4th Semester project

Assessing the performance of startups which have participated in acceleration programs against non-accelerated startups

Spring 2016 – 4th Semester

MSc. International Business Economics

Aalborg University

Word count: 19 039

Characters (with spaces): 124 442

Total number of pages: 114

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Acknowledgments

The present master thesis, along with all my work and effort invested into completing my master degree at Aalborg University is dedicated to the loving memory of my friend Miguel Ribeiro Salvado Henriques. Miguel, you will be deeply missed and forever remembered as one of the kindest person which I had the pleasure to know for eighteen beautiful years.

"And so it turned out that only a life similar to the life of those around us, merging with it without a ripple, is genuine life, and that an unshared happiness is not happiness." – Boris Pasternak

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February 2016

Abstract

In an increasingly entrepreneurial world, the number of entrepreneurs and consequentially, the number of startups are exponentially increasing. Therefore, it is natural that side business which relate to this wave are created. Such is the for startup support programs such as accelerators, which provide young companies and its founders relevant resources to help grow the business to the next-level. However, the question of whether or not these accelerators as support programs can actually have a long-term positive impact on these startups arises. This thesis has the ultimate objective of investigating and answer the research question of if whether or not startup which are accelerated present higher performances against those companies which have not been involved with acceleration programs. This is achieved by presenting and using a performance measurement framework to analyze real companies' data of over 400 startups in order to answer a series of hypotheses and ultimately be able to answer the research question.

Keywords: Startups, support programs for startups, accelerators, Y-Combinator, Seedcamp, incubators, performance measurement metrics.

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Chapter 1: Introduction

The theme for the present master thesis is an assessment of the performance of startups which have participated in acceleration programs against non-accelerated startups". This thesis was developed as part of the curriculum for the 4th semester of my master degree in International Business & Economics from Aalborg University. Upon the decision of choosing a theme to write my master thesis, I was advised to choose a topic which was both an interest of mine and that contained international business features in order to reflect the knowledge gained throughout the master program. Having this in mind, and since from a young age I have been involved and interested in entrepreneurship, I have decided to study accelerators as support programs for startups that help entrepreneurs grow their businesses by providing support in various areas of the business.

In order to further present this theme, the introduction chapter will provide readers with an overview of the global startup scenario, the support programs for startups and specifically the rational for focusing in accelerators. At last, the hypotheses and research question will be presented followed by an outline of the upcoming chapters.

1.1. Startups' current scenario

Entrepreneurship is a topic which has been increasingly gathering the interest and attention of various management schools, scholars and social scientists since the 1980's. (Jones & Wadhwani, 2006) Nonetheless, just because this topic has gained an increasingly amount of tracking worldwide it does not mean that becoming an entrepreneur and creating a business is getting easier. Although there are more tools and resources which entrepreneurs can use to help them succeed in this path, the number of entrepreneurs who actually decides to start a new business increases proportionally. Therefore, it becomes a highly competitive field, where recent

statistics indicate a substantially low success rate for startups to prosper and achieve success. It is also important to understand that there are multiple definitions for failing when it comes to starting a company. It can mean liquidating all assets with investors losing all their money, where it has been estimated that 30% to 40% of high potential U.S startups fail, or it can be failing to see the projected return on investment where more than 95% of startups fail. (Gage, 2012) Amongst the various reasons that contribute to such low success rates for startup companies, a study from a venture capital database named CB Insights has gathered that the reasons which are more common as well as more relevant to cause a company to fail are as follows: no market need for the product/service in question (representing 42% of all 101 startups polled); lack of financial resources to continue activities (29%); do not had the right team to lead the project forward (23%); and superior competition (19%). (CB Insights, 2014) Together with many other researches which have been conducted with the purpose of further understanding the main reasons for why startup companies fail, it has also been recorded that having prior experience, trusted advisors, a business plan, and frequently engaging in networking events are commonly absent factors amongst entrepreneurs and their startups, which ultimately become the reason for another failed attempt at building and growing a business. The fact is that this topic has been gaining more traction every year, and nowadays there are various institutions, government programs, universities, private investment groups, etc., that are focused in further developing and investing in this entrepreneurial wave both in a direct and indirect way. Therefore, to tackle all these liabilities related to the creation of a new venture, which could potentially and eventually lead to failure, entrepreneurs have been increasingly seeking new tools and resources that can improve the chances of survival of their startups.

1.2. Support programs for startups

Various startup support programs have surfaced the entrepreneurial industry as a tool to help entrepreneurs succeed in creating a startup. These resources exist in many forms such as startup accelerators, business incubators and business angels. Theoretically, these three categories exist to help new ventures in the development process of their business. Accelerators or seed accelerators, as the name itself suggests, are short-term programs, with a maximum length of 3 months, focused in helping develop and grow startups that are in their seed stage, where often the founders are trying to figure out the direction and goals of the business. Generally, these programs do so by: investing a small amount of seed-money into the startup in exchange for a portion of their equity, which can range from 2% to 12%; helping to validate ideas; allowing startups the opportunity to create a functioning beta and find initial customers; connecting the entrepreneurs to business consulting and experienced entrepreneurs; assisting with the preparation of pitches to try to obtain follow-up investment, amongst other services. (Dempwolf, et al., 2014) Business incubators are programs that usually last longer than accelerators. These programs can last between 1 to 5 years long and they rarely include seed-funding, which is when the support program itself offers in exchange for equity a small amount of investment to let the company continue their operations. The positive note for entrepreneurs that choose this type of support programs is that it means that the entrepreneurs will not have to let go of any equity of their company. These programs focus on helping startups gain access to management and other consulting experts such as intellectual property specialized experts and networks of experienced entrepreneurs, it also helps entrepreneurs develop their business management skills, develop a management team, and obtaining external financing. (Ibid) At last, business angels are not considered a program such as the former two types of programs presented. The fact is that the inclusion of business angels within this category is very subjective since many scholars and entrepreneurs view business angels as only a financial resource and not a tool which entrepreneurs can use in order to help them develop a new company. Business angels provide financial support to new ventures as well as ongoing mentorship by those who make the

investment. However, the entrepreneurs are not subjected or required to participate in any kind of business development education as accelerators and business incubators do, therefore, this type of support program for startups should be seen first and foremost as a financial support for startups and for this reason, throughout this thesis it will not be considered as a support program.

Furthermore, some of the accelerators and business incubation programs have been becoming highly specialized in niche markets, thus providing a far richer and better experience for the entrepreneurs and their founders. This strategy to focus only in niche markets has arrived in the form of programs which, for example, establish a rule indicating that they only accept companies operating in e.g. the healthcare market, or only companies focusing in e.g. the FinTech (Financial technology) industry. Others specify their boundaries in terms of acceptance requirements for the acceleration programs by only including social entrepreneurship or green startups with a focus in helping the environment, and so on. From this, it is possible to understand how specific these programs are becoming, and with higher specificity these programs are ultimately seeking higher performances. This happens because the programs become able to present entrepreneurs with more relevant and specific investor relations; educational content regarding the industry where the startups are operating in; business consulting, etc. Nonetheless, it is important to establish that all of these programs present an extremely competitive field to those who intend to join them, and often the rate of acceptance is very low in order to filter the applicants and end up with a stronger batch of startups.

1.3. Accelerators

Even though the difference between accelerators and business incubators is very small, accelerators should still be considered as the most competitive as well as enriching programs available to entrepreneurs. As it was previously mentioned in point 1.1, an article by Gage (2012) described the following factors as those which most contribute to the failure of a new venture: no market need for the

product/service in question, lack of financial resources to continue activities, an unfitting team to lead the project forward and superior competition. By understanding these factors, it is possible to deduct that in order for a startup support program to be efficient to its maximum potential it would have to tackle all of these possible barriers. Although business incubators present entrepreneurs with many opportunities for networking and getting advice from experienced people, they lack in getting further involved with the startup, and therefore accelerators should be considered as the most enriching startup support programs available nowadays. Whereas accelerators engage in a very active way with the startups that they are accelerating. They not only allow entrepreneurs with the same opportunities which incubators do, but they also get involved in hiring suitable employees, partners and founders for the young company, tackling the recurring problem mentioned above about unfitting teams. Furthermore, they also invest seed-money into the startup in order for the entrepreneurs to be able to subsist in the first months of existence, and this is highly relevant for entrepreneurs since the lack of financial support has been proved to be one of the major reasons for young companies to fail. Another important feature of accelerators is that they will work with their accelerated startups on validating their ideas. This means that both the accelerator and the startup will focus in the beginning on taking a beta/alpha version of their product into the market in order to understand if in fact there is or not a market need for the product/service in question. This is an important feature for entrepreneurs because it allows them to understand if it is worth the effort of what they are trying to build or if the market is currently not interested in that product/service, thus saving entrepreneurs resources or at least allowing them the opportunity to re-think/build their idea.

Overall, accelerators are becoming a hub for startup development, and entrepreneurs are now increasingly seeking these sources of support to lead their businesses to the next level without minding having to distribute part of their equity to do so since the advantages are supposed to lead to a higher performance of the

startup. Therefore, for the above and other reasons which will be presented and discussed throughout the literature review chapter, accelerators were chosen to be further explored in regards to their impact on startups performance against non-accelerated startups performances. In order to be able to answer whether or not accelerators are actually capable of presenting startups with an advantage over other startups operating in the same market, the following research question and hypotheses were raised.

1.4. Research question

The literature on startups is quite extensive and covers a wide range of sub-themes of the entrepreneurial field. More specifically, startup support programs have also been studied in terms of their characteristics and the programs' operational structure. However, these programs have not yet been investigated in terms of their impact on startups performances. This thesis was therefore conducted with the main purpose of specifically researching the performance of accelerated startups, and to do so the following hypotheses have to be addressed:

1) Do startups which have attended acceleration programs (accelerated startups) secure next stage funding more often than those who have not attended such programs (non-accelerated startups)?

2) Do accelerated startups secure on average larger amounts of follow-on-investment compared to non-accelerated startups?

3) Do accelerated startups have higher online attention (Mindshare score) compared to non-accelerated startups?

4) Do accelerated startups have, on average, a higher number of jobs generated per firm compared to non-accelerated startups?

5) Do accelerated startups raise more capital in the long-term compared to non-accelerated startups?

6) Do accelerated startups secure a higher number of investors compared to non-accelerated startups?

7) Is the impact caused by accelerators on accelerated startups greater or lesser throughout time?

8) Does the impact which accelerators have on their accelerated startups change depending on the companies' location?

By answering the above hypotheses, it will become possible to answer the following research questions of this thesis:

Do startups which have attended acceleration programs have better performances then those who have not attended such programs?

This will be achieved by collecting information from startups which have attended startup accelerators and startups from the same industries and operating within the same markets but which did not attend such programs in order to compare and further analyze both realities and ultimately be able to answer the research questions of if whether or not startup acceleration programs are able to improve the performance of startups.

1.5. Outline of the project

In order to answer the above research questions, this project will be based on the following outline:

Chapter 1 consists of an introduction to the subject of this thesis, where the reader is introduced to the main topics which are leading to the motives behind conducting this study as well as the hypotheses and research questions this thesis attempts to answer.

Chapter 2 which is the next chapter, is where the choice of methodology will be argued for, and where the methods for conducting this research will be presented. Also, this chapter describes how the data was collected, analyzed and reported.

In **Chapter 3** is the theoretical chapter of this project, where the reader will find a review of the existing literature explaining the various terms, concepts and theories present in this thesis. It will describe what drives startups success; what is an accelerator; what services do accelerators offer startups; etc. Ultimately, this chapter explains why, theoretically, startups which have attended accelerators should in fact be more valuable than those who did not.

Chapter 4 is where the reader can find the conceptual framework that will be used to conduct the analysis of this thesis.

Chapter 5 is the data collection chapter, where the information of the startups which will be compared in chapter 5 is presented and analyzed.

Chapter 6 is where the analysis of the accelerated startups vs the non-accelerated startups will take place. The results from this analysis will then be analyzed and used to answer the defined research questions for this project.

Chapter 7 will be the final chapter, where the conclusions of this thesis, as well as its limitations and suggestions for further research will be presented.

Chapter 2: Research Methodology

In order to be able to answer the hypothesis outlined in the previous chapter as well as the research question at hand, it is fundamentally important to collect data. It is not only important to collect quantitative data regarding the performance of startups, but also to collect qualitative data that will compose the theoretical foundations needed to address the research question. With this in mind, the 3rd and 4th chapter which regard to the literature review and the conceptual framework respectively, includes relevant definitions, concepts and models that can be found throughout the available literature on entrepreneurship, support programs, accelerators and startups' performance measurement. This chapters provides the qualitative/theoretical knowledge earlier mentioned. As for the 5th chapter, it presents the quantitative data, as it includes the performance metrics collected from each startup which is being analyzed. Therefore, the purpose of the Research Methodology chapter is to address the methodological approach which this thesis has had, as well as the method utilized to collect data. Ultimately, by reading the methodology chapter, the reader will be able to understand how the data was generated, collected and analyzed. Also, since this chapter attempts to transparently describe the entire process of researching and collecting information to answer the hypotheses and the research question, it will allow fellow students and researchers to repeat the process and assess if they are able or not to reach the same results that will be yielded from this thesis. At last, the importance of describing the approach taken to write the present thesis becomes more clear since it will help readers understand the reasons why specific methods and procedures were chosen instead of others.

2.1. Methodological assumptions: The analytical view

Arbnor & Bjerke have described three methodological views which are analytical, systems and actors' view. The authors defend the importance of defining the perspective taken when studying a subject. The premise is that it is important to establish how the reality will be perceived throughput a study, given that different methodological perspectives can lead to different results. The authors have also taken into account theory of science and different paradigms when describing the three methodological views. By further investigating the three views given by Arbnor & Bjerke, it becomes clear that the analytical view is the suitable perspective to take and use throughout the present thesis. (Arbnor & Bjerke, 2008) The following section will further describe the analytical view, the reasons for choosing this perspective as well as why the other two methodological views from Arbnor & Bjerke were not chosen for this particular research.

2.1.1. The analytical view

The analytical view considers that reality is filled with facts, and that the whole is the sum of its parts. What this means is that through this perspective, the reality is made of both objective and subjective facts which are independent from each other but that can be added together and create the whole. The objective facts usually represent unquestionable and uninfluential circumstances which could either be a company's revenues, the age of the company or simply its address. The subjective facts could be opinions which one may hold, however, given that these are facts, from a methodological perspective, subjective facts are treated similarly as objective facts. Nonetheless, subjective facts are often questioned as for their reliability. Furthermore, given the existing independence between these, one is able to study these facts in a separate manner. Ultimately, the objective of using this view is to identify causes-effect relations that maintain consistency over time; are generalizable; and independent from any subjectivity conveyed by the researcher. (Arbnor & Bjerke, 2008) Furthermore, the thesis layout is in line with the analytical

view given that throughout the project, objective and subjective facts will be collected as data from startups in order to answer the hypotheses which ultimately will explain the cause-effect relation between accelerators and startups and thus answer the research question.

Moreover, neither the actors view and systems view where chosen as the methodological perspective taken for this research. As for the systems view, it assumes that knowledge is dependent from one system which is composed by sub-systems, and in order to understand it, one must look at it as a whole and not independently from each other. (Arbnor & Bjerke, 2008) Therefore, exploring individual hypotheses related to startups´ performance metrics becomes controversial, given that in the systems view, one would have to look at the performance metrics as a whole and draw a result from the aggregate data. Regarding the actors view, it considers reality as a social construction and thus it is dependent of its observers. It recognizes that objectivity is created by people themselves, therefore it can be questioned and changed. (Arbnor & Bjerke, 2008) For this research neither of these views goes in line with the intended purpose. The goal is to be able to individually investigate various performance metrics and from each metric draw a conclusion, so that when all is summed, it becomes possible to understand the whole, thus becoming able to answer the proposed research question.

2.2. Research approach

Furthermore, choosing the research approach becomes very important since it describes the outlook of a research project. There are two ways of classifying the research approach, deductive and inductive. These will be further described below:

A deductive approach is chosen when the research has developed one or more hypothesis based on existing theories/frameworks, and then designed a suitable research process which sets out to either prove or disprove those hypotheses.

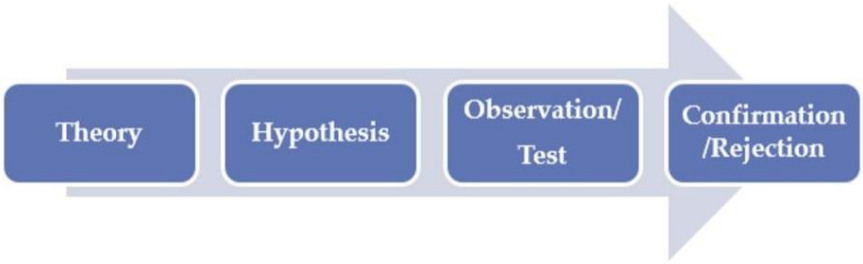

Figure 1 - Deductive approach (Saunders, et al., 2009)

In other words, the deductive approach deducts conclusions from premises or propositions by defining an expected pattern and then test it against observations.

On the other hand, through the inductive approach, the researcher starts by relevant data that proves to be relevant to his/her research, once the topic at hand is thoroughly researched and considerable data has been collected, the researcher attempts to look at the collected data to find patterns. Ultimately, the researcher objective is to develop a theory/framework which explain those patterns.

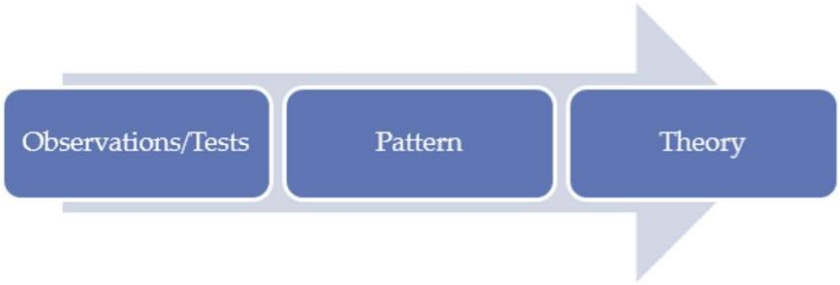

Figure 2 - Deductive approach (Saunders, et al., 2009)

In other words, induction begins with observations and seeks to find a pattern within them.

From these definitions and specific differences between the deductive and inductive research approaches, one can understand that, amongst various differentiations, the existence and the implementation stage of hypotheses throughout the research project is extremely important. What this means is that if the researcher defines

from the beginning hypotheses to be verified, then the research approach becomes deductive. However, if there are no defined hypotheses from the beginning of the research, an inductive research would apply. Therefore, the relation of hypotheses to the research can be understood as a clear difference between the deductive and inductive approaches.

