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Agency and Economic Change in Regions: Using Qualitative Comparative Analysis (QCA) to identify Routes to New Path Development

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Abstract:

This paper investigates the role of human agency in 40 phases of regional economic development in 12 Nordic regions over 30 years. The paper contributes with a theoretical framework to study agency over time and a fuzzy-set qualitative comparative analysis based on a unique dataset combining over 200 interviews, with printed and online sources, and quantitative data. The paper identifies which combinations of agency types and context conditions make industrial upgrading or diversification possible, and investigates how such combinations come into being. The causal claims from this analysis are illustrated with empirical examples and discussed in relation to previous literature.

Keywords: regional development, industrial diversification, innovation, entrepreneurship, place-based leadership, institutions.

JEL codes: R11, O10, O30,

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1 Introduction

This paper contributes to the literature on economic change in non-metropolitan regions and which role agency plays in this process. *Economic change* has recently received a lot of attention, not least in response to fundamental economic, social, and environmental challenges of our times (Boschma et al., 2017, MacKinnon et al., 2019). Contributing to this broader debate, this paper studies how new forms of economic activities arise in regions, conceptualized as new path development (Hassink et al., 2019). Metropolitan regions account for most knowledge production, new firm formation, population and economic growth (OECD, 2018). Yet, *non-metropolitan regions* must be taken seriously, if only because half of the people globally call them home (JRC, 2020). Identifying ways to develop new economic activities in non-metropolitan regions is necessary to address large regional disparities, which, in addition to increasing urbanization and declining cohesion, have contributed to major social and political tensions in the past decade (Rodríguez-Pose, 2018, McCann, 2020). *Agency* captures 'intentional, purposive and meaningful actions, and the intended and unintended consequences of such actions´ (Grillitsch and Sotarauta, 2020, 707). Agency is considered essential for developing new economic activities in regions (Isaksen et al., 2019, Bækkelund, 2021, Beer et al., 2021).

We propose a theoretical framework that explains new path development with i) regional preconditions, ii) agency as the main causal power, and iii) external events, which are largely outside the control of local actors. Regional preconditions capture the structural characteristics of a specific locality and include actor endowments and the networks and institutions relevant for innovation and entrepreneurship. In terms of agency, we build on the work of Grillitsch and Sotarauta (2020), asking which combinations of innovative

entrepreneurship, institutional entrepreneurship and place-based leadership make new path development possible. As regards external events, we focus in particular on crises that lead to a substantial drop in demand or prices for local firms. Theoretically, this work is anchored in a critical realist tradition, implying that regional outcomes are most likely to result from one or several combinations of causal powers and context conditions (Sayer, 1984, Bhaskar, 1997, Archer et al., 1998). The task is to identify which combinations of regional preconditions, types of agency and crisis contexts make new path development in non-metropolitan regions possible. More precisely, the research questions are as follows: *What are the necessary and sufficient combinations of conditions for new path development in non-metropolitan regions? How do they contribute to economic change in regions?*

We provide answers to these questions with a substantive empirical study in Finland, Norway, and Sweden, using longitudinal register data, an extensive document analysis, and a total of 207 interviews. The comparative analysis comprises 40 cases (phases of regional industrial development) with variation in the outcome: In some cases we observed new path development and in others not. The analysis is based on triangulating between in-depth theoretical and empirical knowledge as well as the results of a fuzzy-set qualitative comparative analysis (fsQCA). QCA is an analytical approach for searching answers to why and how questions (Ragin, 2008, Rutten, 2021). It is designed to identify multiple configurations of conditions explaining, in our case, new path development. Even though the usefulness of QCA for regional studies and economic geography has been demonstrated (Järvinen et al., 2012, Rutten, 2019, Lagendijk et al., 2020), its use in this field lags behind many other disciplines (Verweij and Trell, 2019).

2 Theoretical Framework

The current paper examines the role of agency for economic change in regions, relating to the intricate debate on structure and agency in the social sciences (Archer, 1982, Giddens, 2007:1984). Being inspired by the morphogenetic approach of Archer (1995), the proposed theoretical framework constructs a logic of regional economic change over time (see Figure 1).

Insert Figure 1 approximately here

The regional preconditions at a given point in time (T1) predate agency and can be conceived of as the result of the sum of all past actions and interactions. Agency is exercised in a certain period (T2–T3) in a context that is not of its own making and is influenced by regional preconditions, as well as external events. Agency affects both the direction and speed of economic change in regions, which is conceptualised as new path development. New path development sets in at some time between T2 and T3, with an observable result in T4. At T4, the regional preconditions have changed, opening for a new cycle of change (T5, T6 and T7).

New path development can occur in different forms (Martin and Sunley, 2006, Boschma et al., 2017, Hassink et al., 2019). We follow the typology of Grillitsch and Asheim (2018) distinguishing between regional industrial upgrading, diversification, and emergence. Industrial upgrading is defined as a process that leads to higher value-added activities in an existing industry by technological renewal, climbing global value chains or positioning in market niches. Industrial diversification is defined as a process leading to a move from an

existing industrial specialisation towards new ones based on related or unrelated combinations of knowledge. Emergence refers to the rise of new industries in regions that are unrelated to existing ones, either through importation (the industry exists in other locations) or the emergence of entirely new industries.

The importance of regional preconditions for new path development can be traced to the early writings of Marshall (1920), the literature on various types of territorial innovation models (Doloreux and Parto, 2005), regional innovation systems (Asheim et al., 2019), and recent work on entrepreneurial ecosystems (Alvedalen and Boschma, 2017). Accordingly, actors do not operate in isolation but are embedded in wider systems, are linked through regional and extra-regional networks, and are embedded in a multi-scalar institutional architecture. In such open systems, the region plays a role because it facilitates knowledge exchange and learning not only through the ease of face-to-face interactions (Malmberg and Maskell, 1999), but also because of the social and institutional environment in which learning takes place (Gertler, 2003).

Non-metropolitan regions have particular challenges for new path development such as a thin endowment of actors or a heavy specialisation in a particular industry (Isaksen and Trippl, 2016, Carvalho and Vale, 2018), which make extra-regional networks and knowledge sources particularly important (Trippl et al., 2018). As non-metropolitan regions can be geographically peripheral and as preconditions in the wider region may be geographically distant, we study in particular the *local* preconditions relevant to the specific regional industrial paths under investigation. We acknowledge different dimensions of peripherality and investigate regions in relation to their geographical location and position in networks (Kühn, 2015).

Recent studies emphasise the importance of agency for new path development (Hassink et al., 2019, Bækkelund, 2021). Agency can be directed at maintaining or changing regional structures (Jolly et al., 2020), and here, regional preconditions influence the prevalence of and dynamics between maintenance and change agency (cf Archer, 1982). For instance, regions where a diverse set of actors meet, provide for a high local potential for change agency based on local knowledge exchange and innovation, promoting new path development. Because the outcome of interest is new path development the theoretical framework foregrounds change agency as causal power, that is, actions directed at initiating, coordinating or implementing change. Acknowledging the complex and varied nature of new path development, agency is best understood as distributed between a set of intentional actors and a strategic driver for change (Dawley, 2014). The power of actors to affect new path development is rooted in the set of competences, networks, and resources they are able to mobilise in given spatial and temporal contexts (Grillitsch and Sotarauta, 2020). This also implies that local actors may receive their power through their positions in extra-regional networks providing access to extra-regional knowledge and resources. The aim is to go beyond one-dimensional models that simplistically highlight the roles of firms and organisations (Isaksen et al., 2019).

Based on an extensive literature review, Grillitsch and Sotarauta (2020) argue that the trinity of change agency (TCA) brings together three theoretically distinct but influential types of change agency for new path development: innovative entrepreneurship, institutional entrepreneurship, and place-based leadership. Innovative entrepreneurship is the nexus of opportunities and proactive actors who perceive and grasp opportunities, thereby generating novelty in different forms, such as new products, processes or organisational forms. In this way, innovative entrepreneurship is a pivotal force for economic change (Shane and Venkataraman, 2000, Block et al., 2017). Innovative entrepreneurship is influenced by the

institutional environment, including well-functioning capital markets, integrated juridical arrangements, high-quality labour and a variety of intangible assets, such as access to novel ideas and new knowledge, innovation networks, access to large markets and future-oriented leadership supporting their activities (Venkataraman, 2004).

Consequently, as the TCA theory proposes, institutional entrepreneurship and place-based leadership play an important role in creating an environment in which innovative entrepreneurship can flourish. The institutional landscape of a region is often adapted to its current industrial specialisations, as it has both shaped industrial development and been shaped by it. Therefore, institutional change is in many cases necessary for new specialisations to flourish. Institutional entrepreneurship is a type of change agency that directs attention to actors who work on changing informal and formal institutions in support of innovative entrepreneurship and new path development (Battilana et al., 2009, Sotarauta and Pulkkinen, 2011). Institutional entrepreneurs spark institutional changes and participate in their implementation (Battilana et al., 2009). Place-based leadership is about the identification of common interests and the mobilisation of crucial resources, competencies and powers (Collinge et al., 2011, Sotarauta and Beer, 2021), and thereby contributes to economic change in regions (Bailey et al., 2010). Different types of actors may, formally or informally, lead the processes of proactive work for new path development (e.g. Blažek et al., 2013, Hidle and Normann, 2013). Furthermore, the types of change agency are not constrained to specific actors but different types of actors can play different roles in different contexts and at different times (Flanagan and Uyarra, 2016, Grillitsch et al., 2021a).

The theoretical framework furthermore considers external events as confounding conditions for new path development. External events are largely outside the sphere of control of local

actors, including changes in global demand, the macro-institutional environment or technologies. In the current study, external events are considered that constitute a market crisis manifested in a drop in prices or demand and contraction of workplaces in the studied location. A market crisis calls for change to safeguard jobs and income opportunities while freeing up resources from previously profitable economic activities (Holm et al., 2017). Crises can therefore be considered critical junctures in which a change to regional structures is more likely than in other times (Collier and Collier, 2002, Pierson, 2004, Capoccia and Kelemen, 2007).

