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Contextualizing system agency in new path development: What factors shape regional reconfiguration capacity?

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Abstract: This paper examines factors shaping the reconfiguration capacity of regional innovation systems (RIS). The concept of 'system selectivity' is introduced, referring to factors such as regional imaginaries, power relations and directionality shaping how RIS reconfiguration plays out. The conceptual arguments are illustrated with a comparative case study of industrial change in two Swedish regions (automotive industry in West Sweden and digital games industry in Scania). The findings confirm the influence of system selectivity on agents' formulation of strategies for RIS reconfiguration and highlight the importance of considering structure-agency dynamics to move beyond the stylized view enabling or constraining RISs.

Keywords: system agency, new path development, regional innovation system, reconfiguration capacity, digital games, self-driving cars

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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 and Frenken, 2006; Boschma and Frenken, 2018), economic geographers have sought to explain how regional industrial structures change through path creation, diversification, importation and renewal processes (Neffke et al., 2011; Dawley, 2014; Boschma, 2017; Isaksen and Trippl, 2017; Miörner and Trippl, 2019). Recent scholarly work has advocated a broad approach to path development, with increasing attention given to social, institutional and cultural influences (Dawley, 2014; Mackinnon et al., 2019; Hassink et al., 2019). In line with this, scholars have forged links between evolutionary models and the Regional Innovation System (RIS) approach (Isaksen and Trippl, 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.

Studies have started to outline how the development of new paths and the transformation of existing ones (Baumgartinger-Seiringer et al., 2019) are intrinsically linked to the reconfiguration of existing RISs (Tödtling and Trippl, 2013; Trippl et al., 2019), in order to facilitate the provision of assets to new paths (Miörner and Trippl, 2019). There is however 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 determining the reconfiguration capacity of a RIS.

This paper departs from the idea that regional reconfiguration capacity is shaped by factors and conditions influencing the capability of actors to reconfigure RIS structures. It thus refers to a region's ability to balance emerging changes in the industrial dimension with changes in other parts of the regional innovation system, in order to facilitate the provision assets corresponding to the needs of new industrial paths. The paper develops a novel analytical framework for analysing RIS reconfiguration capacity from the perspective of the interplay between regional context conditions and agentic processes. The paper introduces the concept of 'system selectivity' as a tool to understand how different factors shape how RIS reconfiguration plays out. It is argued that existing RIS structures are not just enabling or constraining agents' 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 system agency and RIS reconfiguration, associated with the emergence of a digital games industry in the region of Scania and changes in the automotive industry in the region of West Sweden.

Literature review and analytical 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 and Hansen, 2018: 4). Regional industrial paths are embedded in a regional innovation system (Isaksen and Trippl, 2016) consisting of all industries and firms located in the region, networks between actors, organisational 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; Tödtling and Trippl, 2013). This has the implication that existing RIS configurations may need to change in order to support new industrial development paths, and studies have begun to explore how RIS reconfiguration takes place (Tödtling and Trippl, 2013; Miörner and Trippl, 2017; Trippl et al., 2019; Miörner and Trippl, 2019).

Agency has been argued to play a potentially crucial role in RIS reconfiguration. Isaksen et al. (2019) introduced the notion of 'system agency', defined as "actions or interventions able to transform regional innovation systems to better support growing industries and economic restructuring" (Isaksen et al., 2019: 5). System agents are actors who transcend organisational boundaries and are able to mobilise other actors, create visions and alter the functioning of the RIS. Reflecting the most recent contributions to the new path development debate, system agency should not only be seen as efforts to add or remove elements in the organisational support structure, but as actions or interventions targeting the functioning of the RIS (Miörner and Trippl, 2019; Binz et al., 2016). This is not only dependent on the creation or adaptation of strong organisations, such as educational facilities, incubators, cluster organisations and so forth, but also on supportive institutions such as policy initiatives and regulations (Zukauskaite et al., 2017), and guiding visions and expectations (Steen, 2016).

However, the literature lacks convincing explanations for *why* and *when* agency can play a role, and neglects the recursive relationship between structure and agency in RIS reconfiguration. On the one hand, it could be argued that the success of system 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). On the other hand, studies have shown how regions provide more or less enabling or constraining preconditions for new path development (Isaksen and Trippl, 2016), and a range of contributions have been made in order to disentangle how context conditions shape the preconditions for new industrial path development.

The existing literature has adopted a rather static perspective of the regional conditions that matter for new path development, emphasising a set of pre-existing enabling or constraining conditions. A more dynamic perspective would involve shifting 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 system agency.

Enabling and constraining regional factors

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 can offer sector-specific factors for entirely new industries (Storper and Walker, 1989). More recent views are built around the idea that regional industrial change is path dependent, meaning that new industrial paths are drawing on assets of existing industrial paths (Martin and Sunley, 2006; Martin, 2010).

