

Paper no. 2014/01

Institutional Change and Economic Evolution in Regions

Markus Grillitsch (markus.grillitsch@circle.lu.se)
CIRCLE, Lund University

This is a pre-print version of a paper that has been submitted for publication to a journal.

This version: March 2014

Abstract

The overall objective of this paper is to contribute conceptually to the questions why and how regions transform and it joins the debate on economic evolution and institutional change. The paper addresses the challenge of how to conceptualise the interdependencies of institutions of different types and spatial scales. It aims at developing a conceptual framework that i) appreciates the variety of institutional forms and the multi-scalar nature of institutional landscapes, ii) is tangible enough for operationalization in the context of empirical research, and iii) contributes to our understanding about institutional change and economic evolution in regions. The paper offers a review on how institutions have been conceptualised in the context of evolutionary economic geography, a proposal for understanding regional institutional frameworks and institutional change through a novel way of conceptualising institutional layering, a clear distinction between concepts such as agency, networks, social structures and institutional layers, and a discussion about how this can improve our understanding about regional transformation.

JEL codes: B52, R11

Keywords: Evolutionary economic geography, institutional theory, regional change, institutional layering

Disclaimer: All the opinions expressed in this paper are the responsibility of the individual author or authors and do not necessarily represent the views of other CIRCLE researchers.

Institutional Change and Economic Evolution in Regions

Markus Grillitsch, CIRCLE Lund University, markus.grillitsch@circle.lu.se

Abstract

The overall objective of this paper is to contribute conceptually to the questions why and how regions transform and it joins the debate on economic evolution and institutional change. The paper addresses the challenge of how to conceptualise the interdependencies of institutions of different types and spatial scales. It aims at developing a conceptual framework that i) appreciates the variety of institutional forms and the multi-scalar nature of institutional landscapes, ii) is tangible enough for operationalization in the context of empirical research, and iii) contributes to our understanding about institutional change and economic evolution in regions. The paper offers a review on how institutions have been conceptualised in the context of evolutionary economic geography, a proposal for understanding regional institutional frameworks and institutional change through a novel way of conceptualising institutional layering, a clear distinction between concepts such as agency, networks, social structures and institutional layers, and a discussion about how this can improve our understanding about regional transformation.

JEL codes: B52, R11

Keywords: Evolutionary economic geography, institutional theory, regional change, institutional layering

Acknowledgement: I thank Ron Boschma for highly valuable feedback to earlier versions of this paper and colleagues for comments at the CIRCLE seminar.

This work was supported by VINNOVA

1 Introduction

The overall objective of the paper is to contribute conceptually to the questions why and how regions transform. This paper ties in with the debate on economic evolution as well as institutional change in regions. It has been argued that industries and institutions co-evolve, implying causal interdependencies between the two (Murmann, 2003; Nelson, 1995). Frequently, these interdependencies have been analysed at a specific spatial scale or for specific types of institutions. The literature on varieties of capitalism and national innovation systems focusses on how national institutions affect the evolution of industrial sectors (Freeman, 1995; Hall & Soskice, 2001; Lundvall *et al.*, 2002; Nelson, 1993). The literature on sectoral innovation systems sheds light on the co-evolution of industries with sector-specific institutions (Breschi, 2000; Malerba, 2002, 2005). At the regional level, several theoretical and conceptual approaches draw attention to the importance of institutions, including the regional innovation systems approach (Asheim & Gertler, 2005; Cooke, 2001; Cooke *et al.*, 1997), the innovative milieu concept (Camagni, 1995; Crevoisier, 2004; Maillat, 1998), the literature on industrial districts (Asheim, 1996, 2000; Harrison, 1992; Markusen, 1996; Pyke *et al.*, 1990) or Storper's (1995) discussion on the role of conventions in creating untraded interdependencies.

Rather obscure remains how institutions of different types and spatial scales are interlinked and how this can be understood in relation to economic evolution and institutional change. Gertler (2010 p. 6) criticises that "one needs to understand far better than is done currently exactly how institutional forms and the incentives they create at any one particular scale influence, are influenced by, and interact with, the institutional architectures that are erected at other geographical scales." Hassink (2010) argues that political-institutional factors at the regional, national and supra-national level have an important impact on old industrial regions but that each case has to be considered individually because of the complex interplay between different scales. Strambach (2010) suggests that firms combine different types of institutions and reinterpret existing institutions but that we lack knowledge about the interrelationships between institutional change and innovation processes at multi-level spatial scales. Rodríguez-Pose (2013) attests the importance of institutions for regional development but criticises that institutional theory has remained too abstract resulting in difficulties to measure institutions and to comprehend the geographic nature and the dynamic dimension of institutions. Boschma and Frenken (2009 p. 156) underline the importance of analysing "the interplay between various mechanisms at various spatial levels", of measuring institutions and of evaluating the impact of institutions of different types and geographic scales on economic evolution.

