Aalborg University
The Faculty of Engineering and Science

The Learning Incubator

Master's Thesis
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Entrepreneurial Engineering, Spring 2017

Due date: June 2nd 2017

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AALBORG UNIVERSITET

EXECUTIVE SUMMARY

Entrepreneurship. If only it was as easy to understand as it is to get excited about. And if only it was as easy to support. When it comes to support initiatives like incubators, there are still significant issues at play that make it difficult to conclude anything about their effectiveness, let alone make informed decisions on how we go about improving them. This thesis focuses on the topic of initiatives to support entrepreneurship, where the main output is a framework for a novel type of incubator dubbed The Learning Incubator. A collection of elements from entrepreneurship and organization research, assembled in a framework proposing a different way of supporting entrepreneurship and measuring the impact of doing so.

Starting with entrepreneurship itself and why we would want more of it in the first place, a link is established from prosperity, to economic growth and finally entrepreneurship and the positive change it brings along. From this, the argument of market failure is discussed, giving a reason as to why an appropriate amount of entrepreneurial behavior does not necessarily occur on its own. This argument then brings us to public intervention and a combination of Davidsson's (2016) levels of value creation and Adner's (2012) value aggregator as a way to better understand what a public entity as an aggregator stands to influence. The key feature of a value aggregator lies in its ability to capture value at a level where private actors cannot. Business cases, which could not work for a private actor, can be sustainable for an aggregator. Next, the field of incubators is reviewed and critiqued, finding the impact of the incubator as a policy tool still uncertain and with a heap of methodological difficulties at play. The trouble of creating a counterfactual, i.e. measuring the success of the same startup inside and outside an incubator, means that impact studies have inherent weaknesses, which is found to be scarcely recognized in much of the field. Literature on creating benchmarks and finding a best practice is covered, discussing lacking processes for making continuous improvements.

The framework to address these issues is developed using a conceptual approach. Part incubator, part accelerator and with a pinch of organizational learning, the framework proposes a cohort-based initiative, where startups are supported intensely for a predetermined period and in which the creation of a control group is included in the selection process. Random selection at the final stage of this process is advocated as a means to account for bias, quantify impact and add to a qualitative understanding of the incubation process. To incorporate knowledge gained from this new source of data, organizational learning is applied to create an iterative process where experimentation is an integrated element. All of this is collected under the heading The Learning Incubator. In the discussion chapter, potential issues and limitations is addressed, among others is the lacking statistical significance of the proposed impact measure and what we can still learn from control groups. Avenues for implementation of The Learning Incubator and its constituent parts are discussed, with a suggestion to find such in a university setting.

The thesis seeks to make three contributions. First, it explores the market failure argument that underpins public policy in the pursuit of more entrepreneurial action. By combining the work of Davidsson (2016) and Adner (2012), a novel way of viewing the argument for intervention is put forth, which addresses exactly what role a public entity stands to play. Second, an extensive review of the field of incubators is done, showing how impact assessment is still highly lacking and how methodological issues are being neglected at large. Third, the case for using random selection in the application process of an incubator is made. With a starting point in current methodological challenges, random selection and the creation of control groups is argued to have potential in aiding our understanding of the incubation process and doing impact assessments. A framework for The Learning Incubator is developed in association, using organizational learning to show how such measures may be implemented, what routines it is reliant on and how it can be integrated with the search for a solution to the market failure argument.

SAMMENFATNING

Dette speciale omhandler offentligt finansierede initiativer til støtte af iværksætteri med fokus på inkubatorer, og hvordan virkningen af disse kan evalueres og med udgangspunkt deri forbedres. I arbejdet hermed udvikles en struktur for hvordan en ny type supportinitiativ kan indrettes, som gives titlen The Learning Incubator (Den Lærende Inkubator), der kombinerer elementer fra iværksætteri- og organisationsforskning.

De underliggende bevæggrunde for at støtte iværksætteri og dets udbredelse undersøges, hvor der etableres en forbindelse mellem velstand, økonomisk vækst og endelig iværksætteri og dets andel i skabelsen af positiv forandring. Dernæst diskuteres årsagerne til at iværksætteri ikke er så udbredt, som ellers ville være fordelagtigt, der ultimativt henføres til markedsfejl. På denne baggrund argumenteres der for offentlig intervention med en kombination af Davidssons (2016) værdiskabelsesniveauer og Adners (2012) værdiaggregator, som et værktøj til bedre at forstå præcis, hvad en offentlig aktør som aggregator kan påvirke. Denne aggregators hovedfunktion ligger i dets evne til at appropriere værdi på et niveau, hvor private aktører ikke kan og dermed gøre forretningsideer, der ikke ville være valide for netop en privat aktør, ganske tiltalende.

Litteraturen inden for inkubatorfeltet udredes og kommenteres, hvor der findes manglende beviser på inkubatorers virkning som politisk initiativ og væsentlige metodiske problemstillinger i forhold til bestemmelse af en sådan. Da der ikke samtidig kan måles på den samme virksomhed i og uden for en inkubator, er der uundgåelige svagheder ved studier i virkningsgrad, der desværre kun findes lidet anerkendt inden for feltet. Litteraturen omhandlende benchmarking af inkubatorer og bedste praksis udredes, hvor også de manglende processer i forhold til kontinuerlig forbedring afdækkes.

Den omtalte struktur til at adressere disse problemer udvikles herefter med en konceptuel tilgang. Delt inkubator, delt accelerator og med en smule organisatorisk læring er strukturen et bud på et kohorte-baseret initiativ med intensiv support over en forudbestemt periode, hvor der indbygges delvist tilfældigt udvalg af de medvirkende virksomheder, som en måde at skabe en kontrolgruppe. Denne tilfældige udvælgelse placeres som det sidste skridt i udvælgelsesprocessen, hvormed risikoen for bias mindskes og virkning bedre kan måles kvantitativt og kvalitativt. For at denne datakilde kan bruges i inkubatorens arbejde, foreslås brug af organisatorisk læring som en metode til at bygge på den nye viden, hvor eksperimenter er et integreret element. Alt dette samles under titlen The Learning Incubator. I diskussionsafsnittet adresseres mulige problemer og begrænsninger ved det foreslåede, deriblandt mangel på statistisk signifikans og hvad der på trods kan læres fra kontrolgrupper. Sidst vendes muligheder for implementering af The Learning Inkubator og dets enkeltelementer, hvor der foreslås samarbejde med et universitet.

Specialet søger at lave tre bidrag. Som det første undersøges markedsfejl som argument for offentlig intervention, og på baggrund af Davidsson (2016) og Adner (2012) foreslås en ny måde at anskue dennes rolle på ved støtte af iværksætteri byggende på appropriering af værdi på makro-niveau. Som det andet laves der en gennemgående udredning af inkubatorfeltet, hvor det vises hvorledes virkningen af inkubatorer stadig er ukendt, og hvordan de metodiske problemer forsømmes. Som det tredje og sidste argumenteres der for brugen af tilfældig udvælgelse i udvælgelsesprocessen når inkubatorer søger virksomheder. Med udgangspunkt i de nuværende metodiske udfordringer inden for feltet, vises det hvorledes disse kontrolgrupper kan forbedre vores forståelse af inkubationsprocessen og dennes virkning. I forbindelse hermed udvikles The Learning Incubator, hvor anvendelsen af den nye datakilde, kontrolgruppen repræsenterer, spiller en hovedrolle. I kombination med organisatorisk læring og de tilhørende processer gives der forslag til, hvordan inkubatoren bedst kan søge den underliggende markedsfejl adresseret.

CONTENTS

1. INTRODUCTION

"… the function of entrepreneurs is to reform or revolutionize the pattern of production by exploiting an invention or, more generally, an untried technological possibility for producing a new commodity or producing an old one in a new way, by opening up a new source of supply of materials or a new outlet for products, by reorganizing an industry and so on."
(Schumpeter, 1943, p. 132)

"The entrepreneur is at the same time one of the most intriguing and one of the most elusive characters in the cast that constitutes the subject of economic analysis. He has long been recognized as the apex of the hierarchy that determines the behavior of the firm and thereby bears a heavy responsibility for the vitality of the free enterprise society."
(Baumol, 1968)

"The entrepreneur's activity is essentially competitive. And thus competition is inherent in the nature of the entrepreneurial market process. Or, to put it the other way around, entrepreneurship is inherent in the competitive market process."
(Kirzner, 1973, pp. 16-17)

As you can see, I have decided to begin this thesis with three quotes by some of the most influential people on the subject of entrepreneurship. This I have done, so that I can stand on the shoulders of giants when I repeat the notion that entrepreneurship matters a great deal, and – perhaps with a smirk on my face – say that so must this master's thesis you are about to read. Entrepreneurship and its agents, the entrepreneurs themselves, are to attribute for the ever changing world we live in. A world which gets better, more prosperous and safer every moment due to this insistent pursuit of meaningful progress and from which only more opportunities for entrepreneurship can emerge.

Of course, a statement to the contrary from these scholars would be quite a surprise. Having invested a sizeable portion of their life in the field of entrepreneurship, it is only reasonable to assume that it came about to be so, exactly because they saw the great potential the field held, both for them personally, but just as much for society as a whole. And so it will likely be for scholars of all kinds. But I ask of you to be patient for concrete evidence in support of my statement above, as this introduction fares better if you can, just for now, accept this argument from authority.

As we accept that entrepreneurship is a force of good, let us also, in an equally significant leap of faith, accept the lacking quality and quantity of it – and immediately ask: Why is it so? Partly it occurs as the result of *market failure*. We rely on the market for a great deal and a great deal it has shown to produce on many accounts. But not on all, and the meaningful encouragement and support of entrepreneurial behavior is one where it has been lacking. The reasoning behind such an assertion comes from the reality that appropriating value, an essential part of acting continuously in the market, is immensely difficult when you are in the business of supporting the failure prone act of launching new ventures. Some have certainly succeeded in doing so despite of this difficulty, but their attention has been on the lowest hanging fruit, those most likely to produce a large return on their investment. For this they deserve no criticism, the harvested opportunities have with no doubt had an immense impact worldwide. Yet we must also acknowledge that there is fruit ripe for the picking not being craved, not being targeted and supported, but which could have a desirable impact nonetheless.

Luckily, we acknowledged this a long time ago. Not with the greatest conviction perhaps, or with the attention really focused were it mattered, but the realization was there. The realization that value created through the meaningful encouragement and support of entrepreneurial behavior could be appropriated across the many different individuals whom it stood to influence directly and indirectly. Appropriated by an aggregator, capable of reaching

far and wide, who would in turn funnel a portion of the earnings back towards the support initiative, thus closing the value loop and solving our initial issue. This value aggregator we typically know as the local or state-level government, an entity that appropriates value through force, essentially, and seeks to enact the will of the people who put it in power, the favor of which in recent times has partly been won through the argument for government support of exactly entrepreneurship in its many forms.

And these many forms of entrepreneurship were accordingly met with an equally large diversity in the support initiatives started. From that which can perhaps only peripherally be regarded as an initiative per se – e.g. tax incentives – to the more hands-on approaches of incubators and direct government funding. But while the value appropriated by the market actor has to have an immediate and measurable form, the link between government spending on an initiative and value later aggregated through e.g. taxes is not as clearly evaluated, which again acts to make the decision to offer said support one often based on beliefs rather than hard facts. We may be offering too little, too much, not enough of the right kind or a detrimental amount of the wrong. We have evidence available pointing in all directions and opinions from experts of all kinds to go along with it too.

This especially goes for the aforementioned incubator, the support initiative offering selected startups access to cheap office space along with business counseling and other services of value as they evolve from their fragile beginnings into stable, value-creating companies. Despite existing for more than half a century, and with scholarly attention for most of it, incubators still lack definite proof of their impact, let alone evidence of how such impact may or may not address the market failure argument on which they are typically founded. The nature of a funding structure featuring a value aggregator has the unfortunate side effect of making the livelihood of the incubator only very loosely coupled to its performance. As a result, the feedback loop we would otherwise expect to weed out wasteful behavior and introduce effective and efficient procedures in its place has disappeared. Instead we are forced to merely gauge the apparent value of our efforts through superficial performance indicators, which may be equally decoupled from both our commendable goal and hard work.

It is in this context I wish to make a contribution. One that seeks to establish a new kind of support initiative based on our current best understanding of how entrepreneurship as a societal phenomenon takes place and as a research field can be advanced. I have dubbed it *The Learning Incubator* to signify its origin in the organizational learning literature and to further highlight its evolving nature. It seeks not only to address the greater topic of impact assessment as a key factor in the discussion of goal fulfillment and funding, but also that of the troublesome feedback loop with importance for day-to-day operations and how such can be implemented in an iterative learning process.

While I write this thesis looking back on the process I went through, and thus am able feign immense foresight on where it had to end up, it unsurprisingly developed from a much more uncertain beginning. The initial research question, detailed in my thesis contract application, focused on impact assessment of incubators, as my previous semester working with AAU Inkubator had shown a great potential for improvement of the field with regards to such. The thesis description in full:

In continuation of my work the previous semester (Fall 2016), I wish to further investigate the topic of incubators and the assessment of their impact as the subject of my master's thesis.

Incubators – property based initiatives designed to support new venture creation – has come a long way since their inception in the 1950's. Yet, as the literature review of the field for my previous project revealed, many areas highly relevant to their successful implementation still lack adequate scientific coverage. This in particular goes for the topic of impact assessment and how day-to-day evaluation of value creation at the housed startups may help the management team optimize their support initiatives.

The proposed thesis will delve into this subject to answer questions such as why and how incubators should be measured, in what way metrics create incentives for the various stakeholders involved and how value created at both the micro- and macroscale may be evaluated.

As the answers to these questions will depend (to some extent) on the specific incubator type, the thesis shall put emphasis on the type proposed by the AAU Startup Program in order to make the findings especially relevant here.

I include it here to give you, the reader, the background that led to the proposed framework which you shall see developed later and to put the exploratory research into perspective. Below the chapters of this thesis is introduced, giving an overview of the how the thesis is structured and what it will contain.

THE CHAPTERS IN OVERVIEW

2. The exploratory research method is the topic of the second chapter, where I detail the methodology behind the first half of the thesis, how literature was collected and evaluated and further how my previous work on the topic of incubators helped create an initial foundation to work from.

3. In the third chapter I shall first and foremost give the promised evidence for the virtue and necessity of entrepreneurship, so that its importance is firmly and convincingly established before I later go on to argue for its active encouragement and support. I will discuss the heterogeneity of the population of entrepreneurs and their ventures and show how they may not all be equally valuable to society, arriving at a loose notion of quality of entrepreneurship.

4. Having discussed quality, the fourth chapter begins on the topic of quantity of entrepreneurship and why we would want to actively influence it. This addressed, we head onto the issue of why the quantity of entrepreneurship may not through market forces reach an optimum level and what mechanisms we have available in arguing for public intervention.

5. With the case for intervention made, the fifth chapter details the incubator concept, its origin and impact, while I review a sizeable chunk of the incubator literature along the way and give an overview and critique of the state of affairs. The intention is to give a clear indication of the deficiencies found as context to later suggestions for improvement. This covered, I turn to the accelerator concept, a sibling-of-sorts of the incubator, and introduce the unique characteristics and innovations that set is apart as a support initiative and make it particularly interesting for those contributions presented later.

6. Methodology is again the topic the topic as we get to the sixth chapter. Here I argue for the choice of conceptual theory development and its methods, which will be used in the

latter half of the thesis. The decision to largely forego involvement of newly collected empirical data is discussed and justified.

7. Finally in the seventh chapter we get to the foundations of the proposed framework. Per the methodology just introduced, the reviewed literature and empirical results are used as a starting point for forming a new way of incubating startups that seeks to mend many of the problems discussed in previous chapters and present a clear case for public intervention.

8. The eighth chapter sums up the proposed framework for the busy incubator manager, giving the gist of the ideas contained in The Learning Incubator.

9. Before the overall conclusion, the ninth chapter will be a discussion of the framework and how it may be tested and implemented going forward. Recommendations for further research on the topic of incubators and public support of entrepreneurship are given.

2. METHODOLOGY: PART ONE

The investigation of the initial research question was very much exploratory in nature. Based primarily on the guidelines set forth by Eisenhardt (1989) as employed by Cohen (2013) in her dissertation on learning in accelerator programs, I conducted a comprehensive literature review of not only the incubator literature, but also the fields related to key issues highlighted by the initial research question and any leads this produced. Three distinct areas emerged as the result:

- Impact of incubators and comparable initiatives
- Impact of entrepreneurship
- Knowledge management and organizational learning

Cohen (2013, p. 42) describe a wide range of possible sources such as magazine articles, stories in industry trade e-publications, popular books, blogs entries from actors within the industry and academic research on the topic as a way to get familiar with the field and identify opportunities for research. Of these, the academic research proved to be the richest source for this project, as the focus on metrics and measurable, verifiably outcomes often left other sources wanting. Partially, these other sources had also been covered in my previous work and as such I saw little need to revisit them. Exploratory interviews were also conducted by Cohen (2013), something I had likewise done in that previous work. These interviews were done in the fall of 2016 and featured management and startup founders from the incubator at AAU as part of a case study likewise grounded in the guidelines by Eisenhardt (1989). New input was acquired through email exchanges with a small number of incubator managers in Denmark and abroad on the specific topic of metrics and performance measurement in relation to fostering successful entrepreneurship.

The academic literature was collected first and foremost through Google Scholar and AAU's own search engine, Primo, using keywords derived from the initial research question. A sizeable body of literature on incubators was also available to me as the result of a similar process undertaken for the previous work spoken to above, and these sources combined gave me a wealth of papers from which I could then follow references to other literature. This process was to some extent iterative, as new papers would encourage a search for likewise new keywords, authors and whole concepts, which could again lead to a new search. The feature of Google Scholar to quickly see the number of citations a paper had achieved was used to assess its impact and thus weigh its input in the process. A similar use of Google Scholar has been reported by Coad et al. (2014) and Davidsson (2016) in exactly the field of entrepreneurship. In total around 100 new papers were found to have relevance, of which a sizeable portion was read in full, some were read partially (abstract, introduction and conclusion usually) and a few were only relevant for the abstract. Only little non-peer-reviewed literature was read, of which most were books. Here, the number of citations on Google Scholar was used an indication of peer-acceptance. The format of the first half will largely be that of a regular literature review, including commentary and critique as per Cropanzano (2009) setting up key issues for the conceptual work in the second half. Literature on methodology was acquired primarily through the already found papers as a way to ensure validity in the field of which I was to apply them. This goes equally for the exploratory research here, but also for the later conceptual theory development.

Aside from the purpose of getting an overview of the field, the reason to largely forego non-peer-reviewed sources and literature mainly stem from a desire to anchor the produced work on a more rigorous methodological footing than what I believe has been done previously and should increase the validity of the conceptual model developed. Further, many practitioner-focused sources, like industry associations for incubators, are unavailable to non-members and are at high risk of suffering from conflicts of interest and bias. And when it comes to incubators

specifically, much of the knowledge in the field appears to still be in the minds of managers around the world, waiting to be documented and codified, and as such is not available at large, regardless of any concerns on peer-review and bias. Collecting this information would have been a project in itself, and thus data collected from these sources already available in the scientific literature satisfied the need. Some of the knowledge existing at the world's better incubators is without doubt also considered too valuable to simply share without reservation, the size of the industry and the resources involved considered. It is unfortunate, as there certainly must be insights hidden there that could have been useful. Part of the conceptual model developed later is aimed at addressing this.

In the discussion of entrepreneurship and the role of the entrepreneur in our society you will see the work of Per Davidsson quoted rather extensively, specifically his book Researching Entrepreneurship (Davidsson, 2016). To someone not familiar with the field or his work it may seem slightly problematic to rely so heavily on the opinion and views of a single scholar, especially so when it comes from a source not subject to peer review. The choice arises from the comprehensiveness of the book and the inclusion of a wide range of literature in its discussions, giving an exhaustive background in the field of entrepreneurship. Davidsson manages to unite the views of Schumpeter and Kirzner, who are otherwise often seen as having been in opposition, and presents highly compelling arguments for his proposed definition of entrepreneurship as both a societal phenomenon and research field. Sticking to just a single author for this fundamental part further presents the considerable benefit of having an internally consistent and complete resource to rely on for the later conceptual development in this thesis. Peer acceptance, rather than review, has been confirmed based on the number citations the book has gotten, the fact that it is a second edition, and Davidsson's many years of involvement in the field of entrepreneurship. The very recent release of the book also guarantees inclusion of the newest research, which is evident from the quoted literature within. All in all I believe the extensive use of this source is justified.

Lastly on methodology: the literature reviewed although comprehensive, is not to be regarded as exhaustive. A balance had to be struck between simply consuming the insights contained within the work of others and actually adding to our collective knowledge through the creation of something new and valuable. Literature relevant for this thesis has with no doubt been left on the table, but I have confidence in saying that a significant portion was considered.

3. ENTREPRENEURSHIP AND ECONOMIC GROWTH

One may wonder why it is necessary to address such a grandiose topic as entrepreneurship in relation to economic growth when the research question put forth partly focuses on something as practical as performance measurement in day-to-day activities of an incubator. Can it not simply be taken for granted that entrepreneurship is a force of good? As you have likely guessed from the existence of this chapter, I believe the answer is "No". For it is in my mind only reasonable to expect amble evidence for the positive correlation between entrepreneurship and the prosperity of the society in which we live, when the desire is to increase the quantity of the former. Knowing the quality first seems like a rather good idea.

What follows is an introduction to entrepreneurship and its connection to economic growth, and how such justifies its worth to the modern society in which we live. Doing so allows us to in good conscience and on a stable foundation later move on to argue for why we not only want more of it, but also what specific kind of its many forms we are interested in creating support initiatives for. We are essentially asking: what impact does entrepreneurship have?