The theoretical framework emphasises a temporal logic suggesting that the interplay between structure and agency needs to be investigated over time. Yet, the temporal logic does not imply a linear relation between cause and effect. To the contrary, it embraces complexity where causal powers combine in various, sometimes contradictory ways to bring about an outcome, and where a number of different combinations of causal powers may produce the same outcome (equifinality) (Ragin, 2008, Furnari et al., 2020, Gerrits and Pagliarin, 2021). More concretely, in the current study this means that different combinations of conditions (regional preconditions, types of change agency, and external events) can lead to the same outcome (presence or absence of new path development). For instance, regions with favourable preconditions for new path-development may require a different set of change agency than regions lacking such preconditions. Or, while a market crisis may trigger change agency and release resources, a crisis also challenges existing industrial paths in their existence, possibly requiring a more complex combination of change agency than in relatively stable times. Identifying the different configurations of conditions that causally explain new path development is therefore the objective of the empirical study.

3 Research design

Scholars often need to make tough choices: Should we follow an intensive research strategy (ideographic) to unravel the secrets behind the complexity of economic and social phenomena in cities and regions? Or should we follow an extensive research strategy (nomothetic) to identify more general patterns of development across a large number of cases? Both approaches are used in regional studies, providing both depth and breadth. Yet as Ragin (1998, 106f) observes, '[w]ith variable-oriented techniques, for example, it is very difficult to address questions about actors' motives and subjectivities or to observe event sequences and causal processes', and relatedly, 'with case-oriented techniques, however, it is difficult to gain confidence that inferences are well grounded or that findings are general in any way'. In other words, the strength of intensive case-oriented studies is the weakness of extensive variable-oriented studies and vice versa. QCA is designed to combine the strengths of each approach by allowing for comparison across a large number of cases (Ragin, 1998, Rihoux and Ragin, 2009). We use QCA to identify multiple causal configurations for new path development in regions (cf Rutten, 2019).

However, similar configurations of conditions may lead to different outcomes (multifinality). From a critical realist perspective, this is not per se problematic because causal powers such as the three types of change agency do not produce an outcome in a deterministic nor probabilistic manner but that exercising such powers by local actors makes an outcome possible (Bhaskar, 1997, Rutten, 2021). Whether it produces an outcome depends on the interplay between one or more causal powers and confounding conditions. As society is complex, we can never capture all possible causal powers or confounding conditions and thus it may well be that despite the activation of certain causal powers (e.g. the three types of

change agency) an outcome (new path development) is not present. The main way to deal with this is case selection and the definition of scope conditions or the context in which configurations of causal powers bring about a change (Pagliarin and Gerrits, 2020, Rutten, 2021).

3.1 Context and case selection

The context for this study are three countries in the Nordics, namely Finland, Norway and Sweden. The three countries are characterised by similarities in the general macroeconomic and institutional frameworks. They are coordinated market economies with highly developed social welfare systems, high levels of trust in societal institutions, and high scores in good governance (Charron et al., 2014). The countries are characterised by large territories and low population densities, and by the presence of relatively active policies to support non-metropolitan regions. Nonetheless, in each country the largest cities have grown faster than other regions over the past few decades.

Within this context (scope conditions), we selected 12 regions in which we studied economic change over the last three decades, using theoretical sampling (Eisenhardt and Graebner, 2007). First, we identified when and where regional preconditions and national growth trends poorly predicted regional employment growth using standard growth models (see Grillitsch et al., 2021b)[i]. We thus identified periods in which specific regions grew substantially more or less than could be expected based on their structural preconditions. It is important to note that this is not to indicate new path development because the comparative analysis requires cases with variation in outcome. However, studying change processes in regions where the standard variables capturing regional preconditions (structures) and national growth trends

poorly explain employment growth holds promise to generate insights about other causes for economic development (potentially agency and external events).

Second, from the list of regions exhibiting periods with high unexplained growth deviations, we selected four regions in each country with varying patterns regarding their respective growth deviations (positive and negative) and regional preconditions, including medium-sized regional centres, specialized regions with an industrial tradition, small-peripheral regions and resource-based regions (Figure 2).

Insert Figure 2 approximately here

Third, in each region, we conducted an in-depth study following an identical methodology with shared interview guides and interview protocols (see Grillitsch et al., 2021c). The investigation started with an extensive desktop study of scientific publications, policy reports, planning documents, newspaper archives, and websites of relevant organisations. Using these data, a timeline was created of important events related to the observed outlier periods. Desktop research was also used to identify the actors that could be associated with these events. In explorative interviews, the events timeline was validated and corrected if necessary, and the list of key actors was complemented. Then, we conducted in-depth semi-structured interviews with a total of 207 interviewees, covering firms, local and regional government, support organisations, and higher education institutes (HEI), including universities (see Appendix A). In the interviews, we aimed to identify and validate the events and we traced which actions led to or resulted from them.

Forth, we identified the main industries and development phases in each region. Although there is theoretically no limit to the number of development phases, we found that the empirical reality of 20–30 years of regional development can be represented with two to three phases per region. This aligns with the findings of, for instance, Fritsch and Mueller (2004) that it takes approximately eight years to observe changes in regional systems following the entry of new businesses. Consequently, the units (cases) entering the comparative analysis are 40 regional industrial development phases (see Appendix B)[ii].

3.2 Calibration

For each regional industrial development phase (case), we investigated the regional preconditions for new path development at the beginning of each phase, the causal powers (three types of change agency) and confounding condition (crisis) during each phase, and the change outcome (new path development) at the end of each phase. We evaluated whether any of the conditions or outcomes were present or absent by defining the so-called membership scores. A membership score of (1) means the full presence of a condition or outcome, whereas (0) stands for full absence. To account for different degrees to which a certain condition or outcome is present, we applied fuzzy sets; this means that in addition to the scores of (1) and (0), we awarded a score of (0.67) if a condition/outcome is not fully present but it is more present than absent, and a score of (0.33) if a condition/outcome is not fully absent but it is more absent than present. It is important to note that fsQCA works with a threshold logic. This means that a value of 0.5 would express the maximum ambiguity whether a condition/outcome is present or absent. The scores therefore do not represent real numbers on which e.g. statistical methods are normally applied.

In order to ensure systematic scoring based on substantial theoretical and empirical knowledge, a calibration model was developed (Table 1). The initial calibration model was based on the theoretical framework presented in section 2. Then, each case was individually scored by the researchers who had conducted the respective empirical study. Subsequently, the calibration model was discussed, leading to a more stringent formulation of the outcomes and conditions, which sharpened the correspondence between empirical observations and specific membership scores. For instance, initially we had difficulties in scoring new path development. Consequently, we specified that upgrading entails a strengthening of an existing regional specialisation in relation to national or global markets, for instance through the realisation of enhanced value added or increased market shares, and that diversification requires a change of existing patterns of regional specialisations. We also had to specify that a score above 0.5 requires a validation of such a change through multiple sources, including interviews and documentary sources (triangulation). In contrast, a score below 0.5 means that even if we might have observed some instances of upgrading or diversification (e.g. single firms upgrading or diversifying), we could not corroborate through multiple sources that this strengthened the region's position in national or global markets (upgrading) or that this altered the existing patterns of regional specialisation (diversification). New path development as outcome is defined as the presence of diversification or upgrading, which is the maximum score of the two. New path development than is explained by combinations of five conditions, namely the presence or absence of

- Regional preconditions for innovation and entrepreneurship,
- Innovative entrepreneurship,
- Institutional entrepreneurship,
- Place-based leadership, and

- Crisis

We found the criteria of establishing empirical evidence through triangulation very useful, in particular to ensure that the most important threshold in fsQCA, namely distinguishing between scores above and below 0.5 was consistently applied. Moreover, it was a distinct advantage that most researchers had limited knowledge about the workings of fsQCA, meaning that the development of the calibration model was conducted without awareness of how it might influence the results. Appendix B reports the scores and short justifications.

Insert Table 1 approximately here

3.3 Analysis

A QCA identifies which combination of conditions is necessary or sufficient for an outcome to materialise. X is a necessary condition when outcome Y does not exist without X, that is, Y is a subset of X. X is a sufficient condition when X does not exist without outcome Y, that is, X is a subset of Y. This logic of identifying the necessary or sufficient conditions is generalised by the following formula, which makes it applicable to fuzzy sets:

Necessary condition: $Y \leq X$ (Y is a subset of X)

Sufficient condition: $Y \geq X$ (X is a subset of Y)

A QCA starts with all possible combinations of conditions. For instance, two conditions A and B result in four possible combinations: AB, Ab, aB, ab—where a capital letter indicates the presence and a small letter the absence of the respective condition. The complexity increases exponentially with each condition. We use five conditions in the analysis, implying 32 possible

combinations, out of which 19 combinations were observed, as shown in the truth table (Appendix D).

Scores for combinations of conditions in fsQCA are derived by the following principle:

AB = min(A,B); Ab = min (A,1-B); aB = min (1-A,B); ab = min (1-A,1-B)

The truth table analysis yields the combinations of conditions that are sufficient for new path development. Before starting the truth table analysis, a choice has to be made about which combinations of conditions are associated with new path development based on the raw consistency and the proportional reduction in inconsistency (PRI) consistency calculated from the membership scores. The raw consistency indicates whether a combination of conditions is a subset of the outcome. The raw consistency equals 1 if the score of the outcome is always equal to or higher than the score for the respective combination of conditions. However, raw consistency can be high for a specific combination of conditions, even if the outcome is not present. For instance, the raw consistency criterion is not violated if the outcome membership score is 0.33 and the score for the respective combination of conditions is equal to or lower than 0.33 (cf. Rutten, 2021). This is why the PRI consistency needs to be considered as well, which punishes irrelevant cases where the outcome membership score is below 0.5. By default, the value of the PRI consistency is 0 if the outcome score never exceeds 0.5. The recommendation in the literature is to choose a cut-off value of 0.8 for both types of consistency (Ragin, 2009). As shown in Appendix D, the raw consistency values are high for all combinations (min. value is 0.81). Yet the PRI consistency is only high until row 13 (value of 0.83). In rows 14–19, the PRI consistency value is low (equal or lower than 0.5). This provides for a clear distinction where the combinations of conditions presented in rows 1-13 are

associated with new path development while rows 14-19 cannot be linked to new path development.

