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Policy Learning and Smart Specialization

Balancing Policy Change and Continuity
for New Regional Industrial Paths

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Abstract

This paper seeks to explain what policy approaches and policy measures are best suited for promoting new regional industrial path development and what needs and possibilities there are for such policy to change and adapt to new conditions in order to remain efficient. The paper departs from the notion of Smart Specialization and discusses how regional strategies that are inspired by this approach influence path renewal and new path creation and how they are related to and aligned with policy strategies implemented at other scales (local, regional, national, supranational). Our main argument is that new regional industrial growth paths require both continuity and change within the support structure of the innovation system. Unless smart specialization strategies are able to combine such adaptation and continuity, they fail to promote path renewal and new path creation. Our arguments are illustrated with empirical findings from the regional innovation system of Scania, South Sweden.

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1 Introduction

Smart specialization ranks at the top of public policy agendas in many European regions. This new strategic policy approach is part of the trend towards 'new industrial policies', which have received increasing scholarly attention over the past years (Rodrik 2004). Smart specialization puts innovation at the forefront and applies an innovation-based development strategy by focusing on each region's specific strengths and competitive advantages. Policy measures are based on evidence and strategic intelligence about regional assets and capabilities, with the ambition to exploit the region's unique characteristics through specialization in relation to other regions (European Commission, 2012). Smart specialization puts due emphasis on knowledge and innovation as core determinants of regional growth and development. In sharp contrast to old policy practices, which were often characterized by replicating successful policies adopted in other regions and "one-size-fits all" strategies (Tödtling and Trippl 2005). It emphasizes the need for place-based policy strategies to promote regional economic diversification and structural change, that is, new regional industrial path development (McCann and Ortega-Argiles 2013; Foray 2015) by building on unique regional characteristics and assets. The identification and selection of prioritised areas for policy intervention are supposed to result from "entrepreneurial discovery processes". A core assumption is that policy-makers do not possess all the information that is required for making the "right" decisions related to the identification of policy goals and the selection of priorities. The same holds true for companies and other stakeholders who also have only a partial knowledge of current and future opportunities, challenges and constraints. Promising areas for economic diversification and new path development are not known ex-ante but need to be discovered by policy-makers together with other stakeholders. This calls for new forms of interaction and strategic coordination between public and private actors, allowing for collective efforts to search for and discover policy priorities. Like other approaches to new industrial policy (see Radosevic (forthcoming) for an overview), smart specialisation contains elements of what has been called 'experimentalist governance' (Sabel and Zeitlin 2012), emphasizing policy goal setting in close interaction with policy addressees, recursive learning mechanisms and dynamic accountability through peer review (Sabel and Zeitlin 2010). It is beyond the scope of this paper to thoroughly discuss the policy learning challenges associated with experimentalist governance and the changes and preconditions new industrial policies require in terms of institutional set-ups, shifts in governance structures, structural reforms and policy capabilities (see Radosevic (forthcoming) for an identification of some core challenges). We rather focus on gaining a deeper understanding of how new path development relates to continuity and change within the support structure of innovation systems and how government, policy network and governance learning can support such processes.

It is widely claimed that the successful implementation of smart specialisation strategies – innovation in the economic and social sphere – would require innovation also in the policy sphere (Borrás 2011). Smart specialization strategies thus challenge traditional regional innovation policies and deviate from past policy practices. This paper advances the argument that such a reorientation of innovation policy is a demanding undertaking, requiring to overcome policy inertia and to engage in policy learning processes. Focusing solely on policy changes is, however, insufficient. We argue that such new approaches also require continuity on some dimensions of the policy system. This is because the new regional industrial path development, which the policy aims to stimulate, also requires predictability with regard to aspects such as return on investments. A lack of possibilities for long term

planning reduces the willingness of entrepreneurs to take risks related to experimentation, which hence is an argument in favour of institutional continuity. At the same time, new industrial path development implies new types of economic activities, with new needs and demands from the support system, which is an argument in favour of institutional change and policy renewal. Thus, unless smart specialization strategies manage to arrive at balanced combinations of change and continuity in the policy- and institutional system there is a risk that measures initiated to promote new regional industrial growth paths instead will generate opposite effects and contribute to sustained negative lock in. These arguments are in line with the general assumption that policy measures can contribute to providing and drawing on already available conditions, while hardly being decisive or triggering factors for change in specific directions. Policy measures thus do not generate outcomes per se, but they provide incentives for actors in different parts of the economic sphere to act and interact in different ways. They can hence be powerful means to hinder or further promote changes already set in motion by chance events or actions initiated in different parts of the economic and political sphere, as well as in society at large. Coordination of incentives and activities on different levels and across different domains is thus a main challenge for innovation policy aiming to promote smart specialization.