The following table, adapted from Saunders and his fellow researchers' work highlights the differences between both approaches in a more detailed manner:

Research approach – characteristics	
Deductive approach	**Inductive approach**
▪ Principles based on science; ▪ Movement is done from theory to data; ▪ Casual relationships between variables need to be explained; ▪ Quantitative type of data is mainly collected; ▪ Measures of control are applied in order to ensure the validity of data; ▪ Concepts are operationalized in order to ensure the clarity of definitions; ▪ The approach is highly structured; ▪ Researcher is independent from the research process; ▪ Samples need to be selected of a sufficient size in order to be able to generalize research conclusions.	▪ The meaning of human attachment to events are aimed to be explored; ▪ Research context is understood in a deeper manner; ▪ Qualitative type of data is collected; ▪ More flexible approach to research structure to ensure provisions for changes during the research; ▪ Researcher is perceived to be a part of the research process; ▪ Research findings do not have to be generalized.

Table 1 - Research approach - Deductive VS Inductive (Saunders, et al., 2009)

By further reflecting on the appropriate research approach to use, it becomes clear that this project will take a deductive approach. First and foremost, the research question will be answered by validating a clear set of hypotheses outlined in the introduction chapter. These will be validated mainly through quantitative data. Furthermore, a framework composed of metrics to measure startups performance will be applied. Moreover, the researcher is independent from the research process and at last a considerable number of startups as well as different backgrounds, locations and setups will be chosen to compose the sample which will be further analyzed throughout this research, in order to be able to generalize the research conclusions. For these reasons, this thesis will use a deductive approach towards the research process.

2.3. Data collection

Regarding the data, there are two ways of collecting it which are first and second hand data. First hand data exists when it is generated through experiments, observation, conducting surveys and interviews, etc. Essentially, first hand data is generated by the researcher itself. Oppositely, second hand data is not collected directly from the researcher. It can be drawn from researching existing literature, statistical databases, encyclopedias, etc. This thesis will exclusively use second hand data. More specifically, the knowledge from the introduction, methodology, literature review and conceptual framework chapters has been collected by reviewing relevant books, articles, websites and other sources on the topic at hand, in order to establish an understanding of the definitions, concepts and theories/frameworks being used and mentioned throughout the thesis. Furthermore, the findings and data analysis chapter will consist of startups information and data collected through various entrepreneurial websites. All of these data represents, as described above, second hand data.

It is important to understand that using second hand data could lead the researcher to incur in some limitations. For instance, the fact that the researcher is not

familiarized with the data could represent a limitation, since it becomes difficult for the researcher to explain the methods applied to organize the data. Furthermore, second hand data has not been validated in terms of its quality by the researcher that it is using it, only by those who have collected it. At last, the fact that second hand data represent information collected by someone else for the purpose of their own research/project could mean the absence of key variables that could eventually be considered interesting and or relevant.

2.4. Research process

In order to conduct a scientific research, it is imperative to employ a systemic process that can be used to objectively collect and analyze needed information which would allow a researcher to arrive to a conclusion on a given research question. The importance of using such a systemic process is to document the study in a way that makes it possible for other researcher to replicate the study. Therefore, in order to describe the research process undertaken to write the present thesis, the success strategy created by Chaim Zins will be used. This approach represents a series of five steps, also known as the five W's as well as seven generic guidelines as the table below shows.

1. Assignment (What)	(1) Define the search assignment;
2. Resources (Where)	(2) Locate the resources;
3. Search Words (Words)	(3) Choose the search words;
4. Method (Work)	(4) Select the proper search methodology;
	(5) Execute the search;
5. Evaluation (Wow)	(6) Evaluate the results;
	(7) If necessary, repeat the search by refining previous decisions.

Figure 3 - The Success Strategy (Zins, 2000)

These will be further discussed in the following section, having in mind the research process employed throughout this thesis.

Assignment

The assignment for this thesis started with establishing an understanding of key concepts such as the definition of startups, support programs, specifically business incubators and accelerators. From this point, the research was focused on clearly distinguishing both accelerators and incubators, and explain the reason for proceeding with the former throughout the remaining of the project. At last, in order to be able to address the research question and the adhering hypotheses, it become fundamental to apply a startups' performance measurement model which will be used to conduct the analysis of this thesis.

Resources

Regarding the resources used throughout this thesis, various databases were used. These will be described in the following section. In order to collect the information needed to construct the introduction, methodology, literature review and conceptual framework, databases such as Aalborg University Library, Google Scholar, Research Gate and JSTOR were used. By searching through the Aalborg University Library, other databases such as ProQuest and Scopus became available as well. These databases were mainly used to search the available literature on the topic at hand, given that these hold a wide range of highly respected books, articles, reports and other relevant material. A special attention to Google Scholar was given, in order to filter any unwanted and unreliable information.

One of the objectives of this research is to be able to answer the hypotheses described in the introduction chapter in order to answer the research question. To answer these hypotheses, a series of startup performance metrics have been defined in the literature review and conceptual framework chapters. These metrics have been researched on databases such as Mattermark, 500 Startups, Seed-DB, CrunchBase, CB Insights, Dealroom, AngelList and Owler, which exclusively contain statistics and companies' information regarding startups. Through these platforms, one is able to obtain information such as: companies' names; description

of the companies; employee count; list of investors, and amount raised; business model; etc. However, some of these databases are not free and even when access I made available, some information might be missing. Nonetheless, by formalizing a request to gain access to Mattermark by stating that its final purpose was to be able to conduct the present research, the company agreed to it and offered access to fully use its startup database which collects and organizes comprehensive information on various startups as well as on the world's fastest growing companies. This tool has proved to be essential to conclude the present research, given the lack of available free resources on startups.

Search words

Regarding the search words used throughout this thesis, it started with researching startups and startup support programs on the above mentioned databases for books, articles, etc. From this point, the need to further research accelerators and incubators as support programs emerged, which led to a comparison on both and ultimately, an explanation of why accelerators would be the appropriate choice for continuing this study. At last, startups' performance measurement metrics were included as part of the search works, in order to establish an understanding of how success can be defined amongst companies. This point was vital for the purposes of this thesis, since it was the basis for building the startups' performance metrics model that ultimately served to compare accelerated startups with non-accelerated ones and from that point onwards, answer the research question.

Method

The search method used to find relevant information for this thesis was through query searching using the various databases mentioned in step 5 concerning the resources used to conduct the present study. This search method allows the researcher to find information by selecting a certain keyword or even combining multiple keywords such as "startups", "startups performance metrics", "accelerators", incubators", "differences between accelerators and incubators", etc.

By doing this and combining more than one keyword, the results yielded from the research could become more related and specific to the desired topic, thus improving the quality and relevance of the information collected.

Regarding the 5th and 6th chapters of this thesis which correspond to the findings and data analysis respectively, various startup databases, which included advanced options to screen results, were used in order to collect the data needed to test the hypotheses given in the introduction. Amongst the various available filtering options, these databases allow users to filter companies by industry, business model, year founder, investors, last funding date, location, etc. which represented a needed feature that will help in creating clusters that can be individually analyzed later on.

Evaluation

At last, because all the information collected has derived from known academic and professional databases, the present study was provided with an increased validity and reliability, since all the material used has been collected through some type of revision, and also, since all authors possess a scientific background which they have applied to their own studies.

Chapter 3: Literature Review

The following chapter will be consistent of a further presentation of the terms and concepts which have already been used in the introduction chapter to explain the purpose of this thesis, in order to establish a basis of understanding for the thematic at hand. First, the concept of startup will be examined in terms of its definition, what their goals and interests are as well as what they are seeking in the current market. Following the *startups* sub-chapter, it will be again introduced the *support programs for startups* which intends to shed some light into what type of programs are available to entrepreneurs and what do they offer them. This sub-chapter will be important in order to further understand the reason for choosing accelerators, as the main focus for this thesis in relation to the support programs for startups. Next, the *accelerators* sub-chapter is introduced, answering questions such as: what is the definition of an accelerator? what are its goals and interests? How are acceleration programs structured? And, what do these programs offer startups? At last, a sub-chapter regarding key success factors & key performance indicators will take place, in order to establish the metrics which will be used to test the hypothesis outlined in the introduction chapter.

3.1. Startups

3.1.1. Definition

As it has been pointed out in the introduction chapter, entrepreneurship is a trending topic nowadays, and consequently, the word startup is increasingly becoming a natural part of the vocabulary of everyone, even those not related to entrepreneurship. Nonetheless, it seems that there is more than one perspective to take, when defining a startup, and for the purposes of this thesis, it is found relevant to further research the various perspectives and definitions to ultimately define

startups as they are meant to be understood throughout this paper. Also, an analysis of the goals and interests of start-ups will be made.

According to the Business dictionary (Businessdictionary.com, 2016), startups can be defined by the maturity of the company's life-cycle. It assumes that every company which finds itself in an early stage of the company life-cycle usually characterizes by gaining an idea and developing it, followed by the search for funding, the establishment of core structures for the business and at last the actual initialization of operations. Aswath Damodaran (Damodaran, 1995), a professor and the author of several widely used academic and practitioner texts on valuation, corporate finance and investment management, has also supported this definition of startups in his publications. He believes that the definition of a startup should reflect the stage of development of the company rather than its structure or respective industry. Damodaran has further researched companies' life-cycles and from his researches he presented the following figure:

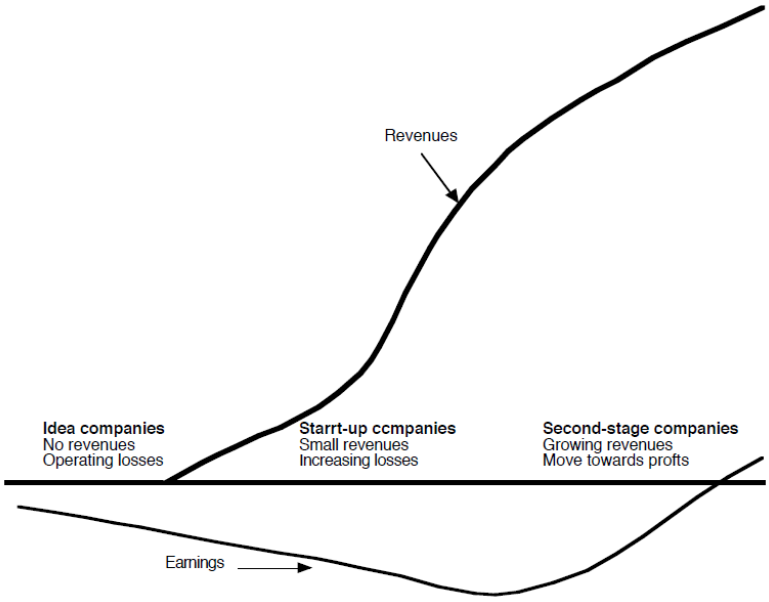

Figure 4 - The Early Stages of the Life-cycle (Damodaran, 2009)

With the above figure, Aswath Damodaran attributed certain characteristics to a startup, such as its lack of history and past financial statements, its dependency on private equity, and its statistically small rate of survival.

Authors with different backgrounds such as Paul Graham, a computer scientist and venture capitalist, best known for co-founding the Y-Combinator seed capital firm, the most successful accelerator in the world, presented a different vision towards how startups should be defined. For Paul Graham, a startup "is a company designed to grow fast.". For the entrepreneur, growth represents the most important aspect of a company in order to gain the denomination of "startup". For him, someone which is creating a startup is committing to solve a harder type of problem than ordinary businesses do, thus committing to search for one of the rare ideas that generates rapid growth. (Graham, 2012)

From the standpoint of a United States Government agency such as the U.S. Small Business Administration, startups are every business that is technology oriented and has high growth potential, a position which goes against entrepreneur Paul Graham's definition for startups. (U.S. Small Business Administration, 2016)

Furthermore, Steve Blank and Bob Dorf define startups as the organizations that are formed to search for a repeatable and scalable business model. They have highlighted the word search because they believe that it is the key difference from startups and established enterprises. Startups are yet to find a business model that proves to work. They explore unknown or innovative business models with the objective to disrupt existing markets. Established corporations on the other hand, operate based on an already existing business model. The authors defend that it is not only about the size of the company, as they believe that startups are not merely a smaller version of an established corporation. This view can be seen as a life-cycle, since Steve Blank and Bob Dorf idea is that startups are temporary in the sense that they will exist until they find a repeatable, high-growth business model. Eventually, they will either fail and continue their search, learning from each failure

and thus improving their chances of succeeding, or they will actually succeed and move on to become an established corporation. It is also important to keep in mind that for the authors, to be considered a startup, an early stage venture must be able to rapidly scale-up, otherwise it would be considered a small business. (Blank & Dorf, 2012)

Moreover, another interesting view is given by Alexander Bergfeld, who possesses extensive international experience in Business Development and Project Management and also who accelerated several startups and consulted international corporate accelerated programs, stating that established companies can actually "go back to startup mode" given that for the author a startup is seen as "the temporary organizational phase of a young company where a core-team of founders attempt to transfer an idea into operation and to develop a repeatable business model as a result.". Alexander Bergfeld based his definition off of the Marmer stages which represent the different development stages that a startup goes through, throughout its life-cycle. (Bergfeld, 2015)

In conclusion, as it can be understood from the above paragraphs, there are various ways to define startups, however, the core aspects of the definition are not so distinct as they may seem. For the purposes of this paper and having in mind the knowledge taken from the literature about startups from different perspectives, a startup is defined as a company that is in an early stage of its life-cycle, exploring unknown or innovative business models, to ultimately find one that is scalable and repeatable, thus moving from its temporary startup concept to become an established organization.

3.1.2. Goals and interests

Having in mind that the present thesis attempts to understand how effective startup support programs are for startups in comparison against those who have not attended such programs, it is relevant to explain what are the main goals and in general the interests of startups. To do so, the following paragraphs will present the

Marmer stages representing the different development stages that a startup goes through, throughout its life-cycle. Ultimately, this will help the reader to understand what motivates entrepreneurs to search for such support programs as well as what they expect to gain from them.

As it was mentioned in the above paragraph, the Marmer stages represent the different development stages that a startup goes through, throughout its life-cycle. This framework was developed by Max Marmer and his fellow researchers, as they were attempting to assess the progress of a startup, but realized that to do so one would have to understand where the startup is positioned in its life-cycle. The framework ended up being composed by six stages, Discovery, Validation, Efficiency, Scale, Sustain and Conservation as it can be seen in the following figure.

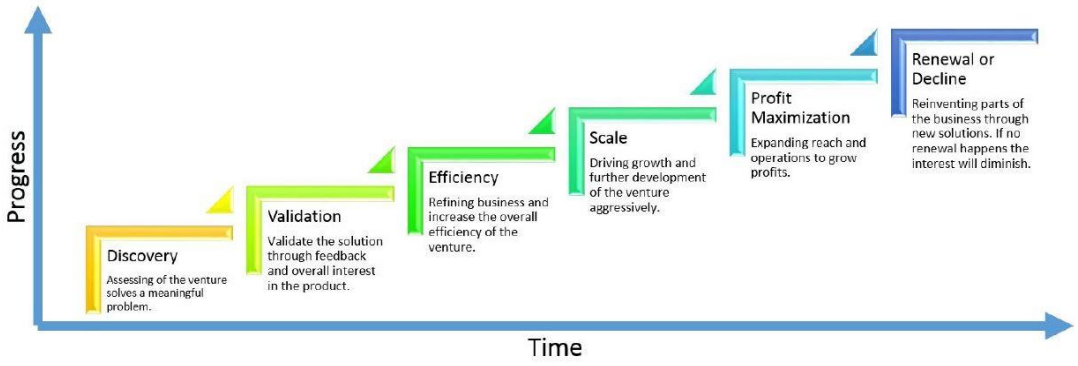

Figure 5 - Marmer Stages (Bergfeld, 2015)

These six stages will be described in the following paragraphs:

Discovery – This stage is where the startup begins to exist. It is when the entrepreneur realizes that there is a problem or a business opportunity within a certain market and creates a solution/product for it. Most existing startups are sitting at this early stage. From this point, entrepreneurs will attempt to understand if they have a valid solution/product to the market, and if not, they will either pivot their business or drop the idea;

Validation – At the validation stage, entrepreneurs assess if their product/service is viable by either presenting a minimum viable product or a beta/alpha version of their business. Ultimately, this will determine if there is any need to pivot the business model, or even if the product/service is not at all viable and if the entrepreneur should drop the idea entirely;

Efficiency – This stage is when entrepreneurs have proved the validity of their company's business model and that it is replicable. Also, this stage is characterized by being one of the first stages where entrepreneurs start seeking funding opportunities for the company. Also, companies at this stage start to refine the efficiency of their operations;

Scale – Growth is the key for this stage. Entrepreneurs give a special attention to costumer acquisition and begin to increase the company's size. Furthermore, the entrepreneurs also take a closer attention at the efficiency of their operations in order to help the company grow and to attract more funding opportunities. Most investors hope to get involved and invest in startups that are sitting at the beginning of this stage;

Sustain/profit maximization – At this stage, startups have successfully scaled-up and moved on from being considered a startup, to become an established company. The performance of the companies at this stage becomes one of the focal points of entrepreneurs, since they are now seeking ways to increase revenues, decrease costs and in general maximizing its profits;

Conservation/ renewal or decline – At last, the conservation stage is where the companies need to act again in order to avoid a decline of the business. Usually, entrepreneurs at this stage seek to find a new product/service, or in general some kind of innovation or business renewal option that prevents the company from facing a decline. (Bergfeld, 2015)

Furthermore, by understanding the above stages of startup development, one can understand that entrepreneurs seek support to successfully go through each

individual stage to ultimately accomplish its goals, whether they are: developing a business plan; validating a product/service; network with business partners and investors; grow the team; establish a more stable organizational management team to sustain the business, etc. (Sage, 2015)

3.2. Support programs for startups

As it was previously mentioned, this project will only consider accelerators and business incubators as viable startup support programs, given that business angels, due to their specific characteristics, will only be considered financial support programs for startups. Therefore, this subchapter will discuss the importance of these support programs followed by the definitions of accelerators and business incubators, their goals and interests, and a further explanation of these programs' structure and characteristics. This will help establish a clear comparison of both startup support programs which in turn will be used to explain the choice of accelerators as the type of startup support program that will be further analyzed throughout the thesis.

