HISTORY AND GEOGRAPHY MATTER

THE CULTURAL DIMENSION OF ENTREPRENEURSHIP

Sabrina Fredin

Blekinge Institute of Technology
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Department of Industrial Economics

History and Geography Matter

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To Gisela & Willi

Abstract

This dissertation deals with the rise of new industries through entrepreneurial activities. The aim is to investigate how differences in contexts might encourage or discourage entrepreneurial activities. This contextualization of entrepreneurship enhanced our understanding of when, how and why entrepreneurial activities happen.

Entrepreneurship is recognized to be a spatially uneven process and, in addition to previous research that has examined the actions of individual entrepreneurs, we also need to understand the context in which entrepreneurship occurs. We have a good understanding of how structural conditions like industry structure, organization structure and agglomeration effects influence the context, but we know little about how the social dimension of the context is the transmitting medium between structural conditions for entrepreneurship and the decision to act upon identified entrepreneurial opportunities. Following this line of argument, this dissertation is built on the assumption that entrepreneurship is a social phenomenon which gives strong arguments for including local culture in entrepreneurship research.

The temporal persistence and the pronounced differences of culture and structural conditions between places reflect path-dependent processes. I therefore use regional path dependence as an interpretative lens to study the contextualization of entrepreneurship in two Swedish cities.

Although each context is unique, some generalizations can be drawn from the four individual papers in this dissertation. The first is that industrial legacy leads to the formation of a distinct local culture and that the persistency of this culture influences the subsequent entrepreneurial activities in new local industries. The second is that this persistency of culture suggests that entrepreneurs who are outsiders, geographically or socially, are the driving forces for the emergence of new local industries. Finally, new industry emergence is a result of a combination of exogenous forces and initial local conditions, but it is the entrepreneurial individuals who translate these forces and conditions into entrepreneurial activities.

Acknowledgements

This book rests on the assumption that entrepreneurship is a social phenomenon where activities are made possible because of the involvement of other people. This PhD is a perfect example of a social phenomenon.

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Karlskrona, March 2017

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List of publications

Four peer reviewed journal articles are included in this dissertation:

Fredin, S. 2014. New perspectives on innovative entrepreneurship and path dependence – a regional approach. *International Journal of Entrepreneurial Venturing* 6 (4): 331–347.

Fredin, S. 2014. The dynamics and evolution of local industries—The case of Linköping, Sweden. *European Planning Studies* 22 (5): 929–948.

Fredin, S. 2016. Breaking the cognitive dimension of local path dependence: an entrepreneurial perspective. *Geografiska Annaler: Series B, Human Geography* 98 (3): 239–253.

Fredin, S and Jogmark, M. 2017. Local culture as a context for entrepreneurial activities. *European Planning Studies*. *DOI:10.1080/09654313.2017.1306028.*

INTRODUCTION

This dissertation deals with the rise of new industries through entrepreneurial activities. The aim is to investigate how differences in contexts might encourage or discourage entrepreneurial activities. This contextualization of entrepreneurship will enhance our understanding of when, how and why entrepreneurial activities happen.

It is of immense importance to understand the entrepreneurial context since entrepreneurial activities do not happen in isolation. Context provides opportunities, but at the same time sets the boundaries within which entrepreneurs can act. This approach includes a more prominent role of entrepreneurial activities themselves in shaping the context. Contextualizing entrepreneurship suggests that entrepreneurial activities both are conditioned by past activities and at the same time create new contexts for themselves and others.

Entrepreneurship is recognized to be a spatially uneven process and this suggests that the entrepreneurial context is most appropriately studied at the regional and local levels. Scholars have investigated how regional variations in entrepreneurship can be explained and, as a result, researchers have attempted to 'decipher the near magical qualities' (Plummer and Pe'er 2010: 520) of entrepreneurial success regions such as Silicon Valley in the US (Saxenian 1994), Cambridge in the UK (Segal Quince and Wicksteed 1985) and Gnosjö in Sweden (Johannisson and Wigren 2002).

This has been done by identifying mainly regional economic factors or structural factors which have an impact on entrepreneurship rates (Stam 2011). We have a good understanding of how the regional industry structure (Brenner and Fornahl 2008, Klepper 2007), organization structure (Mueller 2006, Sørensen 2007), agglomeration effects (Neffke et al. 2008, Weterings and Boschma 2006), the distribution of venture capital (Zook 2002, Sorenson and Stuart 2001, Gibbs 1991) and the geographic proximity to new technological knowledge (Audretsch and Lehmann 2005, Audretsch and Feldman 1996) affect entrepreneurship.

Studying the entrepreneurial context mainly through these structural factors somewhat neglects the social dimension of entrepreneurship, meaning that we know little about how social factors influence the context for entrepreneurial activities. This dissertation is therefore built on the assumption that entrepreneurship is a social phenomenon. This means that the focus of analysis is not on a few grand entrepreneurial events, but on everyday entrepreneurial activities. If we now assume that entrepreneurial activities are social processes, then they are rarely carried out by one

individual alone, but in relation with other persons: many different people provide input and the social dimension of the context is the transmitting medium between structural conditions for entrepreneurship and the decision to act upon identified entrepreneurial opportunities. In that sense, entrepreneurial activities ought not to be seen as a separate social process in itself, but as an integrated part of everyday life, which mainly happens locally.

This understanding of entrepreneurship as a social phenomenon has some implication on the choice of methods. The qualitative approach is most adequately chosen if the desire is to investigate a complex social phenomenon. The qualitative approach will enable me to explain how the analysed social phenomenon works and allows for in-depth analysis. To some extent, this dissertation will complement the dominant quantitative approach in entrepreneurship literature. It has been pointed out that the mainly static and deterministic studies addressing the structural factors for regional entrepreneurship might benefit from qualitative, long-term approaches which might contribute with a more dynamic view on the matter (Stam 2010).

Based on this discussion, two contributions of this dissertation can be identified. First, in order to be able to understand how context influences which business opportunities can be created or discovered, how they can be exploited and who will act upon these identified opportunities, one has to understand how this context has evolved. This calls for an inclusion of the temporal and spatial dimensions. In doing so, I will follow recent calls for a more dynamic and long term-oriented approach in entrepreneurship studies (Zahra et al. 2014, Glaser et al. 2010, Stam 2010). I suggest that this can be achieved by using the concept of path dependence as an interpretative lens when studying the entrepreneurial context. The factors identified above, which have shown to have an impact on entrepreneurship, reflect path-dependent processes owing to the pronounced differences within and between regions as well as the temporal persistency of these differences. Studies have shown that entrepreneurially successful regions tend to stay successful over decades and centuries, but did not identify the mechanisms which contribute to this temporal persistence (Andersson and Koster 2011, Fritsch and Wyrwich 2014, Klepper 2007). It is equally important to show statistical correlation, but if we want to understand why this temporal persistence occurs we need to understand the mechanisms behind such reinforcing processes.

Some of these enabling mechanisms are of course tied to the structural factors, but cultural aspects are also of importance. This leads us to the second contribution. If entrepreneurial activities are indeed a social process, this gives strong arguments for including cultural aspects in entrepreneurship research. Recently, the existence or lack of an entrepreneurial culture has been used as an explanation for large variations in entrepreneurship rate at the national, regional and local levels and their persistence over time (Andersson and Koster 2011, Fritsch and Wyrwich 2014). Previous work on entrepreneurship culture has used an aggregated sum of entrepreneurial attitudes in individuals as a proxy for regional entrepreneurship culture, but the results are inconclusive. A qualitative approach will offer new insights on how to conceptualize and operationalize cultural aspects of the entrepreneurial context.

The empirical part of this dissertation is concentrated on two Swedish cities: Norrköping and Linköping. Both are closely situated within the same region and are of comparable size, but they provide rather different contexts for entrepreneurial activities. Linköping's economic development is driven by a combination of small and large high-tech companies and is often referred to as an entrepreneurial success story in Sweden. Norrköping's economic development, on the other hand, was based on the long-standing dominance of a few manufacturing companies in the textile and paper industry. These two apparently polar cases within the same region are two good examples for theorizing general conclusions on the importance of cultural aspects for entrepreneurial activities. The argument is made that past economic development not only influences which entrepreneurial opportunities might be created or discovered, but also influences the social dimension of the context which stimulates or hinders entrepreneurial behaviour.

THEORETICAL FRAMEWORK: ENTREPRENEURSHIP AND GEOGRAPHY

Regional entrepreneurship

Entrepreneurship has been identified as a regional event (Feldman 2001), because people start ventures where they were born, have worked or currently live (Stam 2007, Haug 1995). Owing to this geographical inertia, regional conditions are recognized to play an important role for both the decision to start a company and the start-up's success (Sternberg 2009). Start-ups are therefore a product of the regional context. Hence, academic interest in 'regional entrepreneurship' has increased considerably in the past decade and the 'geographical turn in economics' (Martin 1999) is also visible in entrepreneurship research (Sternberg 2009).

The challenge of (regional) entrepreneurship as a field of research

There is a broad agreement that entrepreneurship is a complex and multifaceted phenomenon which requires multiple perspectives if one truly wants to understand entrepreneurship. This complexity leads to three main challenges of regional entrepreneurship as a field of research. First, research has established that entrepreneurship comes in many shapes and sizes, which makes it difficult to come up with a concise *conceptualization* of entrepreneurship. An alternative explanation could be that that the definition of entrepreneurship is too broad and therefore includes different phenomena. Second, *multidisciplinarity* leads to different beliefs about the nature of entrepreneurship and different views of what entrepreneurship, as a phenomenon, consists of. Third, the literature of entrepreneurship is full of *inconclusive findings*, which makes it difficult to pin down what we already know about regional entrepreneurship. These three interrelated challenges are now discussed in detail.

Conceptualization. This highly multidisciplinary character of entrepreneurship demands a clear and concise definition of entrepreneurship in this study. It is beneficial to study the same phenomenon from different angles to highlight different aspects, but there needs to be consensus on the particulars of the phenomenon which is to be studied. At present, the lack of a generally accepted definition of entrepreneurship is seen as 'a major challenge for entrepreneurship research' (Bosma et al. 2009: 60).

Schumpeter (1934) describes entrepreneurs as individuals who combine existing resources in creative ways. Innovation was therefore at the core of entrepreneurship, differentiating entrepreneurs from capitalists and business managers. When the entrepreneurship research took off in the 1970s and 1980s, the definition took an occupational turn owing to data limitations on innovative behaviour. Entrepreneurs were understood as self-employed or small business owners (Sternberg 2009).

Since then, the scope of entrepreneurship definition has been expanded rapidly. Early entrepreneurship trait research concluded that entrepreneurs are no homogenous mass, but come in many shapes and sizes (Hatten 1997, Baron 1998). Hence, in an effort to allow for commonalities to emerge, there have been considerable efforts to identify more nuanced types of entrepreneurship: technology entrepreneurship (Shane and Venkataraman 2003, Bailetti 2012, Carayannis et al. 2015), start-up (Birley and Westhead 1994), social entrepreneurship (Eikenberry and Kluver 2004, Pierre et al. 2014), corporate entrepreneurship (Burgelman 1983, Zahra and Covin 1995), self-employment (Hamilton 2000), necessity entrepreneurship (Poschke 2013), political entrepreneurship (Wohlgemuth 2000, Holcombe 2002), academic entrepreneurship (Shane 2004, Powers and McDougall 2005), opportunity entrepreneurship (Acs and Varga 2005), habitual/serial entrepreneurship (Birley and Westhead 1993, Wright et al. 1997), nascent entrepreneurship (Arenius and Minniti 2005, Wennekers et al. 2005), institutional entrepreneurship (DiMaggio 1988, Maguire et al. 2004, Hardy and Maguire 2008, Battilana et al. 2009) and family entrepreneurship (Heck and Mishra 2008), to mention just a few.

It might indeed be that entrepreneurship comes in many shapes, but an alternative explanation could be that the concept of entrepreneurship is too vague, which misleads researchers to use the same concept for studying rather different phenomena. Entrepreneurship is nowadays a popular term which is frequently used due to its positive connotation. The dark side of entrepreneurship is rarely discussed, but generally entrepreneurs are described as innovators, as creators of jobs or as important players for the emergence of new industries. The growth in numbers of different types of entrepreneurship as described above is an indicator of the increasing popularity of the concept. The popular use of entrepreneurship has however not contributed to increase our understanding, but actually hindered the accumulation of knowledge. In the past, entrepreneurs were economic actors of some sort; nowadays, any actor, from the political, economic or social sphere, might now be called an ‘entrepreneur’. It is not perfectly

clear what binds these different types of entrepreneurship together. In an attempt to bind these different types of entrepreneurship together, entrepreneurship might then be described as an activity which happens outside existing frames. But, with this very broad definition, there might be a lack of justification to consider these types as different types of the same phenomenon. If the definition is so broad that almost anyone can be described as an entrepreneur, the tool loses its analytical power.

The different types of entrepreneurship mentioned above can be grouped into different categories. Most of the types cannot be assigned to one category only, but numerous overlaps exist. Some types, such as opportunity and necessity entrepreneurship, explain the reasons for why a certain activity happened, while other types focus on the background of the entrepreneur (academic, family and immigrant entrepreneurship); some types see entrepreneurship as a process (nascent entrepreneurship), while others see it as an act (start-up); some types focus on economic actors (self-employment, start-up), while others focus on the innovativeness of entrepreneurial actions (high-tech, institutional entrepreneurs). In that sense, a technology entrepreneur might all at the same time be an academic, immigrant, opportunity and start-up entrepreneur.

This myriad of different but overlapping types of entrepreneurship illustrates that entrepreneurship is a vague concept used in many contexts. In particular, the understanding of entrepreneurship as a social process might have had immense importance on the further differentiation of different types of entrepreneurship. In an effort to do justice to the complexity of social interaction between the entrepreneurs and their networks, entrepreneurship research tends now to include these enabling actors as one particular type of entrepreneur. Innovative behaviour, be it on the political (introduction of new formal institutions), social (introduction of social innovations) or economic level (introduction of a new technology), found its way back once again into entrepreneurship, but at the expense of the occupational notion. Especially in my empirical work, I could have discussed the role of institutional entrepreneurs, which actually played an important role in shaping a favourable environment for the pioneering entrepreneurs. Instead I have chosen to treat these individuals as enabling actors closely tied to the entrepreneur. This decision is based on the attempt to avoid competing and overlapping notions of entrepreneurship in one paper and to keep the discussion on track of the economic activities and their effects on others. At some point, we need to draw a line in order to identify the phenomenon, and researchers have

become increasingly aware of defining the particular type of entrepreneurship under investigation.

In this dissertation, I follow only partly the occupational notion of entrepreneurship. While entrepreneurs are defined as individuals who started a company with the intention to lead this company, I focus (in line with Schumpeter) on entrepreneurial activities, which are categorized as technology entrepreneurs exploiting new, immature technologies. Hence, it can be assumed that the entrepreneurs are involved in innovative activities. In that sense, I combine the occupational notion of entrepreneurship with a more behavioural notion of entrepreneurship (Sternberg 2009). The definition of entrepreneurship in this dissertation comes close to the Schumpeterian entrepreneur. Schumpeter described entrepreneurs as individuals whose function was to carry out new combinations (Schumpeter 1934). The Schumpeterian entrepreneur does not passively operate in a given world, but her actions create a different world. At the very heart of the Schumpeterian entrepreneur therefore lies innovativeness, initiative and creativity. For the purpose of this dissertation, I shall assume that entrepreneurship is about the creation of something new, both in terms of organization and also in terms of new products or services. Hence, there is a need to distinguish the Schumpeterian entrepreneur from (small) business owners and managers (Carland et al. 1984).

Multi-disciplinarity. Entrepreneurship research has a long history, but more systematic research on the topic only began in the 1970s. Entrepreneurship gained interest from many different disciplines and researchers applied concepts and theories from their respective fields such as economics, psychology and sociology. By adapting their theories and concepts to study entrepreneurship, entrepreneurship has emerged as a multidisciplinary field of research with strong ties to mainstream disciplines. No single discipline or rationale can claim to provide answers to all questions about what entrepreneurship is or how entrepreneurs behave (Parker 2005). The use of well-researched theories from established disciplines also enhanced the development and legitimacy of entrepreneurship as a research field (Lohrke and Landström 2010). Although there are clear benefits in employing concepts and theories from various well-established disciplines, there might also be some difficulties to overcome. Owing to different traditions in different disciplines, scholars hold different beliefs about the nature of entrepreneurship and different views of what entrepreneurship, as a

phenomenon, consists of (Gartner 1990). Kilby (1971: 1) observed that entrepreneurship is described very differently by different researchers and drew parallels with the Heffalump, a mythical animal from A.A. Milne's Winnie-the-Pooh:

> *The Heffalump is a large and important animal. He has been hunted by many individuals using various ingenious trapping devices.… All who claim to have caught sight of him report that he is enormous, but they disagree on his particularities. Not having explored his current habitat with sufficient care, some hunters have used as their bait their own favourite dishes and have tried to persuade people what they have caught was the Heffalump. However, very few are convinced, and the search goes on.*

Thirty years later, Koppl and Minniti (2003: 81) conclude that we are 'getting more pieces of the puzzle, but no picture is emerging'. As a consequence, blind assumptions have hampered entrepreneurship theory development and resulted in a highly fragmented research field (Zahra 2007). Since then, an increased interest in generating theory in entrepreneurship can be observed and researchers are now more aware of the assumptions on which different concepts and theories are based on. Nonetheless, there is not yet a common theory of entrepreneurship, but the literature is full of definitions and conceptual disagreements (Davidsson 2008). Recognizing the differences in beliefs and views might be a first step to understanding how differences in these beliefs and views might be aspects of the same whole (Gartner 2001).

Regional entrepreneurship research, a newly emerging strand within the entrepreneurship literature, is influenced in particular by sociology and embraces entrepreneurship as a socio-spatial embedded activity (Trettin and Welter 2011, Steyaert and Katz 2004). This focus on social interplay increases the complexity of regional entrepreneurship study. If entrepreneurship is indeed a collective phenomenon, meaning that entrepreneurship is a social process driven by social and economic factors that rest in the immediate environment of the entrepreneur, the focus on a small, elite group of entrepreneurs is far too narrow. Nonetheless, entrepreneurship is not simply a mere outcome of the environment; entrepreneurs are individuals who make their decisions based on the outcome of their social interactions. Entrepreneurship is shaped by activities of many different kinds of actors with different individual abilities (Johannisson 2003). Hence, regional entrepreneurship literature

can gain much by focusing on the interplay between structure and agency. Entrepreneurs rely on their networks for information and access to resources, family and close friends provide moral support, and entrepreneurship policy might create a beneficial regulatory framework. The challenge is to take into consideration all these different influences, at the same time acknowledging the individual entrepreneur.

Inconclusive findings. Knowledge accumulation is one important necessity if a new research field wants to go beyond the formative stage. The myriad of entrepreneurship definitions however hinders the progression of accumulating knowledge about the particularities of entrepreneurship. Major differences in definition make it difficult to compare results of different studies, because scholars use the same concept to study different phenomena. This also leads to inconsistent results.

Somewhat paradoxical is the observation that inconclusive findings lead to a more nuanced differentiation of multiple types of entrepreneurship, while the rapidly increasing number of different types leads to more inconclusive findings. There is a general agreement in entrepreneurship literature that entrepreneurial activities are a process influenced by regional conditions (Stam 2010) and through social networks (Freeman 2001, Johannisson 2003, Schienstock 2007), but there is disagreement on the degree of impact and importance of specific regional conditions.

For example, there is empirical evidence that regions dominated by small enterprises have a relatively high level of entrepreneurship (as measured in number of start-ups) (Audretsch and Fritsch 1994, Mueller 2006, Sorenson 2007). Others however have stressed the importance of large companies as anchors for new regional industries (Feldman 2003), which again stimulates more start-ups (Malerba and Orsenigo 1995, Aldrich and Fiol 1994). Empirical results have also been inconclusive on: the importance of science parks for entrepreneurial activities (Tamásy 2007, Ferguson and Olofsson 2004), the impact of entrepreneurship education at universities on entrepreneurial intentions and whether these latent intentions are turned into actual entrepreneurial activities (Fayolle and Gailly 2006, Oosterbeek et al. 2010, Matlay 2006) and how the claimed temporal-spatial persistency of entrepreneurial start-ups can explain the emergence of dynamic centres at new places while old centres stagnate (Saxenian 1994, Fredin 2014). These are just a few inconclusive findings when discussing regional conditions for entrepreneurship.

There might be several reasons for these inconclusive findings. First, different authors might use different definitions of entrepreneurship in their studies. Hence, even though the phenomenon under study might be termed entrepreneurship, the results might actually not be comparable owing to differences in measures of entrepreneurship. One should expect different degrees of impact when investigating regional conditions on self-employed and technological entrepreneurs. In order to enable knowledge accumulation, the type of entrepreneurship should be clearly and concisely defined. In that sense, the increasing number of different types of entrepreneurship is not problematic, as long as clear definitions enable the reader to understand which type of entrepreneurship is studied.

Second, while entrepreneurship research has surely benefited from borrowing theories from established disciplines, researchers have rarely discussed if and how these borrowed theories might need to be adapted to study a complex phenomenon such as entrepreneurship. Theories are grounded in assumptions which form a certain prejudice about the nature of the phenomenon, actors and sites to be studied, which again determines which research questions ought to be examined or which research methods should be used (Zahra 2007). One might argue that assumptions should not be questioned in order to confirm the robustness or generalization of the chosen theory. But this does not excuse us from discussing if the theory is applicable to such a complex phenomenon as entrepreneurship. Hence, Zahra (2007) identifies a potential mismatch between theories and phenomenon as a frequent source for inconclusive findings.

Third, the reinforcing or hindering interplay between different regional conditions might also lead to inconclusive findings. Numerous regional conditions of entrepreneurship have been identified in the literature (see e.g. Stam 2010 for a general overview), but Stam (2010) makes the criticism that the empirical studies on regional conditions of entrepreneurship have a quantitative, static and deterministic approach. In that sense, quantitative studies provide a partial view of the complex phenomenon of entrepreneurship commonly neglecting the wider context (Welter 2011).

Fourth, the operationalization of the regional level might influence the findings. Territorial subdivisions and geographic borders are needed to study any spatial-temporal phenomenon. But it is debatable how these geographical borders should be drawn to provide the best suitable geographical frame for the phenomenon under investigation. Quantitative studies might require administrative regional borders, because data on

regional conditions is still mostly available for administrative regions. Human interactions might not occur in well-defined administrative boundaries. Hence, administrative boundaries might not overlap with effective borders of human interactions (Rinzivillo et al. 2012, Thiemann et al. 2010).

Call for contextualizing entrepreneurship

The call for contextualizing entrepreneurship research can be distinguished between substantive and methodological contexts (Johns 2001). The substantive context refers to the embeddedness of individuals in larger structures, while the methodological context stands for the contextualization of the applied theory to study a particular phenomenon. The lack of the latter has been identified as one source of inconsistent research findings in entrepreneurship research, as discussed above (Zahra 2007). In this section, I will focus on the substantive context(s) of entrepreneurship. The methodological context of this study will be discussed in a later Chapter, where I discuss if and how the interpretative lens of regional path dependence, as borrowed from evolutionary economic geography, can contribute to advance the field of entrepreneurship research.

Problematizing the contextualization of entrepreneurship

Context and contextualization are ill-defined terms, which causes confusion and inconsistencies across studies (Zahra et al. 2014). This is no surprise as it is certainly challenging to set the boundaries of context. Context is defined as the interrelated conditions in which something exists or occurs and that help to explain its meaning. Most researchers agree broadly that context are conditions or circumstances that are external to the particular phenomenon but are associated with it (Capelli and Sherer 1991, Mowday and Sutton 1993). Major exponents of this call argue that studying entrepreneurship in its natural setting, the context, will advance the quality of entrepreneurship research. Contextualization has therefore been a reaction to the studies which highlight entrepreneurs and their personal traits as heroic and stubborn, but neglect that there are other factors influencing entrepreneurship (Ucbasaran, Westhead and Wright 2001). These other factors form the context within which entrepreneurial activities occur. Context can enable entrepreneurial opportunities but can also set the boundaries for these actions (Welter 2011). Since I am interested in studying the interrelation between entrepreneurial actors and the setting

they are embedded in, this call for contextualization might give guidance on how to approach this objective.

While researchers generally agree that this call for contextualization in entrepreneurship research is valid, the conceptualization of this context is somewhat problematic. This means that I have to clarify what am I actually studying when following this call for contextualization. Welter (2011) is very clear in her arguments that several contexts exist. Contexts might be of a geographical, cultural, social, institutional, political or organizational nature. It is a bit more unclear how Zahra et al. (2014) are arguing. They move frequently between different 'dimensions of context' and different 'contexts'. The former suggests that there is one context, which has different dimensions, while the latter suggests the existence of several contexts. But Zahra et al. (2014) follow a similar line of argument as Welter, who argues that every entrepreneurial activity happens in different contexts. For example, Zahra et al. (2014:4) argue that 'contextualization can generate competing explanations of the same phenomenon'. If the same entrepreneurial activity can indeed be placed in different contexts, studies might indeed generate competing explanations. If they would acknowledge one context only, they might have argued that complementing rather than competing explanations are possible.

The understanding of different contexts might be somewhat problematic, since it would imply that exact boundaries can be drawn between the different types of contexts. This would be somewhat paradoxical to the very definition of 'context'. Welter (2011) distinguishes four 'where' contexts for entrepreneurship: business, spatial, social and institutional. For example, the social context would focus on the structure of networks or the frequency of network relations, while the business context would focus on stages of industry life cycles or the number and nature of competitors. Zahra et al. (2014) distinguish between temporal, social, industry, market, spatial, institutional and organizational contexts. It seems peculiar, however, to draw the boundaries first, instead of using the entrepreneurial process as the focal point and then discussing the issues that are of relevance.

Acknowledging the existence of different contexts would question the actual claim that entrepreneurship research is rarely contextualized. Ever since the interest in regional entrepreneurship emerged, entrepreneurship literature has identified regional conditions of entrepreneurship (Stam 2010). These regional conditions might form different contexts as understood by major proponents such as Welter (2011) and Zahra et al.

(2014): the industry structure might be described as the industrial context, the predominant organizational structure as the organizational context and so forth.

But simply translating conditions into different contexts does not answer the call for contextualization. Contextualization will indeed advance the research field of entrepreneurship. But the context needs to be conceptualized differently. Contextualizing entrepreneurship means to complement the predominating partial, static and deterministic studies in regional entrepreneurship with qualitative studies (Stam 2010). These partial, static snapshots might actually contribute to inconclusive results. Among many different regional conditions for entrepreneurship, entrepreneurship is considered to be an organizational product, where the nature and numbers of organizations is a strong indicator for entrepreneurship in a region (Stam 2010). Focusing on the organizational 'context' only, one can explain why some findings suggest that small firms are seedbeds of entrepreneurship, while other studies highlight the important role of large firms for entrepreneurship. Simply focusing on one 'context' does not clarify why at some time small firms and at others large firms are of greater importance for entrepreneurship in a region. Hence, there is only a single – but rather complex – context for entrepreneurial activities, which includes several dimensions feeding back to each other. Context actually demands to focus on the interplay between the different dimensions.

Defining context as 'interrelated conditions', it is precisely the interplay between the different conditions that makes the context. According to this understanding, each action has only one context, which is formed by different conditions. This intertwined relationship between different 'contexts' might even be more pronounced when discussing the spatial context of entrepreneurship. It is argued that the consideration of the spatial context highlights 'close links between social, institutional and geographical contexts' (Welter 2011: 171). The predominating single-context focus is perceived as too narrow, because contexts are intertwined. This argument actually also weakens the view of different contexts. If the focus of one single context is indeed too narrow, the borders of context needs to be expanded. In that sense, entrepreneurship does not happen in various contexts, but in a single, constantly evolving context.

Researchers need to address how they can capture this context that is constantly changing. This discussion is nothing new. Granovetter (1985) has already posed the question of how to study activities embedded in

structures while, at the same time, these activities are changing the structures. While the context is indeed constantly changing, it does so very slowly. This is precisely why the context (or regional conditions) is identified to have such a strong impact on entrepreneurship. But this is not to neglect the time dimension.

It has been argued that the temporal and historical contexts need to be included in (regional) entrepreneurship research, since the context is changing slowly over time. This critique goes again back to the rather static investigations of quantitative empirical papers that dominates the literature. Often treated as a dummy variable, an individual either is or is not an entrepreneur at a given year or month. Hence, entrepreneurial activities are measured as start-up entries. Contextualization however demands that entrepreneurial activities are understood as a social process, therefore we need, by default, to also include time in our analysis. If an inclusion of the entrepreneurial context facilitates a better understanding on the why and the how of the event, we also need to understand how the context came into being. This also means that nothing can be explained without including the social and temporal dimension of the context, arguing once again against the perception that different contexts can exist.

Problematizing the territorialization of entrepreneurship

The territorialization of entrepreneurship should be problematized from two perspectives: first, how the recognition of entrepreneurship as a spatial phenomenon might improve or hinder advances in entrepreneurship research, and, second, how this territorialization can be operationalized in order to provide a suitable geographical area for entrepreneurship.

Scholars observe a 'spatial turn' in social sciences and humanities (Warf and Arias 2009). Recent works in the fields of e.g. cultural studies, sociology, history and economics regard space as an important dimension of their topic under investigation.

> *Geography matters, not for the simplistic and overly used reason that everything happens in space, but because* ***where*** *things happen is critical to knowing* ***how*** *and* ***why*** *they happen.* (Warf and Arias 2009: 1)

Hence, scholars have started to put space first, neglecting to see things historically or socially. In that sense, scholars have both welcomed this spatial turn, which has led to a reinsertion of space into social sciences, and

also criticized that this spatial turn is placed upon diverse concepts which in their original meaning had no spatial dimension. For a proponent, this multidisciplinary spatial turn is necessary to correct a prevailing 'ignorance of space', while opponents argue for a 'hypercorrection' (Döring and Thielmann 2008). Also, in relation to the contextualization and embeddedness debate, concerns have been raised which criticize an over-territorialization of economic activities (Hess 2004). This over-territorialization shifts the focus away from social interactions. The call for context and embeddedness in entrepreneurship research is used to justify local and regional levels of analysis in economic geography. Embeddedness and context in their original meanings were however not meant to be 'spatial' but social concepts (Polanyi 1944, Granovetter 1985).

While scholars agree that spatial dimension is important to understand entrepreneurship, there is less agreement on how to include this spatial dimension in the most proper way. The social sciences have for a long time been dominated by 'unhappy dualisms' (Danermark 2002) or 'false dualisms' (Martin and Sunley 2001), which seem to suggest that either/or approaches are to be preferred to both/and approaches: quantitative vs. qualitative, sociological vs. economic perspectives and so forth. The discussion about the spatial turn is just another illustration of this unhappy dualism. The call for a spatial turn in many disciplines is simply a reaction to other proclaimed turns. It is not impossible for one field to have several 'turns' in just one decade or even at the same time. For example, economic geography recently experienced cultural (Barnes 2001), social, institutional, relational (Bathelt and Glückler 2003) and evolutionary turns (Bathelt and Glückler 2003, Ettlinger 2001). Overly focusing on one 'turn' triggered the calls for other turns.

Such unhappy dualism is misdirected since it tries to separate different aspects which ought not to be separated but are intertwined. Unhappy dualisms might be facilitated when postulating that several different contexts exist. Instead of focusing on where to draw the line between the social and economic context for entrepreneurial activities, more effort should be placed on how these different dimensions are intertwined and form one context. If we constantly move between different turns, we might never attempt to capture the whole picture of a complex phenomenon and might not strive to see how the different pieces of the puzzle can fit together.

One can argue that most investigations in social sciences are partial, which means that they are focusing on selected parts of a complex

phenomenon. This fosters these unhappy dualisms, but it is also a perfectly legitimate approach since phenomena in social sciences are often so complex that one needs to abstract certain aspects in order to be able to study them. This is certainly one reason why such a complex phenomenon as entrepreneurship still lacks a general theory.[1] I am not questioning this partial focus of investigations in the social sciences but instead the necessity of the researcher to define herself into one particular school or follow one particular 'turn'. In that sense, I do not argue for a social turn in entrepreneurship research, but to focus on the interaction between different dimensions, where social, economic and other dimensions influence and shape each other.

Any researcher who is interested in regional studies faces the challenge of how the regional level should be operationalized. There are numerous different definitions of regions, which even contradict each other. Hence, the researcher needs to be aware that different operationalizations of the region will lead to different results. Regions can be small or huge. They can be part of a nation state or go beyond, such as cross-border regions. At the European level, for example, NUTS 1 regions are made up of nation states, such as Luxembourg and Denmark, federal states, such as Germany, or a combination of several federal states, such as Austria.

The discussion of how to define a region is nothing new and can be found in many disciplines. A region is defined by several characteristics, the most basic factor being geography. Regions are contiguous land masses, but they are much more than simply a geographical space. For social scientists, a region is nothing without its people. Hence, regions might also be defined by economic or cultural characteristics. Each region serves as an arena for interaction between different actors and is dominated by a different set of actors, whether those are cultural elites or economic and political agents (Schmitt-Egner 2002).

The issue is to not simply draw a line randomly but decide where the line should be drawn to capture the geographical dimension of the phenomenon under study in the most appropriate way. This flexible understanding would imply that regional boundaries should not be fixed independently of the phenomenon but should be a product of time and context. Much data is still collected for geographical units with administrative borders. This focus on administrative regions might raise a

[1] Owing to the vague and broad definition of entrepreneurship one might say that entrepreneurship seems to be several complex phenomena. This needs to be sorted out before one can attempt to construct a general theory of entrepreneurship.

critique of whether the variables have been measured at the appropriate scale (Behrens and Thisse 2007). Researchers might run into the risk of drawing implications which might not be valid for this level of spatial aggregation.

Qualitative researchers have more options to draw their own boundaries to reflect on the phenomenon, especially when they have collected their own data through interviews and observations. Following this understanding that regions are a social construct, the regions are not fixed units but space–time phenomena that can be expressed on a map but also have trajectories through time (Paasi 2004). Regions are created, reproduced and might finally disappear as new regions are formed just as interaction pattern change or the world economy is restructured.

In this dissertation, the starting point of the investigation are entrepreneurs in the cities of Linköping and Norrköping. These cities are urban regions where the daily face-to-face interaction of entrepreneurs is taking place. In that sense, the region is not the starting point but the phenomenon I am interested in.

What constitutes the entrepreneurial regional context?

It is well established that early entrepreneurship research has been inspired from psychology and focused on distinguishing entrepreneurs from non-entrepreneurs based on personal traits (Katz and Shepherd 2003). Research has been focusing on certain traits such as the need for achievement (McClelland 1961), the locus of control (Brockhaus 1980a, Hull, Bosley and Udell 1980) and risk-taking (Brockhaus 1980b, Liles 1974), to mention just a few. Such research was of modest success at best and researchers failed to present clear-cut differences between entrepreneurs and other people (Baron 1998). Hatten (1997: 40) concluded that 'entrepreneurs come in every shape, size, colour and from all backgrounds'. Traditional research underestimated the extent to which crucial entrepreneurial skills can be acquired by learning (Deakins 1996) and neglects the importance of the environment (Ulhøi 2005). As a reaction, more recent research turned away from the 'big men' and has been shifted towards the view that entrepreneurial activities are social processes which are influenced by different (regional) conditions (Stam 2010) and through social interactions (Freeman 2001, Johannisson 2003, Schienstock 2007).

So far, the regional entrepreneurship literature has focused on identifying regional conditions of entrepreneurship, most of which are temporally persistent due to self-reinforcing mechanisms. This literature

can be summarized into five general regional conditions: industry structure, organizational structure, access to knowledge, agglomeration effects and, more recently, entrepreneurship policy.

In entrepreneurship literature, it is well established that the *industry structure* of a region affects the entrepreneurship rate in a region since entrepreneurs are faced with sectoral inertia, meaning that, in order to cope with uncertainty and risk, entrepreneurs start companies within the sectors they are already familiar with (Cross 1981, Lloyd and Mason 1984, Vivarelli 1991). There is quite robust evidence that a person is more likely to identify a business opportunity in an industry in which she has work experience (O'Farrell and Crouchley 1984). In some industries, barriers to entry are low and/or entrepreneurial opportunities, such as low barriers to product imitation, emerge more easily (Braunerhjelm and Carlsson 1999, Makadok 1998, Dean et al. 1993). Evolutionary economic geographers have also provided evidence that the set of related industries in a region is rather temporally persistent, because regions are more likely to expand into industries which are closely related to their existing portfolio (Boschma and Frenken 2011).

Also, the *nature and number of organizations* in a region matters for entrepreneurship in a region (Stam 2010). There is empirical evidence that regions dominated by small and/or young enterprises have relatively high level of entrepreneurship (Audretsch and Fritsch 1994, Mueller 2006, Sorenson 2007). Others have investigated why spin-offs tend to stay close to their parent company (Klepper and Thompson 2006, Buensdorf and Fornahl 2009, Boschma and Wenting 2007).

The *access to new technological knowledge* is crucial for entrepreneurship, especially in high-tech industries. Knowledge spillovers from other organizations, whether those are universities or incumbent firms, are one way for new knowledge to enter a firm, but these spillovers are described as geographically bound (Audretsch and Feldman 1996).

Agglomeration effects that affect entrepreneurship rate have been differentiated into localization economies and urbanization economies. Localization economies (or Marshall–Arrow–Romer externalities) describe advantages which emerge when firms in the same industry geographically concentrate closely to each other (Neffke et al. 2008). This close spatial proximity affects regional spillovers, such as pooled labour market, input–output linkages and knowledge spillovers. Localization economies are therefore based on specialization, which should stimulate more incremental innovations because knowledge spillovers between

similar firms foster gradual improvements of existing products and processes (Weterings and Boschma 2006). Urbanization economies relate to advantages which emerge due to different demand effects such as population density and population growth. Urbanization economies are found in large cities because they require a large number of firms and a certain variety of industries (Duranton and Puga 2004).

Recently, *regional entrepreneurship policy* has also been understood as a regional condition which influences entrepreneurship even though most studies point towards a marginal effect on entrepreneurship. Sternberg (2009) defines regional entrepreneurship policy as government support policies to the benefit of entrepreneurship in one or more subnational regions. Most popular have been investigations of the role of technology-oriented business incubators and science parks. Rabe (2007) found that entrepreneurs make extensive use of these local entrepreneurial policies, but that the existence of business incubators is an additional support rather than a factor determining whether to start a company or not. Similarly, Malecki (1997) argues that the entrepreneurial environment is far too complex and not easily manipulated by policy efforts.

A cultural approach to entrepreneurship studies

These five general regional conditions are very much concerned with capturing the effects of different regional structures on entrepreneurship rate, such as differences in industrial, organizational and knowledge structures of the region. Although the regional conditions identified above are important drivers of entrepreneurship, the sole focus on these 'structural' variables leaves a great level of unexplained variation across countries and regions. Researchers have therefore included region-specific fixed effects in order to control for regional differences in cultural factors that are difficult to measure quantitatively (Georgellis and Wall 2000). These variations which cannot be explained with structural variables have been labelled regional *entrepreneurial culture* (Audretsch 2001), *entrepreneurial ability* of a location (Kangasharju 2000) and *entrepreneurial human capital* in a location (Audretsch and Keilbach 2004, Georgellis and Wall 2000). Hence, regional entrepreneurship literature acknowledges that there are additional influences which have not (yet) been captured by these dominating structural approaches to regional entrepreneurship.