The aim of this paper is to explain what policy approaches and policy measures are best suited for promoting new regional industrial path development and what needs and possibilities there are for such policy to change and adapt to new conditions in order to remain effective. By examining the preconditions for such 'policy learning' (Borrás 2011) the paper presents an assessment of to what extent and how policy can utilize regional preconditions and influence the capacity of regional economies to develop new regional industrial paths. Observations from Scania, Southern Sweden are used to illustrate our theoretical arguments. Scania hosts around 1.2 million inhabitants and is one of the most innovation intensive regions in the EU. It displays a strong potential for new path development due to its diverse industrial structure (including sectors such as food, life science, ICT, new media and cleantech) and the presence of a strong university sector, hosting amongst others Lund University, one of the oldest and most prestigious universities in Scandinavia. Scania has been one of the first regions in Europe that have integrated smart specialization ideas into their policy-making processes. This makes Scania an interesting illustrative case for analysing policy continuation and change processes in relation to smart specialization.

The paper is organized as follows. Section two draws on insights from evolutionary and institutional economic geography and provides a conceptualization of new regional industrial path development. We distinguish between two main forms, that is, path renewal and new path creation. In connection to this we conceptualize policy making as a strongly path dependent process, based on similar mechanisms as industrial path dependence. In section three we reflect on how policies aiming to stimulate new path development differ from "traditional" regional innovation policy approaches. In section four we advance the idea that both change and continuity at various policy levels are eminently important for smart specialization strategies that aim at promoting new regional industrial path development. Section five provides a discussion of different types of policy change processes, differentiating between 'displacement' and 'layering'. Finally, section six summarizes the main arguments of the paper and draws conclusions.

2 Conceptualizing regional industrial path development

As stated in the introduction, smart specialization strategies aim at promoting new regional industrial path development, that is, structural change and economic diversification of regional economies. It is thus worthwhile to take a closer look on what recent advances in economic geography, innovation studies and related fields have added to our understanding of how regional economies develop and transform over time. Insights into such change processes are eminently important to further discussions about the nature of policies for new regional industrial path development and how they differ from traditional approaches.

We depart from theories in evolutionary and institutional economic geography[i] and the work that has been done on regional path dependence and new path development. The concept of path dependence is mainly used to explain the economic specialization of regions that includes lock-in effects that push a technology, an industry, or a regional economy, or its dominant policy agenda and innovation support system, along one path rather than another (Strambach 2010).

Traditional accounts of path dependence had a strong focus on explaining the continuation and persistence of regional industrial structures and restrictive lock-ins. More recent work goes well beyond these approaches and seeks to provide conceptualizations of regional industrial change. A distinction between three main forms of regional industrial path development, that is, path extension, path renewal and new path creation, is suggested (Isaksen, 2015; Isaksen and Trippl 2016)[ii]. Arguably, these three types of path development may co-exist in a region[iii]. Path extension reflects continuity and lock-in. Path renewal and new path creation, in contrast, point to changes that follow from different forms of reorientation of regional industrial structures (Garud et al. 2010; Martin 2010, 2012; Neffke et al. 2011; Boschma 2015).

Path extension occurs through incremental product and process innovations in existing sectors and well-established technological paths. Such *intra-path changes* may in the long run result in stagnation and decline due to a lack of renewal (Hassink 2010). Regional industries are then locked into innovation activities that take place along restricted technological paths limiting their opportunities for experimentation and space to manoeuvre into more radical forms of innovation. Such situations may reflect high connectivity between regional actors and a low connectivity to the outside world. Ultimately, this erodes regional competitiveness and can lead to *path exhaustion*. Path dependence and negative lock-in may not only be observed in the knowledge exploitation subsystem (production structure) of regional innovation systems but also in other subsystems (Morgan 2013; Tödtling and Trippl 2013). Moreover, well-established linkages between the production structure, the knowledge infrastructure and the support structure increase the likelihood that path dependence within each of these subsystems reinforce each other.

Path renewal takes place when existing firms and industries switch to different but related activities and sectors. The opportunities for path renewal are strong when a region's industrial structure exhibits related variety (Frenken et al. 2007; Boschma 2015) or shows high potentials for combinations of knowledge bases (Asheim et al. 2011). Such conditions are assumed to be conducive to inter-industry learning and new recombination of knowledge. Regions may then develop new growth paths 'as new industries tend to branch out of and recombine resources from existing local industries to which they are technologically related' (Boschma 2015: 738). Path renewal is often industry driven as regional industries mutate and

widen the industrial structure (Boschma and Frenken 2011). In addition to such endogenous processes, exogenous sources (arrival of organizational and individual actors from outside the region and non-regional knowledge linkages) may also stimulate path renewal (see e.g. Trippl et al. 2015b). Also such renewal processes should be seen in relation to the correspondent development in the policy and other sub-systems of the regional innovation system, because changes within these subsystems might reinforce each other.

