Change agency in (old) industrial regions

Shaping new futures

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Shaping new futures

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The transformation of the economic landscape and the development of old industrial regions are often explained using structural factors. That line of thinking often downplays the role of agency. This dissertation instead puts actors, their agency, and their actions at the centre. By doing so, it enhances our understanding of the role of agency in the dynamic transformation processes of old industrial regions.

Theoretically, the dissertation builds on previous research on old industrial regions and combines it with literature on human agency. It focuses on the concepts of change agency and reproductive agency in particular. Empirically, the dissertation investigates agency expression and new path development in three Swedish regions with a long industrial tradition. The dissertation highlights the significance of local agency and enhances our understanding of temporal and regional variations.

LINDA STIHL is a PhD Candidate at the Department of Human Geography and a member of CIRCLE Centre for Innovation Research at Lund University. Her research interests include human agency, regional development, the transformation of old industrial regions, and cartography.

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DOCTORAL DISSERTATION

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Title and subtitle: Change agency in (old) industrial regions - Shaping new futures

Abstract: The aim of the dissertation is to develop a better understanding of the role of local agency in the transformation of old industrial regions. Theoretically the dissertation builds on concepts which are important in the debate on regional development in old industrial regions such as path dependency, negative lock-ins, the role of institutions, and new path development, while exploring and unpacking the role of agency. Old industrial regions are studied using a dynamic and process-oriented approach. Together with detailed, longitudinal case studies, it enhances our understanding of when, why and by whom agency is used in new path development. This challenges the assumption that old industrial regions are static, without any large variations, and that their fate is pre-determined.

Empirically, the dissertation investigates agency expressions and regional development in three traditional Swedish industrial regions (Borås, Kiruna, and Olofström) which have suffered from decline and structural crisis. Different types of development and industries are under scrutiny, and the dissertation offers valuable methodological insights into the study of agency.

Old industrial regions are structurally constrained and locked-in. Nevertheless, the dissertation finds that new path development is possible in heavily constrained regions. Furthermore, it finds that local actors use their agency in every part of industrial development, and use both local and non-local resources. The dissertation distinguishes between change agency and reproductive agency, which work in tandem. Change agency is important for developing new products, perceiving new futures, and bringing local actors together and, thus, is mainly used in initial stages of path development, whereas reproductive agency is used to stabilise later phases. Change agency can initiate institutional changes, which can pave the way for further change agency. Furthermore, the dissertation nuances our understanding of reproductive agency by showing that, reproductive behaviour can also be the result of a lack of perceived agency or the enforcement of a continued power asymmetry. When no agency is perceived, change agency becomes impossible.

Key words: Economic Geography, Change agency, Reproductive agency, Old industrial regions, Regional development

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To Calle, Oscar & Viktor

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Acknowledgements

A PhD project is not like any other job. Therefore, when reading PhD dissertations, I always start in the acknowledgements. It gives an additional dimension to the work of a PhD candidate, something more than what can be found in the conclusions. My PhD journey started when I turned 35. I looked back on the last 5 years and felt like I had not accomplished much. Somehow, I completely overlooked the fact that we had a toddler at home, had our second-born and dug a cellar under our house by hand. Anyway, this led me to set up two ambitious goals for the coming 5 years: write a PhD dissertation and finish a Swedish Classic (four long-distance races during a 12-month period). Come September, I hope to accomplish both. Although I write "I", this is not an endeavour that I have made on my own. Hence, I would like to take this opportunity to thank those that have helped me along the way.

First, I want to thank the 62 informants who have given me their time and trust. The informants have shown a willingness to share their thoughts, ideas, and convictions. I have learnt more from them than I ever expected (and much more than could fit in this text). Although they might not find themselves in the text, their many details have been considered and processed like the cancelled trip to Barcelona and the agony of fire alarms in a hotel of ice. Their engagement and stories have also made me convinced that everybody can do something, and together one can do a lot. There are so many people in places that might be disregarded as 'lagging' or 'old', who every day strive to make their municipality, their home, prosper. This dissertation shows how important their work is. Like 40,000 scouts once sang on a camp, "if it's a change in you, then the world is changing too" (Lemma & Klang, 2011).

I have been fortunate to work in two projects, ReGrow and ACORE. The two diverse groups have broadened my horizons, taught me important research skills and theoretical depth. To my two supervisors, Markus Grillitsch and Brita Hermelin, I send most gratitude for guiding me throughout this challenging process. Markus, thank you for giving me the opportunity to join the projects, for your many pieces of advice in the daily work, and for pushing me theoretically. Brita, thank you for your patience, thorough readings, and ability to bring in alternative perspectives. During the research process I have also had the great opportunity to receive most helpful feedback from Teis Hansen, Robert Hassink, and Markus Steen at three progress seminars.

I started studying at the Department of Human Geography in 2004, and since 2009 it has been my workplace. I have worked with many great colleagues and students there and at CIRCLE since then, too many to name here. Nonetheless, I wish to thank the PhD community for your support, especially Hanna Bach, Kristin Smette Gulbrandsen, and Stine Hach Juul Madsen. Your friendship and support, especially during the pandemic and in the last months, has been essential. The same goes for Sanna Händén-Svensson, Karin Lindsjö and Mona Tykesson Klubien. I hope there

will be many more interesting coffee and lunch dates on academia, pedagogical ideas and family life to come. I want to thank Mikhail Martynovich for all his enthusiasm and help in quantitative matters. In Josephine Rekers I have found a great collaborator and a dear friend. Thank you for your comments, encouragement, and support.

I want to thank my 2-6 parents, the two I have had from the start and the additional four that have come along. Thank you for your encouragement and for helping out with the boys when time has been short. And Tjejligan, our monthly book club (where we rarely read books) is a most needed and highly appreciated air vent in everyday life. Half of this doctoral work have been conducted during the pandemic and I cannot count the days that I spent alone in the home office. Although I have grown to love working in the living room, it has not always been the case. I would therefore like to send some extra thanks to my neighbours. Centralvägen in Dösjebro is truly the best place to live, and there is always a good excuse to have coffee (or something else). When everything else was cancelled, we still found opportunities to meet. With this dissertation, I would also like to send my warmest thoughts to Prof. Dr. Dr. h.c. mult. Holmberg (or just Börje). I am truly sorry that I was so late in starting a PhD project that he could not see it finished.

Finally, this work would not have been completed if it weren't for the three men in my life. Calle, for 23 years we have supported and challenged each other to try new things and do crazy endeavours. You have never doubted my capability of finishing this project. Your enthusiasm has gotten me through the many times, when I was less sure that I could make it. Oscar och Viktor, tack för ert tålamod och för att ni låtit mig sprida ut mina papper på matsalsbordet (som ju hellre borde vara ett pingisbord). Och killar, tack för Kung Fu Panda 3. Varje dag har jag läst Master Shifus kloka ord på min anslagstavla "If you only do what you can do, you'll never be more than you are now".

Linda Stihl
9 August 2023
Dösjebro, Sweden

Populärvetenskaplig sammanfattning

Denna avhandling studerar lokala aktörers roll vid förändringsarbete i *gamla industriregioner*. En gammal industriregion definieras som ett område med en ensidig och överspecialiserad industristruktur, som är dominerad av mogen industri och som upplever minskad sysselsättning och/eller avindustrialisering. Denna typ av region är ofta starkt påverkad av gamla strukturer och förväntas därför ha svårare att förändras, då tidigare forskning har visat på att alla regioner är *stigberoende.* Det innebär att lokal utveckling byggs baserat på resurser, kunskaper, färdigheter och infrastruktur som skapats i tidigare/existerande näringar. Lokala resurser i gamla industriregioner ger i många fall sämre förutsättningar för att skapa nya utvecklingsvägar. Tillsammans med rådande strukturomvandling riskerar de därför att hamna i *negativa inlåsningar*. Det kan ske på tre olika sätt såsom ett låst tankesätt, tekniskt beroende av dominanta företag, eller att beslutsfattare ensidigt stimulerar befintlig utveckling. Slutligen så formas regioner av normer, traditioner och konventioner (kallade *informella institutioner*), samt lagar och regler (*formella institutioner*). Institutioner är obenägna att förändras, men i gamla industriregioner finns ofta sämre möjligheter eller högre motstånd till förändring.

Avhandlingen försöker förstå hur och varför förändring i det som kallas gamla industriregioner ändå kan skapas genom att använda det teoretiska begreppet aktörskap eller *agens* (agency på engelska). Agens beskriver människors *medvetna handlingar* och *deras avsedda och oavsiktliga effekter*. Avhandlingen studerar speciellt agens som försöker skapa förändring (*förändringsagens*), men studerar även agens som antingen vill stabilisera pågående utveckling eller motverka förändring (*reproduktiv agens*). Under arbetet har totalt 61 intervjuer genomförts med beslutsfattare, företagare, tjänstemän, forskare med flera i tre olika svenska industriregioner. Materialet har kompletterats och jämförts med tidigare forskning, samt olika typer av skriftligt material såsom planeringsstrategier, rapporter, tidningsartiklar osv. Materialet har analyserats med hjälp av ett tillvägagångssätt som kallas *Path tracing* vilket innebär att forskaren studerar utvecklingen av en plats över längre tid genom att följa och studera handlingar och skeenden bakåt i tiden. Under intervjuerna ställdes frågor såsom: vilken är den viktigaste förändring som skett i din region sedan 1990? Vem initierade och vem genomförde förändringen? Vad möjliggjorde handlingen, och vad gjorde det svårt? Med hjälp av svaren kartlades platsernas utveckling kring centrala händelser och faser dem emellan. Genom att studera lokala aktörers uppfattning av händelser, hinder och möjligheter, kan även bakomliggande faktorer, så kallade strukturer, studeras. Strukturer, som stigberoende, inlåsningar och institutioner, sätter ramar och begränsningar för människors agerande, men dikterar inte framtiden eller vad som är möjligt.

De tre regionerna som studerades var Olofström, Kiruna och Borås. Ordet *region* är här inte likställt med Sveriges politiska och administrativa regioner, utan syftar på ett specifikt avgränsat område. I detta fall användes lokaliseringen av dominerande

industrier och dess omland vilket motsvarade den geografiska nivån för en kommun. *Olofström* studerades från 1990, men fokus kom att ligga på perioden kring 2008–2010 då Olofström genomgick en stor kris. Deras största arbetsgivare, Volvo Cars varslade 2008 många anställda och det triggade fortsatta varsel hos underleverantörer och annan lokal service. Totalt sett förlorade 1000 personer sina jobb i Olofström, med en befolkning på endast 13 000 invånare. *Kiruna* studeras ända tillbaka till stålkrisen på 1970-talet, men fokus för undersökningen kom att studera utvecklingen av besöksnäringen i skuggan av den dominanta gruvnäringen och omorganisationen av lokala stödstrukturer för näringslivet. Även den pågående stadsflytten studerades, eftersom den har påverkat all annan utveckling i Kiruna sedan 2003. *Borås* studeras tillbaka till TEKO-krisen på 1970-talet. Med sina många olika näringar som omvandlats och växts fram sedan dess, kom fokus för studien att ligga på det växande samarbetet mellan offentliga och privata aktörer efter år 2000 samt olika investeringar som gjorts i Borås för att lyfta den lokala självbilden som drabbades hårt av krisen.

Avhandlingen består av en *kappa* och tre publicerade *vetenskapliga artiklar*. Kappans syfte är att knyta ihop de olika artiklarna och innehåller tidigare forskning, teoretiskt ramverk, metod och avhandlingens slutsatser. Kappan innehåller även en bredare och djupare beskrivning och analys av de tre olika fallstudierna. I den första artikeln (Rekers & Stihl, 2021) studeras hur Olofström och en annan kommun i samma arbetsmarknadsregion hanterade krisen 2008. I Olofström hade Volvo Cars tidigare satt ramarna och riktningen för Olofströms utveckling. Under krisen drog sig Volvo Cars tillbaka lokalt för att hantera sin interna kris. Det gav mer handlingsutrymme för andra aktörer att vara med och sätta agendan för Olofströms framtid. I artikelns jämförande kommun fick krisen få effekter och artikeln visar därför på hur stora skillnader det kan finnas i informella institutioner även på lokal nivå. Den andra artikeln (Stihl, 2022), som tar sin utgångpunkt i Kirunas utveckling, studerar länkar mellan besöksnäringen och gruvnäringen och visar på att den dominanta gruvnäringen både hjälper och stjälper utvecklingen av lokal turism. Eftersom näringarna är så pass olika, sett till marknader och behov av resurser, var det överraskande hur många länkar som trots allt fanns, speciellt hur de konkurrerar om samma arbetskraft. Artikeln visade även på att förändringar i informella institutioner, initierade av framväxten av en ny näring, skapade mer möjlighet för förändringsagens. Den sista artikeln (Stihl, 2023) studerar hur olika lokala kulturer (en form av informell institution) skapar olika förutsättningar och möjligheter för lokal agens. Borås, med sin entreprenöriella anda, jämförs med Kirunas bruksortsmentalitet. Artikeln visar hur de olika lokala kulturerna påverkar sammansättningen av lokala aktörer och deras agensuttryck. I en entreprenöriell kultur finns mer öppenhet för förändring och förändringsagens. Samtidigt visar artikeln att denna öppenhet kan skilja sig mellan olika aktörer i samma kultur, dvs. alla lokala aktörer upplevde inte samma öppenhet och vilja till förändring eftersom de var olika påverkade av inlåsningseffekter.

Avhandlingen bidrar till forskningen genom att utmana bilden av gamla industriregioner och visa att de inte är låsta i sin utveckling utan att det finns en dynamisk utveckling i dem som drivs av lokala aktörer med hjälp av lokala och icke-lokala resurser. Lokala aktörer driver inte ensamt utvecklingen, utan aktörer från andra regioner och andra politiska nivåer spelar även de olika roller i platsers regionala utveckling. Avhandlingen visar att det finns variationer i regionernas förutsättningar, möjligheter och agensuttryck genom sina detaljerade fallstudier över långa tidsperioder. Vidare så visar avhandlingen på att det är möjligt att skapa nya tillväxtbanor i regioner trots bilden av att detta inte är möjligt. Detta kan ske eftersom aktörer använder sin agens för att utveckla nya produkter och tjänster, utmanar tidigare bilder av framtiden med alternativa vägar och samlar lokala aktörer för att med gemensam agens arbeta framåt tillsammans. Förändringsagens används främst i början av nya tillväxtbanor. Därefter dominerar reproduktiv agens för att skapa en stabil utvecklingsbana. Avhandlingen nyanserar även vår förståelse av reproduktiv agens. Denna form av agens används inte bara för att stabilisera utveckling eller motverka förändring, utan avhandlingen finner ytterligare två skäl till denna form av agens. Dels att dominanta aktörer, som ledare vid bruket i en bruksort, kan använda denna form av agens för att bibehålla ojämlika maktförhållanden lokalt, dels att aktörer kan bli så inlåsta i en utveckling att de inte ser att de har någon agens att påverka framtiden. När en aktör inte uppfattar sig ha någon agens, kan den inte använda förändringsagens utan kommer att kopiera tidigare beteende. Slutligen så visar avhandlingen på att förändringsagens kan skapa förändring i institutioner. När många lokala aktörer accepterar ändrade institutioner, såsom en välvilligare inställning till entreprenörskap och förändringar, kan större förändringar ske lokalt. Samtidigt kräver förändringsagens att aktörer kan föreställa sig en annan framtid än den utstakade, och olika inlåsningar, speciellt ett låst tankesätt, försvårar detta.

Avhandlingen lyfter tre lärdomar att betänka i det praktiska arbetet med regional utveckling. Uppfattningen av vad som är möjligt och förväntningar på framtiden är viktiga frågor för att kunna lyfta blicken från nuvarande utvecklingsbana. Avhandlingen pekar därför på vikten av att arbeta med mjuka värden i policyarbete kring långsiktig utveckling i sårbara regioner. Därefter pekar avhandlingen på vikten av att identifiera perioder när lokala aktörer uppfattar det som att de saknar agens då detta hämmar utveckling. Andra aktörer, på olika politiska nivåer, kan här bidra. Slutligen så lyfter avhandlingen Sveriges styrning av regional utveckling och vad det innebär för dess arbetsfördelning. Avhandlingen visar att de lokala aktörerna, har många av de verktyg som krävs för att arbeta med regional utveckling. Samtidigt är det de politiskt styrda regionerna som har ansvar för arbetet, trots att de saknar flera reella verktyg för att arbeta med frågan. De lokala aktörerna lyfte även hur den nationella nivån (regeringen, riksdagen och statliga myndigheter) på olika sätt påverkar och begränsar lokala aktörers handlingsutrymme. Arbetsfördelningen kring regional utveckling kan därmed både förtydligas och förbättras.

List of Papers

Paper I

Rekers, J. V., & Stihl, L. (2021) One crisis, one region, two municipalities: The geography of institutions and change agency in regional development paths. *Geoforum*, 124 (August 2021), 89-98.

Paper II

Stihl, L. (2022) Challenging the set mining path: Agency and diversification in the case of Kiruna. *The Extractive Industries and Society*, 11.

Paper III

Stihl, L. (2023) Local culture and change agency in old industrial regions: spinning forward and digging deeper. *European Planning Studies*, (Epub ahead of print)

Prologue

In January 2023, at the start of Sweden's Presidency of the Council of the European Union, all heads were turned towards Kiruna where the council was meeting for two days (Wikén, 2023). The Swedish prime minister stated that "We've chosen to hold this meeting in Kiruna to showcase a unique area of Sweden – a unique region of the EU where a green industrial transition of historic magnitude is currently under way" (Sweden2023.eu, 2023). Events during the visit were delicately planned. Through a carefully planned press release LKAB, a large state-owned Swedish mining company, announced that they had found a new deposit of rare metals that the EU desperately needs for a green transition (LKAB, 2023). The news was published in newspapers around Europe (Finke, 2023; Le Monde & AFP, 2023; Ramsbæk, 2023). During the second day, a new ramp for launching small satellites from the local space base was inaugurated by the Swedish king, the Swedish prime minister, and the President of the European Commission. This was framed as an important step for Europe to keep their footing in space (Sternlund, 2023a). Although these two examples showcase present and important companies in the municipality, Kiruna was only the host site. The European Union made all their arrangements themselves (Sternlund, 2022). The spectacular Icehotel, the short days in January, the vast and beautiful landscape, and rich mineral deposits were just the backdrop to a two-day European event (Liljeheden, 2023). Then the delegates returned to Brussels.

Only a month earlier, I held a workshop in Kiruna on its past and future development with local actors from different sectors and organisations. The group repeated many of the constraints for local development (such as state laws and regulations) that had previously been described in interviews. However, they saw the two days in January as an opportunity to inform national and European leaders of their issues: how they do not feel that they have the opportunity to develop, even though external actors both want and expect to continue extracting resources from Kiruna. Although local actors achieved some media attention concerning their constraints (Haupt, 2023; Linder et al., 2023) and hope that the visit will bring more tourists in the future (Sternlund, 2023b), it is an opportunity to reflect over local actors' opportunity to influence their future. To what extent can local actors influence their development and to what extent are localities just pawns in a bigger game?

Around Europe, there many localities who struggle to change their story and to overcome structural constraints. This dissertation looks closer at three cases and how local efforts have aimed to transform their development.

1. Introduction

Many small- and medium-sized manufacturing cities and regions in Europe have, over the last 20 years, continuously suffered relative decline in both income and employment (Iammarino et al., 2017). In contrast to this, metropolitan areas are becoming more expansive when it comes to the creation of wealth, jobs, and employment. This creates growing inequalities between regions (Iammarino et al., 2017), an inequality that is not only visible in the statistics, but is also present in the narrative of the big cities as places of the future, with advantages of dense agglomeration (Rodríguez-Pose, 2018). Places that have become overspecialized in mature industries and which are experiencing decline are often called *old industrial regions* in the literature (Coenen et al., 2015; Hu & Hassink, 2015). For regions such as old industrial regions, which experience persistent poverty, economic decay, and lack of opportunities, the narrative of successful cities has been described as spurring a feeling of being 'left behind' (The Economist, 2017), or that residents 'don't seem to matter' (Rodríguez-Pose, 2018). In the scientific debate, these regions have also been described as 'lagging' regions (see, e.g., Ganau & Kilroy, 2023; Simone, 2022). Through expressions of discontent forming distinctive processes like Brexit (UK) and the yellow-vest movement (France), the growing regional inequalities have also caught the attention of politicians and media (Hassink & Kiese, 2021; Kinossian, 2019). Considering this development, there is a need for more studies on how regional disparities are continuously produced, how these processes can be decreased, and how declining regions can change their development paths. However, not to be overlooked, there are also small- and medium-sized manufacturing cities and regions with alignments to what has been associated with old industrial regions that have not followed a negative path or who have been through decline but managed to change their story. What is it that makes these locations different? How have they managed to stay competitive or turn the boat around, while both policy and research have focused on success stories (e.g., high levels of innovation, clusters, entrepreneurial activities, etc.)?

From previous research we know that old industrial regions face greater challenges than other regions (Hu & Hassink, 2015) due to their often narrow industry paths (Hedfeldt & Lundmark, 2015), as well as a general lack of support organisations (Blažek et al., 2020), sufficient capital, and advanced technology (Hu & Hassink, 2015). Different forms of negative lock-ins are often used to explain why old industrial regions continue their current paths instead of transforming into something

new with better prospects (Grabher, 1993; Trippl & Tödtling, 2008). Nevertheless, from the literature on new path development (Grillitsch & Asheim, 2018; Hassink et al., 2019; Martin et al., 2019), we have learnt that there are various possible ways for a place to transform. However, depending on a place's pre-requisites, this will be more or less difficult. What is it that makes some old industrial regions able to break negative lock-ins and pursue new path development?

Figure 1: The three case study regions.
Map source: GADM, 2023; © Lantmäteriet, 2023. Map layout: Stihl, 2023

Against this backdrop, this dissertation studies regional development in three old industrial places in Sweden (see Figure 1). Swedish industrialisation and economic development grew to a large extent in more peripheral areas to be close to important natural resources such as iron ore, forests, and water (Alvstam, 1995). Therefore,

many traditional manufacturing towns and regions can be found outside the larger cities. Many of these places also grew as *company towns*, meaning that they were developed by a single, large company. In some company towns, the company has closed, and the local community has struggled to find new developments. In some, the company remains, but a strong dependency has formed between the company and the local community which discourages other developments (Isacson, 1997). In others, the local communities have developed into more diverse and economically resilient regions. Even though many of them share the same structural preconditions (such as size, location outside the largest cities, and a tradition of manufacturing) they have developed differently. Why are similar regions not developing in the same way?

This dissertation draws on the growing body of work on *human agency* in economic geography, that argues that one explanation for these regional differences comes down to how people and organisations take action, meaning how they use their agency (Grillitsch & Sotarauta, 2020; Kinossian, 2019). The study of agency incorporates peoples' actions and their intended and unintended effects. *Actions* include, from grand actions such as a revolutionary innovation, down to everyday mundane actions such as choosing to participate actively in a networking meeting. The work presented in this dissertation answers a broader call for more studies on agency (Boschma, 2017; Bristow & Healy, 2014; Grillitsch & Sotarauta, 2020; Kinossian, 2019; Uyarra et al., 2017) in order to (i) understand the role of agency in path development better (Martin & Sunley, 2006) and (ii) to study agents on a micro-level, as this is the front line of regional change (Boschma, 2017; Kinossian, 2019).

Building on the growing literature on *change agency* in particular (Bækkelund, 2021; Grillitsch & Sotarauta, 2020; Sotarauta et al., 2022), the dissertation focusses on regional and industrial change processes and investigates the role of agency in places that have experienced industrial decline or crisis and that later have renewed or changed their industrial paths in some way. To do so, the dissertation takes a long-term perspective on regional development, where two of the three case studies experienced structural crisis over 40 years ago. As suggested by Grillitsch, Sotarauta, et al. (2022), there is no single script for inducing change in regions. Regions have different local endowments, geographical context, and history that shape possible futures. The dissertation contributes to our understanding of the role of agency in combining and mobilising these historical and geographical contexts in efforts to shape path development.

Aims and research questions

As previous research concludes, we already know much about regional development in industrial and old industrial regions. However, new path development, which has been used to describe how new paths grow in regions, has been criticised for

neglecting the role of agency (Hassink et al., 2019). Additionally, there is a lack of knowledge regarding how actors can create and exploit opportunities in different contexts, why actors manage to do so in some places, but not in others (Grillitsch & Sotarauta, 2020), and which conditions promote and hinder agency aimed at transformation (Grillitsch, Asheim, et al., 2022). This dissertation contributes to knowledge of regional development in places that have suffered from decline and crisis, and contributes to the theoretical understanding of how and why different forms of agency affect regional development (Boschma et al., 2017; Grillitsch & Sotarauta, 2020) together with more empirical findings (MacKinnon et al., 2019) using a longitudinal approach.

The aim of this research is to *develop a better understanding of the role of local agency in the transformation of old industrial regions*. It will do so through studying three traditional Swedish industrial regions that have suffered from decline and that are in various stages of tackling it. The study period starts around 1990 and goes up until today. Theoretically the dissertation builds on previous research on concepts that are important for the debate on regional development, and old industrial regions in particular, such as path dependency (Boschma & Martin, 2010; Martin & Sunley, 2006), lock-ins (Grabher, 1993; Hassink, 2010), the role of institutions (Battilana et al., 2009; Rodríguez-Pose, 2013), and new path development (Boschma & Frenken, 2011; Grillitsch & Asheim, 2018). These concepts are used as a basis, as the dissertation explores and discusses the role of agency in regional development. Much research within economic geography has been looking at firms as actors of change. However, the dissertation unpacks the agency of actors within firms as well as studies other actors outside firms, as suggested by Feldman and Storper (2018); Hassink et al. (2019); MacKinnon et al. (2019). There is a need for a better understanding of the agency of non-firm actors in regional development (i.e., higher education institutions (HEIs), local policy makers, support organisations, networks, civil society, etc.). The dissertation focuses on agency expression at the local level and the municipal government is therefore a central actor.

The overarching research question for this dissertation is: *How can change agency create new development paths in old industrial regions?*

To operationalise the overarching research question, the following sub-questions have been formulated:

1. In what forms, when and why does local agency occur in the formation of new development paths?
2. Which conditions enable and constrain change agency in regional development?
3. How do actor constellations influence the formation of new development paths?

By exploring these research questions, the dissertation contributes to the literature on agency in the following way:

- With an agency approach, in combination with using a dynamic and process-oriented perspective on their long-term development, it challenges the understanding of old industrial regions as static and unpacks regional varieties within them.
- Through detailed, long-term case studies it enhances our understanding of who engages in change agency in new path development, and when and why they do so. A combination of firm and non-firm actors, using local and non-local resources, can initiate transformation in old industrial regions. Furthermore, it develops our theoretical understanding of reproductive agency, which not only obstructs change or stabilises current trajectories, but can also be used when no agency is perceived or when powerful actors want to preserve local power asymmetries.
- Through putting agency at the local level under scrutiny it identifies several conditions that hinder a locality from developing new industry paths or using change agency. However, structures and conditions related to old industrial regions (like lock-ins, path dependency, and institutions) do not influence agency in the same way in all regions due to their different place-specific contexts.
- Lastly, the dissertation contributes methodologically with new knowledge on how to study agency in depth. Using a critical realist approach and path tracing, it shows how the study of agency needs to be conducted in close connection with place and actors' jurisdictions over long time periods, and that there can be large variations in expressions of agency between seemingly similar and closely located places, between actors in the same place, and across time.

Structure of the dissertation

The dissertation consists of three scientific papers and a *kappa*. The kappa is placed first in the dissertation and introduces the research, summarises the findings, and concludes by answering the specified research questions.

Following this introduction come four chapters that will set the scene for my work. In the chapter "Situating old industrial regions", the development of old industrial regions is introduced and linked to three important concepts: path dependency, lock-ins, and institutions. The third chapter introduces the conceptual framework and the literature to which this dissertation contributes, namely agency. The two following chapters elaborate on the methodology as well as introduce old industrial regions in Sweden.

When studying agency, it's a requirement to collect very rich empirical material to trace past courses of events. This provides unique insights into one or more phenomena. When taking a longitudinal approach, a region or a locality is not just one thing, but includes a diversity of activities, projects, innovations, people, etc. All informants have their own version of the local narrative and their own story. Neither is a region static. What happens today may slightly change tomorrow and the perception of it will be regarded in a different way in a year or a decade. This complexity creates a real challenge of capturing a locality over almost 30 years and its important details within the word limit of a scientific paper. Behind the papers there are additional paths, stories, and details that together form local development. The three case study regions are therefore further elaborated on in Chapter 6, to give credit to the complexity and the informants' stories, and to provide a more comprehensive picture of local agency.

The kappa ends with Chapter 7, which first summarises the three papers and provides a cross-case analysis. It then concludes the dissertation by answering the research questions. The three papers are placed after the kappa.

Research projects

This dissertation is written in connection with two different research projects. Both projects were shaped by the contemporary debate on 'left behind places', 'places that don't matter', and 'lagging regions', and both have addressed it using the concept of agency. The project *Agents of change in old industrial regions* (ACORE) funded this dissertation work to a great extent and was funded by the Volkswagen Foundation from January 2019 – December 2022 (grant number: 94 757) and coordinated by the Leibniz Institute for Regional Geography (IfL) in Leipzig, Germany. The project included researchers from Leibniz Institute for Regional Geography (Germany), Lund University (Sweden), Jan Evangelista Purkyně University in Ústí nad Labem (Czechia), Centre for Economic and Regional Studies, Hungarian Academy of Sciences (Hungary), and Cardiff University (Wales). By using the notion of Europe's growing disparities and economic inequalities, decreasing social cohesion, and decreasing belief in democracy as a point of departure, the ambition of the project was to "…explore how old industrial regions of Europe can create new development paths leading to prosperity, strengthening long-term stability and socio-economic cohesion of the EU" (ACORE, 2019). The project conducted 10 case studies, two in each country. For Sweden, the cases of Kiruna and Borås were explored by me. The project resulted in both a joint publication (Görmar et al., 2022) and individual publications (Stihl, 2022, 2023).

The project *Regional Growth against all odds* (ReGrow) was funded by Länsförsäkringar (grant number: 2017/01/011) from August 2017 to August 2021.

The project focused on three Nordic countries (Finland, Norway, and Sweden), and involved researchers from Lund University, the University of Stavanger, and the University of Tampere. ReGrow also addressed growing disparities, but between cities and more peripheral regions. Departing from the fact that there are differences in economic growth, even when accounting for structural factors (such as size, infrastructure, access to capital, industry base, and human capital), the project wanted to explore which regions grew more or less than expected. These were identified through an initial quantitative analysis (see Grillitsch, Martynovich, et al., 2021). Qualitative studies were then conducted on a selection of the outlying regions, aiming at explaining their exceptionally high or low growth through focusing on actors, networks, and institutions. The project conducted 12 case studies, four in each country. I conducted data collection and analysis in the cases of Olofström and Kiruna in collaboration with Josephine Rekers. The project resulted in both joint publications (Grillitsch, Sotarauta, et al., 2022; Rekers & Stihl, 2021) and an individual publication (Stihl, 2022).

The dissertation uses collected material and papers from the projects. My work has greatly benefited from the projects through discussing and mirroring empirical findings, methodological questions, and understanding of theory. With that said, the dissertation is the result of my own work and efforts.

2. Situating old industrial regions

The features of old industrial regions are an important ingredient in this dissertation, since their characteristics create a particular setting for agency which is more constrained. It should be noted that in the literature, the use of the word 'region' in this context is often not tied to administrative or political boundaries, but rather a vaguer description of geographical industrial concentrations[1] (Hermelin & Rusten, 2016). Old industrial regions can be defined as *geographically concentrated agglomerations* which are *mono-structural* and *overspecialised* in *mature industries* and which are *experiencing decline* and *deindustrialisation* (Coenen et al., 2015; Hassink & Kiese, 2021; Hu & Hassink, 2015). They are often characterised by their narrow paths, homogenous knowledge and limited connections to networks outside the declining industry (Hedfeldt & Lundmark, 2015; Kinossian, 2019). Additionally, they are often poorly equipped with support organisations, such as universities and other intermediaries (Blažek et al., 2020), and suffer from high unemployment (Hu & Hassink, 2015). Together, these characteristics often create negative lock-ins (Grabher, 1993; Trippl & Tödtling, 2008). These lock-ins, as well as a common lack of sufficient capital, advanced technology, and know-how, mean that these regions face greater challenges than others when restructuring (Hu & Hassink, 2015).

With that said, not all regions face the same challenges or severity. The properties of the region's industry(ies) matter, such as firms' ownership, size, type, and number. Large capital intensive firms, committed to high sunk cost (e.g., steel industries and extractive industries), have larger difficulties in changing or exiting a path than more flexible, labour intensive industries (e.g., textile firms) or SMEs (Hu & Hassink, 2015). Additionally, regions specialised in heavy industries, risk evolving exposure to severe difficulties with pollution or environmental waste (Castree et al., 2013; Coenen et al., 2015). However, localities are not old industrial regions from the start, *nor is it a permanent state*. Old industrial regions start as industrial regions with one or more industrial path. A *path* can be explained as a temporal sequence of events which captures the direction of a region or a certain industry within a region (Sotarauta & Grillitsch, 2023), such as the mining path in the case of Kiruna. The choice to use the concept of old industrial regions is linked to the overall temporal interest of this dissertation.

[1] In Paper 3 (Stihl, 2023) these concentrations are referred to as old industrial places.

The industries in a region can be *organised* in different ways. Thus, there are a number of concepts that are related to old industrial regions, but that will be explored in less detail in this dissertation due to its focus on a broader set of local actors. For example, with the changing spatial division of labour starting in the 1960s, *branch plant economies* became more common (Phelps, 2009). This refers to the situation when transnational companies create functional and physical separation between their different units, where branch plants perform intermediate or final assembly of firm products, often far away from headquarters and without any higher status activities (Castree et al., 2013; Kleibert, 2016). Old industrial regions can become branch plants or suffer from high unemployment as production has been moved to a branch plant in a low wage country. Regions can also be organised around one industry or one company in *single-industry regions* or *company towns* (Moonesirust & Brown, 2021; Porteous, 1970). Company towns are particularly relevant in the case of Sweden and will be further described in a later chapter. They can have very long roots, and it is not uncommon that company towns have transitioned into branch plant economies as ownership structures have changed. An old industrial region does not have to be organised in larger companies but can also be formed as a *Marshallian industrial district* with a group of small-sized firms specialised in different stages of production (Amin, 2000).

The development of old industrial regions

In the beginning, an industrial region consists of a group of firms in the same or highly complementary industries (Castree et al., 2013) and includes both core firms and suppliers. It can be formed as a Marshallian industrial district (Amin, 2000) or dominated by a single or a few larger firms (Hedfeldt & Lundmark, 2015). Industrial regions can be characterised by having an industrial atmosphere, highly specialised infrastructure, close interfirm relations, and strong support from local and regional institutions (Hassink, 2010). They often rely on informally constituted learning, such as learning-by-doing (Amin, 2000). The initial strengths of the region are based on firms' geographic closeness and strong intraregional networks, which, especially for smaller firms, can be advantageous, due to low transport costs and access to specialised labour and knowledge. Additional advantages are an enabling division of labour, specialisation that can stimulate spin-offs and entrepreneurship, and the (often) strong ties between society and industry (Amin, 2000). However, the initial strengths of the industry path can become obstacles if the industrial region becomes too inward looking. When an industry matures, it risks falling in the trap of rigid specialisation when firms no longer look for new opportunities or stop innovating (Hassink, 2010). As the strength of strong ties flips over to become a weakness, industrial regions become negatively locked-in, and as the development progresses, they become industrial regions of the past, i.e., *old industrial regions*. If the negative development

further continues, old industrial regions risk becoming *former* old industrial regions, a broad category of regions that suffer from long-term decline, deindustrialisation, and below average income and innovation indicators (Hassink & Kiese, 2021). This latter development has recently gained the attention of both researchers and media, as persistent poverty and limited prospects have spurred the rise of populist parties in both North America and Europe (Barca, 2019; Hassink & Kiese, 2021).

Looking back at the last 30–40 years, income inequalities worldwide have been decreasing at the national level with the rise of a growing middle class in non-western countries. However, during the same time period, interpersonal income inequalities have stopped decreasing within all western countries (Barca, 2019). There, regional inequalities are growing with regional 'winners' that can be explained by location, social origin, and positive externalities from agglomerations, and 'losers' that bear negative externalities (Barca, 2019). According to Iammarino et al. (2017), the growing interregional inequality which Europe is experiencing can be explained through two drivers: (i) a long development cycle in the economic structure and (ii) a long cycle of regional evolutionary features. The first of these points at a wave of technological innovations starting in the 1970s that have stimulated a concentration of high-technology and knowledge intensive sectors in metropolitan areas, to which highly skilled labour and creative jobs have been attracted. In parallel, the increasing automation of manufacturing industries has replaced routine low- and medium-skilled jobs. Furthermore, outsourcing to low-wage countries has further decreased the number of jobs in industrial regions. The second driver refers to the long cycle of regional evolutionary features, meaning a region's place-specific endowments such as its inhabitants, their skills, firms and industries, institutions, ability to innovate, and adaption to change (Iammarino et al., 2017). This has been locally shaped by previous industrial paths for decades or even centuries.

When a region does not have the ability to develop a new path, one suggested alternative is to import an innovation or industry originating from elsewhere. However, for a new industry to be able to be imported to a region, existing local endowments must be receptive and have the absorptive capacity to integrate it locally (Hedfeldt & Lundmark, 2015). In the past, there have been opportunities for declining regions to catch up through processes of interregional convergence and diffusion. However, since the 1970s, and especially since the turn of the century, there has been a growing divergence as the current long wave of development favours urban core regions and concentrations of the 'best' and most innovative (Iammarino et al., 2017). To this, Barca (2019) adds a policy perspective, by explaining growing interregional inequalities with both cooperation-led agglomerations, that do not see to the greater good of regions, and a series of policy failures. The latter refers to space-blind and top-down institutional reforms, i.e., top-down policy that has not recognised structural differences between regions. Additionally, governments have tried to compensate for regional inequalities through various compensations to mainly peripheral, de-

industrialising, or rural areas. However, this has weakened local motivation for mobilisation and change, rather than building local capacities (Barca, 2019).

Coming back to the concept of old industrial regions, from an evolutionary perspective, becoming an old industrial region is not the 'end station'. Regions continue to (positively or negatively) change, and there are multiple possible pathways and spatial arrangements for economic development (Barca et al., 2012; Blažek & Květoň, 2022). Regions face multiple challenges and as regions are different, their characteristics and challenges will also vary with time and space, and need place-, industry-, and time-specific policy initiatives. Increasingly, challenges also come from the outside, as regions are all part of a wider industrial transition that reaches beyond the region (Coenen et al., 2015). This puts higher demands on local actors to navigate a more complex future where many decisions affecting the local are taken far away. However, this also delimits opportunities for local actors and place-based policy to influence future developments to a certain degree. Evolutionary theories in economic geography argue for more place-based approaches (Hassink & Kiese, 2021) which focus on geographical context (social, cultural, and institutional characteristics) and the importance of the right knowledge in policy intervention (Barca et al., 2012). Place-based approaches aim to give local inhabitants the power and knowledge to change. This points at the importance of what local key actors do (Barca, 2019) but also that some actors need to change their ideas of the future, since "local elites are [both] part of the problem and part of the solution" (Barca, 2019, p. 88).