Many studies situated in EEG depart from the idea that the existence of different but related industries serve as enabling conditions for new path development (Boschma, 2017). However, scholars have criticised the 'relatedness' argument for neglecting social, institutional and cultural influences (Hassink et al., 2014; MacKinnon et al., 2009; 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. There is a growing recognition in the literature that 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 and Trippl, 2018; Trippl et al., 2019). Whilst 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. Previous studies have indicated that the enabling effect of actors being able to shape the regional innovation system to support new paths might exceed the potentially constraining effect of existing structures (Sotarauta and Mustikkamäki, 2015) and actors can work to 'turn' a constraining environment to become more enabling (Miörner and Trippl, 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 might depend greatly on regional economic agents' perceptions of these structures (Sotarauta, 2017; Zukauskaite et al., 2017). Sotarauta (2017)

introduced the concept of 'institutional navigation' to describe a form of agency which refers to the identification of relevant institutional arrangements and the ability to strategically comply and adapt to a set of institutions that ensures the maintenance of the actors' strategic intentions. 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 and Sotarauta, 2019).

Reconfiguration capacity of regional innovation systems

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 (see 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. Structure and action are thus analysed in conjunction, rather than temporarily bracketing one of them (see Jessop, 2001). Inspired by the structure-agency debate, particularly the strategic-relational approach (Jessop, 2001; Hay, 2002; Jessop, 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. System selectivity can be traced back to the results of events 'happening', and not necessarily the materialised or institutionalized outcomes of the events per se. They reflect political processes, regional imaginaries and conventions (Storper and Salais, 1997; Hajer and Versteeg, 2018) 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 (failed) development (Schneiberg, 2007; Henning et al., 2013), 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 (c.f. political lock-in).

System selectivity refers to factors such as legitimacy, power, discourses, imaginaries, expectations and visions. These are factors that are increasingly taken into account in the path development literature (see e.g. Steen, 2016; Steen and Hansen, 2018; Isaksen, 2018). In this paper, close attention is given to three types of system selectivity (regional imaginaries, power relations and directionality), encompassing several of the factors previously highlighted in the literature. The paper does however not make claims in terms of providing an exhaustive list of factors that shape RIS reconfiguration capacity.

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 (Steen, 2016; Isaksen, 2018). For example, Isaksen (2018) illustrated 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" (Beckert, 2013: 220).

The idea of 'regional imaginaries' is that fundamental perceptions, conventions, mental representations and world-views exist not only within regional industrial paths, but at a very basic 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 academic literature, we often refer to regions as old industrial-, peripheral-, entrepreneurial-, natural resource based-, IT-, automotive-, and so forth. 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 (c.f. 'spatial socialisation' introduced by Paasi, 1991). Regional

imaginaries are thus mental maps of collectively shared beliefs that structure economic life (see also Boudreau, 2007; Jessop, 2012).

Regional imaginaries are expected to shape the reconfiguration capacity of a RIS by empowering or supressing actors in emerging industrial paths. Strong and well-aligned imaginaries influence the opportunity space (Grillitsch and Sotarauta, 2019) 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 (Sotarauta and Mustikkamäki, 2015; Miörner and Trippl, 2017). Similar arguments are found in the technological innovation systems literature, highlighting the existence of powerful actors as a key factors enabling system building (Musiolik et al., 2012; Musiolik et al., 2018). In transition studies, the constraining effect of existing power relations have been investigated, largely referring to the stabilising 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 mobilised as a resource for change activities (Van Mossel et al., 2018).

Historically built up power relations play an important role in terms of coordinating assets and activities in the RIS. In most regions, no single organisation or individual has the power of distributing assets among actors in the RIS, but regions may be characterised by a more or less balanced power distribution (Zukauskaite et al., 2017). In some regions, the RIS is dominated by a few powerful organisations, while in other power is distributed among a variety of stakeholders (Sotarauta and 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 be the legacy both 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 institutionalised features in the RIS. Such set-ups have the potential of increasing the flexibility of established power relations, by institutionalising 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 and Rohracher, 2012), shaping the 'purposefulness' of the innovation system (Schlaile et al., 2017). Directionality represent a form of institutionalised expectations, guiding the direction of change efforts in the regional innovation system. 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 sense-making activities (Weber and Rohracher, 2012; Sotarauta and Mustikkamäki, 2015). Directionality thus defines the frame of engagement of regional actors, setting out possible future scenarios through the formulation of technological and institutional problems that deserves attention, and by steering actors away from other trajectories (Grillitsch et al., 2019). As opposed to regional imaginaries, directionality is made up of normative elements (Scott, 2010) that are formulated, contested and reinforced by actors over time. 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) highlighted the role of public actors in setting directionality in the development of an off-shore wind industry in the North East of England, through policies for niche support. Also Tanner (2014) emphasise 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 a 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 around a specific set of issues, sometimes shaped by the interests of incumbent actors (see above). A strong directionality is however not only influencing the direction of RIS reconfiguration, but might both reinforce or constrain new activities, depending on their alignment with existing structures.