3.2.1. Importance of support programs for startups

According to David Thomson, every startup that has experienced substantial growth at some point in time, first went through a preparation phase. This initial phase is the time when the company is able the establish its market and understands the value that it can bring to its customers, thus becoming able to scale up as it can be seen in the following figure. (Thomson, 2006)

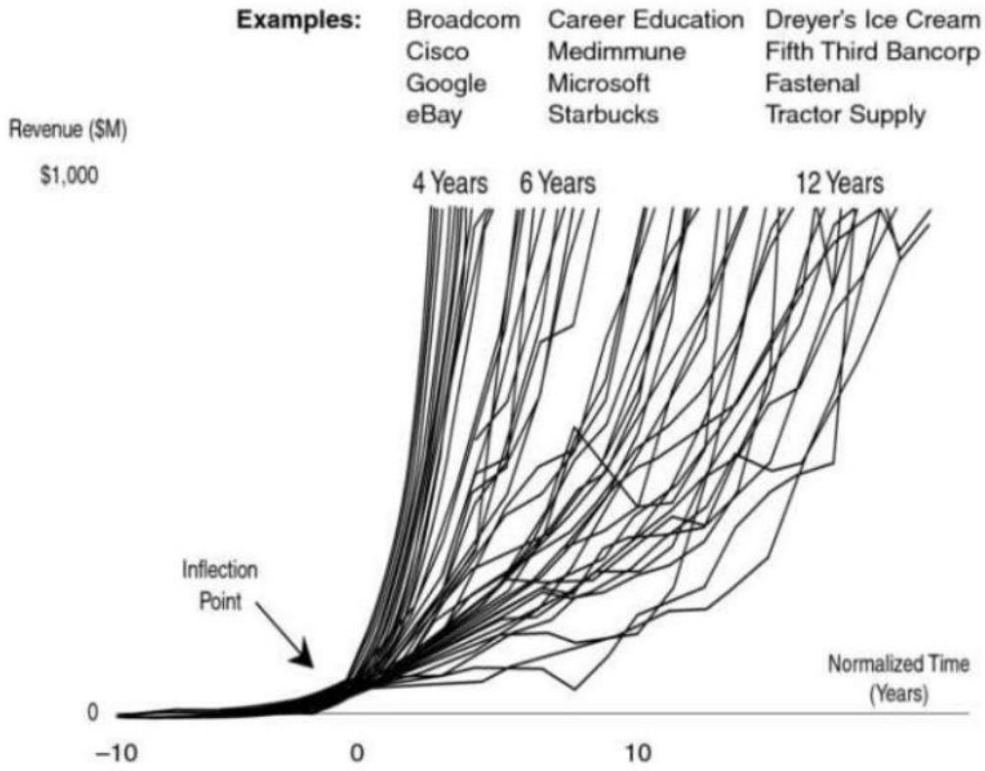

Figure 6 - Revenue growth trajectories for high growth ventures (Thomson, 2006)

Ash Maurya has also addressed these stages in his book, stating that the first stage is the Problem/Solution fit, followed by the Product/Market fit, and at last the scale up phase. Through the first two stages, the focus of the startups is in validating learning and, companies at this stage often pivot their business model in order to find a perfect market to product fit. In the last stage (scale up), the focus of the young companies becomes growth and they engage in consistent optimization of their operations. However, the preparation phase is not equal in terms of length amongst every company. Sometimes one must spend many years in the search for the product/market fit, whilst other times, companies can actually find it considerably quickly achieving it in a matter of less than a year. The author defines this initial stage as "Starting a new business is essentially an experiment. Implicit in the experiment are a number of hypotheses (commonly called assumptions) that

can be tested only by experience". (Maurya, 2012)As a result, it can be assumed that the preparation phase is compiled off of uncertainty for startups which in turn can lead to high amounts of risk and this is the reason that the author states for why so many startups fail until they reach the inflection point and begin the scale up. This is where the support programs come into play, since, as it will be discussed later, incubators and accelerators are the organizations that exist to support startups that wish to go through the preparation phase and afterwards the scale up phase.

The following sub-chapter will describe what are the interests of these organization to run such business models.

3.2.2. Support programs' goals and interests

Furthermore, for the purposes of the present thesis, it is important to clearly understand the motivation behind the startup support programs in terms of their goals and interests. With that in mind, Jed D. Christiansen, the author of the MBA dissertation "Copying Y Combinator", one of the most recognized works about accelerators, addressed this very same topic in a clear way. In his paper, he identifies 5 motivations for running such business and they are as follows:

- The first motivation regards to the development of a startup culture/ecosystem in certain areas, which in turn will create long-term employment opportunities and also, over time develop a bigger and better environment for companies;
- The second is about generating a financial return. This point, as the author highlights, is quite obvious given that accelerators' business models are made to be profitable, the founders of such programs seek a positive return on their investment. This point is not always true for incubators since most of them are non-profit organizations, however, there are incubation programs which in fact operate on a for-profit basis by charging small commission fees and sometimes a percentage of the equity of the startups. However, accelerators usually have to wait several years until they begin to

be profitable given that they will only cash-in when one of the accelerated startups exits, by either being acquired; listed on the stock market (IPO); amongst other exit possibilities, where incubators which ask for the small fee for their services start to see some returns right after accepting new candidates for the programs.

- Moreover, another motivation is related to the background of the founders itself. Most of them, besides managing accelerators or incubators are also business angels' investors. This means that they not only get a change to work and retain a certain percentage of equity of various high-potential startups, but also, since they have a front row to such market, they are able to maintain connections and further invest their own money on the most promising companies that go through these programs when these begin further rounds of investment.
- The fourth motivation is the creation of local/regional influence by accelerators and incubators' founders. Entrepreneurs such as Paul Graham, the founder of Y-Combinator, the biggest accelerator in the world, have developed over-time a highly-respected reputation due to their previously work and successes with startups. For example, this means that the simple fact that one startup is related to Y-Combinator and Paul Graham, will serve itself as a proof for the entire industry that the company has an interesting idea and business model as well as a good team behind it. Off course that support program founders use this influence to promote the businesses which they get involved with, thus increasing their exposure and success rate.
- At last, the author suggests that most people behind support programs have been at some point involved with the process of developing a startup. The motivation here lies in that fact that support programs let these entrepreneurs stay involved with the entrepreneurial industry and consequently share the benefits of being involved in the development phase of a young company without incurring in the negative aspects of it. This way, accelerators and

> incubators get to deal with new technologies, problem solving ideas and constant innovation without having to become highly stressed, deprived of regular sleep and constantly concerned with financial stability. (Christiansen, 2009)

3.2.3. Accelerators

Accelerators could be described as programs created by a group of experienced professionals from various areas who provide startups with business services, mentoring, financing, and ultimately, a greater chance of survival in a highly competitive and crowded market. (Bøllingtoft & Ulhøi, 2005) (Isabelle, 2013) Bo Fishback and his fellow researchers have defined accelerators as support programs which help entrepreneurs taking their ideas into the market. Accelerators make batches of startups every year and expect them to further develop their idea throughout a certain period of time which usually lasts 3 months. (Fishback, et al., 2007) Other authors have defined it as highly competitive open programs that last between 3 and 6 months and which focus on small teams, that provide startups with pre-seed investments in exchange for equity, as well as ongoing support and mentoring, finishing the program by hosting a demo day where investors come together with the startups to look for investment/funding opportunities. (Miller & Bound, 2011) (Clarysse, et al., 2015) Moreover, for the International Business Innovation Association, both accelerators and incubators share various similar characteristics, where their main difference lies in either the nature, intensity or duration of a certain specific aspect of the program, and not in the presence or absence of that characteristic. For the association, accelerators are meant to help startups go from one stage of their life-cycle to the next, and it is all about traction and fast-growth of the company. (International Business Innovation Association, 2016)

In conclusion, and building on the knowledge gained from reviewing the literature, accelerators are short term programs that last from 3-6 months, designed to boost

startups to the next level, by mentoring entrepreneurs and by helping them to develop and perfectly fit a product/service to a certain market, as well as gathering funding to continually grow the company in size and resources and ultimately end up with a successful and repeatable business model that is well established and generating profits.

3.2.4. Incubators

Furthermore, it is important to understand as well what is the definition of an incubator in order to be able to clearly distinguish these specific startup support program from accelerators. Incubators, according to the BusinessDictionary.com are defined as organizations that exist with the main goal of nurturing startups during the early stages of their life-cycle by providing them with certain services such as work space/shared offices, management seminars and eventually mentorship, marketing support and often business contacts to connect the startups with some type of financial support. (Businessdictionary.com, 2016) There are various authors which argue that incubators have gone through three generations so far. The first generation was related to economies of scale, where incubators provided startups with office spaces and shared resources. After this first concept of incubators, the market evolved and the need for deeper support grew. Thus appeared the second generation which had its efforts concentrated on providing young companies with business support in order to accelerate their learning curve and achieve success more frequently and faster. In other words, the business support of the second generation incubators was mainly counseling, skills enhancing in areas such as business expertise, marketing knowledge, sales skills, and networking services as well. Nowadays, the existing incubators represent the third generation of incubators which have developed its focus towards the networking aspect of running a business. Currently, incubators strongly emphasize their network as a main source of value which they can provide the startups that they are incubating. Consequently, as the incubators' network grows, the startups' network will grow as well, thus making them more favorable to access potential suppliers, customers,

investors and technological partners. (Huijgevoort, 2012) (Bruneel, et al., 2012) Other definition is found in Sherman & Chappell's work, which defined incubators as tools for economic development that attempts to help entrepreneurs creating their business and growing it as a community. This help is delivered in the form of various support services such as assistance in developing the business plan, marketing plan, building management teams, obtaining capital from outside sources, and also providing startups with a work space, shared technical equipment and administrative services. (Sherman & Chapell, 1998)

What is it possible to gather from the incubators' definitions collected is that most of them are actually quite similar, and the distinction appears only to reside in the specific characteristics which some specific incubators might offer their startups. Furthermore, the resemblance is not only across the different definitions found throughout the literature review regarding incubators, but also, looking closely at the accelerators definition, it is also possible to find some similarities with incubators. Both the similarities and differences of these programs will be addressed in the next subchapter in order to solidify the information which has been presented so far.

3.2.5. Accelerators vs incubators

Having in mind what was found in the literature regarding the existing knowledge of startup accelerators and incubators, it has become clear both these types of startup support program explore the same industry but do so in different ways. Therefore, this subchapter will further explore what actually distinguishes accelerators from incubators and why the focus of the remaining of the thesis will be on accelerators.

Nowadays the distinctions have become general knowledge to those involved in the entrepreneurship industry, however, for most people which are not involved in this industry, both terms still generate some sort of confusion. Authors have discussed the existing distinctions before in various articles. According to Thomas van Huijgevoort, incubators share the following characteristics: They are usually non-

profit organizations that often are associated with universities; the services that they provide are usually an office space for the startups being incubated at lower rates than what the market is offering; they mainly target local startups; and they do not directly invest in their startups, however, they do provide access to the incubators network of investors. (Huijgevoort, 2012)

Regarding accelerators, their main characteristics are the following: they are for-profit organizations that usually retain a small percentage of their accelerated startups' equity, in exchange for providing them with initial financial support; regarding the services provided, not always accelerators provide an office space for the startups to work, but most programs do offer shared facilities for hosting meetings and for other space requirements; at last, in terms of these programs reach, they can range from targeting only regional startups up to targeting global ones. (Radojevich-Kelley & Hoffman, 2012) (Isabelle, 2013) These characteristics can be seen in further detail in the following table:

Common traits of incubators and accelerators:		
	Incubators	**Accelerators**
Clients	All kinds including science-based businesses (biotech, medical devices, clean energy, etc.) and nontechnology; all ages and genders; includes those who have previous experience in an industry or sector	Web-based, mobile apps, social networking, gaming, cloud-based, software, etc.; firms that do not require significant immediate investment or proof of concept; primarily youthful, often male geeks, gamers and hackers
Business Model	Primarily (90 percent) nonprofit business model; for-profits created by corporations and investors	Primarily for-profit business model
Sponsor	Universities, economic development organizations and other community-based groups,	Serial, cashed-out entrepreneurs and investors

	sometimes with help from government	
Selection process	Competitive selection, mostly from the community	Competitive selection of firms from wide regions or even nationally
Term of assistance	1-5+ years (33 months on average)	Generally, 1-3 months' boot camps
Services	Access to management and other consulting, specialized IP, and networks of experienced entrepreneurs; assists businesses mature to self-sustaining or high-growth stages; helps entrepreneurs round out skills, develop a management team and often, obtain external financing	"Fast test" validation of ideas; opportunities to create a functioning beta and find initial customers; links entrepreneurs to business consulting and experienced entrepreneurs in the Web/mobile apps space; assists in preparing pitches to seek follow on investment
Investment	Usually does not have funds to invest directly in the company; more frequently than not, does not take equity	Invests up to $18,000 to $25,000 in teams of co-founders; takes equity in every investee, usually 4-8 percent
Facilities	Provides flexible space at reasonable rates throughout incubation period; many incubators also work with nonresident affiliates	Provides meeting space during boot camps; some are beginning to provide longer-term space
Metrics	Initial: revenue growth, payroll, capital acquisition, number of patents commercialized or filed, new products introduced, number of companies started, percentage of business survival and retention; long-term: ROI to community/university in the form of jobs, technology commercialization, industry sector/cluster expansion, wealth	Initial: sales, margins and third-party investments; long-term: ROI on investors' cash via liquidity events – sales, acquisition, larger investment rounds, etc.

	creation and economic diversification, among others	

Table 2 - Common traits of incubators and accelerators (Adkins, 2011)

As the table above shows, there are various similarities among these two types of support programs, however, although similar, accelerators and incubators are not equal to each other. Through the table one can understand that incubators provide a less intensive and hands on approach, were the role of the support program lies in providing startups with the essentials tools such as networks in terms of employees and investors, office space and supplies. On the other hand, accelerators are considerably hands-on on the startups which they accelerate, and provide, although only for a very short period of time comparing to incubators, all the support that incubators offer, plus initial investment from the accelerator, direct access to investors and strategic mentoring regarding the various decisions and operations of the companies, amongst other perks.

After establishing the major differences as well as the similarities between incubators and accelerators, the next chapter will help the reader to understand why this research will focus exclusively on assessing accelerated startups' performances and not incubated startups.

3.2.6. Focusing on accelerators

As it has been said throughout the above sub-chapter, both incubators and accelerators offer very similar services to their startups, however, their main distinction lies in the targeted life-cycle stage that the startups which are chosen to be incubated/accelerated are currently in.

Fernando Sepulveda, the managing director of Impulse Business Accelerator, has written about this topic where he explained the distinctions of the targeted stage in the life-cycle with an interesting analogy relating it to the life of a human being. The author arguments that there are 3 major stages of life, them being childhood,

adolescence and adulthood. The incubators, like a parent that teaches to a child how to walk and talk, are the organizations which provide startups with shelter by offering them with office space, business skills, and access to networks of experienced professionals as well as possible investors. The incubator takes care of the business throughout its initial stages (childhood) giving them the necessary tools and advice so that the startup can stand on its own and start to operate its business. However, the second stage of humans' life-cycle which regards to the adolescence where teens gain a sense of self and identity, is very often filled with bumps and challenges, and the need to have a parent guiding their children through this stage is as imperative as the need for startups to seek further support. At this stage, when companies are going from their childhood stage to adolescence, one of the most recurrent challenges that they can face is that eventually, the need to established long-term strategic plans regarding the development of the business fails will appear, and very often, companies fail to implement such plans. By failing in establishing these plans, companies can eventually wonder off of what is their unique value propositions which is what defines the startups identity.

The support that most incubators provide to startups ends at this point, since at this stage, the startups are ready to grow exponentially in terms of their team, markets and in general the size of the company. It is here that accelerators come into play and establish their unique value proposition over incubators. Companies that are on the verge of going from adolescence to adulthood need more than ever to: receive further advice and mentoring from experienced people; help in developing the product/service; and to receive financial support to maintain the company's operations running. So, in other words as the authors describes it: "while incubators help companies stand and walk, accelerators teach companies to run".

The figure bellow, taken from Alexander F. Bergfeld's book on business acceleration, illustrates the timing of both accelerators and incubators in relation to the Marmer stages.

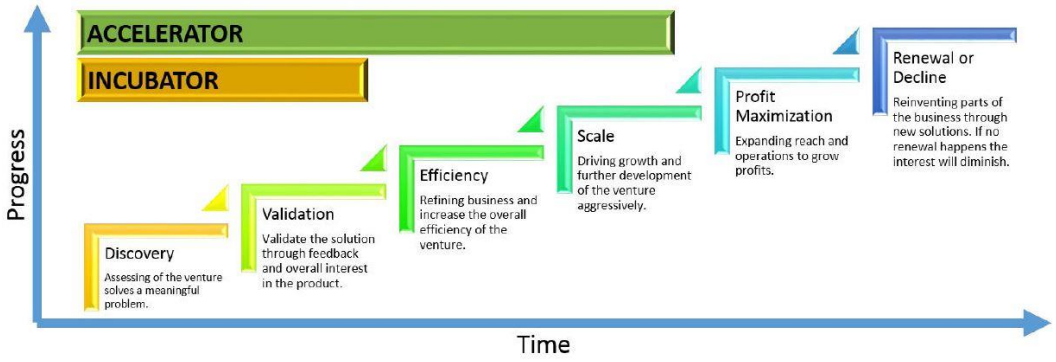

Figure 7 - Accelerators VS Incubators timing throughout the Marmer stages (Bergfeld, 2015)

The figure explains the analogy above given regarding the various phases which startups go through, and how support programs are design to go along the companies throughout some of the phases in order to provide support and increase the chances of the companies to succeed. Moreover, what can be drawn from this sub-chapter is that the support which both accelerators and incubators offer to startups, provide invaluable resources to the companies in order to make sure that these are able to effectively progress throughout their life-cycle. (Sepulveda, 2012)

In conclusion, due to the fact that accelerators provide a more thorough support by going further in time regarding the different stages which a company is expected to go through, and actually provide specific support to help the startups to scale, which could be considered one of the most crucial phases for young companies, the present thesis will exclusively address acceleration programs instead of choosing business incubators.

3.3. Measuring accelerators performance

This following sub-chapter is highly important for the purposes of this thesis as it will give the reader an overview of existing literature which discusses relevant metrics and models that can be used in order to measure accelerators performance.

As it was stated in the introduction chapter, this thesis has the ultimate objective of presenting the results of an analysis between startups that have been involved in accelerations programs against startups that have not engaged into such support programs. The following paragraphs will provide readers with metrics and in general a model that will be used in the analysis chapter in order to ultimately assess if startups which are accelerators present higher performances compared to those of companies that have not been involved with acceleration programs.