For as Baumol (1990) so convincingly argues in his seminal paper on productive, unproductive and destructive entrepreneurship throughout the ages, the enterprising individual has not always been encouraged by society to direct its efforts towards an outcome valuable for more than just itself. Working from the notion that entrepreneurs are primarily *"… defined, simply, to be persons who are ingenious and creative in finding ways that add to their own wealth, power, and prestige…"* (p. 897), Baumol puts forth the hypothesis that while the supply of entrepreneurs remains relatively stable, the greater outcome of their activities are determined by circumstances external to them, what he calls the prevalent rules of the game. He describes the circumstances in Ancient Rome, where great wealth was a legitimate desire, yet profiting from participation in industry and commerce was considered improper and unfit for honorable people. Instead, these occupations were left to those already carrying significant social stigma such as freed slaves. Baumol quotes Finley (1973):

> "We must remind ourselves time and again that the European experience since the late Middle Ages in technology, in the economy, and in the value systems that accompanied them, was unique in human history until the recent export trend commenced. Technical progress, economic growth, productivity, even efficiency have not been significant goals since the beginning of time. So long as an acceptable life-style could be maintained, however that was defined, other values held the stage." (Finley, 1973, p. 147)

In a case where the rules of the game incentivizes unproductive or even destructive entrepreneurship, even the most efficient and effective encouragement and support of entrepreneurial behavior (e.g. by an incubator) would produce no value at a societal scale. But we are not in Ancient Rome, or any of the other bygone periods described by Baumol, and we would of course assume that such forms of entrepreneurship are impeded by the modern justice system and our civilized society. As Davidsson (2016) argues, also with reference to Baumol (1990), such cannot always be guaranteed:

> "… if one enjoyed the luxury of a perfect and just institutional framework, it would be easy to argue that redistributive ventures equal illegal ventures. Regrettably, we will have to live with the fact that in real economies "legal yet redistributive" and "illegal yet socially beneficial" ventures are both possible." (Davidsson, 2016, p. 14) ("Redistributive" can here be regarded as effectively equal to Baumols "unproductive" and "destructive")

One may just consider the litigious dealings of "patent trolls" for an example of legal yet redistributive ventures, and the work of enterprising individuals to offer medical marijuana to patients in need as illegal yet socially beneficial.

In the above quote by Davidsson (2016), notice how he talks about *ventures* and not entrepreneurs. Davidsson is of the view that entrepreneurship as a societal phenomenon should not include these redistributive ventures in its definition. Here, a new venture is a new-to-the-market activity and hence can entail activities in established companies as well as the classic startup. For a venture to be considered entrepreneurial, Davidsson argues, it must drive the market process and as such restricts entrepreneurship to the market context. He alternatively phrases it as entrepreneurship being the introduction of new economic activity that leads to change in the marketplace (p. 1). This change comes about through one or more of the following ways:

1. They provide customers with new choice alternatives, potentially giving some of those customers more value for their money.
2. They stimulate incumbent actors to improve their market offerings in their turn, which increases efficiency and/or effectiveness of those actors.
3. If successful, they attract other new entrants to the market, thus further increasing competitive pressures toward improved efficiency and effectiveness
   (Adapted from Davidsson (2016, p. 7))

In his view, then, entrepreneurship can only be a force of good – otherwise it is not entrepreneurship. But it also introduces the interesting idea that failing ventures can still be considered entrepreneurial, if they regardless of this micro level failure still end up driving the market process, e.g. by inducing a competitive response by other actors in the market. He calls these "catalyst ventures" (Figure 1).
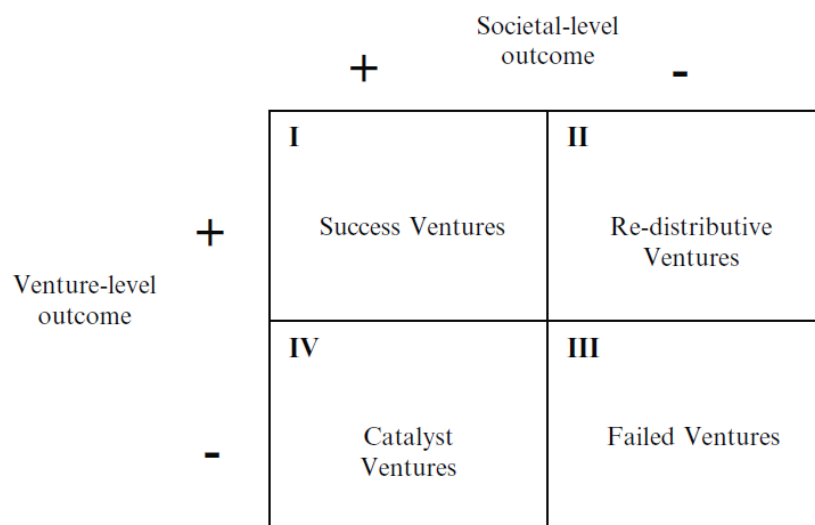

Figure 1 – Venture-level versus societal-level outcomes of new venture creation. Entrepreneurship is restricted to quadrants I and IV – (Davidsson, 2016, p. 13)

Davidsson (2016) describes two distinct levels on which value can be created – the venture-level (micro-level) and the societal-level (macro-level) and in Figure 1 we see how this creates four possible outcomes and venture types. The clear successes, the ventures that create value for both themselves and society, are straightforward to understand. The same goes for the clear failures with no value created at either level. As a societal phenomenon only the left hand side of the figure is considered entrepreneurship – those with positive outcomes at the societal level.

We thus have a clear difference in the views of Baumol and Davidsson, and it further highlights the issue of defining entrepreneurship – how can we assess the impact of that which we do not agree on what is? To again reconcile them, Davidsson does recognize the need to consider the right hand side of Figure 1 to be entrepreneurship when it comes to it as a *research domain.* He writes:

> Starting from assumptions of uncertainty, heterogeneity, and disequilibrium, the domain of entrepreneurship research encompasses the study of processes of (real or induced, and completed as well as terminated) emergence of new economic ventures, across organizational contexts. This entails the study of new venture ideas and their contextual fit; of actors and their behaviors in the interrelated processes of discovery and exploitation of such ideas, and of how the characteristics of ideas, actors and behaviors link to antecedents and outcomes on different levels of analysis. (Davidsson, 2016, p. 35)

This opens up a broader perspective where we can equally asses the positive as well as negative consequences of entrepreneurship on what he calls "outcomes on different levels of analysis". Davidsson (2016) builds his definition primarily on the highly cited and influential paper by Shane and Venkataraman (2000), and as these represent relatively recent efforts towards truly delineating the domain of entrepreneurship research, it is perhaps no surprise that empirical studies on the impact of entrepreneurship has had a questionable foundation to work on for many years.

Often entrepreneurial ventures have simply been equated to small and/or young firms. The work by Birch (1979) and the heap of research that followed his paper on US job creation tend to do so, even while recognizing that small firms are not always entrepreneurial:

> "Though most entrepreneurial firms are small, small firms are not always entrepreneurial and identifying small firms as entrepreneurs is therefore less straightforward, though a common practice among entrepreneurship policy makers and academics to which we comply." (Praag & Versloot, 2007, p. 354)

Praag and Versloot (2007) choose to define entrepreneurial firms as those that employ fewer than 100 employees or are younger than seven years, in their paper on the value of entrepreneurship. Given a view of entrepreneurship as that held by Schumpeter (1934) (1943), who does not limit it based on firm age or size, there is a clear mismatch when the authors themselves acknowledge a Schumpeterian view of the entrepreneur. Davidsson (2016) addresses this in a discussion of measuring self-employment:

> One common mismatch in entrepreneurship is the use of a more Schumpeter-like conceptualization of entrepreneurship and its effects on the economy and then use "self-employment" as the dependent variable— simply because no measure of what the theory actually speaks about is available. (Davidsson, 2016, p. 54)

The definition used by Praag and Versloot (2007) leaves out companies such as Google and SpaceX. Firms who you would be hard pressed to argue do not drive the market process (Davidsson, 2016) or fit a Schumpeterian view of entrepreneurship, and their study had perhaps better been positioned as one focused on small and new businesses rather than entrepreneurship. It also speaks to the significant challenge of operationalization and choice of dependent variable when doing this type of research as emphasized by Wennekers and Thurik (1999), Stel et al. (2005), Fritsch (2008), Henrekson and Stenkula (2010), Carree and Thurik (2010), Davidsson (2016) and I am sure many others. And it is certainly not only an issue of leaving out older and larger entrepreneurially minded firms, but just as much about lumping every new and small venture into the same group of startups when they are not homogenous even in the slightest.

It is increasingly being recognized that only a very small fraction of startups actually go on to drive the market process in a significant way. In a study based on GEM[1] data from 37 countries, Wong, et al. (2005) found little overlap between innovation and new venture creation, noting it suggests that only few entrepreneurs engage in true technological innovation. Shane (2009) directly calls public policy to encourage entrepreneurship bad, instead arguing it should focus on "gazelles", high-growth firms – a term also used by the previously referenced Wennekers and Thurik (1999). Schoar (2010) applies the terms subsistence and transformational in an effort to characterize the wide field of entrepreneurs, of which it is only the latter that stands to make a meaningful impact by, as the term alludes to, transforming the market in a Schumpeterian way. In a meta-analysis of the empirical evidence related to gazelles and their counterparts, Henrekson and Johansson (2010) find clear backing to these prior notions, showing how the vast majority of employment growth stems from a fraction of the (initially) small and young firms. In their introduction to a special section on exactly high growth firms in Industrial and Corporate Change, Coad et al. (2014) note increased interest in the field from 2010 and onwards, stating that it has "exploded" (p. 93) and thus will likely begin to have policy implications. In the same issue, Nightingale and Coad (2014) address the positive bias they find to currently exist regarding entrepreneurship in public policy. They argue the empirical evidence does not support such an uncritical view of entrepreneurship, again emphasizing the heterogeneity of the new ventures. Muppets, or marginal undersized poor performance enterprises, is what the authors call these counterparts to gazelles, proposing a continuum between these two extremes as a way to enlighten the conversation of entrepreneurship and its value for society. In a paper specifically addressing the role entrepreneurship in job creation in the US from 1980 and onwards, Decker et al. (2014) echo the previous arguments, stating:

> "Overall, the evidence shows that most startups fail, and most that do survive do not grow. But among the surviving startups are high-growth firms that contribute disproportionately to job growth. These high-growth young firms yield the long-lasting contribution of startups to netjob creation." (Decker, et al., 2014, p. 10)

Speaking of survival rates, we must equally keep in mind the possible impact of failing companies, the catalyst ventures elaborated by Davidsson (2016). As Fritsch (2008) makes clear, there can be many additional supply-side effects of new ventures entering the economy, like the threat perceived by incumbents and the opening up of new markets despite the first mover failing, both of which may have spillover effects into other markets or geographical regions (Figure 2). Doran et al. (2016) acknowledge the same effects in the study of employment growth due to entrepreneurship in Europe, in which they find a positive relationship between the two.

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[1] Global Entrepreneurship Monitor, an international collaborative effort to measure entrepreneurship worldwide by the Global Entrepreneurship Research Association. Established in 1999.
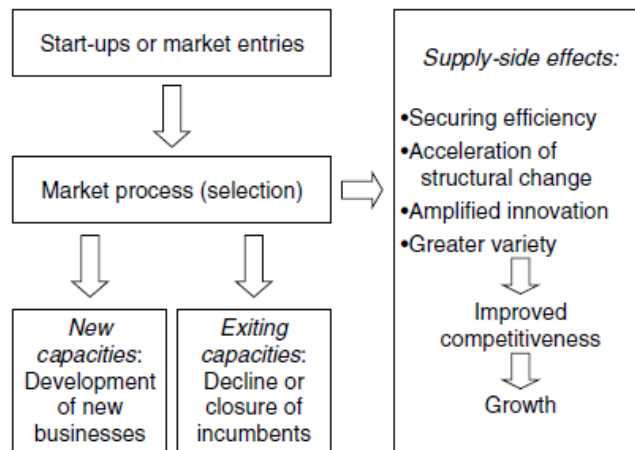
Figure 2 - New venture creation and market impact - (Fritsch, 2008, p. 3)

Despite the numerous concerns covered here surrounding accurate measurement – and delineation – of entrepreneurship, the overall consensus, although it may sometimes be stated rather implicitly, is that entrepreneurship is ultimately a force of good. While a challenge to measure, there can be little doubt that enterprising individuals, be they part of an independent startup or a large corporation, can and does have a significant impact on the prosperity of the societies in which we live. But we cannot simply view all forms of entrepreneurship as equally valuable and go on encouraging entrepreneurial behavior uncritically as if it were so. Although this goes especially for the kind of directed support initiatives which are the topic of this thesis, it also, as Baumol (1990) argues, has large scale policy implications, which can again be influenced by the public and their beliefs. Research efforts like the large scale work of GEM (2016) have shown this latter effect to be quite pronounced. That is not to say that every new startup should aim to take on Google, Amazon or Facebook. As even Coad, et al. (2014) state in their argument for gazelles, the view must be one looking at the environment as a whole: *"… dung beetles and all…"* (p. 107). We do not recognize the heterogeneity of the field, our starting point of all this, by staunchly focusing on one small subsection. Regardless of venture size and ambitions, the focus on producing value remains, however. At a minimum on the macroscale (left-half of Figure 1) and ideally on the microscale too.

4. MARKET FAILURE AND THE NEED FOR INTERVENTION

Having looked at the benefit of entrepreneurship in the previous chapter, we shall now look at the quantity of it and how such may be influenced. For that is essentially the goal of most support initiatives, like the incubator. Discussing this aspect of quantity we must concern ourselves with not only how we get more, but also the fundamental issue of why we would want more than what occurs without our purposeful intervention. The main focus of this chapter is the arguments for using public policy to encourage entrepreneurial behavior, where I will build upon the ideas of value creation at the micro- and macro-levels, in order to capture the underlying rationale behind creating support initiatives like the incubator. This will lead into a discussion of the concept of market failure, including input from scholars who are rather critical of its validity. Also covered is the source of entrepreneurship, the entrepreneurs themselves, and how different views of this elusive individual impact our chance of making more of them. First however, we shall briefly consider the opposite scenario of having too much entrepreneurship.

4.1 THE QUANTITY OF ENTREPRENEURSHIP

With the focus on increasing the quantity of entrepreneurship it may seem silly to look at a case where we actually have too much of it. But as the question enjoys a rather succinct answer, mainly due to lacking data and concern in the scientific literature, I will address it just to make sure the angle is covered and the skeptical reader has been satisfied. If we strictly look at entrepreneurship as new venture creation, Stel, et al. (2005) find that in some economies, specifically developing countries, entrepreneurship has a negative impact on GDP-growth, which they speculate can be because there is a lack of complementing large companies. As these new ventures often merely represent attempts at self-employment, attaching the e-label is a bit questionable. The only other mention of this issue in the heap of reviewed papers is in the previously referenced paper by Decker, et al. (2014) on job creation in the US:

> "An optimal pace of business dynamics—encompassing the processes of entry, exit, expansion, and contraction—would balance the benefits of productivity and economic growth against the costs to firms and workers associated with reallocation of productive resources. It is difficult to prescribe what the optimal pace should be, but evidence accumulating from multiple datasets and methodologies suggests that the rate of business startups and the pace of employment dynamism in the US economy has fallen over recent decades…" (Decker, et al., 2014, p. 4)

So while the authors make no guess as to the exact, optimal rate of new venture creation (and exit), they do nonetheless hint at there being one, although it is a very theoretical observation indeed. If we additionally consider the wide spectrum from muppets to gazelles (Nightingale & Coad, 2014), we must further deal with the possibility that the optimal rate for each segment is different. But given the paucity of relevant research and the apparent lack of concern for the issue among scholars, I shall be content knowing that we likely have not reached a point of too much entrepreneurship just yet and move on.

The answer to the question of why we want more entrepreneurship is primarily embedded within the arguments shared in the previous chapter. We want more entrepreneurship (as in in the competitive behaviors that drive the market process (Davidsson, 2016)), because it, when viewed on an aggregate level, leads to a more prosperous society. It is essentially an argument in favor of change and at odds with conservatism. It is a way to rise above the rest in our globalized world and can be found *"… at the heart of national advantage."* (Porter, 1990, p. 125). Entrepreneurship is *"… the engine of economic growth."* (Yu, 1998, p. 906), and *"… generates growth because it serves as a vehicle for innovation and change, and therefore as a conduit for knowledge spillovers."* (Carree & Thurik, 2010, p. 588). Wennekers and Thurik

(1999) say it very simply: *"Entrepreneurship matters."* (p. 51). Even the more critical – e.g. Shane (2009), Nightingale and Coad (2014) etc. – can likely get behind the above statements, as long as the heterogeneity and thus disparate impacts of the field is recognized. Combined with the assertion that the need for entrepreneurship is currently not saturated, as discussed above, we essentially believe that increasing the quantity of it will lead to greater levels of prosperity sooner. With this we have an answer to why we want more entrepreneurship.

But how come these greater levels of entrepreneurship we seek have not simply occurred through the effect of the dominating market forces? If we believe all these positive outcomes are accurately attributed to entrepreneurship, then pursuing the life of an entrepreneur above all else would be the rational choice for all equally rational individuals. As "entrepreneur" is not the sole career choice available, we can rather safely call such a depiction false. As the following few pages will make clear, the answer to how we increase levels of entrepreneurship is quite complicated. Earlier we found reason to believe that entrepreneurship, when viewed at an aggregate level, leads to greater prosperity, but as we have also discussed, the chance of making it big as an independent entrepreneur is slim. The quantity of muppets by far outnumbers that of gazelles (Nightingale & Coad, 2014), and as these ventures are unsurprisingly not empty husks, a large portion of individuals end up as failed entrepreneurs. This too goes for entrepreneurs in established companies. There is a cost to entrepreneurship and those engaging in it must be prepared to fail. Can we increase the number of people willing to make that bet?

4.2 ENTREPRENEURS AS INDIVIDUALS

If we stick with Baumol's (1990) hypothesis that the supply of entrepreneurs is relatively constant, then we are out of luck. In such a world, the quantity of entrepreneurship is bound to be proportional to population size and if we, sensibly, regard the birth rate as too troublesome an element to affect, our search for an answer ends there. On the other hand, as long as the population is rising, we have essentially achieved our goal of likewise increasing the quantity of entrepreneurship. But perhaps letting life do its thing is not sufficient for us and hence we may look at increasing the ability of the entrepreneurs we already have on hand in order to get fewer muppets and more gazelles. This then begs the question (and one quite fundamental to the thesis): can we actually influence the ability of enterprising individuals or is it simply innate? A nature versus nurture debate has suddenly happened upon us!

Much of the early literature on entrepreneurship focused on the entrepreneur herself and her almost mythical ability to conjure up something where there was previously nothing (Sarasvathy & Venkataraman, 2011). This line of research was perhaps most famously criticized by Gartner (1988) who already in the paper's title – *"Who Is an Entrepreneur?" Is the Wrong Question* – denounced the value of looking at the traits of successful entrepreneurs. In more recent times there have been attempts to link entrepreneurial activity to genetics using studies of twins (Nicolaou, et al., 2008), and although Davidsson (2016, p. 24) admits that he will never be a fan of the trait-approach, he nonetheless recognizes the research which suggests that personal, innate characteristics do matter to some degree. Overall the debate is rather controversial and Sarasvathy and Venkataraman (2011) maintain that the trait-approach has produced mixed results at best (p. 127). They go even further and suggest:

> "… there exists a distinct method of human problem solving that we can categorize as entrepreneurial. The method can be evidenced empirically, is teachable to anyone who cares to learn it, and may be applied in practice to a wide variety of issues central to human well-being and social improvement." (Sarasvathy & Venkataraman, 2011, p. 125)

Their notion of a universally teachable entrepreneurship method is clearly at odds with one that views the entrepreneur as a rare creature worthy of study. The true answer is probably going to be found somewhere in between, as these things often are.

Most people can run a 100 meter dash, but only a tiny fraction can do it in less than 10 seconds. It is not controversial to suggest that an innate ability is at play there. But if we as humanity want to get anywhere, we will likely do better if everyone pushes in the same direction, regardless of innate talent, rather than merely having the fittest drag the cart with the rest of us sitting in it. Even if we accept that innate talent plays a significant role, the research is nowhere near close to suggesting that the quantity of (successful) entrepreneurship cannot be positively influenced. Drawing a parallel, the growing number of scientists today far exceeds the general population growth (Shamoo & Resnik, 2009), so either we are actively creating new scientists through a teachable method or there is simply a yet-to-be-exhausted supply of people with the innate talents it takes to become one from which are mining. Either way, the deliberate effort by universities and other research institutions worldwide has clearly had an effect. Returning to Baumol (1990), we thus have no evidence to suggest that we are limited by the number of individuals able to engage in entrepreneurship and its lacking quantity must be the result of something else.

4.3 WHO PAYS THE PRICE AND WHO GETS THE REWARD?

As I alluded to before the discussion of traits, enterprising individuals can be faced with a tough decision on whether to pursue a new venture idea or not. The potential payoff can be significant, but so can the loss – monetarily and personally. If we consider the failing entrepreneur part of a larger cohort of entrepreneurs of which a relatively stable and predictable fraction is successful, then additional entrepreneurs in that cohort will equally represent an increase in both successful and failed ventures in absolute terms. In order words, if we have a cohort of 100 new ventures and a success rate of 10%, 10 of the ventures will be successful. If we somehow persuade enough people to choose a life of entrepreneurship and as a result add another 900 new ventures to our original cohort, we stand to gain another 90 successful ventures, as we assume the success rate remains constant. At a societal level this is a huge plus – we have increased the rate of entrepreneurship enormously, gaining both the main benefits from the successful ventures as well as all the supply side effects (Fritsch, 2008) (Davidsson, 2016) produced by the failed ones. But we also have 900 failed ventures filled with individuals for whom the personal costs have been significant. Their work, at an aggregate level, created a lot of value, but only society managed to capture it.

