local region. The accelerator's 13-week program structure was to refine, build and show, meaning that teams meet to refine their business proposition, collaborate with their mentors to develop the product and business, and finally pitch to investors. Startup Bootcamp is a European accelerator program with multiple locations across countries, including Copenhagen, Madrid, and Dublin. The program has taken inspiration from Techstars, and they have chosen promising companies across the world over the years, ranging from America, Europe, Asia, and Africa. (Miller and Bound, 2011)

There are alternatives for participating in the accelerator. Miller and Bound (2011, p. 28-29) mention that if the founders have experience in founding a company, they will likely have some network, and if the founder has already some initial capital, it might be a significantly cheaper option than selling 5 to 10 percent of the company's equity to an accelerator program. Some founders work simultaneously somewhere else alongside their business venture, which works as a source of capital. Bank loans are also an option, but they require security or a solid revenue stream. Some business schools and university programs offer initial investments of the same size as accelerator programs. However, these programs are much longer than accelerators, some programs taking up to two years.

Despite all the notable success, business accelerators have received much criticism. According to critics, YC alumni, such as Reddit, Dropbox, and Airbnb, have received too much credit merely by being perceived as YC companies. Moreover, the accelerator screening process has been under scrutiny; as the portfolio size expands, the less accurate the screening process becomes in selecting solely high-quality ventures. The critics point to the demise of CMGI, one of the most notable incubator programs, as an example of how a company of such astounding size can fail. Some critics state that up to 90% of all the

incubator and accelerator programs will fail. (Kim and Wagman, 2014, p. 520 - 521) Critics assume that the portfolios in the most renowned accelerator programs might have high valuations due to top accelerator programs' small portfolio size and because the program managers do not reveal unfavorable information about the participating startups. Furthermore, it is not unusual that the valuation differs starkly between the accelerator managers and the startup owners.

Criticism has also been presented regarding the participating companies' growth expectations. Accelerators tend to focus on building relatively small firms instead of aiming to build large global companies, and some accelerators have a bad reputation of benefiting overtly from the received equity in comparison to the program organizers' startup experience. Another problem is that accelerator programs have successfully attracted young talent to such an extent that already established startups lose their talent to these programs. The promise of accelerator programs turning nascent firms into sustainable companies diverts the founders' attention from how hard it is to build a lasting company. Moreover, as the application process to accelerators tends to be short, the information does always convey the objective situation of the company, thus enabling b-grade companies that have low chances of survival to join accelerators. Sometimes investments made to participating companies have been deemed random, which is driven by the hope of making a return on investment in some invested companies. Some investors prefer making a large number of investments, while some deem a small number of carefully selected investments. Some critics see the accelerator programs being mere "startup schools", a reaction to the poor university education system, but many attendees of accelerators appreciate the high-learning curve and real-life experience that accelerator programs have to offer. (Miller & Bound, 2011, p. 32-33)

2.3 Accelerators in Finland

According to the publicly available information, there are approximately 45 accelerator and incubator programs in Finland. Kiuas business accelerator is among the top programs (Starter Story, 2022). Kiuas business accelerator is a Finnish business accelerator program. The program's organizers are physically located in Startup Sauna, a startup hub located in the campus area of Aalto University in Espoo. Kiuas includes over 400 alumni founders and shows very high participant ratings. In 2010, the Aalto Entrepreneurship Society started an

accelerator program for summer named Summer of Startups, which was aimed at university students. The program was facilitated every summer, and in 2017 Kiuas was founded, later becoming an independent entity. In 2020, in the midst of the Covid-19 pandemic, Kiuas was developed into an entirely virtual program. The 2021 accelerator was, for the first time, an international program accepting participants virtually from abroad for the first time. (www.kiuas.com)

Kiuas business accelerator aims to help the participating teams validate their business ideas, scale fast, or pivot. Kiuas offers workshops, mentoring sessions, peer support, and access to software tools. The program is tailored according to the participating companies' needs, offering the latest tools and access to the best mentors in each field. Kiuas offers other services, such as Kiuas Inside, which helps alumni companies find co-founders. The main objectives of Kiuas include supporting the creation of a sustainable world by stimulating sustainable entrepreneurship and generating both social and business value. (www.kiuas.com)

Despite a thorough search of the current academic literature, there seem not to be any research papers about Kiuas business accelerator. There are, however, several published papers that examine the business and incubator services in Finland. (Komi et al., 2015; Kairikko & Dhaliwal, 2021) Furthermore, there are multiple bachelor's and master's theses published in the student portal Theseus. (www.theseus.fi) In light of this knowledge, this paper will contribute to the already existing master's thesis literature about Kiuas and highlight the opportunity to be the first to conduct similar research as Del Sarto et al. (2020, 2021) and Mas-Verdú et al. (2015) about the impact of Kiuas accelerator program on the startup survival.

2.4 Accelerated startups: which type of companies survive?

This chapter discusses cases of startups that have participated in business accelerator or incubator programs and have survived. Company survival in this context means companies that have remained and are active. This section presents and describes three articles (Del Sarto et al., 2020, 2021; Mas-Verdú et al., 2015) that have been deemed useful for conducting the analysis in this thesis. These articles have analyzed the companies that have mainly participated in a business accelerator program, but in some cases a business incubator. The

articles have a similar focus to this thesis, and they have been selected for a detailed analysis to give direction for forming the research questions and conducting the analysis part in this thesis. Table 3 lists the selected articles and their respective research questions. Other articles with varying approaches to the research question have also been considered, and they will be presented in this section.

Table 3 List of articles and their respective research questions

Article	Research Questions
Del Sarto, N., Di Minin, A., Ferrigno, G., & Piccaluga, A. (2021). Born global and well educated: start-up survival through fuzzy set analysis. Small Business Economics, 56 (4), 1405-1423.	"Which interactions among which firms' internal resources affect start-up survival?"
Del Sarto, N., Isabelle, D. A., & Di Minin, A. (2020). The role of accelerators in firm survival: An fsQCA analysis of Italian startups. Technovation, 90, 102102.	"Is there a relationship between participation in accelerator programs and firm survival?", "How does participation in an accelerator interact with other firm-survival variables?", "Are the variables related to firm survival the same for accelerators and incubators?"
Mas-Verdú, F., Ribeiro-Soriano, D., & Roig-Tierno, N. (2015). Firm survival: The role of incubators and business characteristics. Journal of Business Research, 68 (4), 793-796.	No research question, the research topic is: analyzing the impact of business incubators on firm survival.

The article by Mas-Verdú et al. (2015) studies how participation in business incubators affects firm survival. The interest in business creation is on the rapid rise. As business incubators foster regional development and innovation by boosting business creation, these programs aim to support the creation of successful businesses. The firms participating in business incubators can leave once they manage independently and have a solid financial basis. Earlier research suggests that there is a lack of an adequate theoretical tool to analyze the incubator's impact on firm survival systematically. For example, Phan et al. (2005) suggest that there is no existing systematic framework that would enable researchers to understand incubators and their impact on company performance. Other studies propose that an in-depth analysis of the startups throughout the process is necessary to assess the

incubator's impact. The article by Bruneel et al. (2012) presents a theoretical framework that displays the evolution of business incubators' value proposition, and they present performance fluctuations among different generations of business incubators. Mas-Verdú et al. (2015, p.1-2) propose that the literature on incubators' impact on firm survival is inconclusive.

Mas-Verdú et al. (2015) have found literature that suggests a positive correlation between firm survival and innovation. Technology-based firms tend to have higher chances of survival than non-technology-based firms. Furthermore, some research has detected that larger startups are more likely to grow than smaller counterparts. Thus, the initial firm size positively affects survival. The authors have detected a link between the firm's sector impacting survival. Companies that operate in growing sectors will also more likely grow themselves and will consequently have better chances of survival. Lastly, prior research indicates a positive relationship between firm survival and export. Firms that export have higher chances of survival than firms that do not operate in international trade. The literature explains that international trade companies have specific characteristics, such as high levels of efficiency, productivity, and innovation.

Mas-Verdú et al. (2015) selected data from a 2009 survey of CEOs and managing directors. The survey included 47 firms from Spain, out of which 30 were still active in 2014. Twenty-six of these firms received support from incubators, and 21 did not. Each company had between 10 and 50 employees. The method used in the article was fuzzy set qualitative comparative analysis (fsQCA). It is a tool that utilizes principles of comparison to study nonlinear complex relationships in the domain of social phenomena. Kraus et al. (2018) explain that fsQCA can detect individual and combined effects of variables on a specific outcome. A detailed explanation of fsQCA will be given in the methodology chapter.

The analysis by Mas-Verdú et al. (2015, 3-4) did not show any necessary conditions. The results show that solely the participation in an incubator does not improve a firm's chances of survival. To boost survival, firms in incubator programs should be large. Firms operating in the manufacturing sector that participate in incubators have a higher survival rate. The key finding is that entrepreneurship policies for incubators should not be designed as one-size-fits-all but rather tailor-made to serve the needs of each firm separately.