However, before delving into explaining the method to measure startups performances, it is important to understand what does it actually mean to measure a company's performance. As Andy Neely described, a performance management system represents a group of metrics which can be used to quantify both the efficiency and the effectiveness of certain actions. (Neely, 2015) According to the BusinessDictionary.com, performance management is defined as the assessment of a process to quantify progress towards predetermined goals. (Businessdictionary.com, 2016) Moreover, the U.S. Department of Commerce describes this as being a process through which companies "communicate their organizational goals and objectives as well as reinforce individual accountability to meeting those goals, track and evaluate individual and organizational performance results". (U.S. Department of Commerce, 2016) Through these definitions, it becomes clear that performance management applied to the case in questions which is the startups accelerators, is the process by which these organizations create a standardized model composed of metrics that will be used to quantify their own efficiency and effectiveness in helping accelerate startups. This will therefore bring more transparency to the industry and thus help entrepreneurs, investors, and other parties interested in performing comparability and benchmarking analysis to the acceleration market.

Furthermore, nowadays accelerators are becoming a well-known resource for entrepreneurs and their startups, when looking at available literature on this topic, there has been a scarce amount of work done to document the performance of these

support programs. According to Elizabeth Caley, most accelerators are just now beginning to explore models and metrics that will serve as standards for the industry in order to allow the above mentioned support for comparability and benchmarking for such support programs. In her paper, Elizabeth describes two categories for measuring the startups performance, one relates to the metrics associated with the survival and growth of the accelerated startups, and the second relates to the operation of the support programs. These metrics are further characterized as follows:

1st category – Survival and growth of the startups

- Current status of the startups (operating; closed; acquired);
- Number of employees;
- Number of startups who have received investment, follow up investment rounds and amount of investment;
- Customers acquisition.

2nd category – Operation of the accelerators' programs

- Number of applicants;
- Mentor engagement;
- Number of investors attending demo day;
- Net Promoter Score as rated by participants;
- Participant exit interviews and surveys.

Since the hypotheses presented in the introduction are mainly targeted to the startups which are being accelerated, rather than the accelerators themselves, the 2nd category becomes irrelevant as its use is only valid for support programs performance' measurement purposes. However, the author also reveals some issues which have been identified through interviews to accelerators directors, which are currently becoming obstructions to the process of measuring performance of both accelerators and their accelerated startups. These issues arise from various factors:

- Lack of resources – this is recorded to be one of the main reasons for why these support programs are lacking official statistics and performance reports. Reportedly, all the staff from accelerators is focused on providing support to the current accelerated startups as well as recruiting the following batch of companies to accelerate. Therefore, the team is left with little to no time at all to perform data collection and performance management with those startups which have already finished their acceleration;
- Data collection – another major issue with performance reports is that only those startups which have received investment from the accelerators in exchange for equity, are legally obliged to report their financial performance to the investors, thus this is the only setup which allows accelerators to hear back from their alumni. Otherwise, accelerators have to rely on startups will to kindly provide the information required, or on external news sources which very often present merely rumors and not proved facts;
- Metrics – regarding the metrics, it becomes clear the importance of establishing guidelines for measuring performance for the accelerators industry. However, due to the various types of acceleration programs (e.g. government, university and venture capitals programs) the metrics which become important to measure become different. For instance, for a government acceleration program, job creation becomes the metric which will define success, whereas for a university accelerator the relevance lies on how many patents their accelerated startups get approved or for a venture capital accelerator, who's objective is primarily on achieving a return on their investment.
- Tools – at last, this issue addresses the fact that until now, there has not been a tool which have been widely adopted by the entire market and that supports accelerators and other support programs for startups to collect data from the startups which they supported and measure their own performance. So far, tools such as interviews, surveys to alumni, excel spreadsheets and databases such as dealsroom.io and dashboard.io are being used for this

purpose. However, the need to standardize the process of performance management across all support programs is yet to be solved.

Additionally, the Centre for Digital Entrepreneurship and Economic Performance (DEEP Centre) has contributed to this subject by proposing another measurement process which is composed of three key performance measurement categories, program quality, efficiency and sustainability; economic impact; and investment impact.

The program quality measurement, measures the effectiveness, efficiency and financial viability of the support programs available for startups. It allows one to understand: if high-quality candidates are being more or less attracted to these support programs; the acceptance rate of each program; the candidates' performances regarding the creation of minimum viable products; validation of market demand; how successful can the entrepreneurs be at finding the right customers as well as investors; the ability of the support programs to maintain an interesting roster of experienced mentors; the total cost of each program; and the ability for these support programs to gain sufficient revenues in order to cover their costs.

The Economic impact, which is highly important for the purposes of this thesis, attempts to understand the impact which support programs have on firms' performance. It measures the startups' growth after graduating from these programs regarding their revenues, jobs, exports and profitability. The reason why this performance category is so important is because by measuring those aspects of a given company, one becomes able to further investigate to what the degree the growth in revenues, jobs, exports and profitability can be accredited to these support programs. Not only this, but also, it helps understand if there is and to what extent accelerated startups outperform those which have not been involved with any support programs.

At last, the investment impact measurement tracks the impact that the support programs have had on the startups' investment outcomes. It allows one to understand: if accelerated startups are able to obtain follow-on investment; how much can they obtain and from whom; and the percentage of these companies which are actually able to exit and generate a return to the support programs/investors. (Centre for Digital Entrepreneurship and Economic Performance, 2015)

Furthermore, the DEEP Center found a suitable method to evaluate performance against the above three key performance measurement categories and arrange this in a framework which applies different metrics, across different stages of the startups' life-cycle, from acceleration to five years after graduation. The framework has been reviewed and chosen as the main source of inspiration to build the conceptual framework which will be presented in the 4th chapter, since it addresses key performance points of startup companies. The original framework created by the DEEP Center can be seen in the following table:

Economic and Investment Performance Metrics:		
Stage	**Measure**	**Metrics**
Intake	Selection process	▪ Number of applicants ▪ Percentage of applicants accepted
	Cohort size	▪ Number of participants per cohort ▪ Number of cohorts per year
	Participant demographics	▪ Age of participating firms ▪ Growth stage of participating firms ▪ Founder demographics (age, gender, nationality, ethnicity)
Program structure and Characteristics	Seed funding	▪ Average size of seed investment
	Equity stake	▪ Average percentage equity stake
	Tenure/Engagement	▪ Average length of engagement with supporter firms
	Mentorship resources	▪ Number of mentors/firm
	Program efficiency	▪ Cost of programming per firm

	Program/service quality	▪ As qualitatively assessed by graduates
Program milestones	Product/service creation	▪ Number of firms completing of a minimum viable product
	Market research	▪ Number of firms completing a vetted market research plan
	Internationalization	▪ Number of firms completing a vetted export strategy
	Demand validation	▪ Average number of meetings with qualified customers/firm
	Investment attraction	▪ Average number of meetings with qualified investors/firm
Graduation (Plus 12 months)	Operational status	▪ Percentage operating, closed, acquired
	Investment attraction	▪ Percentage receiving next-stage funding ▪ Average size of follow-on investments ▪ Sources of funding: VC, angel, government, other
	Sales/Revenue generation	▪ Average increase in number of customers ▪ Average increase in revenue
	Job creation	▪ Total jobs generated/year ▪ Average number of jobs generated per firm
Post-graduation firm performance (1-5 years after graduation)	Firm survival rates	▪ Survival rates at years 1-5
	Sales/Revenue growth	▪ Annual growth in number of customers ▪ Annual revenue growth
	Employment growth	▪ Net jobs created at years 1-5
	Investment growth	▪ Total capital raised ▪ Number of investors
	Export growth	▪ Percentage goods/services exported ▪ Annual growth of international revenues
	Firm profitability	▪ Annual growth of net profits

Table 3 – Economic and Investment Performance Metrics (Centre for Digital Entrepreneurship and Economic Performance, 2015)

The aggregated measurement of the five stages is relevant for the entire industry in order to ensure that the market is transparent and that it allows their participants to perform comparability and benchmarking analysis to ultimately assess a program's suitability for specific startups, entrepreneurs and investors. However, the first three stages have been specifically designed to assess and measure the accelerators performance rather than the startups. For this reason, only the last two stages, correspondent to the graduation and post-graduation, will be considered, since the metrics present within these two stages aim to measure the accelerated startups performance.

Moreover, given that the present thesis aims to measure the accelerated startups performance against the performance of non-accelerated startups, the following chapter will present a conceptual framework containing an adaptation of the original Economic and Investment Performance Metrics table developed by the DEEP Center, reflecting exclusively the measures and metrics that will be further utilized to specifically target the startups and not the support programs' performances.

Chapter 4: Conceptual framework

Maxwell defines a conceptual framework as a system of concepts, assumptions, expectations, beliefs and theories that serve as a support for readers to understand how the data collected will be interpreted and analyzed. (Maxwell, 2013) According to Mosby's Medical Dictionary, it is a group of concepts defined and organized to provide a rational for the integration and interpretation of the research findings. (Mosby, 2012) Therefore, for the purposes of the present thesis, it was found relevant to include and further explain the model which will be used in the data analysis chapter in order to be able to answer the research questions and the proposed hypotheses as well.

In accordance with the research question of this thesis, it became important to address the metrics which measures the performance of startups. These metrics are the basis for investigating the various hypotheses described in the introduction chapter and will be used to compare the performance of startups which have attended acceleration programs against those who have not, in order to ultimately be able to answer if there is in fact an advantage for those companies which have been involved with such programs.

Therefore, in order to attain more precise results, the following table which is an adaptation of the original work done by the DEEP Center, targets not only accelerated startups but also non-accelerated startups. It represents the measurement framework which will be applied throughout the findings and data analysis chapters.

Performance Measurement Framework		
Timeframe	**Measure**	**Metrics**
1st year	Operational status	▪ Percentage of exited startups, through IPO, acquisition or other method (i.e. merger); Percentage of startups operating;
	Investment attraction	▪ Percentage receiving next-stage funding; ▪ Average amount of capital raised per startup;
	Customers growth (online)	▪ Companies online attention (Mindshare Score);
	Job creation	▪ Total jobs generated; ▪ Average number of jobs generated per firm;
2nd to 5th year	Operational status	▪ Percentage of exited startups, through IPO, acquisition or other method (i.e. merger); Percentage of startups operating;
	Customers growth (online)	▪ Companies online attention (Mindshare Score);
	Employment growth	▪ Total jobs generated; ▪ Average number of jobs generated per firm; ▪ Average employees' month over month growth;
	Investment growth	▪ Total capital raised; ▪ Average amount of capital raised per startup; ▪ Number of investors.

Table 4 - Performance Measurement Framework (Centre for Digital Entrepreneurship and Economic Performance, 2015)

The following paragraphs will provide the readers with a description of the measures and the metrics which will be used to track startups performance.

Due to the nature of what these measures and metrics are individually analyzing, they have been divided into two categories that are distinguished by the timeframes of the startups' life-cycle at which the data is meant to be collected at. The first category (1st year) includes the metrics which are meant to be collected after the first year of life of the companies. For those companies which were accelerated, the metrics collected are from after one year of completing the acceleration program. Regarding the second category (2nd to 5th year), the metrics collected are from the 2nd year to the 5th year of the companies' life, and for those companies which have been accelerated, the metrics are from the 2nd year to the 5th year after completing the acceleration program. This method of organizing the data is meant to cluster the information into short-term performance metrics (1st year category) and long-term performance metrics (2nd to 5th year category). This way, the analysis can reflect if there is any impact of accelerators to the accelerated startups performances, and if that impact has a tendency to either increase or decrease throughout time.

Furthermore, another change made to the original table is the addition of the Mindshare Score which is a metric created by Mattermark database that combines web, mobile, and social traction to determine a company's growth of online attention and how it changes over time. The signals tracked to create the Mindshare Score include estimated web traffic, estimated mobile app downloads, inbound links from other websites, and followers/likes on various social media sites. Additionally, a positive score indicates aggregate growth across these signals, a score closer to zero indicates a plateau, and a negative score indicates a declining online footprint. Companies need 4 weeks of data to be scored. (Mattermark, 2016)

Additionally, other measures of the table have been taken out due to a lack of available information regarding the startups. Specifically, all of the economic measures, such as net profit and revenue metrics have been taken out of this adapted table for the reasons expressed above.

Moreover, the next section will describe what each stage category is meant to evaluate using the given measures and metrics.

1st year stage

The 1st year timeframe is meant to evaluate the short-term performance of the startups. The metrics proposed will be used to evaluate:

- Companies operational status, by registering how many are operating and how many have successfully exited by either filing an IPO, being acquired or other exit methods (i.e. merging with another company);
- Companies' investment status by registering the percentage of companies which have successfully conducted a round of investment and the average size of the investments;
- Customers growth by looking at the mindshare score, produced by Mattermark, the startup database company, which combines web, mobile, and social traction to summarize companies' growth of online attention;
- Creation of new jobs by looking at the total number of jobs created as well as the average number of jobs generated per firm.

2nd to 5th year stage

The 2nd to 5th year timeframe is meant to track the companies' long-term performance. To track the companies' performance, the proposed metrics will evaluate:

- Companies operational status as it is evaluated in the 1st year timeframe, by registering how many are operating and how many have successfully exited by either filing an IPO, being acquired or other exit methods (i.e. merging with another company);
- Customers growth, as the 1st year timeframe also evaluates, by looking at the mindshare score, produced by Mattermark, the startup database company, which combines web, mobile, and social traction to summarize companies' growth of online attention;

- Employment growth through the total number of jobs generated, the average number of jobs generated per firm and also through the average employees' month over month growth;
- Investment growth by looking at the total capital raised by the startups, the average capital raised per startup and the average number of investors per startups.

Ultimately, by aggregating all the metrics information, it will be possible to compare accelerated and non-accelerated startups' performance from both a short and long term perspectives.

In conclusion, the following chapter (Chapter 5: Findings) will present the data needed to be able to make this comparison, describing the main databases used, how the data was categorized and clustered, the reasons for doing it and at last, the data itself with the results from the performance metrics of the startups chosen as subjects to be analyzed.

Chapter 5: Findings

The previous chapters have presented the theoretical foundations needed in order to understand key concepts, definition and frameworks. Amongst these, questions such as: what are startups?; what challenges do entrepreneurs face while attempting to lead their startups to success?; what can these young companies do to possibly increase their chances of success?; what is the role of startup support programs in the field of entrepreneurship?; and how are accelerators built to tackle entrepreneurs' obstacles?, amongst some other key points. Moreover, chapter 4 has established the conceptual framework which is going to be used throughout this thesis in order to be able to draw any conclusions regarding the research question of whether or not accelerators increase startups abilities and thus their chances of succeeding.

Therefore, this chapter will include: a description of the databases used and how individually, each one of them contributed to the data collection section of this project; the metrics information regarding the chosen startups which will later on be analyzed; and the process of choosing startups.

5.1. Databases

In order to be able to answer the research question, it was imperative to collect data from startups regarding their performance measurement metrics which have already been further explained in the conceptual framework chapter. After researching the available information, it was noticeable that startups information relies almost entirely on the good will of entrepreneurs volunteering information of their startups in order to build these databases and to elaborate on entrepreneurial related statistics. Also, not all of the volunteered information is aggregated in one major database, instead, these can be found across various different databases which many times include different metrics amongst them all. The following section will

describe the primary databases used in this thesis regarding the information which was individually collected through each of them.

5.1.1. Mattermark

Mattermark is a data platform for venture capital companies to quantify signals of growing and potentially lucrative start-ups. It has been the major source of information for this thesis given that the company has agreed to lend the use of a pro membership which includes full use of their database as well as sorting options, which for the purposes of this research, was considered an extremely important feature to have in order to be able to create startup clusters. By using this database which includes a total of 1,547,193 startup listings, it is possible to filter them by choosing the business model; industry; location; investors; current funding-round; funding bucket; employee count; date of foundation; and date of last funding amongst other specific filtering options. Overall, the majority of the metrics described in the theoretical framework have been collected through Mattermark.

5.1.2. Seed-DB

Seed-DB database started as an MBA thesis at the University of Cambridge on seed accelerators titled "Copying Y Combinator: A framework for developing Seed Accelerator programs". Jed Christiansen, the author, built a comprehensive list of all known accelerators (235 world-wide) as all of the companies that had gone through those programs (5710 companies), in order to properly analyze seed accelerators. What this database offer is a centralized resource for all information on business accelerators and the companies which have gone through them. Furthermore, the use of this database in the present thesis was mostly to be able to name all accelerators which in all of these platforms consider as investors. This was relevant in order to be able to start creating two startup clusters which included both accelerated and non-accelerated startups.

5.1.3. CB-Insights

At last, CB-Insights is a platform to access smarter, faster and friendlier intelligence on high growth private companies. This database defines itself as being the ideal tool for those engaged in private equity, venture capital, corporate development, investment banking, corporate innovation & strategy, angel investment and consulting. If provides its users with resources to discover the right private company information in the most efficient and comprehensive way. Also, CB-Insights it helps unveil future disruptive companies, emerging trends, new markets to enter, competitor's strategies, what companies should one consider acquiring/investing, etc. Furthermore, the use of this tool within the present thesis was to serve as a complement to the Mattermark database. Even though CB-Insights refused to offer free unlimited access to its services, the company allowed the creation of a demo account which lasted for 30 days and lets its users access all the above mentioned features of the platform plus performance, financing and industry trends & competitors' information regarding startups.

In conclusion, the combined use of the above databases was fundamental in order to collect data on the subject and thus be able to conduct the present research.

5.2. Categorizing the startups

For the purposes of this thesis and in order to increase the reliability of the analysis which will be conducted in the following chapter, it was important to organize the data into clusters. Cluster analysis is a method which aims to classify a collection of objects which are similar between them and are different to the objects belonging to other clusters. Furthermore, when collecting the startups data from the databases previously introduced, the search options available in these platforms were extremely comprehensive and allowed to specifically define the search parameters desired. The following section will further explain the parameters used to collect the startups performance metrics data and organize the data into clusters:

Accelerated & non-accelerated startups

The first parameter which has already been extensively discussed regards to the fact of if whether or not a startup has been or has not been accelerated which represents the main cluster. This categorization is essential in order to be able to elaborate a performance comparison between accelerated and non-accelerated startups and thus answer the research question.

Locations

Furthermore, the second parameter was to choose between two different locations from where the startups are based off, in order to be able to understand if whether or not the location influences in any manner the way the performance of accelerated or non-accelerated startups. The two locations chosen are California and London, and the reasons for choosing such locations is because California is assumed to have one of the worlds' most active entrepreneurial culture. As for London, it is considered to be the "California" of Europe, also in terms of its entrepreneurial environment.

Timeframes

The last parameter to be used is related to the timeframes of the Performance Measurement Framework metrics. These timeframes separate the startups performance metrics, which are to be collected and later analyzed, into a short-term category (the 1st year stage metrics) and a long-term category (the 2nd to 5th year stage metrics). By performing this separation into short and long term metrics, it becomes possible to further understand if there is an impact caused by accelerators to the startups which they accelerate, and specifically, if that impact is either greater or lesser throughout time.

