Transformation Capacity of the Innovative Entrepreneur: On the interplay between social structure and agency

Markus Grillitsch (markus.grillitsch@keg.lu.se)
Department of Human Geography & CIRCLE, Lund University, Sweden

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Centre for Innovation, Research and Competence in the Learning Economy (CIRCLE)
Lund University
P.O. Box 117, Sölvegatan 16, S-221 00 Lund, SWEDEN
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JEL: L16; O30; R10

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Department of Human Geography, Lund University, Sölvegatan 10, 22362 Sweden and CIRCLE – Centre for Innovation, Research and Competence in the Learning Economy, Lund University, Sölvegatan 16, 22362 Sweden; Email: markus.grillitsch@keg.lu.se; Phone: +46(0)46 222 84 04

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1. Introduction

As a response to pressing economic, environmental and demographic challenges, structural change has become a priority for public policy and features prominently in the scientific discourse. The scientific discourse has focussed on barriers to structural change, which is reflected in the literature on lock-ins (Grabher, 1993; Hassink, 2010), structural and transformation failures of innovation systems (Tödtling & Trippl, 2005; Weber & Rohracher, 2012), and socio-technical regimes that stabilise consumption and production patterns (Geels, 2002, 2004). These explanations, however, can be criticized for being "oversocialized" (Granovetter, 1985) assuming an overly deterministic influence of social structure on human agency.

The objective of this paper is to further our understanding of the interplay between social structure and agency in shaping structural change. The focus lies on innovative entrepreneurship as form of agency that drives radical innovations and thereby triggers new specialisations as well as the allocation of resources to activities that realise higher private but potentially also social value (Foray, David, & Hall, 2009; Kirzner, 1997; Shane & Venkataraman, 2000).

It is widely acknowledged that radical innovations are the outcome of open-ended learning processes with many uncertainties. Radical innovations rest on the combination of knowledge and resources distributed in different institutional domains (Strambach & Klement, 2012). However, institutional distance, often paired with cognitive and social distance, creates barriers to combining knowledge and resources (Boschma, 2005), and consequently to learning and innovation that may bring about structural change (Grillitsch, 2016). Furthermore, radical innovations often require institutional change, which foregrounds the role of institutional entrepreneurship (Battilana, Leca, & Boxenbaum, 2009; DiMaggio, 1988; Garud, Hardy, & Maguire, 2007).

This raises the key question about the factors that enable the innovative entrepreneur to overcome institutional barriers in the process of generating radical innovations. Hence, the paper does not focus on transformation barriers and failures but on *transformation capacity*, which is defined as the ability to combine knowledge and resources across different social structures and stimulate institutional change. It is argued that transformation capacity depends to a large extent on three mechanisms, namely multiple positions, positional mobility and social networks across social structures.

Multiple positions imply that an individual holds at one point in time a position in different social structures (e.g. a researcher who is also engaged in a firm). Positional mobility captures the move of individuals between social structures (e.g. a researcher who quits a position at a university to engage in a firm). Social networks across social structures differ from the before-mentioned mechanisms as individuals do not change positions but are connected through personal ties to individuals positioned in other social structures. This last mechanism links closely to the literature on bridging social capital (Putnam, 1995) and structural holes (Burt, 1992). The three mechanisms constitute distinct analytical categories but exhibit positive interrelations. For instance multiple positions and positional mobility promote social networks across social structures.

As powerful as these mechanisms may be, they also bring about potential unintended consequences pertaining to conflicts of interest, pervasive rent seeking behaviour, insider-outsider problems, nepotism and clientelism. This calls for a discussion about the institutional pre-conditions that keep such unintended consequences at bay. Two such pre-conditions are identified, the first relating to the role of good governance (Rodríguez-Pose & Di Cataldo, 2014), and the second to overlaps between different social structures (Grillitsch, 2015).

The paper advances in three steps. Section 2 discusses social structures as prerequisite and barrier for structural change. Section 3 conceptualises the innovative entrepreneur as connecting and change agent across social structures. Section 4 elaborates on key mechanisms and institutional preconditions that underpin the transformation capacity of innovative entrepreneurs and Section 5 provides the conclusions.