New path creation denotes the most wide-ranging changes in a regional economy. It includes the establishment of firms in new sectors for the region or the introduction of solutions (product, process, organizational innovations) that differ from those that have hitherto predominated in the region. Path creation may take two forms (Tödtling and Trippl 2013); first, the formation of established industries that are new for the region (triggered, for example, by inward investment), and second, the emergence of entirely new industries. The latter is often research driven and fuelled by the commercialisation of research results and the foundation of new firms and spin-offs. However, it may also be linked to the search for new business models, user-driven and social innovation. It can be triggered by endogenous and exogenous sources and it often requires active policy interventions and the creation of new organisational and institutional support structures (Tödtling and Trippl 2013). Furthermore one could argue that the degree of entrepreneurial experimentation is more pronounced in processes of new path creation as compared to path extension and path renewal, which also calls for changes in the policy sub-system of the regional innovation system. Situations of policy lock-in or rigid paths of policy evolution in the regional support system will hardly foster transformation processes in the innovation system as a whole. However, as argued above, such wide-ranging changes in a regional economy are also associated with a high degree of uncertainty, which at the same time calls for some degree of continuity in the policy domain.

Recent academic work suggests that regional innovation systems and policy actors associated with these differ in their capacity to stimulate new regional industrial path development. Isaksen and Trippl (2016) argue that thick and diversified innovation systems provide favourable conditions for new path development due to the strong presence of related variety, different knowledge bases, knowledge generating organisations and a vibrant entrepreneurship culture. Such assets may be exploited in different ways, but they also require coordination across different domains such as industry sectors and territories. However, these regions may exhibit weak structures for path extension brought about by a limited industrial production capacity. A too strong focus on and use of resources for knowledge exploration and new path development can lead to a decrease in knowledge exploitation capacity, resulting in fragmentation problems due to limited coordination capacities. Organisationally thick and specialised regional innovation systems have rather weak structures for supporting new regional industrial path development. They mainly support path extension but face the risk of path exhaustion if positive lock-in turns into negative lock-in. Organisationally thin regional innovation systems also have a limited capacity of promoting new growth paths and thus they have to deal with the danger of path exhaustion. Such challenges are hence hardly successfully addressed by more coordination among the regional actors. Rather these regions need to tap more into non-local pools of knowledge.

Explanations to these tendencies, and the regions' respective capacities to deal with them, can be found partly in the general abilities of innovation policy in respective regions and partly in the composition of the knowledge base upon which such regional innovation policy has to build. With regard to general abilities, it is natural that organizational thinness

implies a less developed support structure and, thus, less ability to promote new regional industrial path development. With regard to the composition of the knowledge base upon which regional innovation policy builds it is also natural that thick and diversified regions offer more potential for new combinations and therefore also stronger capacity to initiate measures in support of path renewal and new path creation. Thick and specialised regional innovation systems, on the other hand, may have equally strong general capacity of initiating change and development, but the regional knowledge base is less diverse and dominated by fewer fields of knowledge which makes the potential for new combinations more limited. Also, these regions are more likely to suffer from lock in due to vested interests among powerful incumbent actors.

This underlines that the degree of path dependence and opportunities for new path development in the respective subsystems of a regional innovation system should be seen as mutually reinforcing. Focusing on the policy subsystem, our argument is in line with the smart specialization approach and contextual policy interventions. This literature has highlighted the crucial role played by the quality of government and sub-regional institutional capacity for socio-economic development and its promotion through new policy strategies (Charron et al. 2014; Rodriguez-Pose et al. 2014; Dawley et al. 2015).

Policy path dependence and policy lock in may have different sources, related both to the general abilities and the composition of knowledge bases in the policy domain. Morgan (2013) sheds light on factors such as anachronistic skill-sets, inert and risk-averse compliance culture of government, the fact that learning from mistakes is not a political priority, and the orientation of politicians on short-term electoral cycles. These factors are found to severely curtail the capacity of policy actors to promote new industrial development paths. In addition to these factors, policy path dependence may also be the outcome of particular multi-actor and multi-level governance settings. The former relates to interactions between policy actors and other regional stakeholders in policy networks and the well-known phenomenon of "policy lock-in" (Grabher 1993; Hassink 2010). The limited capacity to fashion new regional industrial paths is then the result of a conservative culture among key stakeholders who actively oppose regional industrial and policy changes to protect their vested interests.

Finally, failures to engage in successful coordination processes with other spatial levels may be a core factor that potentially hampers the capacity of regional policy actors to undertake interventions that support new regional industrial path development. This relates to issues of multi-level governance and regional autonomy and the need to align regional policies with those implemented at local, national and supra-national levels. Regions may engage in innovative experiments but funding from higher policy levels is often required to provide the long-term support necessary for nurturing and sustaining new industrial path development. Likewise, implementation of such experimentation requires instruments also on a local scale, especially in contexts where a lot of policies influencing people's everyday lives are organized locally. If regions fail to align their policy initiatives with national or European ones to ensure that they are reinforcing or complementary to each other (Zukauskaite 2015), or if regional initiatives are lacking correspondent support at the local level, the opportunities for promoting new paths will be limited. Thus, coordination across spatial scales and sectorial domains, or what sometimes is referred to as "holistic" innovation policy (Edquist 2014), is important.