The truth table analysis implements a process of logical simplification. The simplification based on existing observations works as follows: If outcome Y is observed in cases representing the combination AB and Ab, then A would be a sufficient condition. B is a logically redundant condition. Yet because not all possible combinations are observed, the QCA approach foresees a simplification process that considers theory-derived assumptions. This works as follows: If outcome Y is observed in cases representing the combination Ab, but if observations for AB are lacking, A would still be a sufficient condition if theory backs the assumption that only the presence of B affects outcome Y. For instance, let Y be new path development, A innovative entrepreneurship and B place-based leadership. If we then observed new path development in cases characterised by innovative entrepreneurship but not place-based leadership, we could assume that new path development also occurs in cases where both types of change agency are present. Using this type of logical simplification based on theory-derived assumptions leads to the so-called intermediate solution. The QCA approach also yields a complex solution with no theory-derived assumptions and a parsimonious solution, which treats all conditions as if the assumption was made that only the presence of conditions is linked to new path development (all solutions are reported in Appendix E**Fel! Hittar inte referenskälla.**). In our case, to arrive at the intermediate solution reported in the findings, the *unobserved* combinations of conditions are treated with the theory-derived assumption that only the presence (not the absence) of change agency contributes to new path development.

3.4 Theory-building

Theory building rests on substantive interpretation bringing empirical, contextual and theoretical knowledge in a dialogue (Rutten, 2021) where a distinction is made between formation and causation (Rutzou and Elder-Vass, 2019). Formation captures how certain configurations of conditions come into being, or how – in the current paper – certain combinations of change agency emerge in a time-place specific context. Each case provides a highly idiosyncratic formation story capturing the particular actor constellations and their embedding in regional as well as extra-regional networks, and institutional settings. In this paper, the formation stories typically have antecedents in history and unveil processes of change. This paper can obviously not describe 40 formation stories but we select some cases to illustrate the emergence of the identified sufficient combinations of conditions.

Each sufficient combination of conditions, in contrast to formation stories, makes a causal claim. A sufficient combination explains why an outcome (new path development) comes into being. The causal claims are thus of general nature, which are valid within the defined scope conditions. Critical realists also call such causal claims mechanisms (Groff, 2017, Gorski, 2018). The causal claims resulting from substantive interpretation may then corroborate or contradict existing theories about economic change in region.

4 Findings

The analysis of necessary conditions did not identify any necessary conditions for new path development (see Appendix C). The analysis of sufficient conditions identified five combinations of conditions, which are sufficient for new path development to occur (Table 2, see Appendix E for the details). For simplicity, we use the term ‘routes’ for these combinations of conditions. The solutions have high coverage (0.89) and consistency (0.93). Each identified

route also has a high consistency (above 0.9). Routes 4 and 5 even have a consistency of one, meaning that in all cases, the score for new path development was higher than the score for the respective combination of conditions.

Insert Table 2 approximately here

The analysis distinguishes between routes that are only available in noncrisis times (Routes 1 - 3) and such that lead to new path development irrespective of the presence of a crisis (Routes 4 and 5). The latter are characterised by a higher degree of complexity; that is, more conditions need to be present for new path development to happen. As elaborated below, this suggests that crises require more radical change made possible through the combination of causal powers.

4.1 Route 1: Innovation-driven new path development in noncrisis times

Route 1 stands for cases where the combination of *innovative entrepreneurship* and the *absence of a crisis* led to new path development. This combination of conditions was observed in 19 cases, out of which six times as a unique combination[iii].

Formation: We find that innovative entrepreneurship may be driven by single lead firms as well as a set of small and medium-sized enterprises (SME). Salo, a fairly small subregion in the eastern part of Southwest Finland, illustrates the former scenario. Since the 1920s, electronic device manufacturing has been the key industry. Salo is an essential part of the history of the Finnish electronic industry and Nokia's mobile phone saga. Nokia established a unit in Salo in the late 1970s, at first in the form of a collaboration and later as a joint venture. By the end of

the 1990s, Nokia had become the world's largest mobile phone manufacturer, and for a long time, Salo was its key site. Nokia grew rapidly and expanded its operations elsewhere in Finland and abroad. Still, the Salo site remained a crucial nexus in terms of both R&D and manufacturing. The first observation period in Salo can be labelled the golden era of the global mobile phone business (1990–2008). This meant climbing the global production chain and industrial renewal based on new technologies. The golden era ended in Nokia losing its position in global mobile phone markets and the closure of all its activities in the region (more precisely Microsoft, to which Nokia sold its mobile phone business).

Conversely, a set of SMEs has driven innovative entrepreneurship in Jakobstad, a rural region located in the Swedish-speaking area at the west coast of Finland. Jakobstad has an exceptionally vivid and export-oriented SME sector. The industry is versatile, including food, boat, forest and machine industries, and agriculture. Continuous innovative entrepreneurship inspired by local and nonlocal networks has led to a gradual diversification of the industry during both observed development phases, despite individual innovation often being of a rather incremental nature. Especially here, the forest and food clusters diversified and restructured into smaller firms. Jakobstad is also characterised by collective and business-led place-based leadership, resulting, for instance, in the establishment of a firm-led industrial park.

Causation: The importance of innovation-driven new path development in non-metropolitan region is at odds with extensive literature in economic geography emphasising agglomeration economies as driver for innovation (Shearmur, 2012). This proposition has been increasingly questioned. Fritsch and Wyrwich (2021), for instance, find that patenting is geographically dispersed with a large share occurring outside metropolitan regions, and conclude that the

role of agglomeration economies is exaggerated. Existing literature on innovation in the periphery finds that firms do not necessarily need to have knowledge close-by but can compensate through external linkages and in-house competences (Grillitsch and Nilsson, 2015). To be sure, the context of the study are the Nordic countries where building in-house competences and external linkages may be easier than in a low-income and resource-scarce context. Also firms' knowledge links result hardly from serendipity and chance encounters but are most often strategically built with extra-regional networks contributing more to the innovativeness of firms than regional links (Fitjar and Rodríguez-Pose, 2013).

Yet, innovative entrepreneurship does not suffice for new path development in crisis times (substantial drop in prices or demand). Crises challenge firms in their existence with substantial consequences to employees, regional policy makers, and citizens more generally. While innovative entrepreneurship might help a single firm to survive, the results suggest that in crisis times new path development, which is a regional outcome, needs a reorientation and mobilisation of many actors for new goals, this is to say the more complex configurations identified in Routes 4 or 5. In noncrisis times, such reorientation and mobilisation is not necessarily required and thus innovative entrepreneurship on its own right makes new path development possible.

4.2 Route 2: Institutional change-driven new path development in noncrisis times

Route 2 captures cases where *institutional entrepreneurship* combined with the *absence of a crisis* led to new path development. This combination of conditions was observed in 12 cases, out of which three were a unique combination.

Formation: The development of tourism in Kirkenes in the remote and sparsely populated northeastern part of Norway is an illustrative case. Kirkenes shares a border with Russia and

Finland and has an ice-free coastline. The mining of iron ore had been the core industry but its importance varied and the mine closed in 2015. Since the mid-1980s, local actors have sought to capitalise on localised assets such as its wilderness and location in the arctic and at the Russian border. However, the local preconditions were relatively weak and tourism as an industry not valued. The tourism industry was fragmented, poorly developed, and dominated by uncompetitive small firms. In the second observation period (2006–2015), tourism was promoted and increasingly perceived as an important industrial path. Local entrepreneurs initiated more concerted efforts to upgrade the service provision and simultaneously to change attitudes to become more supportive for tourism development. An example is the recognition of the tourism industry in the regional strategy 2012, which was later revised, and contributed to the establishment of the tourism marketing organisation in 2017. This led to an upgrading of the tourism industry in Kirkenes, even though seasonality and dependence on tour/cruise operators from Finland and Norway remain a challenge.

Arendal in Agder, South Norway, is another example where institutional change drove new path development in phase 1 (2000–2008). Arendal is known for its oil and gas service suppliers and the electronics industry, which had historically been characterised by large nationally and internationally owned firms. The institutionally driven path development by the local and regional government, higher education institutes and firms refers to actions aimed at strengthening a collaborative culture and aimed at changing the reputation of Arendal locally and nationally. This led to an upgrading of the existing path, in particular enhanced innovation activity based on increased firm-university linkages. The institutional change in phase one also played a role in the development during phase two, in particular the opening of a new campus of the University of Agder in 2010, the development of cluster

organisations and innovation labs, as well as the organisation of 'Arendalsuka', a week of events and discussions where top politicians, organizations, HEIs, and industries meet.

Causation: Route 2 supports the arguments highlighting the importance of institutions for regional development (Gertler, 2010, Rodríguez-Pose, 2013). Institutions have emerged as central objects of study in regional development and economic geography (Martin, 2000). It has been argued that institutions—both formal and informal—matter more for economic development than the traditional targets of attention, such as physical resource endowments, education, or technology transfer (Acemoglu et al., 2005). Our findings corroborate previous literature suggesting that institutional entrepreneurship is important to legitimise emerging development paths (Heiberg et al., 2020) and to changing norms, conventions or culture leading to new networks or organisational forms supporting new path development (Strambach and Pflitsch, 2020). It is important to note, however, that institutional entrepreneurship only makes new path development possible in noncrisis times. In combination with the other types of change agency it is more powerful (Route 4), making new path development possible also in crisis times.

4.3 Route 3: System-based new path development in noncrisis times

This combination identifies cases where favourable *regional preconditions* with the *absence of a crisis* led to new path development. This combination was observed in 11 cases, out of which it was a unique combination once.