2. Social Structure: Prerequisite and Barrier for Structural Change

The conceptual starting point is the literature on innovation systems. Innovation systems are relevant because they set out to explain learning, the creation and diffusion of knowledge and consequently the generation of innovations. It views innovation as a result of complex, uncertain and collective learning processes, which are shaped by institutional conditions. Innovation systems include all stakeholders that can contribute to collective learning processes, including users and consumers as well as the civil society even though the latter have not always received sufficient attention in the literature. Equally, all formal and informal institutions are considered to be relevant that enable or constrain learning and knowledge exchange within the innovation system (B.-A. Lundvall, 1992; Markard & Truffer, 2008). Institutions in innovation systems have the functions of reducing uncertainty and transaction costs, managing conflicts and enabling cooperation, and incentivising innovation activities (Edquist & Johnson, 1997). The main argument is that the actors who constitute an innovation system share a common institutional framework, which promotes interactive learning, the generation of knowledge, and innovativeness.

Research on national systems of innovation and varieties of capitalism has identified patterns of institutional configurations that influence the emergence, evolution, innovativeness and competitiveness of specific industries (e.g. Freeman, 1995; Hall & Soskice, 2001; Nelson, 1993). Accordingly, institutional complementarity or coherence between different institutional domains positively affects innovation and economic outcomes. There are parallels to the more recent literature on transitions, which identifies the institutional regime as stabilizing force for existing consumption and production patterns (Geels, 2002; Markard & Truffer, 2008). The regime creates coherence and complementarities between different institutional domains, which are difficult to break and change.

At the regional level, the innovation systems approach emphasises the importance of informal institutions. Shared norms and values, as well as the network embeddedness of actors facilitate the generation of trust and interactive learning (e.g. Björn T. Asheim & Isaksen, 2002; Cooke, Uranga, &

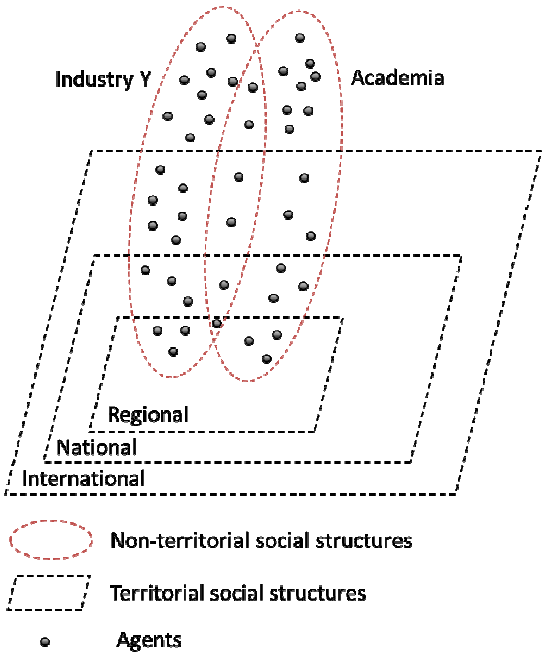
Etxebarria, 1997). Evolutionary accounts emphasise the co-evolution of industries, technologies and institutions (Murmann, 2003; Nelson, 1994), which is reflected in the literature on sectoral and technological innovation systems (Carlsson & Stankiewicz, 1991; Malerba, 2002; Markard & Truffer, 2008). The latter are not geographically defined but suggest the development of institutional complementarities and coherence at a global scale related to a specific sector or technology.

It can be questioned, however, if institutions are such an unspecified force that shapes the actions of all individuals and organisations in an innovation system in the same way. After all, the behaviour of researchers is shaped by different institutions than the behaviour of business leaders. Institutions in the construction sector are different from those in the tourism or financial sectors. The division of labour is reproduced in professions, each of which develops specific institutions. Profession-specific institutions and knowledge bases imply that for instance academics, top managers, or financial experts can relatively easily switch jobs between countries while switching professions is very difficult.

This is illustrated in figure 1. The doted lines in the form of parallelograms represent social structures associated with regional, national or international boundaries. At the regional level, this can relate for instance to an entrepreneurial culture, which was found to be a persistent and important factor explaining entrepreneurial and innovation behaviour (Fritsch & Wyrwich, 2014; Grillitsch & Asheim, 2016). National institutions include laws and regulations governing for instance labour relations, bankruptcy proceedings, banking and finance, consumer protection and safety, etc. The international level reflects that laws and regulations are often harmonised in line with international treaties or as required due to a membership in international organisations such as the EU (Fromhold-Eisebith, 2007).