3 Towards a new generation of regional innovation policy

Whereas European regional innovation policy during the past couple of decades has focused strongly on promoting regional specialization of current industry strongholds largely based on a science-push strategy, there are reasons to claim that such an approach is insufficient for promotion of new growth paths in most regions. Failure to adapt to the specific context in which it is applied, or failure to design holistic innovation policies characterized by coordination across spatial scales and sectorial domains, has resulted in attempts of promoting industries in regions where the basic preconditions for such are absent or in fields which are disconnected from the rest of the economy. Such priorities of supporting specialized (often science-based and/or "creative") industries have gradually moved attention away from more generic policy strategies for human capital development, competence building, resource mobilisation and wealth redistribution. In recent years, however, there has been a shift away from such specialization towards more broad-based and diverse policy measures, sometimes referred to as platform strategies (e.g. Cooke 2007). Not least in light of the above-mentioned awareness that different regional innovation systems hold different preconditions for regional industrial change such broad based policy approaches have proved necessary; the one-size-fits-all model influencing early generations of regional innovation policy has been widely rejected (Tödtling and Trippl 2005).

Research on regional innovation policy has during the last decade increasingly called for both more tailor made and more broad based strategies for regional innovation (e.g. Tödtling and Trippl 2005; Asheim et al. 2011; Nauwelaers and Wintjes 2002). While these two aims at first sight may seem contradictory, they unite on the central claim that innovation policy must be direct and specific if it is to stimulate change (Asheim et al. 2011). Research in this field has had an impact on policy agendas in European regions during the past decade, a trend that accentuated with the launch of smart specialization strategies. As opposed to the specialized (cluster) strategies of the 1990s in which best practice approaches not always were adapted and translated to the real preconditions of the regions in which they were implemented, the "smartness" of smart specialization strategies are geared towards doing exactly this. This means that general insights from best practice cases observed in another context not necessarily have to be rejected because regional preconditions are different, but adapted to cater for such new context.

Another feature of the new generation of regional innovation policy is an increased awareness of regional innovation systems being functionally open and globally connected systems. Since there are hardly any regional industries or economies any longer, and hardly any regional markets (except for some very specific parts of the service economy), regional policy aiming to promote path renewal and new path creation is increasingly dependent on policies initiated, controlled and implemented elsewhere. Furthermore, given the increased awareness of related variety as a crucial source of industry dynamics and economic transformation, sector focused policies become obsolete unless they are adapted to this new reality. There is therefore a need for coordination both across spatial scales and across industrial domains. A challenge for regional innovation policy is thus both the previously highlighted need for being place-based and context specific, and at the same time being adapted to and in line with policies at other levels of society. Such coordination implies taking into account exogenous sources of path development in the local strategies, and making regional strategies correspondent to strategies implemented elsewhere. Failure to do so may very well work on a regional level in a short term perspective, but when such attempts of new

path creation are to be up-scaled, lack of policy coordination and adaptation can prove to be major obstacles (e.g. Coenen et al. 2015).

Smart specialization strategy differs from traditional tools for innovation policy (e.g. Nauwelaers and Wintjes 2002) when it comes to the level of support. Instead of focusing on a few firms or industries or promoting the region as a whole, it is based on priority areas that are defined through a collective discussion with the actors from different domains. The selection of areas is based on market and technology knowledge, must represent existing strengths and new possibilities in the region as well as open up for many actors rather than a few entrepreneurs in order to achieve structural change (Foray 2015). When it comes to the focus of support, smart specialization strategies in many aspects are similar to other types of innovation policies. For priority areas to develop there is a need for both hard and soft instruments such as funding, networking activities, and consultations. However, since the definition of priority areas is a collective process where many actors are supposed to be involved, soft tools are not primarily geared to changing attitudes and behavioural values, but rather serve as facilitators for new collaboration possibilities.

4 Towards a balance between policy change and continuity

A key question that emanates from the discussion above is how to overcome policy inertia and lock-in on the one hand, and provide long-term continuity for new regional industrial path development on the other hand. Policy learning and change are prerequisites for the transformation of innovation systems and the emergence of new growth paths (Lundvall 2010; Borrás 2011). However, frequent and abrupt policy changes create insecurity among entrepreneurs and other stakeholders and prevent them from planning their activities and investments in efficient ways. Especially when it comes to radical change in regional development leading to a new path creation, there is a need for policy continuity. Upscaling of new technologies and modes of production into commercialization involve high risk taking and usually investment schemes lasting for several years. When the rules of the game are unstable this may create a deadlock situation in which everyone is aware of the potential for transformation but no one dares to make the required investments. An example of this is the attempt of promoting green technologies in the Swedish forest industry, which, due to a lack of long-term horizon with regard to subsidies and environmental regulation, so far have not reached a breakthrough, despite well-developed technological capacity to do so (Coenen et al. 2015). Furthermore, as mentioned above, public authorities are risk averse and often unwilling to introduce changes in the policy-making domain (Morgan 2013). The combination of continuity and change in new policy programmes might increase political acceptability of new ideas and facilitate their implementation.