The different meanings of culture

Culture has been used in many disciplines to explain why individuals behave the way they do. Hence, the concept of culture is elusively all-embracing, but contradictory (Baskerville 2003). Culture is often defined by using different key terms such as patterns, assumptions, norms, attitudes, values, symbols, artefacts, rules and routines, but these are weakly defined (Wigren 2003, Alvesson 2009). Norms and values are highlighted as components of culture, but few define them in their studies. This impressive list of related terms means that several cultural theories and cultural definitions exist (Geertz 1973, Schwartz 1992, Inglehart 1997). Consensus tends to centre on three key characteristics. First, most definitions of culture are based on the assumption that culture is a collective phenomenon that is *shared among members* of the same culture. Second, culture is also commonly seen as something that is *learnt* through social interactions between group members. This might place a particular emphasis on location since people's daily social interactions happen in close geographical proximity, but many studies also focus on national cultures. Third, culture is considered to be passed on from generation to generation, which implies that culture is *changing slowly* and is therefore not easily changed. To sum up, culture is seen as the social legacy an individual acquires through social interaction with group members and that this social legacy needs to be known in order to behave in a manner which is acceptable to its group members.

One can however also distinguish general differences in how culture is defined and therefore subsequently also how culture is operationalized. The most prominent division is on whether culture is an observable, and therefore measurable, system or an internalized, integrated whole. Inglehart (1997: 15) defines 'culture as a system of attitudes, values and knowledge that is widely shared within a society and transmitted from generation to generation', while Hofstede (1984: 9) defines culture as 'the collective programming of the mind which distinguishes the members of one human group from another'. Culture is here most commonly defined as a system and researchers have therefore divided culture into several system components or different values or attitudes in a quantitative style (Baskerville 2003). Using 'system' and the 'collective programming' as a metaphor for culture reflects the instrumentality of culture and gives the impression that it is an entity which can be measured directly. First, such an approach would require that the people are aware of their values and attitudes, but culture is often assumed to be internalized and therefore not

easily communicated or debated. Second, this would also assume that all values are streamlined and not in conflict with each other. In that sense, culture can be understood as a unifying mechanism.

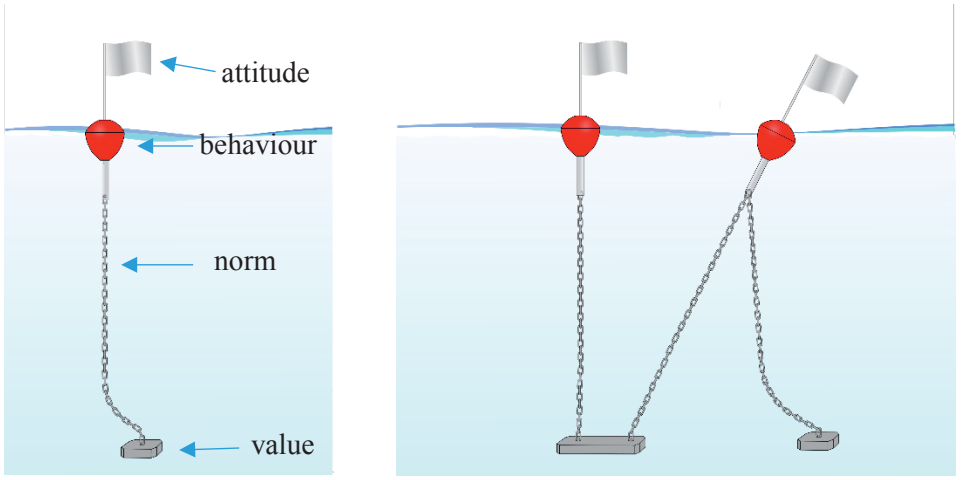
Culture could also be understood as an integrated whole which is not easily divided into subcomponents (Baskerville 2003), but can only be measured indirectly. Geertz (1973: 17) demands that 'behaviour must be attended to … because it is through the flow of behaviour that cultural forms find articulation'. Schein (1990) argues and shows how a group can hold conflicting values that manifest themselves in inconsistent behaviour. If one culture can include conflicting values, this would suggest that culture should not be considered a uniform entity. Defining culture as an integrated whole which is created through social interaction does allow for a more nuanced understanding. In that sense, culture is here understood as an 'open system' that exists in multiple environments (Schein 1990). Culture is about to make sense of the world around us. Hence, changes in the environment will challenge the existing understanding, forcing adaption and change. Furthermore, new group members will bring new understandings that will influence currently held understandings. To some degree, culture is no stable and fixed entity, but there is a constant pressure to adapt and evolve. However, since culture is internalized and handed from generation to generation, group members do not easily give up or change their jointly held understandings. This is a slow process.

As seen in the discussion above, culture is most often used as an umbrella concept which includes many other terms and concepts. Independently of whether one defines culture as a measurable, stable system or as an integrated whole, scholars are critical of the lack of clarity of the definition and culture-related concepts such as norms, attitudes, climate and values. In 1990, Schein criticized the insufficiently explored conceptualization and, to date, much of this insufficiency persists (Wigren 2003, Giorgi et al. 2015). If we want to understand and operationalize culture, we have to understand what 'culture' comprises and how the different sub-terms relate to each other and to the bigger picture.

The interrelatedness and dependence, though, makes it difficult to separate between different terms and concepts, such as norms and values. In order to avoid confusion, some authors might only include one of them or treat them as interdependent. Hofstede (1984) in his seminal work uses only values, while North (1990) refers only to norms. Wigren (2003: 40) states that it is 'difficult to draw clear-cut boundaries between norms and

values, since they are interrelated. I am not making any attempt to separate between [them].'

The relation between culture and culture-related concepts is mostly clearly expressed in an illustration. Figure 1(a) illustrates how culture is made up of several components: values, norms, behaviour and attitudes. In illustrating the relation, I use the metaphor of a moored buoy. The floating buoy is the observable behaviour, while the chain represents norms and the anchor represents values. The flag on top of the buoy represents attitudes. Norms and values are beneath the surface, since they are usually described as internalized. This means that these values and norms are not easily debatable (Schein 1990).



(a) **(b)**

Figure 1: Culture as a metaphor

Values are the anchors, which are difficult to move and keep the buoy grounded. Values in this sense might be honesty or that all persons are considered of equal value. These basic values will stay most likely the same during a person's lifetime and are grounded in the society the person belongs to. Values have the tendency to be rather general and less specific.

Norms are tied to values, since they concretize how the basic values should be ensured. Norms are represented by the chain, which allows the buoy to move around freely within a certain area. The length of the chain determines how much the buoy might be able to move around. Hence, in my understanding, norms are more open to change than values. Values are

difficult to change, but how the group wants us to concretize a particular value can change more quickly. It that sense, values are on the individual level, while norms are on the group level and define the context for the individual. An individual might easily change the context and the norms by changing the location, but it is more difficult to change your values.

The buoy floats on the water and represents the behaviour that we can observe. The flag on top of the buoy represents an attitude, which can easily change direction. Personal attitudes like e.g. towards migration issues can be easily influenced by current public debate, while the value of equality of people is not easily changed. The movement of the flag on top however has little effect on the movement of the buoy.

The figure is of course simplified and might give the impression of a straightforward relation between values, which are concretized by norms that lead to an observable behaviour. However, the relationship between norms and values on the one side and norms and behaviour on the other side are complex and not linear. In order to make matters even more complicated, each individual does not embrace only one value and one norm. If this would be the case, the behaviour of each individual might be reasonably predictable once we have identified the norm and the value.

Figure 1(b) illustrates the metaphor, including the interplay between several values and norms. As Wigren (2003) pointed out, individuals are part of many groups which shape their norms. Possible differences in their combination of norms and past experiences determine how they behave. One action is not only guided by one norm but is the outcome of the consideration of multiple norms. In other words, one norm might be outplayed by another norm, resulting in a different behaviour. This consideration of norms is guided by past experiences and by the expected outcome of the action in question. This is not to argue for well-grounded rational decisions. Norms are often internalized and the individual is not aware how the norm system is influencing her decisions. In fact, research has shown that individuals often do not know why they behave the way they do (Schein 1984). While we should assume that there is some rational consideration in place, much is also influenced subconsciously as the norms are internalized.

Figure 1 might give now the impression that I propose that behaviour can be explained by values and norms only. The purpose of Figure 1 was to show in a simplified metaphor how I understand the relationship between behaviour, norms and values, but this is not to dismiss other influences, such as structural variables.

What do we know about culture and entrepreneurship?

Entrepreneurs are social creatures and their economic activities, as for any other activity, are influenced by a social dimension. While the importance of culture for business activities is rarely questioned, the topic has been investigated sporadically over the past century. In the past, such influences have been more implicitly addressed as something that is not easily captured, but 'that is in the air'. In recent years, researchers have now focused on explicitly measuring these cultures.

Distinct for the literature dealing with culture and entrepreneurship is the either/or approach. It is concluded that either there is an entrepreneurial culture or there is not. This leads to the assumption that there might be a common entrepreneurial culture across nations. Empirical evidence points towards the opposite direction. Baum et al. (1993) compared entrepreneurs and managers in two different countries and their findings only weakly support the contention that there might be an entrepreneurial type across cultures. Furthermore, findings by Stephan and Uhlaner (2010) contradict the established view that individualistic cultures are supportive of entrepreneurship and show that collective cultures can have a high share of entrepreneurship. This might suggest that there is not one single entrepreneurial culture, but that different cultures might foster entrepreneurship. Once again it might depend on the context and the type of entrepreneur in question.

The influence of culture on business activities and on entrepreneurship in particular has been investigated on different levels. Differences in national cultures, regional cultures and organizational cultures have been used to argue for differences in entrepreneurship rates across different countries, locations and organizations (George and Zahra 2002). Studies on national cultures can operate with a fairly clear entity, which is defined by formal boundaries. Scholars have however questioned whether there is such a thing as national culture (Tönnies 2012). More open for discussion is the region as the level of analysis. In regional entrepreneurship culture research, regions seem to refer to municipalities (Aoyama 2009), planning regions (Fritsch and Wyrwich 2014), labour market areas (Davidsson and Wiklund 1997) and European NUTS 1 regions, which can comprise federal states and smaller nations as a whole (Beugelsdijk 2007). In this dissertation I have chosen to use the term local since my cases are two Swedish cities.

Since I am particularly interested in cultural differences within a country, my focus is on literature which deals with regional entrepreneurship culture. This literature might be divided into three different streams depending on how culture is operationalized in the studies. One stream identifies entrepreneurial attitudes and values as measures for an entrepreneurial culture. The second, emerging stream of literature focuses on the temporal persistence of entrepreneurship rates as evidence for the existence of an entrepreneurial culture. The third stream takes on a behavioural approach to study entrepreneurial culture.

Entrepreneurial attitudes and values as measures for entrepreneurial culture

Over the last three decades, entrepreneurial attitudes and values have been used as direct measures for entrepreneurial culture. Most of the work following this line of argument is heavily based on Hofstede's (1984) seminal work on 'culture's consequences'. Even though Hofstede focuses on organizational culture, his four identified cultural dimensions have been frequently used to explore the relationship between culture and entrepreneurship on the national and regional levels: individualism–collectivism, uncertainty avoidance, power distance and masculinity–femininity. Later on, Confucian dynamism was included as a fifth dimension. Hofstede's definition of culture is commonly used and hence the systemic view on culture dominates such studies. It is assumed that culture can be divided into measurable subcomponents, such as entrepreneurial attitudes and values. Scholars have been focusing on measuring entrepreneurial attitudes and the existence of an entrepreneurial culture has been explained through the dominance of entrepreneurial attitudes in individuals in a specific place. Data has been collected by asking individuals if they agree or disagree with certain statements, such as important qualities to teach children, attitudes towards social issues, financial pay-offs etc. (Bosma and Schutjens 2011, Beugelsdijk 2007, Davidsson 1995). These statements should reflect certain dimensions of entrepreneurship as identified in entrepreneurship trait research, such as need for achievement, need for autonomy and locus of control (McClelland 1987, Brockhaus 1980).

Despite the popularity to measure culture in terms of entrepreneurial attitudes and values, such operationalization has been criticized as being too simplistic (McSweeney 2002, Williamson 2002, Hayton, George and Zahra 2002). It has been argued that general 'off-the-shelf' cultural

dimensions are too broad and do not do justice to a more nuanced reality. The variance in culturally heterogeneous places in the same country is not captured adequately by such broad cultural dimensions. Even if concretizing the broader dimensions into values and attitudes, the assumption remains that there is one general entrepreneurial culture across all nations which can be captured by off-the-shelf values and attitudes. This discussion can also be linked back to my earlier discussion on different types of entrepreneurs. If we assume that there are different types of entrepreneurs, we also need to assume that they thrive in different entrepreneurial cultures.

Another issue which needs clarification is the origin of entrepreneurial attitudes and values from entrepreneurship trait research. Early entrepreneurship research has focused on personal traits distinguishing entrepreneurs from non-entrepreneurs (Hull, Bosley and Udell 1982, Brockhaus 1980, Hornaday and Bunker 1970), but the results have been modest at best (Gartner 1988, Brockhaus and Horwitz 1985). Despite, or actually because of, the extensive list of entrepreneurial traits, the literature is full of contradicting results regarding which traits are associated with entrepreneurship and which are not (Hayton, George and Zahra 2002, Bowen and DeClercq 2008, Hofstede et al. 2004, Wennekers et al. 2007). Since trait research itself struggles with inconsistent results, the entrepreneurial attitude research might also struggle with similar issues.

These inconsistent results urge caution in the reduction of cultural dimensions to single components. By operationalizing culture in this way, possible interactions cannot be captured (Hayton and Cacciotti 2013). Criticism has been raised that research on entrepreneurial culture should not stand alone, but a greater attention should be placed on the interaction between cultural and industrial characteristics (Williamson 2002, Hayton, George and Zahra 2002). To date, this particular stream of research has not been linked to research on other conditions for entrepreneurship. As highlighted above when problematizing the contextualization of entrepreneurship, the context is very much influenced by the interrelatedness of different conditions. A region might have a strong entrepreneurial culture, but if the industry structure does not allow for entrepreneurial business opportunities the number of entrepreneurs might be low owing to the sectoral inertia of entrepreneurs.

Another point for discussion is about how adequately attitudes of individuals reflect culture. Scholars in this stream of literature must assume that culture is an aggregate of individual attitudes. Several studies,

however, have shown that there is a low and sometimes even negative correlation between attitudes of individuals and member-shared assumptions of groups (Fischer 2006), implying that culture is more than just the sum of individuals' attitudes.[2] This potential mismatch can explain some of the inconclusive results, which fail to evidently link dominant entrepreneurial attitudes to high regional start-up rates. To what extent the individual attitudes reflect culture can be linked to the debate of whether culture should be considered a uniform entity, where all members share exactly the same values and norms. If we acknowledge that individuals are part of different groups which shape their norms, it is difficult to argue for total conformity among members.

Culture as long-term persistency in entrepreneurship rates

While the first stream of literature works with data at any one given time, such as the year people were asked about their attitudes and established correlations between these measured attitudes and the entrepreneurial rate in well-defined administrative regions, the next stream of literature includes the temporal dimension of culture. Here, entrepreneurial behaviour is measured as entrepreneurship rate over time and implicit conclusions are drawn that regions with a high entrepreneurship rate over time have a strong entrepreneurial culture (e.g. Andersson and Koster 2011, Wyrwich 2012). Fritsch and Wyrwich (2014) investigate whether entrepreneurial culture in regions can survive severe shocks in environmental conditions. In more detail, they investigate whether four decades of the socialist planned economy in East Germany had an impact on the self-employment rate in the regions of the former German Democratic Republic (GDR). Interestingly, they show the temporal-spatial persistence of entrepreneurship rates in regions despite severe shocks and argue that this implies evidence for a historical tradition in entrepreneurial culture. These studies do not place a focus on an entrepreneurial culture, but use culture as a means to explain the temporal-spatial persistence of entrepreneurship rate even in times of disruptive shocks. In this argument, enduring start-up rates are used as evidence for entrepreneurship culture rather than discussing entrepreneurship culture per se. Especially when using entrepreneurship rates as an indication of entrepreneurship culture, the question arises how different levels of entrepreneurship rates would

[2] For an in-depth discussion on the issues with measuring self-ratings as indicators of culture see, e.g. Bierbrauer et al. 1994, Bond 2001, Heine et al. 2002, Oyserman et al 2002, Peng et al. 1997, House et al. 2003, Terraciano et al. 2005

translate into the simplistic description of the either/or approach to entrepreneurship culture. This would also lead to the question of whether an entrepreneurial culture would always need to lead to high levels of entrepreneurship rate or if other local factors, such as industry structure, could weaken the effects of an entrepreneurial culture.

Behavioural approach to culture

Much of the research on entrepreneurship culture is based on quantitative methods, meaning that it is centred on the first two streams of literature. Few studies have deployed a qualitative case study approach to study possible effects of culture on entrepreneurship and vice versa. These case studies take a behaviour approach and study entrepreneurial activities (Saxenian 1996, Wigren 2003, Aoyama 2009). They focus mainly on how regional cultures are resilient and relevant for entrepreneurship, and uncover and discuss unquantifiable dimensions of regional culture (Aoyama 2009). Scholars build up strong arguments for why and how the regions differ in their culture, but there is little conceptual discussion about what this culture actually is.

A more comprehensive conceptual discussion can be found in Wigren (2003), who takes on a process-oriented approach in her ethnographic study on the 'Spirit of Gnosjö'. Gnosjö is a region in southern Sweden which is characterized by an enterprising and networking culture. Although the level of analysis is the regional level, much of Wigren's theoretical discussion rests on the field of organizational culture. Since culture is shared by a community/group of people, much of the argument in organizational culture is also relevant for the discussion on regional and local culture. One might argue that the boundaries of organizational culture are stricter to draw, that organizational culture can be easier identified owing to official statements and documents which communicate what leadership expects from its staff and that members can be more easily punished if their behaviour does not conform to the organizational culture. Such assumptions would presuppose that informal social relationships which go beyond formal structures have no influence and that organizations have one integrated and fixed culture which leads to uniform behaviour since it is shared by all organizational members. One of the main contributions of Wigren's (2003) work is to include this discussion to the regional entrepreneurship culture literature.

Wigren (2003) follows the argument in organizational culture literature and stresses that culture is about both what a community of people share

and also what they do not share. Recently, most authors emphasize the difficulty of considering culture as conformity. If culture however consists of shared and not shared understandings, when does someone then belong to a culture and when do we need to exclude this individual as a carrier of culture? Furthermore, Wigren (2003: 36) questions 'the robustness of any group as **a** culture. People participate in many groups and acquire culture in all experiences'. If culture is not tied to a collective, where does it then take shape? Taking Wigren's argument further, it seems that culture lies in the individual and that each individual can have its own culture since no two individuals will participate in exactly the same groups and share the same experiences. But is not the purpose of the concept of culture to bind people with shared understandings together? To me culture always represents the context of the individual and this context is shaped through the social interaction of different individuals. Of course, it is impossible to argue that all members have the same understanding of culture and behave identically, but acknowledging that there are differences does not require that we let go of the similarities.

This discussion, of whether culture should be considered a consistent entity or should allow for inconsistencies, has implications for how one studies changes in culture. If the focus is on culture as a consistent entity, it is mainly argued that change in culture is triggered by outside influence, such as the inflow of outsiders with different views or the changing context which results in an outdated culture.

If one however discusses conflicts, ambiguities and inconsistencies within one culture, culture is considered to be slowly, but steadily, changing. Hence, the focus might be to argue that cultural change is triggered from within the group, namely how existing norms might need to be adjusted to the new context. Local culture reflects the culture of existing groups in the city. Strong local communities, either in size or power, have a stronger impact than smaller communities. So, changes in local culture can either depend on changes inside existing dominant local groups or reflect changes in the importance of different local communities. A smaller local community can grow and become more influential on the local culture, while formerly dominant local communities lose importance and consequently their impact on the local culture is weakened.

Deciphering the content of culture in this dissertation

The previous discussion revealed large variations in the definition of the term 'culture' and its operationalization. The increasing use of culture to

explain differences in human behaviour, such as entrepreneurial behaviour, has led to different conceptual assumptions and operationalization of culture. Culture is used to cover everything and consequently nothing (Alvesson 2009). One might now argue that, if culture comprises everything and nothing, culture is too broad and vague to be useful as an analytical concept. This is not to dismiss culture but rather to argue for a more thorough conceptual base to stand on. In this dissertation the specific phenomenon under investigation is how people interpret and respond to entrepreneurial actions. Before we set out on a cultural analysis we have to take a step back and summarize some conclusions which can be drawn from the previous discussion.

Culture is more than the sum of individual attributes

Each individual has a unique set of norms. It might be precisely this interplay between different norms which might account to some extent for the inconclusive results when studying culture as made up of several system components or different values. Culture is more than the sum of individual attributes.

I assume that culture is most adequately captured by studying behaviour. This assumption is based on the inconsistent results of the stream of literature on entrepreneurial attitudes as a measure for regional entrepreneurial culture and the proposed low and sometimes even negative correlation between attitudes of individuals and member-shared assumptions of groups. Relating back to Figure 1, only behaviour is observable while norms and values are underneath the surface. An alternative approach could be to ask people about the member-shared assumptions. But we cannot assume that people are always aware of these assumptions. Individuals are likely to conform to prevailing assumptions in a local setting by repeating behaviours that are typical for their group. These repeating behaviours can either be conscious acts to gain social acceptance or less conscious imitations of typical, valid behaviour (Powell and DiMaggio 1991). In that sense, member-shared assumptions might be internalized by the members and are therefore highly implicit and thus not easy to confront or debate.

Culture leaves room for diversity

Any scholar studying culture must deal with a dichotomy. Culture is obviously used to explain the glue that binds certain individuals together and to explain why members of a group (or organization) behave the way

they do. This might lead to the assumption that culture can be used as a mechanism which leads to a uniform behaviour among members. This assumption might be strengthened by linking it to the work of Fischer (2006) and others, which found that there is a low and even negative correlation between attitudes of individuals and member-shared assumptions. One might interpret these results as culture triumphing over individual attitudes. Similarly, Landolt and Portes (1996) argue that common norms create conformity, which implies restrictions on both individual freedom and business initiative. If an individual decides that s/he wants to be part of a particular group, one has to subordinate the member-shared assumptions. This would mean that every member of the group would behave exactly the same way and that once a culture is 'established' and 'fixed' it can only be changed through outside forces.

On the other hand, culture and human behaviour are far more complex than simply imposing culture onto individuals to predict their behaviour. This understanding acknowledges that not all members have exactly the same understanding of culture and interpretation of norms. An individual might very well enjoy the belongingness to a specific group with shared understandings, while at the same time being open to welcome new people. Another individual, belonging to the same culture, might favour the closeness of the group. It might be more adequate to consider norms as a fence that defines what acceptable behaviour is. Members of the group are expected to stay inside the fence, but there is some space which allows for individual freedom for the single person. This is to acknowledge some freedom of interpretation of how norms should guide an individual's behaviour in a specific situation. Such an understanding of culture rejects the most popular definitions of culture, which are based on the assumption that members of a particular culture share the same norms and values.

Culture allows for a nuanced view on human behaviour beyond simplistic descriptions of two extremes

The focus on culture as uniformity might lead to simplistic descriptions of extremes, e.g. the good against the bad. Also, in existing entrepreneurship studies the discussion is mainly centred on the existence or lack of an entrepreneurial culture in a particular location. There is an increasing number of studies which discuss entrepreneurship culture on the national and regional levels. The US, for example, has been frequently highlighted as the archetype of an entrepreneurial-friendly culture, with communistic countries such as Taiwan and China as their least entrepreneurial-friendly

counterparts (McGrath et al. 1992). But also, within a nation, studies have highlighted regional differences in entrepreneurship culture and compared entrepreneurial regions with non-entrepreneurial regions (Saxenian 1995, Aoyama 2009).

This choice of the good against the bad might be for methodological reasons. Comparing two opposite extremes will help illustrate the differences. But Yin (2013) and other scholars demand that such studies should also focus on the commonalities. Otherwise there is a risk in stating the obvious.

But the choice of extremes might also be traced back to the widely held assumption in entrepreneurship research that entrepreneurs display similar characteristics across nations. Entrepreneurs are individualists, tolerate uncertainty and have a low power distance. To date, few studies have investigated whether different types of entrepreneurs might thrive in different cultural settings. The rejection that culture leads to uniformity might call for a nuanced view on entrepreneurial behaviour which fits neatly in the emerging discussion that there might be different types of entrepreneurs.

During my interviews for the four attached papers, I encountered two general groups of entrepreneurs. The first group we might want to call 'lifestyle' entrepreneurs. Their primary goal was to set up a business as they wanted to embrace the life of an entrepreneur, with independence and control over their own schedule. They wanted to set up a company, but they had no specific preferences which products or services they wanted to offer. The other group we might call 'nerd' entrepreneurs. Their primary motivation was to develop a certain product or technology. This type of entrepreneur was interested in understanding the technology behind their research fields and to advance them. Starting up a company in order to do so was a necessary evil.

Each human action is triggered by motivation and desire to achieve something. Since motivation and desire are not the same for all individuals, we should assume that there are different types of entrepreneurs with different types of characteristics. It might be difficult to argue that the second group of entrepreneurs are individualists and tolerate uncertainty. None of the second group gave up their employment, but reduced their employment rate when it was needed in intensive development phases and increased it again when these phases were completed. In that sense, it is difficult to argue that entrepreneurship culture should always include norms which enhance individualism and uncertainty tolerance.

Furthermore, this dissertation highlights the importance of context. Culture is no independent variable, but instead captures the effects of structural factors; e.g., as we will see in Article 3, the industrial legacy of a location leads to a distinct local culture. We must therefore assume that entrepreneurial culture looks different in different places. There are some common characteristics, but much also differs due to the different local contexts within which culture was created.

Local culture is a mixture of different group cultures

When studying culture in organizational studies, the unit of analysis is the organization. In that sense, clear boundaries have been established to study organizational culture. These strict boundaries have raised some discussion on the assumed closeness and stability of culture. Also, when studying culture on the local, regional or national level it seems that clear geographical boundaries have been drawn. The challenge is now to argue that this particular place has one distinct culture. Each particular place houses many different individuals and groups. It might be a bit far-fetched to argue that each group has its own culture, but in any case we can argue for that each group, through interactions between members, establishes certain guidelines, routines or understandings. This is not to assume total uniformity, but that there is a glue that binds the group together. If the group members did not share anything in common, the group would dissolve. We might want to argue that the similarities are stronger than the dissimilarities.

Wigren (2003: 41) sees culture as 'constructed by a group of people who interact regarding a certain issue.… This implies that the question of [group] belongingness is settled in the moment.' Following this line of argument it might be difficult though to argue that culture is persistent. While I do not entirely agree with Wigren's understanding of culture, it highlights the importance that people do not belong to one group only but move around. This might mean that they are exposed to different understandings. Somewhat contradictory however is her observation that in Gnosjö different social arenas, such as churches, local theatre associations, local rotary clubs and so forth, existed as meeting places but, she stresses, at the same time these social arenas provide informal networking activities between business owners. It is therefore important to understand who is participating in these different, not strictly business-related arenas. In some cities, such as company towns, the same actors

might very well dominate different business- and non-business-related arenas (Grabher 1993, Hassink 2005).

Nonetheless, if we acknowledge that culture is not only about homogeneity but also about inconsistencies, we need to acknowledge that different groups exist in the same location. If a city or a region houses many different groups, can we then argue that there is one local or regional culture? Even though Wigren (2003: 36) argues that 'culture is primarily a thing of relationships rather than of territory', most everyday relationships still happen at the local level. None of the local groups will be in total isolation, but people participate in many groups and become bearers of culture. Through this daily social interaction, we can assume that there are some norms emerging which are valid to a majority of the people.

Challenging our understanding of culture

In this section I want to critically reflect upon how my conclusions relate to and might challenge the existing understanding of culture in the field of entrepreneurship. Up to now, it seems difficult if not impossible to 'measure' entrepreneurial culture since no one really knows what an entrepreneurial culture looks like. The discussion of the three streams of entrepreneurship culture showed that scholars often link entrepreneurial culture with 'values', 'norms' and 'traits' which characterize entrepreneurs as risk-taking individuals with a strong need for achievement and self-fulfilment. This might be indeed true for the classical Schumpeterian entrepreneur, but if entrepreneurs come in many forms and shapes applying this one general US-centric culture might be problematic. Different entrepreneurs might respond differently to different 'entrepreneurial cultures'. In particular, studies on national differences have questioned that there is such a thing as entrepreneurial societies. They have also found evidence that socialistic countries score high on entrepreneurship rate (Uhlaner and Stephan 2010).

In a region with many craft(wo)man entrepreneurs, a culture which favours risk-taking and achievement might not be found even though the self-employment rate might be high. We also need to be open to interpretations which suggest that even a resistant environment can trigger high entrepreneurship rates. In poor countries or regions with high unemployment rates, the necessity for an individual to start their own company might override their shyness and push them into self-employment. Since different types of entrepreneurs are guided by different motivations, there might not only be *the one* entrepreneurial culture.

The first wave of high-tech entrepreneurs in Linköping did not describe themselves in heroic terms such as risk-takers and achievers, but rather as 'nerds' with a keen interest in developing their academic research into products and services that could help to solve real-world problems. Once again placing the entrepreneur in his/her context enables us to gain a more nuanced picture on the entrepreneurial process. In that sense, culture does not determine everything, but it also depends on how different individuals react to a specific environment.

Instead of applying one general, US-centric culture derived from trait research, it might be more rewarding to place the entrepreneurs and their activities in the research focus. Entrepreneurs should be asked if and how the regional environment might have influenced entrepreneurial activities. More specifically, through in-depth interviews entrepreneurs can describe their entrepreneurial process and how other regional actors reacted to particular entrepreneurial actions.

At first, it might also be a bit paradox to argue for an entrepreneurial 'culture'. Landolt and Portes (1996) argue that common norms, as found in cultures, create conformity, which implies restrictions on both individual freedom and business initiative. The very aim of any entrepreneur is however to question homogenous norm structures and integrate heterogeneity (Barth 1963). 'Economic entrepreneurship is about non-conventionality, as well as about initiative and action' (Johannisson 1984: 7). It is also known that entrepreneurs only reluctantly become members in associations whose aim is enculturation (Johannisson 1984: 8). Cultures fostering entrepreneurship must therefore include rules which encourage diversity and change, rather than uniformity and stability (Johannisson 1984). If culture creates conformity and entrepreneurs reject uniformity, should we then use culture to study entrepreneurship? I think that much can be gained by going away from conceptualizing culture as a conforming process only. Yes, culture passes on shared understandings and binds individuals together, but we need to allow for a more nuanced view than uniformity.

History matters in a cultural approach to regional entrepreneurship

Evolutionary economic geography (EEG) regards economic actions as contextual and takes on an explicit dynamic perspective rejecting static accounts of equilibrium analysis (Boschma and Frenken 2006). In that sense, evolutionary economic geography might help us to address the call

for the contextualization of entrepreneurship and also to include the temporal and cultural dimension in regional entrepreneurship research. For major proponents of the newly emerging evolutionary economic geography, path dependence is essential to their approach (Boschma and Frenken 2006, Martin 2010). Evolutionary thinking and concepts are at the core of evolutionary economic geography: new things emerge out of the old and if there is a visible link between the new and the old then path dependence arises.

So far, little has been done to link path dependence with entrepreneurship. Notable exceptions are Kenney and Burg (1999) and Brekke (2015). This can be explained with the overly structuralistic focus of the traditional model of path dependence, which left little possibilities to include any kinds of agents. This neglect of agents in path dependence also meant that the social and cultural aspects received little attention in the path dependence literature. In 1993, Grabher made a first attempt to include several dimensions by proposing three types of lock-ins: functional, cognitive and political lock-ins. Following his call would have allowed a reduction of the excessive focus on technological path dependence and to include additional aspects, but few have taken up this approach. Recently, scholars have started to distinguish between the traditional or canonical model of path dependence and a new model (and numerous variations of it) (Martin 2010, Simmie 2012). This new model has been used as the theoretical starting point to include local economic agents in path creation. This inclusion of economic agents and their actions requires a consideration of cultural aspects since local cultures shape locals' perceptions of what behaviour is accepted and desired. Individuals might very well have the technological knowledge to follow entrepreneurial opportunities, but if entrepreneurial activities are not desirable in a location they might decide not to act.

Before discussing the actual content of regional path dependence and how it can be used to study cultural aspects in regional entrepreneurship, we need to clarify its scope of literature. This has been proven difficult to do, but we need to know if regional path dependence is a concept or if it is more vaguely used as one element in other theoretical concepts. This distinction is important to make since it has strong implications for what constitutes this model of regional path dependence. We need to know what I am actually applying to study cultural aspects in regional entrepreneurship.

One can divide the literature into two categories according to how path dependence is used. In the past, we have seen that path dependence has been used as a concept in its own right. This includes theoretical papers which aimed to advance the concept, but also (mostly empirical) papers which mentioned the term quickly without any further definition, assuming that the concept was well-defined in the literature (Fredin 2014). Nowadays, owing to the popularity of the concept, path dependence (or variations of it) is described as particularly history-driven, self-reinforcing mechanisms which allow the inclusion of a time dimension in other theoretical models. The latter understanding would make it immensely difficult to grasp the path dependence literature. While the concept was not particularly well-defined to begin with, its boundaries have been diluted even more. If path dependence is not a concept on its own but a mechanism which is used to explain other theoretical models such as product life-cycle or its most prominently related variety, it becomes an almighty process to try to grasp everything.

In my dissertation, I treat path dependence as a concept in its own right with relevance for other theoretical models. I will therefore focus on the literature using path dependence (or newer variations) more explicitly, but at the same time refer to a smaller extent to the possible relevance of other theoretical models.

Lack of entrepreneurs in the traditional model of regional path dependence

While there is no place for entrepreneurship in the traditional model of regional path dependence, this traditional model still needs to be addressed. The newer model(s), which allow for agents and their purposeful actions, are grounded in this traditional model and some of the conceptual assumptions were transferred from the traditional to the new model(s). Hence, in order to be able to understand the newer model(s) we need to understand its origins. Figure 2 depicts the traditional model of industrial path dependence.

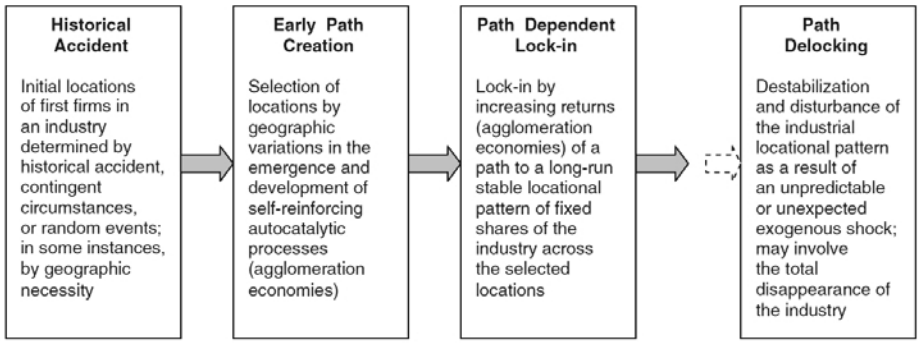


Figure 2: Traditional model of path dependence (Martin 2010: 5)

Since the introduction of the concept to social science in the 1980s, the frequent use and misuse of the concept in many different disciplines led to an erosion of its theoretical foundations. To date, there is no general theory of path dependence in any discipline, but there is a broad consensus that the concept highlights a causal process that moves along a certain trajectory which is relatively predefined by earlier events (Strambach and Halkier 2013). Owing to its potential explanatory power of the past, the concept of path dependence provides a highly relevant perspective to explain the evolution of the economic landscape despite the lack of agents. Its basic mechanisms have a local dimension and a path-dependent process must therefore be seen as locally embedded. In that sense, the concept of path dependence puts the evolutionary perspective in economic geography (Boschma and Frenken 2006). Despite its popularity, a concise definition is still missing in the literature, but the maxim most commonly referred to is that history matters. Such broad conceptual boundaries however diminish the potentials of the concept to be used as meaningful interpretative lenses (Page 2006). It is therefore crucial to go beyond the description of past dependence (Sydow et al. 2009).

Critics of the traditional model of path dependence have highlighted the uncritical use of the concept. This uncritical use is no rare occurrence in social sciences, but has been highlighted frequently across different disciplines (Markusen 2003, Lagendijk 2003, Alvesson and Sandberg 2011). Concepts are interpretative lenses which are formed by several core assumptions. These will provide some prejudice about the subject to be studied. Hence, the choice of concept will determine what the researchers will be focusing on. Without an initial understanding of the concept, there would be no guidance what to look for, how the study should be designed and how to analyse the material. It is therefore of utter importance that the

researcher is aware of the core assumptions which will shape the analysis. Often, however, these core assumptions are taken for granted and remain unchallenged in the literature, resulting in a largely uncritical use of the concept itself (Alvesson and Sandberg 2011). In that sense, prejudices are reproduced and small conceptual advancements are made on unchallenged premises.

As a next step, I will now identify the core assumptions which form the backbone of regional path dependence. Core assumptions are the ideas which are most central in the literature. I searched across different papers to see if they have anything in common. Additional, previous literature reviews on path dependence provided some guidance which common grounds could be identified in different research streams (Martin and Sunley 2006, Henning et al. 2013).

Table 1 shows these core assumptions, how they are described in the most influential empirical papers, their critiques and what limitations this potentially imposes for the human agency perspective. These core assumptions are already (partly) identified as problematic in the literature. By that, it is already acknowledged that important contributions on the topic can be made. The regional path dependence papers have been identified through a search in different databases, such as Web of Knowledge, SCOPUS and ScienceDirect. Table 1 includes the most influential papers, i.e. those which are cited between 22 and 345 times.

Table 1: Core assumptions of traditional regional path dependence

	External shocks	**Lock-ins**
Core assumptions	Exogenous shocks, which are random and non-purposive events, push a region along well-defined trajectories.	A region becomes locked in by self-reinforcing mechanisms into paths whose evolution is determined by chance events.
Key papers	e.g. Hassink 2005, 2007, Bathelt and Boggs 2003, Meyer-Stamer 1998	e.g. Hassink 2005, Bathelt and Boggs 2003, Kenney and Burg 1999, Meyer-Stamer 1998, Grabher 1993
Critiques	In many studies, too much focus has been placed on random accidents as the source of novelty (Martin and Sunley 2006). Explaining the consequential creation of new pathways as a serendipitous process undermines the search for causal explanations (Simmie 2012).	Most empirical research focuses on reinforcement of paths and lock-in situations (Henning et al. 2013) The core concept lock-in stresses continuity rather than change denying a true evolutionary perspective (Martin 2010).
Possible contributions through entrepreneurship studies	It is not enough to have exogenous shocks originating from external entrepreneurial activities, but local entrepreneurs translate these into local change. Purposive experimentation of actors lead to a new local path (Martin 2010). Multiple roles of different actors: state agency, entrepreneurial actors, firms (Dawley 2013).	Including ongoing entrepreneurial activities on the everyday base would challenge the traditional notion of lock-in. The path is a process, where path creation is a part of the ongoing, never-ending interplay of path dependence, path creation and path destruction (Martin and Sunley 2006).

Table 1 (cont.)

	Path disruption	**Regional path formation**
Core assumptions	Path dependence will lead to lock-in and therefore needs to be disrupted.	Regions are considered to be actors and by that one regional path exists. No conceptualization about the regional path to be studied is required.
Key papers	e.g. Fuchs and Shapiro 2005, Cooke and Morgan 1998, Storper 1995, 1997, Grabher 1993	e.g. Belussi and Sedita 2009, Hassink 2005
Critiques	Few empirical papers have looked at how new trajectories can arise from inherited knowledge (Henning et al. 2013). Most focus on the creation of new paths and by that the disruption of path dependency (Martin and Sunley 2006).	Few articles problematize how a region with a diverse economic structure can follow one single trajectory (Martin and Sunley 2006).
Possible contributions through entrepreneurship studies	If we consider path as a process, we need to investigate under which circumstances entrepreneurial activities lead to a more radical, rather than incremental change.	If the concept should be applicable beyond single-industry regions we have to discuss if numerous entrepreneurial activities across different industries can be summarized in one regional path. If not, how can we contextualize industrial path creation through entrepreneurship in regions with a diverse economic structure?