Del Sarto et al. (2020, p.2) studied whether there is a relationship between firm survival and participation in business accelerators, how participation in accelerator programs correlates with firm-survival variables, and whether the firm-survival variables are identical for incubators and accelerators. The research by Del Sarto et al. (2020) was fundamentally a replication of Mas-Verdú et al. (2015) with new variables and settings. The article by Del Sarto et al. (2020, p. 4-5) analyzed companies that had participated in a private Italian startup accelerator. The authors chose startups with a five-year maturation time, thus being able to assess how the accelerators had, over time, affected the startups' survival rate. Thirty-eight accelerated startups were selected for the study, and a control group of 38 non-accelerated startups. Control groups are typically used to examine the impact of variables on the result. For example, the article by Storey and Westhead (1994) analyzed in the UK the impact on firm survival based on location in a science park compared with companies that were not located in science parks.

To examine these questions, the authors (Del Sarto et al., 2020) employed fsQCA to probe the configurations. According to the authors, fsQCA is a research strategy rather than a method for analyzing data. Whereas regression analysis is used to explain the mean effects of specific variables, fsQCA identifies the causes of certain results. By using fsQCA, the authors were able to study different variables combined with participation in startup accelerators and their combined effect on different configurations on firm survival.

A significant finding in the article by Del Sarto et al. (2020, p. 8) was that participation in accelerator programs alone is not enough to affect firm survival. Accelerator participation has to be combined with other factors to improve chances of survival. The technological nature was found relevant for survival, as well as export activity. The latter variable might be explained by learning by exporting, which according to the article by Martins and Yang (2009, p. 443), enhances a firm's performance due to access to international markets. Accelerated tech-based companies that do not export will likely focus on domestic markets. Expanding too early might have hazardous consequences on the firm's survival. (Del Sarto et al., 2020, p. 8-9) Learning by exporting is further supported by the third configuration, small accelerated startups that operate in the service sector and do not have export activity. This also highlights the meaning of small teams, which might be correlated with the dynamic nature of the digital economy, where small flexible teams are effective in the competitive environment of the digital economy. Finally, firm survival is attributed to firms in the service

sector. This might be explained by the fact that the service sector has smaller expenses than firms in the manufacturing sector. Thus, the seed capital of $10K to $50K will benefit more service sector startups than their manufacturing counterparts.

In a follow-up study, Del Sarto et al. (2021) assessed the impact of a company's internal resources on firm survival. The study selected 38 accelerated companies from Italy and applied fsQCA to study the data set. Del Sarto et al. (2021, p. 13) found, as in the earlier study (Del Sarto et al., 2020), that learning by exporting mechanism affects startup survival positively. Furthermore, the configuration of human capital combined with export activity positively correlates with startup survival. Learning by exporting affects startup survival over time, but the authors mention that the literature on the subject suggests that learning by exporting affects survival after five years, when combined with a high level of human capital. Startup survival can be affected by learning by exporting more effectively when combined with specific sector knowledge. This means that the entrepreneurs need sector knowledge to harness the true potential of learning by exporting. The literature suggests that startups with highly skilled employees have greater chances of survival. This is because these employees hold tacit knowledge, bringing a competitive advantage because of the hard replicability by the competitors. The impact of highly skilled workers is strongly linked with the initial phase of the startup, meaning that the startup has a better chance to survive when hiring highly skilled workers. Over time, the impact of highly skilled workers decreases.

The authors identified three ways that startup survival is linked with human capital. First, the literature suggests that there exists a correlation between human capital and R&D. This entails that startups with highly skilled workers that invest in R&D have greater chances of survival, which has been detected in research on Chinese startups. However, the authors did not detect a positive correlation between high human capital and R&D to startup survival; only between high human capital and export activity on startup survival. However, this might be explained by the discrepancy between empirical research contexts. Second, the authors note that the high human capital only impacts startup survival positively in the early stages of the firm's life cycle. This effect decreases over time. However, in their research, the authors found that highly skilled workers positively affect startup survival when combined with export activity, meaning learning by exporting. Finally, some scholars have found a positive link between highly skilled workers and startup survival. However, the authors only found this to be valid for a narrow sector. High human capital and export activity combined is the

only positive link the authors found in this case (Del Sarto et al., 2021, p. 14) Table 4 presents the outcome and variables from these articles, and Table 5 presents the outcomes. The ~ sign entails an opposite variable state (e.g., ~Tech-based means a non-tech-based company).

Table 4 List of outcomes and variables used in the selected articles

Article	Outcome & Variables
Del Sarto, N., Di Minin, A., Ferrigno, G., & Piccaluga, A. (2021). Born global and well educated: start-up survival through fuzzy set analysis. Small Business Economics, 56 (4), 1405-1423.	Outcome: Firm survival Conditions: 1) R&D activity; 2) Advertising activity; 3) Export activity; 4) Human capital.
Del Sarto, N., Isabelle, D. A., & Di Minin, A. (2020). The role of accelerators in firm survival: An fsQCA analysis of Italian startups. Technovation, 90, 102102.	Outcome: Firm survival Conditions: 1) Firm size; 2) Manufacturing/service sector; 3) Technology versus non-technology-based firm; 4) Export activity.
Mas-Verdú, F., Ribeiro-Soriano, D., & Roig-Tierno, N. (2015). Firm survival: The role of incubators and business characteristics. Journal of Business Research, 68 (4), 793-796.	Outcome: Firm survival Conditions: 1) Technology-based firms and survival; 2) The influence of firm size and sector on survival; 3) Firm survival increases in accordance with business size; 4) The influence of export on firm survival.

Table 5 Results from the selected articles

Article	Necessary Conditions	Sufficient Conditions
Del Sarto, N., Di Minin, A., Ferrigno, G., & Piccaluga, A. (2021). Born global and well educated: start-up survival through fuzzy set analysis. Small Business Economics, 56 (4), 1405-1423.	None	1) Export activity * Human capital
Del Sarto, N., Isabelle, D. A., & Di Minin, A. (2020). The role of accelerators in firm survival: An fsQCA analysis of Italian startups. Technovation, 90, 102102.	None	1) Tech-based * ~Manufacturing sector * Export activity 2) Tech-based * ~Export * Accelerator 3) ~Manufacturing sector * ~Firm size * ~Export activity * Accelerator 4) ~Firm size * Manufacturing sector * Export activity
Mas-Verdú, F., Ribeiro-Soriano, D., & Roig-Tierno, N. (2015). Firm survival: The role of incubators and business characteristics. Journal of Business Research, 68 (4), 793-796.	None	1) Size ∗ Technology-based-company 2) Size ∗ Sector 3) Size ∗ Incubator 4) ~Technology-based-Company ∗ Sector ∗ incubator

To gain a deeper insight into related research about firm survival, this section will also assess other papers that have studied firm survival and the impact of accelerators and incubators. The paper by Bone et al. (2019) examines the impact of incubators and accelerators on startups based in the UK. They focus mainly on drivers of impact (e.g., distributed workspace, funding, education, and mentorship), and how the business accelerators and incubators alike shape the business ecosystem they belong to. The study included a survey of startups that had attended business accelerators and incubators, comprising 428 answers. Interestingly enough, the startups that attended an incubator were more likely to report that the program was significant or vital for the success of their business (73%) than those who

attended an accelerator (63%). The paper also reports similar findings in previous studies that participation in accelerators sends positive outward signals of the fitness of the business in terms of starting capital, survival, and team growth. The study also included regression analysis for examining the type of support on the startup's perception of the program's impact, change in the proportion of the staff's educational level, level of innovation, patent applications, and investment level on R&D.

Bone et al. (2019, p. 5-6) found that the programs had the most significant impact on access to capital, network, the formation of the team, gaining media exposure, and receiving mentorship from experts and venture capitalists. However, the way in which the support systems affect the startup's success rate differs from each other. For example, access to a network and receiving mentorship directly affect the startup outcomes, whereas other support typers change how startups approach raising capital, strategic planning, forming partnerships, and recruiting new staff. Bone et al. (2019, p. 8-9) describe the accelerators and incubators as programs with the same goal of assisting startups through the early stages of growth, which often are very fragile. The programs help the attendees avoid the often done mistakes, access capital, reach a fast growth speed, and boost their chances of survival. The paper states that incubators are not program-based as accelerators.