Explaining regional development

Within economic geography, a core theme involves explaining the causes and consequences of this uneven development, within and between regions (Hu & Hassink, 2015). *Evolutionary economic geography* (EEG) helps us conceptually to understand the development of regions and regional transitions. Developed as a critique to streams of literature within economic geography (such as the cultural turn, institutional turn, and new economic geography) that do not shed enough light on historical aspects, Boschma and Martin (2010) argue that explanations for uneven development and the transformation of the economic landscape can be found in historical processes. By adding an evolutionary dimension, EEG demonstrates how geography matters for determining the nature of an economic system's development (Boschma & Martin, 2010), and that this development is both path dependent and place dependent. EEG contributes to economic geography by giving new insights, and partly also alternative explanations, to questions such as why industries concentrate in space, how networks evolve in spaces and why some regions grow more than others (Boschma & Frenken, 2018). EEG draws on Generalized Darwinism, Complexity theory, and Path Dependency theory for inspiration

(Boschma & Martin, 2010). Each of the three approaches emphasise different segments in the evolutionary process: complexity theory targets the creation of variety, path dependency emphasises the retention of existing information and knowledge, and generalized Darwinism studies how key actors and institutions evolve through interaction with themselves and the natural and social environment that they help shape (Essletzbichler & Rigby, 2010).

EEG has been criticised for neglecting the role of agency (Blažek & Květoň, 2022; Hassink et al., 2019) in path development. Nevertheless, there is room for actors to influence development within EEG. Boschma and Martin (2010) write that "Putting emphasis on selection forces and constraints does not necessarily mean that human agency does not play a role in evolutionary economic geography […] On the contrary, the role of entrepreneurs is crucial" (Boschma & Martin, 2010, p. 12). Entrepreneurs are considered the ones who initiate change and transform the economic landscape. They can be seen as boundary spanners, rather than tied to a single path (Martin & Sunley, 2006). Complexity thinking helps us understand how actors interact in systems that are adaptive to change and difficult to predict. This means that actors act on incomplete information, are subject to errors and biases, and learn and adapt with time (Martin & Sunley, 2010a).

For old industrial regions, there are two central concepts within EEG that are often considered to explain the internal barriers to industrial restructuring: *path dependency* and *negative lock-ins.* Coming from another strand of economic geography, the role of *institutions* is also often considered related to economic development and regional inequalities. The following sections elaborate on these three concepts (path dependency, negative lock-ins, and institutions) and on how they help the understanding of regional development. Although this theoretical background gives important insights, the three concepts in many ways underestimate the role of agency. The importance of incorporating an agency perspective will be addressed in the conceptual framework in the following chapter.

Path dependency

Path dependency theory concerns how past trajectories influence future possibilities. Decisions made in previous and current paths create local endowments such as technologies (embodied in machinery and product design), firm endowments (patents or specific competences), or labour skills (Walker, 2000). The most famous example of path dependency is probably that of the QWERTY keyboard that has continued to dominate the global market through habitual reinforcement even though more efficient keyboards have been developed (David, 1986). However, path dependency does not only reinforce current directions. Local endowments also form springboards for future developments. This does not mean that regions are bound to certain developments and that they must build on local endowments, skills, and competences. Path dependency rather means that some

directions will be easier to take than others. There are multiple possible paths available for actors, but some can be forgotten or hidden through disuse (Martin & Sunley, 2006), while others are easier to pursue. It is not deterministic, but probabilistic, and a contingent process. In practice this means that it is easier for a firm to pursue a new product when they make use of existing endowments, knowledge, and skills, rather than branching out into a completely new arena. Martin and Sunley (2006), however, find that economic geography has approached path dependency rather uncritically, and that there are several unresolved questions, e.g., what is path dependent? Is it firms, regions, or industries? Are there different types, degrees, or causes to it? How is human agency related to path dependency?

A central defining characteristics of path dependent processes is non-ergodicity, which highlights its inability to shake free of history, and that processes evolves as a consequence of their own history (Martin & Sunley, 2006). Martin and Sunley (2006) argue that we need to approach a path as a *process*, where economic evolution continuously includes an interplay between path dependence, path creation, and path destruction. Path creation and path destruction are always latent and co-exist in the process of path dependency (Martin & Sunley, 2006). A more diverse region is more likely to contain multiple processes of path dependency. They can be unrelated, but more likely they share some degree of related path dependency. Path interdependence occurs when different path dependency trajectories in a region reinforce each other to some extent (Martin & Sunley, 2006). Martin and Sunley (2006) identify multiple reasons for why regional path dependency occurs:

- a high dependence on raw materials and the technical possibilities that this brings to related and derived industries. This aligns with the literature on the resource curse (Auty, 1993; Venables, 2016),
- the durability of local equipment and infrastructures with high sunk costs (especially relevant for heavy industries). This has also been identified by Clark and Wrigley (1995),
- that local districts and clusters of industrial specialisations create a high degree of local economic interrelatedness (i.e., skilled labour, dedicated suppliers, and intermediaries),
- the development of a rigid specialised regional technological regime (regional technological lock-in),
- self-reinforcing development based on various agglomeration externalities,
- region-specific institutions, social forms, and cultural traditions that embed economic activity in local paths,
- that paths are shaped by and relying on paths in other regions through interindustry and intraindustry linkages and dependencies.

These sources all have geographical components. As industrial paths develop over decades, or even centuries, they, and the endowments they create, shape the localities.

This process not only shapes material endowments (technology and infrastructure), but also the people who live and work there. Development paths are consequently not only path dependent, but also place dependent. Place dependency is an important dimension of path dependency and can help explain why some causal factors are activated in the creation of new paths in some places, while not in others (Martin & Sunley, 2006). Hence, industry paths will vary regionally, as well as nationally, due to local history, politics, and institutions.

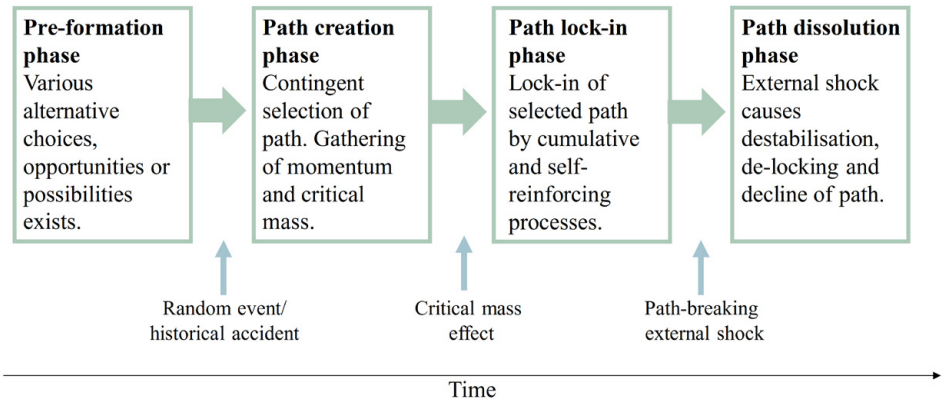

Figure 2: Phases of economic evolution of an industry.
Based on Martin & Sunley, 2010b, p. 66

Path dependency can be used to explain the development of an industry in a particular region or across multiple regions (Martin & Sunley, 2010b). Figure 2 shows different phases of development of an industry path according to Martin and Sunley (2010b). It starts in a phase where there are multiple possibilities open and firms or other actors in a region test and seek new opportunities. At one point in time, often described as serendipitous (Martin & Sunley, 2010b), more activity and more actors select one path to follow such as a particular industry, technology, or type of product. The creation of a new path needs a certain number of firms or activity for it to be considered a regional industry path. When there are enough firms or investments targeting the same path, that path gets locked-in. In this line of thought, lock-in means chosen; it is the path that is chosen, and which is then developed in a seemingly self-reinforcing process. This phase can include the different strengths that were described as existing in industrial regions. This model ends with an external chock that breaks the path and starts a period of decline. However, as already suggested, a path is a process and there is often an interplay between path destruction and path creation. Additionally, there can be multiple paths operating in a location at the same time, more or less related to each other, which means that the dissolution of one path can be more or less problematic for a

region. External shocks, which could drive path dissolution, could also stimulate regions to break free from current lock-ins and move into more competitive paths. Empirically, this is, however, less common (Martin & Sunley, 2006).

The phases of economic evolution as explained by Martin and Sunley (2010b) (shown in Figure 2) do not address agency. However, as they argue already in their seminal paper from 2006 (Martin & Sunley, 2006), agency needs to be incorporated when discussing path dependency. It is a problem that the model sees paths as originating from serendipity (Martin & Sunley, 2022). Actors' micro-level actions are embedded in the phases and can be both deliberate and somewhat more accidental (Martin & Sunley, 2010b). Although the phases are constrained by path dependency, the development is also shaped by human actions. The different phases are shaped by human actions and their intended and unintended effects, as actors push for certain developments to fit their agenda. The event that pushes the process into the next phase is the result of agency through, e.g., the work of local innovative entrepreneurs, local strong actors pushing for their agendas, or the result of global structural change processes. Finally, the path-breaking external shock is most often also the result of a human action, even though the action might be triggered elsewhere and therefore harder to account for locally. EEG has been criticised for over-emphasising structural factors. Putting too strong an emphasis on structural factors risks blocking actors' views on potential futures. The future is adaptable and shaped by actors' actions (Garud et al., 2010) as will be shown in the analysis of the three cases.

Negative lock-ins

As suggested in the previous sections, it can be beneficial for industries to be located in a cluster or an agglomeration. Hence, the path lock-in phase can be seen as a *positive lock-in*. Several of the regions that we later have called old industrial regions have earlier strongly benefited from their geographical location and embeddedness in networks. Firms' tight networks and strong collaborations have been an important part of the regions' success. Yet, strong clustering can have negative effects on innovativeness and renewal and develop into *negative lock-ins* which can create barriers to innovation. The negative lock-ins can create blinders, making it difficult to perceive or pursue alternative futures. As industries mature this can lead to path dissolution phases. Mono-structural regional economies, with a high degree of specialisation, are most likely to become negatively locked-in, especially capital-intensive industries such as steel, coal mining, and shipbuilding with large sunk costs that make it more difficult to change (Hu & Hassink, 2015). Labour intensive industries, such as textiles, are less likely to become locked-in as they are also less prone to spatially concentrate (Grabher, 1993; Hassink, 2010) and often more flexible as they have less sunk costs (Hu & Hassink, 2015). However, as the case of Borås shows, places can become locked-in even though they are dominated by a

more flexible industry. Additionally, technologically leading regions, such as the case of Massachusetts' Route 128, can get trapped in the rigidities of the local industrial system (Saxenian, 1996). Together, this means that regions in very different industries can become negatively locked-in, although in the past, some industries have proven to be more prone to do so.

The concept of negative lock-ins has conceptually been unpacked by Grabher (1993). Starting with the declining Ruhr area of the 1970s, Grabher (1993) argued that there was more to the story than only a dramatic decrease in demand in a few industries. Otherwise, why did the industries not adapt to the change in demand? Why was the decline happening in various industries, and even in highly technological industries? Grabher argued that the answer lies in interfirm linkages and in the close intraregional interdependence on coal, iron, and steel. Grabher (1993) identified three types of negative lock-ins: *functional, cognitive,* and *political*, which in separate ways explain why regions can become trapped. The severity of the three different forms of lock-in can vary between regions, but together they can enforce each other. Furthermore, Hassink (2010) has developed the concept of *regional lock-in*, to bind the three together into one concept, a set of interrelated lock-ins.

Functional lock-in refers to a hierarchical lock-in where suppliers become dependent on the development conducted in the core firm. Through developing close together, firms and their suppliers can create stable relationships and when adapting to each other, transaction costs are decreased. This can be particularity important for smaller suppliers. However, this can create severe shortcomings in boundary-spanning activities. In Ruhr, suppliers decreased or ceased their own long-term R&D, and thereby decreased their own possibilities of developing new products, markets, or customers. They did so due to the large investments in R&D done by the core firms and the strong connections between middle management in the different firms (Grabher, 1993). In practice this meant that suppliers became so dependent on the core firms (and their innovative activities) that they gave up their own capacity to pursue new products, markets, or customers. When the core firms went through downsizing or closure, suppliers consequently struggled with finding new opportunities. Firms of various sizes and technological advancements can fall into this trap (Grabher, 1993). *Cognitive lock-in* refers to group-thinking locked to the current path which is reinforced by well-established relations and personal ties, making much needed restructurings and adaptions impossible. In Ruhr, the unchallenged group thinking prevented the industries from understanding that they were at the beginning of a long-term decline and prevented them from much needed reorganisations in the regional economy when there was still time. Instead, firms increased the speed on the current, doomed path (Grabher, 1993). In practice, this meant that the group of regional actors were unable to perceive other futures, and without that understanding it also became impossible to pursue new opportunities. Finally, *political lock-in* refers to when policy makers try to preserve the existing traditional industrial structure through different stimulus efforts. The support can be

expressed through infrastructure investments, subsidiaries, and technological programs. The stimulus can slow down restructuring (Grabher, 1993; Hassink, 2010). A high level of skew with respect to power is a key reason behind lock-ins, especially political lock-ins, as development is often defined by local elites (Nilsen et al., 2022). Together, the different lock-ins highlight that there is a weakness in having 'too strong ties' (Martin & Sunley, 2006).

The role of institutions

The two latter lock-ins, cognitive and political, point to processes that incrementally erode regional industrial renewal (Hu & Hassink, 2015). This highlights the role of local institutions. Benner (2022) argues that industrial evolution is not an isolated phenomenon but coevolves with institutional change. But what does 'institutions' mean in this context, and how do they influence regional development? The most common definition of institutions within economic geography (Rodríguez-Pose, 2013) may be the one by North (1990, p. 3), who defines institutions as "the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction". However, this definition is not generally accepted as it has been interpreted as pointing to institutions being equal to formal institutions (Gertler, 2010; Rodríguez-Pose, 2013), meaning laws, charters, bylaws, regulations, etc.

Economic geography's interest in institutions grew with the 'institutional turn' during the 1990s (MacKinnon, 2020). Since then, economic geography has embraced the idea that institutions shape, constrain and enable economic behaviour as well as that this relationship varies between contexts (Gertler, 2018). However, besides formal institutions, institutions are most often also understood to include informal institutions (meaning norms, traditions, and social conventions) (Gertler, 2010; MacKinnon, 2020; Rodríguez-Pose, 2013). A more dominant view of what institutions are is therefore closer to that of Hodgson (2007, p. 331) who writes that "Institutions are enduring systems of socially ingrained rules" (Rodríguez-Pose, 2013). This dissertation aligns with this definition and institutions are here regarded as one type of structure that formally and informally influences agency. The interplay between structure and agency is elaborated on in the conceptual chapter.

Although there are few disputes today about whether institutions matter for economic development, there is less consensus regarding which institutions are important for economic development (Rodríguez-Pose, 2013, 2020). Institutions are, e.g., considered important for a location's learning capacity, when there is a need to restructure (Morgan, 1997). Furthermore, one possible explanation for regional inequalities has been found in the density or thickness of informal institutions. With a greater density of combinations of *intellectual capital* (such as knowledge and resources), *social capital* (such as trust, mutuality, cooperative spirit), and *political capital* (such as capacity for collective action), a locality is considered to create greater potential for economic development (Rodríguez-Pose,

2013). Old industrial regions are often considered to have thinner institutions, which could explain their challenges. However, there are exceptions to this explanation. Coming back to the case of the Ruhr again, this was a region that was considered institutionally thick (MacKinnon, 2020) and yet they underwent a severe crisis. Although this dissertation focuses on local actors, their manoeuvrability and expressions of agency are not only tied to local institutions. A multi-scalar institutional context should be taken into consideration in the analysis (Benner, 2022; Hu & Hassink, 2015; Marques & Morgan, 2021).

When considering institutions, it is considered important to distinguish between *institutional environments* and *institutional arrangements* (MacKinnon, 2020; Rodríguez-Pose, 2013). Institutional environments refer to informal conventions and formal rules that enable and control the behaviour of actors on a higher level, such as identity and culture. Institutional arrangements instead refer to the place-specific or organisation-specific institutions that shape agency, and which can make units like markets, firms, local governments, and trade unions more or less efficient (MacKinnon, 2020; Rodríguez-Pose, 2013). Economic geographers are generally particularly interested in the latter and how local and regional economies are shaped by specific institutional arrangements (MacKinnon, 2020). As this dissertation studies agency, the institutional environment is also important for understanding the room for agency. The successful adaptation and renewal of a local industry or technology is associated with an enabling institutional environment. A constraining institutional environment is instead associated with stasis or lock-ins due to the absence of co-evolution of the local institutional environment (Martin, 2010).

The third paper (Stihl, 2023), looks closer at the institutional environments in Borås and Kiruna by focusing on one type of informal institution, namely local culture. Culture is a highly complex concept with many conflicting definitions (Bole, 2021; Castree et al., 2013) yet was chosen since the institutional environment was found to be an important factor in the first paper (Rekers & Stihl, 2021). Building on the work of Hofstede (2001), the dissertation defines local culture as a "a collective programming of the mind that distinguishes the members of one group or category of people from another" (Hofstede, 2001, p. 9) where the mind refers to a person's thinking, feeling, and acting. As opposed to values (where the unit of analysis is the individual), a culture assumes collectivity and is hence studied on a societal level (Hofstede, 2001). Culture can be studied through how it is manifested in values, symbols, heroes, and rituals (Hofstede, 2001). Paper 3 (Stihl, 2023) contrasts two different types of local culture, namely entrepreneurship culture (Andersson & Koster, 2011; Beugelsdijk, 2007; Stuetzer et al., 2018) and company town culture (Borges & Torres, 2012; Moonesirust & Brown, 2021; Porteous, 1970), and how they affect agency.

Institutional change

As indicated before, there exist several definitions of institutions. Despite this, a fundamental component of institutions is that they are relatively enduring (Mahoney & Thelen, 2009). The differences in definitions, even when they are only very subtle, have implications for the understanding of how institutions change (Mahoney & Thelen, 2009). Mahoney and Thelen (2009) find that there is often a great deal of ambiguity in institutions, even when formalised. Due to this, actors can interpret and push in slightly different directions while still within the same institution. Yet, although there is an inertia in institutions, they change over time. They can change incrementally in the gap between the institution and the interpretation, or between the institution and the enforcement of the institution (Mahoney & Thelen, 2009). The literature on institutional change often indicates that exogenous shocks (such as a structural crisis) bring radical institutional reconfigurations (Battilana et al., 2009; Mahoney & Thelen, 2009). However, incremental changes can be equally important for changing actors' behaviour (Mahoney & Thelen, 2009) and can add up to large transformations (Benner, 2022). Institutional change can be driven by local actors both bottom-up and/or with mutual consent, or pushed top-down by powerful actors at higher political or administrative levels with the authority do so (Evenhuis, 2017).

Gradual transformations can be termed *institutional work*. Institutional work is often defined (cf. Binz et al., 2016; Fuenfschilling & Truffer, 2016; Henderson, 2020) as "the purposive action of individuals and organizations aimed at creating, maintaining and disrupting institutions" (Lawrence & Suddaby, 2006, p. 215). This means that institutional work includes both everyday work in maintaining and stabilising current institutions, and actions that create more profound change (Benner, 2022). According to Gertler (2010), there must be more room for expressions of agency when we consider institutions. Bækkelund (2021) suggests that institutional work can be connected to reproductive agency, meaning agency that reproduces current institutional arrangements. Institutional change that aims to diverge more from current institutions can instead be explained using institutional entrepreneurship (Battilana et al., 2009). These types of changes are driven by institutional entrepreneurs who initiate divergent changes and then actively participate in the implementation of them (Battilana et al., 2009). Institutional entrepreneurship is thus connected to change agency (Grillitsch & Sotarauta, 2020). It should be noted that more agentic influence on institutions will not necessarily shape 'better' institutions (Marques & Morgan, 2021) and institutions can become burdens for a locality (Bathelt & Glückler, 2014). Reproductive agency and change agency will be further described in the conceptual framework.

Transforming from being old industrial regions

In the 1980s there was almost a consensus that new industries do not grow in old industrial regions (Boschma & Martin, 2010), but rather that they would develop elsewhere. However, EEG emphasises that the future of new industries is not as predictable, and with an evolutionary perspective, there should be a possible 'way out' from being an old industrial region. Hassink and Kiese (2021) discuss how old industrial regions can transition into *former* old industrial regions, meaning regions that have endured a continued long-term decline, deindustrialisation, and low-income levels. However, just as regions can transition into more decline, they should (as the three cases studies show) be able to overcome some of their challenges and no longer experience decline, be negatively locked-in, or be overspecialised in a mature industry. After such a transition, places no longer display the characteristics of an old industrial region. Additionally, although the legacy or history of a past path might still be important locally, the name 'old' industrial region has a negative connotation. This might be disregarded as just a semantic negative tone. However, seeing that words such as expectations (Steen, 2016), projections (Emirbayer & Mische, 1998), and perceived opportunities (Kurikka et al., 2022) are considered important for agency and path development, the semantics concerning what we call different places matter. Semantics are also important for how residents in current old industrial regions are portrayed. There is a risk that inhabitants are blamed for regions being stagnant, traditional, or backwards (Eriksson, 2008; Massey, 1983), while disregarding that regional development is in many ways the result of pre-conditions created in earlier paths (Massey, 1983).

Nonetheless, what does an old industrial region, in a positive development, transition into and how? Do they all become industrial regions once more, or do they transition into different things depending on their new development? I would argue for the latter as there are various pathways for old industrial regions to renew themselves. The literature indicates various ways to break with current declining paths. The focus within EEG has been on diversification processes and the significance of recognising path dependence (Coenen et al., 2015). Coenen et al. (2015) argue that old industrial regions need disruptive path breaking. The literature on *new path development*, or *regional industrial path development*, theorises about how to break with old trajectories and indicate possible new directions for regions.

New path development

The literature on new path development tends to focus on 'positive' development, i.e., development leading to something new or something renewed or revitalised, which is beneficial in terms of jobs, profit, etc. This should be distinguished from literature discussing the *continuation of existing paths* (Martin et al., 2019) and the development of *negative pathways*, such as path contraction, path downgrading, and

path delocalization (Blažek et al., 2020). A path "refers to a temporal sequence of events, [and] it is the course or direction in which, for example, a region or an industry in a region is moving" (Sotarauta & Grillitsch, 2023, p. 87). Following Binz et al. (2016) (cf. Hassink et al., 2019; Steen & Hansen, 2018) a *new* industrial path development can be defined as "a set of functionally related firms and supportive actors and institutions that are established and legitimized beyond emergence, and are facing early stages of growth and developing new processes and products" (Steen & Hansen, 2018, p. 191). The literature on new path development includes various typologies with similar, and sometimes overlapping, content (see, e.g., Boschma & Frenken, 2011; Hassink et al., 2019; Martin et al., 2019; Martin & Sunley, 2006). No typology is commonly accepted by all.

New path development is used in this dissertation as a cartographer uses a reference system, i.e., a set of known points that the case studies' developments can be described by. The typology by Grillitsch and Asheim (2018) is used, as it comprehensive as well as fine-grained. They identify three broad categories of new path development; *path upgrading, path diversification,* and *path emergence* (summarised in Table 1) based on Grillitsch et al. (2018) and Isaksen et al. (2016).

Table 1: Types of new path development

Types	Mechanisms
Upgrading	
I – Climbing GPN	Major change of a regional industrial path related to improved position in global production networks: moving up the value chain through upgrading of skills or production capabilities.
II – Renewal	Major change of an industrial path into a new direction based on new technologies or organisational innovations, or new business models.
III – Niche	Development into a niche through the integration of symbolic knowledge.
Diversification	
I – Related	Diversification into a new industry for the region, building on competencies and knowledge of existing industries.
II – Unrelated	Diversification into a new industry path, building on a combination of existing knowledge or resources combined with new unrelated and capabilities to the region/industry.
Emergence	
I – Importation	Establishment of an existing industry that is new and unrelated to the region.
II – New Creation	Emergence of a new industry based on radically new technologies, new business models, or innovations.

Source: Based on Grillitsch and Asheim (2018)

Upgrading of existing industries is one possible way for a region to enhance competitiveness or increase economic growth, and it can take different forms. Through increasing value-added activities by upgrading skills or production capabilities, an industry can *climb the hierarchy in global production networks* (GPN). Through introducing new technologies, change in business models, or organisational innovations that bring major changes to existing industries, an industry can *renew* itself. Finally, through the generation of value by design or branding of traditionally existing products, development can be generated through moving into higher value-added *niches* based on symbolic knowledge. This way, it becomes possible for high-income regions to compete in low-tech industries (Grillitsch & Asheim, 2018).

Diversification instead refers to processes on a firm level where firms' assets (knowledge or resources) from one industry are used in new industries. Diversification may theoretically appear as a related or unrelated variety. *Related variety* refers to when entrepreneurs re-use capabilities in new industries, such as when a mechanical company uses their competences in making hydraulic machinery in underground mines for branching into launching equipment for a space base. The capabilities can be technology, product, or skill related (Boschma, 2017). *Unrelated variety* instead refers to when entrepreneurs from existing industries combine their knowledge with dissimilar knowledge from other industries or research, and together create novelty (Grillitsch & Asheim, 2018). It is more challenging to develop into something where the region can build less on their existing capabilities. Furthermore, unrelated diversification often requires higher cost and risks. Related diversification therefore predominates (Boschma, 2017). Unrelated variety is less likely to occur, but when it does, it has a more transformative power (Grillitsch & Sotarauta, 2020) and has therefore been more associated with jumps in industrial evolutions or radical shifts in underlying local capabilities (Boschma, 2017).

Finally, *emergence* is the most radical form of new path development as it describes the introduction of a completely new path for a region. Path emergence can occur when an industry that exists elsewhere is *imported* to the region. For this to function, it is often dependent on the inflow of actors and/or resources from outside the region. Additionally, through "…new technologies, scientific breakthrough or radical innovations based on new business models, user-driven or social innovations" (Grillitsch & Asheim, 2018, p. 1642), brand new paths can also be *created* within the region (Grillitsch & Asheim, 2018). The two types of path emergence require different capabilities. Path creation requires both a diverse industrial base and a diverse system (i.e., high skill-level, high innovativeness, strong support system, strong networks, and specialisation in several industries). Old industrial regions are often characterised by low capabilities, low variety of actors, and peripheral position in GPNs. When local capabilities may already be spread thin, an industrial diversification can spread out resources even further, and weaken the region instead of expanding capabilities. In a region in this situation, path importation can be a more

promising alternative. However, it often requires that extra-regional knowledge and resources are brought to the region, through direct investments and inflow of people (Grillitsch & Asheim, 2018) as local competences and skills might not correspond to new development. In-migrants can lead to increasing regional capabilities (Hedfeldt & Lundmark, 2015); however, depending on the embeddedness of the new actors and their intentions, it can reconfigure power balances and room for local agency. Actors, especially non-local, can have place-less power (Hambleton, 2019). This means that they can show less care for the local consequences of their actions and steer the development in the 'wrong' direction according to locals (Hambleton, 2019). Place-less leaders shall here be seen as the opposite of place-based leaders who instead have the place in focus and initiate actions for the greater good of the place.

Critical reflections

However, within this typology (Grillitsch & Asheim, 2018), there are also ambiguities, e.g., where do you draw the line between renewal and related diversification? In this example the difference lies in the word 'diversification' which indicates a move of firms into a new industry or sector, and not just an upgraded version of itself. Nevertheless, the differences can sometimes be small.

Additional uncertainties, which relate to all typologies of new path development, lie in the words *path* and *new*. What actually is a path, and when is it new, and not just an incremental continuation? Considering the many papers on new path development: there are few that give clear answers to these two questions. What actually makes up a path has remained rather fuzzy (Martin & Sunley, 2022). From previous work we know that a path captures a temporal sequence of events (Sotarauta & Grillitsch, 2023) and brings together functionally related firms and supportive actors at the growth phase of new products and processes (Steen & Hansen, 2018). Yet, it does not give a quantitative estimate of the required number of actors or to which financial extent the phase must have grown to be termed a path. This does not need to be regarded as a serious issue. Despite its loose definition it has proven to be an "intuitive metaphor for studying the trajectories of local economic systems" (Martin & Sunley, 2022, p. 72). A qualitative judgment can be made to estimate if a large enough share of firms in a study area operates within the same niche and make up a substantial enough part of the local economy. When conducting qualitative data collection, local informants often agree on what is brewing and what already is an established path. Expectations are important in path creation as they draw attention to and foster investments as well as guide activities (Steen, 2016). Local actors and their understandings and expectation are therefore useful value gauges.

It is possible for a location to both have multiple paths through different industries, as well as multiple paths within the same industry, e.g., the tourism industry, which could have one path targeting exclusive winter tourism and another targeting more

low-key summer hiking in the mountains. However, a path does not have to consist of a large number of actors. If a locality is small and completely dominated by one single core company, then that industry alone can make up a path. On the other hand, if the place is large, it can have multiple paths operating at the same time, in different industries and in different stages of development. With multiple paths operating in parallel it becomes more difficult to establish cut-off points between them. Hence, most research on new path development studies single paths (Frangenheim et al., 2020). This leaves a research gap concerning potential relationships between paths, particularly emerging ones. Frangenheim et al. (2020) suggest that agency can create and shape linkages between paths in a number of ways and that the linkages between paths can be competitive (over, e.g., scarce assets and markets), supportive (e.g., building path interdependence), or neutral. Paper 2 (Stihl, 2022) builds on this work and traces how a tourism path has developed in the shadow of a mining path.

To be considered a *new* path, it must involve a substantial difference from before. Furthermore, in the case of *new*, the difference of what should be considered new and what should be considered an incremental continuation of existing paths is captured on a sliding scale, with few clear cut-off points. To navigate this ambiguity, there are justifications to the labelling of the different paths in the empirical chapter on the three different cases. An additional problem with new path development is the combination with the analytical approach path tracing. When deconstructing different courses of events, there are usually always some traces back in time, path dependently connecting current events with previous events, resources, people, etc. This makes path emergence, or path creation, more difficult to identify as this points to something more completely new.

New futures for old industrial regions

Although the literature shows a variety of ways of transforming and restructuring, there are concerns regarding whether old industrial regions have the ability to do so (Hassink & Kiese, 2021; Henderson, 2015). Old industrial regions can appear paralysed and unable to envision alternative futures. The outcome in many ways depends on the willingness of local actors to change (Henderson, 2015). Yet, the legacies left by previous or declining paths, can create various challenges that are land-based (e.g., instability or contamination), found in its built form (i.e., inappropriate and aging infrastructure), cultural (e.g., local skill base, role of unions, and dominance of large scale employers), or form a place loyalty which discourages outmigration (Henderson, 2015) or change. Although unrelated diversification and path creation might not be expected in old industrial regions, it is possible. Paper 2 (Stihl, 2022), describes an example of unrelated diversification in Kiruna. Additionally, the literature on 'Phoenix industries' (Amison & Bailey, 2014; Christopherson, 2009) exemplifies cases of new paths based on previous ones. Phoenix industries refer to how clusters of small and medium sized firms can grow

in old industrial regions through using their 'initial advantages' (such as pre-existing personal networks, technical skills, and market knowledge). Although they do not replace the large number of manufacturing jobs that were previously found in the regions, they can compete with the manufacturing of sophisticated components sold to a variety of customers. An explanation for Phoenix industries success and continued ability to innovate can be found in their links to nearby universities and colleges, which are less prone to relocate, compared to firms, following a crisis (Christopherson, 2009). However, not all old industrial regions are able to renew themselves like phoenixes from the ashes. Instead, path creation benefiting from neighbouring or technically related sectors can be more likely (Hu & Hassink, 2015).

To escape a negative trap and break with lock-ins, Barca (2019) argues for a finetuned external shock that rattles the system and which can entrust policy ownership to local authorities while at the same time prevent them from pursuing status quo. However, this assumes that there are leaders that want to change, that local actors have the ability to choose a 'suitable' path rather than pursuing further negative specialisation, and that there exist 'good' institutions (Hassink & Kiese, 2021). This takes us to the study of agency. We need more information on the role of agency in path creation, (MacKinnon et al., 2019), and especially to understand why particular paths emerge instead of others and how actors respond to change (Steen, 2016).

Before elaborating on agency, Table 2 summarises the different conditions, which have been raised in this chapter, that can influence opportunities for transformation in old industrial regions. Despite the definition of old industrial regions often being the same across the board, the summary clearly shows how different pre-requisites for regions can be.

Table 2: Conditions influencing change in old industrial regions

Conditions	Explanations
Previous and current paths	• *Type of industry*: An industry with high *sunk costs* is less flexible to relocate (Clark & Wrigley, 1995) or change path. Large capital intensive industries tend to have higher sunk costs. Labour intensive industries (like textile industry) or SMEs tend to be more flexible (Hu & Hassink, 2015). Industries with high dependence on raw materials can have negative effects on existing and emerging tradable sectors (Manzano & Gutiérrez, 2019; Venables, 2016). • *Ownership* and *size* influence a localities ability to develop (Hu & Hassink, 2015). Foreign ownership often reduce opportunities for local agency (Kleibert, 2016) and can make space more 'slippery' (Markusen, 1996). Large, dominant firms can create local power asymmetries (Henderson et al., 2002; Moonesirust & Brown, 2021). • *Endowments:* Local infrastructure, technologies, skills and competences can both create opportunities for and hinder new developments (Henderson, 2015; Walker, 2000).
Negative lock-ins	Negative lock-ins reinforces current paths and hinders novelty, renewal and change (Grabher, 1993; Hassink, 2010). Mono-structural regional economies with high degree of specialisation and capital intensive industries are more prone to become negatively locked-in. • With *cognitive* lock-ins, development paths are preserved through strong group-thinking that is reinforced through entrenched relations and personal ties (Grabher, 1993). • With *functional* lock-ins, development paths are preserved through dependence on core firm's R&D and suppliers' lack of own developments (Grabher, 1993). • *With political* lock-ins, development paths are preserved through policy makers' stimulus, such as investments and subsidiaries (Grabher, 1993; Nilsen et al., 2022).
Local institutions	• *Institutional environments* refers to the overarching framework of informal and formal institutions that conditions particular institutional arrangements and that enable and constrain agency. Institutional environment can be exemplied with culture, which varies between places and scales. An entrepreneurial culture encourages agency, independence, risk-taking (Fritsch & Wyrwich, 2014) and an entrepreneurial lifestyle (Andersson & Koster, 2011). A company town culture, on the other hand, encourages company loyalty, social control and reluctance to change (Isacson, 1997; Moonesirust & Brown, 2021). • *Institutional arrangements* refers to organisation-specific institutions like customs and procedures within markets and industries, that also enable and constrain agency (MacKinnon, 2020). • *Institutional thickness*, i.e. high density of informal institutions such as intellectual capital, social capital and political capital is considered to create a greater potential for economic development (Rodríguez-Pose, 2013). However, old industrial regions are often *institutionally thin* (Grillitsch & Asheim, 2018; MacKinnon, 2020). Institutional thickness can be changed through access to HEI or by building a regional innovation system (RIS).

3. Conceptual framework – Agency

Path dependency can help us better understand the development of old industrial regions. New path development can help explain how regions can transform. Institutions and institutional change can further help us understand differences in development. Yet, there is more to the story. As the growing literature on agency (Bækkelund, 2022; Blažek & Květoň, 2022; Eder & Döringer, 2022; Sotarauta et al., 2022) suggests, people, and what they do, matter. Although agency has previously been suggested as playing a role in regional development, it has not been sufficiently incorporated into evolutionary economic geography and models of path development (Grillitsch & Sotarauta, 2020; Martin & Sunley, 2006; Steen, 2016). When acknowledging that each locality's development opportunities are path dependent, it implies that each locality is somewhat different and continuously evolving. This requires actors and expressions of agency to also evolve, adapt, and transform (Barca, 2019; Sotarauta & Suvinen, 2018).

This chapter introduces the concept of agency and outline why it is important to consider in the case of transformation in old industrial regions. The chapter starts by defining agency, its relation to structure and actors before unpacking human agency into change agency and reproductive agency.

Defining agency

Kuus (2019, p. 163) writes that "Agency […] denotes the capacity to act in a given context" and describes how it is an approach that reverses common sense, as it does not start with the bigger picture, but rather the other way around. It starts in the mundane, the informal, and the everyday, and then moves upwards in institutional and spatial structures, and by doing so it can change one's view on both agency and structure (Kuus, 2019). Thus, agency can be used to understand the processes driving innovation and industrial change (Murphy, 2003). As there are various uses of the concept in different fields, agency has been defined and unpacked in various ways. A common way of narrowing down agency is to discuss actions made through *human agency* (see, e.g., Bristow & Healy, 2014; Kuus, 2019; Murphy, 2003; Plummer & Sheppard, 2006) as opposed to non-human agency. When studying human agency, the *agents* (here also called actors) are the individuals or groups that are doing something, and agency captures what actors do and their intended or

unintended effect. I find human agency more fruitful to study than non-human agency, since humans have the possibility to learn from their actions and to simultaneously see things from their own, and others' perspectives (Emirbayer & Mische, 1998). They can *anticipate*, *react* to shocks, and *transform* their behaviour (Bristow & Healy, 2014). There are various definitions of human agency. The concept has its roots in the Enlightenment, but the modern term was developed within sociology by Giddens and Bourdieu in the 1970s and 1980s (Emirbayer & Mische, 1998). Giddens' Structuration theory was brought into the field of geography in the 1980s, through its sensitivity to time and space (Coe & Jordhus-Lier, 2011). Emirbayer and Mische (1998) criticise the dominant definition by sociologists (such as Bourdieu and Giddens) who "…sees human agency as habitual, repetitive, and taken for granted…" (p. 963), meaning too focused on reproducing actions and more strongly shaped by structure. Furthermore, they criticise approaches which focus on one-sided aspects of agency such as traditions and judgement. Emirbayer and Mische (1998) find the concept of agency to be more complex than previous definitions allow, and therefore reconceptualise human agency and situate it within a dynamic time perspective. Aligning with Emirbayer and Mische (1998), human agency is here defined as

> "… the temporally constructed engagement by actors of different structural environments - the temporal-relational context of actions – which, through the interplay of habit, imagination, and judgement, both reproduces and transforms those structures in interactive response to the problems posed by changing historical situations." (p.970)

A key difference from other definitions is that it puts agency into a flow of time, where actors are more than repetitive and habitual actors. Since new situations are never the same as the ones before, it is not possible to only iterate actions as done in the past. Emirbayer and Mische (1998) define three analytical dimensions of agency to capture the temporal changes of structure and agency. First, actors can *iteratively* reactivate selected past thoughts and actions to create order and stability through their actions. Second, actors can *project* the future through reconfiguring structures, thoughts, and actions in relation to other actors. Finally, actors continuously evaluate (*practical evaluation*) and adapt their actions and preconceptions of the future to demands, dilemmas, and ambiguity in the present (as was also discussed as related to institutional change by Mahoney and Thelen (2009)). This means that actors adapt to structural constraints and previous knowledge, the present, and the actor's perception of the future, when acting. The temporal periods (past, present, and future) can be differently influential over time, in terms of which has the largest influence on specific actions at specific times (Emirbayer & Mische, 1998). The temporal dimensions of agency also make it possible for actors to incorporate both path dependency and path creation in their actions (Sotarauta & Suvinen, 2018).

When understanding agency like Emirbayer & Mische (1998), it becomes important to study agency over time. Only then can one see differences in agentic orientation, and through that, analyse the varying degrees of manoeuvrability, inventiveness, and reflective choice. As the literature on path dependency, lock-ins, and institutions has shown, this will vary between both space and time.

A recurrent debate in the agency literature is that of how agency is linked to, or dependent on, structure. Views differ depending on ontological and epistemological standpoints. Structuralist perspectives, like Giddens, see structures as the main forming cause. In economic geography, the balance between structure and agency is often seen as more even (Plummer & Sheppard, 2006). Structures can be various things influencing agency. Formal and informal institutions are considered one type of structure (Castree et al., 2013). Geographers tend to be particularly interested in at which spatial scales these operate, and how they structure the organisation of space (MacKinnon, 2020). However, for geographers, structures can also be something other than institutions. They can be various conditions that simultaneously enable and constrain agency (Coe & Jordhus-Lier, 2011) such as local endowments and competences (meaning, e.g., technology, infrastructure, and knowledge) that have been inherited from earlier or current industry paths (Dawley, 2014). Here, we come back to evolutionary thinking to understand how previous industrial paths create material and non-material structures, that shape regions' transformation through path dependency. An important aim of trying to understand the relationship between structure and agency is therefore to explain why some structures are available to particular individuals, and why certain actors are more able than others to benefit from their availability (see, e.g., Coe & Jordhus-Lier, 2011).