Formation: The unique case of this route was observed in the second phase of tourism development in Kiruna, North Sweden (2005–2015). The background to this case is that in phase one (1990–2005), an innovative entrepreneur kicked off high-end winter tourism by introducing the ice hotel. The idea that the tourism season could be extended from summer

activities such as hiking, kayaking, and white-water rafting to make more active use of snow, ice and darkness was a major (and initially resisted) change in mindset, requiring institutional entrepreneurship. By 2005, high-end winter tourism was an established segment. In the second phase, this type of tourism grew and upgraded as more firms (old and new) targeted the same market segment. At the beginning of phase two, publicly and privately funded support networks connected local firms. Funds were attracted to further promote and develop the market niche through, for example, destination marketing and the development of a quality certificate. The innovative and institutional entrepreneurship that was required to kick off the winter tourism path in phase one became less pronounced in the second phase, when further development mainly relied on networks of local actors. In other words, institutional and innovative entrepreneurship shaped regional preconditions for the following phase.

Causation: Route 3 suggests that new path development can be rooted more in the system, that is, the traded and untraded interdependencies between actors (Storper, 1995) and the institutional environment (Cooke, 1992, Asheim and Gertler, 2005), than in pronounced acts of change agency. This is also supported by the literature on regional innovation systems, suggesting that actor endowments, networks and institutional configurations support innovation-based regional development, which implies upgrading or possibly also diversification of regional paths (Radosevic, 2002, Doloreux and Parto, 2005, Asheim et al., 2019).

The novel insight is that during crisis times, a relatively strong innovation system in the context of non-metropolitan regions does not suffice to generate new path development, possibly because the smaller size of non-metropolitan regions does not allow for sufficient diversity in

the innovation system to promote radical innovation, or to spread risks between different industrial paths (Frenken et al., 2007, Trippl and Otto, 2009). In order to address new path development in crisis times, innovative entrepreneurship and place-based leadership need to be added (Route 5).

4.4 Route 4: Trinity of Change Agency

Route 4 stands for cases where *innovative entrepreneurship*, *institutional entrepreneurship*, and *place-based leadership* together led to new economic activities. This combination was observed in seven cases, and once uniquely.

Formation: The illustrative case covers the development of the IT industry in Karlshamn (Sweden) during the first phase (1990–2005). Karlshamn lacked favourable preconditions for the IT industry. The dominant food industry, facing global restructuring and rationalisation, gradually cut jobs in the 1980s and 1990s, culminating in the closure of the last production lines at Carlshamn Mejeri (dairy) in 2002. In the 1990s, a number of actors from the municipality, higher education, and business sector developed a new vision and strategy aimed at shifting industrial paths from blue-collar jobs to the knowledge economy. This change in mindset (institutional entrepreneurship) in the 1990s, combined with the (re)formation of networks across industry, municipality and academic leaders, resulted in an application to the European Regional Fund to launch Netport at the end of 1999 (place-based leadership). This triple helix organisation hosts a university campus where small firms develop new products in IT and new media (innovative entrepreneurship).

Thus, institutional entrepreneurship initiated the TCA in Karlshamn, triggering place-based leadership and, consequently, innovative entrepreneurship. A similar dynamic could be observed in Olofström (Sweden) and Mo i Rana (Norway), where—in response to a crisis—

institutional entrepreneurship played a role in changing the mindset, which was a precondition for the subsequent collective mobilisation of resources and increased innovative entrepreneurship. However, the empirical material also provides different patterns, such as in Ulsteinvik (Norway), where innovative entrepreneurs initiated and engaged in the other two types of change agency in order to promote new path development. This included strengthening the competence base and anchoring scientific knowledge in the engineering-based maritime sector.

Causation: The theoretical underpinning for Route 4 is provided by Grillitsch and Sotarauta (2020) who claim that the three types of change agency, call for and necessitate each other in regional development processes. This goes back to the literature showing, for instance, how entrepreneurs engage in shaping regional clusters (Feldman et al., 2005) or how institutional change creates the preconditions for innovative entrepreneurship to happen (Saxenian and Sabel, 2008). Recent work explicitly using the TCA provides evidence for the interplay between the three types of agency (MacKinnon et al., 2019, Jolly et al., 2020). The results of the analysis underpin the relevance of the TCA as it is the only combination of conditions sufficient for new path development, regardless of a crisis or noncrisis situation, and regardless of the regional preconditions. This means – at least in the context of the Nordic countries – TCA makes new path development possible even in regions without strong precondition and facing a crisis.

4.5 Route 5: Innovative entrepreneurship and place-based leadership embedded in strong regions

Route 5 represents cases where favourable *regional preconditions* were combined with two types of change agency: *innovative entrepreneurship* and *place-based leadership*. This

combination of conditions was observed nine times, and in two cases, it constituted a unique combination of conditions.

Formation: The first unique case constitutes the maritime industry in Ulsteinvik, Norway, which developed into a global hub for offshore service vessels until 2014. Then, it was characterised by strong networks at the local, national, and international scales. Furthermore, leading firms were embedded in regional support structures, such as the global centre of expertise cluster 'Blue Maritime' and the university campus of NTNU (Norwegian University of Science and Technology) in Ålesund. Following an almost total drop in demand because of the collapse of oil prices in 2014, firms needed to cut employment and radically reorganise. Ulsteinvik is known as one of the most entrepreneurial regions in Norway. Firms invested heavily in new products and markets (R&D expenditures doubled in this period). At the same time, firms, municipalities, and support structures bundled at Ålesund Knowledge Park simultaneously and in unison mobilised support to finance and to provide the required competences for the reorientation from the national government. The combination of innovative entrepreneurship and place-based leadership led to a diversification of the regional economy in the third observation period from 2014–2019.

The other unique case is Gislaved/Gnosjö, which is the densest Swedish region in manufacturing, with a strong production structure characterised by tight networks between small and large firms. The region is associated with 'Gnosjöandan' (the Gnosjö spirit), a culture of entrepreneurship and support to the local community by businesses. Firms show a high level of innovativeness and invest collectively in public infrastructure, as well as technical education. Despite suffering during the financial crisis, the region upgraded within industrial manufacturing during the second development phase from 2000–2019.

Causation: Theoretically, it is not surprising that favourable preconditions combined with innovative entrepreneurship and place leadership provide a route to new path development. The rich literature on regional innovation systems foregrounds the role of local institutional configurations as key for facilitating innovation and entrepreneurship (Cooke, 1992, Asheim and Gertler, 2005). Regions endowed with an entrepreneurial culture and informal institutions supporting knowledge transfer and learning between local actors (Molina-Morales et al., 2002) do not necessarily require institutional change because existing formal and informal institution support path development well. In such regions, mobilising actors and coordinating their activities (place-based leadership) and innovative entrepreneurship suffices for new path development in crisis and noncrisis times (Bailey et al., 2010).

5 Conclusion

This paper investigates agency and economic change in non-metropolitan regions in Finland, Norway and Sweden. The paper develops a theoretical framework, which emphasises a temporal logic to study the interplay between structure and agency. Accordingly, economic change in regions should be investigated over time, with a starting-point when regional preconditions are assessed, a subsequent period where change agency may unfold considering external events, and an end point when a change to the regional economy (conceptualised as new path development) can be assessed.

The paper contributes with an innovative research design to compare in-depth studies of 40 regional industrial development phases over 30 years in 12 regions of three countries. The analysis allowed to distinguish the largely idiosyncratic formation stories from more general and abstract causal claims (Rutzou and Elder-Vass, 2019). The formation stories tell how specific configurations of change agency in given regional contexts and under consideration

of external events came about. The formation stories capture specific actor constellations, their embedding in regional and extra-regional networks, and particular institutional configurations. The formation stories also provide a deep understanding of the change process in a particular place, the sequence of events and actions. The formation stories rely on the strengths of in-depth, intensive studies.

The general abstract causal claims are based on comparative analysis using a fuzzy-set qualitative comparative analysis and substantive interpretation, which aim at the most plausible explanation for an outcome (new path development in non-metropolitan regions) when considering theory, results of the comparative analysis, and deep context knowledge (Groff, 2017, Gorski, 2018, Rutten, 2021). The causal claims refer to the five configurations of conditions (routes) identified in the current study, which – if in place – make new path development possible. In this regard, the advance of knowledge lies in the identification of the sufficient combinations of conditions for an outcome, i.e. in combinatorial arguments. Moreover, the study shows that different reasons (combinations of conditions) can lead to the same outcome (new path development), allowing thus for theoretical pluralism.

One generic causal claim is that simple combinations of conditions (Routes 1 – 3) allow for new path development in noncrisis times. Yet, more complex configurations (Route 4 and 5) make new path development possible even if there is a crisis. The way in which the presence (or absence) of a crisis is related to new path development is somewhat surprising because our reading of the literature was that crises at the national or global level may trigger major changes in regions (Bristow and Healy, 2014, Martin and Sunley, 2014). Hence, we expected to find the “presence” of a crisis to be part of sufficient combinations of conditions. Yet, it was the absence of a crisis that turned up in three of the identified routes.

In the absence of a crisis, new path development was made possible by exercising a single causal power, namely innovative entrepreneurship (Route 1), institutional entrepreneurship (Route 2), or the interactions in regional innovation systems (Route 3). In contrast, the exercising of more complex combinations of causal powers (Route 4 and 5) makes new path development possible regardless whether the region was suffering from a crisis or not. For Routes 4 and 5, crisis is a redundant condition, which suggests that both opportunity- and necessity-driven change can occur under the same configurations of conditions, pointing to the importance of agency. Our interpretation is that in crises a more radical change is required, which is made possible by the complex combinations of causal powers. Radical changes call not only for new products, processes or business models (innovative entrepreneurship) but also a rethinking and consequently change of common practices, conventions, and beliefs (institutional entrepreneurship) and a mobilising of joint efforts for new objectives (place-based leadership), representing the Trinity of Change Agency (Grillitsch and Sotarauta, 2020). Yet, when exercised the Trinity of Change Agency makes new path development possible regardless the presence or absence of a crisis; thus the presence of a crisis is not part of the complex combinations.

The analysis provides for a more fine-grained result by differentiating between two complex combinations of conditions, both being causes for new path development in crisis and noncrisis times. The first one is the Trinity of Change Agency. The second includes innovative entrepreneurship, place-based leadership but not necessarily institutional entrepreneurship in regions with strong preconditions for new path development. Such cases were found in regions, which are commonly known for their high entrepreneurial activities and entrepreneurial culture. Our interpretation thus is that if local conventions are supportive for picking up new opportunities, taking risks, and change (Storper, 1995, Fitjar and Rodríguez-

Pose, 2011, Fritsch et al., 2019), then institutional entrepreneurship is not a necessary ingredient in the complex configuration of conditions.