There is evidence of accelerators being able to increase the company's speed to raise capital, grow staff size, and gain customer traction. Despite the existing evidence, there is a lack of a standard measure of success when examining the impact of accelerators or incubators. Another difficulty when researching the impact factor of accelerators is that only up-and-coming startups are selected for the programs. Therefore, it would be rational to expect the graduates of the programs to have higher chances of surviving than the non-selected companies, regardless of whether it is the program or the companies themselves that have affected the survival rate. Another issue is the signaling effect related to the attending companies in accelerators. As many accelerators might not have a rigorous vetting process, they are known to have such, and the selected companies might thus be perceived as highly promising and gain more access to opportunities. A commonly used method for assessing the impact of accelerators is to compare the selected companies to a control group of similar companies. Despite a careful selection of characteristics, it cannot be known whether the characteristics (e.g., location, age, sector) for selecting similar companies represent characteristics that affect the company's success. (Bone et al., 2019, p. 12-14)

According to Bone et al. (2019, p. 20), the primary objectives of incubator and accelerator programs are fostering local economic growth, stimulating innovation within a particular sector, and supporting the host organization. What the supporting host organization entails depends on the aim of the respective program. For example, corporate programs could provide a solution for a particular problem or promote entrepreneurial work culture, and university-led programs may have the key objective of stimulating innovation. In this sense, the difference between accelerators and incubators might not be clear-cut. However, accelerators tend to emphasize the focus on bringing return on investment. Bone et al. (2019, p. 22) note that startups report more often perceiving incubators as having a more significant impact on the business than accelerators. However, this might be because incubator programs last longer than accelerators (Bone et al., 2019, p. 51).

Regarding the impact of incubators and accelerators on the local business ecosystem, Bone et al. (2019, p. 46) estimate that accelerators have, within five years after establishing the program in a region, attracted an additional £48 million worth of investment in the high-tech sector. Moreover, this additional investment is not primarily driven by funding channeled to accelerated companies but rather to non-accelerated companies. Thus, accelerators in the established region bring more exposure to non-accelerated firms to investors and foster entrepreneurial activity in the area by organizing different events.

Entrepreneurs tend to face the obstacle of getting the necessary resources for beginning a business venture. The paper by Blank (2021, p. 1 - 2) notes that, according to the RBV, incubator programs benefit nascent business ventures by providing them with the needed resources on time. However, despite incubators being resource-rich environments that provide startups quickly and cost-effectively the needed resources, there have been doubts regarding whether incubators actually have any positive effect on startups' performance. It would seem that boosted success rate is less impacted by the incubator program's resources and more by the degree of interaction between the founders and the incubator's resources.

Blank's (2021, p. 2 - 3) study analyzed student startups participating in university incubators. The study assessed the relationship between successful and failed startups with the incubator's mentoring program and how it affected the startups' survival rate during the first year. The survival rate, according to Blank, is affected especially by the founders' prior

entrepreneurial and managerial experience. According to the results, teams with low levels of entrepreneurial experience or high levels of managerial experience that do not use the incubator program's mentoring program have a low survival rate.

The RBV sees firms as a combination of resources and capabilities. The resources comprise tangible and intangible resources, such as buildings, equipment, and the founder's prior experience. Startups usually have limited resources. To survive, they need to access resources, such as human capital, financial aid, and social capital. Thus, as business incubators are resource-rich environments that offer tenets with the needed resources in a timely and cost-effective manner, it would be appropriate to assume that they would boost the startup growth. Startups generally have a so-called "liability of newness". This entails the risk inherent in business ventures commenced by individuals with low prior experience and a lack of access to crucial resources to turn the startup into a viable business. Incubators help new businesses reduce the liability of newness by offering the participants mentors, office space, and the possibility to pitch for investors. (Blank, 2021, p. 3 - 4)

Blank (2021, p. 8 - 11) included in his study participants in the Venture Incubation Program from Harvard's Innovation Labs called the "i-lab". Blank conducted 15 semi-structured interviews with student founders participating in the incubation program. The founders were interviewed regarding their experience, startup's idea, and the factors in the incubator that offered real value for the business venture. Blank also interviewed the incubator's staff regarding their job title, time in the program, and responsibilities. In addition, an online survey was conducted at the beginning and completion of the program to collect qualitative data. The study lasted a total of two years. In the study, the dependent variable was startup survival, and the result for each case was determined 11 months after the beginning of the program whether the startup was still developing (= 1) or not (= 0). The independent variables contained the founder's managerial experience and entrepreneurial experience, with the answers ranging on a Likert scale from one to five. The study also utilized control variables such as the founder's age, team size, and time at the i-lab.

The results showed a positive relationship between the incubator's mentoring program and startup survival. There was a positive relationship between the founders' managerial experience and mentoring and the incubator's mentoring program and startup survival in teams with prior entrepreneurial experience. The mentoring program boosted survival rates in

teams with little entrepreneurial experience that participated in the mentoring program. Interestingly enough, high levels of participation in mentoring contributed to a higher level of startup survival regardless of entrepreneurial experience. Therefore, this study has given support for the assumption that incubators do boost a startup's survival rate when participating in mentoring programs. Furthermore, Blank's assumption held true that participants with prior managerial experience who did not use mentoring did not show a higher level of survival. This might be due to such individuals implementing past processes and not receiving valuable guidance because of overconfidence in personal knowledge and ability. On the contrary, teams with prior managerial experience who took advantage of mentoring showed higher survival levels. Interestingly, teams with low levels of prior managerial experience, regardless of their participation in mentoring, showed higher levels of startup survival. Such teams might be uncertain of their strategy and thus explore different information outlets and professionals to build the most effective strategy. A high level of entrepreneurial experience showed higher chances of survival, regardless of how much such a team participated in mentoring. (Blank, 2021, p. 12 - 18)

The study by Andreeva and Postnikov (2021, p. 1 - 2) analyzed the impact of corporate accelerators on participating companies' survival rates. Andreeva and Postnikov utilize statistical tools to assess the survival rate of technology startups in Russia selected into a corporate accelerator program. The question is relevant, as approximately 1% of innovative commercial projects are turned into actual sales. Despite accelerators creating a promise of boosting venture success rate, participation in accelerator programs does not guarantee market viability. Andreeva and Postnikov (2021, p. 3-6) conducted a comparative data analysis to assess the development of technology startups in a Russian accelerator program from 2018 to 2020. Sixty-two companies were interviewed, out of which 39 participated in general acceleration programs and 23 participated in a corporate accelerator. The results were interpreted according to project survival. Startups that participated in corporate accelerator programs showed a higher survival rate than those who attended standard acceleration programs. The paper discovered that in corporate accelerators, the host corporation provides technical expertise and guidance for the participating startups. However, corporate accelerators do not improve the product's launch on the market.

3. Data collection and methodology

This chapter discussed the selected method, fsQCA. By using fsQCA, this thesis has been able to assess single and combined variable impact on the selected outcome. This chapter will explain why fsQCA was selected as the analytical tool for this thesis and give a detailed description of how the analysis was performed.

Qualitative Comparative Analysis (QCA) has its origin in political science and sociology. QCA is characterized by casual asymmetry and its usefulness in analyzing small sample sizes. This is because causal conditions, or combinations, may lead to an equifinal outcome. Among the QCA methods, fsQCA has been one of the most prominent methods. (Kraus, Ribeiro-Soriano, Schüssler, 2018) fsCQA was developed by the sociologist Charles Ragin, which has resulted in a raised interest in small N-research in social sciences, but it has also gained a broad interest in other academic areas as well. (Ragin, 2009) fsQCA has been applied in business and management studies, marketing, and increasingly in innovation and entrepreneurship research. In fact, the number of articles done with fsQCA in the field of entrepreneurship and innovation research has sharply increased lately. This might be due to fsQCA's ability to broaden the analysis outside of focusing only on single effects and instead detect complex variable relationships and how different variable combinations can lead to the same result. (Kraus et al., 2018) Vancea (2006) explains that Ragin's method does not merely identify cases as the combination of variables but as set memberships. For example, poor countries are a subset of low-income countries. fsQCA allows a far richer combination of theory and empirical study than was previously possible.

fsQCA is well-suited for analyzing sample sizes of ten to fifty cases. Whereas samples with only tens of cases are too small for many statistical analysis tools, fsQCA can be used in both small and large datasets. When asymmetry between the dependent and independent variables has been detected, researchers have used fsQCA for complementing regression analysis. fsQCA combines qualitative and quantitative approaches to detect relationships between different configurations and results. The fsQCA analysis provides an overview of the connection between all possible combinations analyzed by their causal conditions and the result. When the outcome has more than one source of cause, and the variables together produce the result, fsQCA can provide meaningful analysis. fsQCA identifies conditions that

are sufficient but not necessary for the outcome. According to Kraus et al. (2018, p. 17), fsQCA is a method that has elements of both exploratory and hypothesis-testing, thus including both qualitative and quantitative characteristics. (Kraus et al., 2018, p. 16-17)

In his article, Ragin (2006, p. 633-635) highlights the weaknesses in the current paradigm in quantitative research, not in a tearing-down way, but rather in offering enriching ways of conducting quantitative research. There are varying opinions in the scientific community about quantitative research. According to Ragin, the ideal situation in quantitative research would be where the relevant theories highlight variables that make unambiguous conclusions about how the variables affect the empirical outcome. Usually, researchers compile a list of the most likely causal conditions based on relevant theories, and the central task is to analyze the relevance of the listed variables. If the selected variables are the best predictors of the result, then the theory is deemed the most relevant. Ragin notes that this is the most prevalent way of conducting quantitative analysis in the modern research field in social sciences, and it seems to lack an alternative.