In result of this categorization, the data collected from the startups derives from companies which have been involved with the startups acceleration program provided by Y-Combinator and Seedcamp (Location. San Francisco and London respectively) and companies from that same locations but who have not been

accelerated. The data collected ranges from 2010 to 2015 and has been divided into two separate timeframes to allow an analysis of both the short and long term performance of startups.

Moreover, an attempt to further categorize the startups data by industries was made, in order to be able to create a more in-depth analysis. However, due to limitations regarding the available time to conduct the study and more importantly due to the limited access to information it was not possible to realize this categorization.

In practice, creating clusters for this research has proved to be advantageous since it has allowed for a more comprehensive analysis of the data which will take place in the following chapter (Chapter 6th: Data Analysis). Furthermore, without categorizing the data it would have been practically impossible to answer more specific hypotheses such as:

7) Is the impact caused by accelerators on accelerated startups greater or lesser throughout time?

8) Does the impact which accelerators have on their accelerated startups change depending on the companies' location?

These hypotheses are related to the clusters presented and its ultimate objective is to generate a more in-depth analysis of the impact of accelerators on companies' performance. Such information would allow entrepreneurs to evaluate if accelerators are valuable for their companies and also would allow them to choose an acceleration program specifically tailored to the characteristics of the startup in terms of location.

The following sub-chapter will present the data from the startups chosen to be included in this research. At last, the performance measurement framework metrics will be presented in order to be later on analyzed in the 6th chapter (Chapter 6th: Analysis).

5.3. Data

After carefully reviewing and filtering all the available information in accordance with the clusters previously outlined, the data collected comprises a total of 448 startups. This data, which will be used to conduct the analysis chapter of this thesis, was entirely collected using the three databases mentioned in subchapter 5.1 (databases). Furthermore, the 449 startups have been divided into 4 clusters (A, B, C & D) with the following characteristics:

- **Cluster A** is composed of 141 startups which have been previously involved with the acceleration program offered by *Y-Combinator*, located in San Francisco. This accelerator is recognized by industry experts as the most successful in the world.
- **Cluster B** is also composed of 150 startups which are located in San Francisco, but who never have been involved with an acceleration program.
- **Cluster C** includes 53 startups which have been participants of *Seedcamp's* acceleration program. This acceleration program is located in London and is also considered one of the most recognized acceleration programs in the world.
- **Cluster D** includes 105 startups located in London, which have never been involved with any acceleration program.
- **Cluster AC** is the aggregated view of the two accelerated startups' clusters. It is composed of 194 startups that have been accelerated by either Y-Combinator or Seedcamp.
- At last, **cluster BD** is the aggregated view of the two non-accelerated startups' clusters, comprising a total of 255 startups.

Furthermore, all startups included in this study have been founded between 2010 and 2015. For the purposes of this study and in accordance with the timeframes categorization of the data, the short term performance measurement will target accelerated startups founded between 2010 and 2013 and non-accelerated startups

which have been founded between 2010 and 2014. Regarding the long term performance measurement, the study will target startups accelerated throughout 2014 as well as non-accelerated startups founded in 2015.

5.3.1. Performance metrics tables

5.3.1.1. Aggregated view from all clusters

The table below shows the aggregated view from the four clusters.

All clusters - Performance Measurement					
Timeframe	**Measure**	**Metrics**			
1st year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	205	95%
			Exited (acquired)	8	4%
			Exited (ipo)	0	0%
			Exited (other)	3	1%
	Investment attraction	Percentage receiving next-stage funding;	85%		
		Average ammount capital raised per startup	$	13 845 185,19	
	Customers growth (online)	Companies online attention (Mindshare score);	254		
	Job creation	Total jobs generated;	5580		
		Average number of jobs generated per firm;	26		
		Average employees 6 months growth rate;	47%		
2nd to 5th year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	203	88%
			Exited (acquired)	21	9%
			Exited (ipo)	0	0%
			Exited (other)	8	3%
	Customers growth (online)	Companies online attention (Mindshare score);	176		
	Employment growth	Total jobs generated;	9476		
		Average number of jobs generated per firm;	41		
		Average employees 6 months growth rate;	16%		
	Investment growth	Total capital raised;	$	3 137 812 493,00	
		Average capital raised per startup;	$	13 525 053,85	
		Average number of investors per startup	7		

Table 5 - Performance Measurement table with the aggregated view from all clusters

5.3.1.2. Cluster A

The table below shows the performance measurement table from cluster A.

Cluster A - Performance Measurement					
Timeframe	**Measure**	**Metrics**			
1st year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	8	80%
			Exited (acquired)	2	20%
			Exited (ipo)	0	0%
			Exited (other)	0	0%
	Investment attraction	Percentage receiving next-stage funding;	89%		
		Average ammount capital raised per startup	$ 8 146 250,00		
	Customers growth (online)	Companies online attention (Mindshare score);	164		
	Job creation	Total jobs generated;	147		
		Average number of jobs generated per firm;	15		
		Average employees 6 months growth rate;	34%		
2nd to 5th year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	109	83%
			Exited (acquired)	15	11%
			Exited (ipo)	0	0%
			Exited (other)	7	5%
	Customers growth (online)	Companies online attention (Mindshare score);	206		
	Employment growth	Total jobs generated;	6659		
		Average number of jobs generated per firm;	51		
		Average employees 6 months growth rate;	15%		
	Investment growth	Total capital raised;	$ 2 306 860 193,00		
		Average capital raised per startup;	$ 17 609 619,79		
		Average number of investors per startup	10		

Table 6 - Performance Measurement table from Cluster A

5.3.1.3. Cluster B

The table below shows the performance measurement table from cluster B.

Cluster B - Performance Measurement					
Timeframe	**Measure**	**Metrics**			
1st year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	109	95%
			Exited (acquired)	6	5%
			Exited (ipo)	0	0%
			Exited (other)	0	0%
	Investment attraction	Percentage receiving next-stage funding;	89%		
		Average ammount capital raised per startup	$ 16 700 000,00		
	Customers growth (online)	Companies online attention (Mindshare score);	327		
	Job creation	Total jobs generated;	3926		
		Average number of jobs generated per firm;	34,14		
		Average employees 6 months growth rate;	55%		
2nd to 5th year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	34	97%
			Exited (acquired)	1	3%
			Exited (ipo)	0	0%
			Exited (other)	0	0%
	Customers growth (online)	Companies online attention (Mindshare score);	162		
	Employment growth	Total jobs generated;	1330		
		Average number of jobs generated per firm;	38		
		Average employees 6 months growth rate;	15%		
	Investment growth	Total capital raised;	$ 525 060 000,00		
		Average capital raised per startup;	$ 15 001 714,29		
		Average number of investors per startup	4		

Table 7 - Performance Measurement table from Cluster B

5.3.1.4. Cluster C

The table below shows the performance measurement table from cluster C.

Cluster C - Performance Measurement					
Timeframe	**Measure**	**Metrics**			
1st year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	12	100%
			Exited (acquired)	0	0%
			Exited (ipo)	0	0%
			Exited (other)	0	0%
	Investment attraction	Percentage receiving next-stage funding;	100%		
		Average ammount capital raised per startup	$ 7 120 000,00		
	Customers growth (online)	Companies online attention (Mindshare score);	239,4166667		
	Job creation	Total jobs generated;	224		
		Average number of jobs generated per firm;	19		
		Average employees 6 months growth rate;	22%		
2nd to 5th year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	36	88%
			Exited (acquired)	4	10%
			Exited (ipo)	0	0%
			Exited (other)	1	2%
	Customers growth (online)	Companies online attention (Mindshare score);	106		
	Employment growth	Total jobs generated;	867		
		Average number of jobs generated per firm;	21		
		Average employees 6 months growth rate;	11%		
	Investment growth	Total capital raised;	$ 136 327 300,00		
		Average capital raised per startup;	$ 3 325 056,10		
		Average number of investors per startup	4		

Table 8 - Performance Measurement table from Cluster C

5.3.1.5. Cluster D

The table below shows the performance measurement table from cluster D.

Cluster D - Performance Measurement					
Timeframe	**Measure**	**Metrics**			
1st year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	77	96%
			Exited (acquired)	0	0%
			Exited (ipo)	0	0%
			Exited (other)	3	4%
	Investment attraction	Percentage receiving next-stage funding;	77%		
		Average ammount capital raised per startup	$	11 081 372,55	
	Customers growth (online)	Companies online attention (Mindshare score);	166		
	Job creation	Total jobs generated;	1336		
		Average number of jobs generated per firm;	17		
		Average employees 6 months growth rate;	40%		
2nd to 5th year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	24	96%
			Exited (acquired)	1	4%
			Exited (ipo)	0	0%
			Exited (other)	0	0%
	Customers growth (online)	Companies online attention (Mindshare score);	158		
	Employment growth	Total jobs generated;	620		
		Average number of jobs generated per firm;	25		
		Average employees 6 months growth rate;	33%		
	Investment growth	Total capital raised;	$	169 565 000,00	
		Average capital raised per startup;	$	6 782 600,00	
		Average number of investors per startup	2		

Table 9 - Performance Measurement table from Cluster D

5.3.1.6. Accelerated startups clusters (AC)

The table below shows an aggregated view of the performance metrics related to clusters A and C which correspond to the accelerated startup clusters.

Accelerated startups cluster - Performance Measurement					
Timeframe	**Measure**	**Metrics**			
1st year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	20	91%
			Exited (acquired)	2	9%
			Exited (ipo)	0	0%
			Exited (other)	0	0%
	Investment attraction	Percentage receiving next-stage funding;	95%		
		Average ammount capital raised per startup	$	7 576 111,11	
	Customers growth (online)	Companies online attention (Mindshare score);	205		
	Job creation	Total jobs generated;	371		
		Average number of jobs generated per firm;	17		
		Average employees 6 months growth rate;	28%		
2nd to 5th year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	145	84%
			Exited (acquired)	19	11%
			Exited (ipo)	0	0%
			Exited (other)	8	5%
	Customers growth (online)	Companies online attention (Mindshare score);	182		
	Employment growth	Total jobs generated;	7526		
		Average number of jobs generated per firm;	44		
		Average employees 6 months growth rate;	14%		
	Investment growth	Total capital raised;	$	2 443 187 493,00	
		Average capital raised per startup;	$	14 204 578,45	
		Average number of investors per startup	9		

Table 10 - Performance Measurement table from the accelerated startups clusters

5.3.1.7. Non-accelerated startups clusters (BD)

The table below shows an aggregated view of the performance metrics related to clusters B and D which correspond to the non-accelerated startup clusters.

Non-accelerated startups cluster - Performance Measurement					
Timeframe	**Measure**	**Metrics**			
1st year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	186	95%
			Exited (acquired)	6	3%
			Exited (ipo)	0	0%
			Exited (other)	3	2%
	Investment attraction	Percentage receiving next-stage funding;	84%		
		Average ammount capital raised per startup	$ 14 723 793,10		
	Customers growth (online)	Companies online attention (Mindshare score);	261		
	Job creation	Total jobs generated;	5262		
		Average number of jobs generated per firm;	27		
		Average employees 6 months growth rate;	49%		
2nd to 5th year	Operational status	Percentage of exits through IPO, acquisition or others (i.e. mergers); Percentage of startups operating;		TOTAL	(%)
			Operating	56	97%
			Exited (acquired)	2	3%
			Exited (ipo)	0	0%
			Exited (other)	0	0%
	Customers growth (online)	Companies online attention (Mindshare score);	165		
	Employment growth	Total jobs generated;	1941		
		Average number of jobs generated per firm;	33		
		Average employees 6 months growth rate;	23%		
	Investment growth	Total capital raised;	$ 694 625 000,00		
		Average capital raised per startup;	$ 11 976 293,10		
		Average number of investors per startup	3		

Table 11 - Performance Measurement table from the non-accelerated startups clusters

The tables presented above show the results from the data collected and the organization of that same data into four different clusters distinguished by the startups' locations and if they have been involved with acceleration programs or not. Additional tables were added to the chapter, such is the case for tables 5, 10 and 11. Table 5 presents the information from all the data collected and in order to be able to undertake a more in-depth analysis of the results of this thesis, it was important to include it in the chapter. Moreover, tables 10 and 11 are also extremely

relevant for this thesis since one can take advantage of the information present on this tables which regard to the aggregated view of both accelerated startups clusters (table 10) and well as the non-accelerated startups clusters (table 11).

With the data collected from the databases and throughout the entire study, it becomes possible to make an analysis from multiple perspectives:

- *Cluster A Vs Cluster C* – Analyze and compare the performance of startups accelerated by Y-Combinator (San Francisco) against startups accelerated by Seemcamp (London);
- *Cluster A Vs Cluster B* – Analyze and compare the performance of startups accelerated by Y-Combinator against non-accelerated startups from San Francisco;
- *Cluster C Vs Cluster D* – Analyze and compare the performance of startups accelerated by Seedcamp against non-accelerated startups from London;
- *Cluster AC Vs Cluster BD* – At last, analyze and compare the performance of accelerated startups (both Y-Combinator and Seedcamp) against all non-accelerated startups from San Francisco and London.

The following chapter (Chapter 6: Data Analysis) will present the analysis from the above mentioned perspectives in order to be able to answer the hypothesis outlined in the introduction and ultimately answer the research question.

Chapter 6: Data analysis

The previous chapters have presented readers with the methodological approach taken throughout this thesis, relevant literature on the topics handled in this study as well as the startups performance metrics data which will be used to perform the analysis. Ultimately, this analysis will serve to answer the various hypothesis outlined in the 1st chapter and thus understand if startups which have been accelerated present better performances across various areas such as investment attraction, customers' growth (online) and job creation, against those startups which have not been involved with acceleration programs.

6.1. Clusters analysis

6.1.1. Cluster A Vs Cluster C

The following two tables shows a direct comparison between the short and long-term performance metrics gathered from the startups which have been accelerated by Y-Combinator against those which were accelerated by Seedcamp.

Short-term

Metric	Cluster A	Cluster C
Percentage of exits through IPO, acquisition or others (i.e. mergers);	20%	0%
Percentage receiving next-stage funding;	89%	100%
Average amount of capital raised per startup;	8 146 250$	7 120 000$
Startups online attention (Mindshare score).	164	239
Total jobs generated;	147	224
Average number of jobs generated per startup;	15	19
Average employees 6 months' growth rate;	34%	22%

Table 12 - Short-term performance comparison between cluster A and cluster C

Taking a closer look into the information provided by the above table, it is possible to understand that cluster A presents an advantage in terms of performance in operational status, by producing 20% of exits while cluster C has no recorded exits in the short-term; in investment attraction in respect of the average amount of capital raised per firm where, although cluster C leads by 11% the percentage of companies which receive next-stage funding, Cluster A averages approximately 1 million of dollars more than in capital raised per startups; and in job creation in respect to the average employees' 6 months growth rate which surpasses by 11% cluster C's value. Furthermore, where cluster C outperforms is in the customer's growth (online) category, by recording a Mindshare score of 239 vs cluster A's 147 points.

In general, the startup accelerated by Y-Combinator (cluster A) presented a superior performance compared to those accelerated by Seedcamp (cluster C), by averaging more capital raised per firm and by producing more exits in the short-term, which can be seen as a characteristic of successful businesses.

Long-term

Metric	Cluster A	Cluster C
Percentage of exits through IPO, acquisition or others (i.e. mergers);	16%	12%
Startups online attention (Mindshare score).	206	106
Total jobs generated;	6659	867
Average number of jobs generated per startup;	51	21
Average employees 6 months' growth rate;	15%	11%
Total capital raised (US dollars);	2 306 860 193$	136 327 300$
Average capital raised per startup (US dollars);	17 609 619,79$	3 325 056,10$

Average number of investors;	10	4

Table 13 - Long-term performance comparison between cluster A and cluster C

Regarding the long-term performance of these two clusters, the advantage recorded in the short-term period by cluster A over cluster C becomes even more emphasized. Cluster A outperforms cluster C in exits percentage by 4%; it has approximately double cluster C's Mindshare score; it employees on average 51 people per startup vs 21 in cluster C; it has a higher growth rate; it has an average capital raised per firm of 17.6 million dollars against only 3.3 million; and it has a higher number of investors attracted per startups.

The conclusion of this long-term performance comparison is undoubtedly taken by startups accelerated by Y-Combinator against startups accelerated by Seedcamp, whom have recorded the best performance in terms of their operational status, customers' growth (online), employment growth and investment growth.

6.1.2. Cluster A Vs Cluster B

The following two tables shows a direct comparison between the short and long-term performance metrics gathered from the startups which have been accelerated by Y-Combinator against those based in San Francisco but which were not accelerated.

Short-term

Metric	Cluster A	Cluster B
Percentage of exits through IPO, acquisition or others (i.e. mergers);	20%	5%
Percentage receiving next-stage funding;	89%	89%
Average amount of capital raised per startup;	8 146 250$	16 700 000$
Startups online attention (Mindshare score).	164	327
Total jobs generated;	147	3926

Average number of jobs generated per startup;	15	34
Average employees 6 months' growth rate;	34%	55%

Table 14 - Short-term performance comparison between cluster A and cluster B

In terms of the short-term performance of these two clusters, it is noticeable that cluster B, comprised only with non-accelerated startups from San Francisco, has an advantage in the majority of the metrics except one. The operational status is led by cluster A with a difference of 15% between each other. It is important to highlight some of the values recorded from this comparison such as the average amount of capital raised per startup, which in cluster B is approximately double the size of cluster A. Moreover, the values from the Mindshare score, the number of jobs generated per firm and the average employees 6 months' growth rate are also almost double than those from cluster A.

In conclusion, there is no doubt from the above results that non-accelerated startups from San Francisco present higher performances than startups which have been accelerated by Y-Combinator, also in San Francisco.

Long-term

Metric	Cluster A	Cluster B
Percentage of exits through IPO, acquisition or others (i.e. mergers);	16%	3%
Startups online attention (Mindshare score).	206	162
Total jobs generated;	6659	1330
Average number of jobs generated per startup;	51	38
Average employees 6 months' growth rate;	15%	15%
Total capital raised (US dollars);	2 306 860 193$	525 060 000$
Average capital raised per startup (US dollars);	17 609 619,79$	15 001 714,29$

Average number of investors;	10	4

Table 15 - Long-term performance comparison between cluster A and cluster B

Furthermore, the long-term results of this comparison do not follow the same trend as the short-term results did. As it can be seen in the above table, accelerated startup from Y-Combinator actually dominate almost all metrics with the exception of the average employees' growth rate which was recorded to be the same (15%) across the two clusters. In regard to the other metrics, it is important to highlight that Y-Combinator produces 13% more exits that the non-accelerated pool of startups investigated in this study. In addition to a higher Mindshare score and average number of employees per startup, cluster A is able to raise on average more 2.5$ millions per startup comparing to cluster B.