This research is guided by critical realism[2] which has implications for how structure and agency are viewed. Critical realism seeks to explain observed phenomenon through looking at relationships between structure and agency (Stutchbury, 2022). It makes an ontological distinction between structure and agency, which differs from Giddens who considers them to be mutually constituting (Sotarauta & Grillitsch, 2023). Although structure and agency depend to great extent on each other, they can still be studied as separate concepts (Archer, 1998). The causal power of social objects is mediated through human agency (Bhaskar, 1998b). However, the social world is always pre-structured. This means that people act limited by structural constraints and enabled by possibilities that they did not produce themselves (Archer, 1998; Bhaskar, 1998a). This does not, however, mean that structures determine agency or that social change just happens to us. It is made by us (Sotarauta & Grillitsch, 2023). Social structures are both an ever-present condition, and the continuously reproduced outcome of intentional agency. Although reproduction is an outcome of intentional agency, the reproduction itself and the effects, do not need to be intentional (Archer,

[2] I will elaborate further on philosophy of science in the methodology chapter.

1998; Bhaskar, 1998b). Instead, actors' actions in the largest part unconsciously reproduce structures (Bhaskar, 1998b). However, structures are also transformed as a consequence of agency (Booker, 2021). Sayer (2000, p. 26) explains this by noting that "Social change is evolutionary – path-dependent yet contingent, shaped by legacies yet affected by contingently related processes or conditions".

Defining a locality's actors

When studying agency, the word *agent* is often used instead of actor. I find that the two are used interchangeably and choose to use actor over agent, as all agents here are human. Actors can be individuals, individuals in groups, or organisations. In the complex real-world economy, individuals often have limited information and bear a high cost for processing information. Actors therefore often coordinate themselves and act using *collective agency,* which could combine a variety of actors: "…the institutions of purposive adaptation in regions go beyond firms and firm-related actors, and also incorporate a variety of other self-organizing institutions of collective agency, notably those of the state, governance and community" (Bristow & Healy, 2014, p. 930). Even though single individuals can change the growth path of a place, and the local narrative might support it, it is rarely done by a single person alone (Grillitsch & Sotarauta, 2020). To avoid being blinded by a few local 'heroes', it is more suitable to study entrepreneurship rather than entrepreneurs (Beer & Clower, 2014). Applied to agency, this means that agency should be studied centred around actions rather than actors.

On micro level, firms have traditionally been identified as the actors within economic geography (Boggs & Rantisi, 2003; Dawley, 2014), but as Coe and Jordhus-Lier (2011) and Dawley (2014) argue, it is important to look within the firm or organisations. One must study individuals since a firm or organisation is too complex: they are black boxes to explore. Additionally, one must also look beyond firms as the only driver of change (Feldman & Storper, 2018; Hassink et al., 2019; MacKinnon et al., 2019), as there are many non-firm actors (authorities, support organisations, universities, etc.) that also play important roles.

Drawing on the findings above, I have found that agency changing a locality's trajectory can be exercised by individuals, but that it is more likely to be exercised by a group of individuals working together. These groups can be individuals from both firms and non-firms. A critique towards existing work on agency is that certain types of actors often are attributed with certain types of agency (Jolly et al., 2020). Empirical findings support this critique (Bækkelund, 2022; Gunko et al., 2021). By separating agency and actors, it is possible to see how actors can exercise multiple types of agency, either simultaneously or over time, and with different intentions. Different types of agency will be further elaborated on in the following sections.

The literature on agency is vast, and I find two main ways to approach agency within economic geography: either focusing on the *actors* or on the *actions*. An example of a more actor-oriented type of agency is *labour* agency. To point to who has agency and show potential power imbalances, labour agency is divided between *worker* agency and *labour union* agency (Coe & Jordhus-Lier, 2011). This line of thought can be more beneficial when considering *who* (actor type) is transforming regional development. Since the focus here is on specific activities or initiatives in *how* and *why* change is created, human agency is unpacked in a more *action-specific* way using change agency and reproductive agency. In this way it is possible to concentrate on the change activity while also mapping the different actors who were involved in the process.

When studying human agency, it is important to understand the actor's *preconditions*. Our conception of our own agency is intrinsically social and relational due to its construction in the engagement and disengagement with other actors in different contexts. Hence, our capacity is connected to each individual's self. Emirbayer and Mische (1998) argue that actors can strengthen their ability to exercise human agency by increasing their capacity for practical evaluation, meaning adaptation to the situation. Yet, actors within the same arena can have different inherited power based on their status in the arena, which influences their capacity to both act and have an effect (Coe & Jordhus-Lier, 2011). In a locality, there will most often be traditional power elites, consisting of firm leaders or leading politicians. Based on their positions they will have more power and thus create more effect when using their agency. Not only assigned/formal leaders can exercise power. Un-assigned leaders can gain power through how other people respond to them (Sotarauta et al., 2022). In regions with a single large firm, power relations are often more skewed (Nilsen et al., 2022). However, actors with a seemingly less powerful or obvious position can also create effect: e.g., civil servants might not seem to have a strong agency, but going back to thinking of the mundane in everyday life, their everyday work plays important roles in the development, through the use of their power, knowledge, and network (Ebbekink, 2017). Various local actors can also over time cultivate local institutions and build capacity so that there are more opportunities in the future (Sotarauta & Suvinen, 2018). When studying human agency one must not only consider actors' *capacity* to create effects through their actions, but also study their *intentions* (Sotarauta, 2017) and capacity to accept *responsibility* for the effect (Kuus, 2019). Additionally, it is important to not regard actors' capacity as static. The ways in which actors make choices and push for transformations will fluctuate with changing situations and their capacity in relation to that of others (Sotarauta & Suvinen, 2018).

To sum up, actors can be either individuals or a collective of individuals. Their agency, or their perceived ability to use their agency, can differ due to their preconditions and their position, yet their position does not decide which type of agency they can use. Even though the archetype of someone who has a large effect from their agency is a person of power, actors with less power can also create an effect.

Change agency

As already introduced, human agency refers to intentional actions and their intended or unintended outcomes. This dissertation focusses on expressions of human agency that are aimed at (or unintentionally result in) changing existing regional growth paths and processes with the intention of generating something new or breaking with the current, namely *change agency*. Since the 1960's theories of technological change, traditional approaches have argued that change is driven by externally generated crisis. However, change processes can be initiated also from within the region without a crisis (Gertler, 2010). If the assumption is that a crisis has to happen for change to start, local actors are robbed of their agency: change agency should therefore be considered to have the possibility of being both proactive and reactive. Change is usually not abrupt, but rather incremental in changing structures, systems, and related institutions (Streeck & Thelen, 2005). This might, however, be less visible, and therefore more difficult to study. Grillitsch and Sotarauta (2020) argue that agency is best studied in all its complexity, during long, evolving development processes. By doing so, it should also be possible to find incremental change processes.

The concept of change agency has gained much attention within economic geography over the last few years with Grillitsch and Sotarauta's (2020) *Trinity of Change Agency.* Several subsequent publications have applied the framework (see, e.g., Eder & Döringer, 2022; Rekers & Stihl, 2021; Sotarauta et al., 2021). The trinity is based on streams of literature within entrepreneurship, institutional theory, and city and regional development. Since agency can be considered distributed and embedded in a variety of actors, Grillitsch and Sotarauta (2020) identify three key forms of change agency, based on actors' different intentions: *innovative entrepreneurship, institutional entrepreneurship,* and *place-based leadership*. Grillitsch and Sotarauta (2020) argue that the interplay of these three forms of transformative agency is the best way to understand the micro-level processes that relate to the emergence of new paths. The different agency types work together like cogwheels, but as every region is shaped by path dependency, various stages of time and place may favour different types of change agency to initiate change processes and they can be of more or less importance. With this said, one type of change agency is assumed to not be enough to change the trajectory of an old industrial region, due to the common need for radical or pervasive change to break with lock-ins. Additionally, when placed outside of large agglomerations (with the main economic clusters or sophisticated innovation) connecting to the global economy and adjusting to a changing economic landscape becomes more challenging. This makes more peripheral regions more dependent on deliberate local and regional change agency (Sotarauta et al., 2023).

Grillitsch and Sotarauta (2020) suggest that there exist actor-specific, region-specific, and time-specific *opportunity spaces*, which capture the room for change agency. Kurikka et al. (2022) develops the understanding of perceived opportunity spaces further. When using a critical realist perspective, new opportunities are always

available, but may not be activated or visible. For opportunities to be exploited, a region is dependent on individual actors' or groups' perception of potential opportunities and their ability to exploit them (Kurikka et al., 2022). Kurikka et al. (2022) use the concept of social filters to explain actors' ability to see opportunities. Social filters are here understood as a combination of social conditions and socially hegemonic ways of perceiving opportunities in a region. The social filters influence imaginaries and the expectations of what actors can see. Actors then also need creativity to be able to act on the opportunities. The social filters will change for actors over time. In certain periods opportunities will be viewed as very narrow, whereas they can be broader for the same actor in other times (Kurikka et al., 2022). The following sections outlines the three types of change agency.

Innovative entrepreneurship

Innovative entrepreneurship is an important driving force of economic development. It concerns making discoveries, exploiting opportunities, and finding gaps to fill to create value. It is about acting on perceived opportunities and involves risks and radical changes. Actions of innovative entrepreneurship go further than only making innovations in a firm, and also contribute to transforming regional economies through breaking with old paths and (re)creating new ones (Grillitsch & Sotarauta, 2020), especially when new paths move from the pre-formation phase into the path creation phase (Bækkelund, 2021). The opportunities for new possibilities to tap into local knowledge will vary across regional settings depending on the local support structure for innovation. This means that actors will find more or less opportunities in different times. Institutional environment here matters, regarding whether it supports or constrains innovation (Grillitsch & Sotarauta, 2020). Firms and entrepreneurs will typically use this type of agency, but public actors can also do so (Bækkelund, 2021).

For places with fewer entrepreneurs who are more likely to practice innovative entrepreneurship, one way to create new growth opportunities is to import in-migrants with entrepreneurial capacity and interest (Hedfeldt & Lundmark, 2015). However, in-migrants do not automatically lead to new ways of doing things. Tillberg Mattsson and Heldt Cassel (2020) show how public actors in rural Sweden expected immigrant entrepreneurs to be icebreakers and inspirers, and hence open up more opportunities for innovative entrepreneurship. In some cases, entrepreneurs delivered on the expectation, but they were also met with different lock-ins rather than a supportive attitude or functioning networks, which negatively affected their ability to induce change processes.

Institutional entrepreneurship

As previously stated, institutions are not static but develop with time (Mahoney & Thelen, 2009) and are shaped by the past and present. Institutions distribute power and capacity to act in a place and make some decisions easier to make, and other more difficult. However, they do not determine which actions are taken (Gertler, 2018). Nevertheless, negative lock-ins can trigger constellations of institutions that are hostile to change (Bathelt & Glückler, 2014), which make change more difficult. Changes that are aimed at resolving current tensions, can also form the basis for creating new tensions in the future (Benneworth et al., 2017).

Institutions are closely related to regional setting and are therefore of great importance when studying agency as the settings create different opportunities (Murphy, 2003). Gertler (2018) identifies a research gap in the understanding of sources of institutional change, regarding how and when institutional change happens and how agency influences institutions. Institutional change can be created in two manners, either incrementally through institutional work or through more divergent changes using institutional entrepreneurship. The trinity of change agency focuses on institutional entrepreneurship. Institutional entrepreneurs (originally introduced by DiMaggio (1988)) are individuals or organizations that actively *initiate* and *participate* in the reformation of existing institutions (Battilana et al., 2009), either formal or informal. If disregarding the fact that this transformative work does not result in new ventures or products, there are many similarities with traditional entrepreneurship (Battilana et al., 2009).

Time horizons for institutional change can be both short-term and long-term (Mahoney & Thelen, 2009). What may seem to be accidents in initial processes of path development can actually be the result of a long-term cultivation of conditions (Sotarauta & Suvinen, 2018). In the development of new trajectories, institutional entrepreneurship can be crucial for opening up an arena where innovative entrepreneurship can develop. This is particularly important in old industrial regions that often suffer from being negatively locked-in. Institutional transformation can be essential for breaking with both cognitive and political lock-ins at the local level. However, institutional entrepreneurship is not a solo activity (Sotarauta et al., 2021) but requires a large group of individuals to adapt to the transformed institution. Yet, individual actors may act as *visionaries* or *mentors* in the transformation (Sotarauta et al., 2021). Local actors who act as institutional entrepreneurs can either do so with little self-interest, or be driven by economic incentives or other self-interest (Grillitsch & Sotarauta, 2020). Nevertheless, institutional change at higher political levels or on other scales also influence opportunities at the local level (Bækkelund, 2022; Steen et al., 2023). Local change agents often face the challenging task of operating in a 'jungle' of multi-scalar institutional arrangements (Sotarauta et al., 2021). Strong top-down influence weakens the capacity for local actors to act (Görmar et al., 2022; Sotarauta et al., 2022).

Place-based leadership

Various actors participate in regional development efforts. Most of them are driven by incentives that benefit them or their interests in some way. When there are different wills in conflict, it can be problematic to find common ground (Grillitsch & Sotarauta, 2020) and this can hamper development (Baumgartinger-Seiringer, 2022). Beer and Clower (2014) argue that place-leaders might be the missing link in understanding why some regions grow while others do not. They identify a research gap concerning the effects of poor place leadership and argue that the effects of poor place leadership are often underestimated, but also that the greatest risk for a region is not poor place leadership, but an absence of such. Local leadership is important for change. Nations with centralised governments are less likely to support effective local leadership, which can lead to reinforcing already established growth patterns, leaving lagging regions with poor local leadership further behind (Beer & Clower, 2014). This is less relevant in the case of Sweden where the government is more decentralised. However, the imbalance of power can also be related to other types of actors. To exemplify, resource peripheries are often dependent on external actors (this could be a core firm), which weakens local capacity to act and makes local leaders less used to using any form of change agency (Sotarauta et al., 2022). The content and size of cities and regions also vary to a great extent and this variation needs to be taken better into account to more fully understand local leaders' agency (Ayres, 2014).

Place-based leadership sheds light on the leadership that genuinely tries to bring actors together towards a common agenda and join efforts towards choosing and launching development processes. Many local actors experience an increasing complexity in their work, and evidence of good place-based leadership is therefore needed (Sotarauta et al., 2017). A place-based leader can be an individual or group that has the skills to navigate complex multi-actor processes, who might have a stronger commitment to the whole region than other actors, and who can look beyond the narrow interests of individual actors. Place-based leadership can be driven by a 'local hero', but studies need to go beyond targeting heroes and recognise other local actors' actions (Benneworth et al., 2017; Grillitsch & Sotarauta, 2020). Place-based leadership is often thought of as being practiced by formal actors, but informal leaders can also span institutional and spatial boundaries, using place-based leadership (Beer & Clower, 2014). For place-based leaders to engage other actors into seeing new possible futures, institutional entrepreneurship might need to take place to create latitude for the place-based leader (Grillitsch & Sotarauta, 2020). As place-based leadership more often is practiced by formal, local leaders such as political or administrative leaders, this type of change agency is often more constrained by structures than others, which influences the expressions of agency (Sotarauta et al., 2017). Nevertheless, it should be noted that actors may assume roles that do not reflect their position. Gunko et al. (2021) e.g., show how local business elites have the ability to mobilise resources and act as place leaders.

This means that other types of local actors can also engage as place leaders. This form of leadership can be seen as a relay process, where actors engage during a certain period of time, before being replaced by new leaders (Sotarauta, 2016).

Change agency in recent literature

Following the introduction of the trinity of change agency (Grillitsch & Sotarauta, 2020), many papers which use and develop the framework have been written. Gunko et al. (2021) find in their study of three Russian company towns (monogorods) that innovative entrepreneurship and place-based leadership dominate expressions of change agency. In all three cases it is also predominantly the business elite that engages in change agency. Yet, the changes have targeted urban renewal, and all three cases show varying degrees of continuity in terms of industry profile and specialisation. Bækkelund (2021) finds in her study of three regions in Norway that local actors have been key for introducing path creation. Although external actors have also played a role, this finding is empowering for local actors. Nevertheless, new path development cannot be explained by local nor non-local actors alone, but a combination of the two (Bækkelund, 2021).

In large study covering 30 years and 12 case studies with 40 development phases altogether, Grillitsch, Sotarauta, et al. (2022) looked for necessary as well as sufficient conditions for new path development using Qualitative Comparative Analysis (QCA). They did not find any necessary conditions that need to be met for new path development. Yet, they found five different possible routes, with causal relationships. Either (i) innovative entrepreneurship, (ii) institutional entrepreneurship, or (iii) favourable regional preconditions can be sufficient for new path development when there is no crisis. More complex combinations, either (iv) all three change agency types, or (v) favourable regional preconditions, plus innovative entrepreneurship, and place-based leadership, can lead to new path development both with and without a crisis. This indicates that regions experiencing crisis require more complex combinations of conditions to develop new paths. Furthermore, Sotarauta et al. (2021) have identified four additional roles that in different ways support and positively challenge change agency, namely: the visionary, the mentor, the critic, and the support actor.

Change agency has also been combined with Regional Innovations Systems (RIS) in order to develop an analytical framework for studying change agency in RIS (Grillitsch, Asheim, et al., 2022). The different forms of the trinity are then combined with firm-level agency and system-level agency. Blažek and Květoň (2022) use a similar approach but use organisational-level agency rather than firm-level agency in order to open up for more types of actors.

A critique that has been addressed towards studies on change has been regarding the one-sided focus on agency and how that limits the view of the agentic process in

new path development (Baumgartinger-Seiringer, 2022). Maintenance agency or reproductive agency has here been raised as a complement to change agency (Bækkelund, 2021; Jolly et al., 2020). I find this complement highly valuable when capturing all expressions of agency in a region and will elaborate on this in the next section. However, I also find it possible to only study change agency, as a way to capture central transformations, without disregarding the fact that other forms of agency exist.

Another critique has been that it focuses too much on extreme cases and overlooks the limitations of agency (Eder & Döringer, 2022). Eder and Döringer (2022) find in their case study of the establishment of an HEI in a peripheral region in Austria that although collective efforts of change agency were used to start the HEI, diverging visions, fragmented actions, and conflicting interests have challenged the establishment. Visionary mismatch, organisational mismatch (fragmented and uncoordinated leadership), power-related mismatch (power imbalance in multi-scalar arrangement), and strategic mismatch (lack of place-based strategy) have hindered place-based leadership and change agency overall. Although I agree that we need to consider the limitations of agency (especially using multi-scalar glasses), I also find that this critique can be challenged for two reasons. First, as the methodology chapter will later elaborate on, choosing to study extreme cases can be an approach that gains more theoretical insights (Eisenhardt, 2021). Second, we need to consider the time it takes to create change in structurally challenged regions. The HEI was started in 2016, which can be considered quite recent. If we recall Saxenian's (1996) seminal findings on the differences in relations and networks in Silicon Valley and along Route 128, these cases showed that agglomerations and clusters do not always lead to growth. Although the overall finding can still be valuable, Etzkowitz and Dzisah (2008) later showed that the difference between the two cases might be smaller when considering timing and the maturity of industries. Silicon Valley also showed examples of a lesser network culture and a more firm-based system at a later time. With this example I would like to point to the fact that the full effects of the establishment of the HEI might not yet be visible. It is for this reason that I have chosen to study change agency over a longer period.

Reproductive agency

When starting the data collection looking for actions of change agency, I encountered much agency that did not transform anything. Change agency, in the sense that it creates substantial effects on the local level, can be rare. Jolly et al. (2020) argue for observing structural maintenance in parallel to change agency, meaning actions that contribute to reproducing existing structures. This type of agency is called *maintenance agency* or *reproductive agency*. I find that maintenance agency and

reproductive agency are used interchangeably in the literature and have chosen to use the term reproductive agency throughout this dissertation.

This form of agency resists novel activities (Jolly et al., 2020) and instead adapts to change incrementally. Due to its reproducing nature, it can *hinder* change agency, but it should not be seen solely as obstructing development. Reproducing agency can also act as a *stabilising* factor which is important after new paths are created (Bækkelund, 2021). However, too much reproductive agency is likely to lead to negative lock-ins as the path develops (Bækkelund, 2021). Change agency and reproductive agency can exist in parallel or in sequence in a region, and different actors can use both in different roles, or at different times, during a region's path development (Jolly et al., 2020). They can be considered two ends on a continuous scale between continuity and change. Actors can use both change agency and reproductive agency in their favour while shaping path development. Actors are not pre-determined to act in a certain way and may challenge or maintain structures depending on whether they wish to hamper or support ideas of path creation (Baumgartinger-Seiringer, 2022). Incumbent firms, who are mainly associated with reproductive agency, can, e.g., maintain structures to support their current path, but can also challenge structures when they hamper the firm's ideas of recreation or development of new products or paths (Baumgartinger-Seiringer, 2022).

To unpack this form of reproductive agency even further, Bækkelund (2021) suggests three agency types complementing change agency. (i) Replicative entrepreneurship, as a counterpart to Innovative entrepreneurship, where actions are directed more towards gradual improvement rather than radical innovation. (ii) Institutional work, which includes a broader range of efforts than institutional entrepreneurship and therefore includes actions that contribute to maintaining existing institutions that are taken for granted. Finally, Bækkelund (2021) finds that place-based leadership is overly associated with change and therefore argues that this form of leadership (iii) should be divided between change leadership and maintenance leadership. In the analysis of the cases I have chosen to only use the concept of reproductive agency, and not use the subdivided version of it as defined by Bækkelund (2021).

Combing the conceptual framework

The chapter on situating old industrial regions, together with this chapter about agency, has aimed to show how (re)new(ed) paths can be developed in old industrial regions. The two chapters are summarised in Figure 3 and show the phases of path development in blue (based on Grillitsch & Asheim, 2018; Martin & Sunley, 2010b), and that it is shaped by structure (in pink) and agency (in green). I see this process as linear with respect to time and evolution, making the context of every

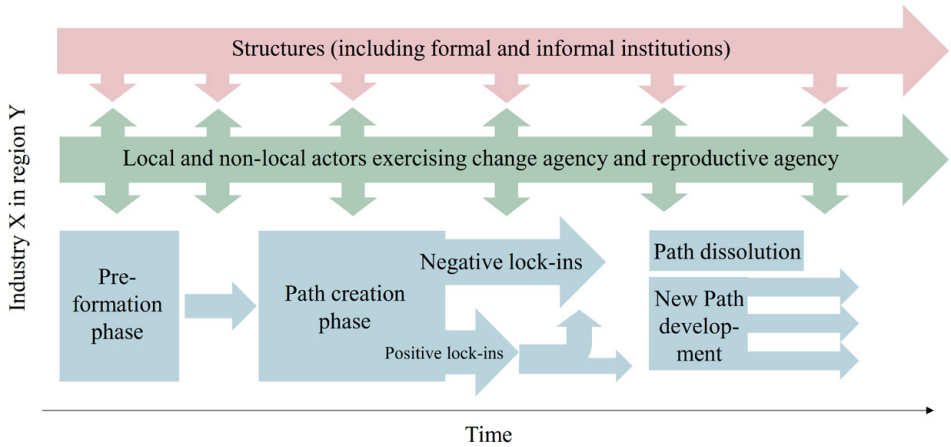

Figure 3: **Combination of forces that shape industrial and regional development.**

new action slightly different from the previous one. However, there can be multiple paths in motion in a locality at the same time and they can be in different stages of development.

Figure 3 shows that structures, which include both formal and informal institutions as well as material and non-material resources from previous and current paths, shape the different phases of path development, along with local and external actors' agency expressions. Which structures and conditions that will be necessary, or at least sufficient, for path development will vary by region, industry, and time. For a region cognitively locked-in, informal institutions can be by particularly influential. For a politically locked-in region, formal institutions can be more important. Depending on the industry and level of sunk costs, material resources will vary in their importance in path development. Capital intensive industries with high sunk costs will encourage actors to build new paths on existing material resources.

Agency expressions will vary with development. Change agency will be especially important in the path creation phase (Bækkelund, 2021). Then, there will be periods where it is most fruitful for actors to use reproductive agency to support existing paths and strengthen positive lock-ins. Yet, as the path matures there will be other periods when reproductive agency can be more hampering, as when a path is negatively locked-in or in a dissolution phase. During these times, change agency, used to break negative lock-ins or to start new development paths, can be essential. Change agency can, however, happen anywhere in time and reproductive agency is active at most times to stabilise current processes. Both are path dependent and part of path creation and path development. Actors' actions are influenced by past events whether they are aimed at change or stability (Sotarauta et al., 2022). This also mean that skewed local power, such as the dominance of the core firm in a company town, will affect agency expressions. We need to learn more about this interplay between

reproductive agency and change agency and between change agency and new path development. Although the focus in this dissertation is on local actors and their locally oriented actions, "local change agency is multi-scalar by nature" (Sotarauta et al., 2022, p. 363). Non-local actors are therefore incorporated in the figure. Local actors may need to reach knowledge, networks, funding opportunities, etc. outside the region to pursue local development. In general, old industrial regions are also influenced by the national level more often than other regions. Although a diverse group, they have in common that the "state looms large" (Morgan, 2013, p. 336).

Expectations, among individuals or groups, are important during path creation as they can attract the interest of others and investments, guide and legitimise activities, and align local actors (Steen, 2016). Kurikka et al. (2022) emphasise that places must constantly be searching for new opportunities in order to achieve long-term development. The concept of *opportunity space* (Kurikka et al., 2022) is helpful to consider with respect to the conditions under which change agency is more possible. However, as I have studied old industrial regions over long periods, I have also found long periods with little change agency at all, especially for certain types of actors. I am thinking of periods when the social filter is so thick that is shows literally no opportunities (even though they might still exist). Sotarauta et al. (2023) find similar patterns in an old paper pulp region in Finland and explain this by reasoning that change agency is also path dependent. They conclude that

> "'If local people see themselves as powerless and voiceless', the local capacity to act – to formulate development strategies, locate and exploit external opportunities and mobilize collective action – will remain at a low level" (Sotarauta et al., 2023, p. 366).

Kurikka et al. (2022) do not ignore the fact that actors can have very narrow opportunities. However, I find that this particular phenomenon needs to be further unpacked. I would therefore like to add the notion of *perceived room for agency* to the framework to highlight periods where actors are so cognitively locked-in that it is impossible to see any opportunity spaces or realise their capacity to use change agency. The explanation for this is that actors do not recognise or perceive themselves to have any agency, and when no agency is perceived, it becomes impossible to intentionally engage in transformative work. Instead, current structures are unconsciously reproduced. This would typically be introduced during the negative lock-in phase and can last long after structural crisis. I argue that this type of period is especially relevant for old industrial regions due to the likelihood of them becoming negatively locked-in and the inbuilt inertia in institutions.

4. Methodology

This chapter outlines the overall methodology for this dissertation, starting with philosophy of science. It then moves on to explain the analysis, the case study approach, and how the material has been gathered and processed. A more specific description for each article can be found in the articles after the kappa.

Philosophy of science

The research in this dissertation is guided by critical realism. Critical realism seeks explanations to observed phenomena by focusing on the relations between structure and agency (Stutchbury, 2022). It is an approach that goes beyond rich, empirical descriptions, and additionally seeks explanation to experiences and events in complex structures (Soon-Chean Park & Peter, 2022; Stutchbury, 2022). Developed by sociologist Roy Bhaskar (1975, 1979), critical realism differentiates conceptually between the transitive (theories about objects) and intransitive (the actual objects) dimensions of knowledge as one should not confuse empirical objects with our experiences of them (Bhaskar, 1975). Aligning with previous critical realists, I recognise that our knowledge of social structures is subjective, relative, and constructed by individuals (Stutchbury, 2022). This means that the world exists independently of what we think of it and that a shift in the transitive dimension does not have to lead to a change in the intransitive dimension. To exemplify, the realisation that the earth was round did not change the appearance of the earth from flat to round (Sayer, 2000). This example also draws attention to a core value within critical realism, namely that research results can be fallible.

Critical realism was brought into geography in the 1980s (Sayer, 2015) and is well suited to economic geography due to its context-sensitive nature (Gong & Hassink, 2020). Critical realists' research often takes differences in context as a point of departure. Hence, the observations made by a researcher are considered theory laden and guided by previous questions, problems, and theories (Gong & Hassink, 2020). By starting with existing theories and going back and forth between theory and empirics, it is possible to revisit and reconfigure existing theories and concepts (Gong & Hassink, 2020). The context-sensitive nature provides opportunities for improving, revising, and discussing both concepts from the discipline and concepts originating from other disciplines. A relevant example in this case is the research

done by Grabher (1993), who improved our understanding of lock-ins by coining the three forms of lock-ins (described in Chapter 3) based on the observation that lock-ins take various forms. By being sensitive to specific conditions, it is possible to see that not every negatively locked-in place is locked-in with the same form or the same severity.

A critical realist conclusion is that observable events arise as a result of interactions with structures. These are not always directly observable (Lawani, 2021). Critical realism therefore uses a stratified ontology with three autonomous (Stutchbury, 2022) yet nested (Lawani, 2021) levels/domains called the *empirical*, the *actual,* and the *real*. The empirical can be seen and measured, and contains people's experiences of events and objects (Sayer, 2000). However, to understand why events happen it is not enough to only study the empirical (Nesbitt-Larking, 2022). The actual lies below the surface and consists of events that take place when the causal powers of structures and objects are activated (Lawani, 2021; Sayer, 2000). The actual can be investigated using interviews and observations (Stutchbury, 2022), as in this dissertation. Finally, the real consists of deep structures and underlying causal mechanisms. It is whatever exists: the realm of objects, their structures and powers (Sayer, 2000). The real cannot be directly observed but must be inferred through a process of retroduction. This involves testing proposed explanations against empirical evidence in order to identify the underlying causal mechanisms and address the structures that are presented as barriers to change (Stutchbury, 2022). In this process, the researcher needs to determine which causal mechanisms have been used in this particular situation, and their effects.

With a stratified ontology, and the possibility of separating the real, the actual, and the empirical, there can be a better understanding of power, actions, and actors. All objects (such as people) have particular causal power, meaning things that they are capable of doing (Sayer, 2015). This means that there exists power in objects even though it is not activated at all times (Bhaskar & Lawson, 1998; Sayer, 2000), and there can be opportunities even though they are not visible to actors (Kurikka et al., 2022). Here it is important to note that *causality* within critical realism *is not the same as regularity*, and hence not seen as deterministic as in some other philosophies. Reality is an open system (Archer, 1998; Stutchbury, 2022) and we can therefore not predict results from mechanisms. We can only reconstruct them afterwards (Sayer, 2000), as done in this dissertation through path tracing. The same causal powers will not always lead to the same effect in different contexts (Sotarauta & Grillitsch, 2023). A structure is activated through a mechanism and leads to a certain effect or event (see Figure 4). In the process the mechanism can operate in similar ways: however, the condition in which the mechanism is activated influences the effect. Outcomes are therefore complex and can rarely be generalised or predicted. Effects are dependent on social constructs and structures, made through societies, which differ between cultures, groups, and individuals, and change over time. Different structures and mechanisms can be in motion at the same

time in the same system/context, which can create methodological problems for the researcher when trying to separate them (Sayer, 2000).

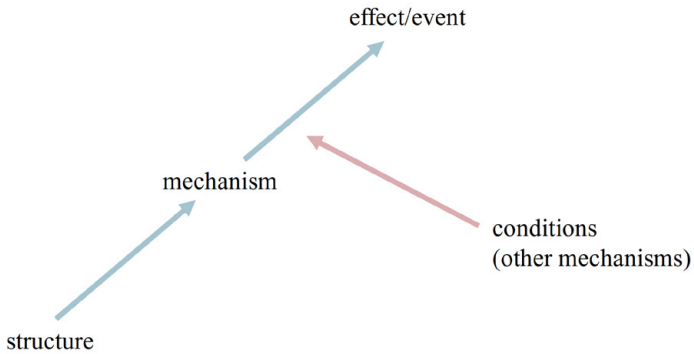

Figure 4: A critical realist view of causation.
Based on Sayer, 2000, p. 15

Path tracing

To understand events and their causes in the three case studies, the material has been analysed using path tracing. Path tracing follows a critical realist perspective in the sense that it differentiates between the 'real' world and the 'observable' world (Sotarauta & Grillitsch, 2023). This means that the 'real', the deep structures in the cases, are mapped and understood through analysing observable events and connecting them to the 'real'.

Research within economic geography and regional development studies often poses evolving and dynamic questions which are suitable to trace backwards in time. However, research tends to overemphasise structural factors such as human capital, infrastructure endowments, institutions, support structures, etc. (Sotarauta & Grillitsch, 2023). Theories like path development struggle to explain the interdependencies of structure and agency. It is not clear under which conditions structures prevail in path development and if or how agency can overcome structural constraints (Sotarauta & Grillitsch, 2023). By using path tracing as the methodological approach, it is possible to capture the relations between structure and agency. However, this requires an agentic approach to how paths are created and developed (Garud et al., 2010; Sotarauta & Grillitsch, 2023), meaning that it is necessary to acknowledge that actors can influence path development in ways that are not determined by structures. Path tracing takes inspiration from 'process tracing' (from organisational studies) and aims to explain path development through changes in both the material (such as employment and infrastructure) and the social world

(institutions and knowledge) (Sotarauta & Grillitsch, 2023). It follows the way in which the two form the 'real', meaning not just *how* (empirical observation), but also *why* (mechanisms and causal powers) regional and industrial paths evolve.

Evolutionary economic geography (EEG) recognises the importance of both time and history in regional development (Henning, 2019) and can therefore be "*inescapably* [considered] *an historical social science*" (Martin & Sunley, 2022, p. 67). This requires tracing the causal history of evolution and means that we should not only make use of historical evidence but also recognise history itself as a causal process (Martin & Sunley, 2022). However, despite the interest in time, longitudinal studies within EEG have been scarce (Henning, 2019; Martin & Sunley, 2022). This is a problem, since ideas and innovations need time to grow, develop, and diffuse. Furthermore, it takes time for markets to select and for dynamics of retention and path dependency to influence regional development (Henning, 2019). EEG is still searching for a good approach to incorporate history when constructing explanatory accounts (Martin & Sunley, 2022). Path tracing is a suitable alternative in this case, as it allows for studying long term development. Qualitative historical investigation is needed to understand causal mechanisms (Martin & Sunley, 2022). This, as well as mapping qualitative change, is possible when using path tracing.

A central part of path tracing is identifying the main phases of the path development process and critical junctures in which one main phase shifts into a new phase (Sotarauta & Grillitsch, 2023). A critical juncture can be an acute crisis which overturns pre-existing agentic patterns. However, it can also include incremental sequences of actions. Within the phases, the key actors and their strategies are identified, in order to understand how agency is activated and deactivated. Causal powers are not seen as changing in path tracing, but only activated and deactivated (Sotarauta & Grillitsch, 2023). When, for example, cognitive lock-ins are broken and actors can start working in transformative ways, this does not mean that they necessarily have acquired new abilities, but rather that existing ones are activated. In path tracing the focus is on actors' experiences, observations, and measurements (the 'empirical') and the triangulation of their stories. Based on this, relevant events are identified (the 'actual') as well as the mechanisms forming them (the 'real') in a long-term perspective. In the last step one moves beyond the sequences of events to identify and demonstrate what potential causes influenced specific changes and outcomes. This involves evaluating whether relations between objects in different phases and critical junctures are necessary or contingent in order to gain insights into causal powers and structures using abductive reasoning (Sotarauta & Grillitsch, 2023). A challenge in this process is that causal powers can lead to different outcomes in different settings, as was shown in Figure 4. Path tracing therefore tries to uncover which combinations of human agency, structural preconditions, and intervening conditions make certain outcomes possible.

While analysing the material, timelines were created for the cases and their different paths to map phases, critical junctures, actors, agency expressions, enablers, and

constraints. Initial desk-based research and the interviews formed the basis for the periodisation and explaining details. Other material and triangulation added rigour to findings through retroduction. A problem with combining new path development and path tracing is, however, that things are rarely understood as completely new (i.e., considered path creation) or proactive. When studying development and agency in a continuum it is often possible to trace back initiatives to previous industry paths through, e.g., infrastructure, assets, knowledge, and networks, or as reactions to earlier events. This has little implication for findings related to agency. However, it can affect the classification of new path development. To exemplify, agency patterns may be understood in similar ways, yet a new path may be seen as an unrelated diversification rather than a new creation, due to its links to previous paths.

Case studies

Critical realism opens for different types of methods depending on the research questions (Sayer, 2000). Studying human agency requires an in-depth and intensive description of how actions and events came about. For this, case studies are a suitable approach (Flyvbjerg, 2006; Yin, 2014). Multiple-case design was chosen in order to be able to test and reconfigure theories and concepts through an iterative process, within cases and across cases and existing theories (Eisenhardt, 2021). Since case studies do not detach the case from any element in the environment, the approach is in several ways more suitable for theory building compared to variable-focused approaches (Peattie, 2000; Piore, 2006). The case studies aim to be theory building concerning how change agency influences new path development. Yet, building on the literature on old industrial regions, the case studies also provide insights into how well existing theory explains agency patterns. The case selection was conducted in a two-step process. This will be described in the following section and the details of the three cases are described and analysed in Chapter 6 and in the papers.

Case studies, especially single case studies, have been criticised as a research approach (Flyvbjerg, 2006; Mukhija, 2010; Yin, 2014) for their deficiencies in making generalisable results, and for not being systematic enough, meaning not rigorous enough. The process of creating enough rigour on the other hand, has been criticised for leading to unmanageable level of effort (Yin, 2014). Instead, theoretical and context independent findings are often valued more than concrete, context dependent findings (Flyvbjerg, 2006). However, there are many misunderstandings and oversimplifications in the criticism of case studies (Flyvbjerg, 2006). Predictive theories, universals, or creating experimental models of reality are not possible when studying social processes (Flyvbjerg, 2006; Peattie, 2000). Every case has a unique context, with a particular set of forces and factors which are combined in a unique pattern. It is this complexity that makes case studies useful as a basis for practical understanding (Peattie, 2000). It is in the complexity, diversity, and contradictions,

that might be challenging to generalise (if it is even desirable) (Flyvbjerg, 2006), which we find a deeper understanding of a locality's development and expressions of local agency. This allows the researcher to reach below the surface of the *empirical* and *actual* domains. From this it is possible to theoretically generalise and build theory about causal powers and mechanisms. From this it is, however, not possible to predict or generalise on outcomes. To understand outcomes better, analysis of a larger set of cases is needed. This can, e.g., be done through Qualitative Comparative Analysis (QCA), through which it is possible to study which conditions are sufficient or necessary for certain outcomes (see, e.g., Grillitsch, Sotarauta, et al., 2022).

Using multiple cases will help build the reliability of the dissertation. To give more rigour to the results, the evidence has been triangulated between different sources and different forms of sources (Yin, 2013). To give further rigour, the methods, approaches, and results have been compared with other case studies in the research projects ReGrow and ACORE. Mukhija (2010) suggests using 'N of one plus some' when working with case studies to indicate that adding secondary cases to a single-case study can help gain deeper understanding of the primary case. The secondary cases, or rather the assisting cases, help the researcher identify issues that are to be expected, find important questions to ask, and identify particular data that need to be found (Mukhija, 2010). Aligning with this approach, it is possible to argue that the basis for this analysis consists of 'n of three plus 18'. Although I have not collected any assisting cases myself, being part of research projects where similar approaches were used on similar cases, has been very beneficial in the research process. During project meetings over the years, we have discussed findings, best practices, and failures, etc., all of which have helped find new theoretical angles on the collected material, unveil my own preconceptions, and fine-tune the methodology. In terms of data collection, the ReGrow project was particularly influential. The work within the ACORE team was more influential when it came to analysis and interpretations. The data collection in Olofström was the first Swedish ReGrow case study and the work was therefore a testing ground for project ideas of data collection and analysis. Through tweaking and discussion within the small Olofström team and with the whole project team, a further developed joint approach was formed. The joint approach for data collection (see Grillitsch, Rekers, et al., 2021 for detailed description) allowed the project to do further cross-case analysis (outside the scope of this dissertation), such as using QCA (see Grillitsch, Sotarauta, et al., 2022).