Ragin (2009, p 635-636) focuses the attention in his article on four aspects of quantitative research: populations, dependent variables, independent variables, and connecting case aspects. According to Ragin, researchers often use standard, taken-for-granted categories when defining the study populations. Such populations are helpful when conducting descriptive research, but such populations can rarely provide exhausting results. Whereas constructed and case-specific populations help assess specific theoretical ideas, taken-for-granted populations are relevant solely for general theories. The larger the theoretical content of a population is (i.e., the more specific the selected population is), the more significant becomes the “responsibility” of the researcher to construct the population. They have to verify the constructed population both empirically and conceptually. As mentioned earlier, researchers tend to be unwilling to construct populations. This is due to fear of limiting the relevance of the outcome solely to the constructed population, even to the point that the outcome is biased to favor a specific theory. Thus, many researchers opt for the general population to avoid producing arbitrary outcomes, but general populations do not guarantee non-biased outcomes. This is because general populations have been used to study unrelated cases, making the correlation seem more significant than it actually is. The irrelevant cases thus automatically confirm the theory and reduce the size of the estimated standard error.

Comparative research begins by assessing the most notable instances of an outcome and consequently looking for instances that share similar features. However, this violates good quantitative practice because the dependent variables, in this case, are selected. Here, Ragin (2006, p. 638) remarks that there appears to be a favorable selection of useful cases for the study, but this might skew the outcome. Comparative research challenges the typical quantitative research by conducting an in-depth analysis of the causing reasons for the outcome instead of finding positive cases. For example, in a study about high-growth countries, the researcher might select variables such as per capita growth. However, a better option would be to identify high-growth countries and assess the causal factors these countries have in common. This requires careful analysis of details and operationalizing the category. When determining whether a country belongs to a high-growth country or not, the fuzzy set analysis provides a good tool for assessing memberships.

Ragin (2006) notes that in conventional quantitative research, the independent variable is seen as an independent cause that influences the dependent variable in a linear and additive way. So it follows that the impact of a given independent variable on the dependent variable is the same regardless of other independent variables. However, this way of thinking does not consider how competing causal conditions subtract the impact of a selected variable. Typically, the greater the correlation is between an independent variable and its competing variables, the lesser the net effect. In comparative research, on the other hand, causal conditions are examined as recipes, meaning an examination of the causally relevant conditions that need to exist in combination for a specific outcome to occur. In such analysis, the focal point is the “how” outcomes come to be.

Nevertheless, comparative research is not a challenger to conventional quantitative research but rather a collaborator that explains the outcomes. The most helpful target of analysis is assessing whether there are one or multiple different combinations of variables that produce identical outcomes. However, the problem with conventional methods is that they are organized to calculate the net effects in linear-additive models. An alternative to this approach is to examine which variables are present in each case instead of measuring the interaction against the additive effects. (Ragin, 2006, p. 639-640) This is precisely the target of interest in this thesis: which one or multiple combinations of variables positively affect startup survival when attending a business accelerator?

Ragin (2006, p. 642-643) comments lastly about connecting case aspects. In conventional quantitative research, the connection of case aspects is usually calculated with correlation, which entails connecting two variables across cases. However, in comparative analysis, the interest lies in assessing an explicit connection instead of an associational connection. When assessing explicit connections, there are two general methods. The first method is to analyze cases sharing a specific outcome and identify their shared causal condition. The second method involves examining cases with specific common causal conditions and analyzing if the cases show the same result. These methods are not meant for detecting only associational tendencies but for seeking full or near uniformities. Explicit connection is different from correlation. Explicit connections can be sufficient but unnecessary for the outcome, which means asymmetry in the interpretation of relationships. For example, Ragin (2006, p. 642-643) remarks that state breakdowns might lead to revolution, but not necessarily. Furthermore, showing that several different cases produce the same outcome demonstrates that a condition or a combination comprises a part of the outcome. This again shows sufficiency without necessity and that there might be many different combinations of conditions that lead to the same outcome.

3.1 Methodology

There are different approaches for analyzing what type of companies have remained active after business accelerators. Having compared different methodologies, the fsQCA proved to be the most useful approach for this thesis. Here are reasons why fsQCA is more suitable compared to quantitative methods.

There are different types of QCA techniques, such as crisp set QCA (csQCA), multi-value QCA (mvQCA), and fsQCA. csQCA, developed in the late 1980s, is the first developed QCA method and it is the most frequently used QCA method. csQCA uses only binary data, distributing either values 0 or 1 to each data point, and uses Boolean minimization for processing the data. (Ragin, 2009, p. 2-32) Crisp means a definite state; for example, either someone has a university degree or has not. (Elliott, 2013, p.2) mvQCA is an extension of QCA. Whereas csQCA allows only results with two different values, mvQCA can contain variables with multiple values, but the outcome remains dichotomous. Whereas logical

remainders are limited in csQCA, mvQCA can include logical remainders. (Ragin, 2009, p. 2-15)

According to Ragin (2009, p. 4-8), fuzzy sets were developed to address the inherent problem with crisp sets. Whereas in crisp sets, each case had only two possible membership scores, 1 or 0, this approach might not be applicable in cases where the observed cases do not unambiguously belong to the one case or the other (e.g., when comparing wealthy and poor countries). Fuzzy sets, however, set membership scores in an interval between 1 and 0, thus assigning partial membership. This approach allows comparing the degree to which a case belongs to a group (e.g., democratic countries compared with non-democratic countries). Because the data set in this thesis contains non-dichotomous variables, such as staff size, fsQCA was used as the analytical tool in this thesis.

A notable reason why Del Sarto et al. (2021, p.7) opted for QCA in their article was that QCA allows the authors to analyze the causal relationship between configurations (i.e., combinations of internal resources) and the outcome (i.e., startup survival). With QCA, the purpose is not to prove the existence of a causal relationship between variables, as is done in inferential statistics. Instead, the aim is to investigate the patterns that reveal the existence of a specific causal relationship. (Del Sarto et al., 2021, p. 7) Whereas the regression analysis explains the average effects of specific variables, the QCA is used to examine the causes of particular outcomes. According to Korjani and Mendel's (2012, p. 1) paper, fsQCA aims to establish logical connections between combinations of causal conditions and the result. Regression analysis aims to analyze the net effect of single variables, but fsQCA analyzes combinations of variables that lead to a specific outcome. (Elliott, 2013, p.2)

Cases with non-QCA analysis on incubators or accelerators on firm survival were examined. This was to acquire a broader understanding of other potential analysis methods for this thesis. The paper by Amezcua et al. (2013) studied how incubator programs affect the survival rate of nascent organizations. Amecuza et al. (2013, p. 1640-1641) employed estimation of parametric models of duration dependence for assessing the effect of incubators. It is a statistical tool for assessing the relationship between a dependent and independent variable and a control variable. The dependent variables included organizational exit, firm age, ownership change, and post-incubation. The authors were interested in

assessing what specific incubator activities improve firm survival and increase rates of firm exit.

Hallen et al. (2020) studied whether accelerators support the development of nascent companies and in which way. To examine this question, the authors used both quantitative and qualitative methods to analyze participants that were accepted with those almost accepted to the program to an accelerator cohort. It is a well-suited method for assessing questions that combine applied and theory-based goals. There was evidence of accelerators benefiting ventures by increasing the speed and likelihood of successfully completing key outcomes, such as avoiding wasting time opportunities. A study by Smith and Hannigan (2015) explored with regression analysis the impact of startups receiving financing from a top accelerator program on subsequent outcomes (i.e., being acquired, quitting, or attracting subsequent funding).

Ragin (2009, p. 4-5) comments that QCA should be distinguished from statistical methods, as QCA uses small sample sizes to analyze a population. Statistical methods function by randomly selecting many cases with a few variables. Despite a need for a small sample size, QCA methods have also been applied successfully with large samples. One of the key features of QCA methods is to combine the advantages of both the qualitative and quantitative techniques (i.e., from both the case- and variable-oriented methods). Concerning the generalizability of the results, Ragin (2009, p. 11-12) states that the analysis QCA can produce is modestly generalizable compared with results inferred with statistical methods.

The purpose of this thesis is to analyze a group of companies that have participated in a business accelerator program and identify configurations that exist in companies that are active today. For this, an analysis tool that identifies the existence of such configurations is required. According to Sarto et al. (2021, p. 3), fsQCA is a suitable methodology for capturing the effect of variable combinations on a specific outcome. fsQCA analyzes necessary conditions that produce a specific outcome. Sufficient conditions lead to the specific outcome, but sufficient conditions might not be the only reason for the outcome. Thus, this analysis is likely to yield results that tell something about the nature of the companies that have participated in the accelerator program and are still active.