Furthermore, by comparing the formation stories for the complex combinations, the empirical material provides evidence for at least two process chains that are important in regional development. First, we found cases where institutional entrepreneurship (a change in cognitive-cultural institutions) provided the grounds for mobilising across actor groups and pooling resources (place-based leadership), which led to improved regional preconditions for stimulating innovative entrepreneurship (cf Saxenian and Sabel, 2008). Second, we found cases where innovative entrepreneurs succeeded in a market niche and engaged in developing the resources required in the region for further growth (place-based leadership). This often called for a change in cognitive-cultural institutions (institutional entrepreneurship) in order to legitimise a new industrial path in the region (cf Feldman and Francis, 2006).

One limitation though is that this study focussed on the combinations of conditions that made new path development possible. Yet, we did not interrogate the magnitude or relative importance of the paths in a regional economy. For instance, we are confident that the development of the winter tourism industry in Kiruna constitutes new path development, yet this did not challenge the existing mining industry, which is of national and European importance. Thus, future research may interrogate the magnitude and relative importance of new paths. A second limitation is the context (scope conditions) of the current study defined by the Nordic countries; this means that we claim that the routes to new path development identified in this paper hold in non-metropolitan regions that are well endowed with basic foundations for economic development, such as good governance, infrastructure and decent education levels. What combinations of conditions makes industrial diversification or

upgrading possible in more resource-scarce environments in low-income countries or peripheral regions in Southern and Eastern Europe would require further research in these contexts. Another limitation is that the present study defined the outcome in terms of new path development capturing economic change in regions. Thus, another research avenue would be to investigate which configurations of causal powers and context conditions make other types of change possible (e.g. addressing climate change and social inequalities).

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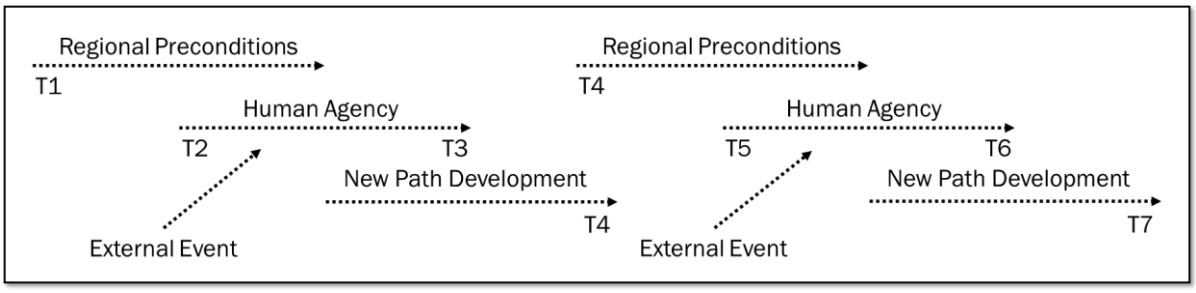
[i] The explanatory variables captured related variety, specialisation, diversity, competition, oil dependency of the region (in Norway), manufacturing share, high-tech manufacturing share, knowledge-intensive services share,

public employment share, median wage, human capital, population density and regional employment. The analysis was conducted on labour market regions in Norway and Sweden and on economic sub-regions in Finland. Because of data availability, the period 1990–2016 was analysed in Sweden and Finland and 2000–2016 in Norway.

[ii] In the context of QCA, a "case" is also termed "event" and constitutes "an 'assemblage' of causal powers, human agents exercising them and the outcome they (fail to) achieve" Rutten (2021, 12).

[iii] A unique combination identifies a case characterised by only one specific combination of conditions. In contrast, a case that fits more than one route is not unique. For instance, a case characterised by innovative entrepreneurship, institutional entrepreneurship, and non-crisis fits Routes 1 and 2, thus is not unique.

Figure 1: Theoretical Framework



Source: Own elaboration inspired by Archer (1982).

Figure 2: Location of regions

Table 1: Calibration of Conditions and Outcomes

Outcomes, conditions	Descriptions	Codes			
		1	0.67	0.33	0
Diversification*	Regional economy moves into new markets / technologies	Consensus in interviews that a regional economy has diversified AND concrete events supporting this; change in existing patterns of specialisation evident	Interviews suggest that regional economy diversifies AND concrete events supporting this; change in the existing patterns of specialisation becomes visible	Some diversification observed, which, however, is insufficient to alter the existing pattern of specialisation	No diversification observed
Upgrading*	Existing specialisations are strengthened	Consensus in interviews that the existing specialisation is upgraded AND concrete events supporting this; strengthening of region's position in national/global markets becomes evident	Interviews suggest that regional economy upgrades AND concrete events supporting this; strengthening of region's position in national/global markets becomes visible	Some upgrading observed, which, however, is insufficient to strengthen the region's position in national/global markets	No upgrading observed
Regional preconditions	Presence of actor, network and institutional configurations that promote innovation and entrepreneurship in locality	Combination of strong and variety of firms and support structures, strong local networks, and collaborative culture	Many elements of innovation systems present but with some weaknesses	Some elements of innovation systems present but fragmented and weak	Few actors, weak networks, no supportive institutions
Innovative entrepreneurship	Strong presence of innovative entrepreneurship	General consensus in the interviews that innovative entrepreneurship played an essential role for regional development and concrete events supporting this (including innovations new to the world/region)	Interviews suggest that innovative entrepreneurship played an important role for regional development and concrete events supporting this (regular innovative activities of medium novelty)	Interviews point to some actions of innovative entrepreneurship that were deemed to have played some role for regional development	Interviews did not point to actions of innovative entrepreneurship, which were considered relevant for regional development

Institutional entrepreneurship	Strong presence of institutional entrepreneurship	General consensus in the interviews that actions aimed at changing institutions (cognitive, normative, regulative) were highly influential for regional development AND events supporting this	Interviews suggest that actions aimed at changing institutions (cognitive, normative, regulative) played an important role for regional development AND events supporting this	Interviews point to some actions targeted at institutional change, which were deemed to have played some role for regional development	Interviews did not point to actions target at institutional change, which were considered relevant for regional development
Place-based leadership	Strong presence of place-based leadership	General consensus in the interviews that actions aimed at coordinating/pooling/mobilising interests/resources were essential for regional development AND events supporting this	Interviews suggest that actions aimed at coordinating/pooling/mobilising interests/resources were important for regional development AND events supporting this	Interviews point to some actions aimed at coordinating/pooling/mobilising interests/resources that were deemed to have played some role for regional development	Interviews did not point to actions aimed at coordinating/pooling/mobilising interests/resources that were considered relevant for regional development
Crisis	Period characterised by a market crisis	Consensus in interviews that period had a crisis coupled with strong decline	Perception of a slow market coupled with below average market growth	Tendency of negative market outlook	Average or higher market growth

Note: * In the 40 cases included in our analysis, we observed diversification and upgrading but no cases of emergence. Hence, we developed the calibration for these forms of new path development.

Table 2: Routes to New Path Development

Conditions	Route 1	Route 2	Route 3	Route 4	Route 5
Regional Preconditions			●		●
Innovative Entrepreneurship	●			●	●
Place-based Leadership				●	●
Institutional Entrepreneurship		●		●	
Crisis	ø	ø	ø		
Consistency	0.91	0.97	0.97	1.00	1.00
Raw Coverage	0.69	0.52	0.49	0.52	0.53
Unique Coverage	0.13	0.05	0.01	0.03	0.03
Solution Coverage	0.89				
Solution Consistency	0.93				

Appendix A: Overview of conducted Interviews

Region	Firms	Local- and regional government	Support organisations	HEI/ universities	Other	Total
Arendal, Norway	4	3	4	3	0	14
Eastern Lapland, Finland	5	4	4	0	2	15
Emmaboda, Sweden	2	4	0	0	1	7
Gislaved, Sweden	5	2	3	1	1	12
Jakobstad, Finland	6	2	4	2	4	18
Kirkenes, Norway	8	1	5	4	0	18
Kiruna, Sweden	8	8	4	1	0	21
Mo i Rana, Norway	8	1	8	1	0	18
Olofström/Karlshamn, Sweden	9	9	3	2	0	23
Salo, Finland	8	6	3	2	2	21
Ulsteinvik, Norway	10	3	6	1	0	20
Varkaus, Finland	12	1	4	1	2	20
Total	85	44	48	18	12	207