The main ways of addressing this imbalanced value distribution is to increase the chance of success, decrease the cost of failure, or of course do both. Policy changes to improve bankruptcy law for entrepreneurs (Lee, et al., 2007) is an example of reducing costs, while publically funded incubators and other similar support initiatives are examples of attempts to increase success rates.

Although public policy is strictly a governmental matter, supporting entrepreneurs in an effort to increase success rates can be and is often a matter dealt with by private organizations. We can in some sense see the venture capitalist as an actor supporting the new firm, working to increase its chance of success by providing high risk capital at a relatively early stage. Contrary to society as a whole, however, the venture capitalist only stands to capture value if the new firm ultimately achieves substantial success. For good reason they are thus only interested in the most promising firms and their "support initiative" is only available to a tiny fraction of the population of entrepreneurs. It only makes sense to create support initiatives from the output of which you (or your financiers) stand to capture value. That goes for all, profit or non-profit. Unless we are talking pure charity, and that exception is even questionable, we expect the value "loop" to be closed for an initiative to be sustainable. Consider the two models in Figure 3 and Figure 4.
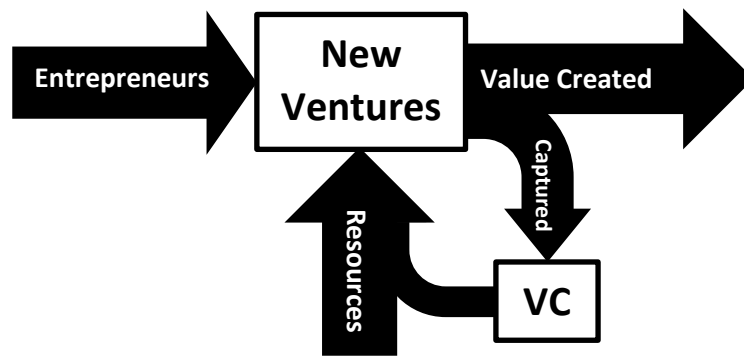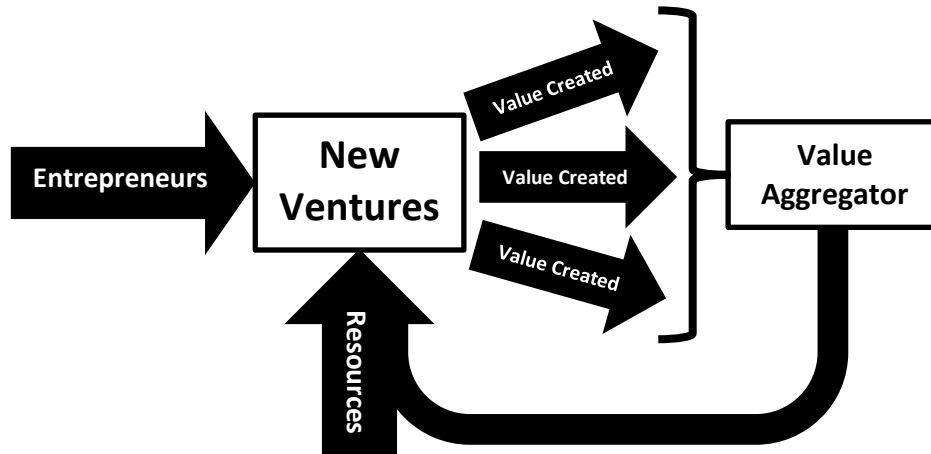
Figure 3 - Value loop at a micro level

Figure 4 - Value loop at a macro level

In Figure 3, the private actor (e.g. a venture capitalist) is offering support, here depicted as a resource stream to qualified entrepreneurs engaged in new venture creation. Part of the value created by these entrepreneurs is captured at the micro-level (e.g. through an IPO) and the private actor is thus able to close the value loop. If the captured value is equal or ideally greater than that originally supplied to the new venture, the initiative will be sustainable and the market forces will act upon it.

In Figure 4, a value aggregator (e.g. a regional or national government) is likewise offering resources to entrepreneurs. The increased economic activity arising from supply side effects of new venture creation is captured (e.g. through taxes) at the macro- (societal) level by a value aggregator. If the resource expenditure compares favorably to the (assumed or measured) supply side effects, then the initiative will likely gain favor among the constituents of the aggregator or their representatives and receive continued funding. In essence, the aggregator stands to capture value that is too diffused for any one single actor to capture on their own.

I here draw on the work by Adner (2012) and his concept of the value aggregator, who acts at a macro-level, capturing value that no single actor can alone. It is particularly the aggregator's ability to compensate for deficiencies in the value distribution along a chain of stakeholders that is of importance. Also used here is Davidsson's (2016) notion of value creation at different levels, micro versus macro, and how this affects value capture (Figure 1, page 8). The distinction between a single actor versus an aggregator and likewise value levels can of course be much more of a sliding scale as opposed to the binary form depicted here. The essential point is that private actors are limited in what value they can capture and thus which entrepreneurs they are interested in supporting. Although public policy can target the value capture mechanism available to private actors (e.g. lower taxes on investment payoffs) to further extend the breadth and quantity of entrepreneurs supported, the fundamental issue remains. Figure 5 shows this relationship between value capture and the level on which is happens for different actors, with the value aggregator here exemplified as a state actor.
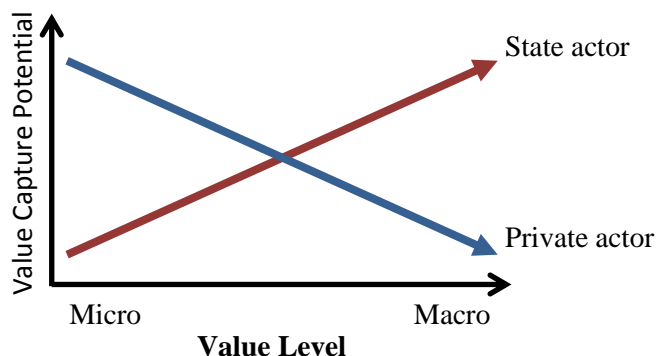
Figure 5 - Value capture potential and level of scope

The issue is often articulated through the concept of market failure. Here, the market forces themselves, essentially the total effect of the rationally acting individuals, fail to adequately incentivize the beneficial behavior that would leave everyone better off.

> "What is it we mean by "market failure"? Typically, at least in allocation theory, we mean the failure of a more or less idealized system of price-market institutions to sustain "desirable" activities or to estop "undesirable" activities.' The desirability of an activity, in turn, is evaluated relative to the solution values of some explicit or implied maximum-welfare problem." (Bator, 1958, p. 351)

The concept of market failure is well-known and well-used in the incubator literature as the main argument to justify the use of public funds to support such initiatives (European Commission, 2002) (Colombo & Delmastro, 2002) (Siegel, et al., 2003) (Aernoudt, 2004) (Barbero, et al., 2012). Potential sources of market failure can be *"…externalities, imperfect information, monopoly power, and public goods."* (Hackett & Dilts, 2004)

We have now begun to scratch to surface of why the quantity of entrepreneurship may not be what we would like it to. Individuals, who would otherwise be willing to engage in entrepreneurship, make the rational choice of not doing so due to a lack of knowledge, funding and a heap of other reasons, while the private actor having the important resources make the equally rational choice of not supporting the would-be entrepreneurs, as they do not stand to capture any of the value created from doing so.

4.4 THE PROBLEM WITH GATEKEEPERS

Critics of the market failure argument, like Tamásy (2007) who makes a case against any form of publically supported incubator-like initiative, will often argue that these would-be entrepreneurs, due to their lacking resources, are unlikely to create any meaningful value in such a role and are thus justifiably rejected by the market. We essentially have a screening stage, where a set of barriers make sure only those with a reasonable chance of succeeding later are let through. The rest will create more value for themselves and society in other roles. Addressing the issue of funding in a paper on entrepreneurship and public policy, Henrekson and Johansson (2010) write:

> "Not all projects should be financed. A failure to raise funds is by no means an example of market failure or capital market malfunction. The credit market functions as an initial filter, screening out the most unrealistic and overly optimistic projects. A bank or a venture capitalist, with many years of experience financing entrepreneurial ventures, may make better judgments than a first-time entrepreneur." (Henrekson & Stenkula, 2010, p. 609)

The argument is certainly compelling. We are not interested in a bunch of unfit individuals creating new ventures with public resources for the sake of acting entrepreneurial in the pursuit of fame and fortune (and supply side effects), only to have them end up with value

created at neither the micro- or macroscale. A true failure per Davidsson (2016) (Figure 1, page 8). In fact, as these individuals could likely have been productive in other jobs, we end up with a clear value loss at both levels! With the large number of muppets discussed earlier (Nightingale & Coad, 2014), one may actually argue for additional barriers to entry, not fewer of them, in order to stifle the creation of these badly performing ventures.

The main issue, and one that Henrekson and Johansson (2010) actually also recognize, is that we cannot accurately know beforehand whether an entrepreneur or her new venture will succeed. We cannot consistently spot the difference between the unfit individual described above and the only marginally qualified would-be entrepreneur, who stand to become a force of nature with a little bit of experience. Even the venture capitalist, with many years of experience financing entrepreneurial ventures, per the earlier quote, will get it wrong. The many stories of investors turning down Google and other giants-to-be in their early days attest to this (Kerr, et al., 2014). Through creation of whole new markets, entrepreneurs and their stakeholders change the rules of the game – the reality in which our original judgement resided simply seizes to exist. This is a cornerstone of Sarasvathy's (2001) influential theory of effectuation, which exactly addresses this apparent lack of predictive power we have when it comes to entrepreneurship. What is often referred to as Knightian uncertainty, essentially unmeasurable risk (Knight, 1921, pp. 19-20), is an inherent element in entrepreneurship and one that makes it impossible to predict outcomes to any meaningful degree of accuracy (Mcmullen & Shepherd, 2006). In a paper on experimentation in the new venture creation process, Kerr et al. (2014) write:

> "Entrepreneurship is fundamentally about experimentation because the knowledge required to be successful cannot be known in advance or deduced from some set of first principles." (Kerr, et al., 2014, p. 25)

That said, there is of course a difference between the probable outcomes of a new hair salon and a new biotech firm. While they are both searching for their unique product-customer match, the result of them finding it will be quite different. The degree of innovation involved has a direct impact on the uncertainty faced by the new venture (Arteaga & Hyland, 2013), which likewise impacts the stakeholders. The recent and very interesting work by Guzman and Stern (2015) show how otherwise superficial characteristics evident at the moment the new venture is legally created, like firm name, can have significant predictive power. In their study of more than half a million firm births in Massachusetts from 1988 to 2014, they find that firms likely to achieve a so-called growth event – IPO or acquisition at a meaningful valuation – for instance rarely use the founders name as firm name, and are formed as a corporation rather than an LLC, to name two of the variables investigated – all of which are reasoned to be indicators of aspirations for growth in the ventures. The authors argue:

> "While most "Silicon Valley"-type start-ups fail, their intention at the time of founding is to build a company with a high level of equity and/or employment growth (and often are premised on exploiting new technology or serving an entirely new customer segment). At the same time, the ambition and potential for even a "successful" local business is often quite modest, and might involve building a firm of a small number of employees and yielding income comparable to that which would have been earned through wage-based employment." (Guzman & Stern, 2015, p. 4)

They go on to compute a quality score, effectively ranking all the firms according to likelihood of achieving a growth outcome. Using a test sample (i.e. not the one used to create the model), the top 1% scoring accounts for 49% of all recorded growth outcomes. And yet, despite this significant predictive power, the authors note that for even this top 1%, only 14% actually go on to achieve a growth event (p. 29). Success is rare indeed.

4.5 CLOSING REMARKS ON THE QUANTITY OF ENTREPRENEURSHIP

Of course a growth event as defined by Guzman and Stern (2015) is a rather narrow view of success. Specifically, the narrow one often targeted by the aforementioned private actors, who understandably are looking for a timely return on their investment. But there is reason to believe, based on the arguments and references presented here, that a value aggregator has a role to play in a society wanting greater levels of entrepreneurship. Regional and national governments are in a unique position to capture value that no other entity can and thus are able to sustainably support initiatives, which would otherwise not exist. Initiatives that stand to leave everyone better off. It is not an argument for removing all barriers to entry – it is simply one for lowering them to a level, where the increased quantity of entrepreneurship is beneficial for all. We want to selectively target barriers that inhibit the quantity of high impact entrepreneurship, be they gazelles or known by some other term, and take an active role in the entrepreneurial economy in order to realize the potential we believe currently lies dormant. This is, in a nutshell and after a long discussion, the answer to how we get greater levels of entrepreneurship.

As a last quibble before we head into the next chapter, we shall recognize that is not the goal of the aggregator to use its might and monopolistic position to displace current private actors, who have already set up sustainable value loops. Coad et al. (2014) likewise argue for caution in use of public policy:

> "From an economic policy perspective, even the clear identification of a link between [high growth firms] and economic performance does not provide an automatic justification of policy interventions. Policy interventions typically need to be based on market failure arguments. If no such argument can be identified, public policies fostering entrepreneurship will not contribute to social welfare and can even be counterproductive." (Coad, et al., 2014, p. 107)

Hence a clear focus on value creation and capture at the macro-level must be kept in order not to have the opposite effect of what is desired. The collaboration between private actors and the aggregator, explicit or not, where each cover the area they are best fit for is the key to a comprehensive ecosystem of support initiatives. This ecosystem is the topic of the next chapter.

5. INCUBATORS AS A POLICY TOOL

The market failure argument laid forth in the previous chapter has been recognized by policy makers for a quite a while. The issue it points to has been attacked from many different angles, often with a goal of employment growth rather than necessarily entrepreneurship as defined here, and the initiatives focused largely on moving people towards self-employment (Shane, 2009) (Henrekson & Johansson, 2010). As discussed earlier, there has been a clear tendency to view all forms of new venture creation as fitting equally well under the headline of entrepreneurship, and little concern has been giving to the differences between the startups from which a giant could emerge, and those which never employed more than the founder (Nightingale & Coad, 2014). Of prime interest for this thesis is of course the incubator, an initiative which actually started as a privately run program in the US in 1959 (Hackett & Dilts, 2004) (Mancuso, 2016), but which has since been adopted by regional and national governments and often run as non-profits reliant on public funding (European Commission, 2002).

This chapter will introduce the incubator as a public policy tool to increase the quality and quantity of entrepreneurship as it manifests itself in the number of startups formed and their success. I will discuss the heterogeneity of the field and why it makes sweeping conclusions of their impact difficult, let alone a fulfilling definition of form and goals, and how bias inherently introduced in their processes is a major complication in any research on them.

The incubator, and its later offspring the accelerator which I shall cover later, represent what we may regard as an intense form of support. It is more of a service offering than a product one, in that it is highly personalized and puts significant pressure on the personal abilities of the management team at the incubator. Whereas a government sponsored website to encourage entrepreneurship can serve an essentially limitless number of would-be entrepreneurs, an incubator has a very finite limit to the number of startups it can assist. The incubator, and intensive support initiatives like it, is particularly interesting due to the high degree of involvement and thus influence we have in the new venture creation process. As we acknowledge the highly varying quality of entrepreneurship present, we too must consider which kind we are interested in encouraging. An intensive form of support is way of directing the allotted resources towards a very specific goal rather than just trying to encourage entrepreneurship blindly, like Shane (2009) criticizes.

5.1 INCUBATORS – AN INTRODUCTION

Attaching the word "incubator" to any activity involving the support of new ventures is perhaps not the greatest leap of imagination, and as such many initiatives have used the term without necessarily sticking to any formal definition. Even for initiatives the literature identifies as incubators we find some heterogeneity (Aernoudt, 2004). One of the most cited papers in the field of incubators, a literature review by Hackett and Dilts (2004), defines the incubator like so:

> "A business incubator is a shared officespace facility that seeks to provide its incubates (i.e. ''portfolio-'' or ''client-'' or ''tenant-companies'') with a strategic, value-adding intervention system (i.e. business incubation) of monitoring and business assistance. This system controls and links resources with the objective of facilitating the successful new venture development of the incubates while simultaneously containing the cost of their potential failure." (Hackett & Dilts, 2004, p. 57)

Mian et al. (2016) offer a similar definition in their recent review of the field and both are again very similar to one given by Smilor (1987). While there is consensus regarding the availability of shared office space, often denoted by calling it a property based initiative,

emphasis on the provided services and whether they are focused on tangibles or intangibles vary somewhat (Aerts, et al., 2007). The rent is very often subsidized, allowing the startups to pay below-market-rates for the office space (European Commission, 2002).

In the above definition of the incubator itself, we also get a description of its objective: to facilitate successful new venture development of the startups while simultaneously containing the cost of their potential failure (Hackett & Dilts, 2004, p. 57). Importantly, this objective recognizes that an incubator also has a role to play in mitigating consequences of failures – another way of reducing the overall cost of entrepreneurship.

Despite the focus in the definitions on providing services, the actual incubators do not always adhere to them. In a study of 97 incubators across Europe, Aerts et al. (2007) find that 14% do not offer help with business plans or further firm development, and 28% do no offer financial advice (p. 260). Looking at 16 Swedish incubators, Bergek and Norrman (2008) note that for four of them, only minor intervention occurred and only when initiated by the startups themselves. Bruneel et al. (2012) also discuss significant differences in what support is offered in their in-depth study of seven European incubators, noting that the oldest tended to be more hands-off.

Based on work by the European Commission (2002), Aerts et al. (2007) adopt a typology that includes a dimension on level of management support and labels only those offering significant levels of such as incubators (Figure 6). As can be seen in the figure, many different, yet related, types exist, adapted to fit various regional and national circumstances. The many types has also made it more difficult to compare studies, as some authors use terms such as "science park" and "incubator" interchangeably, while not always clearly delineating exactly what they are addressing. Some, like Colombo and Delmastro (2002) and Barbero, et al. (2012), see the science park as housing the incubator itself, which does not exactly clear things up. Some incubators, in name only, again appear to be not much more than office spaces with a desire to mainly house startups.
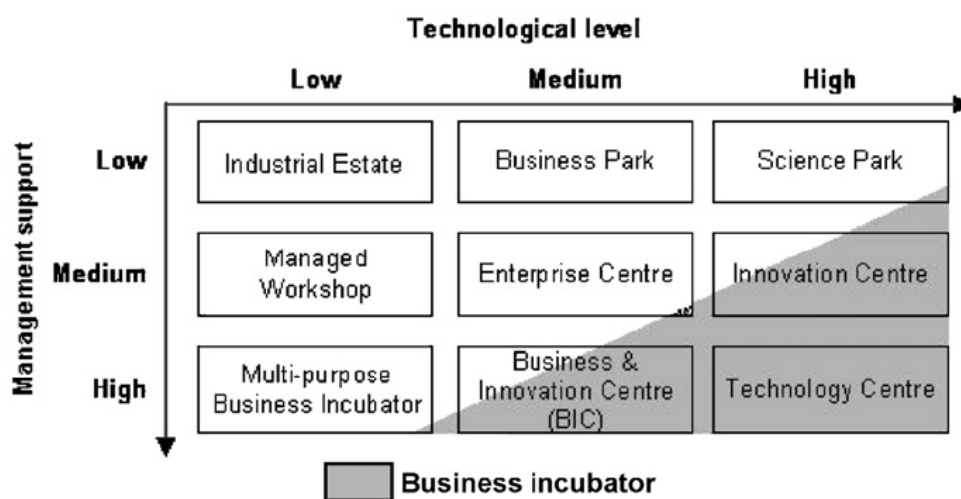

Figure 6 - Typology of Business Incubators (Aerts, et al., 2007, p. 255)

Similar diversity in found in the selection criteria applied. Bergek and Norrman (2008) propose the matrix in Figure 7, giving four different categories based on management's involvement in the selection process and on what factors it is focused. Aerts et al (2007) adopt the categorization by Lumpkin and Ireland (1988), which describe the selection strategy employed along four dimensions: Market, team, financial, and balanced, with the latter being a mix of the three former. Large variations also exist at the other end of the process when it comes to exit policies, typically varying from 2 years to no limits (Allen & McCluskey, 1990) (Mian, 1997) (Phan, et al., 2005) (Bruneel, et al., 2012).

	Survival of the fittest	Picking the winners
Selection strategies		
Idea-focused selection		
Entrepreneur-focused selection		

Figure 7 – Selection Strategies (Bergek & Norrman, 2008, p. 24)

Largely lacking from the literature is a description, even superficial, of the development stage of the accepted startups. Bergek and Norrman (2008), Aerts et al (2007) and Gassmann and Becker (2006) briefly mention a pre-incubation stage used by some incubators, indicating that at least some development time must have been put into the venture upon acceptance. The fact that most European incubators secure a significant portion of their funding (39%) from rent paid by the startups (European Commission, 2002) also indicates that the startups are able to sustain expenses, whether through already held capital or revenue. Yet, Gassmann and Becker (2006) still report assistance with the initial formation of the new venture itself as a key service provided by the incubators, thus an indication of the opposite situation.