Policy learning refers to the process in which knowledge and experience can be used for improving the development of policy formulation and implementation (Borrás 2011). In other words, policy learning is a purposive policy change process, which may also include elements of continuity. This goes in line with the idea of smart specialization strategies, which are understood as conscious efforts to guide regional development based on competences and resources present in the region. Thus, developing a smart specialization strategy may involve substantial policy learning processes since it requires the identification of certain domains in the regional economy that have the potential for knowledge spill-overs and scale as well as the capacity to be original and distinctive (Foray et al. 2011).

Borrás (2011) elaborates on three levels of policy learning – government learning, policy network learning, and governance learning (Table 1). Government learning is primarily related to learning in public government bodies in innovation systems such as regional governments. Such actors have administrative capacity and consciously search for new knowledge in order to manage innovation policy activities in a better way. Policy network learning, in contrast, includes not only public governmental organizations, but also other stakeholders in innovation policy who aim to learn more about the innovation system as a whole and possibly identify strengths and weaknesses of the system. Traditionally, such networks resemble Triple Helix constellations consisting of universities, firms and governmental bodies in the region. However, recently, especially in the context of the smart specialization debate, the need to include civil society actors such as patient organizations, consumer groups and non-governmental organizations (Quadruple Helix) has been highlighted. Learning at the governance level includes an even larger group of actors (e.g., media) who are not automatically associated with innovation policy. Learning at this level requires the capacity to reflect on state-economy-civil society relations and could lead to shifts in innovation policy paradigms. When it comes to regional innovation policy (as in the case of smart specialization strategies) such a shift is less likely to occur if solely regional actors are involved in the learning process. Many regions do not have enough resources to promote a new innovation policy paradigm that is not supported by processes at national and/or global levels. Learning at this level is crucial in order to avoid coordination failures between local, regional, national and supra-national policy making processes.

Table 1: Levels of Policy Learning

Levels of policy learning	Who learns	Learning about what	Organizational capacity	Policy change and continuity	Type of change: Example
Government learning	Government and public-related organizations in the innovation system	Organisational practices/processes (administrative, management failures)	Administrative capacity	Innovation policy management change: performed to improve efficiency; slow and gradual due to the risk aversive nature of stakeholders	*Gradual displacement*: the change of focus from network to branding at MVA *Layering:* adding demand side tools next to the supply side at SFIN
Policy network learning	Networks of stakeholders in innovation policy	Innovation system (identifying systemic failures)	Analytical capacity	Innovation policy programme change: challenging to balance between continuity and change; importance of diversity in stakeholder networks	*Gradual displacement*: coexistence of cluster and smart specialization policies *Layering:* adding service/public sector innovations next to research based innovation
Governance learning	Socio-economic actors in the political system	State-economy-civil society relations related to innovation and diffusion processes (innovation systems' overall governance failures)	Major reflexive and institutional capacity	Innovation policy paradigm shift: slow and seldom due to the complexity related to stakeholders	*Gradual displacement*: the shift towards knowledge economy *Layering*: adding new rationales to the knowledge economy concept

Source: Borrás (2011: 730) with own elaborations

Drawing on the insights outlined above, we advance the argument that new regional industrial path development requires policy learning at all three levels. In a next step, we elaborate on this idea and use evidence from Scania in Southern Sweden (see section 1 for a brief overview on some key characteristics of this region) to illustrate our conceptual arguments. Changes in the innovation policy paradigm create *preconditions* for both *path renewal* and *new path creation*. A well-known example for a new policy paradigm is related to the emergence of the knowledge economy. Policy attention has moved away from the

promotion of price-based competition towards support for high value-added knowledge intensive activities. This change in paradigm has underpinned the design of new public innovation policy programmes that focus on the upgrading of traditional industries through 'injecting' new knowledge as well as the support for path renewal and new path creation. The shift from clusters to smart specialization areas as policy targets is another example for learning at the social level.

The case of Scania is telling in this respect, reflecting a major policy reorientation from traditional cluster approaches towards platform policies that seek to stimulate knowledge flows across industries and sectors. Although smart specialization (as well as cluster) strategies are developed at the regional level, they have been highly influenced and promoted by policy processes at the other spatial scales.

There are strong reasons to assume that learning at the policy network level is eminently important for regional smart specialization strategies. Discovering possibilities for new path development calls for policy networks that bring together a variety of actors such as established firms and stakeholders (i.e. the 'usual suspects') as well as newcomers. Established actors have a good knowledge about the history of the region, its past and current strengths and weaknesses, whilst newcomers represent new possibilities for path development. In addition, non-regional actors (like representatives from other regions and/or the national level) could be included to provide an outsider perspective as well as to facilitate coordination with policy processes taking place elsewhere. This is especially relevant for thin regional innovation systems and for thick and specialized ones (see section 2) in order to overcome the lacking variety of actors, resources and knowledge at the regional level. Furthermore, learning can only take place if established (powerful) actors are open to new ideas and if mechanisms are in place that enable to take into account ideas by newcomers.