In its traditional understanding, regional path dependence is defined as a process where *random exogenous shocks* initiate well-defined, deterministic *regional industry trajectories* eventually resulting in *stable regional states* (lock-ins), which need to be *disrupted* before renewal can take place (Essletzbichler and Winther 1999, Kenney and Burg 1999, Meyer-Stam 1998).

The importance of external shocks which push the region along well-defined trajectories is the first core assumption to be identified (Martin and Sunley 2006). Although external shocks have been used frequently as the source of change in the literature, few concrete elaborations on the term have been made. It is not perfectly clear if the shock is meant to be external to the region or external to the path. External shocks might be the development of a new technology, decrease in demand or the oil crises (Hassink 2005, Meyer-Stamer 1998). These shocks are external to the region. An alternative view could be to see external shocks as external to the path. Explaining the consequential creation of new pathways as a serendipitous process undermines however the search for causal explanations (Simmie 2012). External shocks are most likely to influence numerous regions, but they might lead to a different outcome in each region due to the regions' different paths and sets of actors. The inclusion of local entrepreneurs allows us to analyse how and why these external shocks influence the local path. Entrepreneurs translate these exogenous shocks to local change, and the shape of this local change depends on the local preconditions and the capability of the entrepreneurs to introduce new combinations.

Another core assumption relates to one of the key terms in path dependence: lock-in. A region becomes locked in by self-reinforcing mechanisms, which are seen as becoming increasingly systemic forces beyond the control of the individual actor (Sydow et al. 2009). This however stresses the continuity of a specific process rather than change denying a true evolutionary perspective (Martin 2014). It is not the external shock which leads to lock-in, but the many entrepreneurial activities swarming around a newly emerging business opportunity. In that sense, lock-in can have both a positive and negative meaning. A path can only be formed when there is a sufficient number of entrepreneurs and other economic actors initiating similar activities. This might lead to a positive lock-in in terms of a specialized workforce, infrastructure and so forth. Positive lock-ins are therefore desirable and necessary because they lead to

knowledge accumulation, which might provide a competitive advantage. Entrepreneurs creating this type of lock-in might be described as Schumpeterian entrepreneurs, who enhance new competencies and introduce new combinations. Positive lock-ins can however turn into negative lock-ins when new technologies or decreasing demand makes the accumulated knowledge obsolete. There are numerous challenges when creating a new business and in times of uncertainty entrepreneurs often rely on existing routines and established models. Over time, entrepreneurial imitation reduces variability leading to or reinforcing negative lock-ins. In that sense, entrepreneurs have an important role in both types of lock-ins.

The core assumption has been to analyse the creation of new paths and by that the disruption of the path dependency (Martin and Sunley 2006). In the traditional literature, unpredictable exogenous shocks destabilize the local industrial patterns and might lead to the total disappearance of an industry. Frequently, the traditional path dependence concept has been used to analyse the development trajectories of former heavily industrialized regions. Most of these studies focus on external, shock-induced breaks with the past (Henning et al. 2013). Here, the development of a new path replaces the old, declining path. Hence, few empirical papers have looked at how new trajectories can arise from inherited knowledge (Henning et al. 2013). Entrepreneurship research however highlights the sectoral inertia of entrepreneurs, which suggests that entrepreneurs are not able or willing to shake free from their accumulated experience or knowledge (Stam 2010). The focus on exogenous shocks as sources of change allows the researcher to focus on a limited number of events to depict the regional path. Here, the regional path is depicted as a linear trajectory and illustrates the linear relationship between events that occur in a certain sequence and a certain time horizon. But, if we argue that entrepreneurs translate these exogenous shocks into local change we have to focus on everyday activities of the numerous local entrepreneurs. Instead of focusing on a few major shocks, the analysis shifts towards the power of many and might be more appropriate to see path dependence as a continuous process of alterations (Strambach 2010). This stresses a continuous change or renewal where the path is constantly evolving.

The fourth identified core assumption is the accepted understanding of regional path dependence. Most of the traditional path dependence literature with a geographical focus tend to be single industry-oriented. This is possible since regional path dependence studies analyse the path of a particular industry in one specific region or across different regions

(Bathelt and Bogg 2003, Kenney and Burg 1999, Boschma and Wenting 2005, Klepper 2002). The researchers are moving between the industry and the regional level, but the path of the industry becomes the regional path. It might however be difficult to summarize numerous entrepreneurial activities into one regional path, especially in regions with a diverse economic structure (Martin and Sunley 2006). If the regional circumstances are used to explain the local lock-in of the industry in question, it is essential to understand that path-dependent development might involve the complex co-evolution of interrelated industries.

The new model(s) of regional path dependence

Recently, the traditional model has been criticized and suggestions have been put forward how regional path dependence could be reframed. Martin's (2010) new model is highly cited and is therefore the theoretical departure point for many papers addressing a new framing of the model. This new model dismisses lock-in in its traditional definition and criticizes the accidental origin of new paths and the appeal to exogenous shocks for path disruption. Instead, pre-existing local economic and technological structures determine the path creation phase. Martin's (2010) suggested alternative model is depicted in Figure 3.

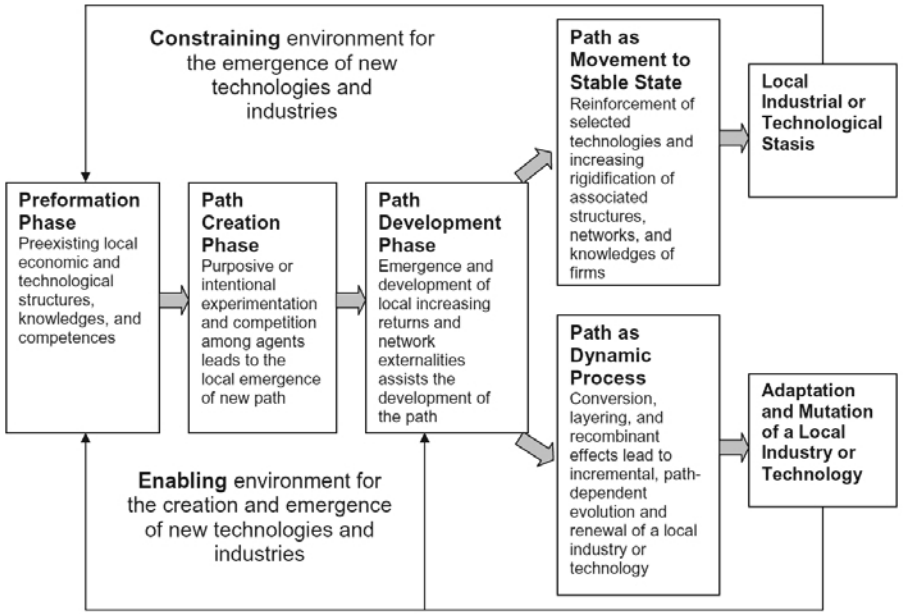


Figure 3: Alternative path dependence model of local industrial evolution (Martin 2010: 21)

In suggesting this new model of regional path dependence, Martin makes two main arguments: first, a shift from exogenous shocks to endogenous preconditions, and, second, an extension of the scope of the concept to different types of regions by highlighting constant adaption and mutation of a local industry. It is not perfectly clear if this new model is really to be considered an 'updated' version of the old model or if these two models are actually capturing different processes. The first criticism of the sole importance of exogenous accidents for local path dependence would certainly lead to an updated version. But the latter might not be as clear-cut, since it is criticizing the model being applied in a way which was never intended. This would imply that these are two different models.

Regional path dependence has been used in the past to explain the development of single-industry regions and their difficulties to adapt to changes which weakened the usefulness of their functional monostructures. Hence, by giving a central role to lock-ins, the traditional model of path dependence specifically wanted to explain one particular, admittedly rare, type of region. Martin's (2010) criticism wants to extend the range of the model by providing a framework which fits different kinds of regions. He does so explicitly by arguing that one of the two possible outcomes after the path development phase in his new model is 'emphasized by the

canonical path dependence model' (Martin 2010: 21). In doing so, Martin's argument actually leads to a further blur of the conceptual boundaries.

Martin's suggestion to extend regional path dependence to different kinds of regions ties in with earlier critiques. Martin and Sunley (2006) raises the question of whether it is most suitable to translate the industrial path to a regional path as in the case of single-industry regions such as the Ruhr region in Germany. Understanding path creation as a dynamic process with conversion, layering and recombination implies that there is a great change of branching out new paths. This understanding places better in larger agglomerations with different industry paths than single-industry towns. Several different industry paths in one region might still be able to be constructed as one regional abstract path, but the larger the number of industries, the larger the abstraction level needs to be. In large agglomerations, such as London and Paris, it might be difficult to defend the view that there is only one regional path representing the whole development in the region. Another possibility would be to acknowledge the existence of numerous paths and the regional dimension could be addressed by addressing the interplay between different paths.

While many scholars use Martin's new model as the theoretical starting point for their papers, many give suggestions on how the model can be developed further. Indeed, Martin (2010) acknowledges that local preconditions shape the environment within which local agents can act, but he does so only in the path creation phase and focuses in the other phases on rather deterministic self-reinforcing processes. Hence, Martin acknowledges the important role of agents for initiating new paths, but for the further path development he falls back on the structuralistic view of the old model.

Recently, scholars have therefore attempted to include a stronger agency-centred view in regional path dependence (Simmie 2012, Dawley 2014). In his 'hybrid socio-economic theory of new path creation', Simmie follows Martin's model, where initial local conditions 'are determined by previous rounds of the historical evolution of path-dependent technological development trajectories [and] path creation starts with mindful deviation of knowledgeable agents … defined as inventors' (Simmie 2012: 12). But Simmie also includes these knowledgeable agents in later phases of the path establishment process, as seen in Figure 4. Simmie's choice of 'previous rounds', however gives the impression that path dependence is not a continuous ongoing process but rather a sequence of processes with a starting and ending point. This observation would go against the newer

understanding of path dependence as constant change. Simmie also suggests that new path creation is initiated by 'inventors', while innovators stand for the path establishment processes.

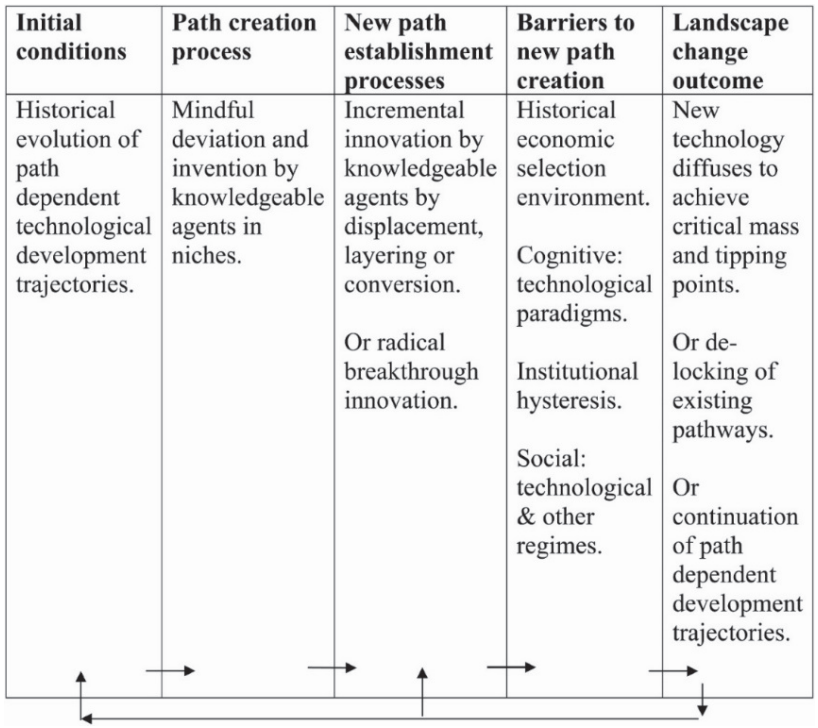


Figure 4: Hybrid socio-economic theory of new path creation (Simmie 2012: 764)

Defining the regional path as an industrial path, it makes sense to put an important role on economic agents, but the sole focus on economic processes and economic agents for path creation and path development centres on one particular and limited part of the context. The call for the contextualization of entrepreneurial activities is applicable to this stream of literature as well.

Simmie investigates a national industrial path where the triggering innovations were actually invented in the investigated spatial setting. Often, however, especially when taking the region as the level of analysis, inventions and innovations originate outside the given region and enter the region through global knowledge flows between organizations and individuals. In that sense, it might be somewhat problematic to tie path creation solely to inventions and innovations since innovation in terms of

a new technology is rarely endogenous to a region but often exogenous. In its extreme understanding, innovation is a rare, grand event, which would imply that these newer models still use shocks to alter trajectories rather than the everyday activities of many agents. This would go against the claim of the newer models to focus on continuous change and would lead us back to conceptualize entrepreneurs as heroes.

The attempts to include an agency-centred view refer back to the sociological approach to path creation by Garud and Karnøe (2001), which focuses exclusively on agents and their actions. In their line of argument, nothing is taken for given, but actors actively create their own circumstances and self-reinforcing mechanisms are not simply happening but are cultivated by actors. Ultimately, any observable processes or structures in the economic landscape are a result of actions. While Garud and Karnøe included only entrepreneurs at first, they later admitted other types of actors. Instead of implying that the region (and agents) is pushed into one particular path trajectory, we need to ask why and how agents initiated actions which allowed these self-reinforcing mechanisms to happen. One of the drawbacks of Garud and Karnøe's path creation might be their focus on path creation 'in real time'. This implies that there is a weak connection to the past and to the future. Such an understanding is in line with their claim that agents themselves create the circumstances for their actions through mindful deviation, which rejects the assumption that there are given structures. But this also means that the time dimension is excluded from their analysis.

It is easy to see why Garud and Karnøe argue that path creation and path dependence are two ontologically different approaches. Path dependence has a strong retrospective perspective. It highlights the explanatory power of the past and explains in retrospect why regions or industries developed the way they did. Path dependence can make no predictions about the future development, but can help us explain processes once they have happened. Path creation on the other hand focuses on the process in real life, but the potential outcome and preconditions are of no analytical interest. Lock-in and change have no place in this understanding of path creation, because these notions imply a relation to the past.

Economic geographers refer readily to Garud and Karnøe's path creation, but in this stream of literature path creation is mainly associated with activities that differ from past activities or 'shaking free from its own history' and by that establish a strong relationship between the past and the

present. In that sense, the same term or concept has been used in different ways.

Generally, recent critiques of the traditional model of path dependence have led to a search for a new terminology. Most scholars argue that it is unfeasible to put new meaning in the misused term of regional path dependence, but suggest that a new model should come with a new term. Currently the search for a new model goes along with a myriad of new terms: path creation, path development, path establishment, path constitution, path exhaustion, path extension, path renewal and path plasticity, to mention just a few. To add to the confusion, these terms are not yet well-defined and are used by scholars differently. Some use path creation as one phase of path dependence, while others see path creation and path dependence as irreconcilable, ontological differences.

The suggested shift from exogenous shocks to endogenous forces opens up the possibilities to include agents in a new model of regional path dependence. If we argue that each process is a result of individual actions, Martin's model does not do justice to the agency perspective. Garud and Karnøe's understanding however does not do justice to the past, and by that exchanges 'dependency' with 'creation'. This is not unique to path dependence literature, but it is rather common in social sciences that the discussion goes 'back and forth between … more structural and process-oriented accounts and those who place more emphasis on social agency' (Peck 2003: 733). There is no either/or in this matter, but both are two different sides of the same coin. Ultimately, it is the research question which determines the research angle. Scholars have identified this as a common problem in the social sciences and advocate for the need of both: structure and agency (Hudson 2003, Markusen 1999). The middle ground would be to accept that actors are embedded in structures, while at the same time their actions are changing these structures (Granovetter 1985).

These structures should not simply be the technological dimension. The traditional model has focused on the industry or technological path and did not include any other dimension. Reasons for this might be that the focus on exogenous shocks and the absence of agency does not require the consideration of other dimensions. Also, the new model(s) focus on the industrial path, but, if we argue that this industrial path is the result of entrepreneurial activities, focusing on the technological dimension is too limited. As early as 1993, Grabher made a first attempt to include several dimensions by proposing three types of lock-ins: functional, cognitive and political lock-ins. But few have taken up this approach and such discussions

can only be found occasionally in the new regional path dependence literature. (Hassink 2010, 2007). Also, here the empirical papers still focus on the technological dimension (Dawley 2013, Simmie 2012, Steen and Karlsen 2014).

In entrepreneurship, there is an increasing interest on how social structures are enablers or disablers of entrepreneurial activities (Greve and Salaff 2003, Hoang and Yi 2015, Jack and Anderson 2002). Further research should elaborate on the importance of different dimensions and their interplay.

How to understand regional path dependence in this dissertation?

After severe critique of the traditional model of regional path dependence, scholars are currently exploring different possible avenues of thought. Such a diversity of different understandings is necessary to test (and dismiss) different ideas which might constitute a more advanced model of regional path dependence. Unfortunately, this means at the same time that the literature is very confusing and we are further than ever away from a clear understanding of what regional path dependence really is. As a next step, I construct my own understanding of regional path dependence.

Sometimes things are more clearly defined by stating what they are not. Regional path dependence does not include all history, but needs to be restricted if it is to be used as an analytical tool. If we take on Martin's expanded view of path dependence as a continuous adaption process, path dependence becomes applicable to all regions, because all regions have change, albeit the degree of change varies greatly. In order to limit path dependence, we have to set boundaries on what we should study when we study regional path dependence.

A structure-agency approach. The discussion above shows that the newer literature does not acknowledge the importance of exogenous shocks for local path dependence or creation. While the traditional literature had an overly structuralistic approach, the newer literature is mainly dominated by an overly agential approach, with Garud and Karnøe (2001) being the most extreme example. Garud and Karnøe's (2001) understanding 'of actions in real time' does only limited justice to the past, and by that exchanges 'dependency' with 'creation'.

If we truly want to understand agency, we cannot separate agency from the existing structure. Also in this case 'both/and' approaches are to be preferred to 'either/or' approaches. Instead of placing so much effort on how to keep agency and structure separated it might be more fruitful to

investigate how these two parts are influencing each other. The middle ground would be to accept both that actors are embedded in structures and that their actions are changing these structures (Granovetter 1985). While the structures are indeed constantly changing, they do so very slowly. This is precisely why the structure cannot be excluded from an agency-centred view of regional path dependence.

Transcend the technological dimension. These structures should not simply be technological or industry structures. The traditional model has focused on the industry or technological path and did not include any other dimension. Reasons for this might be that the focus on exogenous shocks and absence of agency does not require the consideration of other dimensions. As early as 1993, Grabher made a first attempt to include several dimensions by proposing three types of lock-ins: functional, cognitive and political lock-ins. But few have taken up this approach and such discussions can only be found occasionally in the new regional path dependence literature (Hassink 2010, 2007). Also, the new model(s) focus exclusively on the industrial path (Dawley 2014, Simmie 2012, Steen and Karlsen 2014), but, if we argue that this industrial path is the result of agency, focusing on the technological dimension is too limited. Much of the newer literature considers companies instead of individuals as agents of change. This might further explain the focus on the technological dimension in the newer literature.

Taking on an agency-centred view of regional path dependence, which considers embedded individuals as agents, would therefore require a cultural dimension. The industrial structure is the outcome of individual decisions and these decisions are influenced by cultural aspects. Saxenian's (1994) study of two US business communities, Silicon Valley in California and Route 128 in Massachusetts, is a well-known example of how regional differences in culture can influence the entrepreneurial decisions and by that the regional path. Entrepreneurs, just like any other individual, are social creators, which implies that it is not only irreversibility of investments and scale of economies that lead to path-dependent behaviour but also routines, regimes and norms.

Power of many. A stronger agency-centred view of path dependence would also require an analytical shift from a few grand events or shocks to multiple events and actors. The technological path in the traditional literature is depicted as a linear trajectory where a few events occur in a certain sequence. While the new literature opened up the prospect for multiple actors in the path creation phase (Martin 2010, Simmie 2012), the

further path development or path establishment processes are once again restricted to a few actors. This can be explained with their dominant focus on entrepreneurs and their innovations. The introduction of an innovation might not result in new path creation, but the dissemination of the innovation and the swarming of other entrepreneurs around this newly emerging business opportunity will. Focusing on the context of entrepreneurs also means that the action of one entrepreneur might create opportunities for another (Stam 2009). In that sense, paths do not develop from isolated actions, but from a collection of actions that concentrate along a certain direction.

This might also challenge the excessive focus on entrepreneurs and firms in the new literature. Innovations are defined as the starting point of a new path, which justifies the argument that entrepreneurs play a crucial role. While they may indeed play a crucial role, this should not mean that entrepreneurs are the only important actors. Acknowledging that entrepreneurs are socially embedded actors and not isolated heroes (Jack and Anderson 2002, Ulhøi 2005), the development of the path-changing innovation itself requires the inclusion of several enabling actors. In that sense, I argue that we should analyse the actions of individuals rather than companies or other types of organizations.

Why path dependence to study cultural aspects in regional entrepreneurship?

Entrepreneurship research can gain new insights by analysing entrepreneurship through the theoretical lenses of path dependence. It will help us to better understand how and to what extent the entrepreneur and her decisions are influenced by the past, and at the same time also how and to what extent entrepreneurs create their own business conditions. Owing to its strong explanatory power of the past, path dependence might have the potential to bring the temporal and historical context to entrepreneurship research. Regional conditions that affect entrepreneurship reflect path dependence and include the importance of entrepreneurial activities as a social product, the region's industrial structure (Brenner and Fornahl 2008, Klepper 2007, Feldman 2003), the region's dominant entrepreneurial culture (Wyrwich 2012) and the region's size. Culture in particular displays a strong path dependency. It is difficult to unlearn things and change the perception about what is possible and what is not.

Few have explicitly explored the potential link between entrepreneurship and path dependence (Brekke 2015, Brenner and Fornahl

2008, Staber 2005, Kenney and Burg 1999). Owing to the individual-level focus in entrepreneurship research and the lack of agency in path dependence, in the past these streams seemed to be irreconcilable. Over the past years, recent turns in both fields opened up the possibilities for joint discussions. This would be beneficial for both fields: the contextualization turn in entrepreneurship demands the inclusion of structure, while at the same time the recent agency turn in path dependence research opens up the possibility to include strong (economic) agents. There are numerous potential agents and their roles that should be discussed in path dependence, but in the literature regional path dependence is almost exclusively linked to the path trajectory of an industry or a technology. This gives a special importance to the actions of economic actors such as entrepreneurs. Also, the increasing interest on the role of culture for regional entrepreneurship opens up possibilities to join the entrepreneurship and path dependence literature.

Path dependence is ultimately place dependent, raising special implications for the relationship between entrepreneurship and the place to be studied. Entrepreneurs are either outsiders or insiders to the path. Relating these two possible types of entrepreneurs to the continuity and change of path dependence, Table 2 shows the possible outcomes.

Table 2: Relation between entrepreneurship and regional path dependence

		Regional path dependence	
		Continuity	*Change*
Entrepreneurship	*Outsiders*	Assimilation: Outsiders strengthen the continuity of established trajectories.	Transfer: Outsiders transfer their knowledge to the location and new trajectories are initiated.
	Insiders	Embeddedness: Insiders are embedded in the local context that other alternatives are impossible to identify.	Disintegration: Insiders can see beyond the local context and identify alternatives.

The activities of both insiders and outsiders have the potential to introduce change, but it might be more likely that outsiders initiate activities outside the established regional path. These individuals come from a different setting, which might enable them to interpret things in a different way. In other words, outsiders might act in ways other than those prescribed by existing social rules.

The literature shows general tendencies that traditional path dependence emphasizes continuity while the new framing emphasizes agency and change. There might also be a thin line between continuity and change. If one wants to focus on the structural embeddedness of entrepreneurs one would emphasize how the entrepreneur uses *existing* resources and institutions to create their own conditions (continuity). If one however wants to focus on the Schumpeterian entrepreneur as an enabler one would emphasize how entrepreneurial activities are initiating *new alternatives*. Some scholars started to differentiate between path creation and path renewal (Isaksen and Trippl 2014). Path creation refers to the development of entirely new paths while branching out of existing industries or technologies to related activities can lead to path renewal. There seems to be little place for the true Schumpeterian entrepreneur in path renewal, but she is most central in path creation. If such a differentiation should be made, Table 2 needs to be extended into a more nuanced relationship between entrepreneurship and regional path dependence as seen in Table 3.

Table 3: A nuanced relationship between entrepreneurship and regional path dependence

		Regional path dependence		
		Path continuity	*Path renewal*	*Path creation*
Entrepreneurship	*Outsiders*	Assimilation**:** Outsiders strengthen the continuity of established trajectories.	Modification: Outsiders' activities modify the local context and initiate further but related activities based on the information they bring with them.	Transfer**:** Outsiders transfer their knowledge, culture and experience to the new location and entirely new trajectories are initiated.
	Insiders	Embeddedness**:** Insiders are embedded in the local context that other alternatives are impossible to identify.	Adjustment: Insiders adjust the local context and initiate new, but related activities based on new information gained through their global and national networks.	Disintegration: Insiders can see beyond the local context and identify entirely new alternatives.

New combinations might more easily emerge owing to the activities of entrepreneurial outsiders rather than insiders. Especially if the outsiders are both social and geographical outsiders, they might bring new knowledge to the region and might also be to a higher degree unaware of the constraining environment. They might be simply unaware about established local routines or behaviours which determine what is possible and what is not possible in the region. At the same time, outsiders might not be able to make use of the enabling environment. Owing to possible exclusions of local networks, it might be more difficult to activate the local potential for

their own activities as an outsider. This might be more pronounced in path creation than in path renewal owing to the radicalness of new activities. In that sense, the same environment can be enabling or constraining depending on the entrepreneurial activity in question.

Martin (2010) distinguishes in his new model between enabling and constraining environments, which determine if the path will converge towards a stable state or a dynamic process. There is a need to specify further what makes a context enabling or constraining for entrepreneurial activities in a region (Dawley 2014). This ties back to a prominent research question in entrepreneurship studies which investigates under which circumstances entrepreneurial activities turn into radical or incremental innovations.

RESEARCH DESIGN

Philosophers of science agree upon that research findings are determined by the philosophical paradigm of the researcher and the used methods. In any discipline, there will always be certain underlying philosophical tendencies guiding the researcher. These tendencies involve the nature of social knowledge itself or the nature of social reality. Hence, it is immensely important to present and discuss the prevailing paradigm as well as the selected method. Quantitative methods allow us to establish if there is a relation between two variables, while qualitative methods are used to seek answers to why these relations occur and how they are formed. The objective of this dissertation is to investigate how social aspects influence entrepreneurial activities by studying how culture influences behaviour. In order to do so, a qualitative research approach is the suitable choice of method. Qualitative research allows us to see social life as processes rather than static entities and can help us to understand the complex relationship of an embedded phenomenon.

Varieties of social explanation: different ways of knowing and learning about the social world

Social scientists have discussed many important relationships that add greatly to our understanding of social behaviour and problems. Nonetheless, there seems to be no single, accepted way of doing qualitative research (Snape and Spencer 2003). Some qualitative researchers follow the natural science model, where the phenomena to be studied are seen as independent of the researcher and consequently the researchers are objective and their results are value-free. Most qualitative researchers however believe that researchers somehow affect the phenomenon to be studied. Findings are either mediated through the researcher or are created through the interaction between researcher and research participants. This relates to the heavily debated issue of 'truth'.

Questions related to if there is a truth out there and how this truth can be understood and discovered goes back many centuries. Since then many schools have emerged. Positivism, postmodernism, interpretivism and critical realism are just some of the different methodologies which are heavily debated, each offering a different understanding on the nature of knowledge and reality. Social sciences in general have been dominated for a very long time, albeit now to a lesser extent, by an 'unhappy dualistic perspective' (Danermark 2002: 2), where different approaches are

contrasted: qualitative vs. quantitative, positivism vs. hermeneutics, to mention just a few. It seems that researchers need to define themselves into one school rejecting the contributions of others. This 'either/or' approach is now increasingly challenged by the 'both/and' approach. More efforts should be made to make a thorough and concise investigation and less effort to mark one's territory.

This study deploys indeed exclusively qualitative methods, but this is not to dismiss a quantitative approach. My choice of method is simply guided by my interest in particular research questions which cannot be captured by quantitative methods. Understanding this rich array of different philosophical paradigms as an intellectual challenge, I am reluctant to define myself into one particular one. I strongly believe that these many different forms of research approaches, each shaped by different epistemological origins and philosophies about the nature of scientific inquiry and its outcomes (Lewis and Ritchie 2003: preface), is one of its greatest advantages. These different 'schools' create different philosophical debates which should be used to stimulate methodological awareness rather than postulating them as 'true' perspectives (Seale 1999).

My particular approach to qualitative research is based on two central understandings. First, I believe that there is a 'real' out there which can be captured in terms of social constructs, beliefs and behaviours. This real, however, is a multifaceted one and is constantly changing. This stresses once more the importance of including temporal and historical dimensions. Second, my background will to some extent guide what I am looking for in the analysis. Hence, the same phenomenon can be studied from different angles, providing a more multifaceted, but complementary, picture of the same phenomenon. The reflexivity approach, as discussed in a later section, will provide guidance on how to conduct the qualitative research in a rigorous way. This is also why I dedicated a whole section describing my analytical process in each of the individual papers.

In that sense, I might be close to the critical realism. This movement in contemporary philosophy of science is most closely associated with the work of Roy Bhaskar (1979). A critical realist is a realist because she challenges the postmodernist view that researchers attempt foremost to construct narratives instead of uncovering the truth (Cruickshank 2003). Critical realism relates to the question of whether there is a reality out there which lies outside human consciousness. Critical realism acknowledges

> *that there exists both an external world independently of human consciousness, and at the same time dimensions which includes our socially determined knowledge about reality.* (Danermark 2002: 5–6)

In other words, there is a world out there which can be observed as real, but it might be difficult for us to capture this since we are informed by socially constructed knowledge or subjective experiences. 'The real' in realisms refers to two things:

> *First, the real is whatever exists, be it natural or social, regardless of whether it is an empirical object for us, and whether we happen to have an adequate understanding of its nature. Secondly, the real is the realm of objects, their structures and powers. Whether they be physical, like minerals, or social, like bureaucracies, they have certain structures and causal powers, that is, capacities to behave in particular ways, and causal liabilities or passive powers, that is, specific susceptibilities to certain kinds of change.* (Sayer 2000: 11)

Critical realism does not claim that an ultimate truth can be discovered, but claims that more knowledge will enable us to do better informed interpretations of reality. The theories we apply to interpret this reality are fallible which means that our interpretations might change. This means that research is an ongoing process. Theories are considered temporary and are constantly revised. A critical realist thrives to understand and explain reality, but will never reach the real.

In order to illustrate this discrepancy between the not-observable real and our interpretations, Bhaskar (1979) suggests three different domains: the real, the actual and the empirical. The 'real' world is not observable, the 'actual' refer to events as observable phenomena and the 'empirical' constitutes of the subjective experiences of these events (Sayer 2000). In that sense, a critical realist is striving to move from 'the empirical' and 'the actual' to 'the real', but will never succeed in doing so.

'Critical' in critical realism refers to the acknowledgement that the researcher and the object to be studied are informed by ideas or assumptions which may or may not be true. In that sense, social scientists should not simply reproduce uncritically explanations which are based on these assumptions, but should critically question not only the explanations, but also these guiding principles which lead to these explanations. Hence, data triangulation is an important technique in critical realism. Researchers

are biased, their experiences subjective and our interpretation of reality through theories is fallible. In order to eliminate these biases, analysis should rest on knowledge from different sources: multiple data sources to ensure the accuracy of data, exchange with other researchers to increase awareness for different interpretations and theoretical triangulation to see how our interpretation might change due to differences in our interpretative lens.

Compared to other philosophical stands like positivism and interpretivism, critical realism does not limit itself to specific research methods (Danermark 2002). The choice of method should be guided by the nature of the study object and what aspects are to be investigated. In that view, qualitative and quantitative approaches are seen as radically different, but nonetheless complementary. A critical realist also rejects the view that methods are an objective tool which can simply be applied. Social systems are open, complex and messy. If we want to make sense of these complex interactions, we need to abstract out certain components before we can identify how they are combined and interact.

In that sense, there are many ways within which the critical realist is interacting with the object to be study, though this is not because she wants to interfere but because it is a necessity owing to the complex nature of the open social system. The research process is not guided by cookbook prescriptions, but the research process itself is case-specific. Hence, before the investigation starts, the future is open. The critical realist is aware that the study object and its context itself will influence the research process, but will take appropriate measures to ensure the quality of the study.[3]

The quality in qualitative research

The case study approach

Different techniques and methods are available for exploring the topic at hand. But each method is useful for investigating different research questions of the same topic. In that sense, the chosen research question determines which method and data are most appropriate. It is therefore immensely important to be aware of the different methods and their appropriateness for the research question. Case studies would be the preferred method for investigation when (1) the main research question is a ‘how’ and ‘why’ question, (2) the research question requires an in-depth

[3] What measures are estimated to ensure this quality is discussed in a later section.

description of a social phenomenon and (3) the researcher has little or no control over behavioural events (Yin 2013).

The research question at hand is less concerned with relations between agents, but emphasizes an in-depth study of a contemporary social phenomenon and its contextual conditions. Hence, the case study approach has been chosen as the most appropriate method.

There are certain challenges one has to be aware of when doing a case study. How to draw the boundaries of the case study is always an issue. First of all, the boundaries between the phenomenon to be studied and its context might not be clearly obvious. In particular, when studying the phenomenon in its context the boundaries might be blurry. For analytical purposes, it is however important to be aware of these borders. Another challenge is doing good case study research. This ranges from selecting a good case to the actual conduct of the case study. Although there are handbooks published which provide guidance to the researchers by proposing a set of desired procedures, the process itself remains challenging. Much remains in the ability of the researchers to do case studies and the application of systematic procedures. This means that it is vitally important to clearly display the systematic procedures of data collection and analytical process.

As for many other methods, the case study approach is the subject of critiques and misleading assumptions, which Flyvbjerg (2006) summarize under the following five headings: (1) Objective, context-independent knowledge should be preferred over concrete, context-dependent knowledge, (2) results are ungeneralizable due to the small number of cases, (3) case studies are useful for generating hypotheses, but not for theory-building, (4) case studies tend to confirm a researcher's preconceptions since the researcher's own interpretations are given too much scope, and (5) it is difficult to summarize very specific case studies owing to the richness of data and complexity (see Flyvbjerg 2006 for a more detailed discussion).

I would like to address two misleading assumptions, numbers (2) and (4), in more detail, since these were most frequently used to question my choice of method during my PhD. Each qualitative researcher will have, rather frequently, met requests from others, both quantitative and qualitative scholars, to draw generalizations from one's work and subsequently also engaged in discussions clarifying the extent to which generalizations can be drawn from qualitative work. Especially when investigating single case studies, the immediate question is always: what

generalizations can be drawn? This request for generalization seems to evolve into a quality criterion for qualitative research. Somewhat paradoxical is the request for generalization, when (the same) scholars argue at the same time that qualitative studies in general, and case studies in particular, only offer thin grounds for generalizations.

We might debate whether the claim that no generalizations can be drawn from case studies is true or not. But it depends on how generalization is understood. Social scientists are rarely able to control the environment in the same way that natural scientists do during their experiments in clean rooms. So, no, we cannot draw universal laws from case studies, but this is not unique to case studies. No social scientist can, because 'predictive theories and universals cannot be found in the study of human affairs' (Flyvbjerg 2006: 224). But case studies can show general tendencies which are worth being investigated more. In one published article, I explicitly state that I do not attempt to draw generalizations, but that this is an exploratory case study which intends to highlight certain issues worth further investigation.

It is debatable whether qualitative investigations without generalizable conclusions are not noteworthy contributions or, as Eysenck (1976: 9) puts it, '[s]ometimes we simply have to keep our eyes open and look carefully at individual cases – not in the hope of proving anything, but rather in the hope of learning something'. Hence, formal generalization should not be considered as the only legitimate method, but we should be aware of the limitations which such an understanding would pose.

One way to contribute to the generalization debate would be the use of replication studies. Replication studies are used frequently in the natural sciences, but they are not accepted to the same extent in social sciences (Schmidt 2009), where originality is valued highly. Replicating another's approach in e.g. another institutional setting, or at another time does not seem to fulfil this requirement for originality. But, for the same reasons that case studies offer seemingly 'thin grounds for generalizations', replication studies might enable us to draw 'more robust' generalizations from case studies. This might in particular also benefit scholars who investigate how contextualizing entrepreneurial activities will enhance our understanding of the how and why of the entrepreneurial process. This context is constantly evolving since actions will alter the very context within which they have occurred. But context is also place-specific. Hence, before generalizations can be drawn, several replication studies might contribute for the larger picture to emerge.

The other misleading assumption addresses the issue of biases: the statement that case studies are biased and tend to confirm a researcher's perceptions ties back to the objectivity–subjectivity debate, simply another of many 'unhappy dualisms' in social sciences. Qualitative researchers, especially those who are close to critical realism, accept that researchers cannot simply apply a method, but need to have scholarly knowledge of the study object in question (Sayer 2000, Yin 2013). Criticism is frequently raised that this prior knowledge forms a preconceived understanding about the topic of investigation and therefore that case studies tend to confirm these preconceptions. Such criticism would deny that case studies have their scientific rigour, which is of a different nature than other methods but by no means less strict (Flyvbjerg 2006). The interpretative researcher does acknowledge that her presence alone or interaction with interviewees or individuals on site is influencing what is happening. Case study research has over the past decades made great progress in developing stronger rigour precisely to ensure the quality of the study. Data triangulation, or multiple sources of evidence, is central to a case study approach and can counteract biases in researchers' collection and analysis of the data. Criticism of case studies on this misleading assumption would also deny that researchers who deploy case studies have the same ethical standards as any other researcher. Precisely because the case study researcher is aware of the issue of biases, the trail of evidence needs to be flawless. In a later section, I will discuss closer the issue of how biases in case studies can be counteracted by reflexive interpretation (Alvesson and Sköldberg 2000).

The empirical part of this dissertation is based upon the analysis of two case studies, namely two Swedish cities, Norrköping and Linköping, which are situated within the same region and are of comparable size. Linköping's economic development is driven by a combination of small and large high-tech companies and is often referred to as an entrepreneurial success story in Sweden. Norrköping's economic development, on the other hand, was based on the long-standing dominance of a few large manufacturing companies in the textile and paper industry. Until recently, the latter was a declining city waiting for its entrepreneurial turn. In a recent survey by the Confederation of Swedish Enterprise (CSE) investigating the business climate in all 290 Swedish municipalities, Linköping ranks 35th, while Norrköping places 160th in the overall ranking. These two apparently polar cases within the same region are two good examples for theorizing general conclusions on the interplay between entrepreneurship and local context.

Challenges with qualitative interviews

Most qualitative researchers use information gained through interviews (Silverman 2006). Interviews should not be seen as 'a superior technique for tapping subjects on their knowledge about their experiences and/or social practices' because this view would neglect 'the interview situation as a socially and linguistically complex situation' (Alvesson 2003: 14). Furthermore, the language itself is here an unreliable variable. The spoken or written word always carries ambiguity. Language should not be understood as a transmitting medium of the 'truth', but rather should be considered to produce versions of the world 'out there' (Alvesson 2003). To complicate the situation even more, the interview situation itself is a construct.