3.1.1 Sample

The sample in this thesis was constructed by companies that have attended the Kiuas business accelerator. Companies were selected from the business accelerator programs between 2016 and 2019 to be able to analyze the impact of the accelerator programs with some years of delay. Thirty-three companies were selected. The information used in this thesis has been taken from the Kiuas homepage (www.kiuas.com). To find more information about the companies, the thesis used information from the official web page of the Finnish tax administration's business information system (www.ytj.fi), which gives access to company tax records. The companies were either active or inactive, which was determined according to the tax administration's VAT tax. Companies with insufficient information were excluded. Insufficiency, in this case, entailed lacking information from the companies' official sites or other necessary sources. For further information, trusted private sector sources were used: kauppalehti (www.kauppalehti.fi), finder (www.finder.fi), taloustutka (www.taloustutka.fi), and vainu.io (www.vainu.io).

The selection of variables for the analysis in this thesis was conducted by reviewing the findings from previous literature. The selected variables selected for this thesis are taken from articles by Del Sarto et al. (2020), Del Sarto et al. (2021), and Mas-Verdú et al. (2015). The reason for choosing these three articles was the utilization of fsQCA in analyzing firm survival, which is the target of interest in this thesis. However, it should be noted that there is a difference in research methodology between this thesis and the selected articles. The selected articles have used surveys to analyze the sample companies, whereas this thesis has used an open-source information approach in data gathering. Although this thesis aims to build the analysis part on previous literature, the data gathering methods are different, and therefore the results will not lay the main focus on finding parallels between the previous literature and the results found in this thesis. Therefore, the results delivered by this thesis will primarily be interpreted independently from the previous research.

As this thesis's research method was different from the selected literature, this thesis had to edit the variables used in the previous literature to be useful in fsQCA for this thesis. Configurations found significant in the previous articles included small firm size, non-manufacturing sector, non-export activity, and participation in accelerator (Del Sarto et

al., 2020), and were considered for the analysis. Also, the variables of size and technology-based companies (Mas-Verdú et al., 2015) were considered useful for selecting variables. To reach an adequate number of variables for analysis, novel variables that would likely yield useful results were formulated, including SaaS or non-SaaS, turnover, and profit. The full data sheet that includes all the variables is shown in Appendix 1.

The analysis included six variables: location, IT-specificity, staff size, SaaS, turnover, and profit. Table 6 contains all the variables used in this thesis with a description and explanation for the codification.

Table 6 Outcome and conditions: description and codifications

Outcome conditions	Description	Codification	Number of cases or mean value
Outcome: Active	Dichotomous variable that shows whether the company is presently active.	Active 1 Not active 0	24 9
Location	Dichotomous variable indicating whether the company is located inside or outside of Helsinki	Helsinki 1 Outside of Helsinki 0	20 13
IT specificity	Dichotomous variable showing whether the company is registered to the it-sector or not.	IT-sector 1 Non-IT-sector 0	20 13
Staff size	Variable that defines whether the	Fuzzy variable	0.43
SaaS	Dichotomous variable that Distinguishes between SaaS and non-SaaS companies	SaaS: 1 Non-SaaS: 0	22 11
Turnover	Variable that shows the company's turnover	Fuzzy variable	0.30
Profit	Variable that shows the company's profit	Fuzzy variable	0.57
B2B	Dichotomous variable specifying between B2B and B2C companies	B2B: 1 B2C: 0	20 13

This outcome of the analysis was whether the company is presently active or inactive. Whether a company is active or inactive was determined based on the Finnish tax register's information; the information showed whether a company is presently selling goods or

services. The outcome of activity or inactivity was selected inspired by the previous articles´ outcome of firm survival. (Del Sarto et al., 2020, 2021; Mas-Verdú et al., 2015) Therefore, this thesis opted for analyzing companies based on their current activity or inactivity, as it clearly shows whether a company has continued its business up to this day after the business accelerator.

Previous studies did not analyze the locations of the companies. However, as the concentration of companies in specific regions could affect a company's success rate, this variable was included in the analysis. The main target of interest was to assess whether there was a difference between companies located in Helsinki or outside Helsinki. IT-specificity entailed how the companies identified the nature of their business. The selection of this variable was motivated by how Del Sarto et al. (2020) compared companies in the service and manufacturing sector and the choice by Mas-Verdú et al. (2015) to study companies in different sectors. Many of the alumni companies in Kiuas belong to the IT sector. However, there are also alumni companies in other sectors, which is why this variable was included in the analysis. IT-specificity was determined based on the company description on Finnish business websites; if a company declared that it belonged to the IT industry, it was defined as IT-specific. The websites used included Taloustutka (www.taloustutka.fi), vainu.io (www.vainu.io), and Finder (www.finder.fi).

Another similar variable to IT-specificity, yet different, was the SaaS variable. SaaS stands for software-as-a-service, which is an on-demand software that a customer can access through the internet for a subscription fee (Mäkilä et al., 2010). There was a concern for too much overlap between IT-specificity and SaaS variables, but the difference was large enough. Therefore, the SaaS variable was included in the analysis. The previous articles did not include the SaaS variable, and so it was expected that it would yield new results for the literature.

The company's size or the staff was found among the selected articles. (Del Sarto et al., 2020; Mas-Verdú et al., 2015) Therefore, this thesis included a variable of the staff's size during the year participation year in Kiuas. Two new variables that have not been assessed in the previous literature were turnover and profit. The data was from the attendance year in Kiuas, and the data was obtained from the Finnish business websites (i.e., www.vainu.io, www.Finder.fi, www.kauppalehti.fi, www.taloustutka.fi). Finally, the last included variable

assessed whether the companies were business-to-business or business-to-consumer. The information for this variable was obtained from the company links on the Kiuas website (www.kiuas.com) and the Finnish business website mentioned earlier. This variable was not included in the previous articles, and therefore it would yield novel results.

3.1.2 Calibration

fsQCA begins with calibration. The variable values are operationalized as membership scores in predefined sets, attained with calibration. The membership scores are defined according to fuzzy-set analysis that defines the degree to which cases are members of a set. (Kraus et al., 2019) The fsQCA calibrates the values and assigns for each data point the membership or non-membership, depending on the threshold. (Ragin, 2009, p. 8) The data can be imported, for example, from SPSS files, but Google Sheets was used in this thesis. The data has to be turned into fuzzy scores, which entails that variables are calibrated according to the degree of membership, scores ranging from 0.00 (i.e., full non-membership) to 1.00 (i.e., full membership). Here, 0.5 indicates the crossover point with maximum ambiguity. Next, subset relations are analyzed based on the membership scores, meaning the consistency and coverage. Consistency shows the correlation between the subsets of conditions and the result, indicating how closely cases share conditions or configurations (i.e., combinations of conditions). Coverage reveals the relevance of conditions for the result. The lower the degree of coverage is, the more paths exist that lead to the same result. The higher the degree of coverage, the fewer equifinal paths exist. (Kraus et al., 2019)

To understand the calibration process, let us consider the article by Del Sarto et al. (2020, p. 6). The authors applied a frequency threshold of 1 and a consistency threshold of 0.75. Del Sarto et al. (2020, p. 7) calibrated the data according to the previous study of Mas-Verdú. Participation in an accelerator program was indicated as one or zero (i.e., full membership or non-membership), the firm size was defined by adjusting the smallest firm size to one, which represented non-membership (i.e., 0), the median value was three, the point of maximum ambiguity (i.e., 0.5), and five as the point for full membership (i.e., 1). To show whether a startup belonged to the manufacturing sector, the authors set one for startups that offer products for customers and value zero for startups that offer service. To determine tech-based startups, the authors set one for technology-based startups and zero for non-technology-based

startups. The export activity was determined earlier, and the value one was set if the startup's sales comprised more than 25% of exports and 0 if the sales comprised less than 25% of sales of its products or services. Finally, the outcome of the analysis, whether the startup had "failed" or was "active, was determined with the help of data from the Italian Chamber of Commerce. In this thesis, the frequency threshold was set to one, and the consistency threshold to 0.8.

3.1.3 Truth table

Calibration is followed by the building of the truth table. In the truth table, the number of rows is reduced according to two conditions: frequency threshold and consistency threshold. Consistency represents the likelihood of a causal combination resulting in a specific outcome. Cut-off values are scores that can be confidently assumed to lead to the outcome. When coverage is increased, the consistency tends to decrease. (Elliott, 2013, p. 4-6) The exact frequency and consistency threshold varies from case to case. According to Kraus et al. (2019, p. 19), configurations with a consistency score below 0.75 indicate a high level of inconsistency and are coded as zero. Configurations above 0.75 indicate high levels of consistency and are coded as one. Ragin and Rihoux (2009) comment that in an example analysis situation with 18 cases and eight logically possible configurations, an appropriate frequency threshold is 0.5 for being assigned the membership. If the number of cases includes hundreds of cases, then the frequency threshold should be higher. As the sample size in this thesis is 33, the frequency threshold of 0.5 is satisfactory. Regarding consistency threshold, Ragin and Rihoux (2009, p. 27-28) urge to avoid using a consistency threshold below 0.75. Instead, the threshold should be as close to 1.0 as possible.