5.2 INCUBATORS – IMPACT OR LACK THEREOF

With a field so heterogeneous, both regarding theory and practice, is it perhaps no surprise, that results on their impact on local and national economies are likewise all over the place. The primary outcome of concern has been direct jobs created in the participating startups, often with a calculation of the cost per job in an attempt to create a comparable metric. The European Commision (2002) and Barbero, et al. (2012) use this, both with results around 5-6.000€ per job, which at least the European Commission appears to be satisfied with. Aside from the effects arising from direct employment and taxation, many authors discuss secondary or indirect effects (spillovers) that occur in the economy at large in response to the successful startups (Colombo & Delmastro, 2002) (Siegel, et al., 2003) (Phan, et al., 2005) (Schwartz & Hornych, 2010). This is also a subject in the more general literature of entrepreneurship and economic growth as argued by Fritsch (2008), which we discussed earlier. These effects are however much more challenging to measure with any degree of accuracy due to their diffused impact where it is almost impossible to control for outside disturbances. Of the reviewed literature, only the European Commision (2002) actually goes on to quantify the effect. Using a survey, the startups studied were asked to indicate how much they spent in their local economies. From this the authors calculate that about 0.4 jobs is created locally for every job created in the startups (p. 82). Measuring these effects is further complicated by the time lag, which often is at play. Smilor (1987) report 5-10 years as the expected delay before strong economic results manifests themselves from an incubator, and both Carree and Thurik (2010) and Baptista and Preto (2011) discuss how the indirect effects of entrepreneurship in general may even temporarily be negative, via e.g. incumbents laying off workers in face of new competition, before they become net positive later on.

The topic of survival rates among the housed startups has also gotten a lot of focus, although the results have not been unanimous. The European Commision (2002) record a survival rate of 80-90% in their surveyed incubators compared to a reported 30-50% for the wider SME community, but they do not regard it as the performance indicator of most importance. Siegel et al. (2003) find both lower and higher survival rates compared to the general startup population in their review of the literature, and the same goes for Hackett and Dilts (2004). Aernoudt (2004) report very high survival rates in American incubators (86-90%), but does not

give any numbers for comparison. Aerts et al. (2007) use survival rates as the measure of performance in their study of selection criteria to strictly compare various incubators, not the general startup population. Schwartz (2013) appears to be the first to actually create a control group of non-incubated companies, controlling for firm location, industry affiliation, age and legal form. Looking at 371 incubated companies, he finds no significant difference in survival rates between incubated and non-incubated firms. In their comparative analysis of survival rates, Mas-Verdú et al. (2015) likewise find no evidence to suggest that incubators have a significant effect.

In opposition to the use of survival rates, some scholars in the field regard the metric as inherently flawed in the evaluation of incubators:

> "A serious problem with research in this area is that the typical dependent variable, the rate of firm survival (or failure), has little construct validity, since incubators are specifically designed to maintain and increase life span. In short, such studies are selecting on the dependent variable, which creates an endogeneity[2] problem." (Phan, et al., 2005, p. 170)

Phan et al. continue with the suggestion that survival rates are only meaningful when comparing incubators to each other – a notion which Aerts, et al. (2007) would later go on to follow as just described. Udell (1990) addresses the issue many years earlier, arguing that the selection processes introduces such significant bias, that the housed startups are not a representative sample of the population and thus makes any comparison moot, a sentiment Hackett and Dilts (2004) would later go on to repeat albeit not as strongly. Rice (2008) note that *"Survival is a necessary but insufficient condition for success, if success is measured in terms of growth."* (p. 173) and Hackett and Dilts (2004) also argue that "zombie-firms", as they call these firms just able to survive, are not the goal of an incubator.

Going back to the arguments made by Shane (2009), Coad et al. (2014), Nightingale and Coad (2014) and Davidsson (2016) discussed earlier, it is very clear that mere survival is far from a valuable outcome for a venture of any kind – and this goes for comparisons between incubators too, in opposition to the idea by Phan et al. (2005). We may also fear that a focus on survival rates incentivizes behavior that goes against the idea of fast and cheap failure (Hackett & Dilts, 2004), when the new venture fails to show potential. As the incubators in general are partly funded by rent payments (39% of revenue reported by the European Commission (2002)), these zombie companies, who does just well enough to pay rent but not enough to grow and move out, may in some ways represent the ideal tenant, yet one that contributes little value at a macro-level – essentially a muppet (Nightingale & Coad, 2014). This possible conflict is also discussed by Cohen and Hochberg (2014).

The issue of bias is not only relevant when it comes to survival rates. The exact same argument can be made when comparing any metric between incubated and non-incubated firms, and likewise for comparing incubators to each other, as they are situated in unique regional settings, which also introduces bias (Mcadam, et al., 2016). Mian (1997) sum up the issue in four points:

- There is no reliable and cost-effective way to identify a comparison group because of poor data sources on small start-up firms
- There is no reliable way to identify a comparison group because of a strong selection bias of startups – along with the often small number of startups limiting the validity of statistical comparisons

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[2] "Simultaneous causality between the dependent variable and an endogenous variable that is used as an explanatory variable. " (Black, et al., 2012)

- Lack of control on firm variables – such as organizational mission, geographical location, lifecycle aspects, etc. – make direct comparisons of the outcomes misleading due to firm dissimilarities
- The effects of incubators are not limited to their tenant firms
  (Adapted from Mian (1997, p. 261))

The latter effect on the surrounding community is part of the desired outcome when funding an incubator, as Brooks (1986) highlight and which the European Commission (2002) directly quantified. In general, Udell (1990) argues for caution when measuring impact:

> "Even under the best of conditions, the skeptic can cast doubt on most impact claims simply by taking the position that "most incubator tenants would have made it on their own" or that "center impact data suffer from preselection biases." Proving a difference is exceedingly difficult and requires longitudinal data and sophisticated methodology." (Udell, 1990, pp. 112-113)

One would think that in the 27 years since Udell wrote his paper, we would have abandoned the survival rate metric and finally have conclusive evidence for or against the efficacy of incubators. But alas, such is not so. Here follows an overview of the conclusions reached in recent years on the subject of incubator impact.

Still in the nineties, Mian (1997) argues that there is no consensus on what leads to an effective incubator or how the output of such may be measured (p. 254). In an analysis of results reported by the National Business Incubation Association (NBIA) on the valuable impact of incubators, Bearse (1998) largely dismisses all the claims made and heavily criticizes the method of evaluation, from which he argues the results only stand to benefit the marketing arm of NBIA. Sherman and Chappell (1998) are equally unkind in their assessment of the field in general, both among industry and academic researches, stating that they *"… have not done a good job in evaluating the impacts of incubator programs on entrepreneurial development and on local and regional economic development"* (p. 314). They continue on to develop a set of methods for impact assessment, and further do a pilot test on 49 incubators from which they ultimately find *"… a strong indication that business incubators can be an effective economic development tool."* (p. 320). The applied methods focus on growth in revenue, employment, etc. and a survey of incubator manager and stakeholder satisfaction. An otherwise determined effort to create a control group fails, and thus comparison to any meaningful baseline is missing.

In a review of how the incubator as a policy tool has been applied in five member countries, the OECD (1999) find that *"… additional research is still needed to properly assess the economic benefits of incubation."* (p. 20) and further note that such will be complex and costly to conduct. As discussed earlier, the European Commission (2002) finds that incubators make a significant contribution to job and wealth creation (p. ii), but at no point do the authors address the issues with bias articulated by Mian (1997), Phan et al. (2005) or any other of the authors referenced on the subject – an issue the OECD (1999) in their report do recognize.

Colombo and Delmastro (2002) contrast the apparent popularity of the incubator concept with the still lacking evidence for its efficacy, calling the results so far unclear (p. 1105). In the related field of science parks, Siegel et al. (2003) also emphasize a lack of clear evidence of impact. Studying nine incubators in Basque Country and a total of 364 startups, Pena (2004) ultimately finds that there is no benefit to be had: *"Therefore, according to our findings, firms should be able to thrive by themselves without any assistance from the incubator."* (p. 234). The author does however note that the managerial involvement was lacking and that this may have played a significant part in the results. Chan and Lau (2005) review the literature as part of a case study on incubators in Hong Kong and likewise come to the conclusion that no firm evidence exists in favor of incubation, calling the effectiveness still unclear. Phan et al. (2005)

consider our level of understanding of these support mechanisms still phenomenological, i.e. very subjective, but argue that *"… science parks and incubators are important links in the entrepreneurial value chain at the national or environmental level of analysis."* (Phan, et al., 2005, p. 180).

In her review of the field, Tamásy (2007) conclude that the available empirical results do not show that incubators increase innovativeness, growth or the chance of survival and as such is an ineffective policy tool. She further criticizes the empirical studies as often being anecdotal, suffer from adhoc designs or lack of theoretical embedding. McAdam and McAdam (2008) assert that the literature recognizes the University Science park incubator (USI) as an effective support mechanism for new entrepreneurial firms, but offers no peer-reviewed literature as the source of this alleged recognition. The specific term of USI also appears to be of their own making. The authors conduct a case study on two UK-based incubators over a three-year period, and use interview responses from the involved entrepreneurs to again assert the positive impact of the incubator. Bergek and Norrman (2008) conclude that *"… there is a lack of a theoretical base for incubator performance evaluation in general and the identification of best practices in particular."* (p. 21) and argue that the incubator concept has been shown to be anything but clear in practice. Schwartz and Hornych (2008) state that there is no final conclusion to whether science parks or business incubators are *"… effective and efficient tools for the promotion of young or newly founded (innovative) firms."* (p. 438).

In a study on collaboration between startups in German incubators published two years later, Schwartz and Hornych (2010) again find this to be the case. Scillitoe and Chakrabarti (2010) reference literature both for and against the positive impact of incubators, but ultimately conclude that no clear understanding exists yet, just like those before them. Looking at the evolution of business incubators from the 1980s and onwards, Bruneel et al. (2012) position their study as a way to better approach the still lacking consensus on impact. This reasoning is also behind the work by Barbero et al. (2012) in their study in different incubator archetypes and thus also here the inconclusive results are acknowledged. In only the second study to use a control group, Stokan et al. (2015) find that incubators can have a significant positive impact on job creation. Like Schwartz (2013), the authors employ rather limited control variables – this time using the initial number of full-time employees at the business's opening, the level of capital at the business's opening, the firm's environment, and the industry of the firm – which again questions the validity of the findings. They argue adamantly for using control groups to further increase the legitimacy of impact studies:

> "In short, business incubation literature has failed to fully address both the problem of comparison group construction and the necessity of a statistically sound analysis accounting for the presence and extent of selection bias." (Stokan, et al., 2015, p. 319)

Finally, in a review article co-authored by the scholar who started us off a few paragraphs ago, Mian et al. (2016) like their colleagues before them, criticize the available literature as being fragmented and anecdotal, and further emphasize the lack of an agreed upon definition and unified theory as key research challenges, but nonetheless still believe in the promise of the incubator as a support initiative and policy tool.

Despite plenty of work on the issues since the article by Udell (1990) and plenty more not mentioned here, the field does not appear to have made the great strides in understanding the volume of literature might otherwise suggest. There almost appears to be a trend in the articles of first calling the field fragmented and the empirical results for ambiguous and problem-ridden, after which the author(s) suggests a new model or construct, to which they collect confirming data. This work will then be added to the collective literature and understanding of the field, but apparently not change the overall conclusions, as the next authors will make much the same bleak evaluation of the literature, before they again try to

correct it. The difficulty of research in the area is perhaps best exemplified by this seemingly endless cycle. I will also dare criticize the lacking recognition of bias in general, despite its strong influence being well-argued by Udell (1990) and Mian (1997) early on. Schwartz (2013) and Stokan et al. (2015) appears to be the only ones actively pursuing the idea of having a legitimate control group, but even then with significant weaknesses arising from only using superficial explanatory variables such as firm location and industry affiliation that are currently available. The lacking recognition of bias also influences the weight with which different studies are attributed during review, as the results from studies actually trying to correct for bias are unfortunately not given the greater weight they ought to. The literature at large then appears to have evidence pointing in all directions, when it is only that pointing to neutral impact which is credible. More specific literature critique in review articles could be valuable.

5.3 INCUBATORS – WHY WE WANT IMPACT

One may be tempted to take the viewpoint of a pragmatist and equate the apparent popularity of the incubator as a testament to its effectiveness. After all, how can so many thousands of incubators worldwide (Tamásy, 2007) (InBia, 2016) receiving so many resources not have a definite valuable and meaningful impact? They must have! And yet the great effort spent on these support initiatives only makes it more astounding that no clear proof of their effectiveness has been presented in the literature so far – and this despite the age of the incubator concept.

The pragmatist may also be critical of this incessant search for definite proof of impact. Why is it that we need to spend so many resources investigating the output of the incubator when we could funnel the same resources towards actually supporting the entrepreneurs instead? The studies containing satisfaction surveys (e.g. McAdam and McAdam (2008)) clearly show great belief in the positive impact of the initiative among incubator managers and startups – and such evidence may indeed be sufficient for some. Mian (1997), working with university technology business incubators (UTBIs), describe the situation of sustainability:

> "The UTBI's organizational sustainability primarily stems from the articulation and communication of its goals and their actual realization as *perceived* by the various stakeholders, specifically the sponsoring university." (Mian, 1997, p. 263)(My emphasis)

It does certainly show that some perceived value is created, but this does not necessarily mean the created value addresses the market failure argument upon which the incubator is founded. A connection continuously stressed when it comes to public policy and entrepreneurship, and particularly intense support initiatives like the incubator (Henrekson & Stenkula, 2010) (Tamásy, 2007) (Shane, 2009) (OECD, 1999) (European Commission, 2002).

> "… in determining the services to be provided policymakers should ask whether market failure is a genuine problem. If there is no market failure in the provision of support services then the use of public resources should be questioned." (OECD, 1999, p. 19)

First, if we acknowledge the importance of a value loop containing the value aggregator, then we should be adamant in making sure it is indeed a sustainable loop and hence one with a value surplus. In other words, the measurable financial output must be equal to or greater than the financial resources we feed the incubator with. Further, we must have reason to believe that such value could not have been created without public intervention. If a publically funded support initiative fails to live up to either of those conditions we can consider it unfit for the job it was supposed to do.

Of course, even with recognition of these two conditions, stakeholders in charge of authorizing funds may judge them fulfilled with wildly different types and levels of proof. That is politics.

An expressed need for further impact evaluation should perhaps not be expected from this direction. Thus we are in need of a different argument for more stringent evaluations of incubator performance. A common one found among both practitioners, e.g. the National Business Incubator Association (NBIA), and academics, e.g. the work by the European Commission (2002), is an argument based on the need for a best practice for incubator managers to use in their work. To know what produces the most value, we must measure said value and compare the approaches that created it. From such we may begin to improve incubators performing below a given benchmark. This is the aim of a fair number of the articles discussed here. Some scholars, however, are less than optimistic about finding a best practice, as the heterogeneous nature of the field, regional circumstances, stakeholders and mission statements is argued to equally require greatly different approaches despite the same underlying market failure argument (Bergek & Norrman, 2008). Thus, while there may not be a universal best practice, a set of universal metrics could help guide the incubator management team towards some optimum configuration of support services, selection criteria, etc. for exactly their specific circumstances.

As just mentioned, there has been made efforts towards creating benchmarks for incubators, like the project by the European Commission (2002), but further study on their value is lacking in the scientific literature. The International Business Innovation Association (InBia) run a certification program for managers, but little to no information on it or its impact is available without membership. Focusing on university affiliated incubators and accelerators, UBI Global offers what appears to be a rather comprehensible set of services targeted not only at managers of those initiatives, but also corporations wanting to invest and governments looking for evaluation. They claim to have performance data from over 600 incubators worldwide, including rankings. Unfortunately, like with InBia, the information is only available to paying members and is likewise not used in academic work. EBN, a European-based network of incubators, also offers a certification program, and – in contrast to the other examples – releases a publically available annual impact report (EBN, 2016). The results are however strongly plagued by bias, making them meaningless for any absolute measure of impact. But as a relative measure of improvement they may suffice, which is likewise how the benchmarking approach has been tackled.

Any attention given to such continuous improvement is however mostly absent from the reviewed literature. Mian (1997) is one author addressing it, and does so under the headline of feedback loops, yet even he remains rather superficial in the descriptions of how exactly the incubator ought to conduct the process. Hackett and Dilts (2004) also discuss feedback loops briefly, using the model in Figure 8, where the *"… arrows going backward from outcomes to the constructs of interest indicate feedback loops that occur over time and through experience, suggesting organizational learning effects."* (p. 44). Referencing the work by Allen and McCluskey (1990), Hackett and Dilts (2004) argue that results showing incubator age as a significant influence on the performance of the housed startups *"… suggests that the stocks and flows of new venture development related knowledge accumulated and channeled by the incubator over time (i.e. organizational learning) may be the most important variable for incubating new ventures."* (p. 67). No authors really appear to have picked up this avenue of inquiry, as when the focus does happen to be on learning and continuous improvement it is in regards to the housed startups, not the incubators or their management, e.g. Smilor (1987), OECD (1999) Rothaermel and Thursby (2005) and Cohen (2013). While some do suggest the view of the incubator as itself a startup (e.g. Grimaldi and Grandi (2005)), actually applying learning strategies popular in that context is never investigated. Longitudinal studies of incubators have been done, but – perhaps due to the discussed difficulties with collecting data – anything documenting and testing incubator performance improvement over time is still missing.
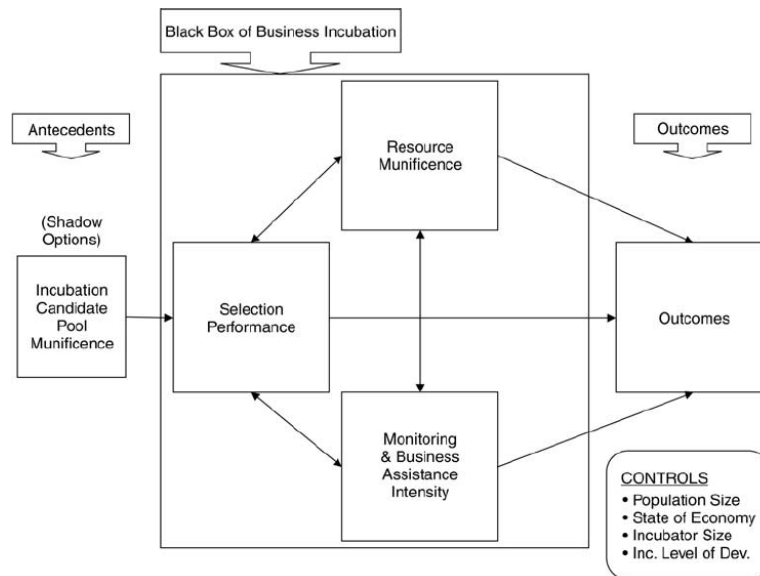
Figure 8 - Incubation process model - (Hackett & Dilts, 2004, p. 45)

This ultimately leaves us in a situation where we do not truly know whether incubators work or how to improve them, should they be found lacking impact. The data and insights that might assist us is locked away either on purpose or as a consequence of a disconnect between academia and practitioners. What is further puzzling is the absence of published work on specific university-incubator collaborations from researches at those universities. One would think that an incubator so closely attached to a university could make for a great research environment, where entrepreneurs, their startups and the managers trying to assist in them their pursuit of success are so readily available. And perhaps such researchers could even feed back their collected insights in an effort to improve the incubator or make data collection easier.

Still standing though is our desire to improve the mechanism with which the failure of the market is mended. Measuring the output is not only about justifying the funding required, but just as much about having metrics to lean on in a search of continuous improvement at each individual incubator. In such a process, even evidence showing the incubator's negative impact may not be reason to completely abandon the idea of a support initiative like it. As the literature has shown, incubators come in all shapes and sizes and there is still room for innovation in many areas. Evidence of a negative impact should just be attached to its current implementation, not all future ones. As long as the underlying argument of market failure and value aggregation stands, then we have good reason to keep looking for a way to lower barriers to successful new venture creation of the kind we are interested in.

5.4 ACCELERATORS – A MARKET SOLUTION

We have so far discussed support initiatives under the circumstances of market failure, but private actors have not shied away from also offering various types of support – and not merely funding – when the value loop could be closed at a micro-level. One of these is the relative recent accelerator concept, by some considered an offspring of the incubator (Pauwels, et al., 2016), with the American Y-Combinator established in 2005 often claimed as the very first (Kim & Wagman, 2014). The accelerator concept sets itself apart from the incubator in a few key areas, which partly can be seen as solutions to the issues discussed until now and partly highlight the differences between support initiatives founded on different rationales. For those reasons it is a valuable subject to briefly touch upon before we head into the conceptual theory development of the latter half of this thesis.

With its so recent creation, the accelerator is still without much coverage in the scientific literature. The article by Kim and Wagman (2014) (on portfolio size and information disclosure) appears to be one of the earliest, with the article by Pauwels et al. (2016) being the first to truly introduce the concept in general. A dissertation by Cohen (2013) only just predates these. These three sources provide the basis for this section. Seed-DB, an indexing site for accelerators, currently reports 188 accelerators running worldwide (Seed-DB, 2017). The clear indication is that the vast majority are operated as privately funded initiatives without public subsidy.

The first major difference to incubators is the application procedure and program duration. Accelerators are cohort based, i.e. applicants are accepted in groups, with set duration of typically around three months for the whole program. A "demo-day", a pitch-event with participation from external investors, will often serve as the conclusion. This is in sharp contrast to the upwards of five year stay of startups in some incubators. The accelerator program is highly planned and the ad-hoc nature of incubators is abandoned completely in favor of a consistent output of startups. The focus will also be on slightly more mature companies with a validated value proposition and for some even considerable revenue and funding (Y-Combinator, 2017). The selection process will be highly competitive.