While observations give the researcher direct access to the phenomenon studied, interviews offer an indirect link through the interviewee. The interviewees usually communicate their own specific interpretation of the world. The perceived information is already processed and interpreted once; this is through the filter of the interviewee, however, and not through the filter of the researcher. While the interviewee might not be aware of his or her own filters, the researcher needs to identify these filters. Furthermore, the interviewee most likely has an own agenda. Consequently, the interview can be used to consciously communicate a certain opinion. In other words, the interview data already carries at this stage the imprint of the interviewee (Alvesson 2003). Furthermore, the interview data is a product of the constructed interview situation. Silverman (2006) refers to it as researcher-provoked data, which would not exist without the researcher's intervention. In conclusion, data provided by the interviewee needs to be approached carefully.[4] Despite such critiques, interviews are the most common method in qualitative research (Silverman 2006).

Open-ended semi-structured interviews are the main method for data collection in the empirical articles. This type of interview combines the advantages of both open style and structured interviews while at the same time eliminating some of their respective disadvantages. Before the interviews, it was identified which information was required to be able to discuss the aim of this dissertation. Some questions were formulated beforehand to ensure that the main topics are covered and that somewhat comparable information was collected through the numerous interviews.

[4] These are just a few of many pitfalls. For a more comprehensive discussion, see Alvesson (2003).

Each of the prepared questions was used to enter a new topic, but the follow-up questions mainly emerged in dialogue with the specific interviewee. This allowed for topics to emerge which were not anticipated by me prior to the interviews. This also meant that after each interview more questions were added or adjusted. Each of the interviews was summed up, with the opportunity for the interviewee to raise additional points which she thought was important but had not been touched on during the interview.

One of the challenges with qualitative interviews is to capture general tendencies, while at the same time acknowledging the voice of each interviewee. In order to eliminate the pitfall that the analysis is based on the statement of one or few interviewees which might not reflect the majority, one of the priorities of the data analysis was to divide the statements into individual perspectives, which represent one or a few individuals, and group perspectives, which represent the majority of the interviewees or specific sub-groups, such as entrepreneurs or municipal employees. This differentiation has been highlighted in the individual papers.

The aim of this dissertation is to capture the self-reinforcing mechanism between regional conditions and entrepreneurship. Interview partners were therefore mainly entrepreneurs, representatives from the respective municipalities, university employees, established companies, trade unions, political parties and numerous entrepreneur support organizations such as science parks or innovation networks.

In both cases, I was interested in collecting information about events which took place more than 35 years ago. The interview partners have been mainly those which remained in the cities. This might raise a potential bias in interview partners. In order to avoid too strong a focus on 'locals', who feel comfortable in their city, I have also contacted entrepreneurs or municipal employees who were moving away. These interviewees might give a different picture than the 'locals', because of the events that led to the decision to move away.

Issues of reliability and validity in qualitative research

The core of qualitative research is interpretation. The same information/data can be interpreted from different angles, offering complementary views on the same topic. The reliability and validity of qualitative research is therefore constantly challenged. Some qualitative researchers avoid the issues of validity and reliability of their qualitative

findings by arguing that 'scientific control would distort reality' (see Hammersley and Atkinson 1983). Others criticize this view, arguing that it is exactly such a scientific control which distinguishes a researcher from a journalist (Silverman 2006). Nowadays, most qualitative researchers agree that we need a concept for evaluating the research process and standards. The traditional criteria of methodological adequacy and validity have justified the use of quantitative methods in the social sciences for many decades, but it has been proven difficult to transfer these criteria to qualitative research (Altheide and Johnson 1994). Some form of quality assessment is needed, but there is some disagreement about how this assessment should be constructed. Some scholars propose different kinds of validity (Kirk and Miller 1986, Atkinson 1990, Guba 1990), while some argue that the traditional concept of validity needs to be replaced with an analogous concept in qualitative research (Guba and Lincoln 1989, Silverman 2006).

In the traditional understanding, reliable findings are findings which are repeatable and generalizable and are therefore valid (Kvale 1989, Altheide and Johnson 1994). Findings, in turn, are repeatable if they are objective. In other words, reliability means that same findings can be revealed independently of the perspective it is approached from (Kirk and Miller 1986, Kvale 1989, Hammersley 1992, Silverman 2006). For a positivist, a finding is valid if it correctly mirrors the world 'out there', while objectivity is strongly linked to the importance of non-biased data collection and analysis (Madill et al. 2000).

In qualitative research, the research process itself rather than the results are the centre of attention (Kvale 1989). Instead of discussing the validity and reliability of results, as in quantitative research, the qualitative research should be concerned with the validity and reliability of the research process. Qualitative research starts from the perspective of the subjects studied (Alvesson and Sköldberg 2000, Denzin and Lincoln 1994). It is therefore often described as flexible, since the research process should acknowledge the specific situation and context of the subject. Or, as Brinberg and McGarth (1985: 13) stated,

> *Validity is not a commodity that can be purchased with techniques.... Rather, validity is like integrity, character, and quality, to be assessed relative to purpose and circumstances.*

Placing the research process in the centre of attention, Alvesson and Sköldberg (2000) have put forward 'reflexive interpretation'. Reflexivity

basically demands that the researcher should constantly challenge the interpretations and the own chosen framework (Alvesson and Sköldberg 2000). The researchers should ask themselves continuously if the phenomenon can be interpreted in another way or if another perspective would lead to a different interpretation.

> *Reflexivity means thinking through what one is doing to encourage insights about the nature of social science and, especially the role of language, power/knowledge connections, social interests and ideologies, rhetorical moves and manoeuvring in the socio-political field play in producing particular accounts. It may also inspire creativity through opening up for new perspectives and providing reference points for what one is doing and to avoid or minimize certain 'harmful' aspects of research that follow from lack of reflexivity.*
>
> (Alvesson, Hardy and Harley 2008: 497)

The reflexive perspective acknowledges the role of the researcher in the research. Reflexivity accepts that the researcher is not a blank tool, but has imprints shaped by previous experience and by the social and cultural environment he or she is embedded in. This however does not mean that the researchers should impose their original frameworks. Throughout the whole process, the scientific and methodological framework should be constantly challenged. This ensures that the researcher approaches the phenomenon studied from different angles and does not simply rely on the first and most convenient perspective.

Reflexivity is very much linked to the research process. The key idea is here that reflexivity is an ongoing process. The text or data is constantly interpreted and reinterpreted as well as the researcher's own framework is constantly challenged. In other words, the hermeneutic 'basic circle' is constantly applied (Alvesson and Sköldberg 2000). Furthermore, throughout the whole process the researcher should critically strive to look behind the facade and look for new meanings to emerge.

Reflexivity acknowledges that the process is case-specific. The demand for reflexivity invites the researcher to be creative and to be open for new insights. These new insights are usually very much case-specific. Reflexivity encourages the researcher to be sensitive to these special circumstances.

In this dissertation, my procedure for the data analysis was based on reflexivity. If one relied on the first and most convenient perspective, the Norrköping case would have been a story of a declining industrial town with high unemployment and a dominant traditional industry. This perspective would however tell only one side of the story. The constant search for less obvious aspects of the same story revealed a more nuanced picture of different processes going on. One potential area for disagreement was the divergent perspectives of entrepreneurs and municipal employees. While entrepreneurs are eager to highlight their own accomplishments in an unpromising environment, municipal employees are eager to present a favourable image of early activities to stimulate and support entrepreneurship. Divergent perspectives were also offered by interviewees from Linköping and Norrköping. Owing to the close proximity between the two cities, and the presence of campuses of Linköping University in both cities, each interviewee offered their own perspective of the neighbouring city. Linköping interviewees described Norrköping as a struggling, old industrial city in decline, while Norrköping interviewees highlighted their city as a city in transformation.

Reflexivity was also immensely helpful in making sense of the interview data. After the data collection was done, each interview transcript was re-read several times. The information gained from other interviewees could place the individual statements into a larger context, contributing to a better and more nuanced understanding.

The research process

Reading the sections above might give the impression that research is guided by clear objectives and conducted as a linear step-by-step process. Doing research is however usually not a straightforward or neat process, but is rather messy and complicated. This is no exception. The articles in this dissertation are important milestones, but give little information about the process of my research. In this section, I would like to give an overview of the research process.

Selection process

The selection of the case(s) is essential to qualitative research. I had a vague idea that my research should be about entrepreneurship and regional development, but decided upon the theoretical angle after the selection of my cases. Right from the beginning of my PhD, I decided upon Norrköping and Linköping owing to their special characteristics. The cities are of

comparable size and are in very close geographical proximity in the same region, but have a rather different economic base. Linköping is known as the aviation capital in Sweden, while Norrköping has a great history as one of the country's largest manufacturing centres. When this dissertation was started, Linköping had an established reputation as a flourishing city, while Norrköping was in the process of redefining its economic base after many economic setbacks. The cities share the same university, Linköping University, which means that the same educational programmes for potential entrepreneurs were offered in both cities.

Figure 5: Map of southern Sweden

The different social and economic characteristics of the two cities led me to explore the social, or more specifically the cultural, dimension of a location and how cultural differences might shape entrepreneurial activities. What was striking after a first acquaintance with the cities was how the local stories were told. This was not only true of the locals, but it seemed that everywhere in Sweden people had a very strong opinion of the two cities. Linköping was exclusively described as a progressive city with thriving aviation and IT industries, as well as a large number of small technology companies. In that sense, Linköping was described as a vibrant city full of highly educated, innovative engineers and novice entrepreneurs. Norrköping on the other hand was described as a city in stagnation or even crisis which never quite managed to break free from its history as a traditional manufacturing centre. The city was dominated by the working class and the restrictive labour union.

Table 4: Key characteristics of the two cities

	Linköping	**Norrköping**
Number of inhabitants (2015)	146,000	130,000
Population change	1950–1990: +46% 1990–2010: +20%	1950–1990: +9% 1990–2010: +8%
Known as	Sweden's aviation capital	Sweden's Manchester
Distance to Stockholm, Sweden's capital	200 km	160 km
University established	Linköping University (LiU) in 1969	LiU – Campus Norrköping in 1995
Economic base in the 1960s	SAAB AB (computers, aviation), NAF (chemicals)	Paper industry, electronics manufacturing
Economic base in the 2010s	IT cluster, aviation cluster	Cargo handling, manufacturing industries

I could have chosen to focus on different pairs of cities in the different articles in order to stand on a wider base. I decided however to focus on two cities for comparison, since I was particularly interested in approaching the same empirical material from different theoretical angles and by that provide a deep rather than a broad analysis. It can also be assumed that a richer analysis was possible, since I got to know the cities over a relatively large time span of six years and was able to conduct several rounds of interviews.

Interviews – getting to know the cities from different perspectives

Altogether, 52 interviews were carried out with people from different groups in Norrköping and Linköping. Table 5 gives a short description of the interviewees. The interviews were carried out mainly in three rounds in the first half of my PhD study. The first round was conducted in the first

year of my PhD to get to know the cities and the local processes. The second round was carried out a couple of months later to collect a more nuanced picture of the two contexts. The data was mainly collected before the empirical articles started to take shape. During the first two rounds of interviews, I worked mainly on my theoretical article. In that sense, the aims of the three empirical articles emerged from the data rather than opposing a theoretical framework onto the two cases right from the beginning. The last round was aimed to sum up and complement some missing perspectives in the articles.

Table 5: Description of interviewees

	Position	**City**	**Geographical origin**	**Years active in the city**
IT industry (25)	Entrepreneur	Linköping: 12 Norrköping: 13	In-migrants: 11 In-migrants: 11	40 to 15 years 25 to 10 years
Municipality (8)	Civil servant	Linköping: 3 Norrköping: 5	In-migrants: 2 In-migrants: 1	30 to 10 years 55 to 40 years
University (6)	Researcher/ academic staff	Linköping: 4 Norrköping: 2	In-migrants: 3 In-migrants: 1	40 to 20 years 30 to 10 years
Established firms (8)	Management level	Linköping: 3 Norrköping: 5	In-migrants: 3 In-migrants: 2	25 to 15 years 40 to 15 years
Labour union (5)	Union representative	Linköping: 1 Norrköping: 4	In-migrants: 0 In-migrants: 2	35 years 45 to 20 years

Selecting the interviewees is of crucial importance as the choice of interviewees determines which stories will be told. This dissertation makes a strong argument for the contextualization of entrepreneurship and it is therefore of immense importance to capture not only entrepreneurs, but also to include representatives which shape this context for entrepreneurship. Table 5 gives a short description of the different groups of interviewees. I was aiming to find a balance between entrepreneurs and the other groups representing the context to avoid focusing too much on one side. The geographical origin of the interviewees was not a selection criterion, but it was striking that in both cases entrepreneurs were mainly newcomers to the city. In the Linköping case in general, most interviewees

were newcomers. This corresponds with local stories that there are no locals to be found in Linköping and is also reflected in the rapid growth rates of the population over the past century. In the case of Norrköping, most of the other interviewees were locals or moved from other Swedish industrial cities like Gothenburg and Eskilstuna.

The entrepreneurs from Linköping started their own companies in the IT industry between 1979 and 2000. More specifically, I have selected IT entrepreneurs, who can be described as representing the first and second waves of entrepreneurship. Figure 6 shows the number of university spin-offs in Linköping. The number of university spin-offs peaked around the beginning of the 1980s, which I describe as the first wave of entrepreneurship. The second peak, which marks the second wave of entrepreneurship, occurred after the mid-1990s. This decision was made to get a more dynamic view of not only how the entrepreneurial phenomenon entered Linköping but also how the context for entrepreneurs changed over the years.

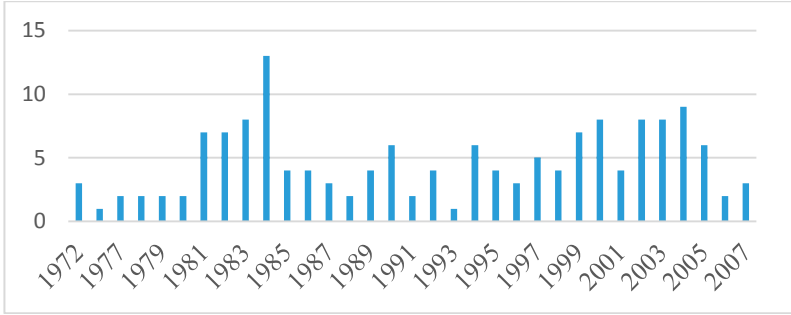


Figure 6: Number of spin-offs from LiU

The interviewed entrepreneurs from Norrköping started their companies in the IT industry between 1992 and 2010. It was important to listen to experiences from entrepreneurs who started their companies before and after LiU opened their Norrköping campus. The establishment of Campus Norrköping was an important event which resulted in an inflow of young individuals and also meant that entrepreneurs now had access to the established entrepreneurial networks of LiU.

COLLECTION OF ARTICLES

Summary of the articles

As stated in the introduction, the main objective of this dissertation is to argue for a stronger inclusion of the social dimension in regional entrepreneurship literature by conceptualizing culture as behaviour. This can be achieved by using the concept of regional path dependence as an interpretative lens when analysing the link between entrepreneurship and cultural aspects. In the following section, I will now give an overview of how the four articles address this main objective and address several limitations of previous studies, which have been identified and discussed in the theoretical framework. Figure 7 shows the alignment between the four articles and highlights their main focus points.

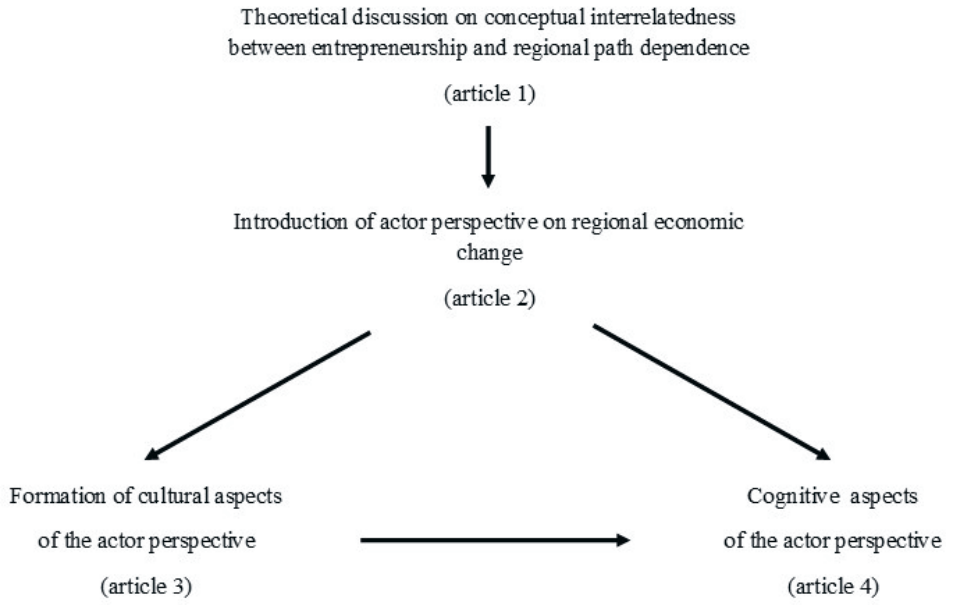


Figure 7: Article alignment

Overview of the articles

The first article is of a theoretical nature and links together the entrepreneurship and regional path dependence literature in order to gain more insights into the conceptual interrelatedness between the two streams of literature. If we want to explain the uneven spatial distribution of entrepreneurship, the core concept of evolutionary economic geography,

namely regional path dependence, might offer more insights. The theoretical discussion in this paper is required to sort out the different definitions and applications of path dependence as well as to show how the inclusion of (entrepreneurial) actors might require a different focus.

The second article follows up on the suggested actor perspective on regional economic change from the theoretical article and it also addresses the open question from the theoretical framework, which is how entrepreneurship is embedded in the geographical context. In this article, I follow recent calls for a more actor-centred view on local economic evolution, where individuals and their actions rather than processes, organizations or networks are the starting point of regional and local economic development. While the social dimension of entrepreneurship is not the main focus of this article, it introduces several social aspects which are discussed in-depth in the following articles, namely how a supportive environment legitimizes entrepreneurial activities. In that sense, Article 2 provides the structural framework for Articles 3 and 4.

In Article 3, I focus on the social dimension of the actor perspective and dwell deeper on the issue of how the formation of a distinct local culture influences the entrepreneurial activities in a city. By analysing two Swedish cities with different industrial legacies, I aim to highlight the key factors which are instrumental in the formation of two distinct local cultures and how the culture's survival shapes subsequent entrepreneurial activities in new industries. In doing so, the article contributes to our understanding how the economy and economic actors are governed by social relations and cultural values. Although the term path dependence is missing in the article, its underlying mechanisms add explanatory value to the formation of the local culture.

Article 4 also deals with the role of actors in local economic development, but focuses on how cognitive path dependence (= culture) can be broken. I elaborate on the idea of cognitive paradigms which represent the conventional wisdom of the relevant community and their shared cognitive frames. Following, with some alterations, the definition of Dosi (1982), a cognitive paradigm is defined as a set of certain assumptions guiding behaviour which is strongly connected to a relevant (specific) situation or problem. The paradigm determines what possibilities the individual is able to see and how these possibilities should be addressed. The existence of a dominant cognitive paradigm can explain why the degree of adaptability differs between locations. I suggest how the dominating cognitive paradigm is eventually replaced by a new alternative

one, opening up space for a new regional path to emerge. This is done by suggesting three stages of path breaking.

Table 6: Overview of the articles included in the dissertation

Article title	Research gap	Research aim	Methods	Main conclusions
1 – New perspectives on innovative entrepreneurship and path dependence – a regional approach	If we want to explain the uneven spatial distribution of entrepreneurship, path dependency, the core concept of evolutionary economic geography, might offer more insights. So far, no theoretical paper has explored the possible relationship between entrepreneurship and path dependence.	What new insights can be gained by studying entrepreneurship through the lens of path dependence?	Theoretical paper	Entrepreneurial activities are an accumulation of events involving cooperation, context and outcome. The social dimension is missing in path dependence, but becomes importance if entrepreneurship is a social phenomenon. There are different types of innovative entrepreneurs in relation to the regional path. Outsiders to a region are more likely to alter the regional path.
2 – The dynamics and evolution of local industries – the case of Linköping, Sweden	The economic geography literature offers little clarification why some regions become successful in the first place.	How and under what circumstances do entrepreneurial activities lead to the emergence of a new local industry?	Single case study	Three stages of evolution of local industries. Different actors in the different stages are needed. A combination of exogenous forces and entrepreneurial individuals to utilize these forces is needed for the emergence of a new local industry.

Table 6 (cont.)

Article title	Research gap	Research aim	Methods	Main conclusions
3 – Local culture as context for entrepreneurial activities	Despite the general acknowledgement that culture matters for entrepreneurial behaviour, no one has investigated how such a local culture is formed.	What are the key factors which are instrumental in the formation of local culture? How does the culture's survival influences subsequent entrepreneurial activities?	Cross-case study	The economic development of the place plays an important role in shaping the local culture. Four key factors are instrumental: initial conditions, characteristics of key players, network activities and composition of newcomers. Large interregional differences due to different industrial legacies suggest that that places with similar industrial legacies within one country are closer in terms of their culture than with their immediate surroundings.
4 – Breaking the cognitive dimension of local path dependence: an entrepreneurial perspective	We know much about technological and industrial trajectories in regions, but we know little about cognitive paths as carriers of path-dependent behaviour. This is particular interesting to investigate if we consider entrepreneurship to be a social phenomenon.	To conceptualize and operationalize the breaking of a cognitive path through entrepreneurial activities.	Single case study	Three stages of breaking the local cognitive path. The important role of entrepreneurial outsiders in breaking the cognitive path throughout the three stages. Historical accidents are conscious decisions of individuals.

Research contributions

The aim of this dissertation is to contribute to a stronger inclusion of the social dimension in entrepreneurship research. Past research has focused on economic factors to explain entrepreneurship, but recently it has been argued that social factors also affect entrepreneurship. Focusing on cultural aspects might help us to better understand why entrepreneurship is a spatially uneven process.

In order to do so, the four articles and the dissertation as a whole rests on two main assumptions which differ from what is common in the field. First, entrepreneurship in this dissertation is assumed to be a social phenomenon. Lindgren and Packendorff (2002) suggested that there are strong taken-for-granted assumptions in the entrepreneurship research field, including the focus on single, non-conforming individuals as 'the friendly face of capitalism' (Bechhofer and Elliot 1981). This focus might be due to two reasons: first, the strong-willed individual is more comprehensible than the complexity of social interplay (Johannisson 1998) and, second, the traditional entrepreneurship research was inspired by disciplines appropriate to study the individual level. It has been pointed out that the entrepreneurship research focus on the individual hero has already been questioned, yet the myth of the individualistic entrepreneur persists (Drakopoulou Dodd and Anderson 2007, Pittaway and Rose 2006).

The second main assumption is that entrepreneurship is assumed to be an activity which forms regional paths. In that sense, entrepreneurial activities can both form and break the regional path. In the past, regional path dependence literature placed a strong emphasis on historical accidents or exogenous shocks as sources of change. In the absence of such exogenous events, regional development occurs along established regional trajectories that ultimately result in lock-ins. In recent years, researchers have proposed a new framing of the regional path dependence concept which shifts the focus from external shocks to agency as sources of change.

My contributions rest on these two assumptions. If entrepreneurship is indeed a social phenomenon and this social phenomenon forms the regional path, it becomes evident that culture plays an important role. In the past, both the entrepreneurship and the regional path dependence literature was overly concerned with economic factors, but the two assumptions of this dissertation would point towards the importance of the social dimension.

Before regional path dependence can be used as interpretative lenses to study entrepreneurship, a theoretical clarification of the relation between entrepreneurship and regional path dependence was needed. To the best of

knowledge, very few have elaborated on the potential links due to an overly individualistic view in entrepreneurship literature and the overly structuralistic view in the regional path dependence literature in the past (Staber 2005, Garud and Karnøe 2001). The two assumptions of this dissertation would make it possible to combine the two streams of literature. In that sense, the theoretical article provided the frame for the empirical articles by suggesting that the driving factors of path formation and path breaking can be identified by focusing on the interplay between the activities of individuals, the local context and historical accidents happening outside of the region. In other words, I show how the (external) historical accidents got strengthened by the many activities of individuals pushing into a certain trajectory. In that sense, I took a more comprehensive view of the evolution process in regional economies than past studies. In the past, many regional studies focus on the spatial and temporal persistence of economic success and entrepreneurship and conclude with statements that 'nothing breeds success like success' (Boschma and Frenken 2006: 279) or that 'successful companies tend to spin-off successful companies' (Klepper 2007: 619). Often the initial historical events which initiated the success stories are exogenous to the theory and, hence, contribute little to a detailed clarification of why some regions become successful in the first place. By analysing the activities of individuals, rather than self-reinforcing mechanisms and processes, it is possible to highlight the driving forces of the formation and breaking of the regional industry path.

Articles 2 and 3 address the question of how the regional industry path is formed. It is suggested that this is a process of three stages, and that the role of individuals and structure differs between the stages. During the first stage, new knowledge enters the region and the role of pioneers is highlighted. In the next stage, when a new industry starts to emerge, the role of imitators is stressed. In the last stage, the anchoring of the industry takes place through institutionalization, where the focus shifts from individual activities to the regional structure. The social dimension of entrepreneurship plays an important role here since the local culture influences how these entrepreneurial activities of individuals are perceived. Hence, the formation of a new regional path does not only depend on the existing industrial structures, but also on local culture. Hence, it is important to understand how this local culture is formed. My findings suggest that industrial legacy leads to the formation of a distinct local culture and how the culture's survival influences subsequent

entrepreneurial activities in new local industries. Four key factors are highlighted, which are instrumental in the formation of local culture: initial conditions, characteristics of key players, network activities and composition of newcomers. This dissertation also highlights how two distinct cultures did emerge in neighbouring cities within the same region and suggests that further insights might be gained through an additional new level of analysis when studying entrepreneurial culture. Large interregional differences owing to different industrial legacies suggest that places with similar industrial legacies within one country are closer in terms of their culture than with their immediate surroundings.

Articles 3 and 4 jointly address the question of how the regional industry path is broken. If we argue that a local culture exists, outsiders play an important role in breaking the existing path. Outsiders are not guided by the same cultural assumptions (or cognitive paradigm) and are more likely to observe different possibilities which might lead to the breaking of the existing path. The long durability of cognitive paradigms and the importance of newcomers suggest the emergence of a parallel, alternative cognitive path. Due to the embeddedness of the cognitive frames, these frames are difficult to change. Instead, the case study showed how a new, competing cognitive frame emerged within the region first. It eventually became strong enough to challenge and replace the previous one.

Table 7: Contribution of the dissertation

Theoretical clarification of the relation between entrepreneurship and regional path dependence, which is summarized in four propositions (Article 1) • Path formation and path breaking can be understood more clearly by focusing on the interplay between the activities of individuals, the local context and historical accidents happening outside of the region.	
How is a new regional industry path formed? (Articles 2 and 3)	How is a regional industry path broken? (Articles 3 and 4)
• It is a process of three stages, where the role of individuals and structure differs across the different stages. • Industrial legacy is important for the formation of a local culture, which influences the activities in other local industries.	• Through the activities of outsiders. • Through the emergence of an alternative, parallel path. • Path breaking is a slow process owing to the long durability of cognitive paradigms.

Between the articles

At first, the theoretical article was meant as a base for the three empirical articles to follow. The original idea was that each of the proposed conclusions should be discussed deeper in an individual paper. This would have ensured a strong coherency across the papers, but it would also mean having to decide very early on in the research process to stake out the path to be taken.

It is no surprise that my focus shifted and the clearly staked-out path started to fade away. This was not because the proposed conclusions were not worth investigating but as I started to make my way through numerous publications new questions started to emerge. In the first article there was no particularly strong interest in culture. This topic started to take shape as the interviews advanced. Norrköping and Linköping were selected due to

the distinct differences in their past economic development. By talking to the interviewees, but also by talking to people in Sweden about my research, a common denominator started to emerge: Linköping, with its free entrepreneurial spirit where everyone can achieve anything, and Norrköping, with its restrictive, dominant labour union culture. Soon I started to read publications through the 'cultural lens' and new questions started to emerge. The original research interest, industrial path dependence, is still there, but it took on a different twist and culminated in the third article, which deals with the important role of industrial legacy in the formation of local culture.

Although cultural or cognitive aspects have not (yet) received much scholarly recognition in regional path dependence literature, the cultural and cognitive aspects contribute much to the continuity of path dependence as it is difficult to change people's perceptions about things. Hence, this new twist in my research interest allowed me to bring a new perspective to an established stream of literature.

ARTICLE 1

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New perspectives on innovative entrepreneurship and path dependence – a regional approach

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Abstract: This paper uses path dependence as an interpretive lens to examine the relationship between innovative entrepreneurship and regional development. A literature review of path dependence explains why that concept is relevant for this paper. This paper reaches four conclusions about the relationship. First, in the study of innovative entrepreneurship in a regional context, the technological, social and cognitive dimensions should be taken into consideration. Second, the effect of the different types of innovative entrepreneurship on path dependence depends on specific, regional situations. Third, the dominant regional network forms an institutional foundation that may either hinder or support innovative entrepreneurship. Fourth, innovative entrepreneurs who introduce new knowledge from outside the region are more likely to alter the regional path.

Keywords: entrepreneurship; innovative entrepreneurship; path dependence; regional development; network-based approach.

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This paper is a revised and expanded version of the paper entitled 'Standing on the shoulder of giants: entrepreneurship and path dependency in a regional context' presented at the ERSA 2010, Jönköping, Sweden, 19–23 August 2010.

1 Introduction

Regional development researchers have long focused on the differences in economic development among regions. In general, the literature has two explanations for such development. The first explanation draws on impressive stories of innovative entrepreneurs whose activities change the course of the regional economic development. Such innovative entrepreneurs are often described as 'big men' who challenge uncertainty and conventional knowledge (Knight, 1921; Schienstock, 1975; Schon, 1963; Shane, 1994). Prominent examples in which entrepreneurs have provided the impetus for change are heavily industrialised regions that have become high-tech growth poles through radical, innovative activities (Hodson, 2008; Knapp, 1998; Lundquist and Winther, 2006).

The second explanation suggests that past activities influence present development (Berndt, 1998; Hudson, 2005; Trachte and Ross, 1985). According to the literature, because of negative constraints from the past, regional development occurs along established regional trajectories that ultimately result in lock-ins. Such regions are caught in destructive path dependence processes with limited possibilities for breaking free from these constraints. A characteristic of this type of regional development is the absence of innovative entrepreneurs.

The innovative entrepreneur explanation derives from an actor-based understanding of regional development in which the emphasis is on the actions of innovative entrepreneurs. They advance the development. The path dependence explanation takes a structural perspective. Here, the emphasis is on how the existing structures (e.g., institutions) influence the entrepreneurs' actions. The regional structures advance the entrepreneurs' initiatives.

This paper argues that these two apparently opposing explanations are related and should be integrated as one approach that can provide a better understanding of regional development processes. This paper presents four conclusions on innovative entrepreneurship and regional development that support this argument.

This paper responds to recent calls to link entrepreneurial activities and localities 'in order to reach a better understanding of the everydayness of entrepreneurship' [Trettin and Welter, (2011), p.575]. Researchers are critical of the fact that the socio-spatial context of entrepreneurship is still missing in most of the entrepreneurship debate (Malecki, 1997; Steyaert and Katz, 2004; Trettin and Welter, 2011). By integrating the two explanations, this paper contributes to the literature and research on entrepreneurship and regional development in three ways.

First, the paper takes a more actor-centred perspective on regional development than is typical in the regional development literature. Second, the discussion veers from the big man theory of entrepreneurship towards a network-oriented understanding of entrepreneurship. The claim is that innovations are seldom the achievement of one individual but rather of a group of individuals (Graf, 2011). In this respect, this paper follows Steyaert and Katz's (2004) recommendation to shift the perspective from the 'elistic entrepreneurs' to entrepreneurship as a collective, network-based activity (see also Schienstock, 2007). While the importance of global networks for knowledge access is undeniable, research has shown that most contacts are local, especially for innovative entrepreneurial activities where knowledge flows between talented individuals are important factors (Nijkamp, 2003; O'Donnell et al., 2001; Smith et al., 2005). Third, the paper addresses different types of innovative entrepreneurship. Bathelt and Glückler

(2003) propose that entrepreneurship, as a collective activity that should be examined in a particular temporal and spatial context, is based in propositions about regional path dependence. In the literature, innovative entrepreneurs are, however, treated as a rather homogenous group. This paper claims there are different types of innovative entrepreneurs who are highly dependent on specific regional paths.

The theoretical framework of this paper rests on the assumption that even such disruptive activities as revolutions or innovations are never really 'discontinuous' because of the informal constraints in societies (North, 1990). Thus, entrepreneurs, individually or in groups, can create new regional paths although those paths, to some extent, depend on existing patterns and behaviours in the region.

Studies of innovation systems (IS) emphasise the systemic nature of innovation (Fagerberg, 2006). In this understanding, innovations are not developed in isolation but are rather the result of an interactive process. Therefore, innovations are subject to institutions, such as laws, rules, norms and routines (Edquist, 2006; Lundvall, 1985, 1988, 1992; Nooteboom, 2000; Nelson, 1993). At the same time, the IS literature focuses on location-specific factors that highlight the importance of local conditions for the innovation process. For example, the IS literature stresses the importance of path dependence in economic geography studies (Cooke et al., 1998; Doloreux and Parto, 2005; Edquist, 1997; Martin and Sunley, 2006; Niosi et al., 1993). Despite its popularity, several shortcomings of the IS approach have been criticised, such as its lack of a general definition of system boundaries and the absence of individual actors (Balzat and Hanusch, 2004; Carlsson, 2007; Doloreux and Parto, 2005). While this paper acknowledges the IS concept of innovation, the focus is the role of entrepreneurs and their interactions in the innovation process.

In this paper, entrepreneurship refers to the identification of new business opportunities, the development of new products or services, and the commercialisation of those products or services (Shane, 2003) through inter-corporate networks in the innovation process. The definition is not limited to the founding of new businesses.

This paper is structured as follows. The next section describes how the concept of path dependence is used in the regional development literature. This section proposes an enlargement of the concept in order to use it in the analysis of the relationship between innovative entrepreneurship and regional development. The entrepreneurial regional path is described in the following section. Then four conclusions are drawn about innovative entrepreneurship in a regional context. The final section discusses implications of the study.

2 Literature review of the path dependence concept

Researchers in many different disciplines have used the concept of path dependence [see Martin and Sunley (2006) for an in-depth analysis], but there is no clear and common definition of it in the literature. It is necessary, then, to examine the suitability of using the concept in this paper as an interpretive lens to examine the relationship between entrepreneurship and regional development.

Perhaps the most well known references to path dependence are found in the research by W.B. Arthur, P.A. David and D.C. North. In economics, Arthur (1989, 1994) and David (1985) have used path dependence to explain technological adaption processes and industry evolution. In this literature, path-dependent processes are characterised by the

quasi-irreversibility of investments, economies of scale, and technical interrelatedness or the need for system compatibility. Because of historical accidents, sub-optimal technologies dominate even if superior technology emerges because of these three characteristics (David, 1985). Due to increasing inflexibility, an industry tends to become more and more locked into one technology (Arthur, 1989).

These characteristics may also be discussed at the regional level. Due to limitations in absorptive capacities (Cohen and Levinthal, 1990), regional knowledge accumulation may lead to path-dependent specialisation in a region. Among other factors, new technology can make such specialisations obsolete. A region may face the challenge of being locked into a technological setting that is no longer useful. Therefore, this review of the literature also addresses path dependence and regional development.

Table 1 lists the eight most-cited articles that deal with path dependence in a regional context. These eight articles were selected from a list of articles with the following words in their title or listed as key words: path dependency, path dependence, regional, region, and economics. Those articles were read to see if they described path dependence. Often path dependence appears in an article title or as a key word without further analysis of the concept. Authors with multiple articles on the topic are only listed once because their descriptions of path dependence did not vary among their publications.

Table 1 Definition of path dependence in selected regional development papers

Authors	*Dimension*	*Definition of the concept*	*Type of paper*
Belussi and Sedita (2009)	Technology	Path dependency can lead to 'lock-in' phenomena, where 'fixity' and 'ridification' are the characteristics of local economic development. (p.507)	Industrial district study
Shapira and Youtie (2008)	Technology	Regions maintain technological leadership through early entry and positional lock-in. (p.191)	Industry case study
Schienstock (2007)	Technology	Technological choices made in the past influence subsequent choices. (p.93)	National case study
Martin and Sunley (2006)	Technology	Inability to shake free of their own history. (p.399)	Conceptualisation
Hassink (2005)	Technology, Institution	The importance of history and institutional contexts for regional development as an explanation of the decline of industrial areas. (p.522)	Regional case study
Essletzbichler and Winther (1999)	Technology	The dependence of technology on past and existing knowledge tends to move firms, regions and countries along relatively well-defined technological trajectories. (P.179)	Industry case study
Kenney and von Burg (1999)	Technology	Small events or historical accidents can be critical triggers that enable one region to become the centre of a particular type of economic activity. (p.70)	Regional cluster study
Meyer-Stam (1998)	Technology	It is an attempt to explain the rationality of behaviour that at first might appear irrational if one assumes utility maximising behaviour. (p.496)	Regional cluster study

Despite its popular use, there is no common definition of path dependence across different disciplines or even within disciplines. It is often not clear what the path is, why some historical events related to the path are more important than others, or to what extent these events can influence present decisions. Most researchers provide little additional conceptualisation of path dependence in their publications. For their research questions, this approach may be adequate. However, without an agreed-on definition of the concept, it is challenging to accumulate knowledge about the concept. In this paper, path dependence must be clearly conceptualised in order to identify the regional path and to discuss its relationship to innovative entrepreneurship.

The eight articles in Table 1 almost exclusively address the technological dimension of path dependence. Within the regional development literature, most articles that discuss the concept deal with the technological development of a single technology or a single industry – either in a specific region or in several regions (Martin and Sunley, 2006). These articles are therefore technologically process-oriented rather than actor-oriented. They describe the evolutionary path of the technology, but the actors (e.g., innovative entrepreneurs) and their roles are often not discussed. Of these authors, only Hassink (2005) takes a more comprehensive approach. He addresses the institutional, although not the actor, context.

The narrow, technological perspective on entrepreneurial activities in the framework of path dependence is too limiting. The study of entrepreneurs requires a much broader cultural perspective (Aldrich and Zimmer, 1986; Granovetter, 1985) that looks at the biases acquired from their experiences and prior knowledge (Shane, 2000) that a narrow, technological perspective cannot address. The comments on the articles listed in Table 1 show that path dependence is often held responsible for technological lock-ins that eventually cause stagnation and decline. This is a negative perception of path dependence that inhibits innovation. The path must be broken.

The many actors in a region may perceive path dependence differently. For example, in certain industries, path dependence is a pre-requisite for the accumulation of relevant knowledge and experience. Actors outside these industries, however, may perceive such a development along defined trajectories as rather restricted. The literature acknowledges that novelties have historical antecedents. In early research, Schumpeter (1934) suggested that entrepreneurs reconstitute existing resources to create new ones. But entrepreneurs are not passive observers who follow the flow of events. Instead, they are embedded in social structures that are jointly created (Granovetter, 1985), and they use prior knowledge to intentionally create new, although related, paths (Garud and Karnøe, 2001).

