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Johan Miörner 

ABSTRACT

This paper examines factors shaping the reconfiguration capacity of regional innovation systems (RISs). ‘System selectivity’ is introduced as a concept to understand how factors such as regional imaginaries, power relations and directionality shape how RIS reconfiguration plays out. A comparative case study illustrates the conceptual arguments, investigating industrial change in two Swedish regions (the automotive industry in West Sweden and the digital games industry in Scania). The findings exemplify the influence of system selectivity on agents’ strategy formulation for RIS reconfiguration and highlight the importance of considering structure–agency dynamics to move beyond a stylized view of enabling or constraining RISs.

KEYWORDS

agency; new path development; regional innovation system; system selectivity; digital games; self-driving cars

JEL O33, R11, R58

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INTRODUCTION

During the last decade we have witnessed a growing interest in questions related to regional industrial change in economic geography. Fuelled by an evolutionary turn in the discipline (Boschma & Frenken, 2006), economic geographers have sought to explain how regional industrial structures change through path creation, diversification, importation and renewal processes (Boschma, 2017; Isaksen & Trippel, 2017; Neffke et al., 2011). Recent scholarly work has advocated a broad approach to path development, with increasing attention given to social, institutional and cultural influences (Dawley, 2014; Hassink et al., 2019; MacKinnon et al., 2019). In line with this, scholars have forged links between evolutionary economic geography (EEG) models and the regional innovation system (RIS) approach (Isaksen & Trippel, 2016) to draw attention to factors and conditions at the system level, beyond the narrow focus on industrial structures and technological knowledge traditionally found in the literature.

The development of new industrial paths and the transformation of existing ones are intrinsically linked to the reconfiguration of existing RISs, in order to facilitate the provision of assets to new paths (Baumgartinger-

Seiringer et al., 2020; Miörner & Trippel, 2019; Tödting & Trippel, 2013). In other words, the emergence of new industrial activities is associated with changes to the broader regional environment in which they take place. However, there is a need to deepen our understanding of system building and RIS reconfiguration. While studies have outlined the modes and mechanisms underpinning RIS reconfiguration and the role played by agency in system changes (Isaksen et al., 2019), less attention has been given to factors shaping the reconfiguration capacity of an RIS.

This paper brings forward the conception that regional reconfiguration capacity is shaped by factors and conditions influencing the capability of actors to reconfigure the regional environment in which they are situated. Thus, it refers to a region’s ability to balance emerging changes in the industrial dimension with changes in other parts of the RIS, in order to facilitate the provision of assets corresponding to the needs of new industrial paths. The paper develops a novel conceptual framework for analysing RIS reconfiguration capacity from the perspective of the interplay between regional context conditions and forces of agency. It introduces the concept of ‘system selectivity’ as a tool to understand how different factors shape how RIS reconfiguration plays out. It is

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argued that existing RIS structures are not just enabling or constraining actors' activities but, through system selectivity, are influencing their capability to reconfigure RIS structures.

The conceptual discussion is followed by illustrations from two empirical cases of agency and RIS reconfiguration, associated with the emergence of a digital games industry in the Swedish region of Scania and changes in the automotive industry in the region of West Sweden.

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

Following previous studies, regional industrial paths are defined as a critical mass of functionally related firms that are 'established and legitimized beyond emergence' (Steen & Hansen, 2018, p. 4). Industrial paths are characterized by a degree of persistence, backed by organizational and institutional support structures, traced back to the quasi-fixity of economic patterns, agglomeration economies and path dependence (Henning et al., 2013; Isaksen & Jakobsen, 2017). An industrial path is 'regional' when a critical mass of actors and activities are spatially co-located within the same region. That said, actors could draw on both endogenous and exogenous sources of assets, and involve activities at different spatial scales (Binz et al., 2016; Trippl et al., 2018).

Reflecting a shift in interest among scholars, from studying forces of continuity and path dependence towards better understanding the dynamism characterizing regional economies, the literature on 'new regional industrial path development' has burgeoned during the last two decades (for a review, see Hassink et al., 2019). New industrial path development refers to the rise of industrial paths that did not previously exist in the region, ranging from entirely new industries (new to the world) to new industrial paths that originate from a substantial transformation of existing regional industries. Various typologies have been developed to distinguish between different types of path development and scholars have directed criticism towards the dichotomy between gradual 'on the path' changes and new path development (Baumgartinger-Seiringer et al., 2020; Miörner, 2019). In this paper, two types of path development are scrutinized: 'Path importation' refers to the establishment of an industry that is new to the region and unrelated to existing industries (Grillitsch et al., 2018), driven by the inflow of actors and resources to the region (Fredin et al., 2019; Trippl et al., 2018). 'Path transformation' denotes substantial innovation-based renewal processes of established industrial paths, based on the development of disruptive technological, organizational or market innovations, leading to a new industrial path which is substantially different from the initial one (Baumgartinger-Seiringer et al., 2020; Miörner & Trippl, 2019). There is also a range of other sources and mechanisms covered in the literature (Grillitsch et al., 2018; Isaksen et al., 2018; Isaksen & Trippl, 2016), which are beyond the scope of this paper.

Regional industrial paths are embedded in an RIS (Isaksen & Trippl, 2016) consisting of all industries and firms located in the region, networks between actors, organizational support structures and institutional conditions. RISs are often configured to support innovation processes in existing regional industries rather than geared towards supporting emerging activities of new industrial paths (Isaksen et al., 2019; Tödting & Trippl, 2013). This has the implication that existing RIS configurations may need to change in order to support new industrial development paths (Miörner & Trippl, 2017, 2019; Tödting & Trippl, 2013; Trippl et al., 2020).