The oval dotted lines represent social structures that are not defined by geographic administrative boundaries such as industries, sectors, professions, religions or nationalities. The figure illustrates only two of such non-territorial social structures, namely industry Y and academia, whereas in reality there will be many. Industries are embedded globally through value chains (Gereffi, Humphrey, & Sturgeon, 2005), production networks (Coe, Hess, Yeung, Dicken, & Henderson, 2004; Henderson, Dicken, Hess, Coe, & Yeung, 2002), and innovation networks (Chaminade & Vang, 2008). Equally, academia is embedded globally through international research collaborations, mobility of star scientists (Agrawal, Cockburn, & McHale, 2006; Trippl, 2013) as well as established institutions about scientific work and publishing.

Figure 1: Illustration of the Multi-Layered and Multi-Scalar Structure of Innovation Systems



Social structures are characterised by interdependencies between agents (for example between firms of an industry), which also implies denser networks (production networks, innovation networks, social networks) within than across social structures. Ter Wal and Boschma (2011) suggest that at early stages of an industry networks are still diffuse while they become more structured and rigid as an industry develops. Frequent interactions will trigger the evolution of specific institutions that facilitate future exchange between agents belonging to a particular social structure. In that way knowledge, institutions and networks co-evolve to form distinct social structures, which may be expressed as sectors, industries, professions, or region specific culture.

Thus, the main interdependencies between agents unfold within the specific social structures, meaning that institutions are more similar and networks denser between agents of one social structure than between agents of different social structures. It follows that between different social structures, “structural holes” of networks (Burt, 1992) are systematic phenomena. However, there are also overlaps between social structures as individuals and firms can belong to different social structures at the same time. For instance actors within a global industry with shared industry-specific institutions may be embedded in different regional or national institutional contexts, thus creating institutional variety within an industry.

By reducing transaction costs and uncertainties, institutions are an important driver for deepening the division of labour, economies of scales and the accumulation of specialised knowledge and resources. With a deepening division of labour, innovation systems become increasingly complex, constituted of multi-layered and multi-scalar social structures that together constitute the regional and national pre-

conditions for innovation and entrepreneurship (Grillitsch, 2015). This then leads to a more frequent occurrence of structural holes and an exponential increase of possible re-combinations of knowledge and thereby opportunities for innovation and entrepreneurship (Schumpeter, 1911; Storper, 1989).

On the other hand, over time social structures often develop strong technological interdependencies, hierarchical, rigid and closed networks, and specific institutions. While such a development is not predetermined (Martin & Sunley, 2011; Trippl, Grillitsch, Isaksen, & Sinozic, 2015), it is a common trajectory for industries (Ter Wal & Boschma, 2011) and clusters (Maskell & Malmberg, 2007; Menzel & Fornahl, 2010) creating situations of lock-in (Grabher, 1993; Hassink, 2010). These path-dependent, cumulative processes induce cognitive, institutional and social distance (Boschma, 2005) between the different social structures and consequently augmenting barriers for establishing connections and bringing together complementary types of knowledge and resources.

This points to the importance of innovation intermediaries and organisations supporting networking and knowledge transfer (Howells, 2006; Klerkx & Leeuwis, 2009). However, the innovation system literature remains largely silent as regards the required agency to recombine knowledge from distinct institutional environments and has been criticized for neglecting the micro-behavioural foundations and dynamics (Hekkert, Suurs, Negro, Kuhlmann, & Smits, 2007). With few exceptions, the role of the entrepreneur is to a large extent evacuated from the literature on innovation systems (Ács, Autio, & Szerb, 2014; Carlsson, 2007). Björn T Asheim, Grillitsch, and Trippl (2016) argue that one of the major challenges of the innovation system literature is to explain structural change, which also requires a better understanding on micro processes, such as institutional entrepreneurship. In order to address this gap, agency in the form of innovative entrepreneurship is introduced in the next section.