This idea reflects Colombelli and von Tunzelman's (2011) recent claim that innovation is a dynamic process characterised by persistence and path dependence. In fact, evidence suggests that prior related knowledge increases the likelihood of initiating successful economic activities in a related field (Boschma and Frenken, 2011; Boschma and Iammarino, 2009; Frenken et al., 2007). Existing industries can attract and anchor new, emerging industries in a region (De Propris and Crevoisier, 2011). The implication from this line of thinking is that one should avoid prematurely labelling path dependence as either positive or negative. The evaluation depends upon the observers, the stakeholders and the specific situation. Until evidence to the contrary is presented, path dependence should be perceived neutrally.

3 The entrepreneurial regional path

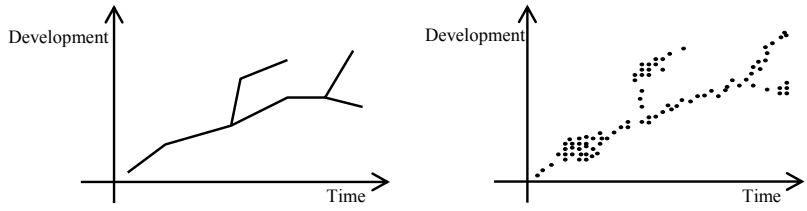
The regional development literature rarely addresses actors. Linking entrepreneurship with regional development through the interpretive lens of path dependence is a way to include actors in the discussion. Entrepreneurs are economic actors who are an important source of job creation and economic growth (Audretsch and Keilbach, 2004; Birch, 1979). As agents of change, entrepreneurs' actopms may disturb obsolete economic and institutional structures. In this respect, innovative entrepreneurs are especially important.

Although entrepreneurs have often been described as champions, this big man theory does not seem to correspond with recent discussions about innovation processes (Schienstock, 2007). Most innovations are now described as processes involving a large network of different actors (Freeman, 2001; Johannisson, 2003). Rost (2011) notes there are two views in the literature on how networks enhance innovation. Coleman (1988) suggests that actors in closed networks are more likely to share information, while Burt (1992) suggests that networks with structural holes provide access to non-redundant knowledge. Despite this ongoing debate about the nature of networks, the value of networks as integral parts of entrepreneurial success is widely acknowledged (Elfring and Hulsink, 2003). If knowledge and experience from different fields are combined as one innovation, it is difficult for an entrepreneur, acting alone, to initiate a new development path.

What, then, is the nature of the regional path and how can entrepreneurs influence that path? In discussions on path dependence, the path is often described as a linear trajectory with certain alterations (Martin and Sunley, 2006). Because researchers can identify paths only in retrospect, they include only the events they think have altered the path. Figure 1(a) illustrates the linear relationship between events that occur in a certain sequence and a certain time horizon. There is a time delay between the entrepreneurial activity and the alteration in the regional path.

It can be difficult to identify a particular path-altering event. The process can obscure the activity, especially when small historical accidents alter the path. In addition, a combination of several activities may affect the path alteration. As Johannisson (2003) explains in his claim that entrepreneurship is a collective phenomenon, paths develop in broad contexts and not just from isolated events.

Figure 1 Altered illustration of a technological path, (a) linear trajectory (b) accumulation of events



(a) (b)

In this paper, a path is defined as a collection of events that concentrate along certain directions. See Figure 1(b) that illustrates how paths are not formed simply by a few, isolated events but by multiple events. All events are included because their interactions affect other events. A single event is important only as it creates opportunities for subsequent events. The adoption of this more complex view of path formation means less attention is paid to a few entrepreneurial success stories. In this view of path formation, one entrepreneurial activity can stimulate similar entrepreneurial activities. For example, Holbrook et al. (2000) uses the failure of the Shockley Semiconductor Laboratory to show that even entrepreneurial failures can create new opportunities.

Events in this context refer to entrepreneurial activities such as the commercialisation of new business opportunities. Each entrepreneurial activity has the potential to create such opportunities for others. Schumpeter (1934) used the term 'swarming' to describe this imitative behaviour of firms when they rush to join new growth areas. Swarm behaviour is often localised because knowledge spillovers tend to remain local (Audretsch and Feldman, 1996), entrepreneurs rarely relocate when starting a new firm (Buenstorf and Fornahl, 2009; Cooper and Folta, 2000), and entrepreneurs act as local role models for other entrepreneurs (Aldrich, 1999; Arenius and Minniti, 2005; Henrekson and Stenkula, 2007).

Entrepreneurial activities may alter the regional (i.e., local) path. But how do we define a regional path? While the region is not an actor itself, and is unable to initiate actions, it houses the actors – the entrepreneurs, the politicians and others – who can initiate the actions that create the regional path. As a simple example, consider a single-industry region in which entrepreneurial activities are concentrated around this industry. The path of this industry, created by those activities, is the regional path.

Single-industry regions are less common today because many regions have multiple industries that are or are not related. The larger the region, the more industries. In such a complex environment, the path of the dominant industry can suppress lesser business activities. Yet, even in multi-industry regions, small events can alter the path development. The question then is: How do we define a regional path when a region has multiple industries with different development paths? One possibility is accept idea that there many paths. But this approach would not serve the purpose of this paper as it would not be possible to alter the path but more paths would be added.

Instead the following is proposed: to link the regional path to the technology trajectories of the regional industries. The regional development path depends not only on the paths of the different industries but also on the interactions between them and the regional actors. Some activities, which are more important than others, are likely also more related to the regional path. The introduction of a new, related technology can lead to the emergence of a new regional industry; this industry is therefore less related to the current regional economic profile.

Entrepreneurs, however, who imitate the successful entrepreneurial activities of other regional entrepreneurs are closely related. Path dependence becomes a selection process achieved through the specialisation of knowledge accumulation. The entrepreneurial activities create a regional path that is linked to the region's industries. Yet, this technological dimension is insufficient as an explanation of how and why regional paths change.

This discussion of the entrepreneurial regional path leads to three ideas. First, the regional development literature should address entrepreneurs as the agents of regional change. Second, entrepreneurial activities are the combined actions of several actors. Third, the linkage of entrepreneurs to regional development offers new insights on regional development.

The next section of this paper presents four conclusions about the linkage between entrepreneurial activities and regional development using the interpretive lens of path dependence. These four conclusions are based on the ideas listed in the preceding paragraph.

4 Innovative entrepreneurship as a regional process

Much research has been conducted on the technological relatedness of innovative entrepreneurial activities (Gathmann and Schoenberg, 2010; Ingram and Neumann, 2006; Poletaev and Robinson, 2008; Shane, 2000; Wood and Pearson, 2009). Entrepreneurs tend to use their existing competences because their prior technological knowledge increases their ability to acquire new, related technological knowledge (Cohen and Levinthal, 1990). Similarly, Bessant (1992) shows that most innovations result from borrowings and not from inventions. Other empirical studies reveal that entrepreneurs' prior knowledge, if it is technologically-related, improves performance in the new venture (Boschma and Frenken, 2011; Klepper, 2010).

However, the research approach that has only a technological dimension provides an insufficient explanation of regional development. Therefore, Zahra (2007) claims a contextualisation of the entrepreneurial phenomenon is needed that acknowledges the dynamics of the research context and eliminates major gaps in the reader's understanding. As shown in Table 1, most research has focused on the technological dimension that is closely linked to the development of a technology. Thus, other, interrelated dimensions of path dependence should be identified in order to present a complete view of the entrepreneurial process.

The research approach that has a cognitive dimension explains how we know the world using mental models based on human experience and behaviour. Cognitive approaches to entrepreneurship emerged in the early 1990s as a result of the criticism of personal trait research and its modest results (Gartner, 1988, 1989; Hatten, 1997; Katz and Shepherd, 2007). Instead of focusing on personal traits that distinguish entrepreneurs from non-entrepreneurs, the cognitive approach suggests that entrepreneurial behaviour should be regarded as a consequence of person-situation interactions and not as a mere outcome of personal traits.

In his description of the development of the disk drive industry, Christensen (1977) discusses cognitive path dependence. He concludes that the large disk drive companies failed, not because they lacked the knowledge to produce smaller disk drive units, but because they could not see the benefit in producing smaller units. The large companies simply could not imagine there was a market for smaller units. According to Christensen, this story reflects the mental impact technology may have. Because the large disk drive companies had worked so long in this one technological setting, they may have lost their ability to recognise new opportunities.

The third research approach has a social dimension that refers to a region's culture. As one example of this approach, Saxenian (1996) describes differences in regional

cultures in a comparative analysis of two US business communities: Silicon Valley in California and Route 128 in Massachusetts. In Silicon Valley, risk-taking was accepted and even glorified. Along Route 128, stability and company loyalty were more highly valued. Similarly, Davidsson (1995) reveals how the cultural differences among regions in Sweden affect entrepreneurship. Feldman (2001) describes the development of an entrepreneurial culture in the US Capitol region. Yet, although there is a great deal of regional variation in cultures and attitudes, more research is needed in this field (Lundström and Stevenson, 2005; Verheul et al., 2002).

Different regional attitudes towards entrepreneurship have some effect on the course of the regional path. Figure 1(b) depicts the formation of a new path when followers swarm around a new business opportunity. Such entrepreneurial swarming is more likely if the social and cognitive dimensions are in line with such opportunities. Cognitive and social differences between regions suggest that path dependence should not be limited to a technological dimension in discussions of entrepreneurship in a regional context. The phenomenon is too complex to be captured by a single dimension. Interaction among the three dimensions is necessary. Therefore:

> Conclusion 1: In the study of innovative entrepreneurship in a regional context, the technological, cognitive and social dimensions should be considered.

A product, service or technology can be new to a region even if it has been previously introduced to the global market. Thus, entrepreneurs' activities can either be radical or related in relation to the path. Radical activities are activities initiated outside the established regional trajectories by the so-called Schumpeterian entrepreneur (Schumpeter, 1934). Related activities reflect established regional trajectories and are initiated by the so-called Kirznerian entrepreneur (Kirzner, 1973). As Shane (2003, p.21) explains, Schumpeterian entrepreneurs are 'innovative and break away from existing knowledge', while Kirznerian entrepreneurs are 'not very innovative and replicate existing knowledge'. It is not enough to begin just any innovative activity; the activity must initiate a new path outside established trajectories. Schumpeterian entrepreneurs form a new path while Kirznerian entrepreneurs follow a path. See Figure 1(b). Both types of entrepreneurs are needed for the regional path.

Because different types of innovative entrepreneurship exist in relation to the regional path, the concept of path dependence should be perceived in general as neutral. Whether path dependence initiates new regional development trajectories or leads to a decline of the regional economy depends on the entrepreneurship type and the specific situation. Furthermore, because different stakeholders may not perceive the same process in the same way, they relate differently to the path dependence process. A negative perception of path dependence is therefore unproductive and inappropriate.

Table 2 Entrepreneurial types and the regional processes

Type of innovative entrepreneurship	*Regional processes*	
	Mature industries	*Emerging industries*
Related innovative entrepreneurship	Strengthening	Support
Radical innovative entrepreneurship	Renewal	Disturbance

Table 2 shows how the same type of innovative entrepreneurship can lead to quite different regional development processes depending on the specific regional situation. If

the region has mostly mature industries, related innovative entrepreneurship will not alter the path. If the mature industries in a region stagnate or decline, the regional economy will also eventually stagnate or decline. In general, path dependence is linked to such lock-ins (Belussi and Sedita, 2009; Hassink, 2005; Shapira and Youtie, 2008). Under the same circumstances, radical innovative entrepreneurship will generate new products or technologies that may initiate new development trajectories. If successful, eventually the regional economy will renew. If the region has emerging industries, related innovative entrepreneurship is needed to support the new industry development. As a result, the regional path can alter.

Related innovative entrepreneurship may support the development of a dominant design and enable the commercialisation of innovations. Under the same circumstances, radical innovative entrepreneurship may disturb the development of the new industry when it hinders the development of a dominant design. This can lead to a failure of the emerging industry such that the regional path cannot be altered. Aldrich and Fiol (1994) suggest, for example, that emerging industries should avoid competing designs in order to eliminate confusion and uncertainty for potential stakeholders. Thus, it is important to be aware of the specific regional situation and the different types of entrepreneurship. Therefore:

> Conclusion 2: There are different types of innovative entrepreneurships. Their effect on the path dependence depends on the specific regional situations.

Entrepreneurial activities are found in some regions more often than in others. Andersson and Koster (2011) discuss the spatial-temporal persistence of entrepreneurship. As suggested above, this persistence is not merely the result of different economic profiles. Each region has different actors and different regional networks. Institutions, also referred to as the rules of the game (Boettke and Coyne, 2009; North, 1990), shape the interactions within networks and between actors. The analysis of entrepreneurship as a combined activity of several actors in a regional context, with its informal institutions (e.g., taboos, norms, traditions and codes of conduct) is of special interest. Different types of entrepreneurs may have different attitudes towards such formal and informal institutions.

Entrepreneurs who engage in related activities are inclined to conform to the established institutions. Entrepreneurs who engage in radical activities introduce either new or new combinations of knowledge/technology are inclined to depart from these institutions. The incompatibility of these activities with the existing institutional framework means the framework must eventually be altered as entrepreneurs swarm around the new business opportunity.

A single event, however, cannot cause a change in an existing institutional framework. Different actor groups and different networks exist in each region. Yet, each region has certain local-territorial, informal institutions as a foundation (Davidsson, 1995; Lundström and Stevenson, 2005). An area with a traditional manufacturing industry, such as the metal or paper industry, for example, has a rather different institutional foundation than an old university or cathedral town. In various ways, different institutional foundations have different effects on entrepreneurial activities. Therefore:

> Conclusion 3: Every region has an institutional foundation. Some institutional foundations hinder innovative entrepreneurship while others support innovative entrepreneurship.

The next issue concerns the circumstances in which the different innovative entrepreneurships emerge. One factor may be the new knowledge, whether tacit or explicit, introduced in the region. It is theorised that new knowledge enters the region in three different ways:

1 migration of entrepreneurs and employees

2 information exchange in global networks

3 regional research activities.

These theories are explored next.

The entrepreneurship literature suggests that entrepreneurs' social networks are mainly local (Hess, 2004; Sorenson, 2003) and that knowledge spillovers are geographically bounded (Audretsch and Feldman, 1996). Despite this geographical limitation of knowledge, entrepreneurs are highly mobile individuals (Godley, 2007), and some research suggests that knowledge migration can overcome long geographical distances (Saxenian, 2006). Migrating entrepreneurs, who typically come from different institutional backgrounds and possess different spheres of knowledge, introduce new knowledge to new regions. Even if this knowledge is technological knowledge, it can change the cognitive or social perception of other entrepreneurs in the region. In accordance with Figure 1(b), the activities of migrating entrepreneurs encourages others to follow them and new paths are formed.

There are three reasons that migrating entrepreneurs are more likely than local entrepreneurs to initiate radical innovative entrepreneurial activities. First, migrating entrepreneurs are not aware of the regional technological, cognitive and social paths. Second, because entrepreneurial networks are local, the knowledge exchange among innovative actors in a local network generally increases the region-specific knowledge stock (Bathelt et al., 2004; Graf, 2011; Storper and Venables, 2004). Specialised regions risk lock-ins where shifts to new development paths are impossible (Camagni, 1991; Malmberg and Maskell, 1997). Similarly, Birley (1985) confirms the importance of local networks where entrepreneurs found firms in similar industries. Migrating entrepreneurs, however, have access to different networks than local entrepreneurs. Third, migrating engineers possess new knowledge. They can become network gatekeepers who link the specific local knowledge to external knowledge (Graf, 2011). Moreover, global networks are a source of new knowledge. While local entrepreneurs can receive new knowledge through such global networks, they may be more restricted in its use because of their established regional practices and cultures. Therefore:

> Conclusion 4: Innovative entrepreneurs who introduce new knowledge to a region are more likely to alter the regional path.

5 Implications and discussion

The concept of path dependence is used in this paper as an interpretive lens to explore the link between innovative entrepreneurship and regional development. Path dependence contributes in four ways to this study of innovative entrepreneurship.

First, the evolutionary view entrepreneurship, in a departure from the big man theory, assumes that entrepreneurial activities are an accumulation of events involving

cooperation, context and outcome. In this view, it is important to consider the different, interrelated dimensions of path dependence.

Second, different types of innovative entrepreneurship are proposed. Related innovative entrepreneurship activities are consistent with path dependence, while radical innovative entrepreneurship activities have the potential to alter that path. It is necessary to distinguish between non-innovative entrepreneurial activities and innovative entrepreneurial activities as well as to distinguish between different types of innovative entrepreneurship. Regional conditions are influential in the determination of which innovative entrepreneurships trigger which regional processes. Both types of innovative entrepreneurship are needed at different stages for regional development.

Third, different institutional foundations in regions have different effects on innovative entrepreneurship. An understanding of these effects helps us understand how regional networks and their informal institutions influence innovative entrepreneurship.

Fourth, innovative entrepreneurship is embedded in existing regional paths. Every region has unique developmental requirements. Entrepreneurs use prior knowledge and experiences to make decisions. These decisions depend, to different degrees, on the regional composition of this knowledge and the industrial structure. New knowledge can also help entrepreneurs use their prior knowledge in new business opportunities. Thus, the entrepreneur should not seek only novel products and processes. New, innovative paths can be found using a creative re-combination of existing regional resources. Moreover, entrepreneurs do not think in terms of related or radical innovative entrepreneurial activities. They initiate such activities when opportunities arise and generally are unconcerned about the effect their activities have on regional development processes. Nonetheless, their activities do influence others.

It is difficult for the researcher, after the fact, to identify the relevant entrepreneurial activities that contribute to the development of a region. Therefore, the researcher should focus on how different activities influence each other and which ones are more related to the regional path than others even though it may be challenging to identify the important ones. When a company fails, it is especially difficult to estimate the importance of their former activities. For example, the history of the failure of Shockley Semiconductor Laboratory was important to the development of the semiconductory industry in Silicon Valley (Holbrook et al., 2000). One company's failure can be a factor in another company's success. If Shockley had succeeded, the 'traitorous eight' who left the company might never have founded Fairchild Semiconductor. The lesson is that while it is impossible to predict which current activity is most significant for future regional development, it is useful to try to understand the different processes within a region.

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The Dynamics and Evolution of Local Industries—The Case of Linköping, Sweden

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Abstract *This article aims to analyse how innovative, individual actions influence the evolution of local industries according to three stages. When discussing the evolution of industries or economies, the concept of path dependency is often a central element. Its vague nature makes it however difficult to be used as an interpretative lens when studying the evolution of local industries. In order to limit the broad concept, several aspects have been identified for discussion; all are explicitly linked to path dependency in economic geography literature and all are acknowledged to be of significance for stimulating the evolution of local industries. Based on a review of the evolutionary economic theory literature, the following three stages have been identified: first, the entering of new knowledge which may, or may not, be the starting point for a new local industry; second, the formation of the new local industry; third, the anchoring process of the new local industry. All three stages are intertwined and include the question how the new emerging industry and the existing local structures relate to each other. The three stages will be illustrated through the discussion of the evolution of the IT industry in Linköping, Sweden.*

Introduction

The emergence of new industries, the decline of others and changes in their overall importance over time constitute an important driver of modern economic growth (Kuznets, 1930; Malerba & Orsenigo, 1996; Schumpeter, 1939). Despite it being widely acknowledged that this is a continuous evolutionary process, Malerba and Orsenigo (1996) criticize the fact that theoretical models primarily have focused on static analysis of the economic structure in the past. Only in recent years has empirical research started to address the evolution of industrial and local economic structure (Boschma & Lambooy, 1999; Martin & Sunley, 2007).

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Much research has been done on why some locations are more successful in transforming and renewing their economic structure than others (e.g. Grabher, 1993; Hassink, 2005). One important finding in the literature is that newly emerging industries do not necessarily form in economically strong regions, but often stimulated the growth and development of rather unknown places, such as Akron in the USA (Buenstorf & Klepper, 2009), Silicon Valley in the USA (Saxenian, 1996) and Bavaria in Germany (Neffke *et al.*, 2009). Taking Germany as an example, the Ruhr area was once a thriving economic centre, but its importance has diminished, while formerly rather unknown places such as Bavaria and Baden-Württemberg have evolved into economic success stories.

Changes in industrial and local economic structure are often understood from the perspective of evolutionary economic theory. Within this theoretical approach, Martin and Simmie (2008) distinguish three overall perspectives. First, generalized Darwinism applies concepts such as variation, novelty, selection and continuity to explain the evolution of firms and industries (e.g. Aldrich & Fiol, 1994; Essletzbichler & Rigby, 2010; Laurent & Nightingale, 2001). Second, the theory of complex adaptive systems draws on complexity theory and aims to understand how networked forms of economic activity are developing and how behaviour on the micro-level shapes behaviour on the macro-level (e.g. Frenken & Nuvolari, 2004; Krugman, 1996; Martin & Sunley, 2007). Third, path dependency theory emphasizes the importance of past decisions for present decisions. By this means, path dependency theory explains distinct, long-term patterns of technological and industrial development and gives a special consideration to "historical accidents" (e.g. Belussi & Sedita, 2009; Essletzbichler & Winther, 1999; Hassink, 2005; Schienstock, 2007; Shapira & Youtie, 2008).

These three perspectives are closely related and following Martin and Simmie's (2008) approach, this article draws on all three perspectives, but especially on the path dependency theory. Much research is done on the spatial and temporal persistence of trajectories, while the historical accidents which alter the given trajectory are exogenous to the economic models and analysis (Andersson & Koster, 2011; Buenstorf & Klepper, 2009; Klepper, 2007). The theory of path dependency stresses the importance of "historical accidents" for the emergence and evolution of industries. Furthermore, the path dependency theory has been recently extended beyond the evolution of firms and industries to the analysis of regional evolution. Martin and Sunley (2006, p. 402) define path dependency as a "probabilistic and contingent process [in which] [. . .] the suite of possible future evolutionary trajectories (paths) of a technology, institution, region, firm or industry is conditioned by (contingent on) both the past and the current states of the system in question, and some of these possible paths are more likely or probably than others". In this article, I address two shortcomings in contemporary literature and research that have addressed the issue of path dependency in relation to change and renewal in local economies. First, it is acknowledged that the concept of path dependency often is used in a very general sense and the question about its applicability as a framework in studies of local economies remains largely unresolved. In this vein, Martin and Sunley (2006, p. 402) object that the unresolved issues associated with path dependency need further elaboration before the concept can be adopted as an explanatory framework for regional development scholars. As such, I provide in this article a review of previous studies that have used the concept in order to discuss and develop its applicability in studies of local economic development. Second, in line with recent calls (e.g. Boschma & Iammarino, 2009; Klepper, 2010), the need for a more actor-centred view on local

economic evolution is acknowledged where individuals rather than processes or networks are the starting point of regional and local economic development. Hence, while the focus is on the process of evolution, I specifically include individuals and their driving forces in the analysis.

This article aims to analyse how innovative, individual activities influence the evolution of local industries according to three stages. The three stages will be illustrated through the discussion of the evolution of the local IT industry in Linköping, Sweden. Of special focus will be the impact of "historical accidents" in changing the local circumstances. In that sense, the focus is not on the evolution of the local IT industry per se, but rather on how historical accidents changed the local circumstances and enabled the emergence of the IT industry through innovative, individual activities. Linköping is one example of a formerly unknown place which developed into a Swedish economic success story (Hommen *et al*., 2006; Klofsten *et al*., 1999). As "historical accidents" are case specific and are by definition unpredictable, a case study is the suitable approach for understanding the alteration of local trajectories. The concept of path dependency will be used as an interpretative lens.

The rest of this article is structured as follows. In the following section, the theoretical framework is developed and will provide an overview of the concept of path dependency; namely, how it has been used and its shortcomings will be presented. In the next section, three stages of the evolutionary industry development process in a local economy have been identified. This will make it possible to tie the study about local industry evolution and path dependency to a few concrete stages. The case study will then be analysed according to these three stages. The last section draws conclusions.

Theoretical Framework

Evolutionary economic theory provides a rich set of possible explanations for changes in local economies. According to Dosi and Nelson (1994), evolutionary theory needs to have the following characteristics. On the one hand, evolutionary theory aims to explain the movement of something over time. On the other hand, the explanation should include both random elements which alter variables in question and mechanisms that systematically winnow on extant variation (selection). In a later article, Nelson (1995) identifies a third characteristic involving a certain continuity of the winnowing. As the next section will show, the concept of path dependency is based on these three criteria.

Path Dependency: The Importance of History

Largely embedded in evolutionary economic theory, the concept of path dependency stresses the importance of history for current activities. However, the applicability of the concept seems somewhat problematic as no clear definition can be found in the literature (Martin & Sunley, 2006). The concept is discussed in many different contexts and its importance has been recognized in many disciplines (cf. Martin & Sunley, 2006, for an in-depth analysis). Unfortunately, this variety of contexts and disciplines seems to have hindered the development of a concrete definition. Mostly, path dependency is defined as small historical accidents which influence present decisions. Therefore, before moving on to the analysis, it has to be critically discussed first whether and to what extent this concept is suitable to be used as an interpretative lens.

Within social science, the works of Arthur (1989, 1994), David (1985) and North (1990) are the most prominent references. The concept was initially introduced in economics to explain technological adaptation processes and industry evolution (Arthur, 1989; David, 1985). The main arguments for path-dependent processes were three features: quasi-irreversibility of investments, economies of scale and technical interrelatedness. In other words, through historical accidents, sub-optimal technologies will remain dominant precisely because of these three features even if a more superior technology will emerge later on (David, 1985). Due to increasing inflexibility, the industry becomes more and more locked into a certain technology (Arthur, 1989).

Lately, path dependency has also been discussed on a regional and local level (Hassink, 2005; Meyer-Stam, 1998; Shapira & Youtie, 2008). In this article, I analyse the dynamics and evolution of a local industry, but of special focus is the impact of "historical accidents" on the changing local circumstances which enabled the emergence of the local IT industry through innovative, individual activities. In that sense, this study has a combined local and industry perspective. Historical accidents are somewhat random happenings and it can be assumed that it is not only important that these accidents are happening, but also when. In that sense, it is not only the activity itself which is important, but its importance depends also on its timing. If the particular activity would have been taken earlier or later, the impact would have been rather different.

Some basic mechanisms of technological path dependency can also be observed on the regional and local level: quasi-irreversibility of investments, economies of scale as well as technical interrelatedness hold true also on the regional level. Nonetheless, path dependency on the regional and local level increases the level of complexity for several reasons. First, the path of a single industry focuses on similar activities of firms. A geographical approach, however, brings in the environment of the location and a broader range of organizations into the analysis. Second, regions and cities usually do not house only one single industry, but several. It is therefore much more difficult to identify the path of a geographical area. It can however be assumed that due to learning processes, knowledge accumulation within the location will lead to a path-dependent specialization of this location. Among other factors, a new technology can make such a specialization obsolete. The region faces the challenge to be locked into a technological setting which is diminishing over time. It is precisely this discussion about why some regions are able to reinvent themselves while others fail which is the main question of many evolutionary papers with a regional focus. Andersson and Koster (2011, p. 181) define path dependency as a "process in which later conditions are dependent on previous ones, such that development trajectories depend on initial conditions". Belussi and Sedita (2009, p. 507) suggest that "path dependency might lead to lock-in phenomena, where fixity and rigidification are the characteristics of local economic development". Martin and Sunley (2006, p. 399) describe path dependency as the "inability to shake free of the own history". David (2001, p. 15) states that "the concept of path dependence refers to a property of contingent, non-reversible dynamical processes, including a wide array of biological and social processes that can properly be described as evolutionary". According to Essletzbichler and Winther (1999, p. 179), path dependency means that "the dependence of technology on past and existing knowledge tends to move firms, regions and countries along relatively well-defined technological trajectories".

There is no clear definition of path dependency in the literature, but it is vaguely defined as the importance of historical events for future decisions. Path dependency is used in

different contexts and how it is specified depends very much on the context. Conclusively, it is often not perfectly clear what the actual path is, why some historical events are more important than others and to what extent they can influence present and future decisions. These important events are context-based, which means that they are different in different locations and in different times. Only in retrospect can the researcher identify the historical events and estimate their importance. It should be noted that beside these rather vague descriptions, no further conceptualization is offered in most of the literature. Often path dependency is mentioned in the title as a catch-phrase, but is not further addressed in the article (e.g. Shapira & Youtie, 2008). This fuzziness makes it difficult to use the concept as an analytical framework. It has however been proven to be difficult to find a more concrete definition of path dependency in a regional, local or industry context. Martin and Sunley (2006) provide a comprehensive summary of unresolved issues associated with path dependency and of unanswered key questions associated with regional path dependency. Following Martin and Sunley's (2006) critique, I chose an alternative approach which breaks down the broad concept of path dependency to three evolutionary stages of local industries discussing both the individual activities of different local actors and non-local activities with a local impact according to these three stages.

Three Stages of Evolution of Local Industries

Much research has been done on lifecycles of products (e.g. Klepper, 1996; Levitt, 1965; Murmann & Frenken, 2006; Vernon, 1966), clusters (e.g. Martin & Sunley, 2011; Menzel & Fornahl, 2010; Van Klink & De Langen, 2001) and industries (e.g. Agarwal *et al*., 2002; Audretsch & Feldman, 1996a; Covin & Slevin, 1990). Two research streams suggest that also regions might develop along different phases analogous to the lifecycle. First, the recent interest in explaining the development of local economies with an evolutionary approach (Boschma & Lambooy, 1999; Martin & Sunley, 2007) implies different stages. Second, also the research efforts on explaining why some locations are more successful in transforming and renewing their economic structure than others (e.g. Grabher, 1993; Hassink, 2005) propose different development stages of a region. Audretsch *et al.* (2008) found empirical evidence that regions evolve over a well-defined lifecycle. Nonetheless, research on regional lifecycles has been scarce so far. After reviewing the relevant evolutionary literature, the papers could be grouped according to three aspects which can be understood as three stages of evolution of a local industry. All three stages are of central importance for the evolution of local industries and are explicitly linked to the concept of path dependency. These three stages of evolution of a local industry are strongly related to the stages of the product and industry lifecycle: introduction, growth and mature (e.g. Covin & Slevin, 1990; Utterback, 1994). These lifecycle stages have been adapted for illustrating the lifecycle of local industries: the entering of new knowledge, the formation of a new industry and the anchoring process of a new local industry.

First, local economies are never static, but are evolving to some extent continuously (Boschma & Lambooy, 1999; Martin & Sunley, 2007). New combination of knowledge is an important driver for the evolution of local economies and emergence of new local industries. One important aspect linked to the evolution of local economies and local industries is therefore how new knowledge is entering and spread in the region (Audretsch & Keilbach, 2004; Dosi *et al.*, 1995). In the literature, it is often analysed in what way this new knowledge is related to the existing knowledge in the region and why this knowledge

in particular entered the region (Boschma & Frenken, 2009; Boschma & Iammarino, 2009).

Second, the emergence of a new industry is another important aspect in the evolution of local economies. While the evolution of local economies is a continuous process, new industry emergence opens up a potential new direction of the regional path. Not all new knowledge, however, leads to the emergence of a new local industry. For a new local industry to emerge, the number of companies which can translate new knowledge into new business ideas needs to increase and concentrate in the particular location (Aldrich & Fiol, 1994; Bresnahan *et al*., 2001; Malerba & Orsenigo, 1996). Also, here one important question is how this new industry relates to the existing one and what mechanisms lead to the formation of a new local industry.

Third, another important aspect is the question how the new industry is anchored in the region and thereby becomes legitimate (Feldman, 2003; Klepper & Thompson, 2006). The entrance of a new industry will always, in one way or another, disturb the existing local structures. On the other hand, the existing structures might shape the new local industry. This mutual influence is interesting to analyse.

The entering of new local knowledge

"New combination of knowledge" (Schumpeter, 1934, p. 65) is often the foundation of new industries. This new knowledge enters the region in two ways: either it is generated locally or it enters from outside. In most cases, the new knowledge is not created locally in the region, but enters the region through different channels: An existing firm might open up a new plant or office in a region, people might be moving to another region and bring new knowledge with them, trade activities might stimulate the exchange of knowledge as well as new knowledge can enter the region through global networks of various kinds. Once new knowledge entered the region, local individuals will create new combinations of existing knowledge. Research has been drawing attention to the importance of networks for innovators, firms and entrepreneurs (Freeman, 1991; Wilkinson & Young, 2002; Witt, 2004). Granovetter (1973) stresses the importance of weak ties for the diffusion of innovation.

Dosi *et al*. (1995) found that incumbent firms are an important source for the creation of new knowledge. Incumbent firms might be operating in another industry but wish to diversify. Often, this diversification occurs through acquisition. Especially if the industry is rather young, the involvement of large firms might give an extra push. This is in line with Penrose (1959) who suggested that the turnover of a single product is limited by the consumer demand for this specific product. Conclusively, the growth of a firm requires a firm to diversify in other products (Chandler, 1962; Frenken & Boschma, 2007). In that sense, when the firm is acquiring new knowledge, this can mean that new knowledge is entering the region in general.

Nonetheless, Audretsch and Keilbach (2004) suggested that also entrepreneurship is an important mechanism in creating a diversity of knowledge. They argue, based upon Arrow (1962), that if incumbent firms do not commercially exploit generated knowledge, but other economic agents do, these economic agents become entrepreneurs and contribute to a diversification of knowledge. In other words, entrepreneurs act upon certain knowledge which has not been valued high by incumbent firms. Thereby, the entrepreneurs can bring new knowledge into the region. Audretsch and Keilbach (2004) do not elaborate

why certain knowledge is not valued by incumbent firms. There might be several reasons for that: First, the incumbent firms might not see the business opportunity (Christensen, 1997). Second, the market is not large enough to be profitable for a large firm. Third, the business opportunity might be outside of the incumbent firm's core competences (Prahalad & Hamel, 1990). Finally, the not-invented-here syndrome might be a barrier, where the firm simply refuses to make use of knowledge with external origin (Katz & Allen, 1982).

Universities are also important sources for new knowledge creation. Although to be considered as a phenomenon specific to North America, the exploitation and diffusion of public research can be seen in any advanced economy (Clarysse *et al.*, 2005). The shift from the ivory tower to an entrepreneurial university in the late twentieth century strengthens the role of the university as a creator of new knowledge (Etzkowitz *et al.*, 2000).

Independently of the discussion about who the actors are, be they entrepreneurs, universities or incumbent firms, an extensive research stream has been dealing with how such new ideas and products relate to the existing knowledge of a firm or a region. Cohen and Levinthal (1990) suggest that the ability to absorb new knowledge depends highly on the firm's prior knowledge. In that sense, a certain path dependency has been acknowledged where a certain pre-understanding is beneficial for further knowledge creation. Biotech companies are more likely to generate new knowledge related to the biotech industry than any other industry. It should however be kept in mind that many inventions and innovations are used in a different way than they were intended.

The main idea behind the concept of absorptive capacity can be seen in the concept of related variety (Boschma, 2008). The related variety concept suggests that new knowledge emerges out of existing, related ones (Boschma & Frenken, 2009). Learning processes and knowledge accumulation steer the companies and the regions in a certain trajectory. Boschma and Iammarino (2009) showed that an inflow of knowledge *per se* did not affect economic growth of regions between 1995 and 2003, but that the knowledge needed to be related to the existing ones. Other research showed that one needs to differentiate between the different development stages of industries. New (high-tech) industries benefit more from inter-industry knowledge spillovers, while more matured industries need intra-industry spillovers (Neffke *et al*., 2011). In that sense, depending on the development stage of the industry, there might be different dimensions to "relatedness".

Formation of a new local industry

Once new knowledge entered the region, a new industry might emerge, if the number of incumbent firms or start-ups engaging in similar activities increases. Schumpeter (1934) referred to this phenomenon as "swarms of imitators". New companies are recognized to play an important role in the formation of new industries (Aldrich & Fiol, 1994; Malerba & Orsenigo, 1996). Bresnahan *et al*. (2001) suggest that the creation of new firms is one critical factor for the agglomeration of firms within the same industry. Formation of new industries is however characterized by turbulence where the entry and exit of start-ups is rather high (Dosi *et al.*, 1995). Andersson and Koster (2011) present evidence of spatial–temporal persistence in start-up rates. Two mechanisms are distinguished: the stickiness of factors influencing the start-up rates (spatial persistence) as well as the path dependency in start-up activities due to demonstration effects (spatial

and temporal persistence). If the creation of new firms is vital for the formation of new industries, this might suggest that new industries are more likely to emerge in entrepreneurially active regions.

Entrepreneurship is not simply a result of a larger number of opportunities (Shane, 2003), but much research has been done on the importance of entrepreneurial role models (Aldrich, 1999; Arenius & Minniti, 2005; Henrekson & Stenkula, 2007). High start-up rates over a long period of time may lead to the development of a positive attitude towards entrepreneurship resulting in supporting formal and informal institutions (North, 1990; Shapero & Sokol, 1982). Role models might not only open up the possibilities about entrepreneurship in general, but open up more specific possibilities within a particular industry. Buenstorf and Klepper (2009) and Klepper (2007) stress the role of spin-offs in new industry emergence. Buenstorf and Klepper (2009) showed that by historical accident Goodrich located in Akron to produce bicycle tyres and, later on, the first pneumatic automobile tyre. Swarms of imitators emerged as Goodrich's company became more and more successful. This swarm behaviour is often localized, because knowledge spillovers are often geographically bounded (Audretsch & Feldman, 1996b). Localized swarming behaviour, localized knowledge spillovers and localized spin-off behaviour suggest that the region might become more and more specialized and thereby develops along a certain trajectory. The related variety concept suggests that it is easier to spill over knowledge to other firms which possess related knowledge (Boschma, 2008). In that sense, "industries are more likely to enter a region if they are technologically close to the regional portfolio" (Neffke *et al.*, 2009, p. 31).

Also universities have been acknowledged as one important source of new technology-related firms (Peréz & Sanchéz, 2003). Research at universities creates new knowledge, which might be used by private companies and even might result in university spin-offs. University spin-offs, in comparison to corporate spin-offs, are more often based on technological advances rather than on pre-assumed advantages on marketing or sales. Founders are often scientists and engineers who want to explore new technologies more freely rather than to test their entrepreneurial abilities (Dahlstrand, 1997). In that sense, university spin-offs with their focus on technological advances are important actors to push the boundaries of new industries.

Anchoring process of a new local industry

The survival of the new local industry depends on how it is anchored in the existing regional structure. Feldman (2003) introduced the so-called anchor hypothesis where existing firms serve as anchors for new industries. It is suggested that single, large existing firms are of greater importance for the anchoring process than a group of smaller ones. It is furthermore suggested that the profile of the existing anchor is of crucial importance for the specialization of the start-ups. This implies "a regional path dependency that stems from the existence of the anchor firm to the specialization of new firms that enter the industry in that location" (Feldman, 2003, p. 3). This regional path dependency occurs because the anchor establishes skilled labour pools and provides knowledge spillovers for new technology-intensive firms in the region. Orlando (2000) and Autant-Bernard (2001) propose that benefits of knowledge spillovers are higher for similar applications. Conclusively, to some extent, the anchor determines the technological development trajectories leading eventually to a specialization of the newly emerging industry. It is however not

discussed how and why existing firms might turn into new directions and thereby turn into anchors for new industries.

Also Klepper and Thompson (2006) acknowledge the role of large companies in the local legitimization of the new industry. They developed a theory of spin-offs suggesting that spin-offs are the result of strategic disagreement within firms. The theory suggests that "the more successful the firm then the greater its expected rate of spinoffs and the better the expected performance of its spinoffs" (Klepper & Thompson, 2006, p. 619). It is also pointed out that spin-offs tend to be located in geographically close proximity to their parent firms. Consequently, a region with one or several superior firms will eventually have an increasing number of superior firms through spin-offs which will lead to an agglomeration of economic activities. Boschma and Frenken (2006, p. 279) argue similarly as "success breeds success through learning".