Where incubators will typically rely on rent payments from startups to fund itself, the money flows the other way in an accelerator. Here, an equity stake will be taken in exchange for a lump sum of money and participation in the program. For Y-Combinator, this investment is primarily meant to cover living expenses for the duration of the program and is currently set at 120 000 USD for a 7% equity stake. The equity percentage appears to be rather consistent across different accelerators. The investment is ideally recouped quickly, with the accelerator looking to exit early as the startups move on the secure additional funding based on their progress during the program. Demo-day also plays a key part in this. With the selection process being so intense, the accelerator gets to choose from the most promising startups, where the chance of an early cash-out is most likely and the value loop can be closed at the micro-level. Although calling these startups low hanging fruit in the eyes of the accelerator is perhaps a bit unfair, the business model definitely demands a certain level of apparent quality in the accepted startups for the accelerator as a business to be ultimately viable.

The primary value offered to the startups is essentially the same as found in the incubator. In the accelerator, however, the finite duration of the program focuses the effort immensely and the degree of support is much more intense. The initiatives employed will be proactive and progress is monitored closely, with designated business developers and coaches attached to each startup. Access to a network of investors and partners is another key selling point, where the mere participation in the program opens up a lot of doors. This includes contact to a growing alumni network, which the startups will themselves be a part of later, adding a lasting relationship. The intense coaching and easy access to a wide network is ultimately meant to accelerate the growth of the startups – thus the name.

Having been created by market participants in search of private profits, impact on a macro-scale has unsurprisingly not been a priority to investigate let alone prove. The academic literature is without doubt also quite a long ways of from addressing this aspect. The proliferation of the concept and apparent sustainability of the more than decade old accelerators however speak to the validity of the employed business model. It is clearly possible to create and subsequently capture value at the micro-scale by supporting this selected group of promising startups. The valued offered to external investors lies primarily in the role of the accelerator as a certification of the participating startups (Kim & Wagman, 2014). The incentive structure arising from relying on equity stakes rather than rent income or selling services as in an incubator, even one not getting public funding, is also very different.

> "As a result [of taking an equity stake], the incentives of accelerator directors are often more closely aligned with the ventures than are those of professional incubator managers … Accelerators typically seek growth that leads to a positive exit, while the best outcome for an incubator might be slower growth, which delays graduation and prolongs the venture's tenant status." (Cohen & Hochberg, 2014, p. 11)

But relying on equity and early cash outs as the primary revenue stream naturally puts significant pressure on the selection process and further narrows the field eligible startups considerably. Value creation on the macro-scale is not the focus, and promising only modest, yet stable growth may not be interesting at all. There is also the question of whether the accelerator actually acts as a business developer or more like a startup marketing bureau, polishing the message and brokering the right deals. An effort that may certainly be valuable, but puts is quite far from that of the incubator.

While Y-Combinator can in some sense be seen as a "pure" accelerator fitting the description and characteristics offered until now, the term has, like incubator, been applied to various initiatives far from this "original" meaning. This has for instance led Cohen and Hochberg (2014) to instead call concepts like that employed by Y-Combinator seed accelerators instead.

Pauwels et al. (2016) embrace the heterogeneity and distil three basic types of accelerator based on an investigation of 13 European examples: The deal-flow maker, the ecosystem builder, and the welfare stimulator. The first is what we can regard as the classic Y-Combinator type, where the major focus is building an investment portfolio. The second type, the ecosystem builder, is a corporate initiative where the goal is supporting later stage startups complimenting the business of the funding company. The latter type, the welfare stimulator, relies unlike the others on public funding and we thus again have the market failure rationale as the underlying motive. Pauwels et al. (2016) however do mention that the business model of this type is still being experimented with and some are still relying on the initial funding they acquired to launch the project. Whether the welfare stimulator is a sustainable model is hence still uncertain and will likely have to face the same scrutiny regarding impact as publically funded incubators. The authors close out the article stating what so many researchers on incubators has said before them:

> "Finally, in order to truly gauge the effectiveness of different models there is a need for studies that compare accelerated ventures to a control group of non-accelerated ventures in order to provide robust insights into the contribution of accelerators." (Pauwels, et al., 2016, p. 23)

5.5 INCUBATORS, ACCELERATORS AND WHERE TO GO FROM HERE
This chapter has reviewed a significant portion of the incubator literature in order to assert the state of the art and from this highlight the fundamental issues at stake. What we have is a very active and crowded field of practitioners with a less populated scientific field struggling to keep up. To have practice outrun theory is perhaps not unusual, but the distance between the two in this case has remained wide for decades now. And with the accelerator concept also recently being employed as an answer to the market failure argument, we have yet another support initiative to study. Two primary areas of concern are evident: Impact assessment and continuous improvement of the incubation process.

No one has yet to come up with a method of impact assessment that adequately controls for bias and seeks to address whether the underlying market failure arguments have been satisfied. Many have called for control groups, but so far little success has been achieved. Many have claimed the failure of the market as the reason for public intervention, but none have actually validated how this failure was then mended, if at all. And why are we missing

pieces of the puzzle? Because finding them is exceedingly difficult and requires longitudinal data and sophisticated methodology – to use the words of Udell (1990, p. 113).

Missing this fundamental part makes improving and optimizing the incubation process a challenge of almost equal magnitude as we are essentially forced to implement changes blindly. Relative measurements are possible, but without an absolute indication of goal fulfillment, we could just as likely be heading in the opposite direction of where we actually want to go. And even with such an absolute measurement, we would have a difficult time knowing which adjustments to make to the incubation process in order to reach the desired goal. I believe that both the literature reviewed and the industry sources investigated have indicated the discussed problem areas to indeed exist and that mending them could be incredibly valuable to the field and stand to benefit society as a whole in a broader perspective. And a suggestion for how that may be done is the topic of the last half of this thesis.

6. METHODOLOGY: PART TWO

The main contribution of this thesis will come in the form of a framework for a novel type of incubator developed through a conceptual approach based on the context established in the first half. The work will mainly be guided by the recommendations given by Gilson and Goldberg (2015) on writing conceptual papers, who again rely heavily on the influential paper by Whetten (1989) on much the same subject. The recommendations by Gilson and Goldberg (2015) were published in an editorial in the journal Group & Organization Management, where Gilson is a senior associate editor, which should be a solid indicator of applicability here and general acceptance in the field. The paper by Whetten (1989) was published in the prestigious The Academy of Management Review, which – aside from the paper's many citations – should likewise bode well for its applicability and validity. Detailing what conceptual papers ought to adhere to, Gilson and Goldberg (2015) write:

> "… beyond summarizing recent research, manuscripts should provide an integration of literatures, offer an integrated framework, provide value added, and highlight directions for future inquiry. Papers are not expected to offer empirical data." (Gilson & Goldberg, 2015, p. 127)

The authors describe conceptual pieces as a way to build new insights from existing theories and data by bridging otherwise disparate pieces, even across disciplines, to form a new perspective. As such, like the quote states, new empirical data is usually not considered.

A conceptual approach was chosen for a myriad of reasons. The choice was first and foremost guided by the insistent voices in the incubator literature calling the prevailing work atheoretical, fragmented, anecdotal and suffer from ad hoc research design (Mian, 1997) (Hackett & Dilts, 2004) (Bøllingtoft & Ulhøi, 2005) (Tamásy, 2007) (Bergek & Norrman, 2008) (Albort-Morant & Ribeiro-Soriano, 2016) (Mian, et al., 2016) (Soetanto & Jack, 2016). Hacket and Dilts (2004) write in their well-cited review article:

> "If the area of incubator-incubation research is to advance in a theoretically meaningful manner beyond simple lists of critical success factors, then we must turn our attention from ''what'' are the important factors to ''how'' and ''why'' and ''in what context'' (''who'' ''where'' and ''when'') these factors are interrelated. Finally, the long term viability of incubator-incubation research depends not only on grounding future research in theory and developing new theory, but also on demonstrating why incubators are intrinsically, theoretically compelling." (Hackett & Dilts, 2004, p. 74)

These keywords – what, how, etc. – are also what Whetten (1989) bases his discussion of the conceptual, theory-building approach on. Whetten emphasizes the "why" as the main attribution of a good theory, explaining the relationships found in the data. He further outlines seven, perhaps slightly provocative, key questions on which to judge a conceptual paper:

1. What's new?
   - Does the paper make a significant, value-added contribution to current thinking?
2. So what?
   - Will the theory likely change the practice of organizational science in this area?
3. Why so?
   - Are the underlying logic and supporting evidence compelling?
4. Well done?
   - Do the arguments reflect a broad, current understanding of the subject?

5. Done well?
   - Are the central ideas easily accessed?
6. Why now?
   - Is this topic of contemporary interest to scholars in this area?
7. Who cares?
   - What percentage of academic readers are interested in this topic
     (Adapted from Whetten (1989, pp. 494-495))

But while Whetten see the conceptual paper as inherently one on theory, Gilson and Goldberg (2015) make a distinction between the two, stating that conceptual work does not necessarily need to address all seven questions in detail, but should take a problem focused approach and aim to answer the what's-new-question thoroughly. They specifically state that no new theory on the construct level need to be proposed, but should rather *"…seek to bridge existing theories in interesting ways, link work across disciplines, provide multi-level insights, and broaden the scope of our thinking."* (Gilson & Goldberg, 2015, p. 128).

A few of Whetten's questions have been addressed in the first half of the thesis. It should by now be clear that the topic of impact assessment is of significant importance within the incubator field and yet one that is still unresolved, ensuring contemporary relevance. The same goes for the related topic of benchmarking and process improvement of these support initiatives. Thus, question six and seven should be answered. Whether the work is done well, question five, is one best addressed by the reader, but the issue of whether it was well done, question four, should hopefully be covered by the extensive literature review conducted already, along with the content in the following chapters. Question three, on the underlying logic and evidence, also rely highly on these points and is partly the reason for including more fundamental issues, such as economic growth and entrepreneurship, in the first half. The proposed framework developed through this conceptual approach will be the "significant, value-added contribution to current thinking" that is the focus of question one and will entail changes to the practice of science in the field, the focus on question two.

As stated in the beginning, the framework will be for a novel type of incubator and thus be prescriptive, rather than descriptive, in nature. In his well-cited paper, Tsang (1997) discuss the dichotomy between the two in relation to organizational learning, making it particular relevant here, as that field of research will play a part in the framework. Prescriptive research is that which attempts to provide guidelines, adopting at times an outright "how-to" style of writing, in an effort to offer clear value to practitioners. But unfortunately, Tsang (1997) argues, the suggestions put forth are often made with little empirical evidence to back them up, sometimes even relying exclusively on personal experience. At the other end, we have descriptive research, which – at you would expect – focuses on detailing the observations made using sound empirical data, rather than necessarily deriving anything actionable, making impact on real world practice unlikely. Of course, the obvious solution is to base the guidelines on sound empirical data, but as the first half of this thesis has shown, the real world is really difficult to shove into neatly arranged boxes, from which we can derive insights worth sharing. Tsang advocates starting from the descriptive end of the spectrum, slowing walking towards the middle, so as to have a stable foundation of empirical data to work from. This figurative walk is what the first half has been about, and thus I believe the suggestions made in the following chapters should stay clear of the pitfalls facing prescriptive research as cautioned by Tsang (1997), instead drawing prescriptive implications from already existing data as he suggests. This again brings us full circle back to the conceptual approach and how such exactly relies on the existing to create new connections, which at the same time acts as a response to the criticism of the existing research in the field of incubators as atheoretical and anecdotal.

The obvious alternative to a conceptual approach focused on already available empirical data would be to actually do some form of new empirical work and from that derive a prescriptive framework. This could for instance be through the method of action research (Brydon-Miller,

et al., 2003), a form of research where knowledge is co-created with and within the community of which it is to be applied. In this particular case, it could have been done by collaborating with a specific incubator, working on issues experienced in their work and tackling the problem of impact assessment directly as they perceived it. The resulting suggestions could as a result be prescribed directly to a known context and thus essentially be guaranteed to have practical relevance.

While certainly valid on its own, such an approach would however face the exact same criticism that previous work on incubators has, namely that of being anecdotal and atheoretical. It would risk being yet another fragment in the already fragmented field, rather than an effort towards achieving the needed consolidation and synthesis. It would implicitly recognize the heterogeneity of the field, but by getting so specific that general relevance would be questionable. Had the subject been chosen as the result of a concrete case proposal from an incubator, then action research could perhaps have been a fitting choice.

Even with a good argument for employing an action research methodology, actually finding an incubator to work with would have been quite a challenge. The one run by the university as part of the AAU Startup Program would have been the most obvious candidate, but that is at such an early stage so as to be highly unlikely to reveal valuable insights just yet. That I can confidently say based on the case study I conducted in the previous semester. Without resorting to options with significant logistical challenges, the number of potential candidates is close to zero. The search for practitioner input, as mentioned in chapter one on methodology for the first half of the thesis, likewise did not indicate significant interest in collaboration of this sort. As such, the arguments for using an action research approach, or similar form involving co-creation, are difficult to spot.

But a conceptual approach does not completely rule out exclusion of newly collected data. Whetten (1989) maintain a need for peer input in the process, and this was acquired through email correspondence and interviews at multiple points along the way. The peers were:

- Email correspondence
    - Carl Josefsson – Business Coach at Chalmers Ventures' Startup Camp
    - Arne Vesterdal – CEO at INCUBA
    - Kara Cronin – Partnerships account coordinator at MassChallenge Boston
- Interviews
    - Morten Dahlgaard – head of entrepreneurship at AAU Innovation and in charge of the AAU Startup Program
    - Kristian Brøndum – Teacher and manager at the New Venture Creation semester at AAU
    - Søren Damgaard – Director of Innovation at AAU

More incubators (mainly Danish ones) were approached for email correspondence, but the reply rate was rather abysmal. Contact with Y-Combinator was attempted. For the interviews, an interview guide was prepared, although the conversation was allowed to stray from it as needed. The duration was about one hour for each. Additionally, a status presentation made as part of the Entrepreneurial Engineering program was used to gain feedback.

Hence, the framework you will see developed in the next few chapters were hence not done completely on literature alone and the recommendation by Whetten (1989) was followed. Some will perhaps feel inclined to criticize an approach so reliant on literature as not connected to reality. But that would be to likewise say that the literature is neither and such would perhaps be a bit too dramatic. I will address the topic of applicability and testing again later when we get to the discussion on limitations of the framework, but for now I consider this discussion of the employed methodology sufficiently detailed.

7. THE PATH TO A NEW INCUBATOR

As stated at the end of chapter 5, for the field of incubator research two primary areas of concern are evident: Impact assessment and continuous improvement of the incubation process. It is these two areas the proposed framework will address and in this chapter I will slowly, bit by bit, develop the arguments and reasoning on which it is formed in order to arrive at a clear description of The Learning Incubator.

The choice to stick with the incubator term rather than accelerator or something completely new deserves a few words. Despite its origin in the private market, the incubator has for the most part, and certainly within the last twenty years, mostly been used as a policy instrument meant to address the market failure argument. Since this too is at the core of the proposed framework, sticking to the incubator term makes the most sense and highlights its origin.

7.1 CHANGE PROCESSES AND SIGNALS

First we must understand that these two areas of concern are intrinsically linked. Without knowing the impact of the incubator, we have no way of improving the incubation process and advance our goal of addressing the underlying market failure argument that justifies public intervention. And without distinct change processes to understand and adjust the incubation process, knowledge of the impact will have little value. Only in an imagined case of impact exactly as we want it and an incubator clearly addressing the market failure argument, could we perhaps do without the change process. But it any real world case, impact assessment without change is a lost opportunity.
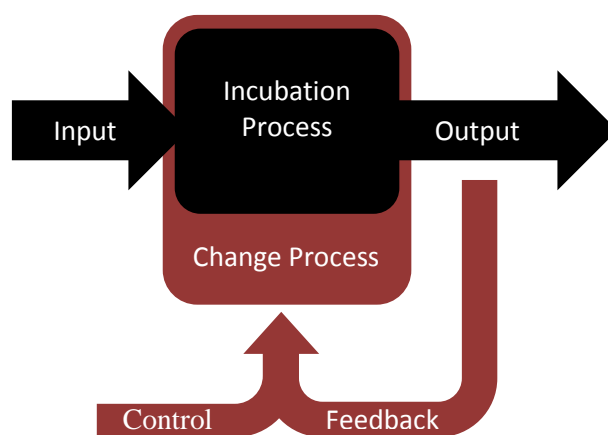

Figure 9 - Incubation and Change processes

Figure 9 illustrates these two areas as they appear in relation to the incubation process in the framework, where we have an input, prospective startups, and an output, incubated startups. Here, the feedback signal comprises metrics on startups completing the program and the control signal comprises metrics on startups in a control group not in the program. Combining these two signals gives us an absolute, rather than relative, bias-free measurement of the output of the incubator. This measurement is then fed to the change process, which has deliberately been drawn to encapsulate the incubation process and thus indicate their hierarchy. By doing so the figure hints at a key idea of the framework: It is all about *learning how to* incubate successful startups. And that requires frequent changes to the incubation process, which must hence by malleable and not the foundation that we stand upon. Arguments for this arrangement will follow. From the outset we recognize that we do not accurately know how to consistently incubate successful startups, but that it is something we can learn by changing the incubation process in response to the right signal.

At their essence, we see successful startups as creators of value, through which they contribute to that economic growth we saw entrepreneurship linked to so many chapters ago.

What we really want our signal to be is some measure of the value produced by both the incubated and non-incubated startups. Then, knowing the amount of value, i.e. resources, fed to the incubator, we can make a calculation of how much it cost us to "boost" the incubated ventures relative to their non-incubated counterparts. Figure 10 depicts the situation, where the incubator is such a "Value multiplier" and the larger arrow representing incubated startups shows their increased value output.
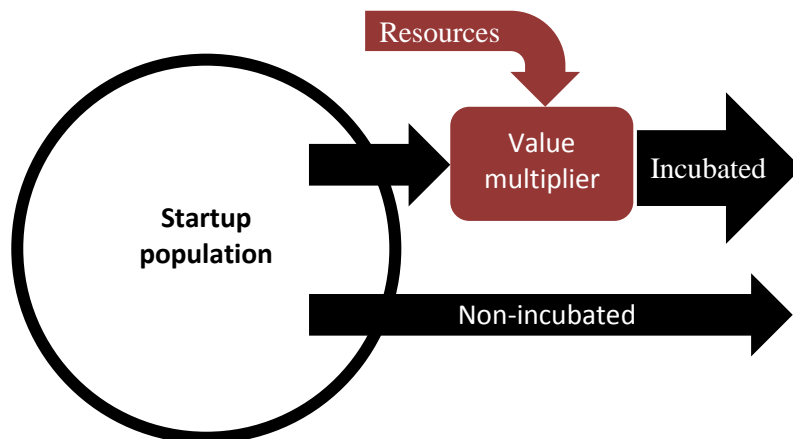

Figure 10 - The incubator as a value multiplier

Unsurprisingly, we want the incubated startups to do better than their non-incubated counterparts in the control group. We also want the relative difference between the two groups to compare favorably with the amount of resources we spend on running the incubator. Accounting for community effects not directly part of the incubated startups, we get this simple relationship:

$$Value\ ratio = \frac{Output}{Input} = \frac{(Incubated - NonIncubated) + Community\ effects}{Resources} > 1$$

For the resources to be well spent, we want the value ratio to be more than one and thus essentially represent a positive return on our collective investment in the publically funded support initiative. Resources acquired in addition to the public funds can be excluded from the relationship above as long as the public funds remain essential to the survival of the incubator. If the incubator can survive without public funds, yet receives such anyhow, then we must consider the output with and without this source of income. The difference in output must then again compare favorably to the resources we spend supporting it. As such a case complicates an already highly involved task of measuring value, it will not be addressed further and thus the framework considers the incubator to be reliant on public funding for initial creation and survival.

Missing from the ratio is any direct value capture from the incubated startups, e.g. through acquiring equity or collecting rents. Doing so is not entirely at odds with the framework proposed, but it is a potential source of issues related to the underlying market failure argument. We are trying to mend the problem of lacking value capture at the micro-level when supporting entrepreneurship, by relying on a funding aggregator able to capture the produced value at the macro-level. By incorporating mechanisms for value capture at the micro-level in a publically funded incubator, we risk displacing, through unfair competition, private actors offering similar services (OECD, 1999). We can envision a spectrum of startups, where the one extreme produces no micro-level value and the other extreme produces lots. At some point across this spectrum, startups produce just enough micro-level value for a private actor offering support to sustain itself by targeting this group. This is the crossover line in Figure 11 and the one that we do not wish our publically funded support initiative to encroach on. On this basis, I argue against collecting rent or charging for the provided services (notably in

opposition to that recommended by the European Commission (2002)), instead positioning the proposed framework firmly as one addressing the far left-hand side of Figure 11. That said there may be reasons other than direct value capture for charging fees or taking equity in the incubated startups. If for instance the management team finds that a lesson on selling equity and raising funding is best given by actually going through the process, then doing so can be completely valid. Sources of direct value capture from the startups will however remain absent from the value ratio, so as to not incentivize such for the purpose of boosting it.
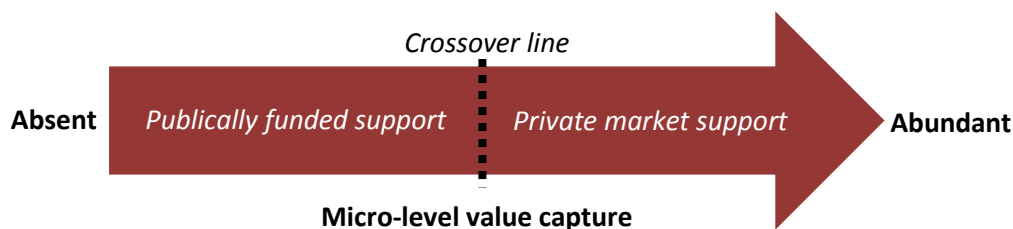

Figure 11 - Spectrum of startups and possible micro-level value capture

To account for effects not directly attributable to value created by the incubated startups, community effects have been included in the ratio. This will likely include the economic activity of the incubator itself and its staff, any outsourced support initiatives (e.g. accounting) and possibly consulting services sold by the incubator (to external customers) based on its acquired knowledge on startups. It may also include branding activities in regards to the region where the initiative takes place.