Agency has been argued to play a potentially crucial role in RIS reconfiguration. Isaksen et al. (2019) highlighted the importance of 'actions or interventions able to transform RISs to better support growing industries and economic restructuring' (p. 5), that is, agency targeting the system level. For regional system change to occur, actors are required to transcend organizational boundaries and mobilize other actors and create visions ultimately to reconfigure RIS structures. Reflecting the most recent contributions to the new path development debate, agency should not only be considered in terms of efforts to add or remove elements in the organizational support structure, but as actions or interventions targeting the functioning of the RIS (Binz et al., 2016; Miörner & Trippl, 2019). This is not only dependent on the creation or adaptation of strong organizations, such as educational facilities, incubators, cluster organizations and so forth, but also on supportive institutions such as policy initiatives and regulations (Zukauskaitė et al., 2017), and guiding visions and expectations (Steen, 2016).

Previous studies have been inspired by other strands of the literature to explain (different types of) agency in new path development more generally. For example, studies have used the concept of 'institutional entrepreneurship' in order to understand agency targeting the institutional dimension of new path development (Holmen & Fosse, 2017; Marquis & Raynard, 2015; Miörner, 2020; Sotarauta & Mustikkamäki, 2015; Sotarauta & Pulkkinen, 2011). Institutional entrepreneurs initiate divergent institutional behaviour, mobilize resources for institutional change and actively participate in the implementation of new arrangements (Battilana et al., 2009; DiMaggio, 1988). In their framework outlining different types of 'change agency', Grillitsch and Sotarauta (2020) argue for the importance of 'place leadership' alongside institutional entrepreneurship when it comes to agency targeting the institutional dimension. Place leadership refer to activities aiming at 'transforming particular places by pooling competencies, powers and resources to benefit both agents' individual objectives and a region more broadly' (p. 708). Finally, recent contributions to the literature highlight the importance of 'path advocates', referring to agents who target the legitimation and anchoring of emergent regional industrial paths in the broader environment (MacKinnon et al., 2019). These actors aim to link new path activities to broader conventions, networks and discourses, rather than primarily targeting to add or remove structural elements.

However, despite this burgeoning literature concerned with the role of agency, the literature lacks convincing explanations for *why* and *when* agency can play a role and it neglects the recursive relationship between structure and agency in RIS reconfiguration. It could be argued that the success of agency is dependent primarily on actor characteristics. Studies have indeed demonstrated how, for example, power and membership in networks have an impact on the ability of regional actors to change the structures in which they are embedded (Sotarauta, 2009). Alternately, studies have shown how regions provide more or less enabling or constraining preconditions, and a range of contributions has been made in order to disentangle how context conditions shape the preconditions for new industrial path development (e.g., Isaksen & Trippel, 2016).

Nevertheless, the existing literature has adopted a rather static perspective of the regional conditions that matter for new path development, emphasizing a set of pre-existing enabling or constraining conditions. A more dynamic perspective would involve shifting the focus from the existing RIS structures to the reconfiguration capacity of the RIS. This requires taking a closer look at the structure–agency dynamics at play, investigating historically developed regional context conditions, and the role they play in shaping the scope and nature of agency.

Enabling and constraining regional environments

The question of what regional conditions that matter for the emergence of new industries is a longstanding topic in economic geography. Early explanations were built around the idea that new industries enjoyed a degree of ‘locational freedom’, since no particular region could offer sector-specific factors for entirely new industries (Storper & Walker, 1989). More recent views are built around the concept of path dependence, arguing that new industrial paths draw on assets of existing ones (Martin, 2010; Martin & Sunley, 2006).

One strand of the literature has been concerned with investigating regional resilience, referring to the long-term capacity of regions to renew their socioeconomic structures (e.g., Boschma, 2015; Christopherson et al., 2010; Hassink, 2010; Simmie & Martin, 2010). A lot of attention has been given to various forms of regional ‘lock-ins’ (Grabher, 1993), outlining political, cognitive and functional factors that hinder restructuring processes and promote continuity in regional economies. More recent conceptualizations of regional resilience, however, have been built around the idea that resilience is a trade-off between adaptation, referring to the ability to absorb short-term shocks through incremental changes within existing paths, and adaptability, referring to the ability to develop new paths (Boschma, 2015).

Many studies situated in EEG are based on the notion that the existence of different but related industries serve as enabling conditions for new path development and hence the adaptability of regional economies (Boschma, 2017). However, the ‘relatedness’ argument has been

criticized for neglecting social, institutional and cultural influences (Hassink et al., 2014; Pike et al., 2016). Being well positioned to approach the regional environment from a broader perspective, RIS scholars have consequently explored the question of what RIS configurations that are most conducive for new path development, highlighting a broader set of factors and influences.

New path development is faced with challenges resulting from a combination of RIS structures being more or less strongly aligned to existing industrial path(s) and the lack of assets needed for new path activities (Grillitsch & Trippel, 2018; Trippel et al., 2020). While new paths might benefit from the existence of some types of assets, complementary assets will have to be developed and RIS structures adapted throughout the path–development process. The enabling effect of actors being able to shape the RIS to support new paths might exceed the potentially constraining effect of existing structures (Sotarauta & Mustikkamäki, 2015) and actors can work to ‘turn’ a constraining environment to become more enabling (Mörner & Trippel, 2017). In that sense, rather than referring to universally enabling or constraining environments, it might be better to differentiate regions based on their ability to enable RIS reconfiguration targeted at supporting the provision of assets to new paths.