3. The Innovative Entrepreneur: Connecting and Change Agent across Social Structures

In general terms, agency can be defined as the ability to take action and make a difference over a course of events (Giddens, 2007:1984, p. 14). This paper is concerned with a specific form of agency, namely the ability to generate radical, path-breaking innovations, thereby foregrounding the role of the innovative entrepreneur. Entrepreneurship is about discovering and exploiting opportunities to create value (Shane & Venkataraman, 2000). In this paper, value is interpreted broadly capturing private pecuniary but also non-pecuniary and social value. Entrepreneurship may rest on individuals establishing new organisations; however, it may also occur within incumbent firms. The individual or the team of individuals perceiving a new opportunity, acting upon it and mobilising the necessary resources, including convincing other stakeholders, takes on the entrepreneurial role. In this vein, Van de Ven, Polley, Garud, and Venkataraman (1999) interpret entrepreneurship as form of leadership performed by a core network of actors in the pursuit of “the innovation journey”. Innovation is understood in the Schumpeterian sense as the introduction of improved or new products, processes, organisations or markets resulting from novel combinations of knowledge and resources (Schumpeter, 1911). Novel combinations rest on

interactive learning processes that involve a variety of actors (Kline & Rosenberg, 1986; B.-A. Lundvall, 1992).

Opportunities perceived and pursued by entrepreneurs do not necessarily entail innovation and some innovations may be realised without entrepreneurship. For instance, a sales person in an ice cream shop may observe the queue of clients and thus perceives an opportunity in opening a new ice cream shop nearby. The sales person acts on this perception and if the market is large enough, this venture may pay off even without introducing any innovation. On the other hand, innovations are thinkable that do not require entrepreneurship. Through learning by doing, using and interacting (B.-ä. Lundvall & Johnson, 1994) firm processes and routines may be improved. This type of path-dependent, cumulative and incremental innovation does not necessarily rely on an entrepreneur who identifies and acts upon an opportunity. Entrepreneurship is not required if, as a result of the daily operations, it becomes evident that efficiency or effectiveness can be increased by changing routines and processes, or in other words if no risk or uncertainty is involved in implementing this change.

Most innovations, however, entail uncertainties and risks related primarily to technologies or markets. Incremental innovations are associated with low levels of uncertainties and risks while the opposite is true for radical innovations. Radical innovations are of path-breaking, disruptive nature and involve changes in several dimensions related to products, processes, organisation, and marketing Markides (2006). Radical innovations require a high degree of entrepreneurship, where a strong belief in a still uncertain potential to create value motivates the mobilisation of resources with a prospect to make substantial changes in technologies and markets.

The process of generating radical innovations is socially embedded and often requires institutional and normative changes to succeed (Granovetter, 2005). The concept of institutional entrepreneurship captures the process of breaking with existing institutions and taking deliberate action to institutionalize alternative ones (Battilana et al., 2009; Garud et al., 2007). According to DiMaggio (1988) a specific interest, intentional action, and the capability to mobilise the necessary resources and support for institutional change are defining features of institutional entrepreneurs. While the capability to affect institutions fits with Gidden's (2007:1984) conceptualisation of agency, the requirement of intentionality does not. Rather intentions and interests evolve and change over time as agents monitor their environment and the unintended consequences their actions cause. Sotarauta and Pulkkinen (2011, p. 101) suggest "to approach institutional entrepreneurs as reflective change agents, who both push for change, and adapt to changes in their operational environment and to activities of other actors. Intentionality may hence evolve during a change process (…)". This view resonates with the perception of the entrepreneur who acts on a perceived opportunity, whose ambitions and strategies, however, evolve with the feedback received during the process.

By acting on perceived opportunities that arise at the interface between technologies, industries, markets and institutions, the innovative entrepreneur is an essential driving force for new specialisations and the allocation of resources to higher value creating activities (Foray et al., 2009; Grillitsch, 2016). The entrepreneur takes actions and risks attempting to realise perceived opportunities, which in the case of success defines an entrepreneurial discovery (Kirzner, 1997). An entrepreneurial discovery signals

technological and market potentials to other actors who, as a consequence, may decide to invest their time, energy and resources to exploit the new potentials. An entrepreneurial discovery is thus a spark for the creation of new specialisations, which entails the co-evolution of technologies, markets, and institutions (Murmann, 2003; Nelson, 1995) and thereby the formation of new social structures. Or, in the words of Shane and Venkataraman Shane and Venkataraman (2000, p. 219) "entrepreneurially driven innovation in products and processes [are] the crucial engine driving the change process".