To not punish the incubator management for letting an underperforming startup fail, the value ratio shall only compare an equal number of non-incubated startups to those that actually graduate from the incubator. As Hackett and Dilts (2004) emphasize, we do not want zombie-companies and letting a startup fail quickly can minimize losses, while its founders go on to create value elsewhere. This way, the freed resources otherwise spent on this one failing startup can go towards those remaining holding greater promise.

A significant chunk of the resources required by the incubator will be spent on activities related to the change process and collecting data to determine the value ratio. We can imagine an incubator strictly focused on replication of a validated incubation process not needing these two aspects and as a result stand to achieve a higher value ratio despite not doing anything novel. To account for this, we can calculate an additional value ratio, a truncated value ratio, where only the resources directly spent on the incubation process is considered. This should likewise give a clearer image of the progress made towards learning what we are after – how to incubate successful startups – as varying expenses related only to the learning process, not the state of our learning, can be factored out for better understanding. It will depend on the funding aggregator to what extent it is necessary to reach a ratio above one with both the full and truncated value ratio.

Over time, as the change process responds to the calculated value ratio and adjusts the incubation process accordingly, we should in an ideal world see it increase (Figure 12). This can essentially be interpreted as an increase to productivity. We are learning what works and what does not, incubating more successful startups for fewer resources.
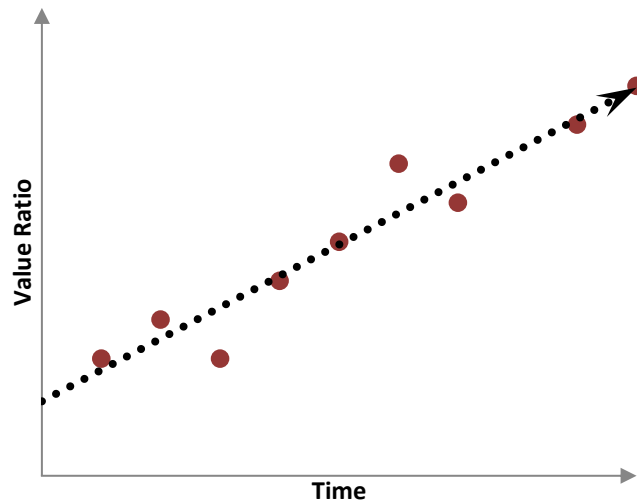
Figure 12 - Idealized incubator performance increase over time

By putting the incubated startups in relation to their non-incubated counterparts and the resources spent, we likewise get a chance to evaluate how many resources ought to be relegated to such a support initiative. An incubator not relating its impact on the incubated startups to a control group would miss the opportunity to find such an optimum level of public spending. Consider the three cases in Figure 13. In a "Spend more, get more" scenario, we would expect economies of scale to kick in and reward increased spending. For a "Get what you spend" scenario, the value ratio would be constant, making low and high spending equally valid. In the third scenario – "Optimum spending" – we have both economies and diseconomies of scale, with an ideal spending level in between them. Note the difference between the units on the x-axis in Figure 12 and Figure 13 (time versus resources spent). And where Figure 12 represents increasing productivity largely internal to the incubator, Figure 13 represents the influence of mostly external factors.
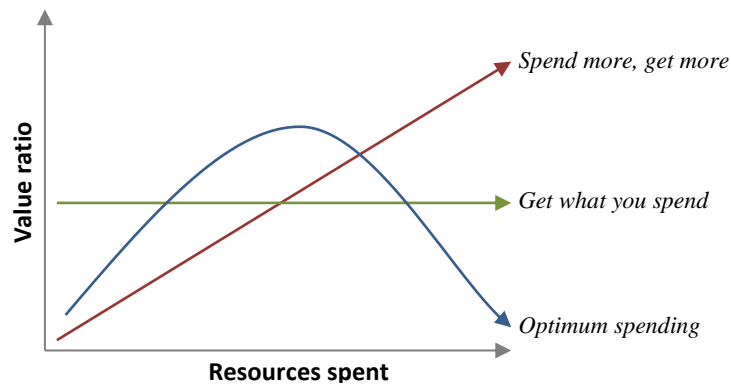

Figure 13 - Resources spent versus performance

While an incubator without a control group could likewise compare its output to the resources spent, the impact reported could be questioned easily by simply claiming that the incubated ventures would have done just as well without the incubator. This is the argument made by Udell (1990) we discussed in chapter 5. By having a control group we attempt to correct for bias in order to extract a more truthful measurement of impact. It also has the effect of incentivizing incubation of startups that benefit the most from it. Startups does equally well without the incubator, e.g. because there are private initiatives ready to assist them or which the incubator stand to offer little value, will automatically produce a lower value ratio, since the difference between incubated and non-incubated startups shrinks as a result. It also means that changes to the surrounding ecosystem that lowers barriers to entry for startups could erode the underlying market failure argument and make the incubator obsolete. It would basically become so difficult to add meaningful value to the incubated startups that they could

not simply get in the private market and hence the difference between them and the non-incubated startups would disappear. Our initial problem of market failure would essentially be solved. Figure 14 illustrates this difference between incubated and non-incubated startups as the incubation process takes place, where we can envision the possible boost-effect attributed to the incubator reduced by better and better performing non-incubated startups. The same mechanism would also work at making the incubator focus its efforts towards the startup development stage on which they could exact the greatest influence and is equally a mechanism to address the issue of gazelle versus muppets discussed in-depth earlier (chapter 3). That is not to say that the incubator will only produce gazelles, however, but that we in an ideal world expect it to gravitate towards incubating the section of that spectrum, where the greatest difference can be made.
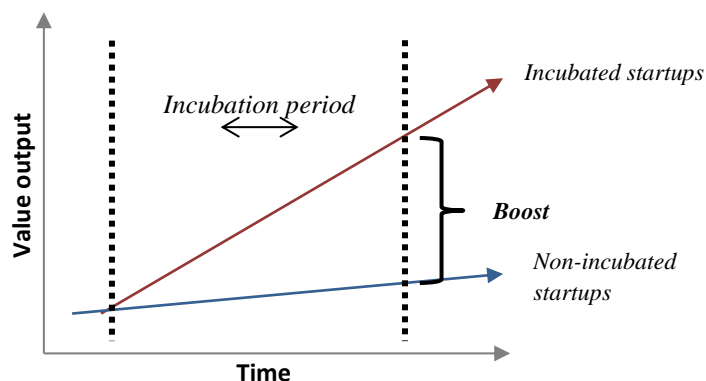

Figure 14 - Value boost versus time

But this scenario of a fading market failure argument is hypothetical to say the least, especially since we are still dealing with rather vague terms here. What we have discussed so far are idealized scenarios and there has yet to be put more concrete details behind them. These will follow in the next sections. As mentioned earlier, the framework will concentrate on the change process and the signals driving it, and only cover the content of the incubation process briefly. Since it is destined to change and inspiration for a decent starting point is readily available in both literature and from practitioners, I will let it be up to incubator managers inspired by the framework to fill in the blanks in this specific area themselves. What exactly this entails will be covered.

In the following I will describe what exactly the changes process and the signals constitutes – starting with the latter.

7.2 SIGNALS – DEFINING VALUE

Until now the notion of "value" has been left without a definition, leaving it up to you, the reader, to determine the meaning. For many, such likely happens automatically. It is not that difficult on a personal level to, superficially at least, judge what is valuable and what is not. That which we regard as desirable holds value and is thus valuable. It all seems simple enough! But of course it is not. The fact that there exists a "Handbook of Value" (Brosch & Sander, 2015) to name just one example clearly indicates a much more complicated issue, evident as we dig deeper into the many possible meanings available to as many individuals. For the purpose of the framework, however, we do not need to indulge in a greater philosophical discussion, so much of it can fortunately be skipped. We do however need to form some sort of consensus of what exactly it means for a company to produce value if we are to have any hope of measuring it.

Following the definition by Davidsson (2016), entrepreneurship is restricted to the market process and thus thinking of value as strictly monetary is straightforward. But as he and also Baumol (1990) discussed, monetary value can at times be produced through activities which we may not deem valuable in a broader perspective and thus our frame of reference matters a

great deal. This is the purpose of Davidsson's two levels of value creation, the micro-level and the macro-level previously discussed, and having them both in mind is exceedingly important if an incubator wants to produce meaningful value for an aggregator. We essentially want companies, or more specifically the startups housed by the incubator, to produce value which leaves everyone, not just themselves, better off. We want a value surplus at the macro-level.

This points to a quality aspect of value, where some forms are better than others. We are only interested in micro-level value to the extent that it represents value creation at a macro-level. In this view, the quality of the value is proportional to its level. Higher quality, higher level. For the aggregator the business case is rather clear: Only that value it stands to capture is it meaningful to support the creation of. If an incubator primarily supported by a regional government incubates startups with a majority of their business taking place in a different region, then that government, or aggregator, unsurprisingly stand to capture very little of the produced value, regardless of how effective the incubation process may be.

Recall the discussion of the value loop portrayed in Figure 4 (page 15). As the financier of the incubator, the aggregator will want the impact of the incubator quantified in the same units as that which the incubator is funded by. If the incubator runs on positive thoughts and rainbows, we would want to quantify its value output in the same units. Now, while positive thoughts and rainbows can indeed get us far, money is what allows us to establish and run an incubator. Consequently, we need to quantify the impact of the incubator in terms of increased tax revenue, decreased welfare spending and other avenues for value capture available to the aggregator. Thus, in the context of an incubator funded by an aggregator (national or regional government, etc.), an incubated startup produces value when such activity leads to a greater degree of value capture at the macro-level. And the incubator is justified when the incubated startups produce sufficiently more value than their non-incubated counterparts to, along with any community effects not directly attached to the incubated startups, recoup the initial funding given. This is our definition of value. Successful startups, another term so far not defined, are then startups creating enough value for themselves and their immediate stakeholders at the micro-level to remain sustainable and produce value for the aggregator at a macro-level. As stated before, we are only interested in micro-level value to the extent that it represents an opportunity for value capture by the aggregator at the macro-level.

The above may seem overly prohibitive, but remember – we are trying to address the market failure argument, not support entrepreneurs blindly. Per the OECD (1999) report quoted so many pages ago, this argument must have a prominent position when public financing is involved. Startups with a clear emphasis on micro-level value creation will be supported by private initiatives, like privately funded accelerators, who themselves are looking to close a value loop. Only by concentrating on the macro-level and the opportunities for value capture by the aggregator can we effectively address the market failure argument and mend its consequences for our society.

7.3 SIGNALS – HOW TO MEASURE VALUE

Measuring the value created by the incubator – through the incubated startups and community effects – then amounts to quantifying the impact on the aggregator. Above I mentioned increased tax revenue and decreased welfare spending, but the specifics will depend on the aggregator. A national government stands to capture value from different sources compared to a local one and again completely different from something like the EU. This makes it difficult to designate appropriate metrics without a known aggregator and a specific context.

Even given an aggregator and a context, numerous issues are still ahead of us. As discussed earlier – and illustrated by Figure 12 – measuring the value created by the incubator is not only about justifying the level of funding, but just as much about having a metric for the management team to rely upon, as they work to improve the incubation process. That is, we

need it as the input to the change process. This dual purpose presents a problem – time. Like we saw Smilor (1987) argue back in chapter 5, strong economic effects from an incubator can take many years to manifests themselves, and others have even found reason to believe indirect effects of entrepreneurship can be temporarily negative (Carree & Thurik, 2010) (Baptista & Preto, 2011). When dealing with value capture by an aggregator, we can hence expect a significant time delay between value creation at the micro-level and when it finally shows up at the macro-level. Value is affected by propagation delay. Figure 15 illustrates another effect – maturing startups.
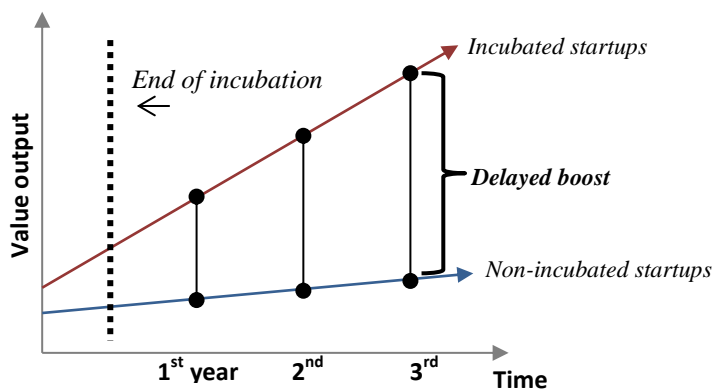

Figure 15 - Post-incubation effects

Simply comparing the incubated startups versus their non-incubated counterparts at the end of the incubation period will be insufficient to capture the full effect of the incubator – or so should we hope. The ideal incubation process should have a lasting effect on the participating startups and thus the value created by the incubator will also in this regard be subject to a significant delay. The value ratio for a given year of incubator operation will likewise be dynamic, changing in response to how the graduated startups fare against the control group as the years go by. Such a difference is also cumulative. If the incubated startups consistently employ more people, then that additional tax revenue slowly accumulates.

Let us imagine an incubator introducing a series of lectures on marketing for the housed startups, as the management team hypothesizes that such stand to increase their ability to market themselves and thus ultimately result in more value being created. If the management has to wait three years to see the effect, then this will naturally impede learning immensely, if not make it outright impossible. It will be like driving around with a ten second delay between turning the steering wheel and the car responding. Getting to where you want to go will be quite a challenge. And this assumes we can actually find the correlation. Figure 16 combines Davidsson's (2016) two value-levels with this time aspect to produce four categories of effects.
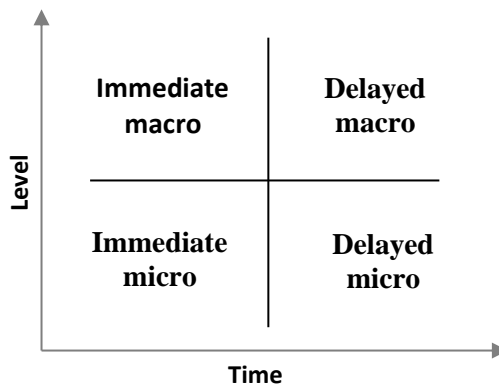

Figure 16 - Time versus level in relation to value

In the category of immediate micro we for instance find the effects of the imagined marketing lectures. The gained knowledge could be evident in a business plan that results in a startup securing funding from an investor. Continuing on to the category of delayed micro, the

investment could be a key ingredient in a later expansion, hiring additional people, etc. Immediate effects at the macro-level could be publicity attracting further interest in the incubator, perhaps additional funding from other stakeholders. And finally, in the delayed macro category we could find spinoff companies, products and so on, everything indicating increased tax revenue.

Of course, simple marketing lectures are unlikely to have these effects on their own, the imagined case is purely for illustration. It does however show how long the path from day-to-day operations to macro-level impact may be. The management team at the incubator may hypothesize that these lectures can increase the quality of the produced business plans, which they again hypothesize can increase the likelihood of acquiring additional funding. This then relies on the hypothesis that raising additional funding will let them produce more value at the micro-level, which the last hypothesis connects with additional value capture at the macro-level. We are relying on not just one, but a whole group of hypotheses being correct for the initial initiative, the marketing lectures, to be worthwhile. And even if they were all correct, it would be impossible to correlate some subjective increase in the quality of a business plan to additional tax revenue for the aggregator available at a later date. What we want to ultimately affect and what we can use as input in the change process are at opposite ends – and literally in Figure 16. There is no solution to this issue. The incubator needs to address many different levels of hypotheses simultaneously to be effective at learning how to incubate successful startups.

Directly correlating changes at the immediate micro-level to the delayed macro-level is not feasible and should not be how the incubator calculates a value ratio. The value ratio should only be calculated using data related to verifiable value capture by the aggregator, quantifiable in monetary units. The value ratio is unit-less and thus the denominator and numerator must have the same units. As we quantify the input – the resources spent on and by the incubator – in monetary units, so must the output – the value captured by the aggregator. For the management team at the incubator, the challenge is to quantify all possible ways the aggregator stands to capture value from its impact. And naturally do so in a convincing and consistent manner, where the link between the two is not strained. Linking tax payments as they appear in the annual financial records for a given startup to value capture by the aggregator is straightforward. Trying to quantify the startup's impact on the local economy and how such may have led to increased employment and subsequently tax revenue from salaries is much more involved. A method akin to that used by the European Commission (2002) may be appropriate. One important caveat is that all data directly tied to the incubated startups, must also be available for the non-incubated startups. We cannot attribute a source of macro-level value to the incubated startups, if we do not know how the incubator affected it. This is the argument from earlier. We can imagine data to be less accessible in the non-incubated startups and hence limit the number of sources used. Yet, I hold that any measurement of impact is meaningless if the effect of the incubator cannot be isolated. The issue of data access will be addressed again later.

In general, quantifying supply side effects of entrepreneurship (Fritsch, 2008) and by extension the incubator is bound to be difficult, but they are also those an aggregator excels at capturing value from. Characterizing and quantifying these sources is thus of great importance for the specific incubator in relation to its unique aggregator and local ecosystem.

It does not get easier as we try to quantify the value created at the immediate micro-level. Since the startups may very likely be at a stage where they are yet to turn a profit or have revenue of any kind, it is not feasible to merely rely on that which can be measured in monetary units. Finding trustworthy metrics available at the early stages of a startup's development that are somehow an indication of their later level of success is the holy grail for any venture capitalist. It is also, as discussed in an earlier chapter, an immensely difficult task to find such metrics. Learning how to incubate successful startups entails this element of

searching for reliable metrics to feed the change process. Having the value ratio as an indicator of value created (and captured) at the macro-level should hopefully allow the aforementioned hypotheses to be validated over time and act to equally validate the metrics used at the micro-level in day-to-day activities at the incubator.

But the management team at the incubator of course needs something to begin their learning process with. In my work talking to incubator managers and others involved with supporting entrepreneurship, a reoccurring metric has been that of customer interaction, specifically the number of them. The work of Blank (2003) and Ries (2011) have evidently resonated quite a bit in the field, and the intense focus on customer and market validation by these authors has had its effect. And for good reason – research appears to indicate the soundness of their recommendations (Frederiksen & Brem, 2017). In some cases, startups are required to have a certain minimum number of customer interactions per week, while in others it is used as an overall indicator of activity. Ries' (2011) "build-measure-learn" loop may also be of interest. Here, a suitable indicator of progress can be the number of these loops completed, essentially representing learning by the startups. These types of metrics, customer interactions and the like, will depend on the startup methodology employed by the management team and must hence be decided upon after such has been chosen. This is also very much an argument for making it an explicit choice, bringing it out into the open to be evaluated like everything else.

For something rooted in the scientific literature, yet with a focus on practice, the assessment model by Davidsson and Klofsten (2003) is an option. Titled "The Business Platform", the model characterizes the startups along eight dimensions – the product, the market, the organization, core group expertise, core group drive/motivation, customer relations, and other relations – and uses a series of questions for the involved entrepreneurs to measure how far the startup has developed. This operationalization of the dimensions are also empirically tested by Davidsson and Klofsten and found to have high reliability. The authors specifically suggests its use by managers and business consultants, making it quite fitting for an incubator. As a way to gauge development throughout the incubation process, the startups could complete the model at the beginning, halfway through and again at the end to show how far they have progressed. It is a suitable starting point for measuring value creation at the micro scale and interested incubator managers should likewise look at Klofsten's previous work with the model.

Of course, to the extent they are available, metrics of the monetary kind should be collected. R&D costs will likely always be available, while revenue, profit, funding raised, employment, growth (profit, revenue, employment), etc. may not always be. Noting absence of meaningful figures here will also be data points.

We can group all the above metrics under the headline of "progress". We expect them to change, largely in response to the startup taking part in the incubation process. But static characteristics of the startups and the entrepreneurs in them may be valuable too. For the startups it could be industry, team size, market (B2B or B2C), initial business model, reliance on partnerships, intellectual property, etc. Characteristics on the entrepreneurs could be previous startup-experience, age, gender, educational background, professional background, entrepreneurs in the immediate family, marital status, and so on. Collecting this data stands to add additional knowledge about the incubation process and how different startups and entrepreneurs respond to it. This latter data on the entrepreneurs themselves harkens all the way back to our discussion of nature versus nurture in chapter 4. To the extent that it is feasible, similar data should be collected for the non-incubated startups and the associated entrepreneurs. It is important to note here that I am not advocating the selection of startups based on these characteristics, but exclusively see them used to extract insights during and after the incubation process.

In overview we have two categories of metrics: Delayed macro-level and immediate micro-level (Figure 16). And these come with associated tasks for the incubator to complete.

Metrics related to the delay macro-level must be chosen in accordance with the specific aggregator in mind and what it stands to capture value from. The most important source is that related directly to the incubated startups and their non-incubated counterparts. How their value creation at the micro-level stand to impact the aggregator at the macro-level must be mapped and ways to characterize and reliably quantify these must be found. This work should include consideration of supply side effects (Fritsch, 2008). That done, effects attributable to the incubator, but not directly dependent on the startups, should be mapped in a similar way. The data these metrics produce, along with the resources spent by the incubator, are then used to calculate the value ratio at set intervals. Maximizing this is a key objective.