The aim of this paper, therefore, is to develop a conceptual framework that i) appreciates the multiple shapes and spatial scales of institutions, ii) is tangible enough for operationalization in the context of empirical research, and iii) contributes to our understanding about institutional change and economic evolution in regions. The paper proceeds as follows: Section two reviews how institutions have been conceptualised in evolutionary economic geography and motivates the paper. Section 3 introduces the concept of institutional layering, which captures the various shapes and spatial scales of institutions. Section 4 discusses the implications of the concept for institutional change. In section 5, the question is answered why and how the concept of institutional layering contributes to our understanding about regional transformation. Section 6 moves a step further towards a typology of regions. Section 7 contains conclusions and suggestions for a future research agenda.

2 Institutions in evolutionary economic geography

Industries and institutions co-evolve. Nelson (1995 p. 179) argues that “[...] various features of the institutional environment themselves tend to adapt and change in response to pushes and pulls exerted by the development of a new industry.” The notion of co-evolution requires causal interdependencies between two evolving populations (Murmann, 2003; Schamp, 2010). Nelson (1995) identifies several changes in the institutional environment that are triggered by the emergence of an industry and which in consequence have a significant impact on the further development of the industry. These changes include the forming of collective bodies, the establishment of scientific communities or the development of regulations for a new industry. Murmann (2003) documents causal interdependencies for the coevolution of the German dye industry, the patent system and the research and training system in the 19th century. He suggests focusing particularly on flows between the different systems, including for instance the mobility of organic chemists between firms and universities or the involvement of professors in drafting patent laws. He concludes that industry, research, education and the patent system co-evolved and led to a strong competitive advantage for the German dye industry.

The literature on varieties of capitalism and innovation systems also appreciates the role of institutions. This literature, however, focuses not on co-evolution but on the effects of specific institutions on the emergence and competitiveness of certain industries, i.e. institutions are largely considered to be constant. The contributions on varieties of capitalism emphasise the importance of national institutions (Asheim & Coenen, 2006; Hall & Soskice, 2001; Lam, 2002; Vitols, 2001b). Liberal market economies such as the US and the UK create a favourable environment for science-driven sectors promoting radical technological innovations. On the other hand, coordinated market economies, like in Germany or the Scandinavian countries, are particularly conducive for sectors that require advanced engineering skills and problem solving capacities at the interface between producers and users. Also, the literature on innovation systems suggests that the institutional set-up has an important effect on innovation activities of firms and thus industrial evolution on the national (Edquist, 2005; Freeman, 1995; Lundvall, 1988, 1992; Nelson, 1993), sectoral (Breschi, 2000; Malerba, 2002, 2005) and regional level (Asheim & Coenen, 2006; Asheim & Isaksen, 2002; Cooke, 2001; Cooke *et al.*, 1997; Tödtling & Trippel, 2005). In the literature on sectoral systems of innovations, the problem of understanding institutions of different types and scales becomes particularly apparent. It is argued that national institutions, in line with the varieties of capitalism and national innovation system literature, affect the emergence and development of specific sectors. At the same time, it is frequently argued that sectoral systems of innovation are local or regional phenomena, which would imply that also regional institutions play a role. At the same time, sector-specific institutions cross regional and national boundaries, especially if firms are embedded in global value chains (e.g. Sturgeon *et al.*, 2008 for the automotive industry). However, there is a lack of conceptualisation of exactly how institutions of different types and scales are interrelated. Also, how institutions change remains largely an open question in the literature on varieties of capitalism and innovation systems (Streeck & Thelen, 2005b; Thelen, 2009).

Addressing institutional change, Streeck and Thelen (2005a) differentiate between incremental and abrupt change, which can both lead to continuity or discontinuity of institutions. Frequently, it is suggested that abrupt changes are of transformative nature leading to discontinuity while incremental changes are sources of adaptations leading to continuity. Within the field of economic

geography, this view dominates the literature on cluster lifecycles (for an overview, see Bergman, 2008) and innovative milieus (Camagni, 1995; Crevoisier, 2004; Maillat, 1998). This literature, broadly speaking, suggests that industries and institutions co-evolve along one development path until a major change, which is usually considered as exogenous, leads to a breakdown of the old trajectory and the emergence of new ones. Many contributions on path-dependency equally follow this perspective (Mahoney, 2000; Streeck & Thelen, 2005a). However, in evolutionary economic geography, path-dependence is conceptualised as an open-ended process, where also endogenous mechanisms such as exploration and innovation activities of firms lead to new paths (Martin & Sunley, 2006, 2010). Streeck and Thelen (2005a) argue, however, that the transformative power of incremental changes has been underestimated. The authors identify and provide empirical evidence for different types of incremental institutional change, which over time accumulate and lead to a gradual transformation of institutions.