This change process rests on the ability to connect and change social structures. While incremental innovation such as improvements of existing products and processes may be possible without bringing in knowledge from different social structures, this is almost inevitable for radical innovations. This claim is supported by recent empirical evidence. Strambach and Klement (2012) show on the basis of innovation biographies that radical innovations necessitate the combination of various types of knowledge held in different institutional domains. Rodan and Galunic (2004) find that managers are more innovative if they can draw on a higher degree of heterogeneity in knowledge through their social networks. Grillitsch et al. (2016) conduct a large-scale econometric study in Sweden showing that knowledge combinations within the firm as well as being located in a knowledge heterogeneous region promotes contribute to innovativeness.

This resonates well with studies on entrepreneurship. Stuart and Sorenson (2007) identify five mechanisms through which social networks influence entrepreneurial ventures, namely access to information and resources, brokerage, status, embeddedness, and sanctions. Of those, the acquisition of information and resources as well as brokerage are directly linked to the idea that entrepreneurs bridge different social structures. The argument is that due to the uneven distribution of information and resources, heterogeneous networks provide advantages in opportunity recognition and resource mobilisation. Empirical evidence supports the thesis that individuals with diverse networks are more likely to engage in entrepreneurial ventures (Renzulli, Aldrich, & Moody, 2000; T. Stuart et al., 2006). Batjargal et al. (2013) find that revenue growth of new entrepreneurial ventures is positively related to structural holes in the entrepreneur's network. Stam and Elfring (2008) provide evidence that the performance of new ventures benefits from networks to actors from different sectors in the innovation system such as research institutes, financial institutes, law firms, foreign companies, open source development communities etc.

Following the argument that the generation of radical, disruptive innovations requires the ability of the innovative entrepreneur to combine knowledge and resources from different social structures and stimulate institutional change, the fundamental question arises about the explanations for such ability.

4. Transformation Capacity of the Innovative Entrepreneur

Transformation capacity is defined as the ability to combine knowledge and resources from different social structures and stimulate institutional change. As will be shown below, this capacity is strongly

influenced by the position and networks of individuals in and across social structures. Concretely, three mechanisms are identified on which transformation capacity can rest: multiple positions, positional mobility and social networks. These mechanisms are powerful but loaded with unintended consequences as will be discussed below.

4.1. Multiple Positions

Individuals may hold positions in various social structures, for example a researcher who is in the board of a firm, a manager who contributes to a civil society organisation, or an academic who holds positions at universities in different countries. Multiple positions imply that the respective individuals are exposed to different social structures, the institutional underpinnings that shape interactions, and the respective ways of thinking and viewing the world. Besides fostering understanding about institutional contexts, multiple positions promote social relationships on which the individual can draw to identify and access relevant knowledge and resources. Suvinen (2014) provides empirical evidence for the relevance of multiple positions as a mechanism. She finds that university professors who engage in innovation activities often hold simultaneous positions in for example firms, politics, or intermediary organisations. Multiple positions support strategic mobilisation of resources in joint activities and collaboration projects but may also trigger spontaneous inspiration and moments of reflection about own habits, routines and worldviews.

Moreover, holding multiple positions enhances interpretative, network and formal power of individuals, which is essential in the process of institutional entrepreneurship (Sotarauta & Mustikkamäki, 2014). Formal power captures the direct influence associated with a position to create or change institutions or commit resources. The level of formal power depends on the competencies associated with a position. However, in a highly networked economy where power and resources are distributed between many actors, formal power is often rather limited and agents need to rely more on network and interpretative power (Sotarauta, 2009). Network power capacitates agents to mobilize distributed resources and to control and facilitate the flow of information. Multiple positions strengthen network power because this implies that agents are embedded (networked) within multiple social structures. Interpretative power rests on an understanding about different contexts; the capacity to explain rationales, perspectives of the world, and behaviour; and the creation of meaning across different contexts. Again, being embedded in several social structures through multiple positions implies that agents learn about the respective contexts.

Multiple positions are, however, problematic due to potential conflicts of interests. For instance, if a researcher gets involved in commercialising scientific knowledge, the incentives increase to publish research results that support the commercial undertaking. The engagement of a public administration official in a civil society organisation may be misused to direct funding and support to the respective organisation. Furthermore, reinforcing tendencies would suggest that influential individuals who are visible and hold powerful positions will be invited more often to take on additional positions, for instance in management or advisory boards. This may in turn lead to political lock-ins due to coalitions of incumbent actors protecting vested interests (Grabher, 1993). Consequently, the mechanism of multiple

positions should be invoked with care. In particular conflicts of interests must be avoided, potential conflicts of interests unveiled, and a high degree of transparency ensured.