Metrics for the immediate micro-level should first and foremost be derived from the employed startup methodology. If it has not been chosen explicitly, then such must be done beforehand. The Business Platform by Davidsson and Klofsten (2003) can be used in addition. Along with data on the financial performance of the startups, these metrics are monitored regularly and used to guide the incubation process. During the selection process, data on the startups and entrepreneurs should be collected and used for later evaluation. Rather collect too much, than too little data. As time goes by and startups are incubated, the relationship between metrics on the immediate micro-level and delayed macro level should receive considerable attention as the incubator tries to maximize the value ratio.

These two elements, or categories of metrics, and the associated value ratio make up the signal fed to the change process and is what the management team shall base the incubation process and its development on. Of the four categories depicted in Figure 16, the immediate macro- and delayed micro-levels have not been addressed. Not because they are useless, but because they are for the purpose here secondary. It should be clear that there is a lot of work to be done on just collecting valid metrics for the two included categories and including the remaining two would likely not add significant insights yet.

7.4 SIGNALS – CREATING THE CONTROL GROUP

Before we get to that important change process, we will first look at exactly how the control group of non-incubated startups so important to the framework is created.

I have previously spoken to the importance of a control group of non-incubated startups to gauge the impact of the incubator and critiqued the literature for not adequately addressing the significant issue of bias in impact studies. Only recently have the criticism by Udell (1990) published so many years ago been answered by Schwartz (2013) and Stokan et al. (2015) and that still with significant weaknesses to the control variables used. Tamásy (2007) sum up the reason for using control groups in her article, also addressing the issue of selecting them:

> "The control-group concept compares characteristics from a group of firms or regions taking advantage of business incubators and a control group not utilising business incubator facilities (cross-sectional analysis). In accord with the strict standards of actual experiments, both groups have to be selected based on chance. In quasi-experimental cases a nonequivalent control group is selected, which is seen as comparable to the experimental group based on set criteria. The actual difficulty lies in the selection of the control group." (Tamásy, 2007, pp. 461-462)

This difficulty of selecting a control group has likewise been mentioned by the OECD (1999) and again by Hackett and Dilts (2004) in their extensive literature review. Stokan et al. (2015) acknowledge their method in only quasi-experimental, stating that is it both ethically

challenging and practically difficult to assign startups to an incubator based on random chance. And of course simply picking newly founded ventures out of the population based on chance and forcing them to be part of an incubation process is completely unreasonable. This also highlights the effect of self-selection (Colombo & Delmastro, 2002). We have more than just two groups – the incubated startups and the rejected applicants – we also have all those startups that did not apply for a spot in the incubator, and their reasons for not applying actually produce a whole slew of groups. Some may not be aware of the incubator's existence, some may consider themselves overqualified, underqualified or simply not just in the target segment. The application process may also create different groups of rejected applicants if it is a multistage exercise, which evidence suggests it is for the most part. So who exactly are we supposed to compare the incubated startups to? Clearly, there is no other group like them.

> "Measuring the impact of a business incubator on a firm's growth pattern is complicated by the fact that there is an inherent selection bias: Firms choose to enter or not enter an incubator, and an incubator manager chooses to offer or not offer a firm the opportunity to locate within the incubator. Furthermore, incubator managers have an incentive to accept the firms that they believe are most likely to succeed." (Stokan, et al., 2015, p. 320)

We need to remove choice from the process, deliberate choice at least. I propose, as part of the framework, a final selection stage relying on random chance.

The incubator shall be cohort-based. That is, taking in new startups in groups, conducting the incubation process, graduating the whole group and evaluating the outcome before a new cycle takes place. This is akin to an accelerator. The application process shall have a final stage, where the accepted startups are chosen at random, creating one group of incubated startups and one group of rejected non-incubated startups – our control group. At this final selection stage, the startups must be equally qualified for acceptance into the incubator and the quantity must be twice that of which the incubator wants to accept. If for instance the goal is to accept 20 startups, then 40 should be available at the time of random selection. The demand for a roughly equally qualified group at this last stage puts pressure on the selection process as a whole and the ability of the incubator to attract a large number of applicants. The startups in the control group will not be allowed to reapply in the next cycle, unless it is with a new venture idea, meaning they failed with their previous one. They are simply too valuable as still non-incubated startups to let them reapply.

I propose this based on the still largely unanswered criticism by scholars regarding bias and lacking legitimacy of current impact studies. It is essentially doing, what have previously been hinted at, but not implemented due to seemingly insurmountable challenges. By incorporating the element of randomness at the final stage, we ensure that all startups in the two groups have been judged to be equally qualified, promising and capable of completing the incubation process. This also allows the incubator to collect data on all applicants. Like the previous section on value measurements made clear, having a control group is an integrated element of the framework.

Having been rejected and thus not eligible to receive any kind of support from the incubator, the control group may appear to have little incentive to actually play the role accordingly and as a result refuse to share any data. Some data will be publically available regardless and from it a lot can be gained, but the valuable, qualitative insights that require actual contact would be lost. This not acceptable and hence something to keep the control group attached to the incubator is needed, yet it cannot be so significant that it jeopardizes their unique role. It is clearly a balance and it may take some trial and error to find the right setup. The control group will anyhow be subject to the community effects of the incubator, so these startups will see some minor influence.

One option would be to do like many accelerators and have a demo-day at the end of the incubation period (see 5.4 on accelerators, page 27), and invite the control group startups as well. This would at least give them the motivation to stay cooperative till such a point and likely buy some goodwill for later data exchange too. The incubator must of course do their utmost to handle the collected information with care and confidentiality, anonymizing it when needed. Sustaining an alumni network for both groups of startups will also be valuable.

A fair criticism of the proposed selection process is that regarding the low number of startups in each group. The statistical significance is certainly limited, if there at all. Stokan et al. (2015) and Schwartz (2013) both use around 600-700 startups in their research (also with a 50/50 split), dwarfing any quantity a single incubator could produce in a reasonable timeframe. There is a risk – from the perspective of the incubator – that a non-incubated startup becomes a huge success, outgrowing the rest of the control group completely, and ruining any chance of the incubator showing a net impact with the value ratio. Outliers of both groups could be discarded, but this would reduce the already small number of data points. It is a great weakness, but not one so significant as to outweigh the unique advantages discussed. The ideal would of course be to have many incubators and accelerators employ a random selection stage in their application processes to increase the amount of data substantially for doing a larger scale analysis. But that will remain an ideal for now. Even in a case with just a single incubator using random selection, the data would be novel and at least in case study form likely worthy of publication.

I realize the idea is not uncontroversial. Authors discussing the option of creating control groups have expressed concern regarding the ethics. I hold that as long as all potential applicants are made aware before applying that there is a stage of random selection, then these issues are largely avoided. No one is receiving a placebo treatment. The reason for creating a control group is to better understand the relationship between input and output, the resources spent versus the impact made. Doing so will put more pressure on the management team to perform and get the most out of the startups – this is unavoidable. It does however also represent an opportunity to save time and effort on the selection process. Some evidence, anecdotal granted, suggests that the quantity of applicants often far outnumber the spots available and the high quality towards the end of the selection process makes it difficult to choose those finally accepted. A random selection stage can aid in this regard.

Speaking of the selection process, all applicants rejected along the way must be registered and their data kept for later use. If possible, follow ups should be done with them as they will be with the control groups. These non-randomly rejected startups essentially constitute a secondary tier of control groups, where valuable data can be acquired. If nothing else, then for research. Many scholars have suggested this source of data be used, but always had trouble finding incubators who actually kept the records. If resources can be allocated to do so, then it may also be valuable to record data on the general startup population in the area as a way to gain insight into what makes startups seek (and not seek) incubation.

I believe that there has been amble evidence presented here to warrant using random choice as the final stage in the selection process. While certainly not perfect, drawbacks have been discussed, it is a move towards the goal of better impact assessment. The topic of statistical significance will be dealt with again later.

7.5 CHANGE PROCESSES – INTRODUCING ORGANIZATIONAL LEARNING

The previous sections have covered the signals we feed the change processes, and detailed the large amounts of data we need to collect and the difficulty of doing so. Implementing it, putting it to actual use and justifying the work and expense of collecting it, is no easy feat either. In fact, it may even be the biggest challenge of the two considering the current state of affairs.

As argued earlier, only in the highly unlikely case of perfect signals, i.e. we measure exactly the impact we want, would distinct chance processes perhaps be questionable. In any other case, we want to actually take action based on what we find. Taking the lead suggested by Hackett and Dilts (2004), I will introduce the research field and practice of organizational learning as a way of formally orchestrating the change processes and employing the insights gained from the collected data to further the incubator's cause. The topic of organizational learning reaches far and wide, so the introduction will be kept brief in order not to get sidetracked. Incubator managers interested in applying the proposed framework should familiarize themselves with the topic on their own beforehand. The cited literature here will be a good start. Figure 9 (page 34) emphasized the hierarchy of the change processes versus the incubation processes, putting the latter as the most fundamental. This and the following sections will detail how the process of change acts to encapsulate the process of incubation and codify the knowledge gained, so that we may over time learn how to incubate successful startups.

First, what is organizational learning? In his highly cited and influential article, "Building a Learning Organization", Garvin (1993) offers this definition:

> "A learning organization is an organization skilled at creating, acquiring, and transferring knowledge, and at modifying its behavior to reflect new knowledge and insights." (Garvin, 1993, p. 79)

This latter part of behavior modification is the main selling point. We want new behavior that gives a competitive advantage in the market place. Or, in the case of this framework, new behavior that makes us better at incubating successful startups over time. This progress is often illustrated and modelled using learning curves, a central concept in organizational learning. In her book on organizational learning, Argote (2013) talk about how these tend to show up again and again as organizations get better at making their specific product. She gives the real world example of fighter jet manufacturing in the US, where the number of labor hours per fighter jet went down dramatically as the cumulative number of jets produced grew, thus increasing the margins. The graph of the value ratio in Figure 12 (page 37) is essentially a learning curve. This curve shows up in a variety of industries, from fast food restaurants to nuclear plants.

But learning is not simply a function of time, destined to increase as the days roll by. A key issue in the literature is the apparent divide between learning at the level of individuals and learning at the level of organizations. According to Argote (2013), psychologists studying individuals were some of the first to discover and research learning curves. In what is perhaps one of the most cited books on organizational learning, Argyris and Schön (1978) describe the issue as somewhat of a paradox, as organizations learn through individuals, yet individual learning is not organizational learning.

> "There are too many cases in which organizations know less than their members. There are even cases in which the organization cannot seem to learn what every member knows." (Argyris & Schön, 1978, p. 9)

Many failed attempts at introducing organizational learning appears to have stumbled at this interface, sometimes expecting the organization to learn simply because its individuals did. Learning must be institutionalized, embedded within the organization, before its effects take root. And how exactly are we going to do that? The article by Garvin (1993) criticize the then current literature on the topic for being high philosophy, containing only grand themes and sweeping metaphors without the details needed for practice. He continues with an attempt at offering more practical guidelines, listing five main activities that contribute to a learning organization.

- Systematic problem solving
  - Data-driven problem solving using the scientific method and statistical tools
- Experimentation
  - Search and test of new knowledge that can be either on-going or demonstration projects
- Learning from past experience
  - Systematic review of past success and failures recorded in an open and accessible form
- Learning from others
  - Sourcing ideas and knowledge from outside and researching best practice through benchmarking
- Transferring knowledge
  - Getting the acquired knowledge spread in the organization through reports, tours, standardization programs, etc.

(Adapted from Garvin (1993))

Garvin's five activities unsurprisingly correlate well with his definition given earlier, and he further emphasizes how these activities must be supported by systems and processes that are integrated into the "fabric of daily operations" (Garvin, 1993, p. 80). This includes allocation of time for reflection and analysis. We want a learning organization, not an organization learning as a means to put out fires.

Equally influential has been the more theoretical paper by Huber (1991), where he distils four constructs related to the field: knowledge acquisition, information distribution, information interpretation, and organizational memory. Just from the wording we can sense a fair overlap with the later work of Garvin (1993). Of particular interest for the framework proposed here, is Huber's discussion of experimenting organizations, which are *"… in a state of frequent, nearly-continuous change in structures, processes, domains goals, etc."* (Huber, 1991, p. 93). Although somewhat of an ideal, which Huber also recognizes, the idea of the organization as fundamentally experimenting appears to be a great match with an incubator tasked with learning how to incubate successful startups.

I will combine the work of Huber (1991) and Garvin (1993) and use their insights as guidance for detailing how an incubator built according to the framework may become a learning organization. Their work appears to have been especially influential and as a pair contains a good mix of theoretical and practical insights, with approachable constructs apt for implementation here. In addition, I take inspiration from the work of Thomke (1998) (2003) and his extensive work on experimentation in new product development. Particularly his book (Thomke, 2003) has offered insights on the numerous challenges to implementing experimentation at an organizational level.

7.6 CHANGE PROCESSES – HOW THE INCUBATOR LEARNS

To adequately cover how the incubator becomes a learning organization, I will detail how Huber's (1991) four constructs – knowledge acquisition, information distribution, information interpretation, and organizational memory – are addressed by the framework.

The choice to go with a cohort-based setup, as mentioned in the discussion of control groups, has wide implications that are especially valuable when trying to implement organizational learning. The cyclic format it imposes lends itself very well to iterative experimentation, where what was learned in the previous cycle carries over to the next. One cycle will consist of five distinct phases (Figure 17): Selection, Incubation, Graduation, Evaluation and Preparation.

Selection entails the application process, where applicants are searched for, vetted and the field is slowly narrowed down until the last stage where random selection happens. Incubation is where the value multiplication happens. The startups are incubated, coached and

pushed forward, ideally progressing much faster than their non-incubated counterparts. Graduation marks the end of the incubation phase and where the chosen exit policy takes effect. It could for instance happen with a pitch-event for interested investors. This is also where I suggested the control group startups are invited back. Evaluation is the phase where all the collected data is analyzed and reflected upon. The initiatives of the incubation phase are evaluated according to their desired goals. Preparation builds upon the findings of the evaluation phase to continue the learning in the next cycle, preparing new initiatives for selection, incubation and graduation. The format is rather close to that employed by accelerators, but here with explicit focus on the last two phases of evaluation and preparation.

How exactly the time shall be divided between the five phases will depend a lot on the specific circumstances. Like Garvin (1993) states, there must be apt time side aside for analysis and reflection, so that the knowledge gained can be internalized properly. I cautiously suggest a 5:1 ratio at minimum – if the incubation period is 10 months, then the period set aside for evaluation and preparation should be 2 months. This would hence give a 12 month cycle. More time may need to be set aside in the first few cycles, as the management team becomes familiar with the process. Part of the preparation phase may overlap with selection. Graduation should likely only cover a very short period (days), but will – like everything else – be open to modification.
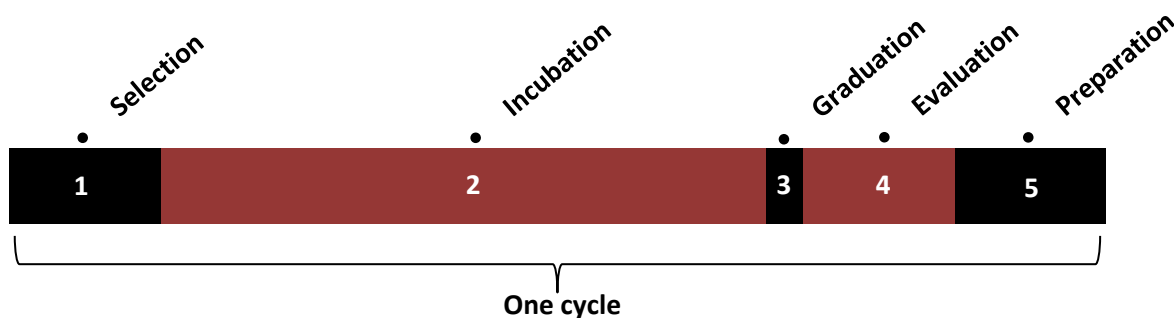

Figure 17 - The five phases of the proposed framework

Each cycle revolves around a cohort of startups (composed of incubated startups and the non-incubated control group) and contains a collection of rudimentary experiments with associated hypotheses and metrics that make up the core of knowledge acquisition. The experiments target the three phases of selection, incubation and graduation and each experiment must have an associated short form report describing it and the hypothesized outcome. Past the first cycle, all new experiments must explicitly be linked to at least one previous experiment, so as to build upon the existing knowledge base. The previous example of marketing lessons could be an experiment for the incubation process. The main objective is to make the knowledge currently held and the unknowns still remaining explicit, so that we can make conscious progress towards learning what works and what does not. Care should be taken not to conduct too many experiments on the same specific issue at once, a caution from Huber (1991), as that may make it very difficult to assign cause and effect. Much per the recommendations of Ries (2011), I suggest the management team first prioritizes what should be learned, then how such can be measured (i.e. which measurable quantities are we relying on and what constitutes a success) and lastly how we can build an initiative to produce the sought after data. As Garvin (1993) argues, the scientific method of hypothesis testing is valuable here as it forces us to make clear beforehand what exactly constitutes a success and on what basis we can reject a hypothesis. The experiments of the cycle must be integrated into a complete strategy and documented in a report with overall goals (Figure 18).
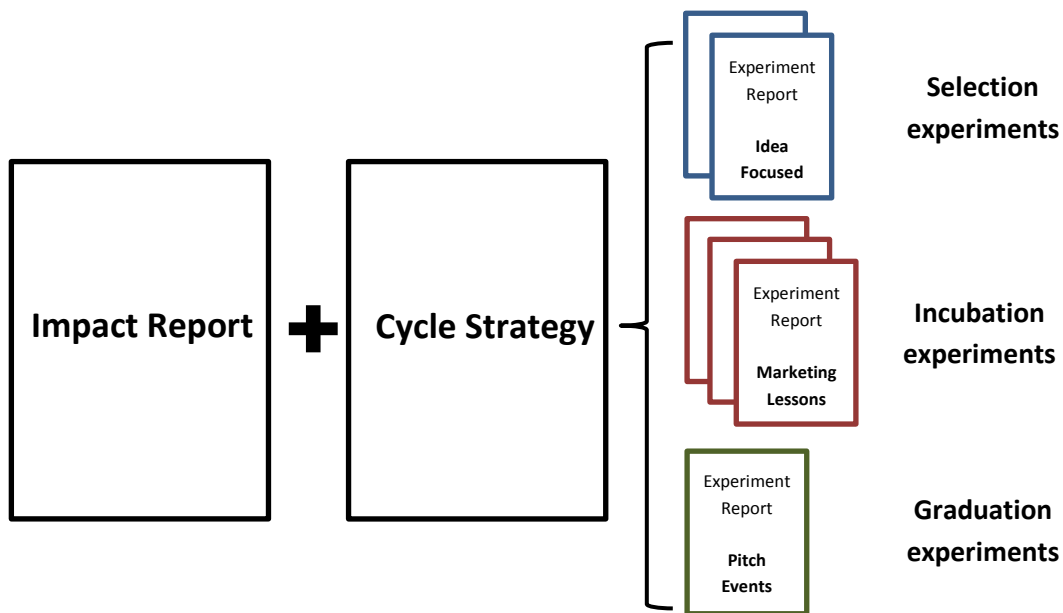
Figure 18 - Documentation for the five phases

Information interpretation (and partly distribution) happens in the evaluation phase, after graduation is complete and all data from the conducted experiments have been collected. Each experiment shall be discussed by the team, and the associated reports concluded with the findings. An annual impact report must be written, collecting information on current and previous generations of incubated and non-incubated startups (including second tier control groups) and linked to progress in day-to-day metrics (the immediate micro-scale). The strategy report containing the experiments of the now completed cycle must be concluded upon. I use the term "report" here and above, but the exact scope may wary. The important part is that the information within them is used and built upon. If that requires short, to-the-point writing, then that is the appropriate format.

All reports shall be made digitally available to the involved stakeholders. This is both information distribution and organizational memory. I suggest a wiki-like format, where the incubator management is given editing-rights, but all involved with the incubator can read. This also enables easy crosslinking between reports (e.g. new experiments building upon older experiments) and encourages frequent updates. This suggestion aligns with that of Garvin (1993), where he argues for easy access to the organization's learning. One person shall have the responsibility for maintaining and encouraging the use of the incubator-wiki. I will call this person Information Keeper. For new employees at the incubator, the wiki will also serve as a way to get themselves familiar with past events and the reasoning behind the incubator's current form. Parts of the wiki may be restricted during a cycle if a particular experiment is best run without the startups knowing the details of it.

Lastly is the preparation phase, which also addresses information interpretation and distribution. It is in this period the new cycle strategy report is started, along with all the experiments for the new cycle it contains.

Another important position is that of the Control Group Manager. The title speaks for itself. The responsibility of this person is to manage the control group (and second tier control groups), collect information for the annual impact report and all in all keep tabs on these companies and individuals. It will likely just as much about managing relationships that it is about managing data.

The documentation load is quite substantial. Aside from all the data I want the management team to collect, they must now also spend time documenting it all, including each and every decision made regarding the content of the selection, incubation and graduation phases. But it

is in this area the incubator may truly stand out and make progress against a stagnant incubator field.

7.7 CHANGE PROCESSES – AN EXAMPLE

To describe how such a cycle might transpire, an example is fitting. We start in the preparation phase, where the series of new experiments is formulated. As stated, these must collectively be part of a coherent strategy for the coming cycle. One such strategy may emphasize, based on learning in the previous cycle, a need for startups with a shorter path towards making their first sale. This is effectuated as an experiment in the selection process, where point allocation towards reaching the last stage (with random selection) is heavily impacted by how close to a first sale the startups are. The hypothesis is that is it this last part of the innovation journey that is the hardest and a place where the incubator stands to make a substantial impact. The metrics of interest will be the number of sales and overall revenue at graduation. The outcome of the experiment will be considered in support of the hypothesis if the incubated startups show meaningful progress on these metrics in comparison to their non-incubated counterparts. The wiki-page for the experiment would contain the above, including specifications on exactly how the selection process would work.