This theory of spin-offs was later used to explain the agglomeration of the US automobile industry around Detroit (Klepper, 2007) and the clustering of the US semiconductor industry in Silicon Valley (Klepper, 2010). It remains rather unclear how these superior, or successful firms were identified, but it can be assumed that a successful firm produces a relatively large amount of cars compared with its competitors. But no concrete criteria have been provided for how the leading automobile firms and semiconductor producers have been identified (Klepper, 2007, 2010). Klepper (2007) explains the agglomeration of the automobile industry around Detroit by noting that the four most successful entrants could be found in and around Detroit and that they had a higher spin-off rate and spun out better-performing spin-offs. It remains however unclear why the four most successful early entrants could be found in Detroit and were not spread throughout the USA. While Klepper explains the self-strengthening effects, he does not discuss the initial starting events of this whole process. "The leading firms, which are disproportionately concentrated in the Detroit area, spawn spinoffs at the highest rate" (Klepper, 2010, p. 22). There are however also other examples where spin-offs from unsuccessful companies marked the starting point of a new industry. In the case of the semiconductor industry, Fairchild, an important company for the success of the semiconductor industry, spun out of Shockley Semiconductor Labs, a company which never produced a commercially successful product. But also this case is a good example of strategic disagreement (Holbrook *et al.*, 2000).

Table 1. Three stages of local industry development

Stage	Description of the stage
Entering of new knowledge	As new knowledge should be understood knowledge which has not been present in the location, but entered the region through different channels. Such channels can be global networks, mobility of firms and people as well as trade. In most cases, this new knowledge is not locally created
Formation of a new industry	New knowledge, whether completely new or a new combination of existing knowledge, will lead to the formation of a new industry if there is a critical mass of local entrepreneurs or incumbent firms which take actions within a similar business area
Anchoring of the new industry	With an increasing number of actors, this new industry will then be anchored in the existing profile of the local economy. The anchoring process is the process that turns the new industry into an established industry in the local economy

Table 1 synthesizes the theoretical discussion by providing a short overview of the three stages of local economic development and their description.

Method

To illustrate the potential three evolutionary stages of local industries, the case study of Linköping has been selected for several reasons. First, Linköping underwent a remarkable transformation during the past century from a small town of rural character into one of the largest cities in Sweden. Second, Linköping's entrepreneurial phenomenon is known throughout Sweden. Entrepreneurial activities are a central part of this success story leading to the emergence of the local IT industry.

Data Collection

Data consisted of interviews, field research, organizational documents and media reports. Several chronicles described the historic development of Linköping and enabled to go further back in time than interviews alone would have allowed (Almroth & Kolsgård, 1981; Hellström, 1983; Knuthammar 1994; Lokalhistoria, 1999). All together 14 semi-structured interviews have been conducted, averaging between 90 and 120 minutes each. Interviews were conducted in 2011. All interviews have been transcribed shortly after the interview took place. Interview partners were mainly entrepreneurs who started knowledge-intensive companies in Linköping during the past 30 years. Several employees from the municipal administration, and other relevant organizations, such as investment agencies and the university, have also been interviewed. Several representatives from SAAB, which is the largest private employer in Linköping, have also been interviewed. It was also important to interview other researchers in order to be able to collect further in-depth information.

It should also be noted that many interviewees had changing roles throughout the decades: entrepreneurs later became local investment managers, university employees became entrepreneurs. Interviews provided insiders' views on the local transformation process and the motivation behind events, and are therefore subject to retrospective biases. Much of the case discussion is based on the interview data.

Data Analysis

In accordance with the aim of this article, the analysis is concerned with understanding how the local economy evolved over time, why it evolved in this way and who the actors were. In accordance with recommendations for process research (Langley, 1999; Zietsma & Lawrence, 2010), different analytical stages were designed. First a chronological list with events and activities has been constructed. Then, a narrative has been composed containing all the interview data. Third, the study's boundaries have been identified in accordance with the research question and the literature review. Thereby, the relevant events were identified. Fourth, the relations between the relevant events and its actors have been identified. Thus, it was closely examined which events resulted in other events and who the actors were. Finally, based on these steps of the analytical process, the narrative has been rewritten according to the structure in the literature review in a condensed form as seen in the following section.

Linköping's Transformation

In the twelfth century, the Catholic Church built a cathedral and from that time on, Linköping played an important role as a centre of education and public administration (Lokalhistoria, 1999). In 1627, Linköping was the third town in Sweden which acquired a high school. The former cathedral school was converted and the school was soon known throughout the country (Hellström, 1983). Despite its importance for the church and education, Linköping remained a small town of rural character with no noteworthy industry before the twentieth century. Nowadays, however, Linköping is well known as the "Swedish aviation capital" and for its "entrepreneurial spirit". This transformation will be analysed according to the theoretical framework.

The Entering of New Knowledge

New knowledge entered the region through an historical accident. In 1907, the Uggla brothers Carl Johan and Erland decided to quit their jobs as engineers at Södertälje Workshop and moved to Linköping to establish the private Swedish Railroad Shop (ASJ). After the First World War, cars and trucks started to compete with railroads and buses and the company was forced to search for new products (Almroth & Kolsgård, 1981). The first airplanes were developed and manufactured in the beginning of the 1930s. Manufacturing steel bodies for trains and buses was at that time not so different from manufacturing bodies for airplanes. It was rather common that train and car manufacturers produced bodies for airplanes during the 1920s and 1940s. The aviation division was soon bought by SAAB AB in 1939, which located its own airplane manufacturing in Linköping after that. Another historical accident was the government decision which led to the establishment of SAAB AB. SAAB AB was created in 1937 with Europe being on the brink of a major conflict. SAAB AB was established through state intervention but in cooperation with leading industrialists such as the Wallenberg family from Stockholm. The company should secure Sweden's neutrality and supply of military aircrafts.

With SAAB, the first large-scale production entered Linköping (Almroth & Kolsgård, 1981). SAAB developed quickly into the largest private company and still is today. Hence, the establishment of ASJ and its purchase by SAAB proved to be of immense importance for Linköping's development. The development of airplanes progressed quickly, which meant an increasing demand for electronic products. In the 1950s, SAAB intended to develop a navigational computer for its fighter jets. The navigational computer was used in the fighter jet "SAAB 37 Viggen" which was introduced in 1971. The navigational computer could be easily transformed into mini and mainframe computers for civilian use. Furthermore, computers were needed to cope with the increasing demand for design calculations. Conclusively, the SAAB computer division was born and was spun out later on as Datasaab.

As a military company, SAAB AB was a national company with a rather closed network. This might be one reason for the traditionally low number of spin-offs. Beside Datasaab, there was basically no other spin-off until the 1980s. Nonetheless, much knowledge has been spilled over from the military aircraft industry to civil application areas. It was however not SAAB, but SAAB's national cooperation partners such as Ericsson, which turned knowledge into products for the commercial market (Eliasson, 2010).

While the local knowledge spillovers have been traditionally weak, SAAB played an important role in bringing the university to Linköping (LiU) in 1969. The establishment

of LiU was made possible by a national decision which was beyond the control of the local and regional authorities and thereby was another historical accident of immense importance for Linköping's development. The baby boom after the Second World War led to an increase in the number of students in the 1960s. The Swedish government decided to establish more higher education institutions and many municipalities tried to attract such an establishment. In Linköping, several individuals were interested to attract an establishment of higher education. SAAB director Lars Brising and civil servant Samuel Bergbäck suggested the establishment of a technical college with strong links to the regional industries. First a technical college, it was granted full university status in 1975. Being aware of SAAB's central role, the vice-chancellor of LiU, Hans Meijer, knew that the university's success was dependent on a close collaboration between SAAB and LiU. At that time, the pre-dominant agreement in Swedish academia was that academia and industry should be kept apart. LiU therefore needed to go against this agreement, if strong ties with the regional industry were something to strive for. The vice-chancellor recruited new professors, such as the new professor of image processing Ingemar Ingmarsson and staff which were known for their relations to the industry. These employees came mainly from established universities, such as from Stockholm, Uppsala and Lund, and have had enough of academia as an ivory tower.

Furthermore, the success of LiU was also dependent on how well this new organization was integrated in the existing economic structure of Linköping. SAAB as the largest private company had a strong influence on the university's profile. Datasaab was rather successful at that time and LiU acquired Sweden's first IT professorship accordingly. Soon, SAAB donated a used model of its D21 for educational use. The local IT activities were therefore related and unrelated at the same time: it was rather unrelated to the history of the location, but related to an isolated activity at SAAB AB. The university opened up this particular knowledge to others outside of SAAB AB. The ties with the university were weakened due to the sale of Datasaab to Ericsson and the emergence of an entrepreneurial university focusing mainly on entrepreneurship. While Datasaab failed, it was important for the future development of the local economy.

Audretsch and Keilbach (2004) suggested that entrepreneurs are important for the diversification of knowledge and that they act upon certain knowledge which has not been valued highly by incumbent firms. The entrepreneurs in Linköping stressed the uniqueness of their product. Often, their product was described as very "odd". This suggests that the market for such kinds of products was small at first and not profitable for large companies, but profitable for start-ups. Conclusively, in the case of Linköping, entrepreneurship was an important mechanism in creating a diversity of knowledge. While SAAB and Datasaab were important players at first to bring new knowledge into the city, the entrepreneurial activities of start-ups diversified the knowledge into odd products.

Formation of a New Industry

Such entrepreneurial activities were very important for the formation of a new industry. Bresnahan *et al*. (2001) suggest that the creation of new firms is one critical factor for the agglomeration of firms within the same industry. In the 1980s, the IT industry was rather young and had remarkable growth rates not only in Linköping, but also on the global scale. The vast majority of local start-ups occurred in the IT industry and thereby reflected the technological profile of the university. Due to high turbulence in

the newly emerging IT industry, the entry and exit of start-ups were rather high. Despite the high number of exits, new IT companies started to emerge. As a new industry with high growth rates, a lot of opportunities existed. These growth rates meant that it was apparently difficult to fail, if one took work seriously. LiU was not a large university at that time with only a few departments. In the beginning, many start-ups were spin-offs from the department of image processing. In 1979, Sectra AB was started by Professor Ingemar Ingmarsson and three of his PhD students: Viiveke Fåk, Robert Forchheimer and Rolf Blom. The reason behind this start-up was that the university research group was approached by a large number of private companies. These projects from private industry were very practical oriented and the research group was drifting further away from academic research. The idea to found Sectra was born. Ingmarsson, Fåk, Forchheimer and Blom could now take care of practical projects outside of the university. The establishment of Sectra proofed to be a role model for other employees. Shortly after, Björn Krause started Imtek AB, Gösta Granlund and Sven-Günther Hanssen started Contextvision, Bengt Sandlund started IDA Infront AB, just to mention a few. In the beginning of the 1980s, most of the staff in the department was to some extent involved in different spin-offs. Interestingly enough, the entrepreneurs did not speak about their companies with their fellow university staff, but they were considered as serious competitors. In some cases, a lot of money was at stake: companies, such as Imtek AB and Contextvision AB, became practically overnight multibillion SEK companies. This opened up the eyes of staff at other departments to identify and exploit business opportunities. While the first university spin-offs were started by the staff, also the students soon became entrepreneurs. Some of the first student entrepreneurs were Bengt Nilsson and Lars Karlsson who founded IFS AB in 1983, Björn Algkvist, Mikael Ageras, Göran Felldin and Rune Groppfeldt who founded Intentia in 1984. Due to the size of the university, the number of students was small and everybody knew everybody. The founders of Intentia and IFS lived in the same student corridor. Also, the girlfriends started companies: Anna-Carin Månsson, for example, started Exit Marketing AB in 1984. While the first entrepreneurs in the 1970s and 1980s were a rather new phenomenon to Linköping, the actual "persistence" in start-up rates can indeed be explained with role models.

During the interviews, the uniqueness of the education during the 1970s and 1980s was stressed. In that sense, the job market was not yet ready for such a type of employees. The increasing importance of IT for all industry sectors meant that it was easy to find a job, but these jobs often did not involve the same degree of newness as the education was all about. Instead of settling for a minor interesting job, many students were inspired to start up new companies developing products which were, due to their innovativeness, considered to be rather "odd" at that time. Pioneers like the Uggla family, Lars Brising and Hans Meijer created a favourable environment and the entrepreneurs took the opportunities. Hence, entrepreneurs were the actors driving the success story of Linköping in the 1980s.

Andersson and Koster (2011) present evidence of spatial–temporal persistence in start-up rates. Until the beginning of the 1980s, the start-up rate was rather low in Linköping. Nonetheless, Linköping is now known for its entrepreneurial spirit in Sweden. This break was a result of the establishment of a university; a university which had a positive attitude towards entrepreneurship. LiU was important in order to attract young people and turned them into entrepreneurs. Therefore, Linköping seems a logical choice for the location of the university's spin-offs.

The early entrepreneurs were later on advisors for investment companies or board members of other start-ups. In that sense, the early entrepreneurs were not simply doing their business, but were incrementally changing the local business environment to fit their needs and the needs of the younger generation of entrepreneurs.

As a result of an increasing number of entrepreneurs, an entrepreneurial support structure started to form. Many organizations were established with the goal to support entrepreneurs in their new activities. This newly emerging local entrepreneurial support structure contributed to a limited extent to the spatial and temporal persistence in the local start-up rates. The story about the local IT industry formation is pretty much a story about a few entrepreneurs making use of a knowledge base related to SAAB and LiU. During the interviews with the entrepreneurs, it was stressed that they only received limited support from public organizations in the beginning. But it can be stated that the establishment of the Mjärdevi Science Park was important for the start-ups because cheap, small and flexible offices could be offered to the new entrepreneurs. In that sense, the entrepreneurial support structure had some impact on the entrepreneurial activities.

Anchoring Process of a New Local Industry

The local entrepreneurial support structure did play a certain role for the formation of the new IT industry, but it was more important for the anchoring process. Anchoring process here means the total of processes that turned the newly emerged industry into an established industry in the city.

In the case of Linköping, this can be observed clearly. SAAB was and still is the largest private employer in Linköping and is very research-intensive. SAAB was bringing new knowledge into the region and the success of Datasaab in the 1970s contributed to some kind of legitimization of the local IT industry. The profile of the anchor is of crucial importance for the specialization of the start-ups (Feldman, 2003). In the case of Linköping, it holds true as well even if the mechanisms are not very clear-cut. Datasaab was focusing not on application software, but on the program codes behind it. As a result, the education at LiU was created accordingly. As most of the start-ups are founded by employees and former students, also the local IT cluster does have a unique profile. While the IT companies in Stockholm are nowadays considered to work with Internet-related applications and games, there is still a much stronger focus on the program codes and the technique in Linköping. Some argue that this specific profile in Linköping was one reason why the local IT cluster could cope much better with the IT crashes in the 1990s. Web-related products, such as apps, are a matter of fashion and trends which can change very quickly. But the technology behind IT is a basic foundation which is always required. In that sense, Datasaab's legacy can be seen today in the profile of the IT cluster and the IT start-ups.

Klepper and Thompson (2006) acknowledge the role of large companies in the local legitimization of the new industry through spin-offs. This cannot be observed in Linköping. SAAB was a rather closed company with a low spin-off rate. From the mid-1980s onwards, the numbers of SAAB spin-offs increased. This might be a result of the increase of entrepreneurial activities in Linköping in general. Local role models might have been stimulating also for SAAB employees and not only for university employees or students. Another reason might be the corporate efforts to turn the company from a closed national company into a more open international company. In that sense, SAAB was becoming

Table 2. SAAB spin-offs originated from Linköping between 2001 and 2010

Spin-off	Product
Sanguistech AB	Systems for blood centrifuging
HS Memory AB	High-speed memory architecture for military radar applications
MX Composites AB	High-performance components
SMM Medical AB	Compression device for the treatment of vascular disorders
Tracab AB	Image Tracking System
A2 Acoustics AB	Active sound control
Efield AB	electromagnetic simulation system
Minesto AB	Tidal energy kite
C3 Technologies AB	3D mapping

more active in commercializing military products and technologies on the commercial market. Military products can often easily be turned into products for non-military use; e.g. a radar altimeter for missiles was developed further into a tanker level-gauging system measuring the level of liquids in a closed tank and resulted in the SAAB spin-off SAAB Marine Electronics. While the number of spin-offs increased in the past 20 years, the spin-offs are not centred on a certain industry, as seen in Table 2. In that sense, SAAB spin-offs originating from Linköping did not contribute to the anchoring process of the local IT industry.

While the company played a significant role in attracting the university and for the university's profile, it has been the university itself which produced the spin-offs that resulted in the formation and later anchoring process of the local IT industry. Conclusively, SAAB had a more indirect impact on the anchoring process of the local IT industry due to the closure of Datasaab and the closed nature of the defence company SAAB AB.

Since the 1980s, the number of start-ups increased steadily and reached its temporary peak with 932 start-ups in 2011. Never before have so many businesses launched in 1 year. The entrepreneurial spirit in Linköping seems to be pretty much alive until today. The increasing number of university spin-offs did not pass the public authorities unnoticed, and especially in the 1980s and 1990s, most of today's entrepreneurial support organizations emerged: Foundation for Small Business Development (SMIL), InnovationskontorEtt, Exportrådet, Innovation Bridge, Teknikbyn, Center for Innovation and Entrepreneurship (CIE), LEAD Incubator, Novare, ECI, Linktech, University Holding AB and so on. Many of the entrepreneurs from the 1980s and 1990s are now working as consultants for these organizations, such as Göran Felldin, Pahl Mellin and Lars-Erik Nordell. This can be seen as an important step for the anchoring process of the local IT industry. Special entrepreneurship programmes were provided at the university and venture capital entered Linköping. Generally, entrepreneurs had now someone to turn to. Many entrepreneurial support organizations are now involved turning entrepreneurial activities into a very formalized process. This also means that entrepreneurs turned from pioneers into the norm: not wanting to be an entrepreneur is now considered to be strange.

The importance of the local entrepreneurial support structure increased during the anchoring process of the local IT industry. While the support organizations played a rather insignificant role in the formation process, they were important for the anchoring process.

Conclusion

This study discussed the evolution of a local industry in Linköping. The analysis of the local evolution included also the small "historical accidents" which actually broke down barriers and opened up the entrepreneurial path. In doing so, this study took a more comprehensive view of the evolution process than past studies. In the literature, many studies focus on the spatial and temporal persistence of success and conclude with statements like "nothing breeds success like success" (Boschma & Frenken, 2006, p. 279) and "successful companies tend to spin-off successful companies" (Klepper, 2007, p. 619). Often the initial historical events which initiate the success stories are exogenous to the theory and, hence, contribute little to a detailed clarification of why some regions become successful in the first place.

However, some problems remain unsolved. The question why some regional economies become locked into development paths where some lose dynamics over time and others have the ability to reinvent themselves through new paths is only partly answered. The case of Linköping showed that small "historical accidents", such as the establishment of the AJS, proved to be the initiating sparks of what later became known as the "Linköping success story" (Klofsten *et al*., 1999): a university town with a large share of knowledge-intensive small and medium-sized companies. The potential of these initial sparks were realized by entrepreneurs and their individual actions. The term "small historical accidents" suggests that the starting points of such success stories are somewhat random and at best very difficult to encourage and steer. Path dependency also stresses that "small" accidents can gain in importance over time. Back in 1909, no one could imagine that the economic activities of the Uggla family would be the starting point for the national aviation and local IT industry. This means that accidents are difficult to create and that it is difficult to predict the importance of every current small accident for future development. In retrospect, the path can be identified, but it is difficult to predict. The case of Linköping showed that beneficial circumstances, unique individuals and a bit of luck might be the starting point of unexpected processes.

Historical accidents might also suggest that these events do not need to be related to already existing local activities. In the case of Linköping, the emergence of the local IT industry was initiated by historical accidents, such as the start of ASJ and the establishment of the university. Historical accidents which are unrelated to existing local economic activities opened up the possibilities for a new local path. The initial events might have been unrelated and driven by pioneers, but the followers and their related activities pushed into a certain trajectory. The case discussion showed that the region developed along a certain path, where one event resulted in another and thereby pushed the local economy into a certain trajectory. In that sense, the historical accidents got strengthened by the many activities of individuals pushing into a certain trajectory.

The main driving forces of the local process were individuals, SAAB AB, the university and the local support structure. As seen in Table 3, the relative importance of these driving forces differed throughout the different development stages: entering of new knowledge, formation of a new IT industry as well as the anchoring process of the new IT industry.

The activities of several individuals were the initial sparks for bringing new knowledge into the region. First, the Uggla family opened up the possibility for SAAB AB to come to Linköping. Second, SAAB director Lars Brising was actively involved in bringing a university to Linköping. Third, the university vice-chancellor Hans Meijer

Table 3. Driving forces in the different stages

Stage	Driving forces
Entering of new knowledge	*Pioneers:* Uggla family as entrepreneurs, SAAB director Lars Brising, university vice-chancellor Hans Meijer
Formation of a new industry	*Followers:* Entrepreneurs who were university staff and former students, such as Forchheimer, Felldin, Nilsson and so on
Anchoring of the new industry	*Infrastructure:* Public support structure

succeeded in creating a university with strong connections to the local industry and hand-picked employees with connections to the private industry. These individuals can be called pioneers who laid down the ground and opened up the path for entrepreneurial activities.

The formation of a new local IT industry was dependent on the university's technological profile and the entrepreneurial-friendly climate at the university, which inspired staff and students to start up IT firms. Stories about the beginning of the entrepreneurial success stories put the activities of entrepreneurs in the focus of attention. While the first entrepreneurs can also be described as pioneers breaking down barriers, the formation of the new local IT industry relied on entrepreneurial followers. This means that the creation of a resource pool, such as the creation of knowledge as well as motivated people equipped with this particular knowledge, was needed or otherwise the evolution would have come to a stop before it even started. The actions of public authorities were described as helpful at best, but were not considered to be of great importance for the formation of the local IT industry.

The actions of public authorities resulted in an elaborate support structure which played an important role in the anchoring process of the new local IT industry. An infrastructure was established to support the entrepreneurs. Actions of the individuals are still important, but are less obvious. The entrepreneurs turned from being rare into the norm. With an increasing number of entrepreneurs, the stories are now less about individuals and more about the entrepreneurial spirit of Linköping. It was also shown that neither SAAB nor its spin-offs played a direct role in the anchoring process. This might be due to SAAB's exceptional role as a defence company which just recently started to open up and diversify in the civilian market.

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ARTICLE 3

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Local culture as a context for entrepreneurial activities

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ABSTRACT

This paper examines how an industrial legacy leads to the formation of a distinct local culture and how the culture's survival provides a context for the subsequent entrepreneurial activities in new local industries. The discussion about culture as a key driver of entrepreneurship and economic growth is well established in the academic debate. However, we know little about how culture is formed. Through a qualitative case study of two polar Swedish cities, the study highlights four key factors which are instrumental in the formation of local culture: initial conditions, characteristics of key players, network activities and composition of newcomers. We show how the local entrepreneurs responded to the underlying assumptions of the two different cultures.

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Introduction

Culture plays an important role for entrepreneurship. Well-known examples are Silicon Valley in the US (Saxenian, 1994), Emilia-Romagna in Italy (Harrison, 1992) and Gnosjö in Sweden (Johannisson & Wigren, 2006). This literature acknowledges that entrepreneurial initiatives are influenced by social expectations, obligations and ethics (Casson, 1995; Kirzner, 1973). In this respect, entrepreneurship is often described as a socially embedded phenomenon that to a large extent is influenced by the habits, customs and traditions of everyday life in specific locations (Johannisson, 2003).

The discussion about culture as one of the key drivers of entrepreneurship and regional economic growth is well established in the academic debate (Gertler, 1997; Saxenian, 1994). Various studies have in this respect focused on how the entrepreneurial culture affects start-up rates and a firm's growth in regions. For example, Davidsson and Wiklund (1997) found that cultural differences explain regional variation in a new firm's formation within Sweden.

Beugelsdijk and Noorderhaven (2004) studied 54 regions in Europe and showed that regions that score higher on 'entrepreneurial attitude' tend to grow faster. Bosma and Schutjens (2011) observed a positive link between entrepreneurial culture and start-up activities at a regional level. Adding to this, Fritsch and Wyrwich (2014) showed that persistently high levels of new business formation could be traced back to the long-lasting

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effect of a regional entrepreneurial culture. In that sense, research shows that culture is identified as having a non-trivial influence on entrepreneurial behaviour.

However, while culture is widely acknowledged as a driver of entrepreneurship and regional economic growth, the scholarly literature is much scarcer when it comes to the issue of how a culture conducive to entrepreneurship is formed (Andersson & Larsson, 2016). Evidence from past studies suggest that the evolution of a culture is closely tied to the industrial trajectory (Aoyama, 2009; Nijkamp, 2003). The literature also suggests that temporal persistency can be observed in business practices, routines and mental maps (Grabher, 1993; Nelson & Winter, 1982). Through the interaction between economic agents, these distinctive local mind-sets transcend sectorial boundaries and influence the activities in new industrial sectors (Aoyama, 2009). This means that the historical economic development of a location leads to the emergence of distinct social foundations of economic life which influence the subsequent economical activities (Amin, 1999). This paper addresses this research gap by contributing to our understanding of the formation of a local culture that influences entrepreneurial activities in new local industries. Based on a historical case study of two Swedish cities, the analysis demonstrates how the industrial trajectory of the cities has shaped their local cultures. In that sense, this study aims to identify the key factors which are instrumental in the formation of local culture.

The two selected cities are of comparable size. Linköping has around 151,000 residents; Norrköping has around 135,000 residents. They are neighbouring cities, but are entirely different in their economic development. Identifying general mechanisms on the formation and survival of local culture is most robustly done by analysing two apparently polar cases. Linköping's economic development is driven by a combination of small and large high-technological companies, while the economic development of Norrköping is based on the longstanding dominance of a few large manufacturing companies in the textile and paper industries. In a recent survey by the Confederation of Swedish Enterprise (CSE) on entrepreneurs' satisfaction with attitudes of local public officials and society in general towards entrepreneurship, Linköping ranked 41, while Norrköping was placed 223 among all 290 Swedish municipalities.

The remainder of this paper is organized as follows. First, the literature on culture and entrepreneurship is presented. A definition of culture is provided and the findings on regional entrepreneurial culture are discussed. In the next section, the method and the analytical process are described. In Section 'The economic conditions for local culture', the analysis on the importance of the historical economic development on the formation of local culture is presented and how this local culture affects entrepreneurial activities. The paper ends with a conclusive discussion highlighting the main findings and its implications for future research.

Theoretical foundations

Early studies focus primarily on economic factors to explain differences in entrepreneurship across nations, such as the availability of technology and levels of economic development (for further elaboration, see Verheul, Wennekers, Audretsch, & Thurik, 2002). The sole focus on economic variables leaves a great level of unexplained variation across countries (Uhlaner & Thurik, 2007). Thus, researchers have recently used cultural differences to explain these large variations in the rate and continuity of entrepreneurship

activity. Studies in the past have focused on national culture (Huisman, 1985; Liñán & Fernandez-Serrano, 2014; Mueller & Thomas, 2001), but scholars have more recently started to address the regional level (Fritsch & Wyrwich, 2014; Kangasharju, 2000; Saxenian, 1994).

What is 'local' culture?

Several cultural theories and cultural definitions exist (Geertz, 1973; Inglehart, 1997; Schwartz, 1992). There is some common ground, but also distinct differences. Generally, culture is seen as the social legacy an individual acquires through social interaction with group members and that this social legacy needs to be known in order to behave in a manner which is acceptable to its group members. Culture is also commonly seen as something that is passed on from generation to generation and therefore not easily changed.

One can, however, distinguish general differences in how culture is defined. Inglehart (1997, p. 15) defines culture as 'a system of attitudes, values, and knowledge that is widely shared within a society and transmitted from generation to generation', while Hofstede (1984, p. 9) defines culture as 'the collective programming of the mind which distinguishes the members of one human group from another'. Culture is most commonly defined as a 'system' and researchers have therefore divided culture into several system components or different values or attitudes in a quantitative style (Baskerville, 2003). Using 'system' and the 'collective programming' as a metaphor for culture reflects the instrumentality of culture and gives the impression that it is an entity which can be measured directly. Culture can, however, also be viewed as an abstraction from behaviour. Geertz (1973, p. 17) claims that 'behavior must be attended to, […] because it is through the flow of behavior that cultural forms find articulation'. Culture should be seen as an integrated whole which is not easily divided into sub-components and is most adequately studied through the study of behaviour.

Local culture consists of societal assumptions shared by the major communities of a location. These typically unconscious assumptions influence how group members of these communities make decisions and behave (Schein, 1984). Individuals and organizations are likely to conform to prevailing assumptions in local settings by repeating behaviours that are typical for their group. These repeating behaviours can both be conscious acts to gain social acceptance or less conscious imitations of observed typical, valid behaviour (Powell & DiMaggio, 1991). Individuals conform to these assumptions because the group rewards individuals whose behaviour reflects these values with social prestige and privileges. Thus, individuals may conform to values even when that behaviour may not be consistent with their own values.

Most studies on entrepreneurship and culture take a regional or national approach, but in this study, we argue that much can be gained by studying culture on the local level for several reasons. Firstly, it is commonly argued that culture is formed through social interaction, and most social interactions are still happening in close geographical proximity, for example, the work place or family. Secondly, the inconsistent results of the studies measuring culture as entrepreneurial attitudes in individuals call for a behavioural approach to culture. Individual behaviour is most adequately studied in a local cultural context, because we can capture how the local community reacted. Thirdly, if we follow Aoyama (2009) and Nijkamp's (2003) assumptions that culture is closely tied to the

industrial trajectory, cities located in the same region but with different industrial trajectories will display different cultures.

Culture and entrepreneurship

The literature investigating the relation between culture and entrepreneurship might be divided into three streams. They differ in how culture is captured in the studies. In one stream, the existence of an entrepreneurial culture has been explained through the domination of entrepreneurial attitudes in individuals in a specific nation or region (Beugelsdijk, 2007; Bosma & Schutjens, 2011; Stephan & Pathak, 2016). These entrepreneurial attitudes should reflect certain dimensions of entrepreneurship, as identified in entrepreneurship trait research, such as the need for achievement, the need for autonomy, etc. (Brockhaus, 1980; McClelland, 1987). The assumption is that if a society holds many individuals with distinct entrepreneurial attitudes, there will be more individuals displaying entrepreneurial behaviour, thus leading to a distinct entrepreneurial culture in that location (Uhlaner & Thurik, 2007).

Another, more recent stream of literature is formed by studies which see culture as long-time persistency in entrepreneurship rates (Andersson & Koster, 2011; Fritsch & Wyrwich, 2016; Wyrwich, 2012). Implicit conclusions are drawn that regions with a high entrepreneurship rate over time have a strong entrepreneurial culture. These studies use culture as a means to explain the temporal-spatial persistence of entrepreneurship rates even in times of disruptive shocks.

The third stream of literature takes on a behavioural approach to culture and uses qualitative case studies to study possible effects of regional culture on entrepreneurial behaviour and vice versa (Aoyama, 2009; Saxenian, 1994). These studies discuss how norms within the local business community differ between regions and lead to more entrepreneurial behaviour.

Common to these three streams of literature is the assumption that a location either holds or does not hold an entrepreneurial culture. A description of these two extremes gives a good description of differences, but there is little discussion on what this entrepreneurial culture consists of: if entrepreneurial culture is one part of a more general local culture or how this culture was formed.

Based on this, the first stream of research might be challenged for its assumption that entrepreneurial culture can be measured directly as an aggregate of individual attitudes. Authors have questioned the attempt to divide such a complex entity as culture into different values, but request culture should be studied as an integrated whole (Baskerville, 2003). This is supported by inconsistent results which challenge the assumption that entrepreneurial values and attitudes are positively associated with entrepreneurial behaviour (Hayton & Cacciotti, 2013). Furthermore, studies have shown that there is a low and even negative correlation between individual attitudes and member-shared assumptions (Fischer, 2006). This is in line with the theory of planned behaviour where desirability is regarded as a motivator to perform certain tasks (Minola, Criaco, & Obschonka, 2016). This desirability is significantly influenced by social norms. Theory of planned behaviour suggests that if a behaviour has consequences for the individual and these consequences are outside the control of the individual, individuals might act against their internally held preferences (Ajzen, 1991). The self-reflecting individual adjusts the

behaviour consistent with the expected consequences of the behaviour (Autio, Pathak, & Wennberg, 2013). Hence, local social norms might outplay internally held preferences.

Especially in the second stream of research, where entrepreneurship rates have been used as an indication of entrepreneurship culture, the question arises how different levels of entrepreneurship rates would translate into the simplistic description of two extremes. This would also relate to the question of how an entrepreneurial culture relates to other local factors. Does an entrepreneurial culture always lead to high levels of entrepreneurship rates or can other local factors, such as industry structure, weaken the effects of an entrepreneurial culture?

In the third stream of literature, entrepreneurial culture has been mainly discussed from the point of view of economic actors and rarely about how the rest of society relates to this specific group. But culture is assumed to be formed through social interaction. An entrepreneur's social interaction is more than simply the immediate business partners and networks (Kibler, Kautonen, & Fink, 2014; Klyver & Foley, 2012). We propose that we need to go beyond analysing entrepreneurs as an isolated group of people, but see them in their specific context. This would also follow recent calls in entrepreneurship research to study entrepreneurial activities in an everyday context. This line of argumentation would suggest that there is one, general local culture. This culture differs from location to location and some local cultures might stimulate entrepreneurial activities to a higher extent than others.

Based on the discussion above, we follow calls to study culture as a complex whole which is not easily divided into sub-values. This complex whole cannot be observed directly, but since culture is assumed to influence behaviour, it is most adequately studied by studying the behaviour of locals. This also means that we want to go beyond the either-or approach to entrepreneurship culture. We suggest that each location has a particular local culture. These local cultures may vary with some being more supportive of entrepreneurial behaviour than others. In other words, no local culture is either entrepreneurial or not, but local culture can foster entrepreneurship to different degrees. This means that there are no conclusions as to whether one culture is more entrepreneurial than the other, but we will focus on how the different local cultures have been formed and how these local cultures influence the local perceptions of entrepreneurial activities.

Research methods

Two Swedish cities were selected for this research based on the results of a recent survey by the CSE. The survey included 60,000 business owners and entrepreneurs all over Sweden who were asked about their municipalities' business climate. One important part of the survey focused on the local entrepreneurs' perceptions of attitudes to entrepreneurship among different local groups, such as local politicians and public servants, but also local society in general.

The survey suggests striking differences between Linköping and Norrköping, which are known as 'twin cities' in Sweden. In terms of perception of attitudes, Linköping ranks well above the Swedish average, while Norrköping scores well below. Taking all factors together, 62% of the entrepreneurs in Linköping stated that their municipality has a good, very good or excellent business climate, while only 32.6% in Norrköping stated the same. Thus, seen as two polar entities operating within the same national and regional

framework, the two cities seem to provide an excellent opportunity to set up a study of how a local culture is formed and influences entrepreneurial activities.

Cities have been chosen as a unit of analysis for several reasons. First, there have been recent claims that the everyday localized context of entrepreneurship needs be studied (Steyaert & Katz, 2004; Welter, 2011). Cities provide this everyday context where people have a daily face-to-face contact resulting in place-specific socio-economic development paths. Second, by choosing a city as the spatial unit of analysis, the interaction between municipal, political and business levels can be discussed in more detail and how these interactions shape and are shaped by culture.

Data collection

Following Eisenhardt (1989), we used multiple sources of data for our case study. In addition to interviews, we collected data from archives, chronicles, media reports and organization documents. In total, we conducted 28 semi-structured interviews and each lasted between 90 and 120 minutes. These interviews gave us insights into the local network structures and the motivation behind the sequences of events. As interviews may be subject to retrospective biases, we cross-checked interview statements with each other and with secondary sources.

One group of interviewees (13) represented the organizations and individuals that were in place before the new industry entered the cities such as municipal administration, investment firms, Linköping University (LiU) and SAAB AB, and local workers which were also members of the Labour Union. Some of these people changed position or affiliation and could give insight from two different perspectives. For example, LiU staff became entrepreneurs, entrepreneurs joined investment firms and union members became active in the Social Democratic Party.

The other group (15) represented both entrepreneurs and local business community leaders. These respondents were randomly selected among the first wave of technological entrepreneurs in the cities. These waves appeared in Linköping between 1979 and 1985 and in Norrköping between 1995 and 2001. We asked the entrepreneurs to describe their motivation and behaviour when they founded their companies. We also asked them how people in the local community perceived and reacted to this entrepreneurial behaviour.

Furthermore, various secondary sources were consulted. Detailed information on the actions and values of the labour union members was obtained from the extensive local archives of the labour union in Norrköping. Norrköping's and Linköping's chronicles gave a good overview of the social and economic development of the cities before 1980. Additional information about the various local organizations was gathered from their internal documents.

Analytical process

The analysis of data is the central element of a qualitative study and it is also the most demanding and least codified process (Eisenhardt, 1989). Following recommendations for process research (Zietsma & Lawrence, 2010), various analytical stages were designed. The within-case analysis is useful for dealing with a large amount of data (Yin, 1981).

Based on the interviews and other data, a chronological list of events for each city was constructed and two narratives were written. Next the study's boundaries were identified and the relevant events. Then, the relationships between these events and the actors were identified. This step allowed determining which events led to other events and whose actions influenced the events. Finally, rewriting the narratives in summary form completed the analytical process. The validity of the data was enhanced by triangulation of the different data sources.

In order to identify patterns, we performed a cross-case analysis using a matrix technique for comparative analysis. In these matrices, exemplary quotes and other research findings were sorted by topic. Examples from the matrices are included in the section on the cross-case analysis. Miles (1979, p. 599) notes there is 'the steady tension between the unique, contextually specific nature of single sites, and the need to make sense across a number of sites'. This comment suggests that accurate although thin generalizations among cases can only be the result of cross-case analysis (Yin, 1981). Linkages to the argumentation in existing literature on regional transformation and culture will allow for a more general argumentation rather than analysing two specific cases. Key quotes from the interviews will, however, ensure that this discussion is grounded in the specific cases.

The economic conditions for local culture

Before discussing the results of the cross-case analysis, the economic histories of the two cities are briefly presented. This overview places the results of the cross-case analysis in a broader context that leads to a better understanding of how their local cultures emerged. As argued in the subsequent sections, the two cities have distinctive industrial legacies: Norrköping as a traditional manufacturing city with large mass-production firms and Linköping as a high-tech pole. Table 1 gives an overview of the historical development of the cities.

The county town Linköping

Ever since the Catholic Church built a cathedral in the twelfth century, Linköping has been an important centre for education and public administration in the region. In 1627, the

Table 1. Overview of the two cities.

Location	Population development	Traditional economic base in the 1950s	Economic base in 2010	Current largest private employers
Linköping	1950–1990: +46% 1990–2010: +20%	SAAB AB (Computers, aviation), NAF (cheminals)	IT cluster, aviation cluster	SAAB AB (Defence industry) Ericsson AB (Communication Technology)
Norrköping	1950–1990: +09% 1990–2010: +08%	Electro-technology, paper industry	Cargo handling, manufacturing industries	Billerud-Korsnäs AB, Holmen Paper AB (Both paper and bulk manufacturer)
Sweden average	1950–1990: +22% 1990–2010: +10%	Manufacturing industry, forest industry, steel and mining	Advanced industry (Ericsson, Volvo, Sandvik, Alfa Laval)	–

former cathedral school was converted into one of Sweden's first high schools. In some periods, the number of pupils matched the number of inhabitants. Linköping since 1634 is the seat of the county government. Although important for education and public administration, Linköping remained a small rural town with no significant industry before the twentieth century.