Case selection

The case selection process is highly important for the ability to theorise (Eisenhardt, 1989), and in this dissertation this means selecting cases where causal powers or mechanisms can be examined. To succeed in the case selection process, one should not use random sampling (Eisenhardt, 1989) nor choose typical/average cases (Flyvbjerg, 2006). Instead, theoretical sampling should be used and when only a few

cases are studied, it is better if they have contrasting characteristics. This is helpful in the iterative process of analysing empirics and theory, and can aid in refining theory building (Eisenhardt, 1989). Extreme cases or deviant cases often provide more information since their deviant situation tends to activate more types of actors and more fundamental mechanisms than a normal case (Flyvbjerg, 2006). However, a set of very different cases can also leave room for many alternative explanations. A case design with *polar types* was chosen. That means that the cases are different in some respects, but that they also share many similarities which helps controlling for known alternative explanations (Eisenhardt, 2021).

The three cases for the dissertation were chosen in two rounds, using different approaches. Olofström and Kiruna were selected in a two-step process within the ReGrow project. The starting point for this was Rodríguez-Pose's (2013) note that the residuals in growth models are large and often growing. This means that growth models which try to predict regional development, explain less and less. First, a quantitative analysis was conducted on all Swedish labour markets (based on commuting patterns, n=90) in order to find the labour markets with the largest residuals (for more information on the quantitative process, see Grillitsch, Martynovich, et al. (2021)). The idea was that a large deviation from the model would imply that there are other factors that play key roles in the development. One such factor could be differences in agency, but it could also be structural crisis or unobserved regional factors. A total of 21 labour markets were found to have periods of consistently unexplained growth variations (more than 1 or more than -1 standard deviation). As a research assistant, I conducted 20 short desk-based studies of the outlying regions (Stockholm was excluded due to its size) focusing on major industries and key changes in the regions. Using theoretical sampling, four labour market regions were chosen as the Swedish case studies, where Olofström and Kiruna were two of them. The four were selected in order to capture a variety of Swedish geography, different types of industries and industry structures.

Following fieldwork in the two labour markets, I initiated a second process to find a suitable complementary third case using a theoretical selection process. Due to the result from the first paper (Rekers & Stihl, 2021), showing that local agency was foremost activated within the political-administrative unit, municipalities were chosen rather than labour market regions. In the case of Olofström the labour market consisted of two municipalities (Olofström and Karlshamn). The two responded very differently to the same crisis, showing that labour market regions were less suitable for this type of analysis. Borås was a potential case from the start of ACORE project, but to make sure that a more suitable case was not overlooked, I conducted a scan for other potential cases. First, municipalities with a population ranging from the size of Olofström to approximately 100,000, and that were not classified as commuting regions were chosen (according to the Swedish Association of Local Authorities and Regions' (SKR)

Table 3: Summary of chosen case studies

Industries	All three municipalities are dominated by large industries in some way, with a long industrial legacy which has been important for the Swedish economy. The industries are, however, different between the regions. All three industries have previously undergone structural crisis and are currently in the midst of major transitions. The textile industry is moving from a linear to a circular economy (Borås), mining is working towards fossil-free production (Kiruna) and the automotive industry is shifting towards electric and self-driving cars (Olofström). In Olofström and Kiruna, the local industry has been dominated by a single large firm. In Borås, there has been a dominating industry, but it has been populated by a multitude of firms. Borås has undergone the largest diversification.
Employment	The largest industry has traditionally dominated the labour market in all three cases. Traditionally, the industry has needed low-skilled workers, but with time the need for advanced competences has become greater. Male workers have traditionally dominated the industry in Olofström and Kiruna and the industry in Borås has traditionally been female dominated.
Geography	All three are located outside larger city regions but spread across Sweden. Kiruna is the most peripheral and can be described as a resource periphery with exotic remote hotspots. Olofström might not be that far away from a larger city region distance-wise, yet it is still perceived as peripheral locally. Hence, it can be described as located in the manufacturing periphery. Borås is the least peripheral location, with Gothenburg only 40 minutes away. As it is both more diverse and larger in terms of population compared to the other two it is today more difficult to label as a certain type of location. (Categories based on Hedlund, 2016; Koster, 2019; Lund & Jóhannesson, 2014)
Population	None of the municipalities are among the largest population-wise in Sweden, yet Borås (pop. 114,000 in 2023) is much larger than Olofström (pop. 13,200 in 2023) and Kiruna (pop. 22,500 in 2023).
Periods of significant change	Both Kiruna and Borås underwent structural change in the mid-1970s. Following decreasing tax incomes, both Borås and Olofström went through municipal budget downscaling during the early 2000s. Olofström suffered much from the financial crisis of 2008.

classification[3]). The purpose of this was to find a municipality with a manageable size, but at the same time not too small, and that did not have too much exchange with other municipalities (which could influence local agency). This first sorting left me with 75 municipalities. In the next step, municipalities that were geographically close to either current cases or the city regions of Stockholm and Gothenburg were removed, to extend the geographical spread of cases. The smallest municipalities (below 20,000) were also removed, leaving me with 56 municipalities. In the third selection phase, after looking at all 56, 19 possible cases were selected as they contained traditional Swedish industry or firms. Of these, Borås, Borlänge, and Säffle were studied in greater depth as they were indicated to have undergone most change. In the end, Borås was

[3] SKR's classification of municipalities includes three main categories with a number of subcategories. They are (a) Large cities and municipalities near large cities (incl. Large cities and Commuting municipalities near large cities), (b) Medium-sized towns and municipalities near medium-sized towns (Incl. Medium-sized towns, Commuting municipalities near medium-sized towns, and Commuting municipalities with a low commuting rate near medium-sized towns) and (c) Smaller towns/urban areas and rural municipalities (incl. Small towns, Commuting municipalities near small towns, Rural municipalities, and Rural municipalities with a visitor industry).

chosen. There was significant change within the industries that made it possible to study the processes of interest. Furthermore, the timing of the structural crisis is comparable to that of Kiruna (making timing comparable) and the industry is different from Kiruna and Olofström, allowing for possibilities of finding complementary processes through maximising variation of cases. The three chosen cases for the analysis, Borås, Kiruna and Olofström, share joint features as old-industrial regions, but also many differences. These are summarised in Table 3.

Although the three cases share a history of a strong industrial heritage, their respective employments by sector show large differences (see Figures 5, 6, and 7) in the period after 1990. In Olofström, employment is dominated by manufacturing within the secondary sector, with the crisis in 2008 as a clear low point (see Figure 5). Although the primary sector (due to mining) is larger in Kiruna than in the other cases, employment is still dominated by services (see Figure 6). Finally, in Borås the dominance of the service sector is larger than in the other cases and growing (see Figure 7). The number of employed in Borås have gradually increased since 1995.

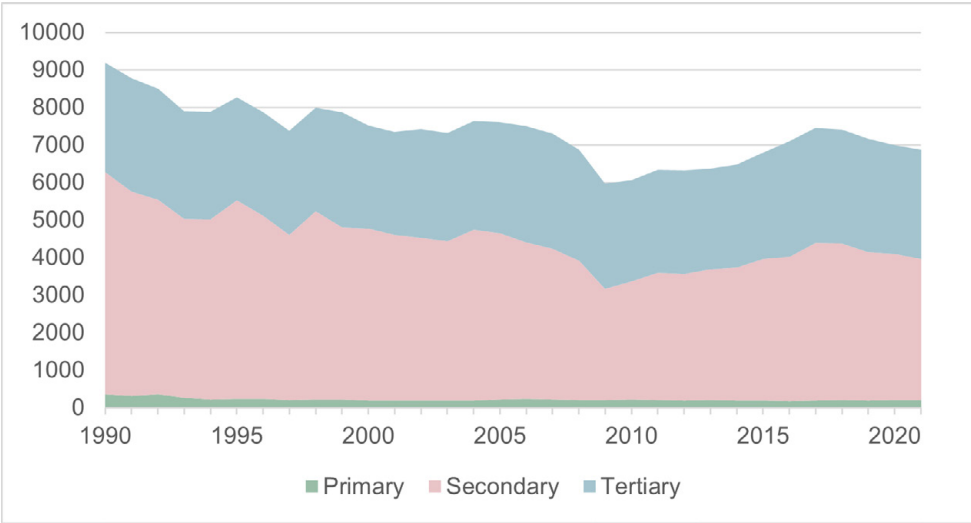

Figure 5: Employment in Olofström
Divided by the primary (agriculture and mining), secondary (manufacturing, utilities provision, and construction), and tertiary sector (all services) (SCB, 2023b).

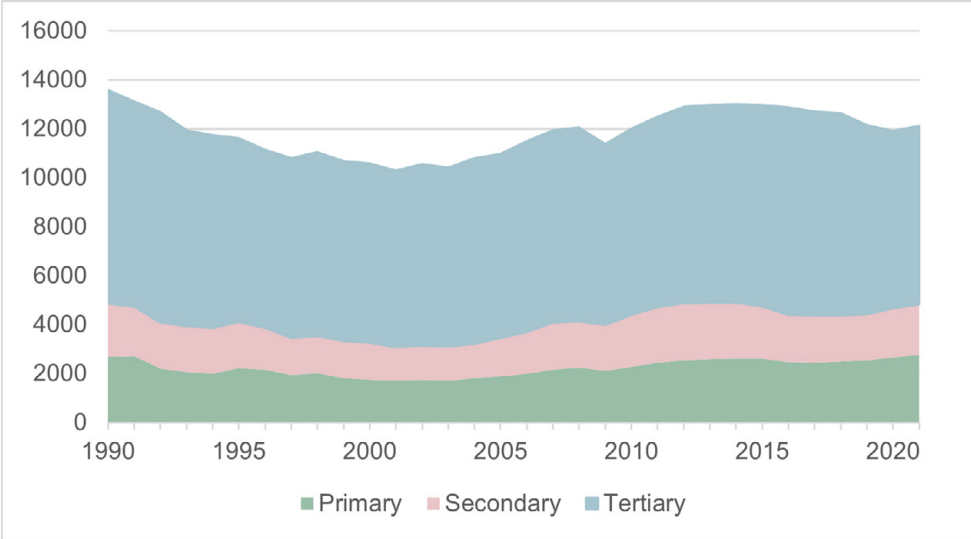

Figure 6: Employment in Kiruna.
Divided by the primary (agriculture and mining), secondary (manufacturing, utilities provision, and construction), and tertiary sector (all services) (SCB, 2023b).

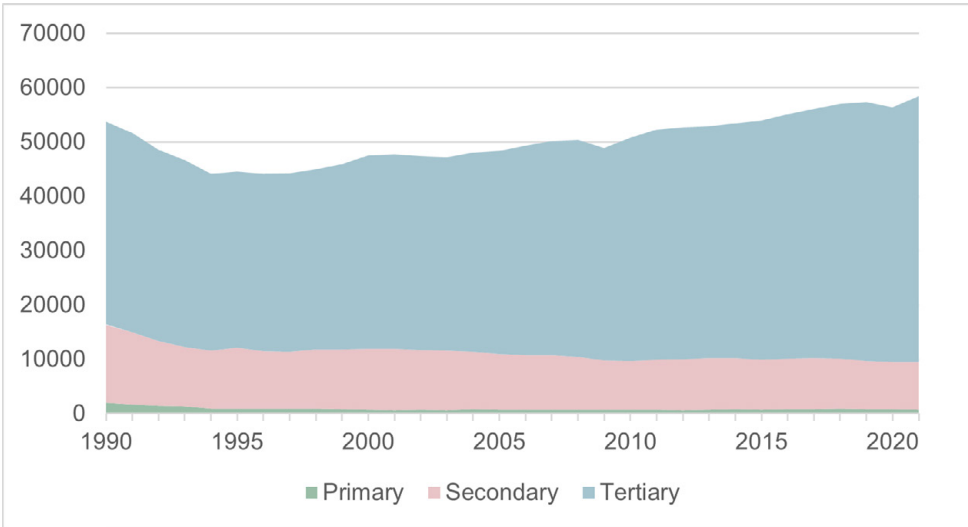

Figure 7: Employment in Borås.
Divided by the primary (agriculture and mining), secondary (manufacturing, utilities provision, and construction), and tertiary sector (all services) (SCB, 2023b).

Data collection and material

The following sections elaborate on the data collection process and materials used in the dissertation in order to reach a deeper understanding of the complexity of each case as well as to identify similar conditions in the three case studies. The intention was to study the cases from 1990 onwards. This has applied to the informants in the interviews, who have all been active in the cases from 1990 or later. However, as a product of path tracing, the deconstruction of processes and events have required that stories and secondary sources go further back in time. The earliest source is dated in the 1960s. Thus, this should be considered a longitudinal study.

Semi-structured interviews

When trying to answer the question of why a certain action came about and what enabled someone to use their agency, the answers can rarely be found in public, written material. Policy documents and minutes from municipal meetings speak to the negotiated decision, the public version. They share the result, what action was taken, but not the full extent of what happened behind the scenes or what local endowments constrained other possibilities. Interviews were therefore chosen as primary method, to learn about people's authentic experience (Cloke et al., 2004). Furthermore, interviews can help unveil actors' embeddedness in complex internal and external networks (Schoenberger, 1991). To keep a similar structure and to ensure comparable material, while at the same time leaving the interview open for adaptation to the informant, semi-structured interviews were chosen. As the informants consist of a variety of actors, with different roles and in different sectors (see Table 4), the semi-structured interviews lean more to the unstructured/qualitative type of interview, rather than structured. The interviews for the cases Olofström and Kiruna were conducted together with project collaborator Josephine Rekers as a part of the ReGrow project. To ensure comparability between all three cases, a similar strategy was used when conducting interviews in Borås. In total, 61 interviews were conducted. Together they make up 72 hours of interview material regarding path developments and agency patterns in the long-term development of the three case studies.

All informants were given information about the project before the start of the interview. Additionally, in all interviews conducted from 2020 onwards, the informants were provided with information about how the material would be handled and asked to sign a consent form. All interviews were recorded after the consent of the informant. During the interviews, the informants were asked to say something about their background as an icebreaker. The informants were then asked to identify and elaborate on key phases in the locality, key events in the locality and their enablers and constraints, key formal or informal institutional changes and key actors.

Table 4: Conducted interviews

	Case Kiruna	Case Olofström	Case Borås	Total
Interviews conducted:	December 2019-April 2020	December 2018-June 2019	March 2021-August 2022	
Average duration of interviews:	72 mins (range: 43-125)	67 mins (range: 31-97)	74 mins (range: 45-100)	72 hours
Researchers	J.V. Rekers & L. Stihl	J.V. Rekers & L. Stihl	L. Stihl	
Number of interviews:	21 (11 on-site)	23 (18 on-site)	17 (6 on-site)	61
Firm:	8 (12 incl. sec. roles)	9 (from 6 firms)	4	21 (25 incl. sec. roles)
Government (politicians & civil servants):	7	9 (2 municipalities & 1 region)	9	25 (4 municipal-ities & 1 region)
University/HEI:	1	2	1	4
Industry support organizations:	4	2	3	9
Other:	1	1	-	2

Seidman (2006) describes the interview as a relationship that must be "nurtured, sustained, and then ended gracefully" (Seidman, 2006, p. 95). In the construction of knowledge from the interview, both the interviewer and the informant participate actively: the interviewer through how they are perceived, formulates questions and keeps the conversation alive, and the informant in how they negotiate and construct their truth and stories told (Cloke et al., 2004). Having rather open interviews can be beneficial for the data quality, as it can encourage informants to speak more freely and in more length (Piore, 2006). A more structured interview can risk the informant to 'clam up' more and elaborate less (Piore, 2006, p. 18). Looking back at the interviews, I agree with Piore's (2006) conclusions on open interviews. During interviews, when we were two researchers, we were able to keep the interview more as a conversation and could take turns at posing questions, listening, and reflecting. This was more difficult to achieve when interviews were conducted alone, and I experienced the Borås interviews as a bit more formal.

Most of the informants have been men, and the interviews have been conducted by one or two women. There is evidence that the gender of informant and researcher matter for the result and that it can be particularly challenging for women interviewing men (Seidman, 2006). Additionally, several of the informants have been local leaders, for firms, political parties, or organisations. Schoenberger (1991) explains how informants who are used to being in control and practicing authority over others can create a problem in the interview when they try to steer the

discussion towards an area of their own interest. This has been the case in some of the interviews, and it has been a balance of letting the informant speak while controlling the areas covered in the interview. Posing open-ended questions is one way of dealing with this, as it gives the informant a sense of control (Schoenberger, 1991). I experienced that actors whose actions often were characterised by innovative entrepreneurship were the most keen to control the interview. Some also clearly tried to see what the interview might bring for them. This experience has created a better understanding of local actors' possibilities for using their agency. Several of the interviewees were around their 50s and 60s, which is older than Rekers and me. Seidman (2006) describes how older informants can be less comfortable with being interviewed by younger researchers. Yet, I experienced the opposite. My perception is that my age and gender were rather disarming in several situations and have made me come across as less of a threat, enabling the interviewee to open up. Overall, I experienced a trust and openness in the interviews, particularly in the face-to-face interviews.

About 60 % of the interviews were conducted face-to-face, on site. The others were conducted on phone or video calls. The onsite interviews sometimes included long or short walking tours of the informants' workplace. These gave more information and deeper understanding of the informants or their organisations, and observations and experiences from these were included in the interview notes (Piore, 2006). The reasons for the high rate of interviews conducted online was either geographical distance (case Kiruna) or the COVID-19 pandemic (case Kiruna and Borås). In the digital interviews in Olofström and Kiruna, the small talk that happens when you meet or at the end of the interview was missing. More time was instead used to solve technical issues and I experienced these interviews as shorter and less deep. This stood in contrast to the on-site interviews, where several took much longer than the originally scheduled 60 minutes (see Table 4). Due to the pandemic, interviews in Borås were first postponed and then mainly conducted online. These included less technical mishaps and informants seemed more comfortable with being interviewed online. It was evident that informants had become more used to, and skilled at, digital meetings as the pandemic had progressed. This strengthened the depth and quality of the online interviews.

Sampling of informants

The overall aim of the interviews was to uncover information about expressions of agency covering the significant industries in the localities, the multi-scalar government, and other non-firm actors. A balance between different types of actors has been sought. As the case studies also aims to cover a 30-year-long study period, this has been a challenging task. Important individual actors that were active in a locality in the 1990s might not have remained in the locality or even be alive. In a small municipality, such as Kiruna, many of the informants had instead held leading positions in multiple organisations and industries over the past 30 years, so that their

interviews covered multiple organisations. Table 4 shows the distribution of completed interviews. Appendix 1 lists the informants and their main role.

Each case study was started with desktop research to map key industries, events and individuals that have played important roles in shaping the regional development, with a particular focus on actions leading to change, through secondary sources such as news articles, municipal strategies, key firms' homepages, etc. With this material, it was possible to start identifying potential informants. In the case of Olofström, a local expert (a former leading civil servant in the municipality) assisted with a list of potential informants. Based on this and the desk-based research, we contacted a handful of potential informants who were emphasised as key (in time, position and/or organisation) in both. In the first round we targeted people that we thought could help us sharpen our picture of regional development or who could help us to find new informants. Using a snowball method, we conducted two additional trips to Olofström, Karlshamn, and Karlskrona (i.e., the central towns in Olofström labour market and in the regional body Region Blekinge) to conduct interviews. In the end, we concluded with some final interviews via Skype. Following the results from the first group of interviews, we chose to focus on informants that could give insights into the experiences of the 2008 crisis and its aftermath in Olofström. In Karlshamn, a broader set of industry paths were traced. Due to the shift of focus from labour market regions to municipalities during the research process, the industry paths in Karlshamn are not presented in the dissertation.

In the case of Kiruna, we had no local expert and only planned to conduct interviews on-site on one occasion. This made the initial desk-based work of more importance. An initial interview was conducted via Skype before booking the interviews in Kiruna in order to verify the desk-based research and gain new insights. Apart from the overall sampling strategy, we focused on informants that could give multiple views on Kiruna. As previously mentioned, Kiruna has a small population. An implication of this was that some people in leading positions (e.g., within firms, political parties, local government, and public authorities) had previously worked in other industries or types of positions. Hence, when choosing informants, e.g., which suppliers we wanted to talk to, we choose informants that also had held a leading position in another sector before or worked in boundary spanning roles. Interviewing informants that have held different leading positions during the study period helped give multiple perspectives on the same development. At the same time, it created a challenge for moderating the time and focus during the interview.

Finally, in the case of Borås, interviews were conducted in three rounds. The first round was selected based on desk-based research and the following two were collected through snowballing. A challenge with Borås is that it is much larger and more diverse than the other two cases. The intention was to mainly follow textile, fashion, and retail. However, the textile and garment crisis during the 1970s and 1980s did spur other industries to grow through unrelated diversification. Hence, the net was cast slightly wider with respect to industry. An additional difference

between this case and the others is that there are more books and research written about Borås. This allowed me to tap into stories of more actors than the ones interviewed (Andréasson, 2013; Franzon, 1994). An autobiography (Blomqvist, 2014), made it possible to gain insights into a deceased key actor's actions and motivations.

Snowballing has, as mentioned above, been used in all cases studies. Through the process of path tracing, key events and individuals during the desk-based study have been found. This has allowed me to make an informed start and then snowball in different directions. The question of "who else should I talk to" has also been posed to all informants, even the last. This has been a way of calibrating to determine whether I am interviewing a suitable selection.

Processing of material

During interviews I have taken detailed notes, as well as recorded the interviews. After the interviews, I have written inscriptions, summarising key themes during the interviews, the setting, and detailed descriptions of expressions of agency. Interviews with many open-ended answers can be challenging to analyse (Piore, 2006). By processing the interview material shortly after the interview, and thus directly beginning processing and analysing the material through the inscriptions, I could better see patterns in the material. Through overlapping data collection and analysis, the data collection can also be adjusted and improved (Eisenhardt, 1989). Although the main analytical approach has been path tracing, for Paper 3, the material was further processed in a CAQDAS using thematic analysis. Following Kuckartz (2013), the interview inscriptions were first coded using a few main themes. Both semantic (explicit content) and latent (underlying ideas, patterns, and assumptions) codes were used. In a second round of coding, sub-themes were generated for deeper analysis.

Looking back at the interviews and the information that was shared in them, the information on critical junctures and particular actions are biased towards successful initiatives. This is a limitation to the study, but not a surprise when making a retrospective study (Henning, 2019; Steen et al., 2023). The informants generally liked to talk about themselves and liked to talk about their successes, but few mentioned failed projects or initiatives, even when asked directly. When unsuccessful projects where mentioned, it was always somebody else's project. Examples of this were a failed windmill company in Olofström and a less successful winter car testing site in Kiruna. As failed initiatives might not have changed the phases in path tracing to a greater extent (since they did not develop into (re)new(ed) paths), this should not be considered a problem for the findings. It does, however, lead to a less complete picture of courses of events. In one of the interviews, I felt that the informant clammed-up for the full interview. This was in the Olofström case, and the specific informant had experienced a negative period with conflicts within the organisation we

were asking about. Although, we made sure to not talk about this period, as it was not important for the case, we could not win the informant's trust.

Informants' memory was sometimes failing when talking about past events. Two older informants, where 15 years had passed since the initiative we discussed, stated that they had gone back to old news articles about themselves to brush up their memory before the interview. I assume that informants' perception of the 'empirical' will change over time and that the stories they have told me would slightly have change depending on when I talked to them. In terms of validity, it might be favourable to read an article to 'go back' in time. However, in this case it is not going back in time to their own story, but one that was written by somebody else. Another informant instead said that she had looked for her old diaries to brush up her memory, but she had not found them. If she would have found them, it would have improved the validity of the claims of her former perception of past events. During the interviews in Borås the material related to Borås Arena was baffling since several people 'claimed' that success. When discussing this at a small follow-up workshop in Borås in December 2022, one of the participants asked if the newly created congress house was not addressed as well. It had not been discussed to a great extent in the interviews and it was therefore not included as a symbol in Paper 3. The participant's reflection on this was that the creation of a new congress house was more of a joint project in the town, bringing different actors together in a collaborative arena. This could explain why nobody felt that they 'owned' the initiative. It could also just come down to my sample of informants or the questions posed during interviews.

Written material

To be able to establish whom to interview and to build trust in the interview, a large set of material has been used to build knowledge about the locality and the industry paths before starting the interviews. Some informants quizzed me during the interviews more than others. There is a great challenge of conducting interviews in fields ranging from mining at 1365 meters below the surface, through municipal politics, to small instruments being sent to Jupiter (and this is just within one case study). The written material includes official documents from the municipalities (comprehensive plans, strategy documents, meeting minutes, local surveys, and policies), county administrative boards (reports and evaluations), regional governments (regional strategies and regional plans), the national level (national strategies, statistics, and national audit office reports), and a smaller number of EU documents and OECD reports. Further material that has been used are newspaper articles, previous research and books on the cases, press releases, and home pages of related authorities, organisations, and firms. There is less previous research on Olofström, but Borås and Kiruna have been studied before from various angles. The amount of material available is very large and material that includes sections about the overall business development in the case study areas as well as the main industries in them have been targeted.

Although the material available is large, there are shortcomings when it comes to material from before the digital age. Material from before 2010 is rarely searchable online in full text and sometimes the paper versions have been lost. The municipalities have helped in the retrieval of some material from their archives. Together, the material has helped me map the cases back to the 1960s. Yet, focus on events and expressions of agency is on the1990s and onwards.

The written material consists of polished documents that do not always describe the story behind the result. This is why it has been important to conduct interviews to find stories that have not been written. However, when conducting interviews about the past, details are forgotten or accidentally changed, and some stories are more polished than others after being told many times before. People do not generally recall past experiences in full and accurate detail. Instead, they interpolate estimation and present them as facts (also called Gist memory) (Nesbitt-Larking, 2022). This is where the written material has become important again. It has been used for triangulation, to verify details and stories, and to fill in missing gaps. Informants have referred to reports and newspaper articles during interviews. Many have misremembered titles or other details, which have therefore not been found after interviews.

Field visits

As a geographer, reading documents and doing interviews can only take you so far. There is more to places, which is hard to catch from afar (Byrne, 2021). It can be the long or short distance between places, the physical presence of a building or a rift valley, the lack of cell-phone reception when you need it, the light in a place that is portrayed as dark and finally, the short meetings with residents or employees that were not planned and are not considered interviews, but that still help you understand what you hear, see, and read.

During the first two case studies, field visits and interviews were done in parallel. The interviews partly guided the field visit as most interviews were done in informants' workplaces or homes, but between interviews other areas of the towns were also explored. I had also previously visited both cases and therefore had an initial understanding of the places, which was helpful for following informants' stories. However, the case of Borås was new to me and the pandemic prevented me from carrying out interviews on-site. As I approached Borås through documentation, I struggled to connect the dots. Therefore, in May 2021, in the midst of the pandemic, I spent two-and-a-half days in Borås and conducted unstructured observations to understand the meanings of places, while recording as much information as possible using fieldnotes (Byrne, 2021). During the field visit to Borås I visited key sites from the desk-based study such as the Textile Fashion Centre, the industrial park Viared, walked along the river to see the remains of the industrial legacy; the renewed spaces and who resided in the old industrial buildings today. I walked the streets to see the

many different examples of public art (and the plaques indicating who funded them). The visit helped me connect the old Borås with the new, to see who was at the Textile Fashion Centre (both on signs and in person) and understand how different places were connected in space. This has been helpful in the following interviews.

Local workshops

In order to verify results and to follow up on local development, local workshops were organised in Kiruna and Borås in 2022. A breakfast seminar with local actors in Olofström and Karlshamn was planned for autumn 2020. However, due to the pandemic it was replaced with a video presenting the findings from the case study.

In Kiruna, the local workshop was organised in December 2022 and was open to all members of a newly started local economic association that joins local actors in their aim of making Kiruna grow. The local workshop had ten participants from the municipality and from private firms in various industry sectors. During the three-hour long workshop, organised by me, I presented my findings and together we discussed the findings as well as the background, goals, and intentions of their new organisation. The workshop created an opportunity to verify the analysis of the material, which strengthens the validity of the results. Additionally, it created an opportunity to follow up on important developments after the interviews in 2020. As the new town centre had just recently been opened, this was one important development. Other developments concerned the increase in companies hoping to mine metals and minerals in Kiruna, the upcoming political shift (following general elections during autumn 2022), and the upcoming EU-meeting in Kiruna (January 2023).

In Borås, a small workshop was first organised in December 2022 with 3 participants from a business support organisation. In the workshop, preliminary findings were presented and discussed from the case and from Paper 3. Participants emphasised the role of entrepreneurs more greatly than I had, and this was helpful in pursuing further analysis regarding the role of an entrepreneurial culture and Borås' conditions. Additionally, I gave a lecture on the preliminary findings in May 2023. The target group of the event was the municipal administrative managers, municipal company managers, municipal presidiums, municipal leading councillors (politicians), the University of Borås, and members of a membership organisation for private firms in Borås. Approximately 100 people attended, including several of my informants. After the lecture, a handful of people approached me with comments. One was an informant who wanted to say that he recognised the picture of Borås that was presented, which was reassuring. Another was an elderly man who said that I should never speak ill of a crisis, since it is such a great opportunity for an entrepreneur. This provided more information on conditions for innovative entrepreneurship.

Combining material for a more comprehensive understanding

As the data collection has covered long time series, interviews have zoomed in on particular events or actions that the informants have found critical. Many of the stories told during interviews have been told before, adjusted through time, and all show the informants' perceptions of events, their empirical reality. Although it is not reasonable to cover all potential stories in a case study, I have tried to cover the breadth of the larger stories and catch the most common narratives among policy makers and other central actors. Nevertheless, for the breadth not to steal focus from depth and credibility, I have used triangulation throughout the process. Triangulation can be done throughout the research process and in various forms (Yin, 2016). In this dissertation, triangulation has been used in three ways, namely data, investigator, and method triangulation. I do not see triangulation as an approach to validate and verify *objective* results, a use which has been criticised. I rather see it as a more comprehensive research approach with steps that build on each other in order to gain more information about the cases (Flick, 2017), and in the process create better opportunities for moving from the *empirical* and the *actual*, to the *real*.

Investigator triangulation: During the interviews in Olofström and Kiruna we were two researchers present. This gave opportunities to triangulate perceptions of answers after the interviews. We were also able to triangulate findings and discuss inference. Findings have then been further understood, compared, and contextualised, when reading and discussing detailed case reports from other ReGrow cases. This allowed me to discover angles and interpretation that I did not initially think of. This relates both to which stories should be studied more deeply and how the conceptual framework can be applied to the empirical material.

Method triangulation: Empirical material has mainly been gathered from interviews and written material. It has further been complemented with unstructured observations and, after initial analysis, findings have been discussed with local stakeholders in Kiruna and Borås at local workshops to verify results and complement how they are understood.

Data triangulation: First, answers from informants have been triangulated against each other when informants have talked about the same event or the same actors. Depending on whether the informants have agreed or not, they have sometimes painted somewhat different pictures of actors' characteristics and courses of events. In some cases, such as in the case of the football stadium in Borås, multiple informants claimed responsibility for the development. Disentangling informants' empirical experiences of reality is then particularly challenging. Secondly, facts, dates, and details from the interviews have been triangulated with written material, field notes, and radio recordings. There have been errors in the stories uncovered during the interviews. I do not consider these errors intentionally misleading, but rather that they represent the informants' perception of the event (which might have transformed over time).

Reflecting on the methodology

Even when well justified, every research approach has its draw backs. The use of a few cases limits my opportunities for making empirical generalisations as findings need to be seen in relation to the context (Steen et al., 2023). The study, however, opens up the possibility for analytical generalisations since there is a transferability of the theoretical analysis to other municipalities with similar conditions (Steen et al., 2023). When considering the case selection, it could also be debated whether the cases are too dissimilar. That Kiruna is too minted by its very peripheral position, whereas Borås can be thought to have much more locational benefits from its geographical closeness to Gothenburg. Although the distance to Gothenburg remains the same, Borås' relation to it has changed over the study period. Today, Borås and Gothenburg are part of the same regional government, and the labour market of Gothenburg is expanding towards Borås. However, this was not always the case. Informants speak of longer perceived distances following the crisis and when large garment companies, like MQ, chose to move their headquarters from Borås to Gothenburg (Gråbacke & Jörnmark, 2008). The perception that Borås was not good enough to host a headquarters anymore, did, however, also spur change agency among entrepreneurs to prove Borås' worth.

There are also methodological challenges with incorporating long time periods in research (Henning, 2019), especially related to validity and trustworthiness. The *modifiable period problem* refers to how outcomes change as periods/phases are redefined, both in terms of boundaries and length (Henning, 2019). To address this, phases and their industries have been adapted to the cases. This means that (i) the phases have not been set before data collection, (ii) that the search for critical junctures has extended beyond the study period starting in 1990, (iii) and that multiple phases are used in some cases to not overlook internal dynamics in the different industries. An implication of this is that there are no set real time boundaries in the three phases used in Paper 3 (Stihl, 2023) when comparing Borås and Kiruna. Instead, a qualitative estimate of the phases in the two cases is used. In Kiruna I have mapped the different industries, with individual phases, separately as they are clearly delineated. In Olofström, this has not been needed due to the lack of paths outside the automotive industry. The industries in Borås have not been separately mapped as they have grown to be too many and too interconnected. It would not have been possible to do them all justice. A second problem in longitudinal studies is *historical validity*, which refers to the problem of assessing the validity and evaluating how selective it is (Henning, 2019). This problem is relevant for both quantitative and qualitative studies (Henning, 2019; Martin & Sunley, 2022). However, when doing retrospective qualitative studies, you have further issues with risk of biases due to individuals' selective memory and their interpretations of events (Henning, 2019). This creates problems with replicability. If asking the same informants the same question after a period of time it is likely

that their answer will at least slightly change. Nevertheless, the value of informants' insights is of great importance (Steen et al., 2023), even though one must be aware of that events seen in hindsight or retrospect can be over-rationalised or simplified (Steen et al., 2023). Informants' answers inform us of how the local legacy is used by informants and thus helps in understanding actors' perception of the future in more recent events. Not to be disregarded, time also curates more joint narratives of past events, influencing joint perceptions of the present and the future.

Finally, I must also reflect on my own positionality and subjectivity. As a native Swede, born into a broader Swedish culture, I have insights and preunderstanding of the broader context of the cases. When an informant in the Olofström case, e.g., referred to a margarine commercial from the 1990s, I could recall it and better follow the informant's reasoning. Nonetheless, I am an outsider in all the cases and approach the cases with preconceptions of them. This requires reflexivity in the interviews and in the analysis in order to not impose my own perspectives on the research. To completely detach my own perspectives is, however, not possible, and findings cannot be considered completely objective. I should also declare that my research interest is shaped by a genuine belief that there should be opportunities for regional development throughout countries, not just in larger agglomerations.

Ethical considerations

Considering a few rare, but severe, research malpractices, the Swedish research community is currently searching for ways forward. It is a fruitful debate but important ambiguities remain. I would therefore like to share my own thoughts and the considerations which have guided my work. To the best of my knowledge, I have followed good research practice and I have continuously improved my performance during the research process. When collecting and analysing my material I have encountered two issues that I find important to bring forward: (I) the challenge of analysing agency in hindsight and (ii) the challenge of being an outsider.

The first is more a general concern when adopting an agency perspective, and change agency especially. When studying a region's development in hindsight, you see how initiatives turned out and uncover periods where regions have been very locked-in, constraining them from using their agency. This comes as no surprise, as it is the purpose of the research. However, it can then be easy to focus on the negative parts and frame a region or an action in a bad light. Grabher (1993) is, e.g., quite critical when studying the developments in the Ruhr. A major difference between my cases and his is the scale. The Ruhr area had about 5 million inhabitants when Grabher did his study. My cases are much smaller in population size, especially Olofström and Kiruna. There are always real people behind all actions, but in small places they are easier to spot even when refraining from naming anyone. This goes for both relating results to informants and to the key actors discussed in the collected material. The material in this dissertation is presented so that it protects

the integrity of the informants. This is both seen in how individuals are described and referred to, but also by focusing on the actions rather than the actors (Beer & Clower, 2014). Learning from others' success can be highly fruitful, but I see little gain from pointing to individual missteps from the past. To protect individual actors, I have grouped negative actions and present them in less detail using the lock-in concepts. I also highlight that agency expressions often are the results of *collective efforts* (Bristow & Healy, 2014; Grillitsch & Sotarauta, 2020). Few key actors can singlehandedly take either credit or blame for actions. Actors are embedded in the locality and need each other's spoken or unspoken *mandate* to act. Just as I have tried to not assign blame to individual actors, I have tried to avoid pointing too much at individual 'heroes' as they are also embedded locally and need other's support.

A second challenge regards studying the complexities of a place as an outsider. This is particularly important to keep in mind when it comes to Kiruna, which, due to historical events, is much more complex than Olofström or Borås. Northern Sweden was colonised more than a hundred years ago, and the extraction of resources from it has been crucial for Sweden's development. At the same time, an indigenous group has experienced displacement and the landscape has been transformed due to mining, forestry, and hydropower. These issues are still very much alive in Kiruna, and, e.g. flared due to the Supreme Court's verdict (The Supreme Court of Sweden, 2020) concerning the Sami village of Girjas' rights to hunting and fishing in their area in Gällivare (Brischetto, 2020) and the planned expansion of the Kiruna mine (Haupt, 2023; LKAB, 2023). In Kiruna, there are geographical conflicts of interest between the Sami reindeer husbandry and the three major industries: mining, tourism, and space (Informant K9; K10). Related to this, there are conflicts between the state owned LKAB's assignment to continue extracting ore (and with that forcing the town to move), and the Swedish state's reluctance to sell land to the municipality for the town move (due to the cultivation limit) (Informant K8; K13). There are conflicts of interest between the town move and other industries, since the resources, focus, and priorities targeting the move have slowed down other industries (Informant K9; K17). The list of conflicts of interest in Kiruna can be expanded. Although they are not at the core of my research focus, they are impossible to leave out. The tensions need to be treated with respect, as they influence the room for agency of the various actors and many of the conflicts of interests can be brought forward as constraints to agency. In this dissertation I try to bring forward the complexity and how they overlap. Even with my best intentions, as an outsider, I will not understand the full complexity and the depth of some of these conflicts. At the same time, the lack of embeddedness also gives me the possibility of approaching the place with less ties to particular sides. This might give me a better opportunity to bring forward the conflicting ideas. Researchers should always consider their positionality and biases. Being a native Swede from southern Sweden, I have found it particularly important to critically reflect on my pre-understandings and my role as a researcher in the case of Kiruna.

5. Industrial regions and regional development in Sweden

This chapter introduces the growth and decline of Swedish industrial regions as well as actors and responsibilities related to regional development. The purpose of the chapter is to provide a wider picture of the setting in which the case regions have developed and show local actors' responsibilities in regional development.

The growth of industrial regions

Sweden had its industrial breakthrough in the last decades before the first world war (Lobell, 2016). Both the state and private actors invested in technical systems, and real capital for manufacturing production, such as railways and hydroelectric plants. This played a major role in Sweden's economic development, and this type of investment by the state was early compared to other countries. The investments created opportunities for exploiting vast natural resources (forest, iron ore, hydropower) and for building strong Swedish firms such as ASEA, LM Ericsson, Electrolux, Volvo, and Saab (Kaijser, 2001). In other places around Europe during the early twentieth century, manufacturing and number of inhabitants grew in large industrial cities like in the Midlands in the UK, southern Belgium, north-eastern France, and the German Ruhr. Similarly, industrial concentration grew early in Swedish cities like Malmö, Landskrona, Jönköping, Göteborg, Borås, Norrköping, Eskilstuna, and Sundsvall. However, in Sweden, the industrial growth in cities happened in *smaller* cities compared to elsewhere in Europe, and industrial growth also developed to a *smaller extent* in cities (Alvstam, 1995). The industries that grew in Sweden during early twentieth century were mainly based on the exploitation and processing of raw materials, dominated by the iron and forest industries. Therefore, the industrial development happened to a larger extent on the *periphery* (Löfgren, 1992) "in small, scattered mill communities" (Alvstam, 1995, p. 7), also called *company towns*. The industries formed local specialised regions in Sweden within various sectors and industries. Bergslagen (mid-Sweden) and the ore fields in the north were dominated by ore mining and steel production, chemical industries developed in Stockholm, paper mills expanded along the northern coastline of the Gulf of Bothnia, etc. As many industries grew on the periphery,

they also required workers. The development of Swedish industry during the first half of the twentieth century therefore also influenced the relocation and distribution of population to a great extent (Nilsson, 2000).