In conclusion, companies which have been accelerated by Y-Combinator present a higher performance in almost all fields than companies from San Francisco which have never been involved with acceleration programs.

6.1.3. Cluster C Vs Cluster D

The following two tables shows a direct comparison between the short and long-term performance metrics gathered from the startups which have been accelerated by Seedcamp against those based in London but which were not-accelerated.

Short-term

Metric	Cluster C	Cluster D
Percentage of exits through IPO, acquisition or others (i.e. mergers);	0%	4%
Percentage receiving next-stage funding;	100%	77%
Average amount of capital raised per startup;	7 120 000$	11 081 327,55$
Startups online attention (Mindshare score).	239	166
Total jobs generated;	224	1336

Average number of jobs generated per startup;	19	17
Average employees 6 months' growth rate;	22%	40%

Table 16 - Short-term performance comparison between cluster C and cluster D

In terms of the short-term performance of clusters C and D, there is not one that stands out from the other in all categories. Although cluster C dominates the percentage of companies receiving next-stage funding, the Mindshare score and the average number of jobs generated per firm, cluster D takes the lead with 4% of exist, 11$ million against cluster C's 7$ million in average amount of capital raised per firm and in the average employees' 6 months' growth rate with a 40% value.

Therefore, due to the mixed results from this specific comparison, we can conclude that in the short-term, companies accelerated by Seedcamp outperform non-accelerated companies from London in some areas, whereas in others, the non-accelerated cluster takes the lead.

Long-term

Metric	Cluster C	Cluster D
Percentage of exits through IPO, acquisition or others (i.e. mergers);	12%	4%
Startups online attention (Mindshare score).	106	158
Total jobs generated;	867	620
Average number of jobs generated per startup;	21	25
Average employees 6 months' growth rate;	11%	33%
Total capital raised (US dollars);	136 327 300$	169 565 000$
Average capital raised per startup (US dollars);	3 325 056,10$	6 782 600$
Average number of investors;	4	2

Table 17 - Long-term performance comparison between cluster C and cluster D

Furthermore, in the long-term, cluster D presents higher performance metric values compared to cluster C. Specifically, in terms of the Mindshare score, the average number of jobs generated per startup, the average employees 6 months' growth rate and most importantly, the average capital raised per startup, registering an excess of 3.3$ million in comparison to cluster C, which will allow the startups to keep operating and to further invest in their business in order to grow and expand operations, increasing the overall value of the company. Moreover, it is important to mention that companies accelerated from Seedcamp presented a higher percentage of exits.

In conclusion, companies from London which have not been accelerated present a higher performance within the most important fields than those accelerated by Y-Combinator.

6.1.4. Cluster AC Vs Cluster BD

The following two tables shows a direct comparison between the short and long-term performance metrics gathered from the startups which have been accelerated by either Y-Combinator or Seedcamp against those based in San Francisco and London as well, but which were not accelerated.

Short-term

Metric	Cluster AC	Cluster BD
Percentage of exits through IPO, acquisition or others (i.e. mergers);	9%	5%
Percentage receiving next-stage funding;	95%	84%
Average amount of capital raised per startup;	7 576 111,11$	14 723 793,10$
Startups online attention (Mindshare score).	205	261
Total jobs generated;	371	5262
Average number of jobs generated per startup;	17	27
Average employees 6 months' growth rate;	28%	49%

Table 18 - Short-term performance comparison between cluster AC and cluster BD

At last, the most important comparison lies here, where the comparison between startups which have been accelerated by either Y-Combinator or Seedcamp against those which have not been accelerated and whom are also from either San Francisco or London. After analyzing the table above, it is possible to understand that in the short-term, non-accelerated startups actually outperform the accelerated ones in the most important fields: average amount of capital raised per startup, Mindshare score, average number of jobs generated per firm as well as average employees' 6 months' growth rate. Leaving cluster AC with an advantage over the percentage of exits and the percentage receiving next stage funding.

Long-term

Metric	Cluster AC	Cluster BD
Percentage of exits through IPO, acquisition or others (i.e. mergers);	16%	3%
Startups online attention (Mindshare score).	182	165
Total jobs generated;	7526	1941
Average number of jobs generated per startup;	44	33
Average employees 6 months' growth rate;	14%	23%
Total capital raised (US dollars);	2 443 187 493$	694 625 000$
Average capital raised per startup (US dollars);	14 204 578,45$	11 976 293,10$
Average number of investors;	9	3

Table 19 - Long-term performance comparison between cluster AC and cluster BD

In the long-term, accelerated startups assume the lead of all but one category, which is the average employees' 6 months' growth rate. As for the other categories, accelerated startups present the most exits percentage, highest average Mindshare score, highest average number of jobs generated, highest number of investors and most importantly, the highest average capital raised per startup. Therefore, it is possible to conclude that accelerated startups present higher performances in the long-term compared to non-accelerated startups.

The following sub-chapter will further review this analysis/comparison between clusters and answer the hypotheses outlined in the introduction chapter as well as the research question.

6.1.5. Answering the hypotheses and research question

This sub-chapter will present the answers to the hypotheses and the research questions using the previous sub-chapter where the various analysis were made as the point of reference. It is worth noticing that even though the analysis made were taken from both a short and long term perspective, what entrepreneurs strive for is the continuity of their businesses, therefore making the long-term results more relevant and valuable for this thesis' purpose.

Starting with the hypotheses:

1) Do startups which have attended acceleration programs (accelerated startups) secure next stage funding more often than those who have not attended such programs (non-accelerated startups)?

It is possible to state that from the investigation undertaken, accelerated startups are actually able to secure more often next-stage funding compared to non-accelerated startup. Furthermore, in terms of the two accelerators/locations investigated which were Y-Combinator representing San Francisco and Seedcamp representing London, the latter has registered a higher performance than the former, thus making

startups accelerated by Seedcamp in London more probable to secure next-stage funding.

2) Do accelerated startups secure on average larger amounts of follow-on-investment compared to non-accelerated startups?

Regarding follow on investments, the analysis showed that neither one of the accelerated startup clusters recorded a higher amount of follow-on-investment compared to non-accelerated startups, with an average difference of 7.2 million dollars.

3) Do accelerated startups have higher online attention (Mindshare score) compared to non-accelerated startups?

In terms of the Mindshare score, non-accelerated startups have a higher average in the short-term, surpassing the accelerated startups category by approximately 55 points. However, in the long-term, accelerated startups take the lead with 182 vs 165 points, suggesting that accelerators are valuable over take for the startups online presence.

4) Do accelerated startups have, on average, a higher number of jobs generated per firm compared to non-accelerated startups?

The job creation section is similar to the above hypothesis, where the non-accelerated group of startups have registered to employee on average, more people than accelerated startups, only in the short-term. Whereas in the long-term, accelerated startups create on average 44 jobs per startup, 11 more than the non-accelerated group.

5) Do accelerated startups raise more capital in the long-term compared to non-accelerated startups?

In term of investment, which is an extremely relevant factor for young companies, accelerated startups take the lead here and average 14.2 million dollars

approximately, compared to the 11.9 million dollars on average which non-accelerated startups have raised. One point to highlight regarding this metric is that, Y-Combinator alone averages 17.6 million dollars raised per startup versus the 3.3 million dollars raised by Seedcamp, therefore demonstrating that San Francisco possesses an advantage over London in terms of raising funds.

6) Do accelerated startups secure a higher number of investors compared to non-accelerated startups?

On average, accelerated startups have been registered to secure more investors than non-accelerated startups, which demonstrates that these companies, because they are imbedded within a strong entrepreneurial community, are actually able to more effectively catch investors' interest over their business. Additionally, just like the previous hypothesis, Y-Combinator is also the dominant accelerator in terms of this metric, registering 10 investors per startups on average, versus 4 investors from Seedcamp startups.

7) Is the impact caused by accelerators on accelerated startups greater or lesser throughout time?

By analyzing the data, one can understand that the impact which was registered throughout this research caused by accelerators to the accelerated startups is definitely greater throughout time. In fact, the short term performances of accelerators seem to have a diminishing effect on the startups performances compared to those which were not accelerated. However, when analyzing the long-term performance metrics, it becomes clear that accelerator have had a positive and meaningful effect on these companies.

8) Does the impact which accelerators have on their accelerated startups change depending on the companies' location?

The answer for this hypothesis has also become clear throughout the analysis. From the registered performances, Y-Combinator has dominated Seedcamp at almost all

areas, with the exception of the percentage receiving next-stage funding and the short-term Mindshare score. Nonetheless, the results suggest than companies accelerated by Y-Combinator present a significant advantage over Seedcamp.

At last, by answering the proposed hypotheses, it becomes possible to address the focal point of this study and answer the research question:

Do startups which have attended acceleration programs have better performances then those who have not attended such programs?

The conclusion for this research question has also been made clear in this chapter. In fact, those companies which go through an acceleration program, register in the long-term an improvement in their performances in terms of customers' growth, employment growth and investment growth.

Chapter 7: Conclusion

This final chapter will present the conclusion of this thesis. Additionally, it will include some limitation of this research as well as present some suggestions for future research.

7.1. Conclusion

The research question which was defined from the beginning of this thesis was:

> *Do startups which have attended acceleration programs have better performances then those who have not attended such programs?*

As it was mentioned in the previous chapter, after analyzing the startups performance metrics data, and clustering that information into four different categories which have allowed for a more narrowed analysis and conclusion, is was found that accelerated startups present improved performances in the long-term compared to startups which have not been involved with acceleration programs. The areas in which these companies outperformed the others were in terms of the operational status, where it was concluded that accelerated startups had 16% of exits against the 3% of non-accelerated startups. Moreover, they have outperformed in terms of their online attention which can be linked to their customers' growth in the online environment. Furthermore, in terms of employment growth, even though accelerated startups presented a lower employees' 6 months' growth rate average, they presented a higher number of jobs generated on average per firm. At last, accelerated startups also presented a considerable advantage in terms of investment growth, where they have an average of capital raised per firm of 14.2 million dollars against 11.9 million.

Therefore, this supports the assumption that accelerators do actually bring value to entrepreneurs, by supporting their path in building a business and in constructing

relationships with investors, employees and other relevant actors of the entrepreneurial community.

The following section will present some limitations found throughout the process of writing this thesis and at last, some suggestion to further research this topic will be made.

7.2. Limitation

Furthermore, there are some limitations regarding the present thesis which will be acknowledge in the following paragraph.

One of the major limitations felt when conducting this research was the scarcity of resources in terms of startups performance metrics data available. The reason for this, as it was previously mentioned, is due to the limited number of entrepreneurs who are actually volunteering information regarding their businesses and making it publicly available for those who are interested in it. Even though access to a major database was granted for the purposes of writing this thesis, the information however remains scarce and limited. Additionally, data regarding startups valuations, revenues and profits, which would be extremely relevant for this research, can sometimes be found on these databases, but only for those who are willing to pay for a membership, thus creating limitations for those who do not have the financial resources to do so. Furthermore, due to scarcity of information, another limitation which was found is the number of subject that have been included within the analysis. Even though the four clusters contained over 400 startups, having a higher number of subjects would only contribute and further support the results taken from the analysis. At last, the use of Y-Combinator as the San Francisco accelerator can be considered by some a limitation given that Y-Combinator is considered the most successful accelerator in the world. However, the results taken from the analysis/comparison of London's accelerator Seedcamp against non-accelerated startups showed that even a smaller and less successful accelerator is

able to provided startups with an advantage over the non-accelerated clusters, thus validating the results taken from the analysis.

Taking into consideration these limitations, some suggestions to further investigate this topic and improve on the reliability of the results will be presented in the following sub-chapter.

7.3. Suggestions for future research

Having in mind the limitation described above and more importantly, relevant aspects and areas of the topic at hand which have not yet been studied the following paragraph will provide readers with some suggestions for future research.

The data collection and data analysis chapters (5th and 6th chapter respectively) have taken the knowledge presented throughout this thesis and applied it into the theoretical framework suggested in the 4th chapter. What resulted from the analysis allow to answer the hypotheses as well as the research question which focused on the performance of accelerated startups. Some more specific hypotheses discussed location specific benefits from accelerators and well as the level of impact which these accelerators cause on startups throughput time. However, one aspect which was not studied due to the unavailability of data was how these accelerators can actually improve the startups performances and for what reason, Y-Combinator has demonstrated to be superior compared to Seedcamp its startups' performances. Additionally, it would be valuable to conduct a more in-depth research by including more accelerated and non-accelerated startups, from various locations other than San Francisco and London and which included startups that have been accelerated by other accelerators than Y-Combinator and Seedcamp. This would allow a deeper analysis of the impacts that accelerators haven on startups as well as a demographical distribution of these impacts in order to see if there are either specific locations or institutions that exert more influence than others, and if so, why and how does this occur. At last, another suggestion would be to include industry related clusters which would allow one to answer if whether or not there

are industries which are more prone to be positively impacted by accelerators, and also, if there are accelerators which provide more value for startups that derive from a specific industry.

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Appendices

Appendix 1 – Cluster A

State	Name	Mindshare Score	Employee Count	Employees 6 Months Growth Rate	Founded	Stage	Total Funding	2.0	City	Investidores
Operating	Exec	-152	3	-40%	2012	Exited (other)	$3 300 000,00	San Francisco	16	
Operating	Fixed	-137	5	0%	2014	Exited (acquired)	$770 000,00	San Francisco	6	
Operating	Crowdbooster	-129	8	33%	2010	Pre Series A	$-	Palo Alto	14	
Operating	Grouper	-105	14	17%	2011	Pre Series A	$-	SoHo	4	
Operating	Diaspora	-69	22	0%	2010	Pre Series A	$-	San Francisco	1	
Exited	GetGoing	-62	32	0%	2011	Exited (acquired)	$2 500 000,00	Redwood City	11	
Exited	BufferBox	-60	0	-100%	2010	Exited (acquired)	$1 000 000,00	Kitchener	10	
Operating	GinzaMetrics	-54	9	0%	2010	Pre Series A	$1 700 000,00	San Francisco	6	
Operating	Aisle50	-50	0	-100%	2010	A	$5 200 000,00	Chicago	13	
Operating	Ark	-34	7	0%	2012	Pre Series A	$5 300 000,00	San Francisco	25	
Exited	Earbits	-33	14	40%	2010	Exited (acquired)	$725 000,00	Los Angeles	10	
Operating	Amicus	-25	3	-25%	2011	Pre Series A	$3 800 000,00	New York	18	
Operating	Scoutzie	-17	0	-100%	2011	Exited (other)	$-	Mountain View	4	
Exited	SendHub	-16	10	-33%	2012	B	$10 000 000,00	Menlo Park	26	

Exited	GazeHawk	-12	0	-100%	2010	Exited (acquired)	$-	Mountain View	4
Exited	Amiato	-8	1	-50%	2011	Exited (acquired)	$2 000 000,00	Palo Alto	5
Operating	Beetailer	0	36	1100%	2011	Pre Series A	$-	San Francisco	2
Operating	Siasto	1	2	0%	2011	Pre Series A	$750 000,00	San Francisco	3
Operating	DataNitro	1	0	-100%	2012	Pre Series A	$-	New York	2
Operating	Flightfox	1	11	0%	2012	Pre Series A	$800 000,00	San Francisco	7
Exited	GoComm	3	2	0%	2013	Pre Series A	$-	Mountain View	2
Operating	SwipeGood	7	1	0%	2010	Pre Series A	$500 000,00	San Francisco	6
Operating	DoubleRecall	8	1	0%	2010	Pre Series A	$1 700 000,00	Mountain View	7
Exited	Glassmap	9	0	-100%	2011	Exited (acquired)	$-	Mountain View	1
Operating	Butter Systems	10	0	0%	2013	Pre Series A	$100 000,00	Los Altos	4
Operating	vastrm	16	5	0%	2012	Pre Series A	$1 000 000,00	Burlingame	7
Operating	mth sense	20	4	33%	2011	Pre Series A	$-	San jose	2
Operating	Amulyte	20	0	0%	2012	Pre Series A	$255 000,00	Mountain View	4
Operating	Upverter	24	8	-11%	2010	Pre Series A	$3 000 000,00	Toronto	9
Exited	dotCloud	30	214	55%	2010	Exited (acquired)	$28 700 000,00	San Francisco	16
Exited	SoundFocus	30	1	-67%	2012	Pre Series A	$1 700 000,00	San Francisco	10
Operating	Zillabyte	31	3	-70%	2011	Exited (other)	$-	San Francisco	11
Operating	Zen99	33	1	0%	2014	Pre Series A	$2 500 000,00	San Francisco	5
Operating	AeroFS	35	26	0%	2010	B	$15 500 000,00	Palo Alto	16

Exited	Freshplum	35	2	0%	2010	Exited (acquired)	$2 600 000,00	San Francisco	21
Operating	Asseta	38	10	25%	2013	Pre Series A	$1 000 000,00	San Francisco	13
Operating	Shout	38	1	-50%	2013	Pre Series A	$120 000,00	New York	3
Operating	Glowing Plant	41	4	-20%	2012	Pre Series A	$484 000,00	San Francisco	2
Operating	Tastemaker	42	2	100%	2012	Pre Series A	$2 900 000,00	San Francisco	4
Operating	CodeNow	45	12	0%	2011	Exited (other)	$120 000,00	San Francisco	3
Operating	Immunity Project	48	9	0%	2013	Pre Series A	$-	Oakland	3
Exited	Rentobo	49	3	0%	2011	Pre Series A	$-	San Francisco	2
Operating	eBrandValue	50	14	-7%	2012	Pre Series A	$120 000,00	Istanbul	2
Operating	neptune.io	53	5	0%	2013	Pre Series A	$-	Seattle	3
Exited	Standard Treasury	56	3	-67%	2013	Exited (acquired)	$120 000,00	San Francisco	4
Operating	Tagstand	57	3	50%	2011	Pre Series A	$120 000,00	San Francisco	3
Operating	Vayable	61	13	30%	2010	Pre Series A	$-	Brooklyn	8
Operating	Cruise	63	29	0%	2013	Exited (acquired)	$16 800 000,00	San Francisco	14
Operating	Comprehend Systems	67	65	-7%	2010	B	$30 600 000,00	Redwood City	21
Exited	Craft Coffee	67	9	-10%	2010	Pre Series A	$-	Brooklyn	5
Operating	Greentoe	67	4	33%	2012	Pre Series A	$75 000,00	Los Angeles	4
Operating	Swapbox	71	5	0%	2012	Pre Series A	$800 000,00	San Francisco	7
Operating	knowmia	72	0	0%	2012	Pre Series A	$-	San Francisco	3