Del Sarto et al. (2021, p. 9) decided to apply in their newer article a frequency threshold of 1 and a consistency threshold of 0.8, whereas in their earlier article (2020, p. 7) they set the frequency threshold to 1.0 and the consistency threshold to 0.75. This thesis set the frequency threshold to 1 and the consistency threshold to 0.8

When the truth table is prepared, a boolean algebra simplifies the truth table, and a Quine-McCluskey algorithm is used to logically minimize the sufficiency statements to reduce complexity to reach a parsimonious outcome. The Quine-McCluskey algorithm

analyses counterfactual conditions and offers three solutions: a complex solution, an intermediate solution, and a parsimonious solution. (Del Sarto et al., 2020, p. 6) This thesis opted for the parsimonious solution. Del Sarto et al. (2020, p. 8) discovered the following existing sufficient conditions in their study. For example, non-accelerated, innovative firms that offered export services in the initial stages and were located in the service sector had sufficient conditions for survival. Furthermore, small-sized firms that participated in an accelerator and did not export their service or product had sufficient conditions. Lastly, sufficient conditions were found in non-accelerated firms with a small firm size that operated in the manufacturing sector and had export activity. Other findings were also made, but these were some of the discovered sufficient conditions.

4. Findings

This chapter will explain findings made in the fsQCA process. The fsQCA was conducted with the fsQCA program downloaded from UCI School of Social Science. (www.socsci.uci.edu) The initial data sheet was compiled in a Google Sheets file. The data was transformed into a useful format so that it could be analyzed with the fsQCA program. The variables were calibrated according to the specifications mentioned in Table 6, and the variables staffSize, profit, and turnover were turned into fuzzy sets. The truth table was prepared with a frequency threshold of 1 and a consistency threshold of 0.8. The analysis was conducted with the variable sets listed in Table 7.

Table 7 Tested configurations (outcome: active)

ITspecific * SaaS * Location * Turnover2New
ITspecific * SaaS * Location * OperatingEarnings2New
ITspecific * SaaS * Location * B2B
ITspecific * SaaS * Location * StaffNew
ITspecific * SaaS * StaffNew * B2B
ITspecific * SaaS * StaffNew * Turnover2New
ITspecific * SaaS * StaffNew * OperatingEarnings2New
ITspecific * SaaS * StaffNew * B2B * Location
ITspecific * SaaS * StaffNew * B2B * Turnover2New
ITspecific * SaaS * StaffNew * B2B * OperatingEarnings2New

4. 1 Analysis of necessary and sufficient conditions

Following the recommendation of Schneider and Wagerman (2012, p. 115), the results section was begun by analyzing the necessary conditions. The analysis is begun by assessing necessary conditions because not every sufficient path is necessary for the outcome. Del Sarto et al. (2021, p. 11) define a condition as necessary when all cases that include the condition also show the wanted result and all that do not show the wanted results also do not include the condition. The authors applied a consistency threshold of 0.9 for the necessary

conditions. This thesis also used a consistency threshold of 0.9. As is shown in Table 8, the analysis detected no necessary conditions in the sample.

Table 8 Analysis of necessary conditions

Analysis of necessary conditions
Outcome: Survival

	Consistency	Coverage
Location	0.541667	0.650000
~Location	0.458333	0.846154
ITspecific	0.625000	0.750000
~ITspecific	0.375000	0.692308
SaaS	0.666667	0.727273
~SaaS	0.333333	0.727273
B2B	0.708333	0.850000
~B2B	0.291667	0.538462
staffNew	0.488750	0.827805
~staffNew	0.511250	0.651620
turnoverNew	0.359167	0.866332
~turnoverNew	0.640833	0.667245
profitNew	0.545833	0.695329
~profitNew	0.454167	0.769774

The analysis of necessary conditions is followed by the analysis of sufficient conditions. According to Del Sarto et al. (2021, p. 11), when all cases that show the condition also show the wanted outcome, but when some cases show the wanted outcome but not the result, the condition is sufficient. Thus, the analysis reveals all conditions that are sufficient for the outcome to occur. Del Sarto et al. (2021) used a frequency threshold of 1.0 and a consistency of 0.8. Furthermore, the authors comment that the parsimonious solution considers solely the variables that are the "core" of the solution and it reduces the causal conditions to the smallest possible number. Therefore, the parsimonious solution is considered the most suitable solution. This thesis applied the same threshold values and also selected the parsimonious solutions. The solutions in the table below were considered the most significant findings. Table 9 shows the parsimonious solution for the most significant results made in this thesis. The solutions were selected by comparing the ratio between raw coverage and consistency. The findings will be discussed in detail in the upcoming sections.

Table 9 Results of parsimonious solution (outcome: active)

Causal configuration	Raw coverage	Unique coverage	Consistency
Variable	Number	Number	Number
~Location * ~profitNew	0.250833	0.179167	0.927581
Solution coverage: 0.470833 Solution consistency: 0.960068			
StaffNew * B2B	0.377917	0.23375	0.970053
Solution coverage: 0.525417 Solution consistency: 0.978278			
~SaaS * B2B	0.25	0.00	1
Solution coverage: 0.684167 Solution consistency: 0.976219			

4.2 RQ1

The first research question was: "What configurations have been found among the companies that have survived in the previous literature?" The literature review revealed nine configurations in total among the selected articles. The findings for this research question have been listed in Table 5.

Del Sarto et al. (2021) discovered that export activity combined with human capital affects firm survival positively. This entails that the combination of these two variables is sufficient, but not necessary, for startup survival. In the earlier article by Del Sarto et al. (2020, p. 8), the study discovered, in total, four sufficient configurations for the outcome of startup survival. The first discovery was that tech-based companies that do not belong to the manufacturing sector, have export activity, and did not participate in accelerator programs are related to startup survival. The following configuration indicated that tech-based companies with no export activity and which participated in an accelerator program tend to have a greater

survival rate than other companies. Small-sized companies in a non-manufacturing sector with no export activity that partook in an accelerator program also proved to have higher chances of survival than their counterparts. Finally, small-sized manufacturing companies with export activity also showed among the findings in the sufficient conditions.

The study by Mas-Verdú et al. (2015) identified four configurations positively correlating with firm survival. The first configuration included large technology-based companies. The second configuration revealed that large-sized companies that operate in the manufacturing sector have better chances of survival than most companies and that large companies that have participated in an incubator program also tend to survive more often. Lastly, non-technology-based companies in the manufacturing sector that participated in an incubator also yielded higher chances of survival.

4.3 RQ2

The second research question was: “Which configurations can be found among Kiuas alumni companies that have survived”? There were altogether three notable configurations among the data gathered from Kiuas alumni companies from 2016 to 2019. In the identification process of the most significant sufficient conditions, the process considered the ratio between the raw coverage and consistency. The three configurations shown in Table 9 were found to have the most significant raw coverage compared with consistency.

The first configuration revealed that companies outside Helsinki with low profits tend to be active more often than other alumni companies. Companies with a large staff size that belong to the business-to-business sector also had higher chances of survival. Finally, non-saas companies in the business-to-business sector turned out to have higher chances of survival. Consistent with the three selected articles, the results in this thesis revealed no single variable that would be necessary for accelerated companies that would be necessary for boosting firm survival. The primary aim of this thesis is not to expand the existing research to a Finnish setting but to explore the impact of the Kiuas business accelerator on participant companies. Despite the discrepancy between the methodological approaches, the results have been compared to the earlier research, but there does not seem to be an evidently strong correlation between the findings of insufficient conditions found in this thesis and the previous research.

5. Discussion

This chapter will provide a more thorough description of the research questions. The findings made in the previous research, as well as the findings made in this thesis, will be discussed here in closer detail. Furthermore, this chapter will delve into the research limits in this thesis and potential areas for future research.

5.1 Conditions that improve the chances of survival of accelerated startups

The study by Mas-Verdú et al. (2015) showed that participation in an incubator alone was insufficient to boost firm survival. Participation has to be combined with other variables for the incubator to provide a boosting effect. The results also revealed that the participant companies had to be large and be in the manufacturing sector. Furthermore, the authors suggest that the entrepreneurship policies should be tailor-made to have an effect.

The article by Del Sarto et al. (2020) examined how participation in an accelerator program affected the survival rate of participant startups in Italy. A notable discovery in the article, similar to the article by Mas-Verdú et al. (2015), showed that solely the participation in an accelerator program was insufficient to strengthen firm survival. This entails that participation in an accelerator program may improve startup survival, but only when combined with other variables.