In the case of Scania, the establishment of a Research and Innovation Council (FIRS) paved the way for network learning processes. FIRS was responsible for developing Scania's smart specialization strategy ('An international innovation strategy for Skåne 2012-2020'[iv]). The council consists of a large variety of actors including the regional government (Region Skåne), several larger municipalities, Lund University, Malmö University College as well as representatives of firms located in the region. Drawing on a rich evidence base[v] FIRS identified and prioritized three areas with high potentials for new path development: personal health, smart materials and smart & sustainable cities. Health care is a well-established sector in Scania representing one of its core strengths. Linking this sector to the IT industry (e-health) and city planners (better access to health) is seen as a promising opportunity for path renewal. The platform 'smart materials', in contrast, represents an entirely new domain in the regional economy, which could have its origin in the establishment of big science facilities currently built in Lund. These areas mentioned above (as well as the platform 'smart & sustainable cities') are promising in terms of scale, scope and knowledge spill-overs and they are distinctive and unique when it comes to the future development of the region. Thus, they are well in line with the idea of smart specialization as suggested by Foray et al. (2011).

Learning at the government level implies a better management of innovation policy. Learning at this level alone cannot support new regional industrial path development. Having well-functioning administrative practices in place is only a necessary but not a sufficient condition for promoting regional industrial change.

Evidence from Scania reveals a rather strong degree of policy path dependence at the government level. In this region it is Region Skåne, the highest elected regional governmental body that is primarily responsible for the implementation of the smart specialization strategy. For each prioritized area (see above) coordinators have been employed to oversee and guide the path development process. One of the main tools those coordinators plan to use in this regard is the creation of physical meeting places to facilitate networking between relevant actors in the three areas. Since the implementation of the smart specialization strategy is still in its early stage, it is hard to say if these tools will bring the expected results. However, Scania's previous policy support programmes have been criticized for overemphasising networking activities at the expense of other types of support (see Martin et al. 2011; Moodysson and Zukauskaite 2014; Zukauskaite and Moodysson 2014). Furthermore, the approach to employ coordinators has been questioned by several key stakeholders who described this approach (i.e. to implement a strategy by employing new people) as a standard element in Region Skåne's policy repertoire. Some other stakeholders would have preferred direct investments into the prioritized areas in the form of funding. This suggests that in the case of Scania learning at the government level is rather slow. The regional government continues managing innovation programmes by using mainly the same tools as in the past regardless of the criticism that was raised by other actors and academic observers.

As indicated above, new regional industrial path development does not only require policy change and policy learning processes but also policy continuity. Innovation policy paradigms (social level) tend to be rather stable over longer periods of time. Once in place, their sustainment requires long-term continuity and planning in the field of policy. However, since their emergence involves mobilization of actors from different organizational domains (society, economy, state) at different geographical levels (interplay between global, national, regional and local levels), changes in paradigms are not likely to happen quickly and often.

As noted above, government learning mainly addresses changes at the administrative level. It improves the efficiency of existing innovation policies and as a consequence, changes and adaptations usually do not have a negative impact on new path development activities but are rather a necessary condition for such activities to flourish.

The biggest challenge to balance between continuity and change can be found at the policy network level and relates to innovation policy programmes. There is a need to revise the innovation policy programme if it is not making the expected impact or to adapt it to changing context conditions. However, as mentioned above, new regional industrial path development (particularly new path creation) is a slow and long-term process. An abrupt change of policy priorities and tools might jeopardize the development of new industrial growth paths. One way to address this challenge is to include a variety of stakeholders in the policy process. Apart from facilitating learning at the network level, a broad inclusion of stakeholders allows for taking into account multiple perspectives when decisions about changing (or keeping) innovation programmes have to be taken. Policy networks require a certain degree of continuity in terms of their members to build up trust, to develop a shared understanding of challenges and potential solutions and to establish routines for communication and decision-making. Too much continuity, however, could lead to the well-known phenomenon of policy lock-in. A variety of actors, especially the inclusion of new entrants representing alternative fields in the region, is needed to prevent the risk of lock-ins since 'traditional suspects' tend to have the same world view and might resist industrial transformation or introduce only small changes when developing smart specialization strategies. A wide inclusion of actors is, however, only possible in regions with a high quality

of governance. Otherwise, there is a risk that vested interests, corruption and poor law enforcement hamper the possibilities for taking multiple perspectives into account.