Sweden's production capacity has been relatively sheltered from wars and major natural disasters (Enflo & Henning, 2016). Between the 1930s and 1975 the Swedish economy experienced a boom of mechanical and engineering-based manufacturing industry. In parallel, the public sector expanded and the Swedish model of economic organisation was implemented in terms of social security and human capital improvement (Enflo & Henning, 2016). From 1950 onwards, Swedish firms started expanding their production abroad. The years between 1950 and 1975 are often called the 'Swedish record years' and are attributed to a strong industrial development. However, during these years, Swedish industries were also challenged by developments outside Sweden. Labour intensive industries, like the textile industry, struggled to compete with low-wage countries (Alvstam, 1995) and the effects of the oil crisis in the 1970s forced closures and restructuring in old, mature industries such as iron, steel, shipbuilding, paper, and wood (Isacson, 2001). The start of the 1970s is therefore the start of a long period of weak economic growth in Sweden.

It is common for regions with industries dependent on raw material or which are energy intensive, to form a one-sided economic structure. This became true for many industrial regions in Sweden. In the mid-1970s, almost a third of all municipalities in Sweden were considered monostructural industrial regions (Alvstam, 1995). During the 1970s, employment decreased by 400,000 industrial workers (Nilsson, 2000). Several old industrial regions put their hope in replacements industries, that would allow these places to continue in their old tracks (Isacson, 2001; Tillväxtverket, 2016). New firms were not regarded as important job creators, as they are today (Tillväxtverket, 2016). However, the promise of replacement industries only came true for a few. Compared to earlier periods of structural crisis there were no expansive manufacturing industries that could compensate for the loss of employment within industries in crisis (Nilsson, 2000). Growth was instead found within the service sector. Many smaller industrial places and municipalities experienced population loss and a decreased need for housing and services, which led to the demolition of many dwellings (Isacson, 2001). This started shifting regional patterns and, in post-industrial Sweden, company towns and industrial cities become unattractive places to live and were often characterised by weak business development (Nilsson, 2000). The vulnerability of individual municipalities has therefore been a recurring question in Sweden since the 1970s.

Swedish company towns

In the small company towns ('bruksorter' in Swedish) that grew close to raw material or energy, a certain *company town system* ('brukssystemet') was created, which also developed a certain culture called *company town spirit* ('bruksanda'). The companies

became the community builders and formed their own local labour market. They offered a variety of jobs, insurance from unemployment, gave social care and fostered a collaborative spirit (Bursell, 1997). The company ensured work and social services, and the residents formed a stable work force over generations. However, this situation also formed a patriarchal system led by the company patron, where the individual worker should do as they were told and not think that they were anything special. The patriarchal and hierarchical power structures incorporated a silent agreement of responsibilities and functions. As the companies often planned and built the towns, towns were built in such a way as to keep a clear social stratification, where inhabitants did not socialise between social groups. Nevertheless, there was a strong feeling of collective and unity as well as a reluctance to change. Individuals' initiatives and entrepreneurial activities were discouraged (Isacson, 1997).

The traditional company town *system* started being dismantled in the early twentieth century through the rise of unions and other associations which made the relationship between the local patron and the workers more formal. When competition rose in the mid-twentieth century, companies needed to specialise income activities and decreased their social activities and services in the communities. The municipality and the public sector took over these responsibilities. Where the company is still in operation, it is often the company and the municipality that remain the central local actors. The local culture that was formed in company towns has developed with time, but can endure even after the company has closed down (Bursell, 1997). It has been questioned whether the company town spirit remains or if it is only the academic society that reproduces it when discussing it (Isacson, 1997). However, Paper 1 (Rekers & Stihl, 2021) and Paper 3 (Stihl, 2023) indicate that a company town culture remains in several industrial places.

Lundberg (1997) argues that company towns need renewal processes before the company closes to avoid negative lock-ins and path dissolution. However, history has shown that inhabitants tend to put their full trust in the survival of the company all the way to the end (Lundberg, 1997). Lundberg (1997) therefore argues for the need to empower the local community so inhabitants perceive that they have the right and possibility to unpick the dependency on the company and the company town spirit. One way of empowering local actors can be to shed light on local actors' possibilities when using change agency to change the trajectory of the industry path.

Post-industrial Sweden

The period following 1975 can be described as a post-industrial era in Sweden and a period where regional inequalities started growing again after several decades of decline (Enflo & Henning, 2016). During the 1980s, new growth paths were developed within manufacturing and the service sector related to microelectronics and the third industrial revolution. Telecom and pharmaceutical industries were especially expansive (Schön, 2014). During this time, a wave of company fusions, where large

firms from different countries formed new larger industrial companies, also started (Schön, 2014). Sweden also saw several institutional reforms during the 1980s and 1990s inducing liberalisation of capital and labour markets (Enflo & Henning, 2016), through, e.g., tax reforms in 1990 and 1991 (Schön, 2014). However, increased entrepreneurial activities in small firms, optimistic expansions, and the deregulation of the domestic credit market eventually led to a transformation crisis in the early 1990s (Schön, 2014). The large domestic financial crisis led to the loss of 600,000 job opportunities across various industries. Additionally, the public sector had to go through large downsizing within health care and care (Isacson, 2001).

In the period between the crisis in the 1990s and the global financial crisis in 2007/2008, Swedish economic development was an overall success, while the economic politics became more restrictive. Apart from the burst of the IT bubble in early 2000s, due to a mismatch between expectations and results within the IT industry, Swedish companies have been successful with innovations in digital technology and the internet, with well-known brands like Spotify and Skype. Meanwhile, the importance of primary industry (agriculture, forestry, and mining) have instead shrunk with respect to exports (Schön, 2014).

The deindustrialisation and structural change of the economy have had various effects around Sweden. Some places have lost large workplaces and job opportunities. In other places the industries have survived, but to sustain global competition, they have experienced higher demands for a competent workforce (Hermelin & Rusten, 2016). Nevertheless, when studying GDP/capita at the Swedish county level (similar to regional government bodies), they appear among the most equal across the population compared to other countries. This means that the production in the periphery that has survived has become more efficient and employs fewer people (Enflo & Henning, 2016). Finally, in larger cities, where the growth of service industries is concentrated, the deindustrialisation has coincided with the growth of new industries and job opportunities. However, the economic structural change has meant a slowdown in growth in many European countries. This means fewer resources at the national level to redistribute across the country as a whole and has led to more bottom-up encouragements and more decentralised responsibilities (Hermelin & Rusten, 2016).

Although the Swedish industries have developed significantly since the 1970s, the issue of vulnerable municipalities remains. A prosperous municipality with high employment, high incomes, and well-functioning social services can, through a large plant closure, become a problem-ridden, depopulating area. The triggering factor for a plant closure or downsizing can be found far away from the municipality, due to a change in ownership structure on a global level, new technology, or change in demand (Tillväxtverket, 2016). The Swedish Agency for Economic and Regional Growth (Tillväxtverket in Swedish) has identified 100 of Sweden's 290 municipalities as vulnerable due to (i) high dependence on individual firms, (ii) the structure of the local labour market and (iii) level of entrepreneurship. A majority of these municipalities

can be found in the middle of Sweden, particularly around the traditional industrial region of Bergslagen (Tillväxtverket, 2016). Many of these also have names that end with -fors (i.e., white water) or -ström (i.e., stream), such as Hagfors, Munkfors and Olofström, which indicates their location close to the once so important hydropower. Numbers show that in 2016, half the wage sum of the private sector was made up by only 1-5 firms in 35 municipalities. In 10 municipalities, whereof Olofström is one of them, one firm alone made up more than half of the wage sum of the private sector, making them particularly vulnerable. The dominant firms in these municipalities were found in metal, engineering, machine, paper, and automotive industry (Tillväxtverket, 2016). Vulnerable municipalities tend to have high levels of industrial employment, a low population density and a small population size. The opportunity to commute to other municipalities for work decreases the risk of becoming a vulnerable municipality. However, this is not feasible or pursued in all municipalities. Tillväxtverket (2016) identifies two types of municipality with low levels of cross-border commuting: (i) sparsely populated places, with large distances and limited communications such as Kiruna, and (ii) relatively large (population wise) municipalities with a self-sufficient local labour market such as Borås.

Local and regional development

The challenges of local and regional development include problems that actors across the whole world encounter. It is an uneven process that creates various results as localities and regions deal with growth, decline, and adaptation (Pike et al., 2017). The Nordic countries are often portrayed as having developed similar institutional solutions within a number of political areas (education, health care, welfare, and social policy), and that this potentially can explain why their income gaps are smaller than other comparable countries (Bengtsson, 2013). Additionally, Denmark, Finland, Norway, and Sweden have all carried out reforms at municipal and regional levels in order to manage welfare missions (Tillväxtanalys, 2021). However, even though the Nordic countries might have similar goals within several political areas, they have some varieties in institutional arrangements (Bengtsson, 2013; Tillväxtanalys, 2021). In Denmark, Finland, Norway, and Sweden regional development is the responsibility of the regional government. However, in Finland the representatives at the regional level are only indirectly elected, whereas in the other three countries they are directly elected in general elections. Additionally, even though the regional level is responsible for regional development in these countries, the scope of duties as well as the mandate differ (Tillväxtanalys, 2021). This part of the chapter therefore elaborates on roles and responsibilities of regional development in Sweden. It should be noted that I use the concept *regional development* throughout this chapter. However, the word 'regional' in regional development does not refer to a particular geographical scale. Regional development can be studied at

different geographical scales, including the local level such as a municipality, city, town, or settlement (Hermelin & Rusten, 2016).

Changing responsibilities

A localisation policy (what we today would call regional development) was introduced during the 1960s in order to support struggling localities characterised by an unmodern industrial structure (Alvstam, 1995). An example of how the Swedish state has tried to support struggling regions was the parliament's decision in 1983 to reduce social security fees for companies within mining in Norrbotten (benefitting, e.g., Kiruna). In 1990, it was extended to the whole of Norrland's inland and for the coming 10 years (Alvstam, 1995).

With Sweden entering the EU in 1995, both the content and the organisation of regional development underwent a large transformation as regional actors were given the main responsibility for it (Hermelin & Rusten, 2016). With this, previous Swedish strategies aimed at regional redistribution, were to a large extent replaced by development policy aiming at creating dynamic processes and generating bottom-up growth in all regions (Hermelin & Rusten, 2016). To create growth and employment on local and regional levels across Europe, the EU cohesion policy is the most important investment tool. Its aim is to decrease regional differences and inequalities and it constitutes of one third of the EU's total budget framework. The cohesion policy is implemented through different structural and investment funds such as the European Regional Development Fund and European Social Fund (SKR, 2023).

The EU has played an influential part in the growing formation of regional bodies across Europe (Hermelin & Wänström, 2017). As a part of this decentralisation process, two Swedish regional bodies were formed as an experimental initiative around the turn of the millennium: Region Västra Götaland (including Borås) and Region Skåne. They were given regional development as a responsibility. Since then, additional former county councils (landsting) have been rebranded as regions and been given regional development as a new responsibility. As of 2019, all 21 regional governments are responsible for regional development. Region Norrbotten (including Kiruna) was given the responsibility in 2017 and Region Blekinge (including Olofström) in 2019. Before the regions, the county administrative boards (Länsstyrelserna) worked with regional development. A central difference with moving the responsibility from the county administrative boards to the regions is that the regions have the right to take their own initiative as they consist of elected officials and are self-governing, whereas the county administrative boards are the national level's extended arm around Sweden. Thus, the formation of regional bodies involved a political *decentralisation*, where responsibilities for strategies and initiatives within regional development were *delegated* (Pike et al., 2016) to sub-national governments.

Nevertheless, the role of the national government in this aspect remains important and the national parliament decides on overarching goals of regional development. It has slightly changed over the years from regional equalisation and development (1995-2002), via regional development (2002-2008), regional growth (2008-2020), to regional development (2020-) (Tillväxtanalys, 2021).

The role of the regional governments

The main responsibility of the Swedish regional governments is the healthcare system. However, they are also responsible for public transport and regional development. The intention of giving regions responsibility for regional development is to have a clear democratic anchoring of the work. Nevertheless, it is steered from the national level through the Law on regional development responsibility (SFS 2010:630), the Regional growth work ordinance (SFS 2017:583) and the National strategy for sustainable regional development in the whole country (Regeringen, 2021). Furthermore, the national level steers the regional level through government approval documents and funding. Additionally, regions must align with the direction of EU's cohesion and growth policy, as well as other national policies (Hermelin & Wänström, 2017).

Regions are to compose and fix regional development strategies, goals, and priorities, decide on the use of funds, evaluate, and report back to the national government. Additionally, they are to collaborate with municipalities and county administrative boards. This means that the role of the region is to lead a regional joint process, for which consensus and trust are needed. They work with and through other actors such as the municipalities. However, the regional leadership is conducted without any formal means of power or traditional ordering (Hermelin & Wänström, 2017; SKR, 2021) and there are no instruments for dealing with conflicts between local and regional levels (Hermelin & Wänström, 2017). This is noteworthy considering the importance of the responsibility at hand. The system has been criticised by the Swedish National Audit Office (NAO) for its lack of clarity with respect to roles and responsibilities, insufficient long-termism (with its focus on short projects), and weak holistic perspective on national government steering and organisation of funds, leading to less efficient regional development (Riksrevisionen, 2022).

The work in regional development is financed through three main sources. Some funding is applied for in competition with other regions and actors, and some is given based on territorial conditions.

- Two-thirds of the regional bodies get more than half of their funding for regional development from the *EU,* through the European Social Fund (for competence supply and labour markets), European Regional Development Fund (for entrepreneurship, research, and development), Rural development programme and Interreg programme (for cross-border initiatives) (SKR, 2022).
- The *Swedish state* provides compensatory funding based on regional conditions. The four most northern regions get most funding/capita. This is regulated in the state budget and distributed through a government approval document. The state also provides funding for research and innovation through Sweden's innovation agency (Vinnova), the Swedish Agency for Economic and Regional Growth (Tillväxtverket) and the Swedish Energy Agency (Energimyndigheten). This is applied for in competition and approximately 70 % of this funding is geographically concentrated in the three largest regions with strong HEIs and large populations (SKR, 2022), i.e., not in vulnerable regions where innovation and entrepreneurship might be highly needed.
- Finally, *regional governments* can use parts of their own tax revenues for regional development. The amount is determined by the regional assembly.

The large dependency on external funding, the need to align with external policies, and the lack of instruments for operational regional development makes this work more complex than other regional duties (SKR, 2020). Nevertheless, regional bodies' work with regional development is only a small part of the work done to promote the development of regions. Municipalities, the non-profit sector, HEIs, and governmental authorities, among others, contribute to developing regions and businesses. Although Swedish municipalities lack the regulated responsibility for regional development, their closeness to firms operating in the localities and their instruments to influence development make the local level highly interesting for studying the influence of agency.

The role of the municipality

The Swedish municipalities have undergone two major municipal fusions, one in the 1950s and one in the 1970s. Before that, municipalities were relatively small, weak in resources, and had few civil servants. This meant that the local politicians had larger areas of responsibility. With the fusions, municipal resources increased. They were also given a considerably expanded mission, in particularly within the area of welfare (Hermelin & Wänström, 2017). Today, Sweden has 290 municipalities,

ranging in geographical and population size. Municipalities in the northern part of Sweden are generally larger in geographical size, whereas population is concentrated to the southern half of Sweden. More than half of Sweden's 10,5 million inhabitants live in the 33 most densely populated municipalities and is thus very concentrated. Municipalities share the same areas of responsibility, yet vary in population size from 2,400 inhabitants to 979,000 (SCB, 2022).

The regional governments might have the responsibility to work with regional development, yet many of the instruments (resources and areas of responsibility) for operationally working with development are tied to the municipalities. The Swedish municipalities are self-governing and steered by directly elected officials. The self-governance is constitutionally protected, as is their right to tax their residents through income tax. Furthermore, the Planning and Building Act (SFS 2010:900) gives them the responsibility, as well as the monopoly, over town and country planning (Tillväxtanalys, 2021). However, working for local growth and development, and running subsequent local policy work, is not a regulated assignment for municipalities. Yet, they have responsibilities for several tasks that clearly influence local firms such as planning, building permits, environmental supervision, and liquor licenses (Hermelin & Rusten, 2016). In spite of both municipal and regional self-governance, national steering has increased in both range and degree of detail over the last few decades within in a number of political areas in order to create more equal conditions for all residents (Tillväxtanalys, 2021).

Since the 1980s, the national expectations of municipal engagement in local growth have increased (Hermelin & Trygg, 2018). Compared to municipal responsibility where the tasks and areas of responsibilities are clearly regulated (such as welfare service, physical planning, etc.), regional development on the municipal level continue to be unregulated and vague. Yet, expectations from the national level remain high and real (Hermelin & Trygg, 2021). The ideal that various sub-national actors shall engage in regional development has also motivated more to engage in development interventions (Hermelin & Trygg, 2021). Apart from their regulating role towards local firms, municipalities can mainly influence local development through public service, education, municipal infrastructure, and work cohesively to gather actors that promote development. To some extent, they can also influence issues like infrastructure for digital communication, human capital, and attitudes and preconditions for entrepreneurs, the local labour market, and a diversified business life (Hermelin & Trygg, 2018). Although cooperation across municipal borders on issues like development and growth could greatly help smaller municipalities to build capacity, this is rarely done (Hermelin & Trygg, 2018).

The municipalities are in many instances on the frontline of regional development, having closer contact with firms, then other political-administrative levels. In a survey sent to municipal heads of economic development (62 % response rate), Hermelin and Trygg (2018) found that (i) contact-making work with local networks, organisations and firms is a central component of municipal development work,

(ii) that the view on development and growth work has widened, which puts pressure to cooperate across departmental boundaries (such as urban planning and competence development), (iii) and that their work differs between geographies. Municipalities, which are dependent on their own labour markets (Medium-sized towns, Small towns, and Rural municipalities) tend to be more active in regional development work than commuting municipalities (Hermelin & Trygg, 2018). However, there is a geographical mismatch for municipalities since the effects of regional development can spill over territorial boundaries as labour market regions can be larger in size. Additionally, administrative boundaries rarely match the geographical extent of firms' networks (Hermelin & Rusten, 2016).

To summarise, regional governments have the responsibility for regional development yet little formal instrument to implement it. They are dependent on EU funding and other regional and local actors to implement their strategies. The municipalities, on the other hand, have many of the instruments required to influence development yet are not formally responsible for doing so.

6. Three places in change

This chapter outlines the three case studies and elaborate on their long-term development with key phases and critical junctures. It gives the full description of the cases, and not just the selected parts that have been presented in the papers. To fully comprehend local agency in the cases, the full picture with its flora of actors must be considered. Every case study is concluded with a summation of key changes and related agency expressions (section "New futures in…") as well as which conditions have been of importance (section "Conditions influencing agency"). The chapter starts with the case of Olofström and is then followed by Kiruna and Borås.

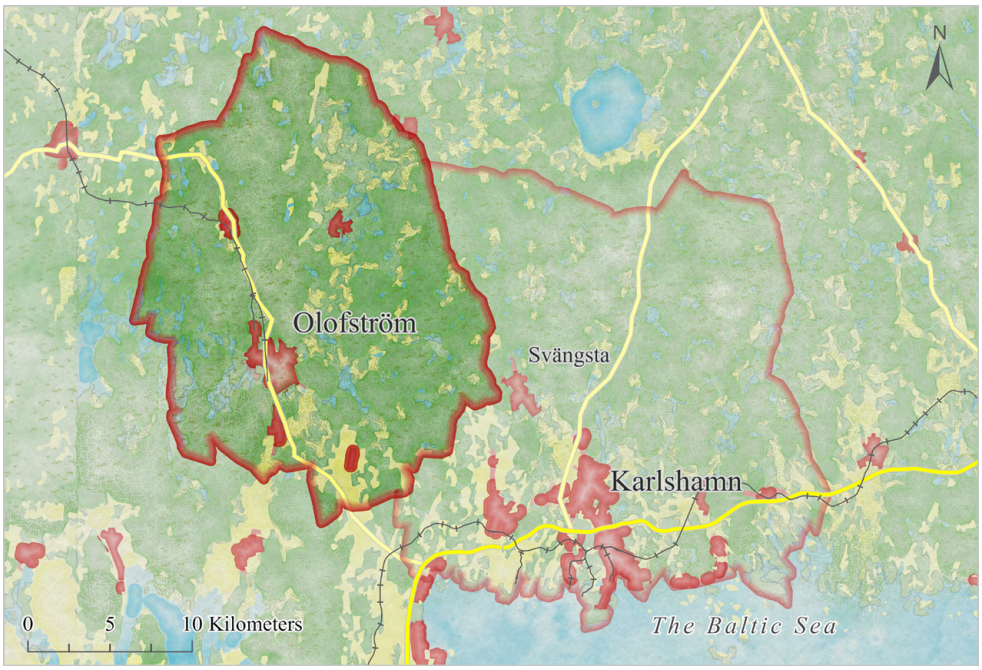

Figure 8: Olofström municipality together with adjecent Karlshamn municiaplity.
Map data: © Lantmäteriet, 2023. Map design: Linda Stihl, 2023

Olofström

Olofström municipality is located in south-eastern Sweden in the regional body of Blekinge, with a small population of 13,500 inhabitants. Even though the region of Blekinge is not that far from the Öresund region (with cities like Helsingborg, Lund, Malmö, and Copenhagen), it is still perceived as quite remote. The railway traffic connecting Blekinge with Malmö follows the coastline, and therefore does not reach Olofström, neither does the motorway E22 (see Figure 8). Olofström is situated, together with four other municipalities in the administrative body Region Blekinge (see Figure 9). The geographical boundaries of the case study are equivalent to Olofström municipality.

Figure 9: Administrative and functional divisions in Region Blekinge.
Map data: © Lantmäteriet, 2023. Map design:Linda Stihl, 2023

Olofström is considered a company town and has a long tradition of shaping and stamping metal and stainless-steel products. Initial production focused on household items, but in 1927 the core company at the time branched into car bodies (Addendi, 2010). Since the 1960s, Volvo Cars has produced car parts in the plant and has become a strong part of the local identity. Many of Olofström's inhabitants have worked at the plant or knows somebody that did or does. It is a workplace where workers can stay, develop their skills, and make a full career. A few of the informants have done so and expressed it to be something very natural. Volvo Cars has been the motor of the local economy and several firms have spun out of Volvo, especially during an outsourcing phase in the 1990s (Informant O4). Volvo as a

local ‘brand’ has stood for stability and continuity. Several of Volvo Cars suppliers can be found near the plant. The core firm draws labour from the surrounding municipalities and based on the commuting patterns, Olofström share labour market region with adjacent Karlshamn, where the Volvo Cars factory (in Olofström) is also the largest private employer.

The automotive industry in Sweden had a breakthrough after WWII and expanded quickly, with SAAB and Volvo as the dominating firms. In 1970, Volvo was Sweden’s largest firm, in terms of number of employees (Schön, 2014). The automotive industry continued to grow during the 1980s and Volvo, just as other large industrial firms (such as AGA, ASEA, Ericsson) expanded their innovation activities. The 1980s was also a period when large industrial firms started merging and during the 1990s it intensified in mature industries like the automotive industry (Schön, 2014). First, Ford Motor Company bought Volvo Cars in 1999 and then in 2010 it was bought by Geely Holding. Production volumes and productivity was kept high within the industry up until 2007.

The Volvo Cars production plant in Olofström is part of a global production network. Since the 1970s, they no longer produce complete car bodies. Instead, they supply two plants in Europe, and to a lesser extent also plants in the US and China, with stamped body parts such as structural details (e.g., crash cages) and skin panels (Informant O4). The press lines, consisting of several dyes, are expensive and very heavy. Additionally, they require much skill to operate, taking up to 5 years to learn. The oldest press lines in Olofström dates to the 1950s and 1960s. As they are written off in accounting, they are cheap to run (Informant O4). This was stressed during interviews as an important factor for keeping the factory in Olofström, and for adding new press lines there.

Tracing development in Olofström

The automotive industry is *the* industry path in Olofström. In the labour market (which also includes Karlshamn municipality with 32,500 inhabitants), statistics emphasise the importance of the industry. Manufacturing of motor vehicles, trailers and semi-trailers (industry code on 2-digit level) was the largest industry 1990-2000 and 2010-2015 in terms of number of jobs. Between 2000 and 2010, it was only barely overtaken by jobs within Health and Social work. However, the automotive industry is also volatile. During 2000-2005 and 2010-2015 it was the most job creating industry (in terms of absolute numbers of jobs) in the labour market. Yet, in 1995-2000 and 2005-2010, it was instead the most job destroying one. Overall, the numbers of jobs within the industry code shrunk from 4487 in 1990, to 2912 in 2015 (SCB, 2018).

Three main phases were identified during the study period 1990-2019. The phases where delimited by critical junctures related to the global financial crisis in 2008.

First, the long period leading up to the crisis in 2008, then handling the crisis in 2008-2010 and finally, the period after the crisis (2010-).

Period leading up to the crisis, 1990-2008

In 1990, at the start of the study period, more than 80 % of industrial workers in Olofström worked at Volvo Cars (Alvstam, 1995). Despite being a relatively small and tight-knit municipality, dialogue, and collaboration between firms or between industry and the municipality was minimal in the period leading up to the financial crisis in 2008. Their actions and activities ran in parallel, and Volvo Cars provided Olofström with its technical competence. The period before 2008 is characterised by reproductive agency and the municipality's unspoken mandate of managing and maintaining the industrial legacy of the automotive industry, being cognitively, functionally, and politically locked-in. Informant O22 (in-migrant entrepreneur in supplier firm) described residents in Olofström as "scared of change", and that the town was a typical company town.

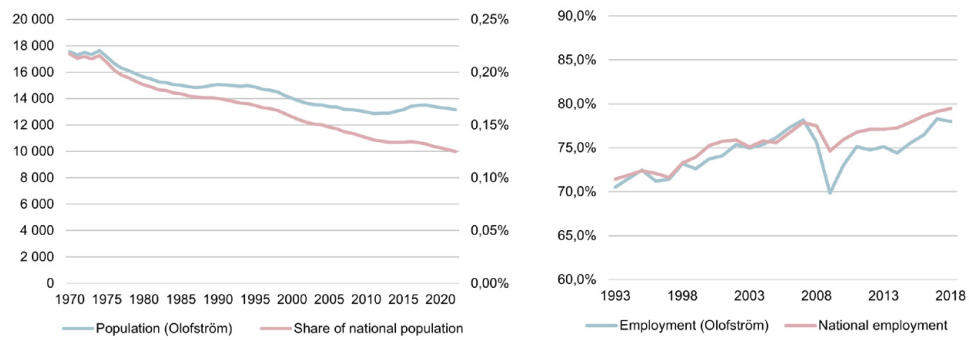

Figure 10: Changes in population and employment (aged 20-64)
Source: SCB (2023a); (SCB, 2023c)

The population has shrunk gradually from its peak in 1970 with 17,500 inhabitants (see Figure 10). For a long time, the municipality just adapted and downsized their services. There were no actions taken to change or transform the industrial path or to diversify the local economy (Informant O5). The gradual population decline, which followed general urbanisation trends, was in the end a trigger for change around the year 2000, when the population was down to 14,000. By then there was a high negative stress on local government finances. The ruling party (Social democrats) appointed a new 'kommunalråd' (the chair for the municipal executive committee) with the task to balance the municipal budget, which was losing 10-15 million SEK annually, due to the shrinking tax base. At that point, there was a general agreement in the Municipal Council that something had to be done to fix the budget. With the change in leadership, fresh eyes came in which were less tied to previous networks and debates, and that were able to perceive new futures and

propose alternative ways of doing things. These two conditions coming together at this time and place, created opportunities for place-based leadership as well as institutional entrepreneurship, which resulted in two outcomes: (i) decreasing municipal costs which helped to turn the economy around during the coming years (ii) and the new political leadership strengthened cooperation over political party lines and built new networks (Informant O11). The chair had no old pet projects to protect: all old deals where off. The budget had to be cut with 50-60 million and the chair had to bargain with the national government to get temporary loans. The Social democrats were not in majority locally at this time and the chair therefore had to cooperate over party lines. These new collaborations proved important when crisis hit a few years later (Informant O11). The political leadership also built trust in the community, and despite a local tax raise in 2005, the Social democrats won majority in the 2006 election.

In 2006, the regional government articulated that the strong dependency on a single large firm in Olofström was a concern (Region Blekinge, 2006). Yet, at the local municipal level, the regional report did not seem to trigger any changes. The ties to the core firm were too strong and therefore perceived impossible to question or break at the local level (Informant O11; O15). It was possible to question the dependence on regional level, but at local level, raising the concern was met with "What, do you not believe in Volvo?" (Informant O15). Interestingly enough, the two changes in ownership were not mentioned by informants as critical junctures. Despite having become a global company, the firm is described as something local, indicating its strong local embeddedness.

Core industry at crisis, 2008-2010

The crisis in 2008 was described during the interviews as a global crisis, a financial crisis and as a crisis in the automotive industry. Whatever it should be called, it had severe effects in the local community, and exemplifies how actions taken far away can have substantial local effects and trigger local change agency. Over a few months, 1,000 jobs were lost in this small municipality, starting at Volvo Cars, and then trickling down to suppliers and local services. One supplier (Informant O22), explained how their firm had given notice to 40 % of their staff, following Volvo's production halt, and that the firm had survived thanks to that they also supplied products to an unrelated industry.

But far from all suppliers were producing for other industries as well. Before the crisis, 52 % of all job opportunities in Olofström were found within the automotive industry (compared to 3 % nationally). Additionally, 80 % of the exporting companies (products and services) in Olofström, where found within the automotive industry (Engström & Johansson, 2008). Therefore, when the crisis hit Olofström, it hit Olofström harder than e.g., Torslanda (Volvo-factory on the west coast near Gothenburg), where the industrial structure was more diversified and could absorb competences after job cuts. In Olofström, there were few other industries or sectors.

The crisis triggered the second phase. There is a clear before and after, and the dates of the big job-cuts are still vividly alive in informants' minds more than a decade later. The chair of the municipal executive board reached out to contacts directly after the news of layoffs were out. By utilising the trust that had been built during the municipal budget cuts in the early 2000s and through acts of placed based leadership, key actors were early on gathered to tackle the situation. The national government also appointed two regional lay-off coordinators to coordinate measures. Early in the crisis phase there were three focus areas; (i) to take care of people who had lost their jobs, (ii) to help companies, and especially Volvo, to keep as much staff as possible to not loose competences, but also (iii) help companies, and especially Volvo, to tackle the large competence loss they suffered when losing a large share of their work force. Volvo Cars turned inwards for 1,5 years to tackle their own internal problems and retracted from being the local leader (Informant O12).

To tackle the acute issues, a new local group (Fordonskomponentsgruppen, FKG09) was formed with members from 12 firms in the automotive industry (whereof Volvo Cars just had one seat at the table) and headed by Region Blekinge. To acquire funds for projects was experienced as a challenge. First, the funding announcement from EU was written in an economic boom (Informant O17). It therefore focused on smaller and weaker firms and did not cover firms with more than 250 employees (like Volvo Cars). Second, the funds required corresponded with a large share of what was given to the entire NUTS II-region (Skåne and Blekinge). The FKG09 group had, e.g., to compete over funding with a large-scale research infrastructure for Lund University (Informant O15). Through the work of FKG09 and the lobbying by local and regional politicians, they gained funds from the European Social Fund (ESF). The main focus for the project was to fill local knowledge gaps following the layoffs, yet during the cooperation and trainings the participating firms also shared much experiences and learning (Håkansson, 2011). This was a central shift. Before the crisis, Volvo Cars had almost a monopoly on competence development. FKG09 was followed by similar initiatives to secure and retain competences (ST11, funded by ESF) and projects targeting increased entrepreneurship (e.g., Entreprenörskap i Olofström funded by ERDF). The focus on competence also extended into building competence in new related areas like hot pressing (shaping thinner metal for lighter products, like electric vehicles) in order to be prepared when production would take off again (Informant O15; O19).

If the period before 2008 is characterised by managing or reproductive agency, the crisis phase is characterised by much more active use of agency and by a more diverse set of actors. Volvo used to dominate locally, but during the crisis when the Volvo branch turned inwards, they left more room for other actors to take part in setting the agenda. Local actors (supplier firms, politicians, and civil servants) started using their agency more actively. Additionally, regional government actors increased their local engagement. The chair of the regional government spent two days per week during this phase in Olofström to take active part in transformative work and

to build trust and bridge an historical east-west divide in Blekinge (Informants O11; O15). Nevertheless, reports (Engström & Johansson, 2008, 2010) from the regional lay-off coordinators give a picture of little support from the national level. This pushed a local revelation: that local actors have to build resilience and be prepared for external shocks themselves (Engström & Johansson, 2010).

Recovery and transformation phase, 2010-

By 2010, Volvo Cars were back on track in terms of volume (Informant O4). Nevertheless, the crisis triggered radical change in business as usual. Supplier firms and other businesses had previously worked in parallel and there had been few meeting points and networks between firms and between firms and the municipality. The core firm had set the agenda, while supplying local competences and creating stability. With the crisis, the dependency on Volvo Cars started unlocking in terms of cognitive and political lock-ins. Other possible futures were seen as possible. The layoff coordinators express in their concluding report, that the work had contributed to a common view on development and a shared picture of what needs to be done (Engström & Johansson, 2010).

To tackle the acute crisis, new formal and informal networks and collaboration had been formed. In the third phase, these are put to use as a way forward, to change the trajectory of the development path. Local actors took advantage of experiences from a previous crisis in Blekinge. The regional capital of Blekinge, Karlskrona, had undergone a crisis within telecom and in the marine during the 1980s, and had since gone through much transformative work (Informant O9; O15). A civil servant that had engaged in this transformative work, now worked as a consultant, calling himself a cluster architect. Through regional informal networks, dating back to the Karlskrona crisis, this non-local consultant was brought to Olofström to bring new ideas. The consultant acted as a *visionary* (Sotarauta et al., 2021) to support local change agency. In the consultant's report from 2010 (Addendi, 2010), it was acknowledged that Volvo no longer was the local motor it used to be, and that other local actors needed to secure development of knowledge and competences and to more actively engage in local development. Three main initiatives were suggested: (i) to actively push the issue of strategic technologies, (ii) to actively push for business development, and (iii) to actively engage in competence development and track new development paths (Addendi, 2010). Tracing development backwards, many seeds of change agency can be found in this report.

Prior to the crisis, the municipality had had too many different goals, impossible to meet with existing resources (Informant O19). When looking forward, the municipality decided they were too small for this approach. They needed to find their edge and focus on it. An overarching goal was set to create 1,000 new jobs within

Figure 11: Examples of projects (and main funders)
Initiated in Olofström to handle effects of crisis and build new competences.

manufacturing industries to replace the ones lost, over the span of 10 years (Project "Jobb till 1000"). Local civil servants started building capacity to apply for funds and worked within smaller delineated projects (like Entreprenörskap i Olofström and Kompetensare 2.0) (see Figure 11), towards the overarching goal. The municipality itself decided to invest 2,5 million SEK/year over the coming 10 years to support the work. This municipal long-term commitment was important for private firms to engage in the transformative work (Informant O3). A civil servant (Informant O3) described this as a courageous act by local politicians. That it was far from self-evident to invest in job creation and industry development, instead of the struggling and unemployed.

The consultant report from 2010 suggested that Olofström should form a technical strategy council ('Strategirådet'). This was initiated in 2012 by the municipality, within the framework of 'Entreprenörskap i Olofström'. With a triple helix in mind, it included eight technical firms, including Volvo Cars, representatives from cluster- and innovation organisations in Blekinge (Karlshamn and Karlskrona), and Blekinge institute of technology (BTH). The firms came from a broader set of technical and manufacturing firms, and none of them were competitors. Strategirådet was headed by a person who was originally from Olofström, but who had experiences from leading organisations and sitting on boards on a national level, and who came with respect, poise, and trust. One member (Informant 21) described the group of members as strong individuals, with courage, and the heart in the community. The climate and culture in the group was considered open when compared to FKG09, which had moved slower and been less open. The group was also more diverse than FKG09, both in terms of types of companies and in terms of gender and background. It was no longer only about the automotive industry. The purpose with the Strategirådet was to identify new growth areas outside current business areas and geographical areas, as well as to strengthen their competitiveness. This was to be done through finding joint points of contact, development possibilities, and new ideas and forms of cooperation. One example of a joint activity was to go to Coventry (UK), where an exclusive car manufacturer is found, to build new networks outside Volvo Cars and expand number of potential buyers of their products. Inspired by

developments in Karlskrona, Strategirådet later initiated a cluster initiative, TechTank, in 2015. By then 600 new jobs had been created over the past 5 years, of which 400 in Volvo Cars. The Volvo Cars plant also gained new hot presses in the early 2010s, which was important for their product development.

TechTank was initially funded as a 3-year ERDP-project. It gathered advanced manufacturing and technology companies and was headed by the municipal business company. TechTank was the result of a lesson from the crisis, namely that companies need broadened markets, technological developments, competence developments, and a future-proof competence supply. Additionally, future challenges need to be met together (TechTank, 2018). According to participating supplier firms, TechTank has raised the local competence level (Informant O22) and has proved a good value for money (Informant O21). Instead of paying for individual courses for their staff, members of TechTank pay a member fee and get access to a smorgasbord of trainings, courses, networking events, and conferences in collaboration with regional and extra-regional HEIs. When funding ran out, the cluster initiative had developed into a cluster organisation that survived on their own. As of 2021, Region Blekinge and its five municipalities share ownership over TechTank to help expand the cluster. It has approximately 60 member firms that together have 9,500 employees in Blekinge and adjacent counties (TechTank, 2023).

New futures in Olofström

The story of Olofström is a story of how all three types of change agency was suddenly triggered with the crisis in 2008 as a critical juncture. Place-based leadership was practiced, by the chair of the executive municipal board, by firm leaders, regional politicians/layoff coordinators and employees within Volvo Cars to join forces and tackle the new situation together. Institutional entrepreneurship was needed to start breaking the strong political and cognitive lock-in. A cluster architect, who was brought in from the outside, triggered this with his work in 2010. Innovative entrepreneurship by smaller firms was enabled when Volvo Cars took a step back, and when support structures like Strategirådet (followed by the cluster TechTank) was formed. By increasing the competence level together and pursuing new technologies, the cluster also helped breaking functional lock-ins. This stands in stark contrast to the long period before, which is dominated by reproductive agency and local actors' lack of perceived room for change agency. Back then, Volvo Cars was the powerful company who set the agenda alone. Although, Volvo Cars remain the core firm and a powerful actor, local power asymmetries have decreased. Other actors perceive to have agency and actively use it.

Political leadership played an important role in this development. The new chair of the municipal executive board (who had been chosen to clean up the local budget) could use her networks and the trust that she had been forced to build during the budget-cleaning period, since their party were not in majority. The chair of the

regional assembly, who was chosen to be one of the regional lay-offs coordinators, had previous experience in dealing with a similar crisis as a municipal governmental leader in a different place in Blekinge. This experience and the fact that both the local and regional leaders came from the same party, was also expressed as important in initiating change in trajectory and when joining forces to attract EU funding. The national level, run by the opposing party, on the other hand supplied less support than expected (Engström & Johansson, 2010). Nevertheless, in a small company town with a strong core firm and with a strong institutional memory, it is not enough with two political leaders steering in a new direction. The cognitive lock-ins were loosened for a wider set of actors, as well as the community. It was locally allowed to discuss and perceive other futures. Through existing networks and previous experiences, an external consultant was brought in. The outsider showed that other futures were possible and wrote a strategy that was delivered to the municipality. This strategy was anchored in the local political landscape and most of the projects and networks developed since 2008 could be seen as a step on the ladder of creating a full functioning cluster.