Furthermore, the impact of existing RIS structures may depend greatly on regional economic agents’ perceptions of these structures (Sotarauta, 2017; Zukauskaitė et al., 2017). Agency can target the identification of relevant institutional arrangements in order to strategically comply and adapt to a set of institutions that ensure the maintenance of the actors’ strategic intentions (cf. the concept of ‘institutional navigation’ in Sotarauta, 2017). In other words, the influence of certain regional conditions is both spatially and temporally contingent and depend on the interpretation of actors (see also Grillitsch & Sotarauta, 2020).

Reconfiguration capacity of RISs

Studies have called for a better integration of ‘the future’ in path development research and have criticized how time and history are treated in EEG more broadly (Hassink et al., 2019; Henning, 2019). In this paper, the influence of certain structural conditions is considered the result of an interplay between agency and structure at a particular place, at a particular point in time. Inspired by the structure–agency debate, particularly the strategic-relational approach (Hay, 2002; Jessop, 2001, 2005), two main features of the conceptual framework in this paper can be outlined.

First, actors have the ability to formulate intentions and strategies reflecting their understanding of existing structural conditions. Actors are thus reflexive and can draw on personal experiences, develop their own views and act strategically upon their ‘objective’ interests. Furthermore, actors monitor the outcome of their actions, intentionally or intuitively (Hay, 2002), and select strategies and tactics recursively, based on the learning capacities of individuals or collectives and their experiences

from pursuing different strategies at previous points in time. Regional actors understand challenges related to the development of the new path and formulate strategies of RIS reconfiguration, reflecting their intentions on the one hand, and their (current) knowledge of the prevailing structural conditions on the other.

Second, the idea of a structurally selective context implies that structures cannot ensure their own reinforcement but only favour some strategies and actions over other ones (Jessop, 2001). Agency is thus placed at the core of the debate, as structures have no meaning outside the context of agents seeking to engage in specific strategies or practices (Jessop, 2005).

Inspired by this, 'system selectivity' is introduced as a core concept in this paper, referring to the tendency of the RIS to selectively reinforce some forms of actions and strategies and dampen others. In other words, system selectivity shapes the context for agency targeting RIS reconfiguration. System selectivity can be traced back to the results of events 'happening', and not necessarily the materialized or institutionalized outcomes of the events per se. They reflect political processes, regional imaginaries and conventions (Hajer & Versteeg, 2018; Storper & Salais, 1997) developed over long periods of time, including failed attempts of action and change efforts. For example, expectations about future outcomes can be the reminiscence of previous rounds of (also failed) development (Henning et al., 2013; Schneiberg, 2007), discourses may develop as a result of conflicts over resources and continue to influence agency interactions long after the particular issue was settled, and power relations between actors may develop and remain when the material conditions change. System selectivity should not be interpreted as a 'barrier' for change processes and differs from established concepts such as 'lock-in' in that it is not meant to explain the persistence and continuity of development trajectories. Instead, system selectivity as a concept is aimed at providing insights in relation to how the context influence change processes, as in 'why does it change like this?' (cf. the discussion on dynamic continuity and change in Martin, 2010, 2012). With the broadening of the path development debate to encompass a broader set of social and cultural influences, as well as the role of agency, system selectivity bridges established conceptions of structural conditions (such as institutions or industrial composition) and the selection environment for new industrial path development, with agency-centred approaches. Structure and action are thus analysed in conjunction, rather than temporarily bracketing one of them in the analysis (Jessop, 2001). Informed by a systemic perspective, it directs our attention to combinations of a broad set of factors and influences. These include the influence of particular configurations of institutional conditions, organizational support and industrial structures, which have coevolved over time. Studying system selectivity thus allows for disentangling *how* the regional environment shapes and select strategies at the agency level and the *interplay* between structure and agency.

Based on previous contributions to the path development literature (e.g., Isaksen, 2018; Steen, 2016; Steen & Hansen, 2018), in this paper close attention is given to three factors (regional imaginaries, power relations and directionality) that are expected to shape how the RIS selectively reinforce or dampen strategies by actors engaging in new path development. In that sense, the factors under scrutiny in this paper are not to be interpreted as an exhaustive list of all factors that constitute the selectivity of a regional system, but as a theory-led expectation of factors shaping system selectivity in the context of new path development, informed by previous studies.

System selectivity 1: Regional imaginaries

Innovation studies have a tradition of highlighting the role played by 'imaginaries', referring to technological visions and narratives that are reflecting actors' desires for the future and work as a guiding force for research and development efforts (Nye, 2004). New path development scholars are increasingly paying attention to the role played by conventions and expectations among actors, both as a mechanism of path development and as part of the socio-economic context for actors' activities (Isaksen, 2018; Steen, 2016). For example, Isaksen (2018) illustrates how path-specific conventions among leisure boat-building firms in Norway damaged the adaptability of the regional cluster and contributed to its collapse during the financial crisis. The case study shows that the actors' decision-making was anchored in what Beckert (2013) refers to as fictions, 'images of some future state of the world of course of events that are cognitively accessible in the present through mental representation' (p. 220).