Implications for system agency

By disentangling the three types 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 types of system selectivity, and exploit them in efforts to modify regional structures for asset provision. In other words, the particular combination of system selectivity 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 and Suvinen, 2018) of system selectivity, actors strategically comply and adapt their activities whilst at the same time maintaining their strategic intentions. Mackinnon et al. (2019) have highlighted the role of 'path advocates' and their efforts of linking new path activities to broader conventions, networks and discourses, rather than primarily targeting to change such structural conditions. 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 conceptual framework is summarised in figure 1.

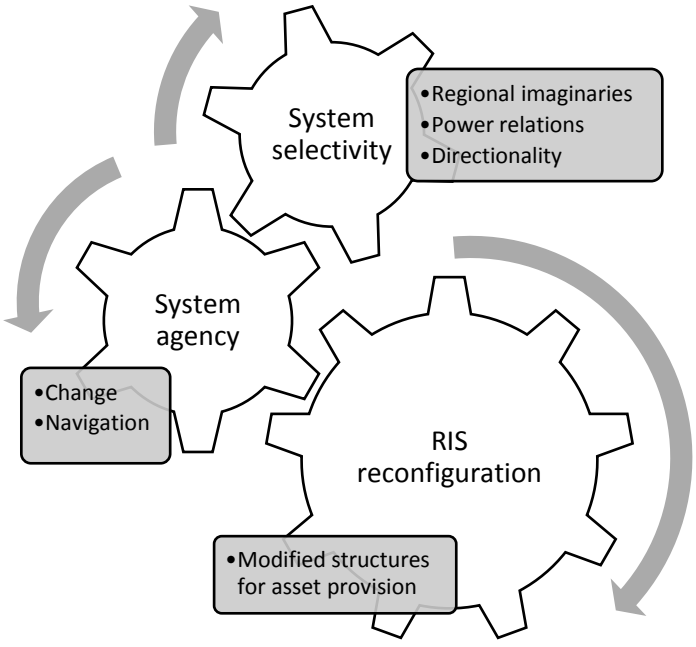

Figure 1: Summary of the analytical framework (own elaboration)

Empirical illustration: RIS reconfiguration in two Swedish regions

This section provides an illustration and exemplification of the analytical framework by applying it to a comparative case study of RIS reconfiguration and the impact of contextual specificities on system

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. 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 empirical analysis is based on qualitative data collected through interviews in combination with an extensive document analysis. 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 organisations, academics and industry experts were interviewed during 2017 and 2018. In Scania, 20 firm representatives of the digital games industry, regional public actors and innovation support organisations were interviewed during 2015 and 2016, followed by two additional interviews in 2018. In both cases, the selection of interview partners was based on an initial document analysis of available reports, policy documents and newspaper articles, 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.

Both cases are located in the Swedish context and are of similar size, both have a history of industrial manufacturing and have went through processes of structural change during the last twenty to thirty years. Today, they are endowed with well-performing research and knowledge generation organisations, 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.

Digital games in Scania

The emergence of a digital games industry in Scania represents a case of path importation (Martin and Sunley, 2006; Grillitsch et al., 2018), initiated by a few game developers deciding to relocate from the neighbouring region of Blekinge. According to previous studies (see Miörner and Trippl, 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 through expansions of existing firms. Actors in the digital games industry quickly realised 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 types of 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 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, including also 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 had been struggling with the perception of their industry as not being 'serious business', a perception that persisted despite rapid growth and export successes. Regional imaginaries provided a point of departure for efforts targeting the legitimation 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 (OECD, 2012) and highly distributed power relations. However, according 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 (Zukauskaite and 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 organisation 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 organisational 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 and Martin, 2017), and a strong innovation support structure was developed around new media. The cluster organisation Media Evolution and its physical facilities was presented as being somewhat the 'flagship' of regional innovation policy efforts in the region. Public actors categorised 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 organisation)

"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)

Attempts among public actors of coordinating the RIS thus limited the possibility to get funding for activities targeting RIS reconfiguration, such as the expansion of the cluster organisation or the establishment of new support organisations. This pushed actors away from strategies that involved the establishment of new support elements, to strategies built on system navigation. From originally arguing for the creation of new specialised support organisations, with limited success, actors turned to focusing on the identification of RIS elements that could be adapted or re-applied 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 Miörner and Trippl, 2017).