Appendix B: Scores and justifications

Region, Industry, Period	Diversification	Upgrading	Regional preconditions	Innovative entrepreneurship	Institutional entrepreneurship	Place-based leadership	Crisis
Ulsteinvik, maritime, 2000–2004	(0) No diversification observed	(0.33) Investments in innovation of some firms; establishment of knowledge park	(0.67) Presence of strong local and international firms, relatively well-developed local value chains, collaborative culture, lack support infrastructure	(0.33) Some firms pursuing long-term innovation projects	(0) Actions aimed at institutional change not observed	(0.33) Joint actions led to establishment of knowledge park but still rather weakly developed	(0.67) Decline in demand and general perception of unsecure future of maritime industry
", 2004–2014	(0.33) Even though some firms addressed new markets, and support structures started to discuss diversification, most activities were focused on the exploiting the boom for offshore vessels	(1) The region became a global hub in the maritime industry with strong investments in the firm and support structures (national and global centre of expertise)	(0.67) Presence of strong local and international firms, relatively well-developed local value chains, collaborative culture, lack support infrastructure	(1) Some radical innovations of key firms (e.g., X-Bow), many firms pursue innovation projects alone and in collaboration with support structures and university colleges, general perception of a highly innovative and entrepreneurial region	(0.67) Support structures, university colleges, and several firms worked on enhancing appreciation of academic/research-based knowledge	(1) Strong leadership emerges in support structures, university colleges, combined with continued strong leadership of firms	(0) Boom period
", 2015–2019	(1) New markets (e.g., cruise ships, ferries, offshore wind) are targeted, new technologies (e.g., hybrid technologies, digitalisation) are used	(0) Regional support structures integrated and enhanced, investments in education, but also reorientation and divestment	(1) Presence of strong local and international firms, strongly networked regionally, nationally, globally, collaborative and innovative culture, excellent support structure, global hub in maritime industry	(1) All firms in the maritime industry seek new markets, also introducing new technologies related to e.g. digitalisation and greening; innovative entrepreneurship seen as the main driver to find a way out of the crisis and developing new growth paths	(0.33) Some actions targeted at changing mindset (e.g., in schools) or adapting institutions in response to crisis	(0.67) Continued strong collaboration and leadership but more fragmented than in phase 2 because of firms focus on own business	(1) Market for maritime industry collapsed completely
Mo i Rana, process, 2000–2004	(0) No diversification detected	(0.33) Some upgrading efforts made by newcomers by the end of period	(0) Process industry at MIL very isolated. No cross-sectoral networking/collaboration with other regional actors	(0) Hardly any investments in facilities/processes/products made	(0) No changes in how things are done	(0.33) MNC (Vale) enters the region 2003 and starts to invest, Helgeland Knowledge Park established by the end of the period and starts to establish cross-sectoral networking	(0.67) General crisis in the international process industry
", 2004–2016	(0.33) Some diversification detected but did not change the focus of the industry	(1) Great investments in improving facilities, production processes, developing new products, and support structures; intersectoral	(0.33) Process industry at MIL still very isolated. However, signs for increased will to explore benefits of networking with other regional actors	(0.67) Product processes improvements and a number of new products – growth on international markets - some new firms established (mainly supplier services)	(0.67) Promote a change in mindset towards a more networked approach both regionally and extra-regionally	(0.67) Several actors worked towards the establishment of support structures (e.g., Kunnskapsparken Helgeland and Campus Helgaland)	(0) Strong growth in demand on international steel and mining markets

		collaboration increased					
Mo i Rana, national public services, 2000–2004	(0.33) New e-service solutions but not changing the industrial specialisation	(0.33) Growth of national public service sector based on digital solutions	(0) Several national public service organisations present, but very little networking and very weak support structures	(0.67) Constant development of new technologies/services (digital solutions/e-services)	(0.67) Lobby for changing mindset in labour market (e.g., for women); Fostering a mindset about 'innovative' public services	(0) No action identified in interviews	(0) No crisis
", 2004–2016	(0.33) New e-service solutions but not changing the industrial specialisation	(0.67) Growth of national public service sector based on digital solutions and upgrading of support structures (Knowledge park Helgeland)	(0.33) Several national public service organisations present, some relevant competences locally in digital solutions, emerging support structures in the beginning	(0.67) Constant development of new technologies/services (digital solutions/e-services/ automatisation)	(0.67) Lobby for changing mindset in terms of educational profiles, fostering a mindset about "innovative" public services	(0.33) Engaged in local networks (e.g., to improve educational opportunities)	(0) No crisis
Arendal, oil and gas suppliers, 2000–2008	(0.33) Some diversification in knowledge support and firms observed, which however, did not change the focus in the industry	(0.67) Strengthening of support structures and success of leading firms	(0.33) Presence of some strong firms and university college, yet fragmented, deficiencies in skill base, and low entrepreneurial culture	(0.33) Innovation of lead firm in the cluster important for growth, yet, innovative entrepreneurship is not mainstreamed	(0.67) Strong efforts to enhance collaborative culture, work of municipality to change perception	(0.67) Firms, HEIs, and government collaborated to build support structures	(0.33) Slow demand until 2004
", 2008–2016	(0.33) Some diversification in knowledge base of support structures, some firms moving in new directions (e.g. mechatronic, automatisation), yet, specialisation did not change in this period	(1) Strengthening support structure (e.g. NODE) and evidence for increased collaboration, plus strong firm growth indicating market success	(0.67) Relatively strong support structures and firms, increased networking as compared with phase 1	(0.67) Oil suppler firms grew fast and had to change organisation of the work from innovation in each project to more standardisation of projects/solutions	(1) Strong efforts to enhance collaborative culture (through NODE), work of municipality to change perception, and building UiA Grimstad Campus	(1) Firms, HEI, and government collaborated to build support structure (MIL, UiA Grimstad, GCE NODE, Agder Regional Research Fund, Teknova)	(0) Boom period
Arendal, electronics/ICT, 2000–2008	(0.33) Build knowledge in new sectors (e-health) and some firms (as spinoffs from the Ericsson department) moving to new markets, but new industrial specialisation not visible	(0.33) Some investments in ICT and electronics sector made, to also overcome disinvestment of Ericsson	(0.33) Existing competences but key actor Ericsson discussed disinvestment at the beginning of the period, and relatively low learning between actors in the region.	(0.33) Some firms with innovative projects but not mainstreamed	(0.33) Work of municipality to change perception	(0.67) Lead employees in Eriksson and region take responsibility to keep jobs in the region (Aust-Agder county council, Edge Consulting)	(1) General crisis in ICT industry and disinvestment of Ericsson
", 2008–2016	(0.67) Enhanced competences in new	(0.67) Enhanced support structures,	(0.67) Firms and support structures with emerging	(0.67) Number of firms moved to new products in new markets,	(0.67) Work of municipality to change	(1) Firms, HEI, and government	(0) Growing market

	fields and firms moving in new markets (e-health, digital platforms, public administration)	larger number of regionally-owned and growing firms	networks (Digin cluster) and increased number of new firms in the field of ICT	municipalities and university innovative with new e-health solutions, research and e-health lab	perception, building of UiA Campus Grimstad	collaborated to build support structure (UiA Grimstad, establish e-health as a priority area in the university and county council	
Kiruna, mining, 1990–2005	(0) No diversification observed, but rebranding of core firm from mining company to iron ore producer	(1) Development and upgrading of palletisation production. Core firms goes from mining to iron ore company	(0.33) There are some firm support networks, but the core firm is very dominant in networks and in setting the agenda in the region	(0.67) Technical development helps core firm survive and develop after crisis years	(0) No institutional entrepreneurship observed	(0) Core firm is dominant in the region and faithfully supported by local government	(0) Stable global market leads to stable employment when other industries in Sweden struggle in early 1990s
", 2005–2015	(0.33) Some suppliers to core firm produce for space industry and city transformation, some suppliers expand to new geographical markets, but specialisation pattern did not change	(0.67) Developments during period 1 and price of ore leads to expansion on new main levels, new pellet plant, new mines	(0.33) There are some firm support networks, but the core firm is very dominant in networks and in setting the agenda in the region	(0.67) Multiple examples of innovative initiatives from core firm and suppliers into new industries (such as space), secure iron ore production in the future	(0.33) Core firm changes mindset and focus more inward and less on outside collaboration	(0.33) Core firm is still dominant, but withdraw support from networks, pooling of resources for city transformation leads to more collaboration in existing networks	(0.33) Decline in global iron ore price puts a long-term pressure on core firm
Kiruna, tourism, 1990–2005	(1) Winter tourism developed from new with Ice hotel in 1989 as starting point, strategic decision to develop tourism, formation of formal networks, new market (price and geography) targeted	(0.67) Branding of region and individual firms to reach international market. Firms upgrade current infrastructure to match a new market niche	(0.67) New support networks, both publicly funded and private cooperations. Presence of local firms that targets national and international market. Local value chains under development	(1) One firm develops winter tourism beyond alpine skiing. Inspires other firms to also developed tourism products during winter season	(1) From previous focus on summer season, tourism during winter is developed and becomes an important role of region's identity, one firms triggers reorientation of mindset	(0.33) Networks are developed, but fragmented, exclusive networks are developed, lack of collaboration within industry overall, regional leaders' focus is turned to other industries	(0) Growing market
", 2005–2015	(0.33) Further development of tourism industry with new firms and complementary products	(1) Growth in high-quality tourism (more firms (old and new) targeting same segment, local development of quality certificate)	(0.67) Support networks present and active and connect local firms. Region attracts funding to develop support and niche further. Collaborative culture among larger firms	(0.33) Some new products developed by new firms, yet mainly focused on market developed in the previous phase	(0.33) A risk averse mindset constrains further development when new initiatives are developed (e.g., space tourism)	(0.33) Fragmented networks, one larger collaboration tries to take the lead (through development of strategy and quality certificate), but larger firms with less need for cooperation show less interest	(0) No market crisis, however local constraints (lack of hotel beds, transport) and city transformation narrows possibilities for industry to expand

Gislaved, manufacturing, 1990–1999	(0.33) Firms enter into new application areas but not changing industrial specialisation	(1) Coming out of a period of crisis (the 1991 financial crisis hit Gislaved hard) the region prospered by building on and developing its specialisation in industrial manufacturing	(0.67) Strong production structure (firms, large and small) and institutions; most dense region in Sweden in manufacturing; tight networks; yet, lack of knowledge infrastructure: Technical gymnasiums exist but there is an increasing demand for higher educated engineers	(1) The region is known for a high level of entrepreneurship, with some firms generating product innovations for a world market	(0.33) Some actions targeted at reorganisation of support structure	(1) Strong networks between firms who collectively and individually invest in public infrastructure and technical education	(0) Strong growth
", 2000–2019	(0.33) Some new developments (e.g. charging stations) though not changing the pattern of specialisation	(1) The regional economy suffered during the financial crisis but the focus remained on the traditional specialisations, developing existing networks and structures within industrial manufacturing	(0.67) Strong production structure (firms, large and small) and institutions; most dense region in Sweden in manufacturing; tight networks; yet, lack of knowledge infrastructure: Technical gymnasiums exist but there is an increasing demand for higher educated engineers	(1) The region is known for a high level of entrepreneurship, with some firms generating product innovations for a world market	(0.33) Some actions targeted at place-branding and re-organisation of support structure	(1) Strong networks between firms (and increasingly with municipality), collective investments in public infrastructure and technical education	(1) The 2008 financial crisis effect the regional economy strongly
Emmaboda, no specialisation, 1990–2003	(0.33) Increase in employment in two industrial firms (AMB and Xylem), which diversified, yet this is limited to the two firms (i.e., no regional specialisation emerged)	(0) The existing specialisation in glass and forestry struggling	(0) Few actors, networks and lack of support structures	(0.33) Innovations of AMB important for the region but innovative entrepreneurship is not mainstreamed	(0) No actions of institutional entrepreneurship observed	(0) No actions of place-based leadership observed	(0.33) The glass industry was slowly dying
", 2004–2019	(0.33) Some attempts of moving into glass tourism, which, however, has not changed the pattern of specialisation	(0) While there are more jobs in industrial manufacturing in one firm, this did not entail an upgrading of the region	(0) Few actors, networks and lack of support structures	(0.33) Some minor actions in the field of glass tourism, and actors in industrial manufacturing	(0.33) Actions related to attempt of re-launching Emmaboda as a glass tourism destination, attempt to change identity from production to tourism/design	(0.33) Actions related to attempt of re-launching Emmaboda as a glass tourism destination	(0.33) The glass industry was slowly dying
Olofström, automotive, 1990–2005	(0) No diversification. Complete focus on one core firm	(0) A period where the core firm outsources activities to focus on core activity	(0) Firms work in parallel with core firm as the motor. Some cooperation with HEI. Not much cooperation between firms, supplier base and municipality. Low entrepreneurial culture	(0.33) Core firm is spinning out non-city activities, some but few innovative actions	(0) Little presence of institutional entrepreneurship, region is cognitively locked-in	(0) Little presence of place-based leadership related to automotive industry, region is politically locked-in	(0.67) A period where core firm adapts to globalisation and GPN, automotive industry under pressure