The idea of 'regional imaginaries' is that fundamental perceptions, conventions, mental representations and world views exist not only within regional industrial paths but, through discourses and institutional rationalities, are ingrained at a very fundamental level of the RIS. Regional imaginaries thus refer to cultural-cognitive traits (Scott, 2010), in the form of potentially powerful labels that describe regional economic patterns at a high level of abstraction. In the academic literature, we often refer to regions as old industrial, peripheral, entrepreneurial, natural resource based, information technology (IT), automotive, etc. They describe the most basic features of the regional economic structure, the dominating industries or other defining features. Such labels or categories are expected to exist among different types of regional actors, describing their perception of the region in which they are embedded, effectively shaping the point of departure in terms of their expectations about the future (cf. 'spatial socialisation' introduced by Paasi, 1991). Regional imaginaries are thus mental maps of collectively shared beliefs that structure economic life (see also Boudreau, 2007).

Regional imaginaries are expected to shape the reconfiguration capacity of an RIS by empowering or suppressing actors in emerging industrial paths. Strong and well-aligned imaginaries influence the opportunity space (Grillitsch & Sotarauta, 2020) perceived by actors in the region. Regional imaginaries can be seen as the most basic feature

shaping the initial reaction to the emergence of new activities, and thus as a kind of ‘mental gatekeeper’ for new industrial activities, but the influence might also extend throughout the path development process.

System selectivity 2: Power relations

Previous studies have demonstrated how the degree and type of power held by actors in emerging paths influence how they approach RIS reconfiguration (Miörner & Trippel, 2017; Sotarauta & Mustikkamäki, 2015). Similar arguments are found in the technological innovation systems (TIS) literature, highlighting the existence of powerful actors as a key factors enabling system-building (Musiolik et al., 2012, 2018). In transition studies, the constraining effect of existing power relations have been investigated, largely referring to the stabilizing effect on existing regimes of incumbent actors (Unruh, 2000). More recent work has challenged the one-sided analysis of incumbents as a constraining force, demonstrating how their power can be mobilized as a resource for change activities (Van Mossel et al., 2018). This reflects the attention to actors’ social position as an important explanatory variable for successful agency in the seminar contribution by Battilana et al. (2009), something which has been largely neglected in favour of other enabling or constraining preconditions at the structural level of the RIS.

Historically, built-up power relations play an important role in terms of coordinating assets and activities in the RIS. In most regions, no single organization or individual has the power of distributing assets among actors in the RIS, but regions may be characterized by a more or less balanced power distribution (Zukauskaitė et al., 2017). In some regions, the RIS is dominated by a few powerful organizations, while in other regions power is distributed among a variety of stakeholders (Sotarauta & Horlings, 2012). Such power relations are historically developed, shaped by previous rounds of industrial development and political processes. Schneiberg (2007) directed attention to the reminiscent of ‘paths not taken’; regional power relations may both be the legacy of successful paths and struggles and movements of failed attempts of path development. In that sense, power relations reflect a deeper historical dimension than the mere existence of incumbent actors.

Unequal power relations are expected to shape how new actors are able to mobilize resources for RIS reconfiguration, in terms of steering access to financial resources, legitimacy and other relevant factors, and by outright confrontation with newcomers in the competition for power over asset provision in the RIS. In other words, power relations have the potential of preventing actors in new paths from accessing resources or by enabling and reinforcing their change activities. In some regions, groups of existing actors have established regional governance functions as institutionalized features in the RIS. Such set-ups have the potential of increasing the flexibility of established power relations by institutionalizing the ability to transfer influence from one group of actors to another

without obscuring the capability to meet new challenges (Normann, 2013).

System selectivity 3: Directionality

Directionality refers to shared visions, strategies and agendas that form collective priorities shared by actors in the RIS (Weber & Rohrer, 2012), shaping the ‘purposefulness’ of the innovation system (Schlaile et al., 2017). Directionality represents a form of institutionalized expectations, guiding the direction of change efforts in the RIS. Innovation systems are complex entities and it is unlikely that a strong directionality is set out by one or a few regional development strategies, but is more likely to consist of a portfolio of instruments and artefacts of (also previous) sense-making activities (Sotarauta & Mustikkamäki, 2015; Weber & Rohrer, 2012). Directionality thus defines the frame of engagement of regional actors, setting out possible future scenarios through the formulation of technological and institutional problems that deserve attention, and by steering actors away from other trajectories (Grillitsch et al., 2019). In contrast with regional imaginaries, directionality is made up of normative and regulative elements (Scott, 2010) that are formulated, contested and reinforced by actors over time. Directionality is not ‘taken for granted’ but continuously contested within and across coalitions of actors in the region.

Several studies link directionality with new path development, in particular when it comes to the renewal of traditional industries based on sustainable innovations. For example, Dawley (2014) highlights the role of public actors in setting directionality in the development of an offshore wind industry in the North East of England through policies for niche support. Also Tanner (2014) emphasizes the role of public actors in setting directionality through strategies distributing funds for research, innovation support and education activities.

However, few studies have set out to investigate what the current directionality of an RIS means for actors aiming at changing the existing structures for asset provision. Just as for other forms of lock-in, a strong alignment of existing visions, strategies and agendas influences the frame of engagement for actors, promoting change processes along a narrow trajectory centred on a specific set of issues, sometimes shaped by the interests of incumbent actors (see above).

Implications for agency

By disentangling different factors shaping of system selectivity, it is possible to outline the structure–agency dynamics shaping how RIS reconfiguration unfolds.