Table 5: Main new path developments in Olofström

New path development	When & what	Type of change agency	Who	Enablers
Path upgrading (renewal)	2013-2014, installing hot presses to allow for pressing thinner metal	- Innovative entrepreneurship	- Volvo Cars	- Investments from Volvo Cars
Path diversification (related)	2015, launch of TechTank to increase cooperation and branch into new markets. Suppliers gaining more power locally.	- Place-based leadership - Institutional entrepreneurship - Innovative entrepreneurship	- Core firm, suppliers, other manufacturing firms, - Municipality	- Networks formed since budget crisis in 2000. - Institutional change, guided by a non-local consultant. - Funding from ERDF, the municipality and Region Blekinge
Path diversification (unrelated)	In progress, cluster initiatives within tourism and food production	- Place-based leadership	- Municipality	- Active municipal business cooperation - Success of TechTank

The crisis in 2008 triggered a lot of change agency, but in terms of triggering new development paths (see Table 5), the regional development has so far been less successful in Olofström. After the crisis years, there were investments made in new press lines, hot presses, which ensures that Volvo Cars can shape and stamp metal

also for electric vehicles. Competence development through the cluster has also targeted this technology development. Two different types of diversification processes have further been initiated. Related to current manufacturing, the establishment of TechTank is a step in diversifying the growth into new geographical areas and give suppliers alternative customers. The network has materialised into e.g., joint competence development and a sales trip to Coventry, UK. If suppliers have managed to lose their dependency on Volvo is however not clear. TechTank is described as a success locally. The cluster is growing in number of member firms and Region Blekinge's recent engagement as co-owner has locally been interpreted as a proof of TechTank's success. At the same time, some of the informants questioned the success and stated that many of the suppliers might have intended to expand into new markets. However, they became dependent on Volvo Cars again as soon as the core firm increased their orders again. This points to that lock-ins might have been loosened, but not broken.

The local business cooperation has further tried to initiate cluster networks within tourism and food production. During the interviews in 2018-2019, these were still in infant stages. As there has been a constant formation phase in creating collaboration, networks, and direction since the crisis in 2008, it can be so that the timing of the study is too early to identify new path development. Olofström has so far experienced a capacity building phase with the intention of making the region institutionally thicker.

Conditions influencing agency

Building on the literature on regional development in old industrial regions, Table 6 outlines how the different conditions have influenced agency expression in the case of Olofström. The influence of the conditions is also further explored in Paper 1 (Rekers & Stihl, 2021), where Olofström is compared with the adjacent Karlshamn municipality.

The conditions with the largest influence on agency in Olofström are tightly knit together. The size of the core firm and its dominance has over decades developed a company town culture. The large size of the core firm in the small community and the local culture have created a local power asymmetry. The skewed power and the core firm's continued presence encourages reproductive agency and discourages alternative futures. When the lock-ins were loosened after crisis, local endowments continued to shape new perceived futures in similar directions, as the previous. Change agency was used to alter current trajectory, yet it was altered into a similar upgraded version of itself. What is different is however that the local power asymmetries seem to have decreased, which allow more local actors to take part in the regional development and that local actors, who used to work in silos, now collaborate more.

Table 6: Conditions influencing developments in Olofström

Conditions	Influence
Previous and current paths	• *Type of industry*: The automotive industry is capital intensive and have large sunk costs. This was used to explain why Volvo Cars have remained in Olofström. Some of the press lines dates back to the 1960s. It was however not used as an explanation to the little new path development. • *Ownership* and *size:* The change in ownership of Volvo Cars did not trigger any change agency or changed agency patterns, even though the firm became foreign owned. The size of the firm, as well as it being the only large firm, however matter for agency. The size of Volvo Cars creates local power asymmetries both in terms of agenda setting and in terms of the low need for suppliers to find other customers (before crisis). This constrains change agency among other actors. Although its dominant size remains, the crisis phase, when Volvo Cars turned inwards, shifted the power balance to become more equal. • *Endowments:* Local technologies, skills and competences was an enabler for suppliers when they looked for new customers. They looked for new customers within the automotive industry, yet their skill set could be used in other sectors. Informant O3 exemplified with that they could just as well shape and stamp metal for fridges.
Negative lock-ins	• Olofström experienced *all three lock-ins* before crisis. Reproductive agency by all local actors had preserved the current path for decades. The crisis loosened all of them and enabled change agency. The cognitive and political lock-ins were particularly important to break in order for a larger group of local actors to be able to start perceiving new futures. Although, Volvo Cars and their path upgrading have had pervasive influence on technical developments, the cluster organisation intends to decrease future functional lock-ins.
Local institutions	• *Institutional environments:* The company town culture has had a large negative influence on new path development. It has shaped a strong loyalty to the core firm and discouraged entrepreneurship. When breaking cognitive lock-ins, it enabled firms to challenge the local culture and for municipal government to support them. A non-local consultant also contributed by developing a new strategy for regional development. • *Institutional thickness*: Before crisis, Olofström can be considered institutionally thin. Following the crisis, the municipality and local firms have together worked to become institutionally thicker through their collaborations leading up to the creation of a cluster organisation. Together with regional and non-regional HEIs they have built local competences and are developing a regional innovation system.

Figure 12: Kiruna municipality.
Map data: © Lantmäteriet, 2023. Map design: Linda Stihl, 2023

Kiruna

Kiruna municipality, which is also equivalent to its local labour market region, is a vast geographical area, remotely located in northern Sweden. The geographical size of the area is the same as Slovenia (with 2,1 million inhabitants), yet it has a population of 22,500 (see Figure 13). Almost 75 % of the population reside in Kiruna town, making the rest of the municipality very sparsely populated. Kiruna is the most northern municipality in Sweden and is located in the Northern Sparsely Populated Area (NSPA) of EU. Its location is of an increasing interest for the EU from both geopolitical and economic perspectives, by being EU's gateway to the Arctic in the north and Russia in the east (OECD, 2017). Furthermore, Kiruna is located in Sápmi (covering parts of Norway, Sweden, Finland, and Russia), the land of the indigenous group Sami. To protect the grazing areas of the Sami reindeers, the Cultivation limit (Odlingsgränsen) was established in 1890. Kiruna is located above the Cultivation limit, and this means that no new property developments are to be planned on grazing areas (Näringsdepartementet, 2006). To enforce this law, the Swedish states own 80 % of the land in Kiruna municipality and the national government decides how it is managed. The municipality owns less than 1 % of the land (Informant 18).

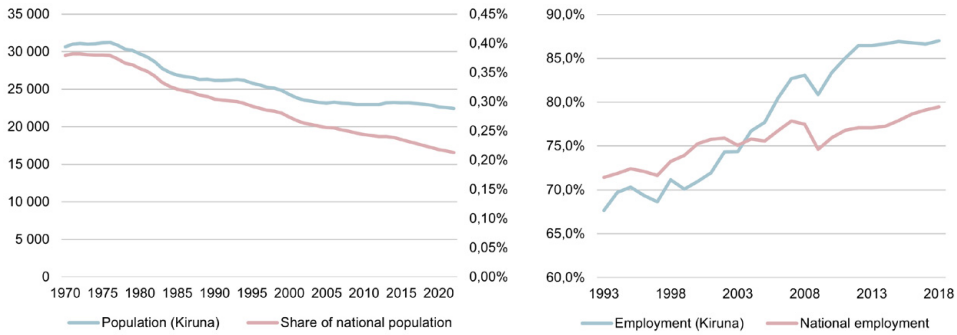

Figure 13: Changes in population and employment (aged 20-64)
Source: SCB (2023a); (SCB, 2023c)

Kiruna was established in 1900, as an iron ore mine was opened. Before that, the population in the area was small and consisting of Samis and people working with forestry in villages to the east. The mines in Kiruna and adjacent Malmberget (Gällivare municipality), the railway (Malmbanan) passing Kiruna between Narvik (Norweigian coast) and Luleå (Swedish coast) and the first Swedish hydroelectric plant in Porjus (Jokkmokk municipality) (see Figure 14), are all examples of large infrastructures investments made around 1900 to invest in industrial development that would gain the whole of Sweden. The town has grown as a company town, and the strong relationship between the core firm and the municipality was discussed in several of the interviews. The relationship between the company and the municipality was described as a *marriage* (Informant 7), in their intertwined dependencies. A common view among residents is that when times are good for the mining company, they are good for Kiruna (B. Nilsson, 2009). On the other hand, during bust periods, a damp blanket is placed on all industries (Informant 2). Downsides of the local company town culture has been a negative attitude and suspiciousness towards entrepreneurship (Berglund, 2011; B. Nilsson, 2009). This has been a restraint to new developments (Informant K1, K4, K18).

After the opening of the mine, Kiruna grew fast and peaked in population size around 1975 with over 30,000 inhabitants (see Figure 13). With the steel crisis' effects starting in 1976, together with job-destroying technical developments in the mine, the population shrank to its current size of 22,500. During a few years around 1980, the staff at the state-owned mining company LKAB were decreased to almost a third. The population loss during the 1980s and 1990s prompted the demolition of 700-800 dwellings (Informant K5).

Figure 14: Region Norrbotten and its municipalities.
Map source: © Lantmäteriet, GADM. Map layout: Linda Stihl, 2023

Traditionally, there has been no opportunities outside mining, yet this has changed (Informant K2). Today, Kiruna has four base industries: mining, tourism, space, and construction. The main industries are all connected to the geographical place and the resources that can be found there. Additionally, most stories (in some way or another) lead back to the iron ore extracted a stone's throw away from Kiruna's (former) town centre. After extraction, 75 % of the processed ore is shipped by train to Narvik in Norway, as this is the closest ice-free harbour during winter. The downhill skiing resorts by the border between Sweden and Norway has its roots from the custom officials, who used to ski while waiting for the ore trains. The entrepreneur behind today's most famous tourist attraction in Kiruna, the Icehotel, also came to the Kiruna to work with iron ore before shifting path. The third industry, space, came to Kiruna to be close to the arctic and study the aurora/northern light in 1957. Space activities today include research, higher education, state companies and state agencies, including the space base Esrange. This launches both Swedish and international rockets and balloons. Finally, a fourth industry is growing, namely construction. Due to land deformations, stemming from the underground mine, Kiruna town centre and 6,000 inhabitants are currently moving to more stable ground. The town move has influenced all other developments during the last 20 years. This is evident in the interviews, in the landscape and the economic development.

When considering its influence, an additional central industry is reindeer husbandry conducted by the Sami's. It is a small industry in terms of employment and turnover,

yet it is an important carrier of identity for the Sami population. It is protected by reindeer husbandry acts (Rennäringslagen, 1971:437 and Rennäringsförordningen 1993:384) and through geographical areas of national interest. Locally, this constrains economic activity of other industries and creates local conflicts.

Tracing development in Kiruna

The tracing of development in Kiruna is not as coherent as the process in Olofström. There are multiple industries, but still few and separate enough to trace individually. Although the study period starts around 1990, as the other cases, the tracing requires a longer period since the steel crisis in the 1970s is of such a great importance for the subsequent development. This section will first address the overall, central critical junctures (within different industries) for the whole municipality (in chronological order), before looking closer at the individual industries.

The first critical juncture, that have shaped an entire industry the subsequent 30 years, is the *establishment of the Icehotel* in Jukkasjärvi in 1989. Inspired by an ice sculpture festival in Japan, a single entrepreneur, who had moved to Kiruna to work in the mine, started building the company using innovative entrepreneurship. The motivation was to extend the tourism season into winter. The innovation was simple: it is a hotel built by and artistically decorated with snow and ice. It is rebuilt every year together with different artists. The establishment was met locally by much opposition as it challenged the local culture, both in terms of entrepreneurship itself, and its product (Informant K5, K12). The Icehotel is an exclusive and expensive experience. It did not sit well with the local Social democratic values of the 90s, who deemed that developments should be available for all and who used reproductive agency to resist change (Informant K18). Through a sneaky press release sent to 1600 newspapers in the early 1990s, showcasing Absolut Vodka bottles on a bar of ice, the Icehotel (as planned) caught the attention of the non-local Absolute Vodka. In 1994, they started a 20-year long marketing collaboration. Absolut Vodka got fantastic, icy pictures and all of them were stamped with "Icehotel". This brought world celebrities to photoshoots in the small town of Jukkasjärvi, while spreading the word of the hotel to the world (Informant K12). It also created a prerequisite and a need for new firms acting as suppliers (Informant K8), selling complementing activities like dogsledding, horseback riding, moose safari, etc. This development has grown into an upgraded industry path targeting exclusive winter tourism.

The steel crisis (1976-1983) made the local government realise their dependency on the mine and during the early 1980s there were local projects aiming for diversification (Nilsson, 1988). But residents remained reluctant to entrepreneurship. A second critical juncture is therefore the *reorganisation of local business support structure* in the 1990s aiming at engaging firms and developing industries. Over the course of a few years, three new organisations where created. The municipal tourist

board was replaced by a new tourism organisation (Kiruna Lappland), incorporating the five largest tourism actors (hotels, downhill skiing resorts) as a way for the municipality to engage the local firms in the development of tourism (Informant K12, K18) through place-based leadership. The municipality closed their own department for economic development and outsourced activities related to new entrepreneurship and business support to a membership organisation for entrepreneurs (Företagarna). This happened in a period when there was an increasing demand from the EU on municipalities to work with business development (Berglund, 2011; Företagarna, 2011). And third, LKAB and the municipality started an additional business support organisation together with two other firms in 1996 (mainly funded by LKAB). This was called Progressum and was aimed at developing the engineering industry. With good intentions of engaging firms to develop Kiruna's business life, the reorganisations directed by the municipal government redistributed power and responsibilities. In the case of tourism, Kiruna Lappland has also been described in interviews as important for the growth of small and medium-sized firms (SMEs). Yet, the reorganisation also meant that the municipality retracted from their responsibilities, and no local actor shouldered the overall responsibility of regional development (Informant K1, K4). In some instances, this created uncertainties over roles and responsibilities as the process that was initiated by place-based leadership found itself without a leader. In 2005, the municipality restarted their own department of economic development. However, this led to further ambiguities over roles and responsibilities and generated conflicts, with now four organisations acting in overlapping areas.

A third critical juncture are investments in space activities in the 1990s and the early 2000s. Both the municipality and the Swedish state invested in space infrastructure, research, education, and higher education (Backman, 2015; Kiruna kommun, 2002; Utbildningsdepartementet, 2000). From the state side, this was done as a compensation for Kiruna losing military jobs as a regiment was closing (Lapplands jägarregemente, I22). By building on existing research and education, the idea was that investment would prompt (i) a new belief in the future locally and (ii) that the infrastructure together with a new triple helix would create new opportunities for business development related to space activities (Utbildningsdepartementet, 2000). In 2003, the municipal government decided on a four-year strategic economic development plan. In that (Kiruna kommun, 2003), the space industry is highlighted as the industrial path with the highest potential in their aim of diversifying the local economy. Its high potential is explained by its level of progress at that time as well as its potential of bringing investments from non-local actors (both nationally and internationally).

A fourth critical juncture, that had its start in 2003, but had little effect until 2011, is the *town move*. Around 2003, LKAB and the municipality met twice a year to discuss areas of coordination and collaboration. This was also a period with low expectations of internal or external shocks. The municipality wrote in their comprehensive plan

the year before that they were coming out of a period of large municipal investments related to the mine, and that they were expected to enter a 15–20-year window of opportunity when they did not need to support the mine. Instead, they could focus on diversification. “During this period, it is absolutely crucial that the strategies, which aim at a more diversified and independent business sector from the mining industry, be implemented” (Kiruna kommun, 2002, p. 6). But at the very end of the autumn meeting in 2003, LKAB says “the town is cracking” (Informant K18). This meant that the complete town centre, including 6,000 inhabitants, would have to move. A communications officer sent out a press release about the news the following year (Halldén, 2004). Informants spoke very differently about this initiative. On the one hand, it brought a lot of national and international attention to Kiruna and the unique upcoming process. On the other hand, it came as a shock for the residents in Kiruna, who subsequently expected fast results.

The moving project is fully funded by state-owned LKAB, but for the municipality it is a highly complex and difficult process. Kiruna was built as a model town, and the municipality used to showcase their town planning and buildings as important strengths and opportunities for future development (Kiruna kommun, 2003; Sjöholm, 2008). Instead, they now had to fight the Swedish National Heritage Board to be allowed to demolish it. Informant K5 explained that constructing new buildings is not difficult, “it is everything else”. One central issue which prolonged the move for several years, was the issue of land. Since the town is located above the Cultivation limit, land is generally owned by the state and the municipality owns barely any land. In practice this meant that the municipality had to move its town centre, but that they had no land to move to and could not buy any. Informants involved in the move, give a unison picture of how they wanted and expected the national government to support the moving process. The need for support was both related to delimited issues like contacts with the Swedish Transport Administration, the Swedish National Heritage Board, the National Property Board, and the county board but also that the national government would take a holistic responsibility for the process involving their company and their authorities. However, the national government didn’t step in. Informant K9 explained that “the chair for the municipal executive committee cannot *negotiate* with the national government”. It is the national government that has the power. The National Audit Office criticised the national government in 2017 for neither giving LKAB, the municipality or other involved parties clear enough game rules or a clear division of labour. This was expressed to have prompted an inefficient process, with unnecessary risks (Riksrevisionen, 2017). For firms in Kiruna, the (so far) 20 year-process of the move have created uncertainties concerning growth opportunities (Öhman, 2019). For the municipality, it has taken focus away from regional development. Their ambitious 2003-2007 strategic economic development plan (Kiruna kommun, 2003) was never evaluated and a new plan has not been written since.

Finally, as explained before, Kiruna's overall development, or at least the experience of it, follows bust and boom periods within mining (B. Nilsson, 2009). From 2003, the commodity prices on iron ore have been on a generally high level, except for a period around 2008-2009, when the whole primary sector experienced times of crisis (Informant K1). The latter created a surplus of labour. However, this swiftly changed and in 2014/2015 there was a shortage of labour (Informant K14). This boom is contemporaneous with a national as well as local construction boom. With several industries expanding at the same time in this small place, there is an overall shortage of labour and a high employment rate (in national comparison, see Figure 13). Informants from various industries, described this as a central hurdle for development and that LKAB, with high salaries and good working conditions, are difficult to compete with, especially during the last 10 years (e.g., Informant K4, K12, K17). The interpath relations between the mining path and the tourism path is further explored in Paper 2 (Stihl, 2022).

The mining path

The mining industry is fundamental for the development of Kiruna and even with today's diversification, no other industry can compete in terms of employment or turnover. There are multiple mines and minerals that can be mined, but currently only one mining company (Luossavaara-Kiirunavaara AB, LKAB) is active in extraction and they extract iron ore from only one of their mines in Kiruna (the world's largest underground mine (Regeringskansliet, 2013)). LKAB, has the ability to mine other local mines when the commodity price is high enough. Additionally, there are additional firms in various stages of the permit processes and exploration of deposits with other minerals (such as copper and graphite) (Informant K8, K14). Although the legislation on minerals were changed in 1992 to open for more explorations (Tillväxtanalys, 2009), the mining permit process remains lengthy and complex. According to the Swedish Mineral Strategy, a large share of planned mines in Sweden are located in areas of high natural values and development must therefore be done in consensus with other industries (such as tourism and reindeer husbandry) (Regeringskansliet, 2013). Nevertheless, Swedish legislation concerning minerals, suggest that the mining industry should not be treated as other land exploitation, as it is not movable (Näringsdepartementet, 2006).

LKAB is state-owned since 1957 (Hägg, 1993), which means that it receives its missions from the national parliament. The Minster for Business and Industry is responsible for the different state-owned companies in the national government. LKAB is one of the most profitable companies for the Swedish state. The mine in Kiruna is important on a local and regional level in terms of job creation (Kiruna kommun, 2002), but due to LKAB's ownership and LKAB being the largest iron ore

company in the EU[4], LKAB's mines are also important on a national and international level. Iron ore can be found in two types in the world; hematite and magnetite, where magnetite is the rarer (only 10 % of known ore findings). The iron ore in Kiruna is magnetite of high quality, i.e., a high share of iron and its magnetic feature makes it easier to separate. The quality becomes better further down in the primeval rock (LKAB, n/a), thus, LKAB's main mine in Kiruna is placed underground since the 1960s. Today the main mining level is at 1365 meters below ground. This demands exceptional technological solutions and makes the ore expensive to extract and thereby sensitive to world market price.

As suggested by literature on the Resource curse, local, regional, and national economies that are dependent on the extraction of raw materials are expected to struggle more with diversification (Breul & Nguyen, 2021; Lashitew et al., 2020; Manzano & Gutiérrez, 2019), even though the volatile commodity market creates a stronger need for additional industries to improve resilience to external shocks. The fixed character of raw materials and mining being capital intensive, lowers the bar for national governments to intervene and support the industry development (Parker & Cox, 2020). Furthermore, high profits from the industry risk to make other industries appear as less competitive. This creates a negative symbiosis. Thus, other industries are weakened during boom periods, and when a bust arrives, the other tradable industries have often weakened to an extent that they cannot compensate for losses within mining (Auty, 1993). Resource rich economies also tend to absorb windfalls into their economies too fast and increase their spending commitment too much (Auty & Furlonge, 2019). This can increase effects of bust periods.

Mining towns may also, like company towns in general, create a particular culture that hinders entrepreneurship and new path development (Dale, 2002). In a study of four Norwegian mining towns, Dale (2002) finds four characteristic informal institutions, namely:

1. a mutual dependency between core firm and community (that also creates joint expectations),
2. collective norms, built on Social democratic values, the working class, solidarity, and union membership, that have negative attitudes towards entrepreneurship as well as an expectancy of state support or intervention if the mine would close,
3. being hierarchical and patriarchal,
4. a social identity that has been created and reproduced over generations.

[4] In 2013, EU used 25-30 % of the global production of metal, yet only produced 3 % of it. Sweden produces 93 % of EU's iron ore (Regeringskansliet, 2013). The EU commission is concerned with the strong dominance of a few countries on the commodity market (Commission of the European communities, 2008). Sweden is therefore encouraged to pursue further extraction as well as develop a strategy for accomplishing it (Regeringskansliet, 2013).

Similar characteristics can be found in Kiruna. Hägg (1993) finds more traditional gender roles in Kiruna compared to southern Sweden which can be explained by the dominating industry. Mining is traditionally an industry that employs men. Up until 1978, it was even prohibited for women to work below ground according to Swedish work environment legislation (Barck, 1999).

The mining path in Kiruna is distinctly shaped by the global steel crisis in the 1970s. Due to shortage of ore prior to the crisis, the Minister of business and industry had decided that LKAB should not seek new orders or customers. Instead, they should supply ore to a planned national steel plant project, Stålverk80 (Informant K15). However, this was never completed due to the steel crisis, and LKAB was left with no customers. They continued their production, but their type of product also became unmodern and, as such, less competitive on the international market. With no customers, unsellable products, and a high taxation of the inventory (that was valued higher than market price), LKAB almost went bankrupt. According to informant K15, LKAB was saved from bankruptcy after a few central individuals within LKAB managed to get the inventory value radically written down. The company was then forced to make radical changes. The CEO at the time, decided that they needed to reduce number of workers and change their production structure. Following the steel crisis, LKAB went from being a mining (extraction) company, to an iron-ore processing company. Research and technical developments, within a small in-house team were crucial. The development of a steel belt process simplified the process of transforming the large inventory into sellable steel. The development of the olivine pellet created a more competitive product. By processing ore into pellets (rather than selling fines, i.e., concentrated non-refined ore), LKAB could attain a higher price for the ore since pellets reduce costs in steel production. Informant K15 described this period as a time when the distance between company management and technical development team was close. It was possible to have a meeting with the CEO to pitch ideas. They would meet at the city hotel, and the CEO would bring in the drinking cart.

The technological development with pelletization led to large investments in new pellet plants in 1981 and 1995 (Barck, 1999). Technological developments aside, the crisis had pervasive effects in the community. Two thirds of the workers were sent home, which induced depopulation and a housing surplus. The mine in the adjacent village Svapavaara was closed. After being very engaged in community services and sports and leisure associations, LKAB retracted from taking extra responsibilities in the local society. In 1983 alone, 2200 workers were dismissed, which was about half of the workers at LKAB in Kiruna municipality. The unemployment became higher than national average in Kiruna during the 1980s (Hägg, 1993). However, the large investments in the mining industry (technological shift and a new main level in 1979) meant that when crisis hit the rest of Sweden in the early 1990s, Kiruna had a much lower unemployment than national average.

Large technical and infrastructure investments were described as critical junctures by several informants. Examples of this is new pellet plants in 1995 and 2008 and new main levels in 1995 and 2013. The different CEOs were described in interviews to have had very different characters that have permeated how the company has been run. LKAB has e.g., gone through a number of outsourcing and insourcing phases. LKAB is currently in an insourcing period (Informant K14). LKAB can keep higher salaries than the rest of the labour market and this creates shortage of labour in other firms and sectors. Furthermore, LKAB control their competence supply in several ways. They have their own program in the local upper secondary school. They also have collaborations with several universities (Informant K14, K15).

LKAB have several subcontractors locally and they estimate that they create 1,700 additional jobs locally and regionally (LKAB, 2016). They have high standards which pushes suppliers to improve and to compete (Informant K4). In this regard, LKAB can be seen as a sophisticated company in a Porter sense. Supplying to LKAB is therefore described as a good reference and a springboard to other markets or industries (Informant K4, K11, K17). Yet, informant K4 described how suppliers are reluctant to pursue new customers. "For as long as LKAB exists, they will not need to… Why go elsewhere?" (Informant K4). Although LKAB was criticised in some interviews for supporting sport teams and various activities in Luleå (where they have their headquarters) more than the equivalent in Kiruna, LKAB funds various projects in Kiruna to keep their strong local position (Informant K21). The large firm also act as a strong unified body behind the CEO, making LKAB's local agency very strong.

From the national government, LKAB has received a strategic mission to grow and be at the forefront, regardless of the commodity price. In collaboration with SSAB and Vattenfall, the company is currently developing fossil free steel. A pilot facility is built in Luleå. In Kiruna, LKAB are collaborating with Volvo and ABB on automatization and self-driving vehicles (Informant K14). The demand for iron in the future is expected to be higher than what recycling of metal can meet (Länsstyrelsen Norrbotten et al., 2015). The current main level in the mine in Kiruna is expected to be operative until 2033, but the ore body goes deeper, and further main levels are expected. Issues with working time to reach workstations and work safety pushes automation processes further (Informant K14). LKAB are also pursuing rare earth minerals in an adjacent mine.

The tourism path

Tourism in Kiruna is very place dependent, and is niched towards snow and ice, nature, hiking, the aurora (northern lights) and Sami heritage. The tourism industry has been present in Kiruna for over a century. The opening of the railway started bringing tourist to the area. The first luxurious train in northern Europe left Stockholm for Narvik in 1903. Due to its remoteness, the tourism industry is very dependent on transport infrastructure. The opening of the railway in 1903 was a

trigger for path creation. The Swedish Tourist Association built their mountain station in Abisko in 1903 and Abisko was for a long time the most internationally known tourist site in the municipality. Air traffic opened up the destination further when the airport was built in 1960 (Barck, 1999). Tourism in Sweden increased after the second world war due to increased vacation, car ownership and standard of living. For the first 90 years, the tourism industry in Kiruna focused on the mountains (summer-autumn), the midnight sun and the Sami. Early on, the tourism industry in Kiruna had the same challenges as they still face today: deficient means of communications and lack of number of guest beds (Eriksson & Wikström, 1961). Apart from the road to Norway opening in 1984 there has been little expansion of communication infrastructure over the last decades. According to the informants, Kiruna's tourism industry is 15-20 years ahead of other municipalities in northern Sweden. However, the other municipalities are catching up. With no star attraction (like the Icehotel) they have grown slower, but stronger together. Sweden is considered far behind Norway and Finland when it comes to tourism, especially in terms of transport which is central for tourism development in remote place (Informant K2, K4, K16, K20). Many of the tourists visiting Kiruna are international, and the lack of connectivity with international air traffic limits the number of visitors. To reach Kiruna from e.g., Asia, tourists need to go through Copenhagen and/or Stockholm, whereas tourist destinations in northern Finland have direct flight to Asia. With the deregulation of flight traffic in Sweden, the number of airlines that fly to Kiruna have expanded beyond SAS, but the stability of the air routes has been unreliable and fluctuating with demand.

Tourism is often seen as an important step in the fight of unemployment in more rural or declining areas (Lundmark, 2006; Tillberg Mattsson & Heldt Cassel, 2020). This is also the case in northern Sweden (Länsstyrelsen i Norrbotten län, 2008; OECD, 2019). It is considered a promising industry since it is labour intensive (with low rationalisation possibilities) and is considered to have low entry barriers (Lundmark, 2006). Nevertheless, entrepreneurship and innovation capacity are central in tourism development as a destination must be perceived to provide a new experience (Tillberg Mattsson & Heldt Cassel, 2020). For peripheral destinations this is particularly difficult since they must develop attractions with strong enough pull factors to overcome the friction of distance (Lundmark, 2006). Kiruna is the most prominent over-night destination in the whole of Region Norrbotten, with several landmark attractions. Kiruna account for 33 % of the overnight stays in the large regional body (Lundmark & Carson, 2020). The general seasonality of tourism paths, create a challenge for the industry to meet the hopes of impact on regional development (Lundmark, 2006). Their impact is also difficult to measure statistically since profits and employment within tourism is statistically recorded in various industries and sectors (at least in Sweden) (Lundmark, 2006).

After the steel crisis, the municipality realised that they were too dependent on mining and that the industrial base needed to diversify. Following this, two critical

junctures have occurred within the tourism industry: the launch of the Icehotel in 1989 and the reorganisation of the industry support structure during the mid-90s. This development is also analysed in Paper 2 (Stihl, 2022). The establishment of the Icehotel was described in the overall tracing of Kiruna's development. The owner of the Icehotel saw that there was no way of targeting mass tourism, due to infrastructure deficiencies. Icehotel therefore aimed for high quality, exclusive and labour-intensive tourism, i.e., a new customer segment. The launch as well as the collaboration with Absolut Vodka bear clear signs of innovative entrepreneurship. But considering the large local opposition that Icehotel met, and the impact it later had on the whole industry, the launch also should be considered as the trigger of institutional entrepreneurship. By needing activities from other local tour operators to make the Icehotel experience complete, the hotel encouraged entrepreneurship and formed informal networks with other operators. The geographical size and closeness were not considered to require formal collaborations (Informant K12). To live up to their customers' demands, Icehotel put demands of high quality on the other local firms, driving up their quality, customer base and attractiveness. The establishment of the Icehotel has had an impact on the entire tourism industry in the municipality, increasing customer base, promoting the Kiruna brand internationally and pushing local entrepreneurs to keep a high quality of their products.

As already noted, efforts to support a growing tourism industry also included the initiation of a membership organisation, Kiruna Lappland in the early 1990s. The reorganisation of the business support structure was intended to engage local firms in regional development. Today the group organises approximately 100 companies in the tourism industry and support smaller firms with product and business development. To develop this support, they have also applied and received regional development funding from both the EU and national bodies (see e.g., Kiruna Lappland Ekonomisk Förening, 2015). Although several informants spoke of the poor collaboration skills in Kiruna in general, there have been several collaborations between tourism firms during the study period. "Destination Kiruna" is one example of this, a formal collaboration started by several local firms together with Scandinavian Express in 1992 with the intention of targeting the MICE-market (Meetings, Incentives, Conferences, and Exhibitions). Over the years, there have been multiple formal and informal cooperation between firms, marketing the destination together to make a 'full' tourist experience. From 2005, Icehotel, Camp Ripan and Abisko (three of the larger tourism firms) have had marketing collaborations together to brand Kiruna as a unique destination abroad (Informant K19). Kiruna Lappland was described by the larger firms to be mostly important in the initial stages of firm development.

Following the growth of a tourism industry path targeting exclusive winter tourism, there was a new wave of innovative entrepreneurship around 2005-2010. These have mainly been located in Abisko and relates to the northern lights. For example, from 2007 the Aurora Sky Station gives an aurora experience from indoors and since

2011, Lights over Lapland run nightly aurora photo tours. The developments in Abisko have been driven by a few enthusiastic entrepreneurs. The institutional entrepreneurship, attributed to the Icehotel, have made it more generally accepted be an entrepreneur in Kiruna. A generational shift was also brought forward during the interviews as an example of changing attitudes towards entrepreneurship. Although the tourism path has grown with Icehotel as a trigger and the northern light developments as a critical juncture, the industry faces several challenges. There is a general shortage of labour (Informant K19), and the salaries in LKAB are considered impossible for tourism firms (and other industries in general) to compete with (Informant K6, K12, K16, K17, K19). Additionally, just as in the 1960s there is a shortage of guest beds. The delayed town move has also delayed expansion of additional hotels. The first hotel in the new town centre did not open until 2022 (and that foremost replaced the one in the old centre). Issues related to land and infrastructure are also reported as challenging for tourism firms (Öhman, 2019). The land issues relates both to the preservation of the landscape (threatened by mining) and co-existing in the landscape (e.g., heliskiing and reindeer herding).

The space path

Space research and space industry have grown since its start in Kiruna in 1957 with the establishment of Swedish Institute of Space Physics (IRF, initially called Kiruna Geofysiska Observation) with only a handful of employees. Today approximately 450 people are employed in space research, education, and industry. IRF was placed in Kiruna due to its location in an aurora zone. This created opportunities to study effects of hot plasma in the earth's environment (Hultquist, 1997). When the newly formed European Space Agency (ESA) looked for a place to build a rocket field in the early 1960s, Kiruna was picked as it had such a large 'uninhabited' area (Backman, 2015; Hultquist, 1997), not considering the four Sami villages who practice reindeer herding in the area (Backman, 2015). With the construction of the space base Esrange, an agglomeration of space activities was started. As of 1972, the state-owned Swedish Space Cooperation (SSC) runs Esrange. SSC, is just as LKAB, run by the Swedish Ministry of Enterprise and the Minister of business and industry. Besides Esrange, SSC provides advanced space services on the global market and conducts space related technical developments. They expanded their physical infrastructure globally around 2000. The state-owned Swedish National Space Agency is also located in Kiruna. The space agency is responsible for all state funded (national as well as international) space activities related to R&D. Educational programs in both upper secondary school and university level (connected to a university elsewhere) was started in the 1990s. Overall, this is a development path that involves many non-local actors and non-local funding.

Apart from the teaching and some local networks, space activities in Kiruna are more tied to external networks. The space research is highly specialised and to be able to secure funding, knowledge, and instruments as well as send rockets,

balloons, and satellites into space at a somewhat frequent pace, research groups from all over the world join forces (Hultquist, 1997; Informant K6). The planetary research, which is conducted at IRF, is a slow process and research projects can take 25-40 years to plan, launch, and analyse. This makes the internationally embedded networks important to keep. It also requires stabile and effective knowledge transfer within the organisation (Informant K6). Informant K6 exemplified with a current planetary project. The project was initiated a decade ago and launched into space in April 2023. The PhD Candidates who will work with the collected data was probably not born when the project was started. After launch, it will take an additional 8 years in space before the space craft reaches its destination and can start data collection. IRF does all their activities in-house for quality assurance, flexibility to make changes, and shortened delivery times. It does however put strain on what is possible in terms of size of projects (Informant K6). IRF's satellite Viking, which was launched in 1986, is regarded as a critically juncture. Its innovativeness increased the international reputation of Swedish space research (Hultquist, 1997) and IRF (Informant 11).

The municipality has taken an interest in space activities in order to diversify Kiruna. Inspired by developments in Silicon Valley, the municipality made some investments in the local space industry during 1979-1986. This broadened space activities into satellite technology and remote sensing (Backman, 2015). In 1992-2000 there were also municipal investments in higher education. This connects the space path not only locally, but also regionally to HEIs in Umeå and Luleå (Backman, 2015).

Yet, the space industry remains highly international in its networks. The actors and technologies are however changing (Informant 11). From having only state actors, private actors are increasingly engaging in space activities. ESA is also acting more commercially. The construction of satellites has experienced a recent technological shift. This involves faster assemblage, but also shorter lifespan of the satellites. Launching the satellites are however still a bottleneck in the process and a market area that SSC wish to pursue. For them to do so, funding from the state is required. When the interviews were conducted in 2020, the SSC just learnt that they would not get funding for it. This was changed in later national government budgets.

The space industry path includes a failed project. Between 2008 and 2012 there was much focus on space tourism and building Space Port (Informant K5, K12). A British company as well as a number of local actors from various industries were involved in the attempt to send tourists into space (K. L. Nilsson, 2009). However, the entry bar was too high in terms of price of product, financing, permits, and adaption to regular air traffic (Informant K5). A rejection from the municipality around 2014/2015 regarding required investments in the local airport was presented as putting an end to the project (Informant K12).

Figure 15: Buildings being moved in June 2017. Mine in the background.
Source: Linda Stihl

The construction path

As already explained, the fourth path was initiated in 2003 with the news of the town centre move as a trigger. However, it took quite some time before it took off in terms of activities and employment. The move has created multiple job opportunities within construction, planning, demolition, moving buildings, and groundwork. While doing so it has also created insecurities related to growth opportunities within other industries (Öhman, 2019). Lack of housing (Informant K3, K4, K5, K6, K8, K11, K17) and the subsequential lack of population (Informant K3, K5, K8, K14, K17, K19) was brought forward during the interviews as some of the most important constraints for regional development.

The town move would only be needed in case LKAB would build a new main level. They took the formal decision to build a new main level in 2008. By then, the work with the move within the municipality had been active for years. To move the town centre, a new in-depth comprehensive plan was needed to incorporate the risk areas. This work was initiated already in 2004 (Berglund, 2011). One informant (K9) questioned that the municipality had started this work before LKAB took their actual decision. K9 had searched for any formal statements from LKAB directed at the municipality regarding the move but found none before the 2008-decision. Informant K3, explained the sequence of events with that there was never really perceived any alternative for the municipality than to say yes and get to work. With that said, K3 did not think that anybody understood the breadth of the process when it was triggered in 2003. For land to

be ‘allowed’ to deform, new detailed development plans were needed to reclassify residential areas into industrial areas. This administrative work was also a reason to start the planning process early. However, the first visible result of the move where not seen until 2014 (Informant K9). As previously stated, the municipality owns practically no land and the national government should not sell theirs, since it is above the Cultivation limit. The negotiations between the municipality and the state authority that control state land, eventually resulted in that the municipality could purchase land. However, the long and difficult negotiations delayed the moving process with several years (Informant K18).

For the local community the message of the upcoming move came as a shock and was the start of a long and slow process since little changes were made in the physical landscape for the first decade. However, Informant K9 added that 99 % of residents in Kiruna were fine with the move. Even if they did not like, they knew it had to be done. This conclusion has been found by many before (Boverket & Tillväxtverket, 2015; B. Nilsson, 2009; K. L. Nilsson, 2009). Inside the local government and in the relationship between LKAB and the local government, the first years where years of forming new structures, relationships, and finding their way together without stepping on each other’s toes. However, from the outside it was perceived like nothing was happening. This created discontent among the public. In 2011, an outsider initiated a one-year dialogue project. The project was funded by LKAB, Kiruna municipality and the Swedish National Space Agency (Informant K21). The dialogue project communicated with almost half of Kiruna’s population in various forms and led to a joint image of what the public found important with the town. The following two years, these views were used to form a development plan with the qualities that the physical form of the new Kiruna centre should have. This second project also worked with forms of collaborations between municipality and the county board and other referral bodies in order to make the planning process more efficient. The two projects were driven by external individuals, who had both been baffled by how local policymakers had not used the moving process as an opportunity to create a new shared vision of the new centre across the community.