Nowadays, Linköping is recognized as the Swedish aviation capital with the only airplane manufacturing site in Sweden. In 1909, the Uggla family established the private Swedish Railroad Shop (ASJ). Soon, cars and trucks started to compete with railroads and ASJ was forced to diversify into airplane manufacturing. The aviation division was bought by newly founded SAAB AB in the end of the 1930s, which located its own airplane manufacturing in Linköping after that. The first large-scale production entered Linköping and SAAB became the largest private company and still is today. In the 1950s, SAAB diversified into the computer industry and the computer division was spun-out as Datasaab in 1978.

SAAB, as a technology-based company, did provide jobs for highly skilled employees, but was also a key factor in bringing the university to Linköping. In the 1950s, SAAB director, Lars Brising, and civil servant, Samual Bergbäck, lobbied at a national level for a university college with strong linkages to the local industries. In 1967, the institute of technology welcomed its first students and was granted full university status in 1975.

From the beginning, Linköping University (LiU) was actively encouraging strong ties between the private industry and university employees. Because of its importance for the local economy, SAAB was actively involved in shaping the university's profile. SAAB's computer division, Datasaab, successfully developed mainframes for the private market and LiU received Sweden's first IT professorship accordingly.

In the 1970s, several public sector research establishments entered Linköping, such as Förenade Fabriksverken (FFV) and the Swedish Defense Research Establishment (FOA). Around the same time, the first university spin-offs were established. University employees saw the commercial potential of their research and started to spin-out from several departments: Imtek, Contextvision, IDA Infront, just to mention a few. Also, students started companies such as IFS, Intentia and Exit Marketing. These spin-off companies would lead to the emergence of the IT industry. In the early 1980s, Mjärdevi Science Park was established by the municipality to support the entrepreneurial activities in the city.

Nowadays, the local economy is dominated by technology-based sectors. The largest 2-digit SNI sectors with a share of at least 5% of the total workforce are: (35) manufacture of other transport equipment, where all employees are classified under (35,300) the manufacture of airplane and spacecraft, (74) other business activities, as well as (72) computer and related activities. Altogether, these three sectors employ 46% of the total workforce.

The industrial city Norrköping

Norrköping received its municipal charter in 1384. However, the first peak in economic development happened in the seventeenth century when Louis De Geer, a man of commerce from the Netherlands, established several industries, such as cloth mills, paper mills, an arms' factory and a shipyard. By the nineteenth century, Norrköping was Sweden's second largest urban centre and the textile industry dominated the local

industry. Early industrialization made large-scale production possible and Norrköping produced over 70% of the Swedish cloths production. Norrköping's economical foundation was now dominated by large-scale manufacturing industries.

In the 1950s, the textile industry started to decline due to fierce international competition and reduced demand for wool products. The last of the big textile companies closed down in the 1970s. With the large job providers closing down, job opportunities for the workers diminished and the number of unemployed people increased.

Ever since the economic decline, the municipality in crises turned to the national government for help. The national government agreed to incentives for the declining local economy and to re-locate several public organizations from Stockholm to Norrköping. In the years 1975–1976, five state agencies with about 1500 employees moved to Norrköping. The incentives were aimed to attract manufacturing companies to Norrköping, but these activities had modest success at best. Few plants settled down in Norrköping such as Flextronics and Strand Interconnect and even fewer survived in the long run.

The national expansion of the higher education system gave LiU an opportunity to establish its Norrköping campus. The campus offered its first education programmes in 1997 and small companies started to settle down looking for close proximity to the university. Spin-off activities from university staff and former students can be observed. The spin-offs reflect the profile of the campus: media technology, transport, electronic design and communication technology. Many of the newly emerging companies focus on virtual reality and scientific visualization.

Nowadays, the traditionally strong industrial sectors are still the largest two-digit SNI sectors with a share of at least 5% of the total workforce: (63) transport sector, (74) other business activities, (21) manufacturing of pulp and paper as well as (29) the manufacturing of machinery. Altogether these four sectors employ 39% of the total workforce.

Formation of local culture

Initial conditions

In terms of their economic development, the two cities had quite different initial conditions, the key difference being the period of industrialization. Advantageous natural resources, such as the river, played an important role to attract the textile production to Norrköping. The river provided large quantities of water required for textile production and provided fast access to the Baltic Sea which enabled the fast distribution of large quantities of textile. Large differences in altitude made the river ideal for driving water mills for textile production. By 1860, 73% of all blue-collar workers in the county were employed in Norrköping. As in many old industrial areas, a resource-based industrial monostructure started to emerge due to the increasing dominance of the textile industry (Hassink, 2007). The business owners had a strong position and could shape their local production environment, such as the emergence of a highly developed and specialized infrastructure. At the beginning of the twentieth century, the manufacturing industries employed over 50% of the local workforce in Norrköping. In the 1900s, the city had 50,000 inhabitants and several flourishing manufacturing industries.

The situation was rather different in Linköping. The establishment of the cathedral in the twelfth century led to Linköping's position as a religious and educational centre in

Sweden. When Sweden was divided into counties, Linköping was a natural choice as the county's town. In 1860, while the county's blue-collar workers were concentrated in Norrköping, Linköping employed only 1%. In the 1900s, the city was small with about 15,000 inhabitants and of rural character with basically no industry. ASJ was one of the first companies within the manufacturing industry. The later diversification into manufacturing of airplane bodies would prove itself as an important business decision with tremendous effects on Linköping's future development.

Powerful key players

With the initial conditions in place, powerful key players entered the cities. Because of large differences in the initial conditions, the key players are entirely different in nature. In all aspects, Norrköping was a perfect example of an industrial city. The early industrialization and subsequent growth of the manufacturing industries led to a remarkable share of blue-collar workers in Norrköping as seen in Table 2. This initiated a self-reinforcing mechanism since the emerging industrial monostructure favoured large manufacturing companies which again provided more jobs for blue-collar workers and left little possibility for other economic activities.

At the same time, all over the industrialized countries, the labour movement emerged as a reaction to the poor working and living conditions of the working class. Also in Norrköping, the workers started to get organized in the trade union. The trade union united the mass of the workers to 'fight the common enemy: the capitalist employer' (Horgby, 2012). It gained its power through the collective, where everyone worked towards the same goals given by the trade union.

In Sweden, there was a strict separation between union members and non-members. The negotiations by the trade union would only benefit members. This led to a high unionization rate in Norrköping which again resulted in a strong position of the labour union as a strategic counterpart of the local business owners. The clear distinction between members and non-members meant that either you were committed to follow the outspoken directives of the trade union or you were socially excluded.

> Every morning the organized workers shook hands with the union members, but not with strike-breakers or those who didn't pay their union dues. It was decided to list their names in our union newspaper. […] There was also a clear directive which newspaper to read and where to buy our groceries. We would ask for your receipts if we suspected otherwise. (trade union official A)

In Linköping, differences in the economic structure and how the working life was organized prevented the formation of a strong labour union. Instead, a large technology-

Table 2. Number of blue-collar workers per 1000 inhabitants.

Year	Norrköping	Linköping	Stockholm
1915	186	65	93
1930	162	89	94
1945	166	119	96
1960	125	105	67
1968	109	98	58

Source: Linköpings Historia.

based company would become the key player in Linköping. With SAAB, the first large-scale production company entered the city and the company quickly became the largest private company. In that sense, Linköping was also to become dominated by a large manufacturing company, but due to the late industrialization and the industry-specific characteristics of the airplane industry, the city would not develop into an industrial city with a strong trade union. SAAB had a large share of white-collar workers who were not organized to the same degree as the blue-collar workers. The low share of blue-collar workers meant that the trade union became less dominant in Linköping. The rapidly increasing complexity of airplane development required substantial R&D and the inclusion of many different technologies. Hence, SAAB required a highly skilled and highly educated workforce which was not easily replaceable. Figure 1 shows the exceptional high share of white-collar employees at SAAB.

Networking activities

Both key players initiated purposeful actions to create a more beneficial local setting. But due to their difference in nature, they also aimed for different particular characteristics of their settings. In Norrköping, the trade union initiated networks which would allow them to increase their sphere of influence in the social, political and economic life. While the business owners already started to create a favourable business environment, the trade union and its subsequent actions would allow for an even stronger alignment on all levels towards an industrial monostructure. The social democratic party in Norrköping was formed by members of the labour union to gain more political power and individuals moved frequently between the union and the party depending on the issue in question (Horgby, 2012). This close collaboration between social democratic party and labour union can be described as part of 'thick institutional tissues aiming to preserve existing traditional industrial structures' (Grabher, 1993; Hassink, 2005, p. 552).

A self-sustaining coalition with a common goal was formed by a homogenous group of political administration, trade union, larger enterprises and workers (Grabher, 1993; Hassink & Shin, 2005). This self-sustaining coalition lobbied for sectoral interventions at a national level. Hence, the national government played an important role in sustaining

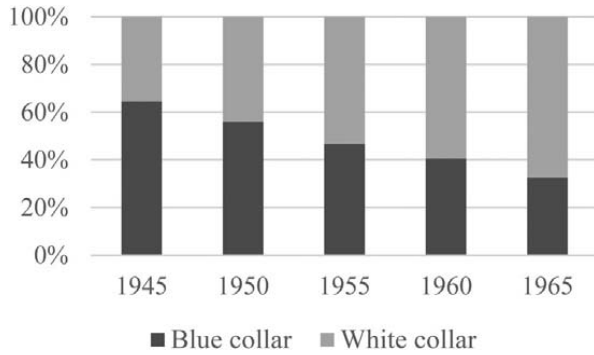

Figure 1. Share of employees at SAAB divided by blue and white collars.
Note: This figure does not include employees of the computer division; source: SAAB AB.

these thick institutional tissues at the local level. In these kinds of cultures, status and power are privileged over creativity, and past over present and future (Hassink, 2005; Morgan & Nauwelaers, 1999). The incentives resulted in a specialization in a narrow group of sectors with correlated demand (Frenken, Van Oort, & Verburg, 2007). From the 1950s onwards, the demand shocks resulted in a decline and high rates of unemployment. This reinforcement of existing structures hampered industrial restructuring and indirectly also the development of endogenous potential.

In Linköping, a rather different network started to emerge between numerous technology-based players. The Swedish military upgraded heavily during the cold war and SAAB AB received large orders for military airplane production. The local workforce, however, did not meet the increasing need of a college-educated, specialized workforce. At the same time, the Swedish government decided to increase the number of higher education institutions and different actors in Linköping were determined to attract such an establishment. The private firm SAAB AB and the municipality as a public actor formed a constructive partnership to suggest the establishment of a technical college with strong links to the private industry (Rangan, Samii, & Van Wassenhove, 2006). Due to its history as an educational centre for the region, Linköping was given a site for a college. SAAB, as the dominant private company, had a strong influence on the university's educational profile. Strong university–industry linkages did not fit into the prevailing academic paradigm, but such linkages were considered beneficial for both SAAB AB and the university. The vice-chancellor acted as an institutional entrepreneur and strived for a new academic culture (DiMaggio, 1988). The vice-chancellor aimed to recruit young scholars from prestigious universities known for their cooperation with industry. In order to match the needs of private industry, new educational programmes were designed: IT and civil engineering programmes originated at LiU. Cooperation with private industry was added as a third task through the amendment made to the Higher Education Act in 1997. In addition to carrying out research and education, Swedish universities were expected to inform the public about their research and to actively cooperate with other actors. This did not affect LiU as this third task had been carried out ever since the start of the university.

> It was a great period of experimentation. To start a new university from scratch with new educational programs required the dedication of young, inspired people. There was no blueprint, but we could create our own university. (university staff A)

It was in SAAB's interest to educate a suitable workforce and the company therefore donated a used model of its mainframe computer D21 for educational use. As a closed military company, the company was, however, not interested in cooperation projects. The technology-based network was further enhanced through the entrance of FFV and FOA. The co-location of private high-tech companies, public research establishments and the technology-based university led to a dynamic labour market and a highly educated workforce.

There is a growing stream of literature acknowledging universities as one of the key factors for regional development particularly in relation to high-tech industries (Guerrero, Urbano, & Fayolle, 2016; Trippl, Sinozic, & Lawton Smith, 2015). This can also be observed in Linköping. The university was a source of highly qualified labour, a knowledge provider and incubator for academic spin-off companies. The university proved to be one

of the key factors for the development of the IT cluster due to spatially bounded knowledge spillovers and tacit knowledge which requires personal contacts and trust facilitated by geographical proximity.

The characteristics of newcomers

In both cases, the cities grew substantially due to the increasing need of labour. Because of their differences in economic structure, the newcomers differed. Norrköping mainly grew in the turn of the twentieth century due to intra-regional movements. The need of the expanding manufacturing industry could be met through the recruitment of unskilled and uneducated workers from the rural hinterland. This fostered a homogenous social structure which fuelled the dominance of the trade union and its preconceptions. Ever since the economic decline, the number of inhabitants stagnated which strengthened the dominance of thick institutional tissues. Through the establishment of Campus Norrköping, there is now a steady inflow of young newcomers which challenge the established closed networks.

> We didn't have a great inflow of new people. No one really wanted to move to Norrköping. The few ones that came, came often from the immediate surrounding or other industrial cities and they felt quickly like home. (municipal employee Norrköping A)

In Linköping, SAAB started to expand quickly and was in desperate need of a specialized workforce. The local labour force could not meet this demand and a high inflow of highly educated newcomers from all over Sweden entered Linköping. By 2012, 55% of all SAAB employees held a university or college degree. Later on, the university also attracted newcomers to Linköping.

The city Linköping was growing because of the exceptional high inflow of people from diverse institutional backgrounds. This high inflow resulted in a high diversity where most of the inhabitants were new to the city and the region. The rural character of Linköping meant that there were little preconceived understandings about the economic arena and no favourable conditions for the formation of closed networks. The newcomers did not need to relate to strong existing preconceptions but could create more freely their own rules of the game (North, 1990).

Only few could really claim to be locals by birth. People were moving to Linköping from all over Sweden. People came from different backgrounds, but they spoke the common language of engineering. The key factors for the formation of local culture in both cities are theoretically summarized in Table 3. The nature of these key factors led to different possible implications for local entrepreneurial activities. In Norrköping, the reliance on

Table 3. Key factors for the formation of local culture.

	Local culture non-conducive to entrepreneurship	Local culture conducive to entrepreneurship
Initial conditions	Early industrialization	Late industrialization
Characteristics of key players	Trade union	Technology-based private company
Networking activities	Preserving existing structures: thick institutional tissues on the local and national level	Creation of new local structures: expansion of the technology-based network
Composition of newcomers	Intra-regional movements of people	Inter-regional movements of people

external input to strengthen the existing local structures and homogeneity left little place for entrepreneurial initiatives (Friedman, 1991). In Linköping, the constant high inflow of newcomers led to a heterogeneity which was important for the development and acceptance of endogenous forces.

The influence of local culture on entrepreneurial activities

If economic activities are conditioned by ongoing structures of social relations, also the entrepreneurial process needs to be seen as contextual and socially embedded. Hence, it is important to understand how local culture continues to affect entrepreneurial activities in newly emerging local industries.

Due to the thick institutional tissues, entrepreneurs in Norrköping felt a strong social pressure of how things should be done in the 1990s. In a local culture, where business owners were described as 'the capitalist enemy' until the 1960s (Horgby, 2012), people had a strong opinion about entrepreneurs (Atherton, 2004). Doing things 'differently' was not easily accepted. Start-up companies did not fit in the idea of the labour union of fixed, long-term employment contracts. Also the idea of providing services and software instead of actual physical products was troubling to many locals.

> People have a very clear idea about how things should be done around here. In the 90s, if you wanted to do things differently in Norrköping, the labour union would come knocking at your door. And the municipality had this fixed idea that the manufacturing industry would turn the fate of this city around. Hence, we didn't get much support. (entrepreneur Norrköping A)

Literature on institutional entrepreneurship suggests that the local entrepreneurs would actively alter the institutions or the impact of institutions already in place (Henrekson & Sanandaji, 2011). But the closeness of Linköping weakened the importance of the local culture. Although the companies were located in Norrköping, entrepreneurs turned to Linköping for support and were not interested in actively challenging the prevailing assumptions of the local culture. Being part of LiU, Norrköping entrepreneurs were integrated in LiU networks. To some extent, Norrköping entrepreneurs took pride in being different from the locals.

> We didn't care much for the culture in Norrköping. At the beginning, we wanted to get support and encouragement, but in the end we were our own little group. Of course we could ask each other for practical things, but mainly it was good to know that you were not alone. (entrepreneur Norrköping B)

Thick institutional tissues are temporally persistent and change only over generations. In line with the theoretical discussion above, it can be argued that a change in the economic conditions, such as the increasing competition from countries with low labour costs, could show that some of the cultural assumptions are not valid anymore (Friedman, 1991). Hence, few individuals started endogenous initiatives, but they could not shake free entirely from existing cultural assumptions. While the need for own local initiatives started to emerge, these local initiatives were aimed towards manufacturing companies. After the modest success of the government incentives, two municipal counsellors sought new companies to revive Norrköping's economy. However, they were targeting established companies, not entrepreneurs. Through the transplantation strategy, they

sought to inject new actors into the regional system. These new economic actors should fit within the existing culture rather than challenging it.

> Two municipal counsellors started to take matters in their own hands. They tried to make things easier for us, but they were mainly trying to attract established companies. There was certainly not much support for such undemocratic decisions. (entrepreneur Norrköping C)

In that sense, local actors need to unlearn much of their conventional wisdom. Studies, however, have shown that unlearning is far more difficult than learning, because of the internalization of cultural assumptions (Malmberg & Maskell, 2006). Most of the time, individuals are not aware of what they have learnt and how learnt assumptions are influencing behaviour.

Such thick institutional tissues could not be established in Linköping due to the combination of the relatively late arrival of the manufacturing industry in the 1940s and the early emergence of an entrepreneurial mass in the 1970s and 1980s. While the thick institutional tissues in Norrköping were formed and sustained unchallenged for over a century, the entrance of different types of economic actors in Linköping led to a local culture where large and small firms can co-exist.

> The entrepreneurial phenomenon was new to Linköping the in the 70 s and 80 s as well, but the situation in Linköping was so different. Especially the university was fostering an environment characterized by openness and experimentation. […] This entrepreneurial spirit is pretty much alive today. (entrepreneur Linköping A)

A major difference between Linköping and Norrköping is the importance of non-pecuniary rewards in the local culture influencing the nature of entrepreneurial activities. In Linköping, the importance of the non-pecuniary reward system was relatively greater implying that these elements of the local culture are temporarily persistent despite changes in the economic conditions.

> It seems that entrepreneurs fitted very well in the engineering culture of Linköping right from the beginning. In the 80 s, entrepreneurs were celebrated like rock stars or astronauts. Here, we dare to build our heroes. (entrepreneur Linköping B)

Such differences in social status meant also differences in the demand for power of entrepreneurs. In both cities, the political actors reacted to entrepreneurial activities within their cities. In that sense, a critical entrepreneurial mass was needed in order for the political actors to become aware. While the municipality in Linköping early on wanted to provide a supportive environment for the entrepreneurs, the municipality in Norrköping was much more reserved. This shows that cultures tend to change more slowly than industries. Culture remains in a location even after the industrial structure to which it belonged has disappeared (Fritsch & Wyrwich, 2014; Hassink, 2005).

Conclusion

The aim of the paper was to identify the key factors which are instrumental in the formation of distinct local cultures and how the culture's survival provides a context for the subsequent entrepreneurial activities in new local industries.

In doing so, we approached the topic differently than past studies by combining different approaches of the identified three streams of literature on culture and entrepreneurship. In our analysis, we did not focus on entrepreneurs, but acknowledged that entrepreneurs are not an isolated group of people. We acknowledge that culture is formed through social interactions and that entrepreneurial activities must therefore be studied in their everyday context (Welter, 2011). Our case discussion showed that culture is deeply rooted in economic history (Aoyama, 2009; Fritsch & Wyrwich, 2014). This means that studying culture from a historical perspective gave us insights into why a particular culture was formed in a specific location. By adopting a behavioural approach to culture, we went beyond common practice to divide culture into measurable sub-values (Davidsson, 1995; Krueger, Liñán, & Nabi, 2013; Mueller & Thomas, 2001). Instead, we focused on how locals perceived entrepreneurial behaviour in the two locations.

By combining the different approaches, we could identify four key factors which are instrumental for the formation of a local culture: initial conditions, characteristics of key players, network activities and composition of newcomers. The initial economic conditions of a place are of immense importance with regard to which key players might be attracted. The characteristics of the key players have a strong impact on which culture will be formed and the subsequent network activities helped to strengthen the emerging local culture. The composition of newcomers is especially interesting in the formation of culture. While both cities were growing rapidly through people moving in, admittedly in different periods of time, the composition of newcomers can potentially strengthen or weaken the existing culture.

Several future lines of research can be drawn from this work. Firstly, much work on entrepreneurship culture is discussed on a regional level, while this study focused on a local level (Andersson & Koster, 2011; Beugelsdijk, 2007; Fritsch & Wyrwich, 2016). The study showed how the two neighbouring cities have quite different local cultures and it might be interesting to investigate how this study relates to studies on regional culture. Is there such a thing as a regional culture? How can the interplay between the local and regional culture be studied?

Secondly, in this paper, we have chosen two opposing cities within the same region to identify the key factors which lead to the formation of a culture. Further insights into the same topic can be gained by analysing two cities with a similar history, such as industrial cities, but display now rather different local cultures.

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ARTICLE 4

BREAKING THE COGNITIVE DIMENSION OF LOCAL PATH DEPENDENCE: AN ENTREPRENEURIAL PERSPECTIVE

by
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ABSTRACT. Few attempts have been made to consider the role of individual activities in path dependence. The purpose of this paper is to analyse how local entrepreneurial activities can lead to a break in the cognitive local path. The theoretical framework rests on the literature on path dependence, but focuses mainly on cognitive frames as carriers of path-dependent behaviour. A qualitative case study has been used to analyse the formation and breaking of a local cognitive path through individual activities. Four main conclusions can be drawn. First, cognitive paradigms explain why the degree of adaptability differs between locations. Second, external shocks are translated to local change through individual activities. Third, acknowledging cognitive barriers to individual behaviour, the important role of outsiders is highlighted for breaking the cognitive path. Fourth, the long durability of cognitive paradigms and the importance of outsiders suggest the emergence of a parallel, alternative cognitive path.

Keywords: path dependence, entrepreneurship, cognitive path, local development, evolutionary economic geography

Introduction

The evolutionary turn in economic geography highlights path dependence as one fundamental feature of the economic landscape (Martin and Sunley 2006; Boschma 2007; Martin 2012). A path-dependent process or system is 'one whose outcomes evolve as a consequence of the processes or system's own history' (Martin and Sunley 2006, p. 399). The concept is often linked to technological lock-ins, but recently path dependence has been discussed on the regional level (Martin and Sunley 2006; Henning *et al*. 2013). In this context, path dependence is described as a process leading to regional lock-ins and is characterized by durability and irreversibility (e.g. Shapira and Youtie 2008; Belussi and Sedita 2009). In this literature, lock-in captures 'the idea that the combination of historical contingency and the emergence of self-reinforcing effects steers a technology, industry or regional economy along one "path" rather than another' (Martin 2010, p. 3).

In addition to technological lock-in, there are other types of lock-in which are of equal importance. Grabher (1993) introduced three additional types of lock-in in his seminal work on the Ruhr area: functional lock-ins refer to the close and stable inter-firm linkages; political lock-ins refer to the effort on the political level to preserve the traditional industrial structures; and cognitive lock-ins refer to the emergence of a specific, common world view among the regional actors. Research on this topic is scant, but recently researchers have started to address political and functional lock-ins (Birch *et al*. 2010; Hassink 2010; Pike *et al*. 2010).

In past years, path dependence has been criticized for leaving the region at the mercy of external shocks or accidents (Garud and Karnøe 2001; Martin and Sunley 2006; Simmie 2012; Henning *et al*. 2013). Such external shocks might be the rise of major competitor districts, technological change or changes in international demand (Elola *et al*. 2012). The path dependence literature has put much emphasis on these external shocks and neglected internal regional or local forces (Martin 2010; Simmie 2012; Dawley 2014). This, however, does not fully consider that regions are made up of individuals who are able purposefully to deviate from the established regional paths (Garud and Karnøe 2001). Acknowledging the importance of individual activities for path-dependent processes, the cognitive path needs to be addressed. The cognitive dimension ought not to be considered a single deterministic factor, but instead, individuals are also influenced by other factors, such as motivation and the availability of resources (Klyver and Schenkel 2013; Fayolle *et al*. 2014). The important role of these factors has, however, been highlighted in numerous studies, while the cognitive dimension is still lacking (Aldrich and Martinez 2001; Shane *et al*. 2003; Boschma and Frenken 2011). This paper highlights the actions of individual entrepreneurs, along with how their actions deviated from the established local cognitive path in Norrköping, Sweden. Norrköping has been chosen as a case study due to its strong position as a leading manufacturing centre in Sweden, its strong and very active labour union, and its current struggle to adjust to downsizing in the traditional industries (Horgby 2008; Svensson *et al*. 2012).

Theoretical foundations: breaking cognitive paths

The concept of path dependence was first introduced to the social sciences through the seminal work of David (1985) and Arthur (1989, 1994) to explain technological adoption processes and industrial evolution. Economic geographers use the concept of path dependence to explain how high-tech regions grow and how past industrial development shapes the current economic landscape in old industrialized regions (e.g. Grabher 1993; Bathelt and Boggs 2003; Hassink and Shin 2005; Hodson 2008). In that sense, researchers have addressed both positive and negative lock-ins.

Putting individual activities into path dependence

Recently, researchers have started to highlight the role of individuals in initiating renewal through path creation, which occurs when individuals purposefully deviate from the established path (Garud and Karnøe 2001; Garud *et al*. 2010; Simmie 2012). However, the term 'creation' might be misleading. While entrepreneurs indeed try to recombine resources to make use of a business opportunity (Schumpeter 1934), they might not think in terms of path creation. Their aim is to create a profitable business, while the researcher in retrospect assigns different individual actions to a specific path.

Contributions of the path creation literature have been mainly of a theoretical nature, with few empirical papers concentrating on technological path creation (Garud and Karnøe 2012; Simmie 2012; Simmie *et al*. 2014). Within this focus on the creation of technological pathways, the importance of cognitive aspects is either not mentioned at all (Fornahl *et al*. 2012; Garud and Karnøe 2012) or mentioned briefly with no deeper discussion (Simmie 2012). A slightly deeper discussion on the cognitive barriers can be found in the case analysis of Simmie *et al*. (2014), but no theoretical considerations are included. The path creation literature also has little to say about path-breaking processes in empirical papers. Often, the initial conditions are clearly identified as external shocks upon which individuals act. These actions generate a new path. This literature focuses exclusively on new path creation, and there is limited discussion on how this new path relates to the past one (Meyer and Schubert 2007). Hence, the path creation literature contributes little to cognitive and path-breaking discussion. It does, however, challenge the assumption that path emergence is beyond the control of individual actors and proposes instead that it is endogenous forces, for example local actors, that lead to a break. External shocks are important, but change only occurs through the activities of individuals within the location (Garud and Karnøe 2001).

By focusing on technological path dependence, the literature has neglected the role of the entrepreneur. Entrepreneurs have been mainly identified as local actors for change in this newer literature (Garud and Karnøe 2001; Simmie 2012). Until recently, the potential role of entrepreneurs in path dependence was rarely considered due to an individualistic view in the entrepreneurship literature and an overly structuralistic view in the regional path dependence literature (Garud and Karnøe 2001; Welter 2011). This traditional focus on the individual hero in entrepreneurship research has been questioned and recent calls for contextualization of entrepreneurship highlight entrepreneurship as a social-spatial embedded activity (Welter 2011). This opens up the possibility to discuss entrepreneurial activities in the light of (cognitive) path dependence.

Cognitive path formation on the local level

The importance of the cognitive dimension of path dependence becomes obvious once we acknowledge the importance of individual actions. Early on, the path dependence literature implicitly discussed cognitive limitations (Dosi 1982; Nelson and Winter 1982), but no detailed investigation has been conducted into this aspect (Thrane *et al*. 2010). Dosi (1982) explores cognitive lock-ins by arguing that technological paradigms influence how technologies develop and diffuse along path-dependent trajectories.

Cognitive frames as carriers of path-dependent behaviour have been discussed most in organizational literature (Kaplan and Tripsas 2008; Sydow *et al*. 2009; Thrane *et al*. 2010). Sydow *et al*. (2009) propose three stages of organizational path dependence emergence. The first stage is the preformation phase, where the range of available options is high and no paths can be identified. Any option is the potential starting point of a path. In the formation phase, a path is gradually emerging, limiting the number of options available. In the lock-in phase, the path is narrowed down and only one option is given. The question to ask is whether a preformation phase exists, since the processes leading to a path are embedded and influenced by other processes. It

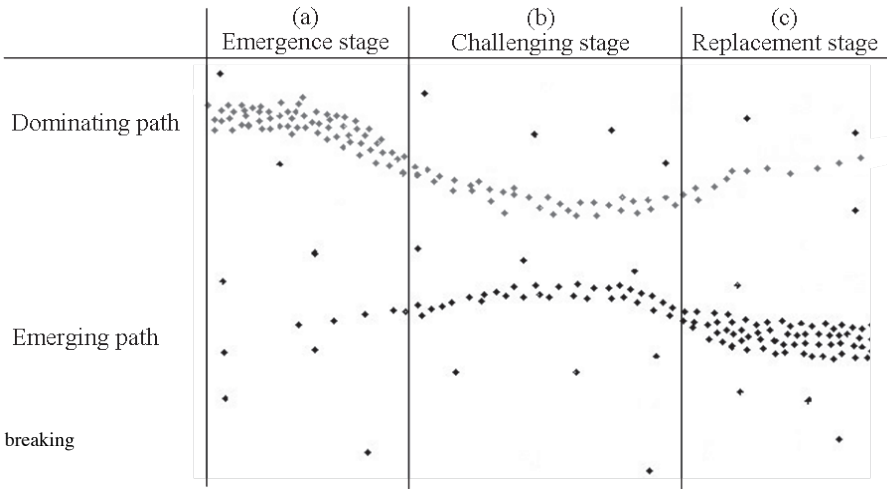

Figure 1. Three stages of breaking the local cognitive path.

might not be so relevant to discuss the emergence of a path alone, but rather how this new path relates to existing ones. Alternatively, one can discuss the mechanisms that limit the number of possible options. It is not the options themselves which are different, but it is the perception that is changed. This underscores the need for a broader discussion that addresses the role of cognitive paths.

This paper argues that an individual's decision is made according to a certain cognitive paradigm. Cognitive paradigms represent the conventional wisdom of the relevant community and their shared cognitive frames. A cognitive paradigm is constructed through daily social interactions of the community members. Following (with some alterations) the definition from Dosi (1982), a cognitive paradigm is defined as a set of certain assumptions guiding behaviour which is strongly connected to a relevant (specific) situation or problem. The paradigm determines what possibilities the individual is able to see and how these possibilities should be addressed. In that sense, cognitive paradigms often lead to considerable socio-institutional inertia. Discontinuities are traced back to the emergence of a new paradigm (Dosi 1982). If most decisions in a location are made according to a certain cognitive paradigm, it can be argued that a dominant local cognitive paradigm exists. Actions based on these decisions form a local cognitive path. Putting an emphasis on individual agency, this should not be argued in the sense of available options, but rather in the sense of actions. Garud and Karnøe (2001) argue that each individual can make a strategic decision to follow the established path or go against it, but it is doubtful whether individuals might think in terms of following or diverting from the current path: instead, they initiate actions which they think are most suitable for fulfilling a purpose. These actions then may or may not follow the established cognitive path. In that sense, path creation ought to be understood as an unintentional outcome.

Breaking the cognitive path at the local level

Figure 1 illustrates the path-breaking process across three stages. In phase (a), most actors act according to the dominant cognitive paradigm and form a dominant cognitive path. The path should not be perceived as linear. The actions should not be connected by a line, as is shown in many figures illustrating path dependence: linear relations would assume that the researcher knows perfectly which action has triggered other actions. In most cases, this is difficult to see and is of no interest for this study. It is not important to identify which action has led to another; only that several actions have emerged according to a new paradigm. Therefore, the path should be perceived as a narrow stream rather than a straight line. This allows for some variance in practice, where individuals can interpret the cognitive paradigm in the specific situation and can be inspired by several things. This also means that there might be some individuals who initiate actions which do not fit the dominant cognitive paradigm.

Several studies have highlighted the important role of in-migrating entrepreneurs in

economic regeneration processes (Bosworth 2006; Kalantaridis and Bika 2006; Hedfeldt and Lundmark 2015). A new cognitive path might often be traced back to cognitive outsiders. There are several reasons for this. First, outsiders may not share the existing cognitive paradigms, but are formed by different cognitive paradigms, guiding them to see options which are not perceived by others. Second, they are not tied up by old local networks and support structures. Third, they might bring with them experiences from other industrial or entrepreneurial activities elsewhere; and fourth, they might bring with them networks and contacts from other cities and regions, both in Sweden and abroad. Outsiders should be understood as individuals who do not share the dominant cognitive paradigm in the location. Outsiders could be in-movers from other cities or locals whose actions are guided by different cognitive paradigms.

The initial starting point for a new path is described in the path dependence literature as a small and random event (Meyer-Stamer 1998; Bathelt and Boggs 2003; Braunerhjelm and Feldman 2006). Conceptualizing a cognitive path, the initial starting point cannot be described in these terms. Introducing the importance of individual agency, actions can rarely be described as random, but as purposeful, conscious and embedded. It should also be noted that without phases (b) and (c), we might not observe that there is a path in the making. Only through the increasing number of actions can the emergence stage of a new path be identified retrospectively. This supports the statement that every action is a potential starting point for a new path.

The framing of the initial starting point for a new cognitive path as an isolated event would ignore the fact that individuals' actions are never completely separate from any imprints of the past. Actions are embedded in past experiences, routines and practices. Actions are indeed illustrated as isolated events in Fig. 1, but this is only to highlight the differences between the single actions and not to deny past imprints. This raises the following question: can a cognitive path be broken or is it simply an alteration? In other words, should the starting point of a new cognitive path in Fig. 1 be shown as an action detached from the established cognitive path or as a branching off? The embeddedness aspect would support the latter; the individual agency aspect would support the former. In order to stress the potential role of outsiders, the starting point is detached. A branching off would fit into the framework of path plasticity which describes an 'elastic stretch of institutions and institutional arrangements and their interpretative flexibility through actors' (Strambach 2010, p. 406). Each action which does not support the dominating cognitive paradigm is the potential beginning of a new path, but only when several actions point in a similar direction is there a real potential that a different cognitive path can emerge.

In phase (b), an increasing number of actions are initiated according to the emerging cognitive paradigm. This new, emerging cognitive path is a parallel one, eventually strong enough to challenge the existing one. In the technological path dependence, different forms of path development are introduced (Isaksen 2014): path extension, where the path develops through incremental innovations along prevailing technological paths; path renewal, when existing companies switch to different but related sectors; and path creation, when new paths form in new sectors. The emergence of a parallel cognitive path stresses the newness and can therefore be described as path creation. It cannot be assumed, however, that a new cognitive path always leads to technological path renewal.

The formation of a new (technological) path is described in terms of self-reinforcing mechanisms (David 1985, 1986) and increasing returns (Arthur 1989, 1994). For the purpose of cognitive path dependence, the process needs to be described in other terms. Obviously, increasing returns do not fit very well with a cognitive path. Instead, it is pointed out that new cognitive paths emerge because this benefits the creation of new, more suitable routines and practices in the location. Entrepreneurs start actions which they believe are most suitable for the identified business opportunity. Entrepreneurial role models might encourage others to see the benefit and potential of the new cognitive paradigm. While it might be difficult for most people to think outside the established cognitive paradigm at first, the demonstration effect of others might open their eyes to alternatives.

In phase (c), most actions are initiated according to the new paradigm and strengthen this new cognitive path. Finally, the new cognitive path is able to replace the old path due to its relative strength. The dominant cognitive paradigm is so strong that it is internalized by most of the people in the location. At this point, lock-in starts to take place. The cognitive path should be characterized as irreversible. However, acknowledging individual agency, the lock-in situation does not mean that no other actions are possible. As Fig. 1 shows, there are always

Table 1. Description of interviewees.

	Position	Geographical origin	Years active in Norrköping
High-tech industry (13)	Entrepreneurs	In-migrants*: 12	Ranging from 15 to 55 years
Municipality (5)	Civil servants	In-migrants: 2	Ranging from 10 to 30 years
Labour union (4)	Union representatives	In-migrants: 1	Ranging from 20 to 40 years
Manufacturing firms (5)	Management level	In-migrants: 2	Ranging from 15 to 25 years

*In-migrants are interviewees who were not born in Norrköping, but who moved there as adults.

some actions outside the dominant cognitive paradigm. This needs to be acknowledged, because total conformity cannot be assumed. Obsolete cognitive paradigms can live on for quite some time due to their embeddedness in the socio-economic environment, but these actions are more single events than forming a path. This embeddedness suggests that the whole process of breaking the local cognitive path is not so much about established actors changing their cognitive model as about outsiders with new ideas gaining influence in the region. These outsiders might be the younger generation or people moving into the region.

Method

Data collection

In total, 27 interviews were conducted, averaging between 90 and 120 minutes each. These interviews were conducted in the years 2011 and 2014. Great care was taken to ensure that the interviewees were representative of both the existing and the newly emerging cognitive paths. The sample consisted of 13 entrepreneurs forming high-tech companies, who are taken to represent the challenging cognitive path. Also included are five representatives from the municipality, four labour union members and five representatives of manufacturing firms. These interviewees represent the old cognitive path. Interviewees were identified through snowball sampling or peer referral. Table 1 gives some information about the interviewees. The interviews have been particularly helpful in determining how people started actions, identifying motivations for certain actions and how these actions were met by the locals, and gathering information on the context surrounding the actions. Especially through the latter two, the local cognitive path in Norrköping could be constructed. Semi-structured interviews ensured that each interview covered the main topics, while it allowed adjustment of the questions to the specific interviewee's experiences. All the interviews have been transcribed.

All qualitative studies face the challenge of ensuring that the information collected through interviews allows general discussion. Data triangulation has been used to ensure that the analysis is based on representative statements rather the opinions of individuals. Hence, in addition to conducting interviews, secondary sources were consulted. The extensive local archives in Arbetets Museum (the Museum of Work) provided detailed information on the habits and norms of workers in Norrköping. The city chronicles gave a good overview of the social and economic development prior to 1980 (cf. Hellström 1983; Nisser 1983; Andersson 1986; Horgby 1989; Lokalhistoria 1999; Nilsson 2000). Interviews with other researchers investigating related issues such as entrepreneurship at Linköping University and the working class and labour union in Norrköping provided another source of information.

Analytical process

Kvale and Brinkmann (2009) point out that the analysis of interview material does not simply mean restating the interviews together with the researcher's interpretation. They see the reporting of interview findings as the last step in a long process. A clear structure is needed to achieve a meaningful level of understanding. In that vein, several steps have been designed for the analytical process (Harding 2013).

As a first step, clear research objectives have been identified. In accordance with the research question at hand, the objectives of the research were to identify the dominant local cognitive paradigm and how it emerged, and to identify the alternative local cognitive paradigm and how it challenged the dominating one. The second step was to link the collected information to the research objectives. Information not relevant to the objectives has been excluded. The third step was to identify patterns in the information. This step reflects the aims of thematic analysis identified by Gibson and Brown

Table 2. Background information about Norrköping.