First, system selectivity shapes how actors formulate strategies targeting *changes* to elements in the RIS. Actors actively search for sources of reconfiguration capacity, originating from the combination of different factors shaping system selectivity, and exploit them in efforts to modify regional structures for asset provision. In other words, the particular combination of system selectivity

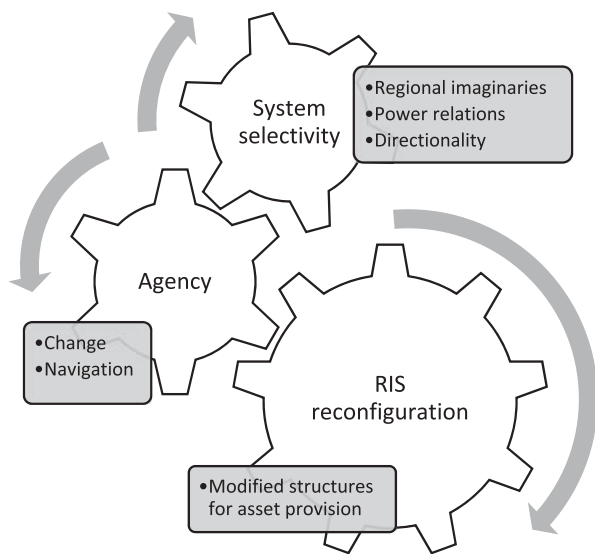


Figure 1. Summary of the conceptual framework.
Source: Author's own elaboration.

effectively shapes the portfolio of strategies and their normative underpinnings, adopted by system agents.

Second, actors *navigate* the influence of system selectivity and formulate strategies in order to exploit the potentially reinforcing effect of, for example, strong directionality or regional imaginaries. Rather than working against the ‘tide’ (Sotarauta & Suvinen, 2018) of system selectivity, actors strategically comply and adapt their activities whilst at the same time maintaining their strategic intentions. An illustrative, but extreme, example is how actors could engage in attempts of ‘greenwashing’ emerging industrial activities to enjoy the benefits of being aligned to a strong regional sustainability discourse.

The building blocks of the conceptual framework are summarized in Figure 1. System selectivity such as regional imaginaries, power relations and directionality shape the formulation of strategies by agents. Based on a combination of their strategic intentions and the influence of system selectivity, they engage in system change or navigate existing structures in order to realize their intentions and reconfigure the functioning of the RIS.

EMPIRICAL ILLUSTRATION: RIS RECONFIGURATION IN TWO SWEDISH REGIONS

This section provides an illustration and exemplification of the conceptual framework by applying it to a comparative case study of RIS reconfiguration and the impact of contextual specificities on agency in two cases: (1) path importation in Scania, where the development of a digital games industry required changes in the RIS to better support the new path; and (2) path transformation in West Sweden, where the automotive industry is undergoing substantial changes related to the development of self-driving cars, with associated processes of RIS reconfiguration. The comparative case study is based on an analysis of data collected in the context of two case studies both analysing

aspects of new path development and RIS configuration. These studies have highlighted the role of agency in RIS reconfiguration, investigated the modes and types of RIS reconfiguration (ranging from more ‘radical’ forms of layering to the adaptation and novel application of existing structures), the geography and multi-scalarity of RIS reconfiguration, and the varying need for RIS reconfiguration throughout the path development process (Baumgartinger-Seiringer et al., 2020; Miörner & Tripl, 2017; Miörner & Tripl, 2019). However, the current study moves beyond an empirical focus on processes of RIS reconfiguration and analyses how, when and why these are shaped by structure–agency dynamics. Following the conceptual discussion, the comparative case study in this paper aims to answer the question of how system selectivity shapes how RIS reconfiguration plays out.

The case selection is based on a theoretical sampling logic (Siggelkow, 2007), and a process of identifying and defining issues of theoretical interest (Yin, 2013). More specifically, the rationale for comparing these particular cases is the ambition to identify cases that can provide empirical material supporting, complementing or contradicting theory-led expectations and conceptual arguments. The cases share several contextual similarities, allowing for a comparison of two different industries in similar regions, with the aim of highlighting nuances in similar processes. The regions are located in the Swedish context and are of similar size, both have a history of industrial manufacturing and have gone through processes of structural change during the last 20–30 years. Today, they are endowed with well-performing research and knowledge-generation organizations, strong support systems, and institutions promoting innovation and entrepreneurship. In both regions, policy actors have been taking a proactive role in shaping the preconditions for competitiveness based on innovation through innovation policy and regional development efforts.

In total, 42 interviews were conducted between September 2015 and November 2018. In West Sweden, 20 representatives of the automotive industry, regional public actors, innovation support organizations, academics and industry experts were interviewed during 2017–18. In Scania, 20 firm representatives of the digital games industry, regional public actors and innovation support organizations were interviewed during 2015–16, followed by two additional interviews in 2018. In both cases, the interview data were complemented by a document analysis of available reports, policy documents and newspaper articles. This analysis also supported the selection of interview partners, which was followed by a ‘snowballing’ sampling method (Valentine, 2005) identifying additional interview partners by triangulating the recommendations of previous interviewees against the findings from the document analysis.

The collected data were analysed ‘from scratch’ guided by the research questions in this paper by seeking for common themes and storylines between different sources of data (interview material and documents) using the technique of ‘rational abstractions’ (Pratt, 1995). Rational

abstractions favour an in-depth understanding of the investigated phenomena and the search for causal mechanisms. The data were coded using computer software¹ according to a first set of predefined, theoretically informed categories, followed by *'in vivo'* coding based on emerging patterns in the data.