The move has turned out to be very logistically and collaboratively complex, and as stated earlier, the municipality and LKAB have gotten little support from the national government. In the municipal office, 30-35 people work full-time with the move (Informant K3). LKAB has an organisation of a similar size. In 2018, the new city hall was the first building to open in the new town centre. More than 1,200 construction workers worked on the project (Kiruna kommun, 2018). The town centre has continued to be developed and in September 2022 all shops and service moved from the old centre, to the new. Construction will continue up until 2035, concluding a 30-year process and 20 years of active demolition and construction. As stated earlier, LKAB pays for the move and requires it. Yet, the municipality does have some power: the planning monopoly. The political leadership between 2018-2022 used this as a bargaining chip to get more out of the move (particularly

focusing on a hospital). This has delayed the process to the extent that LKAB contacted the government in May 2020 asking them to overrule the municipal leadership (Haupt, 2020). Several of the informants also expressed dislike to this approach and the opposition won the local election in 2022.

New futures in Kiruna

The crisis in Kiruna (1976-1983) displayed the strong dependence on the local mine and triggered the unlocking of cognitive and political lock-ins among some politicians and civil servant. The severe crisis exposed how vulnerable the community was. When LKAB withdrew from its strong presence in other areas in the society, the municipality was eventually empowered to start breaking with the dependence and realised that Kiruna's industry base needed to diversify. When looking back, there have been a series of new path developments in Kiruna (see Table 7).

Table 7: Main new path developments in Kiruna

New path development	When & what	Type of change agency	Who	Enablers
Path emergence (importation)	1962, establishment of Esrange	- Innovative entrepreneurship	- External actors	- Large 'empty' area and pre-existing IRF
Path upgrading (climbing GPN)	1980s, mining industry investing in new pellet plant & enhancing product to become an ore processing firm	- Innovative entrepreneurship	- Core firm (LKAB)	- State support through formal institutional change. - Technological developments in-house.
Path upgrading (renewal)	Introduction of high-end tourism (Icehotel) in 1989 and continuous development of product quality	- Innovative entrepreneurship followed by institutional entrepreneurship	- In-migrant and local firms	- Icehotel's need for suppliers was incentives for firms to follow upgrading. - Marketing deal with Absolut Vodka.
Path upgrading (renewal)	Around 2000, SSC expanding infrastructure globally	- Innovative entrepreneurship	- SSC	- State funding
Path emergence	2004-(2035), Planning, demolition and construction due to town move	- Innovative entrepreneurship and place-based leadership	- LKAB - Municipality - Contractors	- Funding from LKAB - Land deformations
Path upgrading (niche)	Around 2005-2010, new tourism products related to aurora	- Innovative entrepreneurship	- Local and in-migrating entrepreneurs	- Earlier institutional entrepreneurship

Space and tourism industries were already present before the steel crisis, and when the municipality sought for new industries, they actively chose place dependent industries with less risk of jobs being moved away. For this, space and tourism industries were early-on highlighted as good options for diversification as both make use of Kiruna's unique geographic features. The municipality has shown examples of trying to support industries outside mining to grow and to decrease the dependency on the mine, during the last 30 years, but their opportunities space for doing so have not been wide and often changing. This have resulted in continued dominance of reproductive agency. Yet, in the 2002 comprehensive plan (Kiruna kommun, 2002), the municipal government recognises that there is breathing space for other industries to be supported, after a series of investments in the mine starting in 1992. The mine was expected to operate without much support from the municipality for the coming 15-20 years. This was a window of opportunity for the municipal government. Yet, a year later the news of the move was dropped, once again closing the room for change. An ambivalence regarding how to best support the other industries can also be seen in the number of industry support organisations that have been supported to various extent during the last 30 years. The creation of three new organisations in the 1990s and the closure of the municipal department of economic development, intended to create a shared responsibility for Kiruna's regional development. Yet, it also decreased the municipality's leadership in these important issues. After more than a decade, the municipality restarted their business development department, but this created even more ambiguities in roles and responsibilities.

The main new path developments, in chronological order, has been the importation of space industry in 1962 with the establishment of the European Esrange space base. Following the steel crisis, when LKAB was almost closed, the firm upgraded their path through advancing both their production and their product. The possibilities to invest was partly due to aid from the tax office through the write-down of inventory value and partly to in-house R&D. The tourism industry had been present in Kiruna since 1903, but the expansion of seasons to winter tourism and introduction of high-end tourism starting with the Icehotel, can be considered a path upgrading which have spread within the industry in the years that followed. In both the cases of LKAB and the Icehotel the path development was sought out to make more profit and expand business. These developments were driven by actions of innovative entrepreneurship. However, the new tourism path challenged the local culture, and institutional entrepreneurship was also needed for this path to grow. The owner at the Icehotel was advised to close during winter season due to severe cold, but by challenging the norms and exposing the opportunities within winter tourism, an entire industry changed trajectory. It also enabled further upgrading in the 2000s. Kiruna can also show examples of initiatives to new path developments that have not succeed in creating a new trajectory, with space tourism as the most known example. But there was also an initiative to expand into winter car testing. This initiative exemplifies the need for alignment with other political scales. Kiruna,

as well as northern Sweden in general, has a tradition of being Social democratic. There are already two municipalities in northern Sweden which are specialised in winter car testing. Hence, the Social democratic regional district actively worked against a competing development in Kiruna. Although a test site was built in the end, it was not considered a success.

After recognising the innovative entrepreneurship and institutional entrepreneurship behind the new path developments in Kiruna, this leaves the third part of change agency to be discussed, place-based leadership. This is more or less absent in the table. The lack of joining forces have created scattered agency expressions, which cannot compete with stronger internal or external actors. During the study period, Kiruna have had between 7 and 12 parties represented in the local government for a population of 26,000-23,000 inhabitants (nationally it has been 7-8 parties). The number of parties have increased even though the population has decreased. The diverse political landscape was described during interviews as an illustrative example of the diverse views in Kiruna. Another example that has been raised has been that of the strong Social democratic rule. Up until 1994, there had only been local Social democratic rule. The Kiruna party (run by a former Social democrat) ran the municipality 1994-2004, when the Social democrats took over again. The Social democratic party has been described in interviews as sitting on the power and reproducing existing paths. Other descriptions from the interviews have been that there are many small groupings that don't want to work together and that there is a mentality in the municipality of not wanting to help each other out. An additional underlying conflict in the area is that between the Sami population (who have rights to the land due to usufructuary rights) and other groups that want equal rights to the land for e.g., industrial developments or hunting rights. This surfaces when there is development of infrastructure or business development on land used for reindeer herding. In 2020, it was also triggered by changing hunting and fishing rights. One Sami village in an adjacent municipality has engaged in a very long legal process against the state, challenging the opening of hunting and fishing right in the early 1990s. Since they won the fishing and hunting right in the Supreme Court in early 2020, there has been several reports in the news about new tensions arising, taking physical form and the lives of reindeers. At the same time, the interviews and literature bear witness of a strong care for Kiruna and its physical space. The stories of the diverse leadership create a picture of how local leaders in the community cannot create a common direction even though they share strong feelings for the place. The conclusion on place-based leadership is therefore that there is a lack of it in Kiruna. There are multiple views and ideas, but little cooperation and just as Beer and Clower (2014) identifies, this is a weakness for the future development of a region. Triggered by a lack of firm support during the last political term of office (2018-2022), a new economic association (Kiruna växer) was established during 2022. The group brings together different industries and sectors under a joint goal of creating better opportunities for firms to grow in Kiruna. This is a type of network that brings together many important actors with agency. If they manage to join their

forces, they have the potential to influence future development in ways that previous groupings have not managed. Only time will tell.

Conditions influencing agency

Building on the literature on regional development in old industrial regions, Table 8 outlines how the different conditions have influenced agency expression in the case of Kiruna. The influence of the conditions is also further explored in Paper 2 (Stihl, 2022) on interpath relations and Paper 3 (Stihl, 2023) on local culture.

Table 8: Conditions influencing developments in Kiruna

Conditions	Influence
Previous and current paths	• *Type of industry*: The mining industry is capital intensive, have high sunk costs and dependent on raw materials. Just as literature suggests, this has put large constraints on new path development. It is best explained by literature on dependency on extractive industries. The industry makes it place dependent and undermining other industries during boom periods.
	• *Ownership* and *size:* Being both state-owned and large in size, makes the mining company particularly powerful locally. This has created a power asymmetry that is reproduced by other local actors. The subsequential town move further consolidates the mining company's power. Additionally, the many boom phases within the mining industry discourages suppliers from finding new customers.
	The population size in relation to development in all current paths, makes new path development requiring more staff challenging. Upgrading within current staff size is still possible.
	• *Endowments:* Closed mines and knowledge about them enables new minig company's to pursue additional mining. (Lack of) local infrastructure is a constraint for new path development within tourism. The rare existing infrastructure, technologies, skills and competences within space enable space-related developments.
Negative lock-ins	• Before crisis, Kiruna experienced all forms of lock-ins. The crisis broke cognitive lock-ins among some local policy makers who initiated diversification efforts as well as reorganisation of business support. However, cognitive lock-ins in the community (related to company town and mining culture) remained and continued to constrain new path developments and change agency. Non-local political lock-ins remains. National and European stimulus give mining industry an advantage over other industries and reproduces its significance.
Local institutions	• *Institutional environments:* The local company town culture as well as the mining culture reproduces the importance of the mine and discourages entrepreneurship. This constrains new path development and change agency. However, it was challenged by an in-migrant in early 1990s and over time there has been increasing entrepreneurship and growing diversification. A tradition of a lack of cooperation has hindered local actors from joining forces.

The properties of the dominant industry have greatly influenced agency expression, just as in Olofström. The state-ownership and the interest of national and international actors (non-local political lock-ins) strengthens the local role of the

core firm. Additionally, the state-ownership and the dependency on raw materials ensures the continued local presence of the core firm. The company town culture and the mining culture have further discouraged other developments. Nevertheless, additional industries have grown locally using local and non-local resources (e.g., financing). The loosening of cognitive lock-ins and institutional change, partly initiated by an in-migrant, have created a greater acceptance for entrepreneurship and change. Yet, the historically low level of cooperation among actors outside the core firm makes agency expression appear scattered and the local power asymmetry, where the core firm dominates, remain.

Figure 16: Borås municipality.
Map data: © Lantmäteriet, 2023. Map design: Linda Stihl, 2023

Borås

Borås city was established for almost 400 years ago and has long traditions within trade and textile. It differs from Kiruna and Olofström in population size, as the town alone has around 74,000 inhabitants today. It is said that it is the lean soils that make people from Sjuhärad (a larger area surrounding Borås, see Figure 17) so diligent. They could never become farmers, and instead became tradesmen. Borås is known for its entrepreneurial spirit, 'Knalleandan', which has traditionally contributed to a favourable business development, but also a negative attitude towards cooperation and education (Edström et al., 2010). The city is situated a 40-minute drive from Sweden's second largest city, Gothenburg, but is not included in its labour market region. Although the Gothenburg labour market is expanding towards Borås, western Sweden has been described to consist of many small and poorly integrated labour market regions (Västra Götalandsregionen, 2005). Since 1999, Borås municipality is part of the large regional body of Västra Götaland, together with 48 other municipalities. Region Västra Götaland was one of the two first new regions to form, as a result of the decentralisation process described in Chapter 5. It was built by four former county councils.

Figure 17: Region Västra Götaland and its municipalities.
Map source: © Lantmäteriet, GADM. Map layout: Linda Stihl, 2023

Borås is a textile city. The industry is highly heterogenous ranging from automated process techniques to handicraft. Additionally, the garment side of it is highly agile. The first mechanical cotton-weaving factory was built in the area in 1835, and this was the start of the textile and garment industry (TEKO[5]) in Borås and the surrounding Sjuhärad region. For many years, Borås was one of the most expanding regions in Sweden. Borås is described to have experienced a Klondike spirit during the 1940s and 1950s (Borås industri- och handelsklubb, 1999). When TEKO was at its peak, 25,000 out of Sjuhärad's 31,000 workers worked within TEKO. Its largest firm, Algot's, coped with the expansion by attracting workers from Finland and southern Europe, as did many other firms. At its peak, 80 % of Algot's 2,200 workers were immigrants (Gråbacke & Jörnmark, 2008). Related to TEKO, small mail-order companies also started expanding in Borås during the 1950s, with Ellos as the most known company. By establishing themselves in Borås they could purchase surplus from TEKO firms. With their trade, they also enabled a growing support industry in logistics, distribution and marketing (Edström et al., 2010; Gråbacke & Jörnmark, 2008). In the 1950s, it started becoming apparent that Swedish TEKO needed to change (Gråbacke & Jörnmark, 2008) as the industry was the first industry to globalise (Andersson-Skog, 2020). However, Swedish firms chose mass-production over specialised, high-quality products. This was a miscalculation considering the

[5] TEKO is a common abbreviation for the joint industries where TE stands for texile (in Swedish 'textil') and KO for garments (in Swedish 'konfektion').

high wage levels in Sweden and a transformation model that endorsed change, free trade, and large chain companies (Gråbacke & Jörnmark, 2008). Production started moving abroad in 1966 (Segerblom, 1994). The structural transformation that followed within TEKO had severe effects on regional development in Borås. Garment production was more or less wiped out of Borås, and the textile industry, which had the garment industry as their main customers, had to adapt. They started moving from staple products into technical textiles in the 1960s. This is R&D and capital intensive and therefore does not need to compete with low-wage countries like garment production (Gråbacke & Jörnmark, 2008).

The TEKO crisis was shaped by political lock-ins at different political scales. Neither the national government, unions nor local firm leaders wanted to recognise that garment production had no future in Borås. The local elite actively tried to stop large firms (Volvo and Ericsson) from establishing factories in Borås (Borås industri- och handelsklubb, 1999). The national government financially supported Algot's to expand in northern Sweden to bring new industrial jobs to that region. Additionally, they formed a gigantic state-owned garment company (Eiser) built by 13 struggling garment companies to stop the rapid growing unemployment (Gråbacke & Jörnmark, 2008). Still, Algot's went bankrupt in 1977. This was the first publicly listed company to go bankrupt since the 1930s. In 1979, the union (Beklädnadsarbetarnas förbund) and Social democratic party pushed the national parliament to adopt a motion dictating that 30 % of all garments sold, needed to be nationally produced (Segerblom, 1994). The motion, as well as Eiser, was dismantled in the early 1980s.

For Borås, the series of crisis was the start of a long downward period with a large outmigration (see Figure 18). However, after a few decades the TEKO industry in Borås developed from traditional manufacturing into a complex and knowledge-intensive business focused on design, logistics, advanced products and process development, and trade and marketing. Employment is dominated by services (see Figure 7). Today, the municipality of Borås use their textile heritage in branding the municipality, something they did not do 20 years ago when the industry was considered a failure. In their comprehensive plan from 2018, the textile heritage is in focus in public spaces and all textile related activities are concentrated in central areas of Borås city. The university college, which was established in Borås after the crisis has strong ties to the textile industry and knowledge intensive industries, and is growing placed in central Borås (Borås Stad, 2018). Apart from a cluster in textile, fashion and design, Borås have built three additional clusters within trade and logistics, high-tech and creative industries (Borås Stad, 2019).

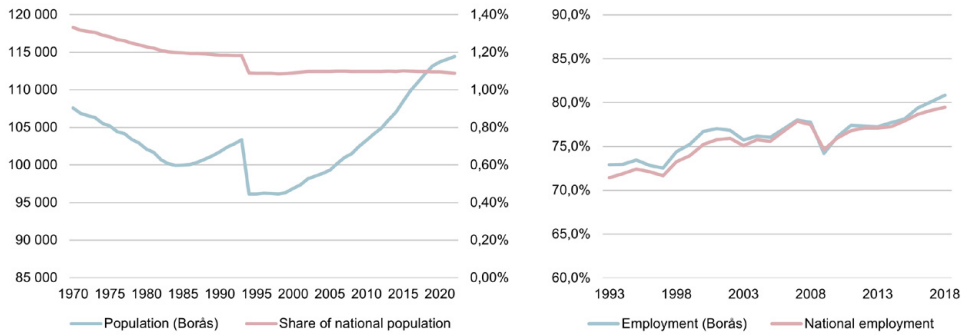

Figure 18: Changes in population[6] and employment (aged 20-64)
Source: SCB (2023a); (SCB, 2023c)

Tracing development in Borås

Due to the size of Borås and the number of related and unrelated industries, the individual industries have not been traced like in the case of Olofström and Kiruna. Instead, the tracing process in Borås have focused on general regional development. Three main phases were identified. First the period following the crisis up until the early 2000s (~1985-2001), which is characterised by entrepreneurial activities in firms but a declining self-confidence in the community and in the municipal organisation. Second, an active period with activities aimed at lifting local spirits and initiation public-private cooperations (~2001-2013). Third, a period with strong local collaborations (~2013-ongoing).

First period: coping with crisis (~1985-2001)

Borås TEKO industry continuously deteriorated up until 1985, when it started slowly developing upwards again (Informant B2). However, in parallel, mail-order firms had been growing. The founder of Ellos, instead describes the period 1970-1985 as an expansive period (Blomqvist, 2014). The bankrupt firms within the TEKO industry set free a large set of resources (buildings, machinery, knowledge, skills, and labour). The former 'Textile barons', the large garment company owners, left the local business life. But a fine-meshed network of entrepreneurs appeared, many with backgrounds in the large firms (Informant B2, B15). Informant B12 explained how it was the local entrepreneurial spirit that saved Borås when it came out of the crisis. Garment production was lost with a few exceptions, but brands, agents and trade remained. The TEKO firms could keep design, niched textile production and trade in Borås, while outsourcing production. The existence of product development, logistics, knowledge, and value-added

[6] The big population drop in 1995 can be explained by a division of the municipality. Bollebygd broke away and formed a municipality of their own.

services explains why TEKO could remain in Borås (Informant 11). The local entrepreneurs did not only create new paths related to TEKO, but also branched out into new industries. The software company Pulsen was a common example in the interviews, highlighting how competence, networks, and software from Eiser could build a new firm outside TEKO.

The Swedish garment industry developed in activities and niches. During the 1980s and 1990s, the importance of brands grew. In late 1990s there was a growth of new Swedish garment firms (such as Björn Borg, Filippa K, J Lindeberg and Acne Jeans) that sold cloths under their own brand, but had production abroad. The opening of eastern Europe played an important role for the expansion of production into the Baltic countries (Gråbacke & Jörnmark, 2008). In the end of this phase there was a critical juncture when the retail chain JC (first Junior Center, later Jeans & Clothes) became listed on the stock market in 2001 and moved their headquarters (HQ) from Borås to Gothenburg. The firm had expanded during the 1990s with a creative design environment that was product-led. With the listing it became a more board led finance company. These shifts within the company pushed many of the creative staff to leave the company and start successful companies of their own, like Gina Tricot, 8848 Altitude, and Svea in Borås and Lager 157 in an adjacent municipality within the Sjuhärad region (Edström et al., 2010, Informant B3, B5). Gina Tricot was lifted in the interviews as a proof of that you could still build highly successful companies in Borås without placing HQs in larger cities. Gina Tricot instead chose to build a striking HQ by a famous Swedish architect in central Borås city.

However, the period following the crisis was not only a period of growing entrepreneurship. Informants told stories of a community in decline: how TEKO was regarded as something of the past, something one wanted to forget. One politician described the feeling in the classroom as the number of classmates was continuously declining when outmigration was growing. The city underwent a wave of demolition during the 1970s and 1980s to clean out the old, filthy, and worn-out (Hjelm, 2016). The community had lost their self-confidence (Informant B7). This is evident in the comprehensive plan from 2006 that plans for zero growth and no new constructions (Borås Stad, 2006).

Regaining self-confidence and initiating collaborations (~2001-2013)

Informants spoke of the second phase as filled of change agency and critical junctures. Despite interview questions being posed in a similar manner in all three case studies, the critical junctures in Borås were described to be of a different kind. Instead of firm and industry developments, informants mainly pointed at urban renewal and collaborations projects.

Triggered by financial recession, Agenda 21, and talk of sustainable development, and inspired by municipal trips to Hamburg and Bilbao, the municipality rebuilt one old factory into an upper-secondary school in the mid-90s. This became a guidepost

for the subsequent urban renewal. The former 'Textile barons' were never interested in collaborating with the municipality (Informant B15). Around 2001, the municipality had realised that collaboration within place branding, economic development policy and planning, was needed (Styrgruppen for översiktsplanearbetet, 2001). They reached out to the local business life (Informant B13) and together they renewed an area by the river Viskan, using mainly municipal funding. Viskan, that runs through the middle of the city, had become a backside of the city but was now transformed into a piazza. The collaboration between the municipality and local firms continued in a new project in 2004. In the early stages of the public-private collaborations there were conflicts regarding who should fund the different projects (Informant B13, B14). The collaborations have matured over the last 15 years (Informant B16). A former politician (B10) described how the TEKO crisis have tied local actors together. During the crisis, the national government did not help, as hoped: Borås had to make it on their own.

During the early 2000s population started growing to the extent that municipal budget started increasing. Additionally, with new political majority in 2002, there were changes made regarding practicalities of the budget work. Together, this allowed for new investments in the city. The new political leadership chose to target landmarks that were locally and nationally known in order to start rebuilding the Borås brand, locally as well as nationally. Through a consultant survey, they concluded that Elfsborg (local football team), Ellos (mail order company), and Borås Zoo were most famous (Informant B10). The zoo was saved from closure and a political consensus decided to invest in a new football stadium in 2005. To build local confidence, it was decided that the stadium should be named Borås Arena (and not a sponsoring company name). On a tight budget, with little sponsor money, the municipality built the stadium. This was something that three informants, involved in the project, were all very keen to point out. This was early in the era of cities building local arenas, and the arena became a national example of how to build cheaply. The project to build local pride was crowned by Elfsborg winning the national league in 2006. Informant B7 expressed that the win alone should be considered a critical juncture in rebuilding a proud Borås.

Another critical juncture was the nine-meter-tall sculpture of Pinocchio (see Figure 19) that was placed in central Borås. In the end, this became the start of branding Borås as a "city of sculptures". However, initially the development was shaped by much political conflict related to who owns and who may take decisions over public spaces. The sculpture was mainly funded by an old 'Textile baron' with interest in arts. However, the public sculpture came with conditions over appearance and placement. This did not sit well with the political parties to the left. Today, the sculpture has grown on the community, and it is no longer a source of conflict. Instead, it is considered the start of further investment in sculptures and mural paintings with yearly events. Local private financing has been instrumental in this, and investors and the municipality have found a balance regarding what and where

(Informant B14). It has become an additional arena where public-private collaborations have developed. The sculptures are seen to create conditions for a more attractive city (Informant B7) and to "build business" through its added value to the city (Informant B4). Apart from local businessmen's private financing, the head of the local arts museum was attributed to a large share of the success due to his eye for art, competence, and wide international network (Informant B4, B7).

Figure 19: Sculpture "Walking to Borås" by Jim Dine, portraying a 9 meter tall Pinocchio.
Source: Linda Stihl, 2022

In parallel to these renewal projects, the municipality mapped their local industry in 2005 (Borås stad, 2005) and realised that their local business life where still important players, nationally as well as internationally, in the textile and garment industry. They realised that they did not have to pursue new industries to strengthen

Borås, but they could continue building on the existing ones. The newfound positive attitude within the municipality towards TEKO was put to use when a local property developer later wanted to build a centre for textile.

A final critical juncture during this phase is the establishment of Textile Fashion Center (TFC). It started with a local private property developer buying a large factory in the central parts of the city in 2006. At that point, there was still some noisy production left in the building, which the new owner managed to relocate by buying parts of that company as well. The owner was not part of the TEKO industry or its networks but chose to target that industry for the development since "it smelled, [and] it felt textile in the building". In the mid-2000s, the School of Textiles was located in Algot's old building (at the other end of central Borås) and was overcrowded. The property developer started lobbying for them to move into the building. The School of Textiles is today a department within the local HEI, but it has its roots in a local technical weaving school from 1866. It had been supported after the crisis, as the regional government was convinced that education and competence development was the way out of the crisis. However, the school had problems with recruiting students (Carlson, 1985) since the industry was not perceived to be an industry of the future. The local HEI had been placed in Borås in 1977 by the national government, and in 1986, the School of Textiles was incorporated into the HEI, to secure its future. In the mid-2000s, the HEI was looking to relocate the School of Textiles to the area of the new development (close to the rest of the HEI) but did not want to choose a building with such a strong textile branding. The School of Textile had a strong brand, yet other departments within the HEI had stronger and more successful research environments. Pursuing a textile centre therefore created internal conflicts within the HEI. Nevertheless, with active lobbying also from the municipality and private actors, the HEI finally agreed to move the School of Textiles into TFC. This was important for the development of TFC. Even more important for the renewal of the building was the municipality, who early on signed a 25-year lease of parts of the building. One informant called this "municipal doping" (Informant B2). The Textile Fashion Center opened in 2013. Today the house includes 80 different organisations within education (from secondary school to university college), research (School of Textiles, Smart Textiles, IUC, Science Park Borås), business development (Almi, Borås Ink, Connect, Companion Sjuhärad, Drivhuset, etc.) and culture (Museum of Textiles and niched food and fika places).

Reproducing successes from past phases (2013-)

The last phase is dominated by building on existing capacity and collaborations. TFC is described as a functioning triple helix (Informant B1) and that the proximity to firms and organisations is central for making interaction and cooperation easy (Informant B11). Although the physical meeting place was described as helpful, the development has also been fraught with problems. The co-location was a management decision built on informal networks, but it lacked a joint vision of what

the centre should become. Early on there were therefore conflicts and lack of trust between the HEI and the municipality, and between TFC and the newly created science park (Dessne, 2016). There were also issues internally within the HEI regarding how TFC did not feel like a place for the whole HEI, but only for the School of Textiles.

The TFC have strengthened Borås' position within TEKO, nationally as well as internationally, with its cluster of strong, related actors. Since 2018, Smart textiles and Science Park Borås lead a governmental mission, a national platform for sustainable fashion and textiles. This is considered an important recognition of the renewed TEKO activities in Borås. Smart textiles was started as a 10-year Vinnova Vinnväxt project[7] in 2006 and has since worked in 500 research and business projects[8] (Smart Textiles, 2018). Smart textiles has its roots in material research and engineering technology. Informant B12 described how Borås had the breadth needed for such an interdisciplinary endeavour, "we were not best at anything". The Smart Textiles organisation has later become a part of Science Park Borås, which is a part of the HEI. Being a part of the HEI was lifted as something important (Informant B3, B12). This means that they have a stable base funding and direct contacts with basic research. At the same time, they have close collaborations with the incubator at TFC, linking them to private actors. These collaborations are important because future solutions within technical textiles "are not found within textiles. You must think cross-industry" (Informant B11).

Development after 2013 is not concentrated to only TFC, the public-private collaborations have also continued and expanded. One important development is the formation of a 'Collaboration arena', where they meet twice a year to discuss overarching questions related to the development of Borås. One outcome of the joint efforts has been the establishment of a congress centre in the city centre. Collaborations have also been extended to incorporate the HEI. Some individuals were described to have been reluctant to include the HEI, as they do not contribute to the collaboration in the same way as firms and the municipality do (i.e., have less funds to put into development projects). However, over time it has been generally accepted that the HEI also contributes, but with other things. Furthermore, local actors meet local and non-local actors in a number of formal and informal networks (Informant B6, B11). There are local networks within Borås where various ideas are discussed. Borås was described to have more local networks than any other Swedish municipality. Additionally, the municipality is networked with other European textile towns through the ACTE-network, where they can build networks for their firms and

[7] Vinnova is Sweden's innovation authority. Vinnväxt is a project funding sought in competition with the intention of promoting sustainable growth in regions, and develop collaborations between firms, public bodies and research.

[8] Examples of products can be cloths that monitor health variables, textiles made out of wood and carbon fiber reinforced hockey sticks.

lobby for industry related questions at EU-level (Informant B5). TEKO firms have national product related networks where they collaborate and share knowledge. Furthermore, they have industry-related networks where there is less collaboration due to competition. In the national TEKO networks, actors from Sjuhärad region are overrepresented (Informant B11).

New futures in Borås

The story of Borås differs from the other two cases. While the other two cases have worked more actively with diversification to overcome the effects of the crisis, this seems to have happened more 'of itself' in Borås. In the period following the crisis and in the first phase, there is lots of innovative entrepreneurship happening in Borås. The crisis releases resources that new entrepreneurs turn into new products, firms, and paths. Within the garment industry there is both upgrading in terms of climbing GPN and finding new niches. There is related diversification into logistics, distribution, value added services, and computer services. The endogenous growth is explained by the region's entrepreneurial spirit, the 'Knalle spirit'. Additionally, Volvo and Ericsson initiated new trajectories during the crisis years.

Yet somehow this development was hidden from the municipal government and local community. Although cognitive and political lock-ins started loosening during the 1980s, the municipal government and the community could not perceive any new futures. With a lack of perceived agency, they kept reproducing existing structures. The TEKO industry became a sad memory that people wanted to forget, and the river Viskan, which used to be at the centre of production, became a place people looked away from.

During the second phase, the municipality recognise their agency. And when doing so, then can also use change agency. In an internal report (Borås stad, 2005, p. 49), the municipality conclude that "We must remember that we are the ones who create the future". Using place-based leadership, they reach out to local firms and start a joint urban renewal project. Using institutional entrepreneurship, they start rebuilding local self-confidence through building Borås Arena, supporting the local zoo (which was facing closure) and restoring and renewing old factory buildings. Local firms grabbed the opportunity, and with their engagement and funding, the period between 2000 and 2013, is considered an active one. There are failed collaborations and heated debates over e.g., financing, division of labour, and sculptures. Yet overall, it rebuilds a proud Borås, who consider that they are the master of their own success, and who use their textile heritage as a brand. Considering the establishment of Volvo and Ericsson, the placement of the HEI and one additional state authority (Authority for Testing, Inspection and Metrology) in Borås after the crisis, the narrative of the self-made city could be debated. Nevertheless, the narrative fill local actors with agency.

The third phase is a more stable phase, where both the municipality, local business life and the HEI, reproduce the current development. Through strong collaborations rooted in both informal and formal networks, they build consensus over the things that matter. Their unified agency, make them strong. Informant B8 call it a "collective agency". With a higher regard for higher education and collaboration, parts of the 'Knalle spirit' is considered replaced by a more collaborative entrepreneurial spirit. The change in local culture is investigated in Paper 3. However, some of the informants also spoke of the price of a strong, unified agency. It is difficult to challenge the set agenda. This indicates that new cognitive and political lock-ins are developing. Additionally, others spoke of the risk of becoming too comfortable in the current development. Some of the local larger firms have been sold to international owners. As local CEOs become site managers, their manoeuvrability and ability to support regional development will most likely decrease. The municipal government has become dependent on the strong engagement of local firms. It is therefore worth considering how Borås' regional development will be affected with the decrease of firm engagement and funding.

Conditions influencing agency

Building on the literature on regional development in old industrial regions, Table 9 outlines how the different conditions have influenced agency expression in the case of Borås. The influence of the conditions is also further explored Paper 3 (Stihl, 2023) on local culture.

A central difference in conditions between Borås and the other two cases, is the large numbers of bankruptcy in Borås during the crisis. This set free many local endowments, and the local culture encourage people to make good bargains. For example, a cheap property, such as the old factory buildings, is considered a better alternative than something new and fancy. This created many opportunities for change agency following the crisis. Furthermore, TEKO is an agile industry, so firm actors were more used to adapt to new trends and circumstances. The characteristics of the industry and the institutional thickness suggests that local actors would be less likely of becoming locked-in. Still, they became cognitively and politically locked-in and despite that there were no state-owned firms in the region, the national government played a role in prolonging the crisis through political lock-ins. This encouraged reproductive behaviour. Entrepreneurs used the opportunities from the crisis, but other local actors continued using predominantly reproductive agency for one to two decades. The local entrepreneurial culture did not encourage change agency among all local actors. The institutional thickness has thickened over the years and built more capacity for change agency.

Table 9: Conditions influencing developments in Borås

Conditions	Influence
Previous and current paths	• *Type of industry*: An agile, labour intensive industry enabled new path development. Many immigrant workers returned home after crisis, which decreased local unemployment. • *Ownership* and *size:* As a large number of the larger firms went bankrupt during the crisis years, they did not constrain new path development or change agency. With a larger set of firm actors, a more even division of power have been created locally. • *Endowments:* Local infrastructure, technologies, skills and competences were of great importance for new path development. Buildings were repurposed or renewed, machinery could be used in education, and skills and competences could be used in upgraded or diversified paths.
Negative lock-ins	• Even though the TEKO industry was hetergenous locally and not captial intensive, Borås became negatively locked-in. Additionally, cognitive and political lock-ins at both local and national level prolonged the crisis and constrained new path development and change agency.
Local institutions	• *Institutional environments:* Just as in the other two cases, local informal institutions shape agency patterns. The entrepreneurial culture enables change agency. The remains of the 'Knalle spirit' encourages people from Borås to make good deals and bargains. It "does not have to be fancy" (Informant B2). • *Institutional thickness:* With its long tradition of higher education within textil and garment production, and despite reluctance to education, Borås should not be considered institutionally thin *before the crisis.* The collaborative work among local actors (public, firms, and HEI) that have been built after 2001, and especially the focus on building a triple helix from 2013, exemplifies local actors efforts to make Borås institutionally thicker.

7. Findings and conclusions

This final chapter summarises findings and outlines the dissertations' conclusions. The first section introduces the three papers. It first gives a summary of their content and then present their contribution to the literature in general and this dissertation in particular. The second section presents a cross-case analysis of the complete set of case studies. The chapter ends by returning to the research questions and presenting the conclusions.

Overview of the articles

Paper 1: One crisis, one region, two municipalities - The geography of institutions and change agency in regional development paths

Summary

In the paper we argue that agency is a missing link between institutions and regional development, and we therefore combine the concepts of institutions with change agency to investigate local variations in change agency within a single labour market. The paper follows the case of the labour market Olofström (population 46,000) during 1990-2015. The labour market consists of two municipalities (Olofström and Karlshamn) and is dominated by a Volvo Cars factory in Olofström (the largest private employer in both municipalities). Following the global financial crisis in 2008, a thousand jobs were lost related to production halt and downsizing within Volvo Cars. Due to their small size and proximity, one might think that the crisis would have had similar effects on both municipalities. However, we found that the local layering of institutions had developed rather independently over the years and that the two municipalities therefore met the crisis in two very different ways.

In Olofström, the period before the crisis was dominated by managing the automotive legacy. Volvo Cars was a dominant, stable, and safe actor, who it was not perceived as possible to question locally. Olofström was cognitively, functionally, and politically locked-in and informal institutions constrained any changes before the crisis even though a regional report (Region Blekinge, 2006) had highlighted the

negative dependency two years earlier. However, lock-ins were broken in the crisis and political leaders on local and regional levels played instrumental roles in change agency processes leading to more local and equal collaborations (through a series of formal cooperations) between local actors (firms, municipality, and business support organisations) as well as in an upgrading of the industry. In Karlshamn, cognitive and political lock-ins had already started breaking in the 1980s and a decade before the crisis a new industry had been imported within IT and New media. This change was driven by informal networks consisting of individuals with personal ties to the region, who were enabled by changed informal institutions and driven by a shared vision and a shared idea of giving something back to the community. The new industry made Karlshamn more resilient, and the 2008 crisis did therefore not have any radical agency responses, as in Olofström. What unites the two municipalities is, however, that change agency (whether earlier or as a crisis response) was a collective and distributed process. Yet, the two municipalities' previous layers of informal and formal institutions shape how firms, local stakeholders, and public authorities perceive and act (or not) to shape regional development.

Contributions

The paper makes two main contributions to the literature. The first highlights how place-specific institutional contexts condition human agency and therefore shape, support, or constrain change agency in pursuit of different path developments. Although the Volvo Cars factory in crisis was the biggest private employer in both municipalities and the two are located close together, local institutions have been different for as long as we have traced development (back to the 1970s-1980s). Olofström can be characterised more as a company town. There, the lock-ins were strong before the crisis and the municipality's smaller size and dependency on one industry and with one large firm, constrained local actors and the community from using change agency for new path developments. However, once lock-ins were broken by the crisis, the tight-knit community could, through formal leadership, work to upgrade the industry. In Karlshamn, other industries located within the municipality had stronger ties to local institutions than the Volvo factory. As several of the other industries in Karlshamn had undergone structural crisis earlier, Karlshamn had for over two decades undergone a slow institutional change and diversification process pushed by an informal network. With their larger population size, diversified economy and focus set on other industries, they were less affected by the crisis.

The second contribution is subsequently a methodological one, highlighting that change agency must be studied in close connection with the geographical contexts, with a careful analysis of where and when actors have jurisdiction and where and when they have opportunities and resources to use change agency. If one uses labour market regions or other functional units which are commonly used in quantitative

analysis, there is a risk of overlooking local bottom-up initiatives or targeted top-down policies that follow administrative units or the political system. In this case it was more suitable to use the Swedish multilevel governmental division, with the municipalities as the primary study level since politicians and civil servants played instrumental roles in the different developments. Nevertheless, one should consider that other actors, like firms and HEIs, are not bound to the same spatial scales. This requires a flexibility regarding unit of study when studying agency, since each locality (and the agency bound to it) can be set in a number of complex multi-scalar hierarchies.

The paper contributes to the dissertation in four ways. First, it contributes methodologically to the dissertation. The paper is an early empirical case study of how the concept of change agency can be applied. The lessons learnt from this case study have guided the succeeding data collection and analysis. It resulted in targeting administrative areas rather than functional areas, guided sampling of first rounds of informants, and gave a better understanding of the importance of local proceedings before the start of a study period (discovered using path tracing). In terms of analysis, it also highlighted the need to incorporate the concept of reproductive agency, as only a small part of agency in a municipality can be labelled change agency. Second, it contributes to answering which *conditions enable* change agency, as it shows how a crisis can be a redemptive factor that breaks lock-ins, as in the case of Olofström. Only two years before the crisis it was not possible to break with the different lock-ins, although some local actors say that they were aware of the problem. The new industry development in Karlshamn is also to some extent a crisis response as it is possible to trace the importation of a new industry to networks, resources, and changed perceptions following an earlier crisis in a smaller town in the municipality. However, it was developed in a slower process. Third, the paper contributes to highlight *constraining conditions* of change agency by showing how lock-in periods constrain change agency, as the opportunity space is perceived as narrow. Reproducing the set path is considered the norm. Finally, the case of Olofström contributes to highlight who shoulders the responsibility of local agency. It shows how local and regional political leaders can be pushing institutional change and act using both place-based leadership and institutional entrepreneurship when the industry (using innovative entrepreneurship) is upgrading its path and changing ways of organising locally.

Paper 2: Challenging the set mining path - Agency and diversification in the case of Kiruna

Summary

The paper follows a diversification process in Kiruna from the end of 1980s until 2020. It investigates agency in unrelated diversification and the interpath relations (Frangenheim et al., 2020) between a developing tourism path and a dominant mining path.

Amongst other things, Kiruna can be described as an old industrial region, a peripheral region, a small region, a resource region, and a mining region. Additionally, the main town is being moved due to underground mining and the move affects all other development directly or indirectly. These multiple layers of structures create a context where it is generally considered particularly difficult to diversify. Despite this, a new winter tourism path, targeting an expensive and exclusive market, has grown. The paper answers why and how this came to be.

The paper finds two key shifts that have been important for the development. First, a single, in-migrating entrepreneur initiated the Icehotel (a hotel of snow and ice) which started the development of winter tourism. This was met by local resistance as it challenged the local mining culture and social democratic values at the time. The norm-breaking act of innovative entrepreneurship was followed by institutional entrepreneurship to consolidate a new way of thinking about entrepreneurship and local growth. The new path was initiated by the Icehotel entrepreneur, but the growth of the industry was created in the interaction with local suppliers. As local norms changed, the first round of change agency paved the way for a second wave of innovative entrepreneurship approximately 15 years later, which targeted new exclusive products (related to the aurora, spa, food, etc.). The second shift was the reorganisation of business support organisations. This was initiated by the municipality in the mid-90s. Their place-based leadership was intended to bring together and better engage local firms in local development. Within the tourism industry a new business association, Kiruna Lappland, was created. This has been particularly important for smaller, growing firms in terms of product development, business development, and sustainability certification.