In terms of directionality, Scania was a frontrunner when it comes to applying a vertical and non-neutral logic of innovation policy, including both specialisation in desirable areas and diversification of activities. The region had developed a smart specialisation strategy, centred around three broad platforms. 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 which 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 specialisation 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: System selectivity and agency in Scania.

System selectivity	Influence	Effect
Regional imaginaries: Post-industrial, multi-cultural and innovative region.	Neither empowering nor supressing actors.	Actors anchored their strategies to the prevailing imaginaries in order to create legitimacy.
Power relations: 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 RIS elements could be adapted or re-applied, rather than pushing the creation of new ones; identifying ways to exploit existing new media support structures in new ways.
Directionality: 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: own elaboration.

Self-driving cars in West Sweden

Since a few years, the automotive industry in West Sweden is 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 self-driving cars (SDCs) (see also Miörner and Trippl, 2019). With a regional innovation system 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 self-driving car 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, regional imaginaries are centred around the perception of a region in which the development of 'automotive technology' takes place. In particular, the RIS in West Sweden have 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.

"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 was reflected also 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 certain actors.

Interestingly, historically built-up power relations between private and public actors in the region has 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 would have allowed it.

This led actors to adopt a more 'thematic' than 'industrial' focus, developing a supportive system around 'SDCs' defined broadly, rather than the automotive industry or even specific technologies. It is captured also by system selectivity originating from the directionality of the RIS. The smart specialisation strategy for West Sweden outlines 'sustainable transport' as a prioritised domain (VG2020, 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 incentivising 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.

This provided a peculiar context for system 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 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'. 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 such as the IT industry, and have a broad thematic focus rather than a more narrow industrial one.

Table 2: System selectivity and agency in West Sweden.

System selectivity	Influence	Effect
Regional imaginaries: Automotive technology region.	Pushing broad participation, empowering marginal actors.	Actors developed broad 'catch all' agendas. Strategies for RIS reconfiguration, even from strong incumbent actors, targeted broad asset formation processes related to autonomous technology and mobility in general.
Power relations: 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.
Directionality: 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: own elaboration.

Discussion and conclusion

Summarising insights from the two cases, it is possible to observe how the reconfiguration capacity of the RIS differed in the two regions, and how structure-agency dynamics shaped how RIS reconfiguration played out.

In Scania, actors exploited loosely anchored regional imaginaries and weak directionality in their system agency efforts. 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 support for their change activities. However, existing power relations played a substantial role in terms of shaping their 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 re-applied. 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, emphasising 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 specialising them to a particular industrial segment, and by pushing actors to align their strategies to broad sustainability goals.

The case comparison illustrates the practical applicability of the framework. Nevertheless, the empirical findings also pointed in the direction of aspects not fully covered by the conceptual discussion. The analysis highlights the recursive properties of agency. Actors' activities often lead to spill-overs in the form of other actors joining or opposing their strategic agendas. The framework should thus not be used to conduct snapshot analyses of one particular point in time, but to analyse the unfolding iterative process of system agency in industrial change processes.

The reflexivity of actors is very important, as actors continuously enhance their knowledge about regional context conditions. On the one hand, actors changed their strategies after gaining knowledge of system selectivity, aligning their activities so that they are favoured by existing system configurations. On the other hand, actors are creative in their interpretation of system selectivity and the influence of the same set of selectivity is therefore not constant over time. Actors experiment with responses and reactions to the influence of system selectivity and, reflecting on the outcomes of their attempts of system agency, gain strategic knowledge about 'what works'. In both cases, 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.

In summary, this paper has contributed to our understanding of factors shaping the reconfiguration capacity of regional innovation systems, by investigating how system selectivity in the form of regional imaginaries, power relations and directionality influence how agents formulate strategies for RIS reconfiguration. The arguments brought forward in the conceptual and empirical analyses highlight the importance of considering structure-agency dynamics for understanding RIS reconfiguration and new path development, beyond the stylized view of regional environments

being either enabling or constraining. By combining temporal and geographical aspects, the concept of system selectivity offers a way to analyse ever-changing regional opportunity spaces, by capturing the ways through which system selectivity is constantly defined and re-defined by regional actors. It provides a deeper understanding of the regional context in which new path development takes place, by offering an attempt to understand how a certain set of conditions are interpreted and acted upon by reflexive agents, without reducing the explanation to 'only agency'.

Future studies should be concerned both with further investigations into the types of system selectivity suggested in this paper and with an exploration of additional factors that might play a role. Furthermore, future studies might 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 (direction of change). Finally, whilst being beyond the scope of this paper, the multi-scalar perspective of system selectivity deserves particular attention, as factors originating from different spatial scales might have a strong influence on the activities of regional actors.

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