Digital games in Scania

The emergence of a digital games industry in Scania represents a case of path importation (Grillitsch et al., 2018; Martin & Sunley, 2006), initiated by a few game developers deciding to relocate from the neighbouring region of Blekinge. According to previous studies (Mjörner & Trippel, 2017), firms relocated to Scania for the region's attractiveness, business climate and living conditions, making it easier to attract highly skilled labour. From being driven by the relocation of a few established firms, the industry developed rapidly through spin-off and start-up activities, as well as by expansions of existing firms. Actors in the digital games industry quickly realized the need to reconfigure the RIS to better support the new path and started to engage in activities in order to secure the provision of relevant assets.

In order to understand what factors shaping system selectivity are prevailing in the RIS, there is a need to turn to the historical development trajectory of the region. Regional imaginaries are not primarily defining what Scania 'is', but rather what it 'is not'. They are to a large extent based on reactions to the industrial decline experienced in the last quarter of the 20th century, effectively rejecting ideas related to the renewal of manufacturing industry and embracing a vision of a new industrial structure dominated by knowledge-intensive business services and innovative technology firms. Previous studies have shown how such discourses have co-evolved with the built environment, with new neighbourhoods explicitly targeting the attraction of 'new' economic activities in Malmö (Holgersen, 2014). In the late 1990s, a decision at the national level gave Scania extended regional responsibilities, also including innovation policy. This mission became closely aligned with the regional imaginaries, and policies targeting the functioning of the RIS were come to be seen as tools for leading the region towards a rather fussy imaginary future of a post-industrial, multi-cultural and highly innovative region.

Actors in the digital games industry were struggling with the perception of their industry as not being a 'serious business', a perception that persisted despite rapid growth and export successes. Regional imaginaries provided a point of departure for efforts targeting the legitimization of digital games as an industry. For example, firm leaders and a range of public actors published a debate article in the local newspaper in 2015 (*Sydsvenskan*, 2015), highlighting the potential of the industry and describing it as 'creative and innovative' as well as 'culturally diverse', thus anchoring their strategies in the regional imaginaries prevailing in the region.

In terms of power relations, Scania had been renowned for its bottom-up approach to regional innovation policy

(Organisation for Economic Co-operation and Development (OECD), 2012) and highly distributed power relations. However, according to critical voices heard in the interviews as well as in a series of articles in the local newspaper at the beginning of the 2010s, the RIS had become fragmented and lacked coordination (Zukauskaitė & Moodysson, 2014). This led to calls for a concentration of power, with public sector units exercising increased coordination of functions in the RIS.

As a way to create a more favourable regional environment, actors in the digital games industry had established a cluster organization that was to represent their interests and lead the efforts of modifying structures for asset provision in the region. However, despite a relatively well-funded and strong organizational support structure, existing power relations shaped the scope of their activities. At the early stage of path development, it was possible to observe a clear divide when it comes to the objectives and strategies of firms in the digital games industry versus public actors coordinating the innovation system. While the firms worked to communicate the particular needs of the industry, public actors wanted to fit the games industry into broader regional support structures related to existing industries. Previous studies have shown that policy played an important role in the emergence of a regional 'new media' industry (Martin & Martin, 2017), and a strong innovation support structure was developed around new media. The cluster organization 'Media Evolution' and its physical facilities was presented as being the 'flagship' of regional innovation policy efforts in the region. Public actors categorized digital games as part of creative and cultural industries and perceived a relationship with the new media industry. This was questioned by several of the interview partners, but had implications for their activities: 'The idea has been that the games industry should be part of Media Evolution, but the games industry does not feel comfortable with this' (representative of existing support organization).

Attempts among public actors of coordinating the RIS thus limited the possibility to obtain funding for activities targeting RIS reconfiguration, such as the expansion of the cluster organization or the establishment of new support organizations. One interview partner expressed that, 'Because of how the system functions here, from the perspective of the regional public sector, ... they do not want to build a new cluster for each industry but to expand upon existing ones' (representative of the digital games industry). This pushed actors away from strategies that involved the establishment of new support elements to strategies built on navigation of existing structures. From originally arguing for the creation of new specialized support organizations, with limited success, actors turned to focusing on the identification of RIS elements that could be adapted or reapplied to fit the needs of the digital games industry. For example, actors wrote funding applications to access funding intended for tackling youth unemployment, drawing on the high diversity of the games industry (see also Mjörner & Trippel, 2017). Actors thus navigated the RIS and slightly realigned or 'repackaged' their activities so

that they were incentivized by existing structural elements. By doing so, rather than contesting the prevailing system selectivity of the RIS, game industry actors were able to tweak the functioning of the system to become more enabling for their activities. One interview partner from the digital games industry explicitly stated that, ‘We used the youth and diversity in the games industry as an argument to get funding’ (representative of the digital games industry). In terms of directionality, Scania was a frontrunner when it comes to applying a vertical and non-neutral logic of innovation policy, including both specialization in desirable areas and diversification of activities. The region had developed a smart specialization strategy, centred on three broad platforms (smart cities, personal health and smart materials). This was complemented by a large number of other strategies concerned with regional development in a more general sense, creating a ‘web’ of visions and strategies that covered a range of future directions. Directionality was not dominated by one trajectory and neither captured by a few incumbent actors. The interview results illustrate how actors were aware of existing strategies and had ideas of how to anchor new activities in, for example, the smart specialization strategy, but lacked concrete incentives to do so. Furthermore, with no dominating direction established in the RIS, actors could engage in efforts of influencing the directionality, for example, by creating visions about becoming ‘Europe’s leading games region’ and mobilize support for the establishment of an annual international games conference (Table 1).