Operating	Eligible	79	59	34%	2011	A	$2 300 000,00	San Francisco	12
Exited	Screenhero	79	0	-100%	2013	Exited (acquired)	$-	Mountain View	4
Operating	Rickshaw	81	4	-20%	2013	Pre Series A	$120 000,00	San Francisco	3
Exited	Buttercoin	83	0	-100%	2013	Exited (other)	$1 300 000,00	Palo Alto	10
Operating	SimplyInsured	87	22	22%	2012	A	$8 400 000,00	San Francisco	17
Operating	Boostable	90	5	-71%	2013	Pre Series A	$3 800 000,00	San Francisco	16
Operating	Doblet	90	9	-10%	2014	Pre Series A	$1 300 000,00	San Francisco	3
Operating	AppHarbor	94	1	0%	2010	Pre Series A	$-	San Francisco	2
Operating	GiftRocket	94	3	50%	2010	Pre Series A	$120 000,00	Mountain View	2
Operating	True Link Financial	103	14	-13%	2012	Pre Series A	$6 800 000,00	San Francisco	7
Exited	Camperoo	103	9	0%	2013	Pre Series A	$120 000,00	Houston	2
Operating	CareMessage	110	23	35%	2012	Exited (other)	$9 800 000,00	San Francisco	19
Operating	Clever	116	114	23%	2012	B	$43 300 000,00	San Francisco	27
Operating	Rescale	123	20	33%	2011	A	$20 500 000,00	San Francisco	19
Operating	Taplytics	124	11	57%	2011	Pre Series A	$2 400 000,00	Palo Alto	17
Operating	Datarank	135	16	-11%	2011	Exited (acquired)	$1 400 000,00	Fayetteville	4
Operating	Wevorce	142	27	35%	2012	A	$4 700 000,00	San Mateo	13
Operating	Style Lend	145	8	14%	2013	Pre Series A	$120 000,00	San Francisco	2

Operating	Custora	153	38	15%	2011	A	$6 500 000,00	New York	13
Operating	Semantics3	153	23	35%	2012	A	$2 200 000,00	San Francisco	4
Exited	Eventjoy	154	4	300%	2014	Exited (acquired)	$120 000,00	Menlo Park	2
Operating	carlypso	155	29	71%	2013	Pre Series A	$-	San Carlos	2
Operating	Submittable	158	20	54%	2010	A	$2 100 000,00	Missoula	10
Operating	Sliced Investing	159	1	-90%	2014	Pre Series A	$2 000 000,00	San Francisco	5
Operating	Wefunder	171	16	14%	2011	Pre Series A	$530 000,00	San Francisco	5
Exited	42Floors	172	17	-6%	2011	B	$17 400 000,00	San Francisco	17
Operating	Apptimize	183	36	29%	2013	A	$6 100 000,00	Mountain View	8
Operating	Science Exchange	185	43	39%	2011	B	$30 600 000,00	Palo Alto	22
Operating	Senic	186	20	150%	2013	Pre Series A	$-	Berlin	3
Operating	Shift Payments	194	5	-17%	2014	Pre Series A	$2 200 000,00	San Francisco	4
Operating	ShipBob	195	21	50%	2014	A	$5 000 000,00	Chicago	13
Exited	Framed Data	196	13	30%	2013	Pre Series A	$2 100 000,00	San Francisco	15
Operating	Double Robotics	205	24	-14%	2012	Pre Series A	$250 000,00	Sunnyvale	5
Operating	Zesty	209	21	-34%	2012	A	$20 700 000,00	San Francisco	12
Exited	Chute	212	59	7%	2011	A	$9 700 000,00	San Francisco	14
Exited	Rocketrip	215	45	25%	2013	B	$15 200 000,00	New York	7
Exited	Impraise	220	31	24%	2013	Pre Series A	$1 600 000,00	Mountain View	4

Operating	Watsi	232	41	21%	2011	A	$4 700 000,00	San Francisco	13
Operating	CodeCombat	234	17	55%	2013	Pre Series A	$120 000,00	San Francisco	3
Operating	CrowdMed	235	15	15%	2012	Pre Series A	$4 800 000,00	San Francisco	16
Operating	Survata	239	23	15%	2012	A	$9 000 000,00	San Francisco	10
Exited	URX	241	42	-13%	2013	Exited (acquired)	$27 200 000,00	San Francisco	27
Operating	Ambition	249	8	-47%	2013	Pre Series A	$2 000 000,00	Chattanooga	14
Operating	GoCardless	253	77	13%	2011	C	$24 800 000,00	London	9
Operating	TrueVault	266	11	0%	2013	Pre Series A	$2 500 000,00	Mountain View	9
Operating	Two Tap	266	5	-17%	2013	Pre Series A	$2 800 000,00	Palo Alto	8
Operating	Vidyard	267	128	39%	2011	C	$60 800 000,00	Kitchener	13
Exited	BuildZoom	268	72	41%	2012	A	$14 200 000,00	San Francisco	18
Operating	uBiome	279	40	82%	2012	Pre Series A	$351 193,00	San Francisco	5
Operating	AirHelp	279	156	64%	2013	Late	$4 800 000,00	Cambridgeshire	4
Operating	EasyPost	282	23	77%	2012	Pre Series A	$3 100 000,00	San Francisco	15
Operating	sendwithus	286	16	0%	2014	Pre Series A	$2 400 000,00	Victoria	8
Exited	AptDeco	293	9	-10%	2013	Pre Series A	$120 000,00	New York	3
Operating	Checkr	297	67	56%	2014	B	$49 000 000,00	San Francisco	12
Operating	Airware	304	139	39%	2011	Late	$66 100 000,00	San Francisco	12
Operating	FarmLogs	325	66	14%	2012	B	$15 000 000,00	Ann Arbor	10

Operating	AnyPerk	333	64	42%	2012	A	$14 300 000,00	San Francisco	11
Exited	Casetext	339	36	33%	2013	A	$8 800 000,00	Palo Alto	15
Operating	Bitnami	343	60	43%	2011	Pre Series A	$-	San Francisco	10
Operating	Swiftype	350	35	9%	2012	B	$22 200 000,00	San Francisco	17
Operating	FundersClub	359	43	10%	2012	Pre Series A	$6 500 000,00	San Francisco	26
Exited	SpoonRocket	360	51	-6%	2013	Exited (other)	$13 500 000,00	Berkeley	10
Operating	Shoptiques	367	68	8%	2012	Pre Series A	$2 000 000,00	New York	5
Operating	Backpack	369	18	50%	2014	Pre Series A	$-	Mountain View	2
Operating	iCracked	376	479	8%	2010	Late	$-	Redwood City	5
Operating	Gobble	412	36	71%	2010	A	$12 100 000,00	Menlo Park	22
Operating	Sift Science	440	60	20%	2011	B	$23 600 000,00	San Francisco	17
Operating	FlightCar	445	84	25%	2012	B	$34 800 000,00	San Mateo	12
Operating	BloomThat	446	41	3%	2013	A	$8 000 000,00	San Francisco	16
Exited	Unbabel	451	208	30%	2013	Late	$1 500 000,00	Lisbon	5
Operating	Cambly	456	58	0%	2012	Pre Series A	$120 000,00	San Francisco	4
Operating	Webflow	463	24	26%	2012	Pre Series A	$1 500 000,00	Mountain View	3
Exited	SmartAsset	478	39	26%	2011	A	$7 600 000,00	New York	9
Operating	Goldbely	485	13	-13%	2012	Pre Series A	$3 000 000,00	San Francisco	11
Operating	Bellabeat	548	47	21%	2012	A	$4 600 000,00	Mountain View	8

Operating	Algolia	549	58	41%	2012	A	$21 000 000,00	Paris	15	
Exited	Caviar	555	145	44%	2012	Exited (acquired)	$15 100 000,00	San Francisco	7	
Operating	Estimote	558	45	2%	2012	A	$13 800 000,00	New York	18	
Operating	Codecademy	573	126	66%	2011	C	$42 500 000,00	New York	22	
Operating	ClearTax	632	67	68%	2010	A	$15 300 000,00	New Delhi	10	
Exited	FutureAdvisor	651	55	34%	2010	Exited (acquired)	$21 500 000,00	San Francisco	13	
Exited	Zapier	675	42	35%	2011	Pre Series A	$1 200 000,00	Mountain View	5	
Operating	Stripe	788	453	34%	2011	Late	$190 000 000,00	San Francisco	20	
Exited	DoorDash	911	655	49%	2013	C	$181 800 000,00	Palo Alto	17	
Operating	Zenefits	932	1,190	-25%	2013	C	$583 600 000,00	San Francisco	19	
Operating	Coinbase	939	113	12%	2012	Late	$117 200 000,00	San Francisco	25	
Operating	Instacart	1000	844	15%	2012	Late	$274 900 000,00	San Francisco	20	
Operating	Teespring	1256	337	20%	2012	B	$56 900 000,00	San Francisco	8	

Appendix 2 – Cluster C

State	Name	Growth Score	Mindshare Score	Employee Count	Employees 6 Months Growth Rate	Founded	Stage	Total Funding	2.0	City	Investors
Operating	Mopapp	-104	-100	3	-25%	2011	Pre Series A	$-	London	1	
Operating	vox.io	-97	-96	0	-100%	2011	Exited (other)	$-	Ljubljana	2	
Operating	Blossom	-88	-90	4	0%	2011	Pre Series A	$40 000,00	San Francisco	15	
Operating	Poq Studio	-42	-50	15	-29%	2011	Pre Series A	$-	London	13	

Operating	Planvine	-22	-31	10	-9%	2010	Pre Series A	$-	London	16
Operating	Farmeron	14	-20	40	8%	2010	Pre Series A	$4 100 000,00	Mountain View	2
Operating	AppExtras	-6	-5	0	0%	2011	Pre Series A	$-	0	14
Operating	GateMe	-6	-4	8	-11%	2011	Pre Series A	$90 000,00	London	1
Exited	Crashpadder	-1	-1	1	0%	2010	Exited (acquired)	$-	London	1
Exited	BUKIT	2	4	10	150%	2011	Pre Series A	$-	0	2
Operating	cashtag	17	22	1	0%	2013	Pre Series A	$-	Lisbon	6
Operating	Antavo	40	29	18	29%	2011	Pre Series A	$-	London	5
Operating	Rawstream	35	34	4	33%	2012	Pre Series A	$-	London	2
Operating	BuzzTale	31	34	3	0%	2013	Pre Series A	$-	Riga	3
Operating	Psykosoft	30	35	0	-100%	2011	Pre Series A	$618 000,00	Tours	2
Operating	Qminder	47	39	11	38%	2011	Pre Series A	$-	Tallinn	2
Operating	minubo	80	54	25	9%	2013	Pre Series A	$-	Hamburg	2
Operating	Zercatto	53	55	2	-50%	2012	Pre Series A	$390 000,00	Porto	2
Operating	CTRLio	62	60	15	7%	2013	Pre Series A	$1 300 000,00	London	2
Exited	Saberr	87	70	11	57%	2013	Pre Series A	$2 700 000,00	London	2
Operating	MightyFingers	77	80	3	-25%	2011	Pre Series A	$-	Riga	14
Operating	SimpleTax	90	84	7	40%	2013	Pre Series A	$-	London	2
Exited	Compilr	86	86	0	0%	2012	Exited (acquired)	$-	Halifax	3
Operating	Futurelytics	80	88	4	0%	2012	Pre Series A	$800 000,00	Wilmington	6

Operating	CrowdProcess	92	90	8	60%	2012	Pre Series A	$150 000,00	Lisbon	4	
Operating	TruckTrack	92	92	6	-14%	2013	Pre Series A	$485 000,00	0	6	
Operating	FishBrain	156	94	32	19%	2010	A	$10 600 000,00	Goteborg	2	
Operating	Countly	109	102	7	0%	2012	Pre Series A	$-	Istanbul	1	
Operating	Teddy The Guardian	128	121	7	17%	2013	Pre Series A	$400 000,00	Zagreb	4	
Operating	Tanaza	162	132	26	53%	2010	Pre Series A	$500 000,00	Milan	7	
Operating	Sayduck	131	133	8	14%	2012	Pre Series A	$65 000,00	Helsinki	4	
Operating	Popcorn Metrics	151	149	2	100%	2013	Pre Series A	$-	London	1	
Operating	GoWorkaBit	197	193	8	14%	2013	Pre Series A	$-	0	1	
Operating	We Are Colony	264	239	17	31%	2013	Pre Series A	$2 000 000,00	London	5	
Exited	GrabCAD	280	241	87	9%	2010	Exited (acquired)	$13 300 000,00	Boston	1	
Operating	Stamplay	320	317	11	0%	2012	Pre Series A	$189 300,00	London	4	
Operating	Lodgify	443	345	19	46%	2012	Pre Series A	$2 300 000,00	Barcelona	6	
Operating	Codacy	382	366	14	17%	2012	A	$1 600 000,00	London	1	
Exited	Holvi	396	378	25	0%	2011	Exited (acquired)	$-	Helsinki	2	
Operating	Codeship	500	424	28	40%	2011	A	$4 400 000,00	Boston	1	
Operating	TransferWise	1097	555	367	24%	2010	C	$90 300 000,00	London	4	
	Now Native	-12	1	1	0%	2014	Pre Series A	$175 431,00	London	2	
	Mailcloud	52	57	6	-40%	2014	Pre Series A	$2 800 000,00	London	6	
	Splittable	124	79	16	45%	2014	Pre Series A	$1 200 000,00	London	2	

	Terminis	134	126	8	-27%	2014	Pre Series A	$82 000,00	Barcelona	7
	Pronto 216	133	27	108%	2014	Pre Series A	$1 500 000,00	London	3	
	Cymmetria	229	139	33	57%	2014	A	$10 600 000,00	Ramat Gan	9
Operating	Formisimo	248	235	11	-21%	2014	Pre Series A	$500 000,00	Manchester	8
	Formisimo	248	235	11	-21%	2014	Pre Series A	$500 000,00	Manchester	5
	Send Anywhere	405	405	13	0%	2014	A	$6 100 000,00	Seoul	3
	Revolut	571	412	33	94%	2014	A	$17 100 000,00	London	3
	Teleport	509	500	12	33%	2014	Pre Series A	$2 500 000,00	Palo Alto	6
	Property Partner	696	551	53	39%	2014	B	$28 400 000,00	London	2

Appendix 3 – Cluster B

Name	Growth Score	Mindshare Score	Employee Count	Employees 6 Months Growth Rate	Founded	Stage	Total Funding	2.0	City	Investors
apozy	38	31	7	-13%	2012	Pre Series A	$-	San Francisco	4	
AssertID	19	17	2	-33%	2011	Pre Series A	$-	Belmont	4	
Brandle	18	24	8	-11%	2011	Pre Series A	$1 100 000,00	Petaluma	3	
CampusTap	128	47	11	267%	2012	Pre Series A	$1 600 000,00	San Francisco	5	
Captora	394	306	66	25%	2012	B	$22 000 000,00	Mountain View	1	
Clari	308	217	78	20%	2012	B	$20 000 000,00	Mountain View	10	
Conversa Health	71	29	16		2013	Pre Series A	$2 500 000,00	San Francisco	7	
Coursmos	475	413	38	36%	2013	Pre Series A	$1 400 000,00	Redwood City	4	
DropThought	68	70	20	-31%	2011	A	$4 200 000,00	Santa Clara	6	

Elastic 55	45	16	45%	2013	Pre Series A	$-	Mountain View	7	
Electric Imp	215	115	53	23%	2011	C	$44 000 000,00	Los Altos	0
Emissary	74	69	9	29%	2013	Pre Series A	$-	San Francisco	2
Focus -73	-168	104	7%	2011	Exited (acquired)		$12 200 000,00	San Francisco	4
Full Circle CRM	106	53	37	37%	2011	A	$4 300 000,00	San Mateo	1
Graymatics	53	34	22	38%	2011	A	$1 800 000,00	Santa Clara	6
Grokker	457	441	37	-5%	2012	A	$5 500 000,00	San Jose	3
HealthCrowd	63	37	18	29%	2011	Pre Series A	$2 100 000,00	San Mateo	2
Lastline	219	190	65	14%	2011	B	$25 800 000,00	Redwood City	3
Leap Commerce	-25	-12	4	0%	2011	Pre Series A	$1 800 000,00	San Francisco	4
Medium	1533	1533	198	27%	2012	C	$132 000 000,00	San Francisco	6
Muzooka	69	80	6	-14%	2011	A	$3 000 000,00	Greenbrae	6
ParStream	156	124	39	-5%	2011	B	$13 600 000,00	Cupertino	6
PicsArt	554	258	187	34%	2011	C	$45 000 000,00	San Francisco	5
Preact 224	271	20	-26%	2011	A	$11 600 000,00	San Francisco	1	
Prime 12	-6	13	-7%	2013	Pre Series A	$110 000,00	San Francisco	6	
Rani Therapeutics	11	11		2012	Late	$25 000 000,00	San Jose	4	
RentMethod	15	24	1	-50%	2012	Pre Series A	$-	San Francisco	2
Robinhood	762	543	106	66%	2012	B	$66 000 000,00	Palo Alto	5
Roundme	313	310	4	33%	2012	Pre Series A	$3 000 000,00	Palo Alto	5
Schoolfy	15	24	3	-50%	2011	Pre Series A	$250 000,00	Palo Alto	1

ShareRails	17	13	2	-33%	2012	Pre Series A	$-	Docklands	4	
Skyport Systems	228	75	78	30%	2013	C	$60 000 000,00	Mountain View	1	
Tripfactory	363	331	36	9%	2013	A	$10 000 000,00	San Francisco	2	
Westward Leaning	80	87	13	-13%	2011	A	$5 100 000,00	San Francisco	11	
YoPro Global	30	23	13	8%	2011	Pre Series A	$100 000,00	San Francisco	5	
Abl Schools	217	175	6		2015	Pre Series A	$4 500 000,00	San Francisco	1	
Alpaca	208	193	8	33%	2015	Pre Series A	$1 000 000,00	San Mateo	6	
ApplePie Capital		175	124	27	29%	2014	A	$9 800 000,00	San Francisco	1
Avaamo	369	322	24	-8%	2014	Pre Series A	$6 300 000,00	Los Altos	15	
Baobab Studios		178	178			2015	A	$6 000 000,00	San Francisco	3
Beyond Pricing		384	373	6	20%	2014	Pre Series A	$1 500 000,00	San Francisco	4
Blueshift Labs	551	476	24	71%	2014	A	$10 600 000,00	San Francisco	1	
Branch Metrics		1003	684	100	61%	2014	B	$53 000 000,00	Palo Alto	0
Breeze	465	330	71	11%	2014	Pre Series A	$2 500 000,00	San Francisco	3	
Cape Productions		454	415	23	21%	2014	Pre Series A	$-	Redwood City	3
Captiv8	287	229	25	150%	2015	Pre Series A	$2 000 000,00	San Francisco	8	
CareerLark	431	431	7		2015	Pre Series A	$50 000,00	San Francisco	0	
Clear Labs	335	287	20	43%	2014	A	$6 500 000,00	San Francisco	3	
Clearbit	546	522	11	57%	2014	Pre Series A	$2 000 000,00	San Francisco	6	
Clover Health	1021	298	197	36%	2014	C	$295 000 000,00	San Francisco	1	
CodeFights	500	468	12	20%	2014	Pre Series A	$2 400 000,00	San Francisco	3	