As regards institutional change, the interdependencies and complementarities between different institutions play an important role. An institution can be considered “[...] to be complementary to another when its presence raises the returns available from the other.” (Hall & Gingerich, 2009, p. 450). Hollingsworth (2000, p. 624) argues that “[...] the more intricately linked each sector is with each other sector and with a society’s rules and norms, the less choice actors have to devise new institutions and institutional arrangements. On the other hand if a sector or actor is too isolated, it may be too weak within a society to bring about any kind of effective change.” Searching for the impact of a specific institution on economic development may, therefore, be misleading (Höpner, 2005). Some empirical studies have analysed the complementarities between institutions of different domains such as financial markets, corporate governance and industrial relations (Amable *et al.*, 2005; Aoki, 1994; Ernst, 2002; Hall & Gingerich, 2009; Vitols, 2001a). Hollingsworth (2000) and Williamson (2000), on the other hand, have differentiated institutions mainly by their stability and durability and discuss how these are interrelated. However, the above-reviewed literature on institutional change and complementarities is mainly concerned with national institutions. It largely turns a blind eye on how institutions of different spatial scales are interlinked, which consequently limits our understanding about institutional change in a regional context.

At the regional scale, Marshall (1920) was one of the first scholars inspired by evolutionary concepts to explain the development of industrial specialisations. His seminal insights were taken up in contributions on industrial districts (Asheim, 1996, 2000; Harrison, 1992; Markusen, 1996; Pyke *et al.*, 1990) and innovative milieus (Camagni, 1995; Crevoisier, 2004; Maillat, 1998), which clearly emphasise the importance of socio-cultural factors and territorial institutions. The innovative milieu is a dynamic concept proposing a perpetual process of rupture and filiation or break and continuity where the local production system and the regional milieu change in an interdependent manner, thus fulfilling the criteria of co-evolution (Murmman, 2003; Schamp, 2010). Recent contributions on cluster evolution also acknowledge the importance of institutions (Martin & Sunley, 2011; Maskell & Malmberg, 2007; Ter Wal & Boschma, 2011). As an industry forms and grows, institutions adapt to the needs of this industry, creating a favourable environment for further growth. “A dominant institutional set-up, once established, would tend to attract those firms and individuals most compatible with it. National, regional or local institutions gradually develop over time in response to the special requirements of the presently dominating industry and lead to further specialization by creating a favourable environment for similar and complementary economic activity” (Maskell & Malmberg, 2007 p. 617). When markets and technologies change, however, the prevailing

institutional set-up can cause regional lock-in and slow down restructuring and adaptation processes (Grabher, 1993; Hassink, 2005, 2010; Tödtling & Trippl, 2004; Trippl & Otto, 2009). Lock-in frequently results from interdependencies of institutions of different types and spatial scales and it is, therefore, important “to take the institutional context at all spatial levels, that is local, regional, national, and supra-national into account” (Hassink, 2010, p. 465). Economic evolution, including both growth and decline of regional economies, is therefore inherently linked to institutional change. However, how to conceptualise interdependencies between different types of institutions at the regional and other geographic scales and how to relate them to economic evolution in regions remains rather obscure.

The debate on the interdependencies between economic evolution and institutions at the regional scale raises the questions why and how trajectories change despite path-dependency and lock-ins. Path renewal and path creation become more probable in regions where different but still related industries and firms are present. “Related variety” stimulates the combination of different types of knowledge and promotes that firms, building on existing capabilities, branch out into new niches (Boschma & Iammarino, 2009; Frenken & Boschma, 2007). Strambach (2010) shows with the concept of path plasticity that such branching processes are feasible despite institutional rigidities. Agents “are able to recombine and convert or reinterpret institutions for their new objectives or transfer institutions to different contexts.” (ibid, p. 412). She demonstrates how the German business software industry has gained competitive advantage on the world markets despite an institutional environment considered less favourable for high-tech industries and knowledge intensive business services. Strambach (2010) suggests that geographic proximity supports the exploration and exploitation of path plasticity. Unintended encounters that may inform about institutional flexibility across fields and sectors are more likely within a region and collective learning promotes the diffusion of successful practices creating the necessary critical mass for a new industry to develop. Strambach (2010, p. 425) concludes that “[b]eyond the use of institutions to explain inertia and stability, there is a need to specify institutions and institutional configurations in a more systematic way and to analyse their impacts on the dynamic interplay between actors and structures of the economic system in time and space.”