", 2005–2010	(0) Some firms manages to diversify into new markets (e.g., from making car seats to train seats), but not mainstreamed	(0.33) Launch of Teknik College in 2008 to secure skilled work base in the future	(0.33) Crisis triggers a series of new networks and collaboration between firms, with local leadership and with HEI	(0.33) As a response to crisis a few firms innovate to move into new markets, innovative entrepreneurship is not mainstreamed and core firm turns inward	(0.67) Crisis in late 2008 allows questioning the dependency on core firm, consider diversification, consider collaboration, more even distribution of power in cooperations—core firm dominates less	(0.67) Crisis in late 2008 triggers the acute need for place-based leadership, emergence of new collaborations following the crisis	(1) Global financial crisis in 2008, affects demands and has significant impact in Olofström at both core firm and related local suppliers
", 2010–2015	(0.33) Rebranding and change in focus from automotive to manufacturing, including initiatives to look for new markets, yet suppliers return to Volvo when demand goes up	(0.67) Core firm invests in new machinery (warm pressing lines) to press metal also for electric cars, strengthened network of the local firms and growth of support structures	(0.67) Region builds first a strategy council, followed by a cluster initiative to strengthen competences and markets. Involves HEI, supplier firms, core firm, and support structure from local and regional level	(0.67) Introduction of warm presses in core firm essential, some supplier firms test new markets	(1) A consultant's report from 2010 on how to cooperate and potential futures is anchored in region and initiates formation of new formal networks	(1) After a series of collaborations, projects and events characterised by institutional entrepreneurship, cluster initiative TechTank is launched in 2015, interviewees lift this development as significant, yet dependency on core firm remains	(0.33) Getting warm presses makes future brighter, but automotive industry remains under pressure
Karlshamn, ICT, 1990–2005	(1) Slow decline in manufacturing industry leads to search for a new direction, new vision in 1991 highlighting knowledge economy, launch of triple helix project Netport in 1999—birth of IT industry	(0) No upgrading. Decline within food industry	(0.33) No formal networks in industry before launch of Netport. Individual actors informal networks (social and business) were driving behind developing triple helix project. Regional HEI and local government also driving initiating the industry. Netport became an important physical space for developing LIS	(1) New firms in IT and new media, and also in food, develops in Karlshamn at Netport and the adjacent old Carlshamns mejeri factory. Global IT crisis freed labour resources to engage in local development	(1) In the 1990s a new vision and strategy was developed to shift path for Karlshamn, from blue-collar jobs into knowledge economy	(1) Strong presence of place-based leadership when triple helix model developed, network of persistent individuals important in realising Netport and keeping BTH campus during crisis 2004	(0.67) Interviewees describe a creeping crisis that was difficult to detect during the 1990s, Carlshamns mejeri closed in 2003, Global crisis in IT sector around 2000s
", 2005–2010	(0.67) Growth of industrial path with increasing diversity of firms in IT and gaming	(0.67) Investment of municipality, engagement to keep and develop Netport, growth of firms and networks	(0.67) Municipality, industry and HEI are aligned and support each other and Netport	(1) Further expansion of (new) firms at Netport and size of Netport	(0.67) In justifying the role of knowledge economy in Karlshamn, publications and events are done to showcase the validity of the new vision as new growth path	(1) Strong lobby to keep BTH campus when vice chancellor threatens to close it in 2004 shows local engagement in Netport also after launch	(0) Growth in industry
", 2010–2015	(0.33) Further development is constrained by lack of support from local policymakers and	(0.33) With new leadership, municipality is less willing to continuing developing Netport	(0.67) More fragmentation in network, lack of awareness between regional stakeholder, lack of energy, and problems with attracting skilled labour	(0.67) Netport continues to grow and develop based on innovative and successful firms, but in a slower pace	(0) Maintenance of what exits, less risk averse	(0) Fragmentation in networks, within municipality (administrative and political) and tension	(0.33) Market has a slower growth and industry are faced with more local constraints

	difficulty in attracting skilled labour		hinders development in industry. Netport remains important in LIS			between HEI (BTH) and local campus	
Jakobstad, manufacturing, 1990–2008	(0.67) A diversified industrial structure with several strong enterprises engaging in continuous innovation activities. Forest cluster has developed through diversification	(0.67) Many middle-sized manufacturing companies' strategy is to make special and high-quality products for global market niche fields	(0.33) Innovation mainly based on corporations own activity and international networks, vocational institutions present	(1) Entrepreneurial and innovative companies with international orientation driving regional development	(0.33) Companies played a role in institutional change, a new network and subcontracting business model to the region with the help of regional support organisations	(0.67) Place-based leadership in Jakobstad region is shared in nature, there is no single organisation that would always take the lead but many who are willing to take the responsibility to take common issues forward, business community is central	(0) Stable global market leads to stable employment and steady growth
", 2009–2018	(0.67) A diversified industrial structure with several strong enterprises engaging in continuous innovation activities. Forest cluster has continued to develop through diversification	(0.67) Continuous upgrading. Many middle-sized manufacturing companies' strategy is to make special and high-quality products for global market niches	(0.33) Innovation mainly based on corporations own activity and international networks, vocational institutions present	(1) Entrepreneurial and innovative companies with international orientation driving regional development	(0.33) Company representatives, entrepreneurs and local politicians present new ideas (like establishing a new culture and education campus) and they also enhance these projects	(1) Strong shared commitment for the community (like establishment of Alholmen Industrial Park community), no single organisation that would always take the lead but many who are willing to take the responsibility to take common issues forward, business community is central	(0.33) Financial crisis has an impact but the region and its companies cope well with the situation, the versatile industrial structure supports
Varkaus, mechanical engineering, 1985–2000	(0.33) The core of local industry Ahlström was split into several firms, international corporations entered the local scene. No significant changes in industrial diversity	(0.67) All industries continuously upgraded their offerings.	(0.67) Strong production structure; local forest industry company (Enso) acted as 'lead user company' creating a test bed for the local mechanical engineering and machinery companies (Andritz, Foster-Wheeler)	(0.67) Key firms and suppliers continuously innovating and upgrading their product portfolio	(0) No institutional entrepreneurship observed	(0.33) Fragmented and inconsistent, no shared vision	(0) Steady growth
", 2000–2018	(0.33) Some attempts of diversifying into other industries (e.g. battery industry, renewable energy, fish) which, however, have not changed the pattern of specialisation	(0.67) Especially mechanical engineering has been upgrading its products and services	(0.67) Strong production structure; attempts to reshape the local HE to meet future needs	(0.67) Several companies developing global market leadership in niches based on innovation	(0.33) Some examples about introducing new mindsets as well as industries (caviar and batteries) and changes in entrepreneurial climate towards those ends, Actions taken but only few lasting changes	(0.67) In and after the crisis, place-based leadership intensified and became more organised	(0.33) Global financial crisis, the mechanical engineering firms coped with it fairly well