	Unemployment rate	Population development	Dominating political orientation	University education level	Economic structure in 1960s	Economic base in 2010
Norrköping	1996: 11.6% 2005: 8.4% 2013: 12.8%	1950–1990: +09% 1990–2010: +08%	Social Democratic parties since first election in 1927	1985: 8.7% 1997: 11% 2013: 19%	Manufacturing industries: electro-technology, paper industry	Manufacturing industries, public authorities
Sweden	1996: 10.5% 2005: 5.7% 2013: 6.7%	1950–1990: +22% 1990–2010: +10%	Until the 1980s: Social Democrats; after that frequent changes	1985: 10.1% 1997: 16.5% 2013: 24.5%	Manufacturing industry, forest industry, steel and mining	Knowledge-based industries

Source: Own calculations, based on data from SCB

(2009)—examining commonality, examining differences and examining relationships. Examining commonality is important to highlight general tendencies. When a commonality has been identified, Gibson and Brown (2009) suggest that the next step is to look for subdivisions, such as different motivations, different groups and so on. Another dimension is added by examining differences. This includes examining differences between the answers of seemingly similar interviewees. Here, the researcher goes beyond stating the obvious. Examining the relationship between different issues within a study is the most important finding. Bryman (1988, p. 101) notes that 'the linkages between events and activities and to explore people's interpretations of the factors which produce such connections' is an important part of qualitative research. Explaining one event in isolation might not tell us much, but placing the event in relation to others enables the researcher to understand the event in more detail. The fourth, and last, step was to link the findings to the literature. This allows us to place individual findings in a broader context of previous research and enables us to highlight differences, complementariness and commonalities to previous research.

When carrying out qualitative research, the researcher must ensure that the presented findings accurately represent the data. Jupp (2006) suggests that the findings need to be cross-checked with the transcripts. Can the identified patterns be seen in the original data? Miles and Huberman (1994) recommend that the researcher looks for data which do not fit with the chosen explanation, as alternative interpretations of the data might be more suitable. Furthermore, a researcher well familiar with the subject matter at hand studied these findings and our interpretation; additionally, a researcher unfamiliar with the subject matter was included to get a detached view as to how well the theoretical framework, the data and the findings fit together. This was to ensure that the analysis would go beyond the most obvious statements (Harding 2013).

Norrköping's industrial structure

Norrköping has been chosen as the case study. In the 1850s, Norrköping emerged as one of the dominant manufacturing centres in Sweden, with a strong textile and paper industry. Later on, other manufacturing industries such as electrical machinery or tyre production were established. Due to the large number of manufactured products which needed to be distributed, the city also became a major distribution hub. From the 1950s onwards, the municipality struggled with high unemployment rates due to the relocation of the manufacturing industry to countries with cheaper labour costs. Norrköping can therefore be described as an example of a former heavily industrialized city which has been struggling for many years to break free from the past. In the mid-1990s, a satellite campus of Linköping University (LiU) was established in Norrköping. Linköping University's main campus is located in the neighbouring city of Linköping. One of the most immediate effects of LiU's new campus in Norrköping was that it brought outsiders to the city. Table 2 shows some background information about Norrköping in relation to the Swedish average.

Table 3 gives a clearer picture of the current local economic base in Norrköping and lists the 10 largest employers by number of employees. The list contains three manufacturing companies in the paper and pulp industry and three administrative units of government which were relocated from Stockholm in the 1970s in an effort to provide more jobs in a

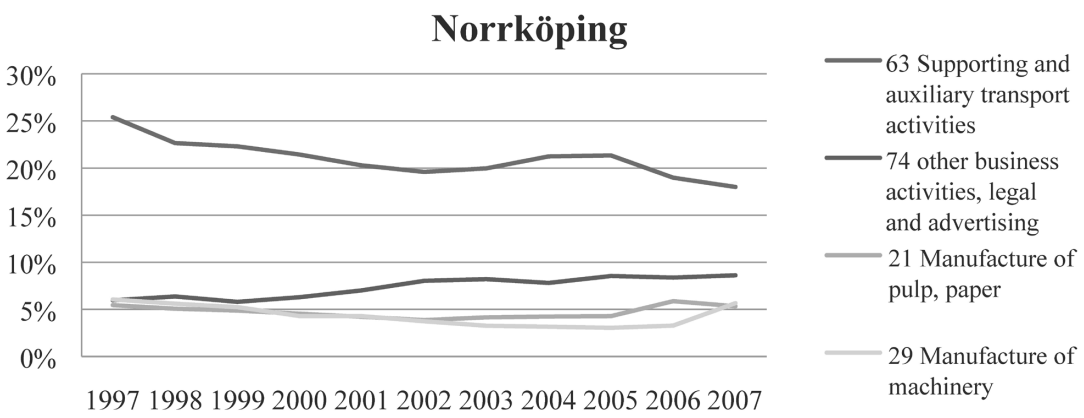

Figure 2. Share of total workforce by SNI2002 2-digits (over 5% share) (*source*: Statistics Sweden (SCB)).

declining city. It can be concluded that the historical economic development is still dominating the current economic structure.

Figure 2 shows the largest two-digit Swedish Standard Industrial Classification (SNI) sectors with a share of at least 5 per cent of the total workforce in Norrköping. Excluded from the figure were (45) construction, (51) wholesale trade and (52) retail trade, since these sectors reflect the local market. Figure 2 also shows that the traditional sectors still dominate. The picture looks slightly different for sectors whose employment expanded by more than 25 per cent between 1997 and 2007, amongst them post and telecommunications, water transport, education, other business services, computer and related activities, as well as the manufacturing of machinery. This is mainly in line with the university's educational profile of communication technology, transportation, IT and electronic design.

Emergence of the local cognitive path

The cognitive path which will be discussed in this section is formed by actions which are initiated in the light of an emerging cognitive paradigm. The discussion will show how this paradigm became the dominant one. In accordance with the purpose of this paper, the analysed cognitive paradigm is a collectively shared logic on how companies should be organized and managed.

The preformation phase

As stated above, individuals' actions are never totally separated from past imprints. Especially when talking about cognitive paths, it becomes clear that a blank canvas cannot be assumed. Hence, we have to understand Norrköping's initial condition.

The textile industry has been an important part of Norrköping's economy for many centuries and in the

Table 3. Ten largest employers in Norrköping.

1. Norrköping municipality *Administrative unit*	6. Linköping University *Public: higher education*
2. Östergötlands County Council *Administrative unit*	7. Martin & Servera AB *Service industry: food and restaurant*
3. Billerud-Korsnäs Skärblacka AB *Manufacturing industry: paper and pulp*	8. Migration office *Administrative unit of government*
4. Holmen Paper AB *Manufacturing industry: paper and pulp*	9. Swedish Meteorological and Hydrological Institute *Administrative unit of government*
5. Swedish Prison and Probation Service *Administrative unit of government*	10. Fiskeby Board AB *Manufacturing industry: paper and pulp*

Source: Norrköping Municipality (July 2013).

nineteenth century it became the dominant industry. In the 1830s, Norrköping produced over 70 per cent of Swedish cloth (Andersson 1986). Nonetheless, small firms with an artisanal tradition still dominated the industry. This changed when textile production was mechanized, making large-scale production possible. Small firms disappeared and large companies emerged. Family-owned firms transformed into limited corporations and the social structure began to change (Nisser 1983). This large-scale production was in desperate need of workers, and skilled artisans were replaced by unskilled workers from the rural surroundings (Nisser 1983). The owners of these few large textile companies became known as the textile barons. A patriarchal leadership emerged, where a few barons took care of 'their children', the workers. This power relation between company owner and workers was sustained every day. The owners went through the factory and listened to the concerns and problems of their employees, as it was considered their duty to improve the work and living conditions of their employees (Horgby 1989).

The formation of a cognitive path

Henning *et al*. (2013) state that the researcher needs to identify whether the path-dependent process has been created by accident or by strategic decision. The formation of manufacturing industries in Norrköping was no accident, but a conscious decision to be close to natural resources. The river provided the large quantities of water required for textile production and provided fast access to the Baltic Sea, which enabled the fast distribution of large quantities of textiles. Large differences in altitude made the river ideal for driving water mills for textile production. Other large-scale manufacturing industries, such as the metal and paper industry, soon followed the textile industry, and Norrköping's economic foundation was formed by manufacturing industries. By the end of the nineteenth century, 73 per cent of blue-collar workers in the county were living and working in Norrköping (Almroth and Kolsgård 1981). The city was also a major manufacturing centre for Sweden in general. Norrköping was one of the ten largest cities in Sweden and only Eskilstuna had a higher number of blue-collar workers (Almroth and Kolsgård 1981). Most of the production process needed a large amount of water and the city's river location with quick access to the Baltic Sea was ideal. The natural resources of the city attracted the manufacturing industries.

The dominance of a single industry can lead to the emergence of a common cognitive paradigm (Grabher 1993). While Norrköping indeed had several industries, they were all manufacturing industries and organized in a few large companies benefiting from economies of scale. The owners of these companies soon dominated the political life in the city. They were members of municipal committees and were represented in associations and organizations which influenced the social life in Norrköping (Andersson 1986). This power position allowed the company owners to spread their world views to other groups outside the immediate business world. A common cognitive paradigm started to emerge.

The lock-in of the cognitive path

Cognitive lock-in is reached when the dominant cognitive paradigm is so strong that it becomes internalized by most of the people in the city. This makes it very difficult to see options outside the existing cognitive paradigm. The labour union was to play an important role in the lock-in of the cognitive path. From the beginning of the twentieth century onwards, the number of members increased, and by 1940 the majority of the workers in Norrköping were organized (Horgby 1989). The reasons for the emergence of the labour union was to ensure a stronger power position for the workers in relation to the business owners. It focused on securing fair wages and good working conditions for its members and fitted in to the existing cognitive paradigm. Another feature of Norrköping's industrial and political landscape that helped to reinforce cognitive lock-in was the close relationship between the union and the local politicians. In fact, the same people who were active in the labour union were also active members of the Social Democratic Party, and soon the cognitive paradigm was internalized by workers, politicians, civil servants and business owners alike. The prevailing cognitive paradigm in Norrköping was described by entrepreneurs as the mindset that:

> the whole business climate was not very suitable for entrepreneurs in the '80s. The main focus of bankers, municipal workers and politicians was on large manufacturing companies. They were stuck in these old ideas. It didn't make much sense to try new things anyway. If you wanted to do things differently, the labour union would come knocking at your door. (Entrepreneur A)

As a result of this dominant cognitive paradigm, political and municipal efforts were based entirely on attracting large, hierarchically organized manufacturing companies which could provide unqualified jobs for the masses. The relocation of manufacturing jobs to countries with a cheaper work force was an external shock of immense importance for Norrköping, and the dominant cognitive paradigm became a barrier to Norrköping's renewal. A number of elements of this paradigm raised significant barriers to the emergence of entrepreneurial activities. These included the strong position of the labour union, which preferred the relocation of large existing companies over SMEs; the hope of politicians and municipal workers to attract 'the one' large manufacturing company compensating for lost jobs; the belief by workers that their problems would be solved by 'someone'; and the difficulty for bankers to see entrepreneurs as calculated risk takers rather than gamblers.

Most people in Norrköping could not imagine organizing and managing a company in any other way than large manufacturing companies. It was not only about how the company should be organized, but also what it could produce. Manufacturing companies produced a physical product which could be sold. In Norrköping, the manufacturing companies produced cloth, paper, tyres and electronic devices.

In a similar case, Hassink (2007) investigates the role of lock-in the Westmünsterland textile industry. He shows that no cognitive lock-in occurred. This is based on three factors. First, the region was indeed dominated by the textile industry, which could have led to lock-ins. However, the region was located close to the heavy industry complex of the Ruhr area which received most media and government attention. The main regional actors could not rely on government subsidies, but needed to act independently. This is what separates the Westmünsterland case from Norrköping. Here, the actors were not forced to think outside their established cognitive paths, because for a long time the government took responsibility for supporting the established economic structure through incentives for the manufacturing industries or relocation of public jobs. The cognitive path was never challenged by such governmental actions, but rather enforced.

The crisis in the Westmünsterland textile industry set in relatively early compared with other old industrial sectors. This enabled the main regional actors to diversify early on and to support new economic activities. The relatively early crisis in the textile industry might also hold true in the case of Norrköping, but it led to a reorientation of efforts in other manufacturing industries such as paper, tyres and telephones. The downfall was that these industries also went into crisis. The manufacturing industries in general faced strong competition from low labour cost countries. Reorienting efforts from one pure manufacturing company to another could not turn the local economic trend; but, again, the dominating cognitive paradigm prevented the actors from seeing other possibilities.

Third, Hassink (2007) concludes that industrial factors which are related to the low entry and exit barriers, strong competition, little influence of the trade union and the large number of small enterprises contributed to a weak lock-in in Westmünsterland. Norrköping, however, did not display the same industrial factors. In Norrköping, there was a strong influence of trade unions and a few large enterprises. Norrköping displayed characteristics which can usually be observed in heavily industrial regions. In conclusion, while Hassink (2007) argues that specific contextual factors contributed to weak lock-ins in Westmünsterland, we can argue that specific contextual factors contributed to a strong cognitive lock-in in Norrköping.

Breaking the cognitive path

Norrköping is still struggling to shake itself free from its past. While locals are eager to talk about a change, entrepreneurs and politicians in the neighbouring town of Linköping still describe Norrköping's inhabitants as traditional and collectivistic-minded. In recent years, an increasing number of entrepreneurial activities has been initiated, suggesting that there is the potential to break the current dominating cognitive path. The three different stages of path breaking as illustrated in Fig. 1 will be discussed in the Norrköping case.

Emergence of an alternative cognitive path

The exact starting point of the alternative cognitive path is difficult to identify for several reasons. First, a path can only be observed when others follow in a similar fashion, but it might be impossible to identify in retrospect which actions led to other actions. Second, a path could also be initiated by failure—the failure of Shockley Laboratories in Silicon Valley made it possible for the 'traitorous eight' to start Fairchild Semiconductor, which was important

to the development of the semiconductor industry in Silicon Valley (Holbrock *et al*. 2000). Third, the first actions might be overshadowed by other actions and might be difficult for researchers to find. However, the identification of the exact starting point is not necessary: rather, the clustering of similar actions is of importance.

In the 1980s, ProNova was formed. This consortium was described as one of the first actions which inspired others to enter a new cognitive path. At that time, Norrköping had attracted some higher educational courses from the neighbouring university in Linköping (LiU). The establishment of LiU can be described as an external shock, since its establishment would not have been possible without the decision of the Swedish government to establish more higher education institutions. The information secretary of LiU sought to stimulate entrepreneurial actions in Norrköping and, together with a local real estate owner, began to make use of the old industrial sites in the city centre. In that sense, possibilities created by LiU were implemented by locals. The first building to be renovated was Tuppen, a former manufacturing textile site. ProNova's aim was to stimulate and support smaller companies in Norrköping by offering flexible and small offices. They showed that the past could be transformed into something new.

> The locals started to realize the potential of these old industrial sites. Before that, the buildings were linked to manufacturing industries, heavy trucks and unemployment. They actually wanted to tear down these ruins of shame. Now, new IT companies use them as modern buildings. (Municipality representative A)

The first company to move in was a fitness studio, but soon small IT companies settled. These companies were started by locals, but they were often local affiliates of a global franchise, like IBM or Oracle. These entrepreneurs did not have unique ideas, but bought licences from larger US companies. In that sense, 'things started to happen in Norrköping, but they were few and on a very small scale' (Municipality representative B).

As the number of manufacturing companies declined and the number of small companies grew, the municipal business office became interested in the ProNova project. Slowly it started to realize that the economic structure was less vulnerable with a large number of small companies than with a few large companies. When the municipal business office started to be engaged in ProNova, 'it was the first time that there was interaction going on between the municipality and SMEs. Before that, the municipality was very much focused on large manufacturing companies' (Entrepreneur A).

Few locals were involved in starting this change. When the local manufacturing industries were in decline, efforts were made to attract other large companies. Representatives from the manufacturing industry were not involved in the search for alternatives:

> After the manufacturing companies shut down one by one, some people decided to start their own company. But they were not many. Their jobs did not involve a lot of responsibility, so people were not used to taking matters into their own hands. (Labour union representative)

There are examples in literature where blue-collar workers showed interest in entrepreneurial activities (Hudson 2005). However, the cognitive barriers in Norrköping were too strong to allow the redundant workers to see the possibilities of starting a company.

Challenging the dominating cognitive path

The modest success of public efforts to attract and sustain manufacturing companies in the city was noticed. The external shocks which led to the decline of the manufacturing industries forced some of the locals to take a different approach. The unsuccessful incentives from Stockholm as compensation for the industrial decline demanded a more proactive approach, where the municipality tried to attract companies directly rather than asking the government for help. However, it should be stressed that established companies should be attracted and not entrepreneurs. This proactive approach was mainly driven by two municipal administrators and was going against the common practice of decision making in the social-democratic municipality. Instead of receiving financial support from above, the municipality of Norrköping itself should give incentives to companies. Furthermore, municipal decisions were made too quickly and were not considered to be democratic. Two municipal administrators did follow the law with their quick and proactive approach, but common practice was that such decisions were made together in a collective municipal meeting.

Everyone should have the opportunity to present their views on the matter. The cognitive barriers were enforced through common municipal practice.

> In the mid '90s, two administrators started to take matters in their own hands. In order to be able to make quick decisions, they passed on the common practice of collective meetings. But there was not much support for such undemocratic actions. (Municipality representative C)

As the number of in-migrants increased, more actions outside the dominant cognitive path were initiated. The alternative cognitive path gained momentum when LiU opened Campus Norrköping. Campus Norrköping, with a focus on transport and computer graphics, attracted young people from all over Sweden. The outsiders agreed that when they came to Norrköping in the mid or late 1990s, Norrköping was still very traditional and collective-minded. Individual activities were not supported. Nonetheless, students and staff started companies in such fields as visualization and computer games. The students, as potential entrepreneurs, had a unique opportunity by accessing the established entrepreneurial support network in Linköping. Being part of LiU meant that they could expect the same support as students from Linköping. Instructors from the entrepreneurial programme, however, pointed out that there were large differences in the number and quality of entrepreneurial ideas. In general, students and staff in Norrköping were less interested in engaging in entrepreneurial activities than students and staff in Linköping. This suggests that the environment in Norrköping does not (yet) encourage people to become entrepreneurs to the same extent as it does in Linköping. The entrepreneurs in Norrköping pointed out that that they received some help from Linköping, but that the main support came from a small group of like-minded individuals.

> We didn't have many relations with people outside 'our group'. The local business incubator was not only important in providing infrastructure, but also for the milieu. Many different people in similar positions were talking with each other about entrepreneurial processes over the printer or a cup of coffee. (Entrepreneur B)

But to what extent is the environment important for the local companies? The answer is twofold. On the one hand, the entrepreneurs in Norrköping built up a parallel business environment tailored to their needs. With access to the Linköping network, much initial support came from the neighbouring town, emphasizing the detachment from Norrköping. On the other hand, the start-ups from the past are now investing in Norrköping, such as the visualization centre and through the recruitment of graduates from Campus Norrköping. It can be stated that the entrepreneurial business environment is not yet integrated, but that this environment is expanding, offering a growing alternative cognitive path.

> It depends whom you are talking to. The politicians and workers often still talk about Norrköping as a town of the workers, while the municipality and the outsiders describe a Norrköping in change … Before, a typical Norrköping company was a large manufacturing company. Nowadays, a typical Norrköping company is small and has a focus on computer graphics. (Entrepreneur C)

While support from the entrepreneurial programmes at LiU was certainly important for the students at Norrköping, their companies were started in Norrköping and not in Linköping. Several decades of decline has led to a weakening of the cognitive path; for example, the number of workers in the city is decreasing, meaning that one of the foundations upon which the old cognitive paradigm rests is weakened. Many activities have been initiated to turn around the downward spiral: incentives for the textile and paper industry in the 1950s and 1960s, relocation of national agencies in the 1970s, and the attraction of electronic manufacturing companies in the 1970s and 1980s. These activities were in line with the dominant cognitive paradigm, but led to no change. Eventually, people started to question the dominant cognitive paradigm, which gave space to alternative choices. If the dominating industries had continued to grow, all local resources would have been used by these industries. No alternative actions would have been possible and the development which is happening right now in Norrköping would have happened in another city. Municipal commissioners would not have changed their strategy, there would be no university, and the city would not have been attractive to academics and students. The breaking down of the dominant cognitive path took a long time, but eventually Norrköping was ready to welcome outsiders.

This new emerging cognitive path was guided

Table 4. Comparison of the dominating and emerging paradigm.

	Dominating paradigm	Emerging paradigm
Focus on:	Collective: initiatives are taken by the organization	Individuals: initiatives are taken by individuals
Interaction through:	Organized networks	Unorganized communities
Scope	Inwards: strong, closed networks	Outwards: open communities
Activities facilitate:	Stability: preservation of the local specialization	Dynamic: exploitation of new business ideas

by a new paradigm which was different from the dominant one. The focus started to turn away from large organizations to the many small initiatives of individuals. These individuals interacted through outward going, unorganized communities, rather than formal, closed networks. Table 4 summarizes the main differences between the dominating and the emerging paradigm which has been revealed through the empirical material available for this paper.

Replacement of the dominating cognitive path

In the Norrköping case, it cannot be argued that the former dominating cognitive path has been replaced by an alternative way where entrepreneurial activities are accepted. Despite some efforts, the cognitive paradigm of manufacturing products in large companies is still dominant, such as among municipal employees, bankers and business managers. This is no surprise, as the cognitive lock-in was rather strong. Since the cognitive path is embedded in the socio-cultural environment, it becomes clear that such replacement processes need time: 'Norrköping is currently renewing itself. There is a distinct shift going on, but at the same time, no one really knows what Norrköping will be in the future' (Entrepreneur D).

Change in the cognitive path is mainly triggered by the activities of outsiders, which is usually a small number of individuals. It takes time for these new activities to reach the critical mass to initiate change. It is of immense importance to keep the cognitive and the technological paths apart, since change in one might not necessarily need to lead to change in the other. Cognitive path creation does not always lead to technological path creation, but might lead to technological path renewal or path extension. In the example of Norrköping, the emergence of a new cognitive path was made possible due to the emergence of new companies within both a new industry (such as visualization) and existing industries (such as media and transportation). The emergence of a new cognitive paradigm is necessary to enable Norrköping to move away from the excessive focus on manufacturing companies across different industries, but this new paradigm might actually lead to re-orientation within existing industries as well.

Conclusive discussion

The purpose of this paper was to analyse how local entrepreneurial activities can lead to a break in the cognitive local path. In that sense, this study also discussed partly how individual activities could be integrated into the regional and local path dependence discussion. Previous studies highlight the importance of exogenous shocks as well as technological, political and functional lock-ins, but cognitive lock-ins are widely neglected. The case discussion showed the importance of discussing cognitive barriers. Technological lock-ins are indeed important barriers for change, but so are cognitive lock-ins. Without the ability to see the application of new technologies, the technology itself becomes useless. Taking this into consideration, the results lead to several theoretical implications and conclusions which are summarized in Table 5.

The concept of path dependence is closely tied together with lock-ins. The theoretical discussion showed that lock-ins in the traditional understanding of one option only might be difficult to argue for: even though individuals share common cognitive paradigms, they make their own interpretations and total uniformity cannot be assumed. This relates back to one of the key questions of economic geography: why are some regions able to renew themselves while others remain in decline? Instead of talking about lock-ins, it might be more suitable to talk about different degrees of adaptability. The existence of a dominating cognitive paradigm can explain why the degree of adaptability differs between locations. Dominating cognitive paradigms are more likely to emerge in social and economically homogenous cities, such as Norrköping.

Table 5. Main conclusions of this study.

Degree of adaptability	Cognitive paradigms can explain why the degree of adaptability differs between locations
Focus on small, individual actions	External shocks or historical accidents might influence regional and local conditions, but a change in the cognitive paradigm occurs only through individual actions
Importance of outsiders	Acknowledging cognitive barriers, the role of outsiders needs to be stressed
Emergence of parallel paths	The long durability of cognitive paradigms and the importance of outsiders suggest the emergence of a parallel, alternative cognitive path, rather than an alteration of the existing one

The study showed the importance of lifting the focus of study away from external shocks. External shocks might influence regional and local conditions, but change only occurs through the activities of individuals in a location. The dominating cognitive paradigm shapes to some extent the range of possibilities that can be observed; hence, it is of equal importance to study small and individual actions and how they relate to the cognitive path.

The Norrköping case also highlights the importance of outsiders. Here, the locals reinforced the dominating cognitive path until outsiders initiated some triggers, enabling the locals to see opportunities outside the dominating cognitive path. The importance of outsiders shows that alternative paths can also emerge in locations with a low degree of adaptability. These outsiders are not aware of the current cognitive paradigms, but are imprinted by the cognitive paradigms in their former cities.

Being outsiders also meant that the new actors were not well integrated into the local business environment, but formed a group of their own. Their actions led to the formation of a parallel path. This, combined with decades of decline in Norrköping, helped to influence the local cognitive path. Actions according to the existing cognitive paradigm could not turn around the downwards spiral. Locals started to question past decisions and the cognitive path was weakened. Norrköping was now ready to welcome outsiders. Even though these outsiders were first detached from the locals, their actions will ultimately integrate them into the local business environment. Eventually, a new cognitive path will emerge, and the process continues.

This study gave further insights into the role of individual activities in path-dependent processes, but during the course of this study, some key issues emerged which require deeper theoretical discussion, especially in light of discussing the emergence of parallel paths. How should lock-ins and paths be perceived when acknowledging individual interpretation? Acknowledging the social embeddedness of individual activities, can we argue for radical breaks? What does the interrelatedness between different types of lock-in look like? Addressing these issues in more detail will enable us to develop a cognitive model of regional path dependence.

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FINAL REFLECTIONS

The research process in retrospect

In retrospect, there are of course things that could have been done differently during the process of designing and carrying out the study. In the following section I would like to address four issues in particular.

First, in the introductory chapter of the dissertation I made a point of how much can be gained by combining quantitative and qualitative methods. So far, much scholarly work has been either quantitative or qualitative, but I firmly believe in a combination of methods, which would allow for a better understanding of the phenomenon under investigation. In my case, the inclusion of a quantitative approach could have been a good foundation for showing and describing entrepreneurship in the two cities, while complementary qualitative analysis, mainly in the form of interviews, could have addressed the cultural issues.

Second, the main focus was on entrepreneurs and how their appearance related to the existing business structure. A stronger focus on the local business structure as a whole could have provided a more balanced view. I tried to provide a balance between entrepreneurs on the one side and representatives of the context on the other side when selecting the interviewees. When going through the articles now, the discussions of past developments is much focused on the context, while the more recent time frames focus almost exclusively on the entrepreneurs. Bringing both sides together when discussing single, more recent events could have enabled me to highlight the embeddedness rather than discussing context and entrepreneur as separate entities.

Third, a strength of this qualitative study was the long-term perspective of the phenomenon under investigation. The time spans were 35 and 30 years respectively. By taking such a long-term perspective, it was possible to analyse how the context changed owing to the activities of different actors. A stronger point could have been made about how the perception and the perspective of the individuals changed as they moved between the different groups. This would have given a more dynamic view of the actor perspective.

The long-term perspective could also be perceived as a weakness of this qualitative study. Interviews were carried out after 2010, which means that some of the interviewees were asked to talk about events which happened 30 years ago. Kvale and Brinkman (2009) see knowledge as contextual. Experiences and knowledge obtained within one situation is placed in this specific situation and might be not easily transferable or communicated. While this is generally a shortcoming of interviews, this might be even

more pronounced in the use of interviews in historical studies. Since the contexts of the interviewees have changed during these 30 years, they might perceive and interpret things differently than they did 30 years ago. Furthermore, as time passes, the emotional distance to the phenomenon under investigation increases and interviewees might rationalize their past actions and might not remember these (small) last important details. In order to eliminate these shortcomings, the stories of the different interviewees were compared and subjected to data triangulation. The vast majority of the companies included in this dissertation were founded by a team of entrepreneurs. I therefore aimed, if possible, to interview at least two of the founding members of the same start-up.

Fourth, in this dissertation I also focused on the cities as closed entities. Especially in the case of Linköping, the first entrepreneurs relied on Stockholm for support. There was no or little venture capital in the city and also few entrepreneurial role models. This means that the early entrepreneurs stressed the importance of Stockholm for securing finance. In that sense, one can argue that I focused on the changes from within rather than on how entrepreneurs secured support from outside the city, which made it possible to start this first wave of entrepreneurship. In the same way, I only elaborated shortly on how the closeness to Linköping enabled the first entrepreneurs in Norrköping to start their companies.

Policy implications

Before suggesting any policy implications, one has to ask if government should act at all and, if yes, to what extent. Obviously, policy cannot change the past, but in this dissertation the importance of the past for shaping the existing structures has been highlighted. Perceiving entrepreneurship as an embedded phenomenon, cultural and historical factors play an important role in shaping this phenomenon. While policy indeed cannot change the past, policymakers can rest their policies on these cultural and historical factors.

Furthurmore, government efforts are often described as slow and conservative rather than proactive and innovative (Grabher 1993, Hudson). Also, in the case of Norrköping, we have seen that thick institutional tissues at the political level preserved the past through subsidies. These tissues tie up local resources in an obsolete industry keeping the industrial structure artificially alive for a couple more decades and at the same time preventing new activities from emerging. The case of Linköping than showed that a combination of thriving individuals and discrete policies paved the way for a rapid development of entrepreneurial activities. In the light of these

findings, one should be realistic about the limitations of policy and its effects. This should be reflected in the suggested policy recommendations below.

Entrepreneurship policy needs a comprehensive approach

In this dissertation I argued that actors and structures are two sides of the same coin and ought not to be separated. This implies that entrepreneurship should be understood as a social phenomenon. Such an understanding has some important policy implications. Just as entrepreneurship research has broadened its approach from an individual-centred approach to an embeddedness approach, entrepreneurship policy should also have a broad approach. If entrepreneurship is a social process driven by social, cultural and economic factors that rest in the immediate environment of the entrepreneur, entrepreneurship policies needs to include that environment. In that sense, entrepreneurship policy should not be implemented through a limited set of instruments targeting only a few individuals or a particular industry, but should span many different agencies and many different policy fields.

Past scholarly work on the role of policy for entrepreneurship has suggested similarly that entrepreneurship policy is not just about stimulating a few more start-up firms, but highlight its potential for an entire new economic approach which leaves 'virtually no aspect of the economy untouched' (Audretsch et al. 2007: 3): the new entrepreneurial economy.[1] Instead of searching for and recommending new policy instruments, entrepreneurship policy might imply to debate on the changing role of traditional policies in this new entrepreneurial economy.

Entrepreneurship policy needs to include a proactive education policy

The necessity to form entrepreneurship policy as a comprehensive approach implies the need for a more proactive education policy. The empirical papers in this dissertation have shown the importance of new industries in stimulating entrepreneurial activities. In both cases, entrepreneurial activities took place outside the established industries. This implies that education policy should to a larger extent aim to stimulate education programmes in industries of tomorrow and not only to supply the current needs of the private industry.

[1] For an in-depth discussion on the proposed shift from the managed to the entrepreneurial economy, see Audretsch and Thurik (2001)

Education policy can also play an important role in changing young people's mindsets. The gap in Europe's entrepreneurial activity rate compared to the US has often been traced back to the weak entrepreneurial culture in Europe (Grilo and Irigoyen 2006, Thurik 2007). This weak entrepreneurial culture fosters stability over risk-taking and prevents people from seeing entrepreneurship as a valid career option. Education policy can already contribute at an early stage to a raising awareness and prepare young people for entrepreneurial careers.

Entrepreneurship policy is a context-sensitive policy

One of the big questions related to governmental intervention is whether governments ought to be grand designers or intelligent players. Governments acting as grand designers are actively picking winners either based on their judgement of expected growth potential or to enhance industries or technologies which have been proven in the market. Governments as intelligent players would imply a less central role, where private actors are making the choices and governments set the broader frames. Taking into the consideration the above two policy recommendations, the role of government as an intelligent player is to be preferred.

Economic development is an evolutionary process with unpredictable outcomes: success in specific areas in the past is no guarantee for future success and the future growth potential of new industries or technologies is impossible to predict. In that sense, policy should aim to create a functional platform for entrepreneurial activities to take hold, without specifying prioritized industries. This means that such policy is context-sensitive policy.

Entrepreneurship policy needs a process perspective

In this dissertation, I argued that much can be gained by recognizing entrepreneurship as a process rather than an act, which implies that entrepreneurship policy needs to take into consideration this process perspective. Entrepreneurship policy should acknowledge that the needs of people differ as they go through the different stages of the entrepreneurial process. In early stages of the entrepreneurial process, soft policy measures, such as mentoring and network building, might be of greater use, while in later stages hard policy measures, such as access to risk capital, are required.

Entrepreneurship policy needs a long-term perspective
Another policy lesson which can be drawn from the importance of a location's history is that changes will occur slowly. All the articles are based on the assumption that actions gain in importance *over time*. The entrepreneurial phenomenon in Linköping did not emerge overnight, but a series of different activities was needed to create a critical mass. Similarly, entrepreneurial activities in Norrköping were seen in the light of the past industrial glory more than 60 years ago. The last article in this dissertation in particular highlights the role of past industrial structure for the formation of local culture, and empirical evidence shows that culture persists over generations and changes slowly. Considering that policies are often short-term due to the short periods between elections, it might be a particularly difficult task to initiate change through policy.

Future research directions – new and old questions arising from this dissertation

This dissertation dealt with the rise of new industries through entrepreneurial activities. The aim was to investigate how differences in contexts might encourage or discourage entrepreneurial activities. The contextualization of entrepreneurship enhanced our understanding of when, how and why entrepreneurship happens. However, many open questions remained, which can be found partly in the conclusion sections of the included articles. While I summed up my PhD process, three general questions emerged, which are discussed below as potential future research directions.

From 'who is an entrepreneur' to 'what is entrepreneurship'?
One of the most central issues when studying entrepreneurship is the issue of how to define entrepreneurship. This issue was also a constant challenge while doing this PhD and I have not come up with a general conclusion on how to do that. Entrepreneurship is a phenomenon that has gained interest from many different disciplines and has been studied through many different theories and concepts of mainstream disciplines. In my opinion, it is desirable to investigate this complex, social phenomenon from different perspectives. But its increasing popularity resulted in a great variety of different types of entrepreneurs and it might be too much of a stretch to try to include all different types of entrepreneurship under one umbrella called entrepreneurship. If the broad idea is that entrepreneurial activities are activities that happen outside existing frames, it might be difficult, if not impossible, to come up with one theory of entrepreneurship. In that sense,

entrepreneurship research might gain much by going back to a more stringent use of the concept of entrepreneurship.

One way of doing so might be to challenge certain underlying assumptions of entrepreneurship. Entrepreneurship research is very much guided by the assumption that entrepreneurs are a special type of people who share certain characteristics. Entrepreneurs are often described in general terms, such as being confident and risk-averse. If we focus on entrepreneurs as a special type of people with such general characteristics, we will find such people outside the economic arena and might name them as institutional and political entrepreneurs. If we want to go beyond this highly fragmented research field and develop a common theory of entrepreneurship, we first have to take a step back and ask ourselves what is entrepreneurship. We should go beyond such broad, common entrepreneurial characteristics and include the importance of context. I propose that much could be gained by the assumption that entrepreneurs are not born, but that the context creates entrepreneurs. Future research might be able to investigate what can be gained from this context-centred understanding of entrepreneurship. This is not to propose that only context matters but more to find a balance between person- and context-centred understandings of entrepreneurship.

What is the relationship between entrepreneurship and path dependence?

As highlighted in the introduction chapter preceding the articles, both entrepreneurship literature and path dependence literature are currently experiencing a turn, which opens up the possibilities for joint discussion. A great part of the articles and the introduction chapter is about how the two streams of literature might benefit from this joint discussion. The articles in this dissertation made some first attempts how these two streams of literature might be combined, but many open questions remain.

Since the regional path is often described as an industrial path, it is reasonable to focus on economic actors. So far, many have focused on entrepreneurs as the most important actors. But, as entrepreneurship literature has shown, entrepreneurs are no homogenous group and can differ in their relation to the regional path. Entrepreneurs who move to the region might bring new knowledge and might therefore be involved in more radical path creation. Owing to their local embeddedness, local entrepreneurs might engage more in incremental path creation (or path renewal).

Then there is also the question of unintentionality. Agents might have certain intentions, but there might be unforeseeable, unintentional

outcomes, whether through the unique combination of actions from different actors or changing circumstances. This becomes even more important to discuss if we assume that most entrepreneurs have no intention of creating regional paths. How can regional path creation be influenced if it is an unintentional effect of economic actors?

What constitutes an entrepreneurial culture?

When I started to take on a cultural approach in the latter half of my PhD studies, I had the impression that culture was a well-known concept which has been used frequently in many disciplines for decades. I was therefore expecting a clear conceptual framework and strong arguments. Despite the long interest in cultural aspects across many disciplines, scholars still hold widely different perspectives on how culture should be conceptualized and operationalized. The more I became acquainted with the relevant literature, the more I understood why it is so difficult to capture culture theoretically and empirically.

Since there is still much ambiguity surrounding the concept of culture in general, this also applies to entrepreneurship culture. One might raise the criticism that, if culture is too broad and vague and comprises everything and nothing, it might not be useful as an analytical concept. But we know that there is something in the air, though it is difficult to grasp. Just because it is difficult to grasp is no excuse to exclude it from the studies.

As it seems now, scholars have mainly tried to capture and measure entrepreneurial culture, but did not discuss what this entrepreneurial culture might look like. Culture is a term that everyone can relate to and is familiar with, since it is used to describe people who are different from ourselves. Few however have attempted to gain a deeper understanding of how culture can be used as an analytical concept. Often, there is a circular argument. A high number of start-ups are used as evidence of a strong entrepreneurial culture, while the existence of an entrepreneurial culture will lead to a high number of start-ups.

Before trying to measure entrepreneurial culture, it might be more fruitful to discuss first what actually constitutes an entrepreneurial culture. Once we have a clearer picture about this, it might be easier to break it into different components, which can then be discussed and measured. But this will be the subject of further investigation.

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To whom it may concern,

The authors hereby certify that the article entitled "Local culture as a context for entrepreneurial activities", accepted for publication in European Planning Studies, is based on 80 % / 20 % contribution by the respective authors Sabrina Fredin and Marina Jogmark.

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ABSTRACT

This dissertation deals with the rise of new industries through entrepreneurial activities. The aim is to investigate how differences in contexts might encourage or discourage entrepreneurial activities. This contextualization of entrepreneurship enhanced our understanding of when, how and why entrepreneurial activities happen.

Entrepreneurship is recognized to be a spatially uneven process and, in addition to previous research that has examined the actions of individual entrepreneurs, we also need to understand the context in which entrepreneurship occurs. We have a good understanding of how structural conditions like industry structure, organization structure and agglomeration effects influence the context, but we know little about how the social dimension of the context is the transmitting medium between structural conditions for entrepreneurship and the decision to act upon identified entrepreneurial opportunities. Following this line of argument, this dissertation is built on the assumption that entrepreneurship is a social phenomenon which gives strong arguments for including local culture in entrepreneurship research. The temporal persistence and the pronounced differences of culture and structural conditions between places reflect path-dependent processes. I therefore use regional path dependence as an interpretative lens to study the contextualization of entrepreneurship in two Swedish cities.

Although each context is unique, some generalizations can be drawn from the four individual papers in this dissertation. The first is that industrial legacy leads to the formation of a distinct local culture and that the persistency of this culture influences the subsequent entrepreneurial activities in new local industries. The second is that this persistency of culture suggests that entrepreneurs who are outsiders, geographically or socially, are the driving forces for the emergence of new local industries. Finally, new industry emergence is a result of a combination of exogenous forces and initial local conditions, but it is the entrepreneurial individuals who translate these forces and conditions into entrepreneurial activities.

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