It should be noted that accelerator programs differ from incubators. This raises the question of whether results from studies analyzing accelerators compared with incubator programs will yield useful results? When interpreting results, this thesis has followed the example of Del Sarto et al. (2020), who opted to compare their results with the research made by Mas-Verdú et al. (2015). Thus, comparing the results of accelerators with incubators yields meaningful results. Del Sarto et al. (2020) comment that their discovery that solely the participation in accelerator programs was insufficient to boost startup survival corresponded with the results in the study by Mas-Verdú et al. (2015) regarding company participation in incubators. However, comparing whether incubator and accelerator programs have a differing

effect on firm survival is a potential study subject. Bone et al. (2019) had conducted something similar, but an fsQCA approach would appear novel in this case.

Technology-based, non-exporting startups in the service sector that did not participate in an accelerator had higher chances of survival than most companies (Del Sarto et al., 2020). This configuration shows that tech-based companies correlate with survival. Exporting activity assumedly correlates positively with firm survival by learning by exporting, which entails that exporting companies obtain valuable market information for enhancing business performance. (Martins & Yang, 2009) Interestingly, the second configuration in the paper by Del Sarto et al. (2020) reveals that technology companies that do not export positively correlate with firm survival. This might be explained by the fact that nascent, accelerated startups focus on the domestic markets instead of internationalization, which could prove harmful for business growth. Learning by exporting increases in a company's lifecycle, which is unlikely to happen during an accelerator program. Because accelerator programs have a short duration, exporting is likely not a vital component during accelerators.

Regarding high-tech startups, the positive correlation might be explained by a high level of innovation in such companies. Del Sarto et al. (2020) comment that there might be signs that high-tech startups correlate with higher innovation levels in the previous literature. The paper by Cefis and Marsili (2011) reveals the need for innovation in the high-tech sector. If every company in the sector innovates and adapts to new changes, then a high level of innovation does not necessarily lead to improved chances of survival. What Del Sarto et al. (2020) assume, however, is that high-tech companies are used to assimilating new knowledge, and thus the knowledge mentoring obtained from accelerator programs is quickly adapted. Therefore, accelerators will boost technology-based companies' chances of survival.

The third configuration in the article by Del Sarto et al. (2020) shows that survival correlates positively with small-sized, accelerated companies in the service sector that do not have export activity. The discovery of non-exporting accelerated companies is in line with the findings in the second configuration. The authors comment that since the service sector demands less capital than the manufacturing sector, the adaptability of small teams to the digital economy might be the reason why such companies have higher chances of survival. As an additional explanation, small teams are less capital intensive than large teams. The longer a startup's life cycle is, the longer the company can try penetrating the market and

transforming the enterprise into a profitable business. Therefore, the funding of $10K to $50K usually obtained from accelerators will give a longer life cycle for small teams than for their larger counterparts.

5.2 Kiuas alumni company analysis

To better understand how the detected configurations from the thesis analysis apply to the alumni companies, this part will present a selection of companies from each configuration. Although the previous literature (Del Sarto et al., 2020, 2021: Mas-Verdú et al., 2015) did not introduce similar analysis to findings, this approach will deepen the understanding of how the configurations are revealed in the respective companies. When considering the quality of the data in this thesis, it would have been helpful to include companies only from the same accelerator batch, thus analyzing companies that have the same graduation year. However, the number of companies was limited, so all the available companies from the oldest possible batches were selected. Due to limited available data, this thesis did not control for qualitative differences between the accelerator programs. Assessing qualitative differences would make an interesting topic for another research case.

5.2.1 ~Location * ~profitNew

The first configuration, non-Helsinki-based companies with low profits, was found among others in Rentle and Muntius. Rentle is an e-commerce company that offers software for building a renting business on the platform. The company offers a high-quality user experience of SaaS-software with free and premium versions. (www.rentle.io) Rentle was founded in 2018 in Espoo, and it belongs to the 2019 batch of Kiuas. (www.taloustutka.fi) Looking into the company's financial information, Rentle has grown significantly between 2018 and 2020. The company's turnover has grown from €9,250.00 to around €137,000.00, and the staff size has also increased from two employees to 16 within the same period. It is not unusual that the first years for successful startups are characterized by negative return on investment; in fact, the margins can be strikingly negative. (Laitinen, 2017) This might be due to initial investments made in order for the company to grow, and the expenses might thus exceed income. As with the case of Rentle, their profit margins were -4.8% in 2018,

-1667.0% in 2019, and -427.2% in 2020, but their staff grew, which indicates a growth of operations and investment for the future.

Moving into the next company, Muntius has developed Kidday, an electronic baby book for smartphones. The users can save photos and text in the app to store baby memories in one location. (www.kiuas.com) Kidday has received more than five thousand installs in Google Playstore and has been rated 3.9 out of five. Kidday was established in 2016 in Hämeenlinna, and it also partook in Kiuas in 2019. According to the company's financial information, the company's revenue was low in 2018, 2019, and 2020. The company's revenue has been negative during that period, with the revenue being -€157,728.00, -€273,991.00, -€223,190.00. Whereas Rentle has generated turnover, indicating that the company has been selling to customers, Muntius reported turnover only in 2018. Furthermore, the staff size has shrunk gradually from five in 2018 to three in 2019 and zero in 2020. (www.taloustutka.fi) These financial statistics signal that Muntius has been unable to turn the enterprise into a profitable business up until 2020, but the company is still active in the VAT register. (www.ytj.fi) The assumption in this thesis is that companies remain in the VAT register only if they aim to pursue profitable business, even if that would mean meager financial records in the short term. However, considering the differences between Rentle and Muntius in turnover and changes in staff size, this begs whether the observed time span after the business accelerator should be set to five years instead of three. This strategy could drop out companies that are potentially on the verge of bankruptcy, whereas companies that are on the way to a significant growth can be more clearly distinguished from each other.

Regarding the local variable (i.e., the companies being non-Helsinki-established), Rentle is based in Espoo, a city located in the close proximity to Helsinki. With a closer inspection of the data set, 7 out of 13 non-Helsinki companies are based in Espoo. Moreover, 6 out of 7 Espoo companies are active, which could shed more light on the interpretation of the location result. Many large corporations have their headquarters located in Espoo (e.g., Nokia, Neste, and Fortum), which could partially explain the reason why the non-Helsinki-established companies proved to be positively correlated with company activity combined with low profitability. Furthermore, Aalto University is located in Espoo along with a well-known startup hub, providing a source for entrepreneurial spirit, which might potentially explain the impact behind this variable. Muntius, however, is located in Hämeenlinna. Hämeenlinna is further away from Helsinki than Espoo, and it does not offer a similar vibrant business

environment as Espoo in terms of the company headquarters and the nearby university campus.

An interesting finding is that the precious articles did not include financial variables in the analysis section. (Del Sarto et al., 2021, 2020; Mas-Verdú et al., 2015) This thesis opted for including the companies' turnover and profit to assess whether these variables would yield meaningful results. The outcome was positive, as the fsQCA detected significant patterns among the companies' financial information. Therefore, including such variables as turnover and profit can yield meaningful results in fsQCA, which can be expanded on in future research.

5.2.2 StaffNew * B2B

The configuration with large staff size and business-to-business companies included, among others, MVision and Vaana. MVision is a company that sells to healthcare enterprises radiotherapy software for cancer treatment. MVision was established in 2017 in Helsinki, and the company participated in Kiuas in 2017. Looking at the company’s public information, its staff size has grown from five in 2018 and 2019 to 13 in 2020. Vaana is a software company that offers a service voucher system for businesses, and the company also offers other financial management systems in the healthcare sector. Vaana was founded in 2016 in Helsinki, and the company partook in Kiuas in 2016.

There has been a discrepancy in the literature regarding whether small or large companies are optimal for company survival. Del Sarto et al. (2020) assert that small teams are flexible and dynamic, offering a good fit for surviving in the digital economy. This thesis also noted that small teams do not have as high a capital spending rate as large teams, and thus small-sized companies have a longer time to experiment with finding a profitable business model. Mas-Verdú et al. (2015), however, discovered that large-sized companies in incubators tended to have better chances of survival than their small counterparts. This could be explained by the fact that large-sized companies belonged to the manufacturing sector in the study by Mas-Verdú et al. (2015), and manufacturing is likely to require larger staff sizes than the service sector. Interestingly, MVision and Vaana are both service sector businesses, as they have ready software they are selling to companies rather than manufacturing physical

products. It could be that, among others, the upkeep, installation, and selling of the products require a large staff, which distinguishes these companies from smaller-sized businesses.