Research has convinced the management team that informal connections made between members of different startups stand to have a great impact on how they tackle obstacles and personal struggles. Data is collected on how well members of the now graduated cohort of startups know each other. This is used as the baseline. Various social events are planned for the next incubation cycle, as the hypothesis states that such ought to increase the number of informal connections between startups. The metric is this number of informal connections at the end of the incubation phase. If there is found to be a significant increase in the number of informal connections, then the hypothesis is supported. This experiment is kept hidden on the wiki-page until the final data has been collected. Additional data may be collected to further detail the process, like number of participants at the various events, etc.

As part of the strategy, the management team wants to strengthen the quality of the pitches made at the graduation event. They do this by having pitching sessions with coaching in the period leading up to the event. The hypothesis is that the ability to effectively sell their business ideas will increase their chances of raising funding later on. The metric will be the score given by the jury at the graduation event. The outcome of the experiment will be considered in support of the hypothesis if the incubated startups do considerably better than their non-incubated counterparts and the incubated cohort the year before.

The three experiments, along with others, are now run for the selection, incubation and graduation phases respectively. Along them runs any general support the incubator may supply. We have now reached the evaluation period, where the previous cycle strategy is concluded upon. We find the results on the first experiment regarding the path to first sales as inconclusive and in response we will consider having more support initiatives in the incubation period specifically addressed at making the first sale. Hosting social events did indeed have an impact on the number of informal connections and we are now interested in looking at the core hypothesis of whether the number of such connections increases wellbeing. Despite concerns regarding the quality of the pitching coach from the startups, they did perform better than both their non-incubated counterparts and the cohort of incubated startups before them. All of these results are noted on the incubator-wiki and maintained by the Information Keeper.

The Control Group Manager, the primary author of the annual impact report in this example, has collected data both on the current cohort and previous ones and released the findings on the incubator-wiki. Interviews with previous cohorts show significant struggles with managing IP effectively.

Lastly, as we reach a new preparation phase, the findings of the now concluded cycle must be built upon. The experiment regarding the selection process is kept in place and amended with one in the incubation process, where an initiative on getting the first sale is introduced. Like before, a hypothesis is formed, metrics chosen and success criteria decided upon. All of it is documented on the wiki-page. The same goes of the other two examples of experiments in the previous cycle. The finding from the impact report that previous cohorts struggle with IP prompts a series of lessons on the topic (with hypotheses, etc.). All of this is, as you would expect, contained in the new cycle strategy.

While the above example is completely made up – and somewhat silly depending on your perspective – it does nonetheless show how the framework envisions the process. And most importantly how the knowledge from one cycle carries over into the next, all while being shared and stored for the future on the incubator-wiki. It shows how the impact report and the cycle strategy can influence each. A lot has been left out. A full description of how an incubator operates for what could be a full year should take up more than a single page. The individual experiments themselves may not be sufficient to confirm a hypothesis, but a collection of them all pointing in the same direction should be reason to adjust the course.

Huber's (1991) four constructs – knowledge acquisition, information distribution, information interpretation, and organizational memory – have been covered. With the example given, I have addressed Garvin's (1993) criticism regarding too little practical material to go on. And with a firm basis in the published literature, I have listened to Tsang's arguments on what can jeopardize the validity of prescriptive work.

8. THE LEARNING INCUBATOR

Over the previous seven chapters the context and since the proposed framework have been developed. Before we head into the discussion, this chapter shall give an overview of The Learning Incubator and the foundation it sits on. If an incubator manager were to read nothing but this, patience allowing, then that person should have a good impression of what it is all about, sans the underlying theory, literature and associated empirical evidence. For the reader who has not skipped any pages, this chapter sums up.

The Learning Incubator

Foundation

The Learning Incubator is a publically funded initiative intended to support entrepreneurship in the form of new venture creation. The initiative incubates a cohort of startups for a pre-determined duration with the purpose of increasing their value output and growth potential.

The belief is that entrepreneurship and new venture creation – to the extent that it produces value at a societal-level – is a means to achieve economic growth and that through support of these activities we stand to reach greater levels of prosperity for all sooner than if we did not intervene.

Intervention is a worthwhile endeavor due to a failure of the market to sufficiently incentivize the support of new venture creation in all its meaningful forms. Specifically, we believe that there is a lack of incentives for supporting new ventures promising only modest value creation at the firm-level, but which may otherwise produce significant value at the societal-level – a level that private actors in the market cannot easily capture value at.

The public entity funding the initiative can, however. Acting as an aggregator, this entity stands to capture value at the societal-level from a diverse set of sources too diffused or simply inaccessible for the private actor. The funding public entity as the value aggregator can hence turn a profit where the private actor cannot and can do so to the benefit of all.

To better gauge whether the initiative does indeed turn a profit for the funding public entity, a control group of non-incubated startups is created as a counterpart to each set of incubated startups. Every cohort will thus consist of two groups. The application process is run with the goal of finding twice the number of applicants than there are open spots in the incubator. The exact procedure for finding these applicants is left open. With a final field of roughly equally qualified startups, random selection determines which half is incubated and which half becomes the non-incubated control group. It is the difference in

value creation at the societal-level between these two groups compared to the resources spent by the incubator, which guides our evaluation of the success of the initiative.

By creating a control group rather than finding it in the general population of startups later on, we remove a primary source of bias and make comparisons between the incubated and non-incubated startups more meaningful. It gives a direct measure of the impact of the incubator. This impact is to be measured by quantifying the realized value capture by the aggregator, the public entity, and by qualitatively assessing the influence of the incubation process.

The value ratio, input versus output, is what we seek to maximize. We wish to *learn how to* incubate successful startups through a cyclic, iterative, learning process where experimentation is followed by reflection, the outcome of which then lays the groundwork for the next round of incubation and experimentation. One cycle consists of five distinct phases – selection, incubation, graduation, evaluation and preparation – of which the last two phases are internal to the incubator and happens without involvement of startups.

Each cycle has a corresponding cycle strategy, with an associated collection of experiments to be carried out. Every experiment is documented. An annual impact report is written on how the current and past cohorts of incubated and non-incubated startups fare. All of this is made available digitally to all stakeholders.

Criteria for selecting startups, how the selection process is conducted (except for the final stage with random choice detailed above), what courses, resources and initiatives the incubated ventures are offered and how the graduation process, including exit policy, is set up, is all open to experimentation in order to maximize the gauged impact of incubation. The change process is, paradoxically, the only constant. There is no preferred type of startup, no specific development stage to accept them at. Idealized, the objective is to have the most cost-effective impact on the incubated startups versus their non-incubated counterparts as measured by the resulting value capture by the aggregator.

The Learning Incubator earns it right to existence in an already crowded market of support initiatives through its intense focus on building a learning organization that creates value not only through the entrepreneurs supported, but just as much through the validated, empirically grounded insights it generates and makes available to society at large. Its value output thus comes in two forms and a having funding aggregator appreciative of both is important.

9. DISCUSSION

A number of issues in relation to the proposed framework for The Learning incubator are still to be discussed, including how it may be rolled out and tested. This chapter will cover these issues and talk about what the proposed framework can add to current efforts to support entrepreneurship being undertaken at Aalborg University.

9.1 STATISTICAL SIGNIFICANCE AND WHY THERE ISN'T ANY

I will begin with a very central piece in the proposed framework – random selection as a means to create bias-free control groups. This aspect was addressed in all interviews conducted and in the majority of email correspondences and is the part with the most feedback accordingly. These peers have not been subjected to the full slew of literature, empirical evidence and arguments as presented here, that much commitment from the interviewees was not available, so the feedback is slightly superficial, admittedly. The main criticism, and one I touched upon earlier, is that of statistical significance, or rather the lack thereof. When given the example of 20 incubated startups and 20 non-incubated counterparts it is of course, and rightfully so, easy to discard any resulting difference between the two groups as simply coincidence. This I do not contend. The outcome of doing a single cycle using random selection should not be used to rule whether incubators, or other publically funded initiatives like it, are effective. One could argue that even with 1000 startups in each group, the risk of the control group being influenced by the incubator or the incubated startups is so serious that they cannot regardless be considered a true control group. I recognize this risk too. But I hold that there is value in creating the control group, even if the statistical significance is lacking, as it presents an opportunity to learn more precisely what difference an incubator makes. Right now the practice is to quantify the economic impact of the incubator (or accelerator) primarily through the micro-level value created by the startups and then attribute all that to the incubator. This is how the infamous cost-per-job metric is calculated. It is troublesome to hear criticism regarding lacking statistical significance of a control group approach, when that same critic so heavily relies on the traditional impact metric. Granted, it makes little sense to exchange a terrible metric for only one slightly less terrible, and if that is the view, then the decision to stick to a cost-per-job figure is unsurprising. But even so, to the extent that the application process has more than enough qualified individuals and startups, the introduction of a control group offers an opportunity to learn more about what works and what does not in an incubation process for relatively few resources. Can we learn from that which is not statistical significant? I certainly believe so.

A control group introduces a more hands-on way of gauging the incubator's impact, where previous metrics have been, as argued here, without much meaning. This new metric could be regarded as a threat to the incubator manager and her team. And for some it certainly can be. The incubator staff must have faith in not only their abilities to foster successful entrepreneurship, but also in this new and yet untested way of gauging the impact of their work. As a result it may be easier to get buy-in from the funding aggregator, than the people running the incubator.

Some will need to have the courage to try it out as the first. And have the patience required to survey the results over a few years, so the incubated startups get a chance to prove themselves against their non-incubated counterparts. It is not something that can be tested on a whim and the need for longitudinal data made any meaningful empirical validation lie outside the scope of this thesis. It is not a question of whether random selection can be done, but what effect it has. As shown earlier, the arguments for better impact measurements are plentiful and compelling and random selection represents a novel way of getting closer to them.

While on the topic of control groups and bias, I will take the opportunity to briefly forget that I am merely a master's student and go ahead and criticize the field of incubator research. I dare do so because it merely amounts to having the field recognize its own criticism. The span between Udell (1990) debunking the use of traditional impact measurements to someone actually responding and creating control groups – Schwartz (2013) and Stokan, et al. (2015) – is surprisingly wide. While certainly not all incubator literature has been read for this thesis (as stated in the first chapter on methodology), the majority – and certainly the most influential – has and the topic of bias has been largely missing. This makes it particular straightforward for a critic like Tamásy (2007) to argue for not using incubators as a policy tool. Essentially I am merely echoing the sentiments of Schwartz (2013) and particularly Stokan, et al. (2015), once again stating, based on the literature review and the conceptual work, that any research dealing with impact assessment on any metric (survival, job creation, etc.) must address the issue of bias.

While I have previously argued that data on impact is of little value without means to take corrective action, the results of implementing just random selection – and not the change processes detailed – would still be interesting, since such a data source has not been used before in the field. Convincing an already functioning cohort-based incubator or accelerator to test random selection in a single cycle will be a great start if a full-fledged implementation of The Learning Incubator cannot be realized. This may have the best chance of happening at an incubator or accelerator attached to a university from where that research could be done.

9.2 THE FRAMEWORK AND AAU

This naturally brings us to the initiative for support of entrepreneurship at Aalborg University: The AAU Startup Program. Although more than just an incubator (or accelerator), the initiative does have the option of employing random selection to their application processes. The program is still under development, which makes it difficult to suggest a specific case in which random selection can be used, but it also creates a possibility of integrating this novel part at an early stage, perhaps employing more elements from the proposed framework for The Learning Incubator. A cohort-based format should fit well, since the source of entrepreneurs and startups will be students already coupled to the autumn/spring semester turnover. For an initiative still being developed, the challenge is likely more one regarding organization. Starting up slowly, accepting entrepreneurs and startups continuously as capacity allows for it, is perhaps a necessary part of the very early learning process. I implore, however, that courage is found to run a cohort-based initiative with random selection in the foreseeable future. I know the ambition is to put AAU on the map for its work with entrepreneurship (Aalborg University, 2015). This is a way of doing so.

The AAU Startup Program also represents an interesting case regarding the funding aggregator – or aggregators more specifically. Not only is the university a sub-aggregator in comparison to the Danish government that is responsible for the majority of its funding, but the Startup Program is also founded by a private foundation (The Obel Family Foundation) and SparNord. The investment from these two latter sources has been given as an addition to the funds allocated by the university, making it the prime aggregator still. A collective of aggregators of this type may challenge the decision to strictly use monetary units in gauging the value ratio. Regardless of the desired impact measure, however, a control group can add a new dimension of understanding to the incubation process and the relation to the funding aggregators.

Speaking of impact measures, there is also the possibility of tracking the entrepreneurs, rather than their startups, when doing comparisons with the control groups. Although the startup is the focal point (and could contain significant IP), the value addition by the incubator happens through the entrepreneurs. Should a startup post-incubation be dissolved, some part of the value added by the incubator remains in the entrepreneurs, ready to be applied in a new startups or in an established company. Of course, analyzing individuals rather than startups is a

much more demanding task and quantifying their impact is equally so to say the least. It may nonetheless represent an avenue of research at a later point.

And so does the aspects of pedagogy and entrepreneurship education in relation to the proposed framework. One of the underlying assumptions only briefly touched upon in the first half of this thesis is that entrepreneurship is something we can actually teach, to some degree at least. The means with which the ultimate outcome of this teaching should be measured has been covered, but how the process of incubating successful startups more precisely happens with regards to the educational aspects have not. An important part, no doubt, but also yet another field to review, analyze, digest and incorporate.

This too is related to the goal of the proposed framework of *learning how to* incubate successful startups, rather than merely stating it as fact that successful startups will be incubated. The Learning Incubator is merely one way of looking at the market failure argument and support of entrepreneurship. The funding entity will likely have other options on the table along with it. Why not go with an initiative promising to actually incubate successful startups rather than one just aiming to *learn how* to do it? The long answer is this thesis, the short is that without means to actually create a control group, the impact of the former initiative will remain a promise, never to be remotely understood. The question highlights the difference between funding a finished product versus what essentially amounts to a research project. A municipality trying to mitigate an economic downturn may not have the patience it takes and neither may the electorate unfortunately. But a simple desire for quick results does not magically make the incubator able to churn out successful startups, regardless of the framework chosen. The incubator has not been and is still not a finished product. Unique regional circumstances may forever keep a universal best practice out of reach (Bergek & Norrman, 2008), always requiring some degree of learning by each incubator, including the necessary impact assessment.

9.3 INCUBATOR INNOVATION AND LEARNING

Of course existing incubators (and accelerators) are not stagnant operations, never responding to the feedback they get. Some learning does happen, the interviews and email correspondences confirm as much, but the literature published have not found this to be the case to any significant degree. Aside from simple operational proficiency, the incubation process itself appears to remain the same. I attribute it to the absence of what this proposed framework includes – better impact measurement and a change process with the authority needed to actually make changes. Learning may be happening, but it appears to be so within an established incubation process and not with it as the entity to be experimented with. It should be clear, after the literature reviewed in the first half, that the value of the incubator as a means to address the market failure argument has yet to be proven. Therefore, it may very well be that the incubator format is simply not the solution to our problem and that to actually be so it must evolve into something different. We could of course just shut down the incubator upon making this realization, opening up a new type of initiative afterwards, repeating the process over in the hope of getting it right this time. For a problem so complicated, the option of evolving a single initiative, keeping the learning stocked in the organization and its individuals, is bound to be a better way forward. The stagnant incubator field suggests so much.

A predefined period of intense support, like suggested as a starting point here, may not be the best way of addressing the market failure argument. Perhaps simply giving the support in the form of direct funding is a better way – of course still with a control group. And for any application process the goal should not be to pick the "best" candidates on some absolute market scale, but rather the individuals and startups most fit for the initiative and for whom the biggest difference can be made. If you can make anybody a successful entrepreneur, then choose the most unqualified candidates – the value addition will here be the greatest. There is also the possibility that the best way is continuously changing, making the ideal initiative not

only highly location and context dependent, but also time varying (as opposed to time invariant).

Further, in Figure 11 (page 36) The Learning Incubator was positioned on the far left hand side and hence meant to address the market failure argument exclusively by incubating startups creating value for an aggregator to later capture. It may be, in tune with critics like Tamásy (2007), that the market failure argument, true or not, is simply found to be unaddressable and that we must have some degree of micro-level value capture for the model to work. This would in turn move us closer to the "crossing line" in Figure 11. If this does not happen by directly capturing value from the incubated startups, then perhaps by capitalizing on the accrued knowledge, as suggested earlier. Corporate sponsors or whole corporate startups could be possibilities worthy of exploration at that point.

But we are still searching for an answer to the market failure argument. And with any search process there is a risk of reaching a local maximum rather than a global one. It could even be that more than one type of support initiative addressing the market failure argument is needed given multiple local maxima. For such a search process to work, the guiding process and the results is produces must be trustworthy. I mentioned this above in regards to the overall impact as exemplified by the control group. Just as important is the faith in the experiments conducted from cycle to cycle. If the approach does not have confidence from the staff and they fear otherwise valuable ideas get shut down due to questionable experiments, then the potential of the framework is jeopardized. Frederiksen and Brem (2017) argue likewise for a similar iterative learning process by Ries (2011). There may be a pressure to shorten the incubation phase to increase the output of incubated startups and as a result make the experiments so short that validity is compromised. The external mentors often employed by incubator and accelerator programs represent another unknown factor with the risk of obfuscating otherwise valid data. They are typically current or previous entrepreneurs themselves coming from a wide variety of backgrounds. Getting them to play along with a top down cycle strategy may not be easy or even valuable.

Like discussed earlier, having multiple initiatives using a framework like that proposed here would go a long way to alleviating many of the issues related to data scarcity and further aide in highlighting differences arising due to regional circumstances. At the same time however, since the knowledge generated by The Learning Incubator represents such a significant investment in resources, there may be resistance to sharing it outright. Depending on the aggregator, a desire to monetize the know-how is not unlikely and could perhaps be beneficiary to some extent in order to further incentivize validated learning.

In the methodology chapter leading this second half of the thesis I referenced the work of Tsang (1997) on prescriptive and descriptive research. He closes out his paper arguing for how prescriptive research is best followed by the descriptive type, so that the *"… knowledge obtained is used to revise and refine on the prescriptions which will be implemented and the result investigated again. Hopefully, after a few such iterations, we are able to arrive at a good theory."* (p. 86). While what I propose here is not a theory, having it follow the advice of Tsang is warranted regardless. Future work is implementation.

10. CONCLUSION

With this thesis I wanted to go beyond merely pointing at a problem and finding fault in the work of others. I wanted to reach a proposal that could in some way constitute a possible step forward, to recognize the many issues at play and give an answer to the question: so what can we do about it? The Learning Incubator is what I arrived at. A collection of elements from entrepreneurship and organization research, assembled in a framework proposing a different way of supporting entrepreneurship and measuring the impact of doing so.

It started with entrepreneurship and why we would want more of it in the first place. Established was a link from prosperity, to economic growth and finally entrepreneurship and the positive change it brings along. I then discussed why an appropriate amount of entrepreneurial behavior does not necessarily occur and arrived at the argument of market failure. This argument then paved the way for public intervention and brought us to a combination of Davidsson's (2016) levels of value creation and Adner's (2012) value aggregator as a way to better understand what this public entity stands to influence. The key feature of a value aggregator is its ability to capture value at a level where a private actor cannot. Business cases, which could not work for a private actor, can be completely sustainable for an aggregator. And the business case of interest was of course the incubator. The field of incubators was reviewed and critiqued, finding the impact of the incubator as a policy tool still uncertain and with a heap of methodological difficulties at play. The trouble of creating a counterfactual, i.e. measuring the success of the same startup inside and outside an incubator, means that impact studies have inherent weaknesses, which unfortunately was found to be scarcely recognized in much of the literature. Existing work on creating benchmarks and finding a best practice was covered, discussing lacking processes for responding to performance measurements and making continuous improvements.

The framework to address these issues were then developed using a conceptual approach. Part incubator, part accelerator and using organizational learning, the framework proposed a cohort-based initiative, where startups are supported intensely for a predetermined period and in which the creation of a control group is included in the selection process. Random selection at the final stage of this process was advocated as a means to account for bias, quantify impact and add to a qualitative understanding of the incubation process. To incorporate knowledge gained from this new source of data, organizational learning was applied to create an iterative process where experimentation is an integrated element. All of this was collected under the heading The Learning Incubator. In the discussion chapter, potential issues and limitations were addressed, among others was the lacking statistical significance of the proposed impact measure and what we can still learn from control groups. Avenues for implementation of The Learning Incubator and its constituent parts were discussed, with a suggestion to find such in a university setting.

In conclusion, the thesis sought to make three contributions. First, it explored the market failure argument that underpins public policy in the pursuit of more entrepreneurial action. By combining the work of Davidsson (2016) and Adner (2012), a novel way of viewing the argument for intervention was put forth, which addresses exactly what role a public entity stands to play. Second, an extensive review of the field of incubators was done, showing how impact assessment is still highly lacking and how methodological issues are being neglected at large. Third, the case for using random selection in the application process of an incubator was made. With a starting point in current methodological challenges, random selection and the creation of control groups was argued to have great potential in aiding our understanding of the incubation process and doing impact assessments. A framework for The Learning Incubator was developed in association, using organizational learning to show how such measures may be implemented, what routines it is reliant on and how it can be integrated with the search for a solution to the market failure argument.

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