Scania's smart specialization strategy can serve as an example for highlighting how a large variety of regional stakeholders aim to balance between continuity and change. Over the past years, Scania has focused on supporting innovation in sectors such as IT, new media, life science and food (see also Henning et al. 2010). Many efforts have been made to promote new path development by linking these industries to the knowledge infrastructure in the region and by creating new support organisations. Scania's current innovation strategy reflects a shift away from sector specific support. The priority areas identified by FIRS might lead to path renewal where these sectors further develop via intersection with each other. In addition, entirely new domains, in particular in the field of smart materials, are also part of the region's smart specialization strategy. Thus, support for traditionally strong sectors is preserved (in a way that provides opportunities for path renewal), while new path creation is also promoted. The prioritised areas in Scania's innovation strategy may also reflect the composition of members in the policy network FIRS. Although it is the main stakeholders ('usual suspects') of the regional innovation system who make up this council, many of them have not been selected based on their 'belonging' to certain organisations or sectors but based on their knowledge of key challenges for Scania's innovation system and their understanding of and interest in regional innovation (Miörner 2015). This holds in particular true for the actors who represent firms and industries in FIRS. In other words: the composition of the policy network has thus far proved to be a well-functioning mechanism to avoid lock-in.

Generalizable statements regarding which policy tools and domains should persist and which ones need to be changed are not possible; concrete needs for policy continuity and change depend on the region under consideration. The case of Scania presented above suggests that there is a need to update the tools for the implementation of policies (improve government learning) in order to promote new path creation and path renewal, while construction of innovation policy programmes (policy network learning) appears to function well and is in-line with policy processes at other levels.

5 Forms of policy change

Policy change takes different forms, ranging from abrupt shifts to small revisions and gradual developments. The literature on institutional change provides tools for conceptualizing and categorizing different types of change that are highly relevant for enhancing one's understanding of the nature of policy change processes[vi].

Among the institutional change processes specified by Mahoney and Thelen (2010), we find displacement and layering as particularly useful when discussing policy change. Displacement means that existing rules are replaced by new ones. It might happen as an abrupt radical shift in case of revolutions and major changes of policy regimes. However, it might also take place as a gradual displacement when older rules are slowly replaced by new ones. Displacement is most often introduced by actors who suffer from the existing rules. Arguably, in the case of innovation policy gradual displacement is more likely than abrupt radical shifts. Old programmes for innovation might exist in parallel with new ones that benefit emerging group of actors and development paths. As more and more actors benefit from new innovation policy programmes the old ones become obsolete and disappear.

Layering takes places when new rules are added to the existing ones. It involves amendments, revisions and additions to the existing set of rules. Most often it occurs when challengers of the original institutional setting do not have the power to change the whole system. As a consequence, they tend to work within the established system and introduce modifications to the existing core set of rules (Mahoney and Thelen 2010). However, from a policy learning perspective, the players who introduce such modifications are not necessarily different from those who originally developed the policy strategy as they often have the capacity to identify and 'fix' failures in innovation policy (Borrás 2011).

Gradual displacement and layering are most likely to promote new path creation and path renewal since these forms of change are associated with new (or improved) policy frameworks allowing different types of actors to benefit from innovation policies. They also facilitate finding a balance between continuity and change in the policy framework since they allow for continuity of previously developed policy tools, programmes and paradigms and the introduction of new ones. In addition, they are in line with a learning environment that is conducive to integrating the perspectives of different stakeholders. The combination of layering and gradual displacement can be identified at all three levels of policy learning (Table 1).

Governance learning, that is, the change of an innovation policy paradigm does not occur overnight. It takes place through gradual changes via reflexive processes in society as a whole, requiring a complex constellation of stakeholders being involved in learning processes. This is evident in the transition towards the knowledge economy as discussed above. In the case of Sweden, one could mark the institutionalization of the knowledge economy in the policy domain in the year 2001 when VINNOVA was established. However, innovation-related discussions took place already in 1970s – arguably the start of gradual displacement processes (Eklund 2007). Furthermore, the 'knowledge economy paradigm' has been further developed after 2001 (layering) by acknowledging that learning and knowledge related activities take place at all spheres of society and not only in high-tech and research-intensive fields.

When it comes to policy network learning, new innovation policy programmes often coexist in parallel with old ones. In addition, new elements are added to programmes over time as stakeholders in the network gain new insights. In Scania, for instance, a range of industry support organizations such as Medicon Valley Alliance (MVA - Life Science), Media Evolution and Mobile Heights (IT/New Media) Skånes Food Innovation Network (SFIN) have been established in the past to promote the development of clusters in these areas. Those organizations continue providing support for their members whilst contributing at the same time to the creation of new specialization areas (such as personal health) rather than being entirely replaced by new combinations, allowing cluster based thinking and smart specialization approaches to co-exist in parallel. The risk with such gradual displacement processes is that old programmes may not disappear fast enough even if they become obsolete and drain resources from new co-existing ones with negative implications for new path development. An example of change via layering includes ongoing efforts in Scania to incorporate service-based innovations into the innovation strategy. Traditionally regional innovation policy in Scania has been strongly oriented on promoting research-based innovation, exploiting the strengths in the knowledge generation subsystem. This has, however, resulted in a neglect of service- and public sector-based innovations (Kontigo 2012). To address this challenge, new projects have been launched, which focus in particular on the health care sector. Concrete examples include attempts to improve the quality of food served

for patients and to introduce e-health system solutions. These activities are at the core of Scania's smart specialization platform 'personal health'. Research-based innovations are still important in regional innovation policy. However, new focus areas have been added to the existing support structure.