In terms of interpath relations, the paper finds examples of how the mining industry both supports and competes with the tourism industry. Physical infrastructure, the underground visitors' mine and the current town move are all factors that have supported the growth of tourism. These examples are, however, the effects of the mining company's development, rather than planned support. The two industries also compete with each other over scarce resources. They compete over land and land use, meaning whether land should be left untouched or deformed by mining. Although they need different competences, they also compete over labour. A lack of housing constrains the labour pool from expanding as needed and labour has

become a scarce resource. Additionally, there is a shortage of the guest beds needed both for tourists and fly-in fly-out workers (construction path). Due to the town move, the expansion of housing and guest beds is a slow process. The move also requires much attention from the municipality, who have worked less in business support since the news of the move. The mining company have larger financial muscles to both buy property for employees and compete over labour.

Contributions

The paper develops our theoretical understanding of the concept of change agency. It contributes to the literature by showing that both private (firms) and public (politicians and civil servants) actors can use change agency in new path development. It shows that innovative entrepreneurship may need institutional entrepreneurship for an industry path to be developed, i.e., that entrepreneurship and innovation within a few firms may not be enough for new path development in an old industrial region, but that institutional change is also needed. Additionally, it shows how change agency, and institutional entrepreneurship in particular, can pave the way for new waves of change agency. Additionally, the paper contributes by revealing hidden and unexpected linkages between two unrelated industries. We already knew from literature on the resource curse (Auty, 1993; Lashitew et al., 2020) that diversification is particularly difficult in resource regions. This paper gives a more detailed view of how the two industries compete. Although mining and tourism supply different markets and seek different skills and competences, they still compete over local resources. With the mining company's united agency and its power being reproduced by the local government and community as well as the national government, it becomes difficult for the tourism industry, who acts in a more scattered manner, to compete with the mining industry over resources.

The paper contributes to the dissertation in multiple ways. It contributes to our understanding of *enabling conditions* for change agency exemplifying how an outsider can be the one who starts norm-breaking behaviour and through innovative entrepreneurship followed by institutional entrepreneurship, initiate a new industry path, a behaviour that was locally discouraged. Additionally, it shows how the municipality (after institutional change) can actively support an industry to grow through their place-based leadership. As previously stated, Kiruna is a highly structurally constrained region. The case therefore shows how new path development can be *constrained* in various ways. First, local culture can constrain and counteract new initiatives. This constraint can be handled locally over time through institutional change. Second, the state (national level) can constrain local agency through various formal institutions and policy. In this case, the state acts in opposing measures through its ownership of the mining company on the one hand and ownership of land on the other. Finally, it shows how a dominant path, not only through the resources curse, but also through sheer size and strong, united agency, crowds out new initiatives targeting new industry paths. Just as in Paper 1, this paper

contributes by showing that a municipality can actively support industry paths through business support organisations. In the case of tourism, the network within the new business association was particularly important for new and smaller firms.

Paper 3: Local culture and change agency in old industrial regions - Spinning forward and digging deeper

Summary

The third paper builds on the first paper (Rekers & Stihl, 2021), and continues exploring linkages between institutions and agency. It focuses on one type of informal institution, namely *local culture*, and local culture's influence on agentic patterns in old industrial places. The cases Kiruna and Borås are used to represent contrasting cultures, with Kiruna having a company town culture and Borås an entrepreneurial culture. Theoretically, the paper combines previous literature on change agency and reproductive agency with literature on the two different cultures. Local culture is defined as "a collective programming of the mind" (Hofstede, 2001, p. 9) and is mapped using local heroes, symbols, rituals, and values.

The entrepreneurial culture is defined as a local culture oriented towards individualism, independence, risk-taking, innovation, and motivation for achievement. It positively shapes the legitimacy of entrepreneurship and increase local entrepreneurial learning. With this type of culture, previous research on it indicates that actors show more expressions of change agency, especially innovative entrepreneurship. Company towns are settlements built around a single enterprise to accommodate its workers. Company control has historically extended beyond the firm and into workers' daily family life. A company town culture is therefore defined as a culture where individual initiatives and entrepreneurship is discouraged and with a strong sense of duty to the core firm and the collective. These characteristics instead indicate that reproductive agency would dominate.

The paper finds that the cultures create different pre-requisites in terms of local actors. In the entrepreneurial culture there are a larger number of actors present due to the existence of multiple strong firms. In the company town the actor landscape has instead traditionally been dominated mainly by the core firm and the municipality. As the two cases have progressed, the development has been marked by these diverse actor landscapes. In Kiruna, the actor landscape remained unchanged to a large extent due to the continuation of mining and the community reproducing its power, whereas change agency in Borås has increased the number of actors. However, opportunities for change agency are actor-specific and both the two municipalities remained cognitively locked-in long after crisis. Once agency was discovered, both tried to support change processes through either supporting diversification (Kiruna) or supporting collaboration and pooling resources (Borås). The paper also finds that even though the two have two different local cultures, their characteristics have not been

static over the study period. In Borås, heroes and symbols have been replaced and values have transformed towards more collaboration. In Kiruna, there has been less change overall. Nevertheless, there are some new heroes (innovative and institutional entrepreneurs) whereas some remain (core firms and core firms' CEOs). The symbols remain but have more ambiguous meanings. Values have transformed towards a greater acceptance of entrepreneurship.

Contributions

Old industrial regions are often addressed as one type of region when discussing agency. The paper contributes to the literature by unpacking two old industrial regions and demonstrating how their local cultures influence agentic patterns, both the composition of actors and how opportunities for change agency can vary between regions and be actor-specific. The entrepreneurial culture has a larger set of actors than a traditional company town. In the entrepreneurial culture, firms and entrepreneurs were able to use change agency directly after structural crisis. Yet, the local government and community remained cognitively locked-in after the crisis and hence did not perceive themselves to have any agency. Their agency was therefore dominated by reproductive agency for the following 15 years. The lack of perceived agency was also experienced by the local government in the company town culture following the crisis. Nevertheless, the core firm could also use innovative entrepreneurship to upgrade their product and process coming out of the crisis. Together, this points to the fact that different actors in a locality will experience negative lock-ins differently. For some, such as the entrepreneurs in this case, lock-ins are more easily broken. Only when lock-ins are broken for all actors can more pervasive change be implemented. This is seen in both cases when the local culture has transformed and opened up for more change agency for a larger set of actors.

The paper contributes to the dissertation by showing how local culture creates particular conditions (*enabling and constraining*) which influence change agency and new path development. Change agency and new path development are possible in both cultures, but an entrepreneurial culture creates better prerequisites for innovative entrepreneurship, and hence change agency. In the company town culture, the innovative entrepreneurship needed institutional entrepreneurship and changing institutions to blossom. Thus, an agency perspective shows how local actors' manoeuvrability and opportunities vary within and between old industrial regions. They should therefore not be regarded as homogenous.

Cross-case analysis

This section compares and analyses the complete three case studies, as a complement to the papers. The analysis investigates how well-known conditions in old industrial regions can help explain the agentic patterns in the three cases. The

three cases have all undergone structural crisis where local actors have used change agency to transform local development in order to avoid further decline. They have all transitioned from being *old* industrial regions. Although the three cases share some pre-conditions, there are also differences that have required the three to develop in different ways and, hence, use different measures.

When faced with crisis in 2008, Olofström had competence, skilled people, and infrastructure. However, too much of their local economy was tied to one industry and one company. During interviews both local and regional actors stressed the need for a more diversified local labour market, although their location (in comparison to Kiruna especially) gives them access to a larger variety of jobs in surrounding labour markets. Nevertheless, Olofström is experienced locally as rather peripheral. Efforts have so far not resulted in diversification, but rather an upgrade of existing path. Following the loss of 1000 jobs, local policy makers and firms saw the need to upgrade their activities as well as that local suppliers needed to be less dependent on the core firm. Enabled (or forced) by the crisis, the suppliers started looking for new opportunities using local firms' external networks, an external consultant outlined a new potential future, and the core firm upgraded their production. Additionally, the crisis shook local power imbalances, and through cooperation, the overall local automotive industry has upgraded. Although lock-ins are perceived to be broken this could be challenged by the fact that many activities and job opportunities remain in the same industry with an upgrade driven by the core firm. The crisis shook the local system, but development has to a certain extent settled back into previous tracks.

Kiruna had a very one-sided industrial structure both before and after the crisis in the 1980s. The core mining firm has continued to be successful and technologically advanced. Just like Olofström, Kiruna needed diversification of the local economy, but in Kiruna distances to other labour markets are much larger. Kiruna needed to create a more diverse local labour market that would attract more people and be a safety net for mining busts or ore depletion. To change they needed new firms in new industries. The local government choose to foremost pursue space activities as this was a way to attract external funding and build local capacity that could be developed into new firms. Nevertheless, an in-migrant, who came to Kiruna to work in the mine, went on to initiate an upgrade of the tourism industry that has had ripple effects for the last three decades. Over time there have also been successful suppliers to the mine who have developed products and services that could be sold to other mines. However, this related diversification has happened later and would not have been advanced enough 20 years ago to compete in other mines. Hence, the unrelated diversification has been very important in the case of Kiruna in creating new growth opportunities and showcasing new potential futures. An ongoing move of Kiruna town centre has, however, constrained diversification.

Borås had a large population, several strong firms, and an entrepreneurial culture before the crisis. After the crisis they could no longer continue with production and

many of the large firms went bankrupt. However, the entrepreneurial culture bred new entrepreneurs who could make use of resources from the previous paths and could initiate new paths. However, the firm growth and the positive trend was not perceived by the community or local government. Thus, what Borås needed was to regain their local self-esteem. This was created through physical investments in Borås and public-private collaborations. Once the perception of Borås was changed local actors could better join their agency, pool resources, and act with more strength. Local actors have formed a narrative of that they alone changed the direction of Borås, and this has boosted their self-image and agency.

Although the cases went into crisis with different pre-conditions and though they have used change agency in different combinations and moved into different forms of new path development, their outcomes have similarities. The clearest similarity is local cooperation. In Borås, they have progressed into a 'city of networks', with several different networks and forums. Private actors from different industries, the municipality, the HEI, and the different business support organisations participate. To a large extent it is the same actors present in the different areas. One informant expressed that these forums are places to pitch ideas, and that good ideas are discussed more. In Kiruna, there were several groups formed during the 1990s, but their success has varied and lacked a clear joint direction. The political leadership between 2018 and 2022 pushed for a less active municipal role in business development. As the activity before 2018 was already withdrawn and ambiguous, this has pushed private actors to engage more. During 2022 there was, therefore, a new association created that bridges the different industries and sectors. Their joint aim is to work for the growth of Kiruna, challenging the various constraints and strengthening the existing industries. Finally, in Olofström the cooperation between suppliers and the core firm first developed into a local cluster focusing on shaping and stamping. In the last few years, it has move to the regional government and grown to work in a larger geographical area. Local cooperation does not necessarily need to be the suggested direction for all regions in transformation. However, from an agency perspective there are benefits to it. The regional development of a municipality is not solely dependent on itself. Local firms and actors are connected to external networks and global industrial developments. Neither local nor non-local actors can alone develop new developments paths (Bækkelund, 2022). However, when local actors collaborate, as in Borås, they can join their agency and tap into each other's networks and competences to pursue external connections, funding, etc. That way they strengthen their local agency against non-local actors and courses of events. But what conditions have enabled these developments?

Conditions

In the empirical chapter, the conditions influencing agency were analysed separately per case. When bringing all three cases together, it becomes evident how

interconnected the different conditions are as well as how they are all shaped by path dependency.

The *type of industry* was not found to directly affect agency, yet its properties influence institutions and lock-ins which in turn affect agency patterns in a long-term perspective. A large capital-intensive industry with high sunk cost and/or state involvement is more likely to form negative lock-ins and shape the institutional environment towards discouraging entrepreneurship. This in turn, increases reproductive agency to stabilise the set path and discourage change. A more agile industry may be more likely to encourage change agency, but as the case of Borås showed, that is not a conclusion that can be drawn for all actors in a region. *Changes in ownership* was only experienced in the case of Olofström. There it had, surprisingly, no effect on local agentic patterns. Volvo Cars becoming foreign-owned raised warning signs at the regional government level, but on municipality level lock-ins were too strong. *The size of firms,* however, showed a large influence on agentic patterns. Both Kiruna and Olofström are dominated by a large firm. The long history of this dominance has created a local power asymmetry where both the core firm and other local actors reproduce the core firm's power. Yet both cases, and especially Olofström, show that the power asymmetry can be reduced if the core firm retracts in some way. When it does, it opens room for other actors' agency and with that, changed conditions and expectations of the future. In both cases this widened opportunity spaces. All cases had *endowments* from previous and current paths that were enabling for new path development. However, the continued presence of a core firm discourages the use of them in new industries. This was different in the case of Borås, where the combination of an entrepreneurial spirit and the large endowments that were set free could materialise in a larger number of new firms and developments paths.

Lock-ins are often interrelated and reinforce each other (Blažek et al., 2020). All *three forms of negative lock-in* encourage reproductive agency and discourages transformation. As agency is shaped not only by the past and the present, but also by the future, cognitive lock-ins have a particular effect on agency. As cognitive lock-ins often require institutional change to unlock, this is found to be the hardest lock-in to break. New path development requires actors to perceive (Kurikka et al., 2022) and expect (Steen, 2016) alternative futures. Without that, change agency is not likely. A structural crisis was helpful for all the cases in the sense that it initiated the unlocking of lock-ins locally. This is especially evident in the case of Olofström. However, even though the functional lock-in there was considered broken with the development of a cluster organisation, dependencies between the core firm and its suppliers remain, pointing to the fact that lock-ins are not something that can just be unlocked, but rather that there is a sliding scale of lock-ins. In the case of Borås there were strong political lock-ins at both local and national level, which were broken after the crisis when cognitive lock-ins started breaking and it became evident that local garment production could not withstand the global competition.

However, in Kiruna, national and European political lock-ins influence local mining development. There, the non-local political lock-ins have grown stronger with global changes in the raw material market. This constrains the room for local agency (Görmar et al., 2022) and encourages reproductive agency. This also informs us that patterns of negative lock-ins can be locked differently at different scales, and unlocking at the local scale can be opposed at other scales.

Finally, the *institutional environment* has proven to have effects on agentic patterns. Both cases with a company town culture have discouraged new path development and change agency. That informal institution instead encourages reproductive agency to stabilise and preserve the current path. Nevertheless, through institutional entrepreneurship this institution has transformed and in so doing allowed for change agency. As the case of tourism in Kiruna showed, once there had been a significant institutional change, it paved the way for further change agency, which in turn pushed institutional change further. However, in both cases institutional change was pushed by an in-migrant/non-local yet required the acceptance of the local community. A more entrepreneurial culture encourages more change agency. However, when considering the various new path developments that Borås experienced following the crisis, it is apparently that they cannot be attributed with the local culture alone. It was possible in combination with the large set of endowments that were set free. If the protectionist initiatives had succeeded, there would not have been as many resources available to use in new path development. In terms of institutional thickness, Borås has the advantage of having a HEI. However, in both Kiruna and Olofström there are formal connections to external HEIs. In the case of space, there has even been the development of a local campus.

But how case-related are these findings? Although they are based on only three cases, they hold promise for influencing agency in similar ways in other regions also. A large dominant firm is likely to encourage reproductive agency to ensure their position also in other regions. Current and previous industrial paths are likely to influence institutional environments and potentially create lock-ins in other regions as well. In old industrial regions cognitive lock-ins are expected to constrain change agency as the low levels of renewal explains why industrial regions become ‘old’. When the institutional environment discourages entrepreneurship or change, an external impulse (like an in-migrant) can start inducing change and present alternative futures. However, an in-migrant cannot create change or new path development alone. It must be accepted (Tillberg Mattsson & Heldt Cassel, 2020), even though it might not be encouraged, by local actors.

Agency expression

When comparing the three cases it is not a surprise that there is more innovative entrepreneurship in Borås than the other two considering that Borås is interpreted as having an entrepreneurial spirit. The innovative entrepreneurship in Kiruna is

more of a surprise considering Kiruna's various constraints. This tells us that innovative entrepreneurship holds potential also in other strongly constrained regions despite that old industrial regions with heavy industries tend to have a low demand for young and small firms, that they rarely manage interactive learning (Trippl & Tödtling, 2008), and that regions with large firms tends to create local power asymmetries (MacKinnon, 2012). The case of Kiruna shows that institutional barriers for new path development, formed by previous industry paths, were overcome through institutional entrepreneurship. Although this type of change agency was needed in all of the three old industrial regions to reach pervasive change, it was a greater need for it in the two company towns where the local culture (informal institution) counteracted entrepreneurship. A crisis can bring radical institutional change (Battilana et al., 2009; Mahoney & Thelen, 2009), but institutional entrepreneurship can also create enough change for new path development without a crisis (Grillitsch, Sotarauta, et al., 2022). Finally, as suggested by MacKinnon et al. (2019), non-firm actors can also play supportive roles in new path development. In Olofström, both the local and regional government played important roles in the upgrading of local industry through place-based leadership. In Borås, place-based leadership was initiated by the municipality, but is today considered more of a "collective agency" (Informant B8) that joins the municipal government, firms, and the local HEI. In efforts to diversify Kiruna, place-base leadership has largely been missing. Crisis can bring out place leaders to take action, but as they are often shaped by previous paths and institutions, local leaders need to find new ways of acting in order to create change (Sotarauta et al., 2023).

However, for change agency to be possible agency needs to be recognised. The literature on reproductive agency shows that it can be used to resist change (Jolly et al., 2020) or to stabilise current paths (Bækkelund, 2021). This type of agency is the most common. Nevertheless, the three case studies show other reasons for reproductive agency. First, the *lack of perceived agency* was found in all three cases but was particularly clear in the municipal actors and the local community in Borås in the 15-year long period following the TEKO crisis. When social filters are very thick, the opportunity spaces become invisible. Although actors do not have the *intention* to resist or stabilise anything, they still end up acting reproductively as they perceive no other way. Considering the influence of cognitive lock-ins and institutional environments that discourage entrepreneurship, a lack of perceived agency may be more likely in old industrial regions. Yet, due to the fact that it was found in several groups in Borås despite various new path developments, as well as an entrepreneurial culture, I would argue that this finding is likely to be found also in other regions and not only in old industrial regions (Stihl, 2023) or peripheral regions (Sotarauta et al., 2022). When actors do not perceive that they have any agency, change agency becomes impossible. Second, in regions with large power asymmetries, core firms encouraged continued asymmetries through reproductive agency.

Conclusions

This research was spurred by a call for more research on human agency to better understand its role in new path development (Grillitsch & Sotarauta, 2020; Martin & Sunley, 2006; Steen, 2016) and the need for more studies of agency outside large agglomerations and technologically advanced regions (MacKinnon et al., 2019; Sotarauta et al., 2023). The dissertation set out to answer one overarching research question: *How can change agency create new development paths in old industrial regions?* The dissertation has advanced our understanding of the role of agency in new path development. It has showed that actors use their agency in every part of industrial development, but that change agency mainly is active in initial stages of path development whereas reproductive agency is present in a larger number of phases to stabilise the current path. It shows how local actors, while focused on regional development at the local level, connect to non-local actors and resources to gain inspiration, knowledge, skills, and funding. While shaped by existing path-dependent structures (material and non-material), actors' agency plays instrumental roles in the transformation of old industrial regions. This challenges ideas of how path creation is formed by serendipity (Martin & Sunley, 2010b) or evolutionary economic geographic research that downplays the role of agency while overestimating structures. Adding to existing theory on reproductive agency (Bækkelund, 2021; Jolly et al., 2020), the dissertation has also showed that there are times when actors use reproductive agency simply because they do not perceive themselves to have any agency. This slightly challenges definitions of agency that emphasise *intention* in actions (Sotarauta, 2017), since actors can be more or less aware of intentions behind their own actions. When actors do not perceive to have agency, it becomes impossible to initiate something new. Additionally, it shows how stronger actors can use local power asymmetries to encourage a continued skewness in power to protect their position.

Empirically, the dissertation has provided solid case studies analysing industrial change in old industrial regions in longitudinal studies with high granularity, demonstrating the importance of incorporating long time periods when studying agency. Using a critical realist approach with a stratified ontology, the empirical material in combination with previous research on old industrial regions has been used to go beyond the more superficial domains (the empirical and the actual) to study the 'real' dimension of structures influencing agency. Although the three cases all have their unique features, they are in many ways quite normal regions in the Nordic setting. The sixth chapter "Three places in change" elaborated on their phases of transformation, agency expressions, and new path development. Even though the chapter might be considered long, it does not include the full level of detail that has been analysed. Critical junctures capture events when a development path shifts from one main phase to another. Behind every critical juncture, there is a complex reality with endless small agency expressions that together led up to the

juncture. The content has been chosen to give insights into the complexity of everyday work and the effects it has, while presenting the overall developments.

To answer the overarching research question, three sub-questions were formulated. The first sub-question asked *in what forms, when and why does local agency occur in the formation of new development paths?* The answer is as complex and diverse as regions. Local agency was found in all parts of new path development. Change agency was important for initiating new paths through developing new products (innovative entrepreneurship), perceiving alternative futures (institutional entrepreneurship), and bringing together local actors in joint missions (place-based leadership). Both firm and non-firm actors where active in this work (Stihl, 2022). Using path tracing, the origin of new path development was often traced back to a reaction to a previous structural crisis, a reaction that could be both *instant* to make use of local endowments that were set free in the crisis (Stihl, 2023), or *brew slowly* for one or two decades before materialising in new initiatives (Rekers & Stihl, 2021; Stihl, 2022). Once new paths were positively locked-in, reproductive agency was important to stabilise the trajectory. Change takes time, both to be initiated and to be carried out. This requires patience and persistence among both local actors and policy makers at other scales. Change agency and new path development are rare, and reproductive agency and path development generally dominate. Both change agency and reproductive agency are path dependent, meaning that past paths and events shape what is perceived as possible for local actors. This applies for change agents as well. Nevertheless, for actors it is not a matter of either engaging in change agency or reproductive agency. The two are found on a sliding scale and actors move on the scale depending on time, context, and activity. When an actor's opportunity space is wider, it creates more opportunities for change agency. When an actor's opportunity space is very narrow, or even perceived to not exist, change agency and path development become impossible.

All three forms of change agency were found in the cases. Similarly to Gunko et al. (2021), I found mainly place-based leadership and innovative entrepreneurship in the path tracing process. This points to the fact that institutional entrepreneurship is rarer. Considering the inertia in institutions and that it requires many actors to accomplish, this is not a surprise. However, institutional entrepreneurship can have very pervasive effects and shape development for a long time to come. In so doing, it can create opportunities for further change agency (Stihl, 2022). Innovative entrepreneurship was only found to be used by firms, but it should not be considered to only be possible for firm actors. Neither should firms be considered to have the same expressions of local agency in all regions. This will vary with the properties of the firm. A branch plant might have strong local roots, but in the end, it follows non-local decisions. A state-owned firm may be subject to other missions and be steered through government approval documents. Finally, a locally owned firm may have more incentives as well as more opportunities to engage locally. Place-based leadership was found in various combinations: municipal government alone,

municipal and regional governments, municipal government and firms, and municipal government, firms, and HEIs. This informs us that a region does not need a certain set-up of actors to practice change agency, but that it is possible to adapt to existing actors and conditions. This is an important fact, since local actors cannot choose their local pre-requisites or conditions, but need to build on what they have. Additionally, considering that non-firm actors were important anchor organisations for change agency in the investigated cases, it informs us that non-firm actors play vital roles in regional development.

To answer the question, *which conditions enable and constrain change agency in regional development?* the papers are supplemented with a cross-case analysis which went more thoroughly through and investigated different conditions from previous literature on old industrial regions (see Table 2 in Chapter 2). Negative lock-ins and institutions were found to influence the agency expressions the most. Negative lock-ins decrease chances of change agency and encourage reproductive agency. Cognitive lock-ins in particular block the perception of other futures which is needed for change agency. Institutions, like company town culture or mining culture, can further constrain change agency if the culture discourage entrepreneurship or the imagining of other futures (Stihl, 2023). Institutions can even become hostile to change (Bathelt & Glückler, 2014). Paper 3 (Stihl, 2023) adds to this by showing that lock-ins need to be unlocked for all local actors for more pervasive change to be possible. Through path tracing, crisis was found to be one example of something that breaks lock-ins. However, it was far from an instant process for all actors. Additionally, the perception that lock-ins, like a door, can simply either be locked or unlocked is questioned. Lock-ins seem rather to be a constant process of loosening and locking as well as moving between 'positive' or 'negative' features. The unlocking of one negative lock-in can become the start of the formation of a new one. As local actors join forces in breaking with the old and forming new developments, cognitive lock-ins risk growing again.

Literature on new path development and path dependency often stresses the importance of previous and current paths as enablers (or constraints) of new paths. Although this is not questioned, its influence on agency varies. It is the properties of current and previous paths that shape institutions, negative lock-ins, and local endowments. These properties can vary and hence influence local change agency in different ways. Firm size is one of these properties with large effects on agency. When a region is dominated by a single large firm, it creates a skewness in local power balance (Henderson et al., 2002; Moonesirust & Brown, 2021), and this makes it difficult for other local actors to challenge the set path (Stihl, 2022). The industry also influences other non-local actors' engagement in a region. When selecting three cases from the same country, I justified it by the rationale that they all were subject to the same formal institutions. Although this might theoretically be true, different rules and regulations are activated in different regions depending on geographical placement and industry. Thus, the room for local agency in a region

like Kiruna is smaller than in the other two cases due the properties of extractive industries with strong interest and engagement of national and international actors (Görmar et al., 2022).

The conditions related to old industrial regions often have negative connotations and it is easy to find conditions that constrain new path development. A central question therefore becomes how constraining factors can be transformed or challenged. The papers and the cross-case analysis present three main ways to do so: a crisis, institutional change, or external impulse from in-migrants. A *crisis* can bring radical institutional change (Battilana et al., 2009; Mahoney & Thelen, 2009) or set a large number of material or non-material resources free (Stihl, 2023). As several of the informants shared, a crisis is rarely a pleasant experience. The negative sides of a crisis can also be found in various places in the geographic literature. Harvey and Wachsmuth (2012, p. 273), e.g., write that "… there is nothing good about saying 'let the system crash'. Because the wealthy have prepared their arks, and they can float above the flood all too easy". However, in one of the cases it was a necessary condition to break lock-ins (Rekers & Stihl, 2021). Although there had been warning signs from the outside and informants spoke of a local awareness among some actors that things needed to change, it was not possible locally to challenge the company before the crisis. In the other two cases the crisis did not manage to break lock-ins to the same extent or at the same pace (as seen in Stihl, 2022, 2023). Instead, a lack of perceived room for agency continued to constrain some of the local actors from using change agency long after the crisis. Also, *institutional change,* through institutional work (Lawrence & Suddaby, 2006) or institutional entrepreneurship (DiMaggio, 1988), can enable new path development. Considering the reasons for why industrial regions transform into old industrial regions, institutional change can even be considered a necessary condition for local actors to form new path development. New industries as well as entrepreneurship have to be locally accepted and allowed to grow (Stihl, 2022). A crisis can trigger the breaking of lock-ins, but to change business as usual, institutional change among a wide set of actors is needed (Rekers & Stihl, 2021; Stihl, 2023). For pervasive change, an entrepreneurial culture and innovative entrepreneurship may not be enough, but institutional change incorporating non-firm actors such as the community and municipal government may be needed (Stihl, 2023). The empirical findings in this dissertation contribute to the realisation of the significance of institutional change for enabling change agency and new path development in old industrial regions, a conclusion that is expected to hold good merit in other old industrial regions as well. Finally, risk-taking *in-migrants* can challenge current structures through being active in institutional ambiguities, as well as challenge existing informal institutions. In a region with little entrepreneurship, like a company town, entrepreneurial in-migrants can model new behaviour. This can be the spark that initiates institutional change and leads to more entrepreneurship. However, for institutional change to happen, a wider set of local

actors need to accept the development. If the community is not receptive to change, in-migrants new behaviour will have less effect on regional development.

The third sub-question read: *how do actor constellations influence the formation of new development path*s? The papers and the cross-case analysis provide several contributions to answering this question, First, *local culture* as well as the *organisation of the industry* influence the structure of actor constellations (Stihl, 2023). An industry with large, dominant firms does not often tend to encourage the growth of new firms. This leaves regions with fewer actors that can influence regional development, as well as create power asymmetries. The culture also affects what is perceived as possible by local actors. An entrepreneurial culture is more beneficial for new path development since innovative entrepreneurship can start inducing change. In a local culture where entrepreneurship is more frowned upon or less accepted, new path development is more challenging (Stihl, 2023) and the number of actors will remain fewer. Second, actors need to have *jurisdiction* (Rekers & Stihl, 2021) to create change, so when local government is involved, it is important to consider actor constellations according to political or administrative borders. Other actors, like firms or HEIs, are less bound to these types of boundaries. Nevertheless, change agency is about finding gaps and ambiguities and pushing boundaries outside their normal spheres (Sotarauta, Kurikka & Kolehmainen 2022). Local actors can therefore act beyond their own jurisdictions, when, e.g., lobbying for EU funding (Rekers & Stihl, 2021). Additionally, local actors do not have to have formal jurisdiction, but can act based on informal jurisdiction or trust, awarded to them by other local actors. Third, *different actors can take the lead* in local development. In Olofström, the municipality took the leading role as the core firm focused on their own issues. This aided existing supplier firms to collaborate and investigate future developments, something that the core firm had not encouraged. In Kiruna, the municipality also eventually supported change, yet it was entrepreneurs' development of new and old firms that made the new industry grow. In Borås, the municipality had a more withdrawn role after the crisis due to cognitive lock-ins and lack of perceived agency. There, it was instead local entrepreneurs who were leading new developments. The presence of an HEI has also mattered for capacity building and local branding (which enables new path development). Nevertheless, even without an HEI, both firm and business support organisations can collaborate with non-local HEIs, making it possible for regions with no HEI to reach capacity-building actors.

Finally, the case of Borås shows that once a region manages to get onboard multiple set of actors and use a collective and united agency, they can act more powerfully. The firms, HEI, business support organisations and municipality work together towards joint goals, and when doing so they manage to join resources (fiscal, competence, skills, and infrastructure). With an abundance of confidence in their own capacity, they strengthen their joint agency even further. Although this might be an advantage in the present, it could also be the start of new cognitive and

political lock-ins since institutional change that resolves existing tension can form the basis of new tensions (Benneworth et al., 2017). It was also perceived as difficult to question the current, joint agenda. This joint local agency in Borås stands in contrast to Olofström (before the crisis in 2008) and Kiruna. In both Olofström and Kiruna, the core company used to dominate the locality in terms of strength and power, and for decades set the direction of regional development. The start of collaborations following the crisis in Olofström, and the formal collaborations that followed are a move towards using local agency more collectively, but the cooperation remains related to economic and industry developments. These two cases cast a light on the challenges for local agency in places with a dominant core company that builds skewed power relations. In Kiruna, a recent (2022) new economic association is building collaborations across industries and sectors. Yet, up until now, local actors have used agency in more scattered manners. It is possible for new paths to grow in this type of actor landscape, but if local actors are to tackle the structural constraints that hampers overall regional development, this is not enough.

Taking a step back and looking ahead

The project has taken a critical realist approach, implying that it has not looked for regularities or aimed to be able to predict results. The dissertation has studied the conditions or mechanisms under which actions are taken in order to better understand how they affect agency. Mechanisms and conditions might not work the same everywhere, but analytical generalisations from the conclusions are possible to draw. The study is limited by only looking at old industrial regions. Nevertheless, constraining conditions are expected to be less severe in other regions, and old industrial regions are therefore suitable to better understand the 'real' dimension of structures.

Old industrial regions are often described as problematic regions using a structural and static perspective. This dissertation has approached old industrial with an *agency perspective* that regards old industrial regions as *dynamic entities* where outcomes are not pre-determined. Regions themselves cannot learn or change. It is the people in them that can and are required to use their agency (Asheim, 2009). However, people are subject to path dependency and projected futures are shaped by past experiences (Sotarauta et al., 2023). Discussing agency in old industrial regions is therefore a fine balance between agency and structure. By tracing development, it was found that change agency mainly influences new path development in early phases. This aligns with findings by Bækkelund (2022). Reproductive agency dominates later phases. The dissertation develops our theoretical understanding of reproductive agency by arguing that reproductive agency does not only hamper change (Jolly et al., 2020) or stabilise development (Bækkelund, 2021), but also reflect periods of a lack of perceived agency when opportunity spaces are extremely

narrow. Additionally, reproductive agency can be used by powerful actors to reproduce local power asymmetries. Furthermore, actors should not be considered to use solely either change agency or reproductive agency. The two are found on a sliding scale and actors use both depending on time, situation, or jurisdiction. Employing an agency perspective is not about arguing that everything is possible. Nevertheless, the future is dynamic and unknown, and it is important to recognise that actors always have agency, even though it is not always perceived to be so. Additionally, the dissertation contributes by showing that new path development initiated by change agents is also possible in highly constrained regions (Stihl, 2022). This suggests that we should view the status of 'old' industrial regions as something temporary.

Time and continuity have been central dimensions in the analysis as it has taken a *process perspective* on change and development. The process of path development is regarded as linear, like time and evolution (see Figure 3 in Chapter 3). As regions develop, layers of former structures remain as well as transform. Institutional structures are transformable yet suffer from inertia. Together with other material and non-material structures, they have been shaped by current and previous industrial paths for decades or even centuries and continue to influence the future as endowments that actors can put to use. When taking an agency approach it is not possible to detach agency from time, geography, or local conditions. By taking a long-term perspective it is possible to see how change agency behind new path development can be traced to seeds stemming from structural crisis. However, those seeds need various amounts of time to grow. It can be decades before they materialise into new paths or regional transformation. In the process of transformation, enabling and constraining conditions like lock-ins are also dynamically transforming. Furthermore, lock-ins are path dependent, and the breaking of one lock can be the formation of a new. Informal institutions are generally understudied as they are difficult to investigate (Rodríguez-Pose, 2020). Cognitive lock-ins are closely related to informal institutions, and also difficult to measure. Nevertheless, their importance is clear as well as the challenge of breaking them. Change agency requires the possibility to perceive and expect new futures. With strong cognitive lock-ins, change agency becomes difficult. With fewer or lesser cognitive lock-ins, change agency becomes possible, but the ability to pivot from current trajectory may remain difficult. Like institutions, cognitive lock-ins have an inertia. With current policy pushing for generating bottom-up development (Hermelin & Rusten, 2016), the effects of cognitive lock-ins become visible in a weak regional development. A first important policy implication is therefore that these soft values must be considered in policy targeting long-term development in declining regions.

Furthermore, the dissertation contributes to the literature by its detailed, long-term analysis. *High granularity* is a requirement to understand agency and actors' conditions. The analysis has unpacked local conditions like local culture, organisation of industry, and jurisdictions to show how conditions between old

industrial regions differ and that this influences actors' ability to use change agency. It has found that both firm and non-firm actors use change agency in new path development and that change agency can pave the way for further change agency. One should therefore not only target firm actors when studying change agency in new path development. Additionally, one must recognise that local actors do not only operate locally, but are nested in non-local networks which allow them (and require them) to tap into resources, knowledge, and funding elsewhere. Futhermore, it has been shown that firms cannot be regarded as the same type of actor in all regions. Firm actors act differently locally with different incentives, opportunities, and level of engagement depending on industry properties, size, and ownership.

A second policy take-away from this dissertation is the recognition that actors can experience a lack of perceived agency or motivation to change, which hinders them from using change agency. With the conditions shaping old-industrial regions it is expected that there will be actors that at times do not perceive themselves to have agency. A policy implication of this is the need to recognise this development and to try to shorten periods of no perceived agency. One of the cases showed how dependencies were perceived at the regional level, but that lock-ins hindered local actors from seeing it. In Sweden, the regional government has the official responsibility for regional development. Although they lack many instruments to implement regional development, they need to find ways of working long-term with supporting local agency. There are several vulnerable municipalities in Sweden (Tillväxtverket, 2016) where change agency and structural change are needed.

Informants in all three cases (and not just in the company towns where it was more expected) speak of the lack of support from the national government. That local actors have found themselves lonely in times of crisis and high need. A third policy implication of these findings is therefore to consider how the national government supports regional development. A national government can act supportive of local agency when goals are aligning across political scales, but can also constrain and delimit local agency (Görmar et al., 2022). Across the Nordic countries there are different ways of organising division of labour in regional development. In Sweden, crises are met within existing organisations, and in e.g., Finland they have a particular organisation for dealing with transformation (Tillväxtanalys, 2021). In Sweden, roles and responsibilities at regional and national levels need to be clarified and improved in order to better support local actors.

Most of the urban population in the world live in smaller cities and peripheries. Still, policy is often written for advanced agglomerations, which works less well in smaller places (Harrison et al., 2020). Local actors are in many ways the frontlines of regional development (Hermelin & Trygg, 2018) and need more attention. Future research is needed on how policy can strengthen local agency in regions outside dense agglomeration.

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Appendix 1: List of informants

Code	Title	Format	Length (min)
Case Borås			
B1	Former civil servant, planning	Online	45
B2	Civil servant, planning	Online	66
B3	Former university management	Online	91
B4	Entrepreneur, in garment industry	Telephone	100
B5	Civil servant, business development	Online	75
B6	Entrepreneur, in real estate	Online	60
B7	Civil servant, management	On site	62
B8	Politician	On site	69
B9	Cluster organisation, management	On site	76
B10	Former politician	On site	80
B11	Business support organisation, management	On site	82
B12	Business support organisation, management	On site	78
B13	Civil servant, management	Online	72
B14	Politician	Online	67
B15	Former politician	Online	85
B16	Entrepreneur, within Tech	Online	56
B17	Former civil servant, management	Online	93
Case Kiruna			
K1	Former civil servant, business development	Online	47
K2	Business support organisation, tourism	On site	70
K3	Former civil servant, management + core firm supplier	On site	81
K4	Business support organisation, management	On site	100
K5	Former civil servant, management	On site	79
K6	Research institute, management, space	On site	116
K7	Core firm, planning	On site	125
K8	Former politician	On site	86
K9	Former business support organisation, tourism	On site	50
K10	Tourism firm, management	On site	77

K11	Civil servant, management, space	On site	88
K12	Tourism firm, management	On site	109
K13	Civil servant, planning	Telephone	56
K14	Core firm, Human Relations	Online	47
K15	Core firm, Research & Development	Online	69
K16	Former business support organisation, management	Telephone	59
K17	SME, mechanics	Telephone	38
K18	Civil servant, management	Online	75
K19	Tourism firm, management	Telephone	43
K20	Tourism firm, management	Online	43
K21	Former civil servant, planning	Online	55
Case Olofström			
O1	Management, harbour (Karlshamn)	On site	61
O2	Former civil servant, management (Karlshamn)	On site	58
O3	Civil servant, business development	On site	60
O4	Core firm, communications	On site	66
O5	Civil servant, management, business development	On site	63
O6	Civil servant, management, business development (Karlshamn)	On site	49
O7	Researcher, local campus (Karlshamn)	On site	58
O8	Business support organisation, management, food (Karlshamn)	On site	60
O9	External consultant, business development	On site	97
O10	Former university management (Karlshamn)	On site	70
O11	Former politician	On site	92
O12	Core firm, management	On site	53
O13	Entrepreneur, in new media (Karlshamn)	On site	66
O14	Former civil servant, management, business development (Karlshamn)	On site	74
O15	Former politician, regional government	On site	91
O16	Core firm, HR	On site	75
O17	Civil servants at regional government, business development	On site	90
O18	Business support organisation, management, new media (Karlshamn)	On site	80
O19	Civil servant, management	Telephone	31
O20	Core firm, management	Telephone	73
O21	Core firm supplier, management	Telephone	60
O22	Core firm supplier, management	Telephone	55
O23	Former civil servant, business development (Karlshamn)	Telephone	54

Total: 71 hours, 46 min
Average: 71 min/interview