Cola	374	196	21		2015	Pre Series A	$1 300 000,00	San Francisco	3
Comma.ai	786	786			2015	Pre Series A	$3 100 000,00	San Francisco	39
Concord	592	592	23		2015	Pre Series A	$2 700 000,00	San Francisco	6
Confluent	823	612	78	59%	2014	B	$30 900 000,00	Mountain View	6
CornerShop	316	231	41		2015	A	$6 700 000,00	San Francisco	8
Dasheroo	462	447	15	-17%	2014	A	$3 300 000,00	San Francisco	6
Diamanti	401	134	37		2014	A	$12 500 000,00	San Francisco	4
Drivemode	204	186	10	11%	2014	Pre Series A	$2 000 000,00	San Jose	3
Eero	673	352	97	83%	2014	B	$90 000 000,00	San Francisco	8
EHANG	422	204	63	91%	2014	B	$52 000 000,00	San Carlos	1
Engagio	298	251	15	67%	2015	Exited (acquired)	$10 500 000,00	San Mateo	1
Enlitic	201	167	25	9%	2014	A	$15 000 000,00	San Francisco	0
Ensilo	401	258	47	68%	2014	A	$19 000 000,00	San Francisco	1
eucl3d	251	239	8	14%	2014	Pre Series A	$-	Berkeley	6
F50	175	185	20	-13%	2014	Pre Series A	$2 000 000,00	Palto Alto	1
Farmers Business Network		352	210	69	28%	2014	B	$15 000 000,00	San Carlos	2
Fetch Robotics		408	338	36	20%	2014	B	$23 000 000,00	San Jose	2
Fleet	284	207	25	108%	2014	Pre Series A	$6 500 000,00	San Francisco	4
Flock	224	117	27	93%	2015	Pre Series A	$2 000 000,00	San Francisco	0
Fove	300	236	18	100%	2014	A	$11 100 000,00	San Francisco	3
Frederick	383	371	8	33%	2014	Exited (acquired)	$-	San Francisco	5

Fronto	164	160	4	100%	2014	A	$4 000 000,00	San Francisco	7
Glassbreakers	170	188	11	-15%	2014	Pre Series A	$2 600 000,00	San Francisco	2
Globality	506	130	55	189%	2015	B	$37 000 000,00	San Francisco	7
GOQii	699	271	116	73%	2014	A	$16 200 000,00	Menlo Park	5
Granular	257	244	55	-11%	2014	B	$22 900 000,00	San Francisco	1
Hatch Baby	473	473	10		2014	A	$7 000 000,00	Menlo Park	4
HeyPillow	292	292	15		2014	A	$3 000 000,00	San Francisco	2
Homie	199	199	24		2015	A	$3 800 000,00	San Francisco	4
hyperledger	168	168	0		2014	Exited (acquired)	#VALOR!	San Francisco	0
Instamotor	253	220	20	54%	2014	Pre Series A	$-	San Francisco	0
Inverse	1374	1265	38	90%	2015	Pre Series A	$-	San Francisco	3
Jobr	233	174	28	65%	2014	Exited (acquired)	$-	San Francisco	10
Joyable	555	460	45	32%	2014	A	$10 100 000,00	San Francisco	1
Knowtify.io	205	205	3	-40%	2014	Pre Series A	$110 000,00	San Francisco	6
Limelight Health	176	128	31	11%	2014	A	$3 700 000,00	California City	1
Lucid VR	292	260	7	75%	2014	Pre Series A	$2 100 000,00	San Francisco	9
MetaMind	412	384	22	29%	2014	Exited (acquired)	$8 000 000,00	Palo Alto	6
Mezi	338	338	31		2015	Pre Series A	$2 800 000,00	San Francisco	3
Minio	275	243	10	150%	2014	Pre Series A	$3 300 000,00	Palo Alto	6
mirOculus	187	154	13	44%	2014	Pre Series A	$2 800 000,00	Mountain View	5
Modsy	211	211	25		2015	A	$8 000 000,00	San Francisco	1

MUrgency	382	243	28	115%	2014	Pre Series A	$-	San Francisco	4
Musical.ly	1994	1678	47	124%	2015	C	$116 600 000,00	San Francisco	1
Naked Labs	781	765	7	17%	2014	Pre Series A	$250 000,00	San Francisco	2
Next Thing Co.		632	598	18	64%	2014	Pre Series A	$50 000,00	Oakland	7
Niantic	548	548	50		2015	A	$25 000 000,00	San Francisco	0
Nimble Collective		300	172	28	100%	2014	A	$9 500 000,00	Palo Alto	2
Nootrobox	505	488	8	33%	2014	Pre Series A	$2 500 000,00	San Francisco	6
Oak Labs	325	283	17		2015	Pre Series A	$4 100 000,00	San Francisco	1
Omni	202	160	28		2014	A	$10 000 000,00	San Francisco	3
OneRent	472	313	39	39%	2014	A	$5 500 000,00	San Jose	8
Original Stitch		181	181	6		2015	Pre Series A	$1 100 000,00	San Francisco	0
PayJoy	200	116	24	85%	2015	A	$22 000 000,00	San Francisco	2
PeerWell	166	155	8	100%	2014	Pre Series A	$-	San Francisco	4
Polarr	310	296	10	25%	2014	Pre Series A	$-	Palo Alto	16
Portworx	191	126	24	100%	2014	A	$8 500 000,00	Redwood City	5
Preemadonna	184	184			2015	Pre Series A	$250 000,00	Menlo Park	1
Purse	462	411	14	75%	2014	Pre Series A	$1 300 000,00	San Francisco	2
Quintype	431	396	29		2014	Pre Series A	$3 300 000,00	San Mateo	2
Rancher Labs	705	736	29	32%	2014	B	$30 000 000,00	Cupertino	3
Re/code	1208	1208	74	68%	2014	Exited (acquired)	#VALOR!	San Francisco	4
Rhumbix	210	126	29	32%	2014	A	$6 000 000,00	San Francisco	0

Roofstock	587	459	31		2015	A	$13 300 000,00	Oakland	1
Rubrik 738	317	152	58%	2014	B	$51 000 000,00	Palo Alto	3	
RushTix	367	340	10	11%	2014	Pre Series A	$300 000,00	San Francisco	4
Savvy 165	155	8	33%	2014	Pre Series A	$1 700 000,00	San Francisco	2	
Scalus 221	202	18	38%	2014	A	$10 000 000,00	San Francisco	1	
SherpaShare	276	269	5	25%	2014	Pre Series A	$700 000,00	2	
Shuddle	233	251	19	-60%	2014	A	$12 200 000,00	San Francisco	8
Sidewire	237	227	17	13%	2014	Pre Series A	$4 900 000,00	San Francisco	8
Singular	316	249	40	29%	2014	A	$5 000 000,00	San Francisco	14
Skydio 203	92	29	93%	2014	A	$28 000 000,00	Menlo Park	2	
Sochat 328	141	13		2014	Pre Series A	$2 000 000,00	San Francisco	0	
Sovrn 334	13	194	29%	2014	Late	$75 500 000,00	Jackson	4	
Speakeasy	242	212	17	-15%	2014	A	$4 800 000,00	San Francisco	12
Stellup 171	124	15	67%	2015	Pre Series A	$200 000,00	San Francisco	6	
StreamSets	306	271	39		2014	A	$12 500 000,00	San Francisco	3
TalentIQ	219	155	15	114%	2015	Pre Series A	$1 100 000,00	San Francisco	1
Teleport	509	500	12	33%	2014	Pre Series A	$2 500 000,00	Palo Alto	8
Trove 164	151	7	133%	2014	Pre Series A	$-	San Francisco	3	
Trusted	219	166	10		2015	Pre Series A	$2 100 000,00	San Francisco	3
Twistlock	191	191	15	25%	2015	A	$12 500 000,00	San Francisco	3
Unchained Labs	313	61	90	200%	2015	A	$-	Pleasanton	3

UNIFi Software	283	174	39	95%	2014	A	$14 500 000,00	San Francisco	2	
UploadVR	1198	1084	25	178%	2015	Pre Series A	$1 300 000,00	San Francisco	3	
Vlocity	372	77	166	19%	2014	A	$42 800 000,00	San Francisco	4	
Volley	165	156	6	50%	2015	Pre Series A	$2 300 000,00	San Francisco	5	
Vulcun	884	810	30	-33%	2014	A	$13 300 000,00	San Francisco	1	
Wag!	908	340	145	169%	2014	Pre Series A	$2 500 000,00	San Francisco	0	
Waggl	198	133	21	75%	2014	Pre Series A	$1 800 000,00	Sausalito	4	
Woo	524	524	23		2015	Pre Series A	$4 400 000,00	San Francisco	7	
Wrap Media	235	307	54		2014	C	$29 200 000,00	San Francisco	11	
Xapo	863	823	38	6%	2014	A	$40 000 000,00	Palo Alto	0	
Yup	319	319	17		2014	Pre Series A	$7 500 000,00	San Francisco	6	
Zerostack	249	172	31	48%	2014	B	$21 600 000,00	San Francisco	3	
Zipline	573	531	27		2014	A	$18 000 000,00	San Francisco	5	
Zirx	206	236	71	-13%	2014	C	$36 400 000,00	San Francisco	4	
Zoomer	647	162	153	240%	2014	Late	$-	San Francisco	4	

Appendix 4 – Cluster D

Name	Growth Score	Mindshare Score	Employee Count	Employees 6 Months Growth Rate	Founded	Stage	Total Funding	2.0	City	Investors
3nder	158	147	6	500%	2014	Pre Series A	$500 000,00	London	0	
Aire	230	211	13	18%	2014	A	$1 200 000,00	London	7	
Autolus	110	25	43		2014	B	$105 000 000,00	London	3	

Azooki61	61	5		2014	Pre Series A	$380 000,00	London	0		
BidVine	82	34	27	29%	2014	Pre Series A	$110 000,00	London	2	
Big Data for Humans	64	11	19	46%	2014	Pre Series A	$1 300 000,00	London	5	
Bijou Commerce	45	45	11		2015	Pre Series A	$3 000 000,00	London	2	
Boomf 567	543	15	25%	2014	Pre Series A	$1 100 000,00	London	5		
BSAVE	480	480	1		2015	Pre Series A	$400 000,00	London	0	
CarSpring	495	444	26	53%	2015	Pre Series A	$3 300 000,00	London	0	
Charlie620	620	12		2015	Pre Series A	$1 400 000,00	London	6		
Chew.tv	296	264	12	20%	2014	Pre Series A	$218 492,00	London	3	
Chic by Choice	338	285	14	27%	2014	Pre Series A	$1 500 000,00	London	2	
Contests4Causes	29	29	1	0%	2014	Pre Series A	$-	London	0	
CrowdIt	-35	0	8		2015	Pre Series A	$2 000 000,00	London	1	
Digital Assess 164	119	25	32%	2014	A	$3 000 000,00	London	1		
Dojo 364	230	45	45%	2014	Pre Series A	$1 200 000,00	London	5		
dopay 478	394	29	53%	2014	Pre Series A	$4 400 000,00	London	3		
Emoticast	-16	-16	7		2014	Pre Series A	$1 200 000,00	London	4	
FinGenius	85	83	2	-33%	2014	Pre Series A	$-	London	1	
Geniac 252	125	47	135%	2014	Late	$34 300 000,00	London	1		
GIUP 8	8	0	-100%	2014	Exited (other)	$-	London	0		
Glisser 219	201	9	13%	2014	Pre Series A	$-	London	5		
Gluru 158	134	16	23%	2014	Pre Series A	$1 500 000,00	London	3		

Gmbl.io	16	16	1		2014	Exited (other)	$-	London	0
GuestU	262	257	22	-21%	2014	Pre Series A	$1 100 000,00	London	1
Habito 503	503	12		2015	Pre Series A	$2 200 000,00	London	6	
Haxi 11	11	7		2014	Pre Series A	$200 000,00	London	0	
Hostmaker	482	334	38	124%	2014	Pre Series A	$2 000 000,00	London	3
Housekeep	201	126	49	69%	2014	Pre Series A	$1 000 000,00	London	1
InCrowd	158	116	15		2015	Pre Series A	$2 400 000,00	London	1
Inivata 159	66	30	58%	2014	A	$45 000 000,00	London	4	
Lendable	180	127	24	118%	2014	Pre Series A	$3 900 000,00	London	3
Lexoo 259	223	13	44%	2014	Pre Series A	$1 700 000,00	London	3	
Lystable	208	94	28	65%	2015	A	$12 600 000,00	London	15
Mailcloud	52	57	6	-40%	2014	Pre Series A	$2 800 000,00	London	7
Mastermind Sports	77	77	6		2015	Pre Series A	$-	London	1
Mereo BioPharma	97	37	19	27%	2015	Late	$119 000 000,00	London	0
Mondo 1022	810	35	150%	2015	A	$11 800 000,00	London	1	
Moodoo	47	39	5	25%	2014	Pre Series A	$28 600,00	London	1
MyBeautyCompare	44	44	5	25%	2015	Pre Series A	$-	LONDON	0
Neyber 76	76	56		2014	A	$8 500 000,00	London	1	
NoviCap	275	214	35	21%	2014	Pre Series A	$1 800 000,00	London	5
Now Native	-12	1	1	0%	2014	Pre Series A	$175 431,00	London	3
OFF3R	227	227	6		2015	Pre Series A	$700 000,00	London	2

Opun	278	193	23		2014	A	$6 200 000,00	London	1
Origin	140	111	9	29%	2015	Pre Series A	$110 000,00	London	2
Otto Petcare Systems	12	12	1	-67%	2014	Pre Series A	$-	London	1
Panaseer	80	55	17	31%	2014	Pre Series A	$2 300 000,00	London	5
PIE Mapping	124	60	32	39%	2015	A	$2 200 000,00	London	2
Playbrush	168	151	10	11%	2014	Pre Series A	$750 000,00	London	1
Privitar	144	96	13	117%	2015	Pre Series A	$1 200 000,00	London	6
Pronto	216	133	27	108%	2014	Pre Series A	$1 500 000,00	London	9
Property Partner	696	551	53	39%	2014	B	$28 400 000,00	London	8
Pycno	107	107	2	0%	2014	Pre Series A	$40 000,00	London	0
Quiqup	542	333	73	46%	2014	A	$-	London	2
Ravelin	281	221	19	73%	2014	Pre Series A	$2 100 000,00	London	5
Real Life Analytics	55	58	3	-25%	2014	Pre Series A	$-	London	2
Reedsy	335	323	13	18%	2014	Pre Series A	$-	London	2
Revolut	571	412	33	94%	2014	A	$17 100 000,00	London	5
RightClinic	19	18	3	0%	2015	Pre Series A	$375 000,00	London	1
Ruuta	8	8			2015	Pre Series A	$-	London	1
SalaryFinance	97	97	17		2015	A	$6 100 000,00	London	1
SAM Labs	318	318			2014	A	$4 500 000,00	London	1
Splittable	124	79	16	45%	2014	Pre Series A	$1 200 000,00	London	3
Starling Bank	351	234	30	131%	2014	Late	$70 000 000,00	London	1

Swanest	145	145	3		2014	Pre Series A	$10 000 000,00	London	1
SwiftShift	138	114	19	6%	2014	Pre Series A	$1 000 000,00	London	1
Tagged By Me		0	0	-100%	2014	Exited (other)	#VALOR!	London	0
The PayPro	101	101	8	60%	2015	Pre Series A	$337 000,00	London	2
The Secret Police	0	0	9		2014	Pre Series A	$281 500,00	London	1
Trussle210	168	15		2015	Pre Series A	$1 600 000,00	London	4	
Twizoo	115	101	7	0%	2014	A	$2 200 000,00	London	4
Vidzor 98	105	3	-25%	2014	Pre Series A	$-	London	0	
VoxWeb	181	161	6	100%	2015	Pre Series A	$450 000,00	1	
Weaveworks	244	244	16	7%	2014	B	$20 000 000,00	London	2
WeFarm	297	212	16		2014	A	$3 000 000,00	London	0
YapJobs	164	164	13		2015	Pre Series A	$1 400 000,00	London	1
Zipcube	186	176	9	0%	2014	Pre Series A	$-	London	2
Zyncd 124	108	12	9%	2014	Pre Series A	$-	London	3	
eReceipts	-16	-20	14	8%	2011	B	$-	London	1
FACEIT	650	503	55	49%	2011	A	$17 000 000,00	London	3
Love Home Swap	160	126	40	25%	2011	Late	$1 300 000,00	London	1
Buyapowa	17	11	18	29%	2011	A	$7 600 000,00	London	2
Stamp.it	-30	-30	0		2011	Pre Series A	$225 000,00	London	0
Rummble Labs		-8	-17	18	29%	2011	Pre Series A	$800 000,00	London	3
TaskHub	36	41	1		2012	Pre Series A	$-	London	2

Miproto	-18	-16	1	0%	2012	Pre Series A	$-	London	6	
CheckoutSmart	263	257	12	-8%	2012	Pre Series A	$2 400 000,00	London	4	
toucanBox	209	156	28	47%	2012	A	$4 700 000,00	London	2	
Soapbox	67	69	1	0%	2012	Late	$-	London	0	
Marblar	-44	-32	0		2012	Pre Series A	$600 000,00	London	0	
Onfido	412	198	97		2012	B	$30 000 000,00	London	6	
Plentific	288	288	18	-5%	2012	A	$4 200 000,00	London	1	
Lending Works	242	242	22	38%	2012	A	$9 200 000,00	London	5	
Supersolid	146	128	18	29%	2012	Pre Series A	$-	London	1	
Picfair	253	243	11	10%	2013	Pre Series A	$520 000,00	London	1	
Agrivi	256	240	14	17%	2013	A	$1 200 000,00	London	2	
WonderLuk	235	235	11	10%	2013	Pre Series A	$250 000,00	London	0	
Jinn	234	234	0		2013	A	$9 000 000,00	London	6	
LendInvest	371	233	94	31%	2013	B	$58 000 000,00	London	2	
Fundacity	220	223	4	-33%	2013	Exited (acquired)	$170 000,00	London	1	
SuperAwesome	477	222	100	39%	2013	A	$7 000 000,00	London	3	
Growth Street	257	218	26	18%	2013	A	$7 200 000,00	London	1	
Push Doctor	294	195	17	325%	2013	A	$8 200 000,00	West Midlands	3	