Self-driving cars (SDCs) in West Sweden

For a few years the automotive industry in West Sweden has been undergoing changes due to rapid developments in the field of automation and autonomous technology. In West Sweden, the industry is going through a process of path transformation related to the development of SDCs (Baumgartinger-Seiringer et al., 2020; Miörner & Trippel, 2019). With an RIS strongly aligned with ‘old’ path activities, the analysis shows that incumbents in the

automotive industry have been engaging in intentional efforts to transform the regional system to better fit their SDC activities.

It is safe to say that regional imaginaries have traditionally defined West Sweden as an ‘automotive region’. It is the heart of the Swedish automotive industry, dating back to the first quarter of the 20th century when bearings manufacturer SKF diversified into vehicle manufacturing and founded AB Volvo. Today it is still the home of a range of vehicle manufacturers and suppliers, Volvo Cars, AB Volvo and Autoliv being notable examples. The regional industry has proven resilient and has developed into a highly successful generator of growth in the region. However, over time regional imaginaries have become centred on the perception of a region in which the development of ‘automotive technology’ takes place. In particular, the RIS in West Sweden has become heavily geared towards the ‘active safety’ segment of the automotive industry, bringing together actors around the issue of safety rather than providing broad support to the automotive industry in general.

This was reflected when actors started to mobilize stakeholders around issues related to the development and introduction of SDCs at the early stage of path transformation. Actors were generally convinced about the regional importance and bright future of the industry, and different types of actors, both public and private, were feeling a sense of belonging to the regional automotive industry. For example, actors such as the local parking company in Gothenburg, the spatial planning division of the city, the regional public transport company and researchers in a wide range of fields became engaged in formulating strategies for the future of SDCs in the region. One interviewee expressed that: ‘We are experiencing how the automotive industry is exploding in different directions; we need to be part of it to understand what is going on’ (representative of the local parking company). In other words, regional imaginaries worked in favour of broad participation and pointed the process towards broad ‘catch all’ visions about SDC development and introduction. This

Table 1. System selectivity and agency in Scania.

System selectivity	Influence	Effect
<i>Regional imaginaries:</i> post-industrial, multi-cultural and innovative region	Neither empowering nor suppressing actors	Actors anchored their strategies to the prevailing imaginaries in order to create legitimacy
<i>Power relations:</i> power of coordination concentrated in group of public actors	Reluctance to fund new support elements; associating digital games with new media	Actors formulated strategies to explore how existing regional innovation system (RIS) elements could be adapted or reapplied, rather than pushing the creation of new ones; identifying ways to exploit existing new media support structures in new ways
<i>Directionality:</i> broad set of directions	No dominating trajectory; few incentives to align activities	Actors were somewhat free to formulate strategies; used the lack of strong directionality to mobilize support for change activities

Source: Author’s own elaboration.

was also reflected in the activities performed by powerful actors in the automotive industry. Despite their strong power and influence, their formulation of strategies for RIS reconfiguration targeted elements supporting broad asset formation processes related to autonomous technology and mobility in general, rather than the specific needs of automotive incumbents.

Interestingly, historically built-up power relations between private and public actors in the region have led to a distributed set-up, where automotive incumbents are used to having to balance their interests with the public sector. In turn, public sector representatives highlighted that formal regulations set at the national level governed their support of the automotive industry, arguing that their support would have been more directly targeting asset provision for the incumbent automotive industry if regulations had allowed it. Put bluntly by one interview partner, 'We have regulations that prevent us from working with this' (interview with a representative of the public sector). This has led actors to adopt a more 'thematic' than 'industrial' focus, developing a supportive system around 'SDCs' defined broadly, rather than the around the automotive industry or even specific technologies. This general strategy was favoured also by system selectivity originating from the directionality of the RIS. The smart specialization strategy for West Sweden outlines 'sustainable transport' as a prioritized domain (VG Region, 2014) and the focus on sustainability in the automotive sector is reflected in different strategies at both regional and local levels. However, the empirical results indicate that the way through which sustainability is interpreted in the region is very broad, essentially steering actors 'away' from traditional automotive activities rather than 'towards' a clearly defined trajectory based on sustainability. This has a concrete effect on agents' activities by incentivizing the navigation among goals that are set out by the public sector, to identify routes that enables access to assets such as funding for innovation activities and legitimacy among influential actors. In that sense, the way through which automotive actors navigated the directionality of the RIS

steered their activities towards adopting a more open boundary of 'the automotive industry' which incentivized a broader range of stakeholders to make use of existing RIS elements.

This provided a peculiar context for agency, both favouring divergent activities, 'away' from the existing automotive structures, whilst still being firmly anchored in the very same structures. For example, actors from the automotive industry working with SDC development actively lobbied for the establishment of an artificial intelligence (AI) research centre in the region, in order to attract top-level researchers, but were explicit about the importance of keeping a broad focus rather than introducing it as an 'automotive AI centre'. For example, one representative of a major automotive technology developer stated that, 'I would say that vehicle AI is one focus area, but the idea is not that it should be only about that. We are trying to attract other firms as well' (interview with a representative of an automotive technology developer).

In a similar manner, 'Mobility X-Lab' was introduced as a new type of incubator inviting firms approaching mobility from different directions, ranging from public transport innovations to new navigation systems for personal cars. It is strongly connected to the automotive industry, but involves actors also from other industries (most notably the IT industry), and has a broad thematic focus rather than a narrow industrial one (Table 2).