4.2. Positional Mobility

Positional mobility captures the move of individuals between positions in different social structures. Academics may leave or put to rest their position at university to start a new firm, engage in a political role, or work for intergovernmental organisations. A successful entrepreneur may sell his or her company and engage as venture capitalist. Employees may move between industries. Others may decide to quit employment in order to realise entrepreneurial opportunities. The main difference to multiple positions is that individuals quit or withdraw from previous positions. Nevertheless, individuals will bring along their experience, worldview, understanding about the institutional context and way of thinking from the previous position. Furthermore, even though the degree of interdependencies and frequency of interactions within the social structure, in which the individual was embedded previously, will reduce, weak ties and latent networks remain that can be mobilised if needed.

Agrawal et al. (2006) corroborate this with a study on mobile inventors who report approximately 50% higher knowledge flows with their previous locations as compared to locations they had never lived before. Moreover, the premium of previous co-location is significantly greater for knowledge flows across technological fields as compared to knowledge flows within technological fields, hence is mediated by social structure and institutional contexts. Based on a comparison of MIT/Boston, Stanford/Silicon Valley, the Research Triangle/North Carolina, and Newcastle University/Northeast UK, Etzkowitz (2012) argues for the importance of permeable university-industry-governance boundaries and refers to mobility across social sectors. This can be achieved for example by expanded leave policies that allow researchers to start businesses. In his view “the absence of a strategy of creating permeable boundaries among the institutional spheres can be a significant retarding factor in regional development” (ibid, p. 768).

In a similar vein, spin-offs and acquisitions bring about positional mobility and have been identified as key mechanisms for entrepreneurial experimentation in innovation systems (Lindholm-Dahlstrand, Andersson, & Carlsson, 2016). Due to the involved technological and market risks combined with inertia in incumbent firms, spin-offs are a suitable mechanism to experiment aiming at radical, path-breaking innovations. Through this mechanism, the entrepreneur is dis-embedded from existing structures while being equipped with technological and market knowledge, understanding of the institutional context and social networks. In the case of an entrepreneurial discovery (Kirzner, 1997), i.e. when technologies and business models meet the market successfully, acquisitions re-embed spin-offs in existing structures that provide access to global markets and financial resources.

Time plays an important role in explaining the raise and decline of network and interpretative power arising from previous and new positions. Context knowledge from previous positions loses value over time as the respective social structures will evolve and by that contexts change. Furthermore, due to labour mobility, retirements, job rotation, and reduced interactions and interdependencies, social

networks also weaken over time. In addition, it will take time to develop context-specific knowledge and to build up a network in the social structure to which the individual moved. Potential conflicts of interest loom especially close to the point in time when the move happens. For example, the move of the former president of the EU commission, Jose Manuel Barroso, to Goldman Sachs has invoked significant criticism raising among others questions about conflicts of interests and contacts with the bank before the 18 months cooling off period has passed.

Positional mobility of key decision makers demonstrates the strength of the mechanism but also unveils the problems it may cause. As with multiple positions, avoidance of conflicts of interest and assurance of transparency are essential. Positional mobility of high-rank individuals is very problematic whereas at lower and middle ranks it allows harvesting the advantages at a relatively low risk. The reason is that lower and middle-rank individuals understand different institutional contexts and knowledge bases, and can draw on a heterogeneous network, while having less power to mend the system to their own benefit.

4.3. Social Networks

Social networks exist within and between social structures. This distinction matches the concept of bonding and bridging social capital (Putnam, 1995). Due to the interdependencies that characterise social structures, networks are denser within than between structures, thus giving raise to structural holes (Burt, 1992). Networks within social structures support cumulative knowledge generation, incremental innovation, and the advance along existing development trajectories, with the risk of creating situations of lock-in. Networks to individuals positioned in other social structures capacitate the innovative entrepreneur to combine and mobilise unrelated types of knowledge and resources.