Eastern Lapland, no specialisation, 1960–2000	(0.67) State investments in industrialisation led to more diversified economy	(0) Steady growth, no need to upgrade or innovative actions.	(0) Few actors, networks and lack of support structures	(0.33) Steady industrial production with some strong corporations, few innovative actions	(0.33) Local actors paved the institutional landscape for industrialisation, which was mainly lead external to the region	(0.33) Local actors paved the institutional landscape for industrialisation, which was mainly led by external actors	(0) No crisis detected
",2000–2009	(0) No diversification observed, instead loss of diversification	(0) Extreme crisis, no upgrading detected	(0) Few actors, networks and lack of support structures	(0.33) Company closures but tourism companies keep developing and offering new products	(0) Not institutional entrepreneurship detected, a survival mode dominated	(0.33) Pooling actors to deal with the situation, on the one hand, and protest against it, on the other hand	(1) Ultimate crisis, all the dominant plants closed
", 2010–2018	(0.33) Efforts to diversify for attracting funding and the core actor for a bio-product plant	(0.33) Some efforts to upgrade the industrial bases as well as tourism	(0.33) Some support networks created but the support structure locally is thin	(0.33) A new company, Boreal Bioref, was established aiming at developing a new biorefinery that would focus on new pulp-based bioproducts	(0.33) Some new local ideas about the future of the forest industry	(0.67) Actions related to attempt of upgrade tourism sectors and attract funding for a bio-product mill	(0.67) Region has not fully recovered from the crisis
Salo: ICT, 1990–2008	(0) No diversification. Steady growth around mobile phone business	(1) Continuous upgrading by renewal and climbing in the global production network (Nokia)	(0.33) LIS largely based on Nokia's activities, some support mechanisms locally	(1) Nokia, the globally market leading corporation, dominated the scene, Salo was among its core sites globally	(0.33) No need for major institutional changes, some changes mainly to support Nokia, the weak institutional entrepreneurship led the region to a lock-in situation where the only way out was a crisis	(0.33) Place-based leadership was not particularly strong or visionary in the golden era of Nokia simply because it was not needed, everybody knew their place in the local system	(0) No crisis, Nokia did well
", 2009–2018	(0.33) Some efforts to diversify the local economy, IoT campus	(0.33) Some efforts to upgrade the existing specialisation by finding new functions for existing expertise	(0.33) LIS was largely based on Nokia's activities, even though some innovation infrastructure; IoT Campus	(0.33) Some innovative firms emerging. IoT Campus and related activities aims at boosting innovative entrepreneurship	(0.67) Enhanced in the crisis, new, more entrepreneurial and agile thinking was called for, a new core group (city, development company, bank, investors, local phone network company) aimed to change local landscape	(0.67) Mayor was taking charge of actions, utilising his networks and bringing together different actors from public and private sector to find new ways out of the crisis	(1) Ultimate crisis, Nokia and its successor Microsoft lost its position globally
Kirkenes, mining, 1985–2006	(0.67) The core of the local industry, mining, was split into several firms, diversification towards ship-repair serving Russian market, increasing activity related to oil and gas	(0.33) Attempts to upgrade mining industry after the closure of the mine. Some more growth in fish exporting businesses and other electronics firms to serve a growing market in Russia	(0.33) Availability of financial support, considerable focus on competence development, but a lack of quality business advisory services, coordination, strategic planning and business facilitation, collaboration with regional universities and research institutions underdeveloped.	(0.67) Innovative businesses were established to serve the growing marked in Russia and compensate for the closure of the mine	(0.33) Very few actions aimed at institutional change, some environmental action and women's project, the mining identity prevented the growth of new paths, yet Kirkenes Business Park were established	(0.33) Some instances observed in the establishment of alternative industries, environmental and women oriented actions, but disagreements about the local management of the restructuring package and low	(1) Decline and then closure of the mine resulting in a loss of many workplaces and decline in related activities

", 2006–2015	(0.33) Diversification was weak because of the re-establishment of the mine, yet some (new) companies operate in new markets	(0.67) Reopening of the mine: Growth of local suppliers and construction companies, external entrepreneurs engaged in oil reloading, boom for previously established port agency, first shipment of iron ore through the Northern Sea Route, electronics business expanded	(0.33) Support structure locally was thin despite several support networks, Opportunities related to High North strategy and the Centre for High North Logistics but lack of infrastructure and local means to grasp them, collaboration with universities and research institutions underdeveloped	(0.67) Some innovative firms (electronics business expanded to aircraft market, new firm focussing on king crabs), developments towards new business model (focus on sustainability and social responsibility), some firms engaged in oil and gas related activities	(0.33) Some networking initiatives (covering a wider region) established, Centre for High North Logistics established, efforts to increase educational level but no closer cooperation with the regional universities, educational offer oriented at local needs rather than new path creation	mobilisation of local efforts in general (0.33) Some networks established but firms focus on own business	(0) Average or higher market growth in oil and gas related supplier industries, opening of the mine
", 2015–2019	(0.33) Many small micro-businesses, no clear industry actors. Some projects are in the pipeline: plastic recycling plant, seaweed and hydrogen	(0.33) Exports of king crab to Russia replaced with other markets. The electronics business expanded into the oil and gas market	(0.67) Strong focus on production structure, availability of financial support after mine closure, strengthened local entrepreneurial environment, focus on collaboration between private and public sectors, business community more united, region more integrated into wider networks, some businesses collaborated with local technology start-ups	(0.33) Some experience-oriented businesses established, focus on sustainability, direct contact with the Chinese market	(0.67) Many actions directed at improving the entrepreneurial climate, positive changes in the administrative apparatus of the municipality, the electronics business aims to establish a technology network in the region (increasingly perspective that alternatives to mining industry are needed)	(0.33) Some mobilisation of efforts in relation to cooperation with China and the Arctic Railway project, yet failure of the port building project, development of the relationship with the regional universities is considered largely a university responsibility	(0.67) Fall of iron ore and oil and gas prices, closure of the mine, unrealised prospects of oil and gas exploration
Kirkenes, tourism, 1985–2006	(0.33) Some initiatives to diversify tourism (Kirkenes Snow Hotel; the ambitious Grenseland project), yet, the initial support gradually reduced to Grenselanmuseet and a hotel	(0.33) Some effort to upgrade tourism industry	(0.33) Some small- and medium-sized enterprises as well as some support initiatives existed. Yet, strong regional scepticism towards an industry with an intangible product, dominated by small- and medium-size enterprises	(0.33) Some new companies emerge and develop further (but most of the newly established businesses did not survive - difficulties in cooperation with Russia)	(0.33) Very few actions aimed at institutional change, some environmental action, women's project and tourism, the mining identity prevented the growth of the new paths this also included tourism	(0.33) A lack of local support for tourism development, an ambitious tourism project was downsized as there was a focus on development of other industries	(0.33) Slow development of tourism industry
", 2006–2015	(0.33) More diversified towards international market (Huritgruten and	(0.67) Tourism started to show some economic growth, accessing new, international	(0.33) Industry structure continued to be dominated by small- and medium-sized companies, tourism destination project provided for a more	(0.33) The innovative entrepreneurship are placed on very few actors, often not local born	(0.67) Coordinated actions aimed at institutional change promoting tourism as new industrial path, tourism	(0.33) Planned destination development process aimed at creating a tourism strategy	(0) Growth in tourism picked up

	direct flights from Asia)	markets (Asia). However, some also noted that the potential was not utilised	planned approach to development		was lifted up as an important industry for regional development (locally and nationally)	involving many stakeholders	
", 2015–2019	(0.33) Tourism development on the Russian side generate some new opportunities. Also some diversification, such as the developing of king crab as a tourism activity	(0.67) Tourism became more important economic activity	(0.33) Some support networks are present and active, connecting local firms	(0.33) Some signs of tourism industry consolidation. The innovative entrepreneurship targeting tourism where still placed on very few actors, often not local born	(0.67) Coordinated actions and institutional change promoting tourism as new industrial path	(0.33) Several actions to support the tourism industry observed but these actions were fragmented between different actors	(0) General good market situation

Appendix C: The analysis of necessary conditions

Outcome variable: New Path Development

Conditions tested	Consistency	Coverage
Regional Preconditions	0.611755	0.937500
Innovative Entrepreneurship	0.866054	0.902876
Institutional Entrepreneurship	0.624950	0.902425
Place-based Leadership	0.704918	0.854167
Crisis	0.344662	0.616154

Appendix D: Truth table

Row	Regional preconditions	Innovative entrepreneurship	Institutional entrepreneurship	Place-based leadership	Crisis	Number of cases	New path development	Raw consistency	PRI consistency	SYM consistency
1	1	1	1	1	0	5	1	1	1	1
2	0	0	1	0	0	2	1	1	1	1
3	0	1	0	1	0	2	1	1	1	1
4	1	1	0	1	0	2	1	1	1	1
5	1	1	0	1	1	2	1	1	1	1
6	1	0	0	0	0	1	1	1	1	1
7	1	1	1	0	0	1	1	1	1	1
8	0	0	1	1	0	1	1	1	1	1
9	0	1	1	1	0	1	1	1	1	1
10	0	1	1	1	1	1	1	1.00	1.00	1.00
11	0	1	0	0	0	4	1	0.96	0.89	0.89
12	0	1	1	0	0	2	1	0.95	0.83	0.83
13	1	1	0	0	0	2	1	0.95	0.83	0.83
14	1	0	0	0	1	1	0	0.92	0.00	0.00
15	1	0	1	0	1	1	0	0.91	0.00	0.00
16	0	1	0	0	1	1	0	0.88	0.34	0.34
17	0	0	1	1	1	2	0	0.85	0.00	0.00
18	0	0	0	0	0	4	0	0.84	0.50	0.50
19	0	0	0	1	1	2	0	0.81	0.00	0.00

Appendix E: Truth table analysis

Choices for Truth Table Analysis: Frequency cut-off: 1; consistency cut-off: 0.94864

COMPLEX SOLUTION

Combinations of conditions	Raw coverage	Unique coverage	Consistency
Innovative Entrepreneurship*~Crisis	0.6929	0.2291	0.9121
~Regional Preconditions*Institutional Entrepreneurship*~Crisis	0.4110	0.0408	0.9680
Regional Preconditions*~Institutional Entrepreneurship*~Place-based Leadership*~Crisis	0.2647	0.0136	0.9511
Regional Preconditions*Innovative Entrepreneurship*~Institutional Entrepreneurship*Place-based Leadership	0.4106	0.0404	1.0000
~Regional Preconditions*Innovative Entrepreneurship*Institutional Entrepreneurship*Place-based Leadership	0.4230	0.0136	1.0000

Solution coverage: 0.867253, solution consistency: 0.92851

PARSIMONIOUS SOLUTION

Combinations of conditions	Raw coverage	Unique coverage	Consistency
Regional Preconditions*~Crisis	0.4922	0.0136	0.9731
Innovative Entrepreneurship*~Crisis	0.6929	0.0808	0.9121
Institutional Entrepreneurship*~Crisis	0.5190	0.0540	0.9745
Innovative Entrepreneurship*Place-based Leadership	0.6649	0.1463	0.9438

Solution coverage: 0.906837, solution consistency: 0.906837

INTERMEDIATE SOLUTION

Combinations of conditions	Raw coverage	Unique coverage	Consistency
Innovative Entrepreneurship*~Crisis	0.6929	0.1343	0.9121
Institutional Entrepreneurship*~Crisis	0.5190	0.0540	0.9745
Regional Preconditions*~Crisis	0.4922	0.0136	0.9731
Innovative Entrepreneurship*Institutional Entrepreneurship*Place-based Leadership	0.5174	0.0268	1.0000
Regional Preconditions*Innovative Entrepreneurship*Place-based Leadership	0.5314	0.0272	1.0000

Assumptions for intermediate solution: Innovative Entrepreneurship (present), Institutional Entrepreneurship (present), Place-based Leadership (present)
Solution coverage: 0.893643, Solution consistency: 0.930475