SUMMARY AND DISCUSSION

Summarizing insights from the two cases, it is possible to discern how the reconfiguration capacity of the RIS differed in the two regions, and how system selectivity shaped how RIS reconfiguration played out.

In Scania, actors exploited loosely anchored regional imaginaries and weak directionality in their efforts to reconfigure the RIS. Trying to develop structures that supported the provision of necessary assets, actors were relatively free to formulate strategies and were not constrained by existing directionality when they mobilized

Table 2. System selectivity and agency in West Sweden.

System selectivity	Influence	Effect
<i>Regional imaginaries:</i> automotive technology region	Pushing broad participation, empowering marginal actors	Actors developed broad 'catch all' agendas. Strategies for regional innovation system (RIS) reconfiguration, even from strong incumbent actors, targeted broad asset-formation processes related to autonomous technology and mobility in general
<i>Power relations:</i> balanced power distribution between automotive incumbents and public actors	Steering assets away from old structures	Actors adopt a thematic focus. Strategies for RIS reconfiguration included the establishment of new elements with a broad focus on technology development rather than automotive focus
<i>Directionality:</i> sustainable transport – away from traditional automotive activities	Steering assets away from old structures	Actors engage in navigation and anchor their strategies in 'sustainable mobility', defined broadly

Source: Author's own elaboration.

support for their change activities. However, existing power relations played a substantial role in terms of shaping actors' efforts and how they played out. Rather than directly engaging in activities for system change, actors formulated strategies to explore how existing support elements could be adapted or reapplied. Structures aligned to the 'new media' industry reflected a political ambition to increase coordination of publicly funded activities in the RIS, and actors in the games industry identified means to exploit them in new ways.

In West Sweden, powerful incumbents engaged in change efforts, but prevailing system selectivity shaped their activities. This further highlights the importance of understanding regional reconfiguration capacity at the intersection of structural conditions and agentic processes. Both in terms of system change and navigation, strategies of change agents reflected the regional imaginaries, power relations and directionality. The influence of system selectivity led actors to engage in RIS reconfiguration essentially 'opening up' the RIS, emphasizing aspects such as a broad inclusion of stakeholders and empowering marginal actors. They focused on changes that broadened the asset provision structures in the region rather than specializing them to a particular industrial segment, and by pushing actors to align their strategies to broad sustainability goals.

CONCLUSIONS

The point of departure in this paper was that the development of new industrial paths and the transformation of existing ones are intrinsically linked to the reconfiguration of existing RISs. However, while studies have outlined the modes and mechanisms of RIS reconfiguration and the role played by agency, less attention has been given to factors shaping regional reconfiguration capacity.

This paper has brought forward the argument that regional reconfiguration capacity is shaped by the prevailing 'system selectivity' in an RIS, and it introduced a novel conceptual framework to understand how different factors shape how RIS reconfiguration plays out. The conceptual framework extends beyond investigating the enabling or constraining effect by existing structural conditions, by focusing on how system selectivity influence the capability of actors to reconfigure RIS structures. In other words, the conceptual framework highlights the importance of considering structure–agency dynamics for understanding RIS reconfiguration and new path development. Based on insights from the path development literature, three factors were expected to be particularly important in terms of shaping the prevailing system selectivity of an RIS, namely regional imaginaries, power relations and directionality.

To illustrate the applicability of the framework, it was applied to a comparison of two cases of new industrial path development in Swedish regions. The empirical analysis confirms the value of the proposed conception of system selectivity capturing the interplay between structure (defined in a broad way) and agency in RIS

reconfiguration. It is demonstrated how the framework allows for a more nuanced analysis of the regional environment, beyond the dichotomy of enabling/constraining, by combining temporal and geographical aspects. The empirical analysis also captures the way through which system selectivity is constantly defined and redefined by regional actors and offers insights into how a certain set of conditions are interpreted and acted upon by reflexive agents, without reducing the explanation to 'only agency'. To exemplify, the case comparison shows that actors tend to improvise and choose strategies that are not constrained by existing structural configurations rather than pursuing strategies to dismantle barriers. This diverges from previous studies focused on identifying barriers to path development and mapping actors' efforts of overcoming them, by giving explanatory power to the *interplay* between structure and agency over time rather than to the effect of certain structural conditions or agentic properties.

Nonetheless, the empirical case comparison also highlights the fact that actors are creative in their interpretation of system selectivity and the influence of the same set of factors is not constant over time. While this is part of the rationale behind a dynamic conceptualization of the regional environment underpinning the framework, it suggests that even more attention should be given to the way through which actors 'navigate' the existing structures in their path development efforts. For example, the empirical analysis revealed how actors changed their strategies after gaining knowledge of system selectivity, aligning their activities so that they are favoured by existing system configurations. Agency that targets the reinterpretation and redefinition of existing structures in order to incentivize path development activities remains an under-conceptualized mechanism of regional reconfiguration. The current study has provided a toolkit through which to understand why actors are 'pushed' into such strategies by perceiving rigid structural conditions as something not necessarily constraining and by disentangling the factors shaping their selective properties, but more research is needed to better understand the navigation strategies deployed by agents.

Finally, in terms of system selectivity, future studies should be concerned both with further investigations into the factors suggested in this paper and with an exploration of additional factors that might play a role. Studies should be geared to provide answers in relation to the relative importance of structure and agency in triggering reconfiguration processes (the source of change), the influence of system selectivity on how efficiently changes comes about (the rate of change) and what steers change processes (the direction of change).

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1. 'NVivo' by QSR International.

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