Government learning takes place within the boundaries of public administrations and government (as well as quasi-public) organisations only and thus, change could be implemented easier and more abrupt as opposed to other levels with a higher diversity of stakeholders. However, as mentioned above, public authorities are often risk averse and unwilling to introduce changes in the policy domain (Morgan 2013). As a result, the tools for innovation policy management are also most likely to change slowly, again combining established practices with the new ones. In the case of the regional government of Scania, learning processes have been path dependent with no clear improvements. However, examples of displacement and layering can be found in quasi-public organizations, which also contribute to the management of innovation policies in the region. Initially MVA has focused on the promotion of networking activities among its members, however, after learning about certain scepticism regarding the value of such support, the activities gradually shifted (i.e., were displaced) towards branding of the region and facilitation of international connections (Martin et al., 2011). SFIN has initially focused on supply side support activities such as the attraction of the young talent to the food sector and promotion of university-industry interaction. Demand side, consumer-oriented support structures (pointing to layering processes) have been added later (Coenen and Moodysson 2009).

6 Conclusions

This paper sought to enhance our understanding of the nature of policy changes and policy inertia and the ways by which they potentially affect path renewal and new path creation in regional innovation systems. Our contribution is threefold. First, we go beyond simple conceptualizations of policy change by suggesting a differentiated multi-level perspective on such processes. Inspired by Borrás (2011) work on various levels of policy learning, we advance the idea that the successful adoption of smart specialization strategies requires government learning, policy network learning and governance learning. We have shown that learning on each of these three levels serves different functions, ranging from the creation of basic preconditions for implementing smart specialization strategies to facilitating collective discovery processes and securing an efficient management of innovation programmes.

Second, in contrast to current accounts of policy path dependence, which mainly emphasise its dark side, we highlight that a certain degree of policy continuity has also several positive aspects and forms a prerequisite for regional industrial change. Policy continuity provides the predictability entrepreneurs need to take risks and engage in experimentation processes. The core argument put forward in this paper has been that a balance of policy change and policy continuity is required for nurturing and maintaining new path development[vii].

Third, we sought to build a deeper conceptual analysis of the ways by which policy changes can take place. Applying Mahoney and Thelen's (2010) typology of institutional change, we argue that new regional industrial path development may benefit in particular from 'gradual displacement' of old policy programmes by new ones and 'layering'

(modification of existing programmes and support structures) as these forms facilitate the required balance between policy continuity and change.

Arguably, there are many unresolved issues that deserve due attention in future research. A core question that needs to be addressed is how policy change and continuity affect new path development in different types of regions. In this paper, we used empirical evidence from Scania – an institutionally thick and diversified well-performing region – to illustrate our conceptual arguments. Drawing on a broader evidence base that also includes regions with less-developed innovation systems may lead to some conceptual refinements and better insights into the nature of policy learning that is required to successfully adopt smart specialization strategies for regional industrial change in a variety of European regions.

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[i] For an overview on other approaches see, for instance, Storper (2011).

[ii] It must be emphasized that this typology is not exhaustive. Other types of paths such as intentional path defence or extension, unintended path dissolution, or breaking a path without creating a new one (Sydow et al. 2012) may also exist. Strambach (2010: 407) points to the potential plasticity of paths 'which describes a broad range of possibilities for the creation of innovation within a dominant path of innovation systems'. The author argues that radical innovation can take place within an existing path and institutional setting and does not necessarily result in breaking out of the path and the creation of a new one.

[iii] Tödtling and Trippl (2013: 300) note that a regional innovation system (RIS) "often consists of different industries ..., each being at a specific stage of the development path (emerging, growing, declining, renewing). Consequently, this could lead to an overlapping of regional industrial trajectories and different types of change within a RIS".

[iv] Scania does not have a separate smart specialization strategy, but its international innovation strategy has been designed by taking into account the ideas of smart specialization.

[v] In their work, FIRS members used inputs from previous studies on regional (innovation) development done by consultant companies and researchers from universities in Sweden and abroad.

[vi] We apply Mahoney and Thelen (2010) framework as a useful typology for analyzing change processes. We would like to point out that conceptually policy change and institutional change are not the same. Policies, especially innovation policies, seek to change institutions in the region such as establish new norms supporting knowledge exchange, positive attitudes to innovation and trust. However, if they lead to such a change in the institutional framework differs from case to case (see also Martin et al. 2011)