Networks that cut across social structures increase the likelihood that individuals engage in entrepreneurial ventures (Renzulli et al., 2000; T. Stuart et al., 2006). Such networks have a positive influence on revenue growth (Batjargal et al., 2013) and the performance of entrepreneurial ventures (W. Stam & Elfring, 2008). Moreover, networks between social structures strengthen the ability of innovative entrepreneurs to stimulate institutional change (Sotarauta, 2009). Actors with such networks "can utilise the resources and competencies of their partners, bring actors together, remove obstacles hindering communication, set the agenda, resolve conflict, enable information flow, build trust, link different matters to each other, orient people to their places and roles, inspire, excite, and so forth" (Sotarauta, 2009, p. 904).

In a study on the "new argonautes", Saxenian and Sable (2008) trace the emergence of the venture capital industry in Taiwan to social networks of migrants to their home countries. The social networks were underpinned by trust and shared institutions related to professions and nationality. The networks were essential for accessing knowledge about the venture capital industry in Silicon Valley and mobilising financial resources. In a recent study, Grillitsch and Rekers (2015) find that entrepreneurs in the medical technology industry use social networks with medical doctors and venture capitalists in order to mobilise knowledge and resources from the respective institutional domains. However, this study also unveils the

interdependencies between social networks and institutional change. Institutional change can devaluate social networks and increase boundaries between different social structures, thus obstructing learning processes.

The potential problems associated with social networks are “pervasive rent seeking (or the determination of certain individuals to seek benefits at the expense of all others in the community), insider-outsider problems (or the pernicious conflicts of interest between insiders to a community and outsiders), clientelism, and nepotistic practices. All of these factors have negative effects on overall development and on the distribution of income.” (Rodríguez-Pose & Storper, 2006, p. 4). To a large extent, these negative effects are associated with networks within rather than between social structures. However, also networks between social structures can lead to self-sustaining coalitions that promote lock-in (Grabher, 1993; Hassink, 2010).

4.4. Institutional conditions as mediating factor

Multiple positions, positional mobility and social networks are powerful mechanisms that capacitate innovative entrepreneurs to mobilise knowledge and resources from different social structures and to shape institutional contexts but they also have a dark side. A key issue surfacing from the above discussion concerns the resolution of conflicts of interests, requiring rules for unveiling potential conflicts of interests, limiting the engagement in activities that can create conflicts of interests, and effective sanctioning mechanisms. Another key issue relates to transparency and inclusion of a wide range of stakeholders in public policy making.

The gravity of such unintended consequences from multiple positions, positional mobility and social networks depends to a large extent on the quality of governance. Quality of governance comprises several dimensions, including the effectiveness of government, rule of law, voice and accountability, and control of corruption (Charron, Dijkstra, & Lapuente, 2014). Corruption opens doors for clientelism and nepotism and reinforces insider-outsider problems and pervasive rent seeking. High accountability and the enforcement of law are essential for tackling the problem of conflicting interests. Voice in a strong democracy protects the interests of weaker stakeholder groups, thereby reducing insider-outsider problems and pervasive rent seeking. Therefore, it is not surprising that a positive relationship was found between quality of governance and regional innovation outputs and growth as well as the impact of regional policies (Rodríguez-Pose & Di Cataldo, 2014).

Besides quality of governance, transformation capacity as well as the potentially resulting unintended consequences are affected by the degree of integration of the social structures. Integration refers in this context to overlaps between social structures or institutional arrangements that cut across a variety of social structures (Grillitsch, 2016). Examples are inclusive education systems and open-membership associations or consultative processes in policy making that involve various stakeholder groups.

Integration across social structures implies that individuals positioned in different social structures find opportunities to interact that are easily accessible. Integration across social structures thereby promotes

the accumulation of bridging social capital, raises awareness about the respective institutional contexts and ways of thinking, and as a consequence contributes to the transformation capacity of innovative entrepreneurs. At the same time, overlaps between social structures reduce the insider-outsider problems associated with tightly-nit communities. Furthermore, conflict of interests can be detected more easily due to the improved information flow across social structures.

Empirical evidence provides support for the claim that integration between social structures has a positive effect on innovative entrepreneurship. Davidsson and Honig (2003) find that entrepreneurial opportunity recognition and the success of nascent entrepreneurs benefit from the involvement in business networks such as trade associations, chambers of commerce, or service clubs such as the Lions or Rotary. Champenois (2012) traces the emergence of favourable environments for entrepreneurs to mobilise knowledge and resources from different social structures in Germany to a policy initiative that incentivised collective engagement, a convergence of individual interests, and the creation of organisations that supported cross-sector interactions.