When examining the companies included in the datasheet, one of the companies found in this configuration, Holda Technologies, had declared bankruptcy when the analysis was already completed. (www.taloustutka.fi) This example highlights the fact that sufficient configurations are found more often in companies that survive than in companies that do not have this configuration and did not survive, but having this configuration does not guarantee survival. (Mas-Verdú et al., 2015)

5.2.3 ~SaaS * B2B

The last configuration combines the variables of non-saas companies that belong to the business-to-business sector. Such companies were Young Finnish Design and Monochrome. Young Finnish Design is a design company that designs, among others, furniture, textiles, and graphics. The company was established in 2017, it is located in Helsinki, and it participated in Kiuas in 2018. Young Finnish Design sells designs for other companies. Monochrome is a marketing agency that specializes in Finnish social media influencer marketing. Monochrome was found in 2016 in Helsinki, and it is an alumnus of the 2017 batch of Kiuas.

Looking into these two companies, they deviate to some degree from other Kiuas companies as they do not rely strictly on IT but rather on other skills. Young Finnish Design offers services in the design sector, including physical products and graphical products. Therefore, this company relies more in their business model on the staff's designing abilities which is not limited to IT. Monochrome, on the other hand, does operate in the IT field in terms of social media marketing, but their value comes from partnerships they are able to close with the Finnish social media influencers. These partnerships are then used for marketing the customers' products effectively. Young Finnish Design and Monochrome are non-saas companies, business-to-business companies, which is a discovery compared to the configurations in the selected articles.

6. Conclusion

This thesis has assessed the impact of Kiuas business accelerator on company survival. The companies are alumni companies from the Kiuas business accelerator from the 2016 to 2019 batches, and the study analyzed 33 companies in total. The companies were assessed with fsQCA, an analytical tool that can detect relationships between one or many variables on the selected outcome.

Based on previous research on the business incubator and accelerator programs' impact on company survival (Del Sarto et al., 2020, 2021; Mas-Verdú et al., 2015), there has not been detected a single variable that would be necessary for company survival among the accelerated companies. Therefore, this thesis selected seven variables to conduct fsQCA on the alumni companies. As this thesis did not apply a similar methodological approach as the past articles, the main aim is not to build a connection with the past literature but to explore novel fields with fsQCA on accelerator's impact on company survival. The analysis of sufficient conditions was primarily limited within this thesis, but the correlation to existing literature was also explored. This was done with caution, as the differences between the methodological approach can make the content in findings wholly different.

The analysis yielded three meaningful configurations: company survival was found to be positively correlated with companies that are established outside Helsinki and have low profits, companies that have a large staff size and are business-to-business, and non-saas, business-to-business companies. The first configuration shows that nascent growing companies tend to have low or negative profits. This is due to company growth, as growing startups have the potential for yielding large profits in the future, which often leads to expenses outgrowing profits with a large margin. (Laitinen, 2017) Furthermore, the location (i.e., non-Helsinki-based companies) variable might have to do with fact that many companies in the data set are located in Espoo, which has vibrant business surroundings, has a large crowd of University students from Aalto University, and an attractive startup-hub. Furthermore, Espoo lies in close proximity to Helsinki.

The second configuration (i.e., large-sized business-to-business companies) contributed to the potentially inconsistent discoveries by Mas-Verdú et al. (2015) and Del Sarto et al. (2020).

The question regards whether small or large-sized companies benefit from participating in accelerator or incubator programs. This thesis discovered that accelerated, large-sized business-to-business companies have better survival chances than the majority of companies. To give a definitive answer on the better survival chances of large companies compared with their smaller counterparts requires further studies. The third configuration indicated that accelerated, non-saas, business-to-business companies survive more often than their counterparts. This was a novel discovery when comparing the selected articles.

During the literature review, it became evident that business accelerator and incubator programs have qualitative differences. (Miller & Bound, 2011) For example, the organizers' and mentors' experience, skills, and resources vary from program to program. Furthermore, the methods that are available for startups in different industries seem to vary as well (e.g., the resources available for IT or mining startups). The qualitative differences in business accelerators might directly or indirectly affect the startup survival rate, and the qualitative differences were not controlled in the analysis part of this thesis. A qualitative analysis of different business accelerators' content or comparing the impact on startup survival rate between different accelerator programs would be an intriguing topic for future research. A notable discovery made in this thesis was the use of company financial information (i.e., profit and turnover) in the fsQCA, which turned out to be useful. Such information was not used in the previous articles and could be used in future research.

The results in this thesis provide practical value for startup entrepreneurs and accelerator managers. The fsQCA did not yield results that would give ground for specific accelerator recommendations, but some highlights were discovered in the literature review. The study by Del Sarto et al. (2020) suggests that accelerator programs should select small-sized technology-based startups that are active in the service sector. Mentoring should be tailor-made to the needs of the participating startups, and the interactions between the startups and coaches ought to follow the lean startup methodologies. Finally, the findings in this thesis indicate that entrepreneurs can affect the chances of survival in their companies by being well-informed of what type of companies survive and taking conscious actions to assimilate these variables to their companies.

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Appendix 1

Full data sheet used for the analysis in this thesis.

Program	Company	OfficialName	Active	Founded	Location	ITspecific	Staffsize	SaaS	Turnover	Profit	B2B
Summer of startups 2019	Dealsign	Dealsign Solutions Ltd	1	2017	1	1	1	1	83592	-11250	1
Summer of startups 2019	Emooter	Emooter Oy	0	2016	1	1	0	1	7667	-29120	0
Summer of startups 2019	Finnadvance	Finnadvance OY	1	2018	0	0	2	0	1084	-115208	1
Summer of startups 2019	GuardianX	GuardianX Technologies Oy	1	2015	1	1	0	1	4315	-89300	0
Summer of startups 2019	Gubbe	Gubbe Sydänystävä Oy	1	2018	0	0	0	0	24699	176	0
Summer of startups 2019	Hookle	Hookle Oy	1	2017	1	1	2	1	0	-234579	1
Summer of startups 2019	Indoor Informatics	Indoor Informatics Oy	1	2018	0	0	1	1	51479	-7871	1
Summer of startups 2019	Kidday	Muntius Oy	1	2016	0	1	5	1	0	-273991	0
Summer of startups 2019	Pinoa foods	Pinoa Foods Oy	1	2018	1	0	1	0	42000	-33300	1
Summer of startups 2019	PriceTap	RvK International Oy	1	2017	1	0	1	1	1316	-34501	0
Summer of startups 2019	Rentle	Rentle Oy	1	2014	0	1	2	1	18486	-308159	1
Summer of startups 2019	Saavu	Saavu Oy	1	2018	0	1	4	1	1016	-183334	0
Summer of startups 2019	Unevn	Unevn Oy	1	2016	0	0	2	0	0	-63209	0
Summer of startups 2018	HELT	HELT Global Oy Ab	1	2017	1	1	0	1	232	-5700	0
Summer of startups 2018	Mapple	Mapple analytics Oy	0	2017	1	1	0	1	26150	9 00	1
Summer of startups 2018	Mesensei	Mesensei Oy	1	2016	0	1	1	1	5000	-5400	1
Summer of startups 2018	Neuroflex	Neuroflux Oy	1	2018	1	1	3	1	28188	1500	1
Summer of startups 2018	Young Finnish Design	Young Finnish Design Oy	1	2017	1	0	1	0	17887	-22900	1
Summer of startups 2018	Riskrate	BackedByCFO Oy	1	2018	1	1	2	1	0	0	1
Summer of startups 2017	Action-Reaction Games	Action Reaction Games Oy	0	2018	1	1	2	1	0	0	0
Summer of startups 2017	Holda	Holda Technologies Oy	1	2017	0	1	7	0	0	605	1
Summer of startups 2017	Serviceform	Jacari Group Oy	1	2015	0	1	3	1	59000	-7300	1
Summer of startups	MVision	Mvision AI Oy	1	2017	1	0	5	1	0	0	1

2017											
Summer of startups 2017	DeskMe	DeskMe Oy	1	2017	1	1	1	1	3250	3800	1
Summer of startups 2017	Monochrome	Monochrome Oy	1	2016	1	0	4	0	170000	25400	1
Summer of startups 2017	Suomihealth	Suomihealth Oy	0	2017	1	0	0	0	0	-27398	0
Summer of startups 2016	AdLaunch	AdLaunch International Oy	0	2015	1	1	1	1	0	-75350	1
Summer of startups 2016	Duara Travels	Duara Travels Oy	0	2015	1	0	1	0	1231	-5400	0
Summer of startups 2016	Metodia	Metodia Oy	0	2015	0	0	0	1	0	0	1
Summer of startups 2016	Bithouse	Bithouse Oy	1	2015	0	1	3	0	66665	2800	1
Summer of startups 2016	Coachilla	Coachilla Oy	0	2016	0	1	4	1	293	-4200	0
Summer of startups 2016	Platonics	Platonics Oy	0	2013	1	0	2	0	0	-3270	0
Summer of startups 2016	Lääkärihinta.fi	Vaana Oy	1	2016	1	1	6	1	0	0	1