Grillitsch and Asheim (2016) disentangle the institutional context of the globally leading maritime cluster in Møre og Romsdal, Norway and show how being "local" supports connecting different social structures presented in the cluster. "Being local" constitutes a crosscutting social structure that is characterised by a strong regional identity, high levels of trust and informal knowledge sharing. Locals in management positions of foreign firms are essential in translating between different institutional settings and promoting continuous information sharing, learning and innovation collaboration with local entrepreneurs and businesses as well as regional government and higher education institutes.

5. Concluding discussion

The argument advanced in this paper builds on two fundamental ideas for understanding industrial dynamics, namely the division of labour and the role of the innovative entrepreneur. Specialisation leads to the formation of distinct social structures in which industries, technologies, and institutions co-evolve. This particularisation of innovation systems fosters the cumulative development of knowledge and resources in specific fields and, at the same time, propels the opportunities for novel re-combinations of knowledge, resources and factors of production. Industrial dynamics result from the interplay between incremental innovations pushing the production and knowledge frontier in specific fields and radical, disruptive innovations that rest on the re-combination of knowledge and resources distributed across the multi-layered and multi-scalar structures of innovation systems.

Innovative entrepreneurship is identified as a particular form of agency that connects and changes social structures. The evolving structures of innovation systems constitute the playing field for the innovative entrepreneur. However, the re-combination of knowledge and resources from different social structures is constrained by institutional and cognitive distance as well as structural holes in networks. Furthermore, commonly acknowledged rigidities and lock-ins hinder the institutional change that is

required for the formation of radical and disruptive innovations. Consequently, a pivotal question is what factors determine the innovative entrepreneur's ability to combine knowledge and resources from different social structures and initiate institutional change, in short the innovative entrepreneur's transformation capacity.

The focus on transformation capacity zooms in on an important aspect of agency if one follows the idea that "[a]ction depends upon the capability of the individual to 'make a difference' to a pre-existing state of affairs or course of events" (Giddens, 2007:1984, p. 14). It is argued that transformation capacity depends on the position(s) and networks of the innovative entrepreneur. Three mechanisms, namely multiple positions, positional mobility and networks across social structures surface as particularly powerful for building transformation capacity. The discussion, however, also shows that these mechanisms easily bring about unintended consequences in the form of conflicts of interest, pervasive rent seeking, insider-outsider problems, and nepotism. In order to counter these unintended consequences good governance; strong formal institutions; and crosscutting social structures have been identified as important preconditions.

Furthermore, the concept of transformation capacity establishes a link between the innovation system and entrepreneurship literature. Innovation systems research has been strong in explaining how institutional structures shape innovation behaviour and outcome but rather weak on agency while entrepreneurship research zooms in on agency but is seeking a more systemic perspective. It can be argued that the preoccupation with structural and transformation failures in the innovation system literature is grounded in an oversocialized perspective that assumes a pervasive and highly deterministic influence of social structure on the behaviour of agents (Granovetter, 1985). In contrast, the entrepreneurship literature has always focussed on agency but has been criticized for paying too little attention to the influence of structure on human agency, i.e. proposing an undersocialized explanation. Even though recent literature on regional and national systems of entrepreneurship (Ács et al., 2014; Qian, Acs, & Stough, 2012) and entrepreneurial eco-systems (Mason & Brown, 2014; E. Stam, 2015) sets out to overcome this deficiency, the interplay between structure and agency remains unclear, in particular in relation to radical innovations and structural change.

This paper thus proposes a direction of scientific inquiry that walks the narrow path between oversocialized and undersocialized approaches. This allows developing a theory of change, where the causal interrelationships between social structure and agency are unveiled. Understanding the transformation capacity of agents is a necessary piece for understanding not only the reasons for but also directions of structural change. By pointing to possible policy interventions and institutional preconditions that enhance the transformation capacity of innovative entrepreneurs, this paper is also relevant for recent policy initiatives that aim at addressing structural change such as the smart specialisation (Foray, 2015; Morgan, 2016; OECD, 2013) and system innovation approaches (OECD, 2015).

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