Consequently, there are several reasons why it is important to further work on conceptualising how institutions of different types and spatial scales are interrelated. The theory on institutional complementarities draws attention to interdependencies between different types of institutions. Institutional complementarities have been analysed mainly on the national level. How institutions at different spatial scales are interrelated remains rather obscure. This is particularly problematic for regional studies as local, regional, national and supra-national institutions intersect in regions. Also, interdependencies between territorial and other types of institutions, including sectoral, labour market, intellectual property or financial market institutions, require further investigation. Boschma and Frenken (2009), for instance, question the importance of territorial institutions because firms can replicate routines in different territories and because firms of a cluster differ substantially as regards networks and capabilities despite being subject to the same territorial institutions (see also Boschma & Ter Wal, 2007; Giuliani, 2007; Morrison, 2008; Srholec & Verspagen, 2012). Moreover, linking economic evolution to institutional change requires a more differentiated view of how institutions of different types and spatial scales are interrelated. This will help to illuminate more exactly the causal relationships between economic evolution and institutional change. It will allow identifying concretely which institutions change because of what cause and how this affects other institutions and the behaviour of individuals and firms. Individuals and firms, at the same time, shape

the institutional environment and thus the role of agency in institutional change needs to be better understood. Furthermore, institutional theory, due also to the non-codified nature of many institutions, is frequently difficult to apply in empirical research and for policy guidance. This paper, therefore, presents an attempt to propose a conceptual framework that i) appreciates the multiple shapes and spatial scales of institutions, ii) is tangible enough for operationalization in the context of empirical research, and iii) contributes to our understanding about institutional change and economic evolution in regions.

3 Institutional layering: Conceptualising for the multiple shapes and spatial scales of institutions

The concept of institutional layering aims at clarifying how institutions of different shapes and scales are related within the institutional framework of a geographically defined area. This aim is difficult to achieve because there are debates even about how to define institutions. Probably the most commonly used definition in economic geography follows Douglas North. According to North (1990 p. 3) “institutions are the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction”. Institutions structure interactions in the political, economic and social spheres. They include informal constraints such as sanctions, taboos, customs, traditions, and codes of conduct as well as formal rules like constitutions, laws or property rights. Institutions reduce uncertainty and introduce structure and stability to facilitate human transactions. Geoffrey Hodgson (1998, 2006) views institutions as existing structures into which individuals are born and which confront the individuals with rules and norms. “The prevailing rule structure provides incentives and constraints for individual actions. Channelling behaviour in this way, accordant habits are further developed and reinforced among the population. Hence the rule structure helps to create habits and preferences that are consistent with its reproduction. Habits are the constitutive material of institutions, providing them with enhanced durability, power, and normative authority.” (Hodgson, 2006 p. 6f).

While Hodgson focusses on the interplay between individuals, their habits, agency and institutions, North emphasises the “interaction between institutions and organizations in the economic setting of scarcity and hence competition” (North, 2008 p. 22). In their later works, however, both North and Hodgson increasingly discovered the cognitive dimension of institutions. Hodgson (2006, p. 8) for instance argues that institutions are “simultaneously both objective structures “out there” and subjective springs of human agency “in the human head.” [...] Actor and institutional structure, although distinct, are thus connected in a circle of mutual interaction and interdependence.” In this paper, I view institutions in a similar vein as cognitive constructs of individuals about social order (rules, constraints) that are aligned with those of others through interaction. This definition of institutions is broad encompassing various types such as formal and informal institutions; normative, cognitive and regulative institutions; or regulations, norms/beliefs and procedures; as well as different spatial scales (North, 1991; Scott, 2001; Zukauskaitė, 2013).

In order to better understand the interactions between institutions of different types and scales, i.e. different “institutional architectures” as Gertler (2010) formulates it, authors such as Williamson (2000) or Hollingsworth (2000) have worked on the idea of a multi-level or multi-layer institutional framework. These contributions are important, despite neglecting the role of geography, because they describe how different types of institutions are related. Accordingly, institutions differ in their

durability, stability and level of abstraction. In general, it is argued that higher-level and more intangible institutional layers such as values are more stable and change slower than lower-level and more tangible institutional layers such as regulations. The concept that I will put forward below builds on the insight that an institutional framework consists of multiple layers. Hence, I use the concept of institutional layers from a structural perspective. This differs from the use of the term “institutional layering” to describe institutional change processes by adding new elements to existing institutions (e.g. Schickler, 2001; Streeck & Thelen, 2005a; van der Heijden, 2011).

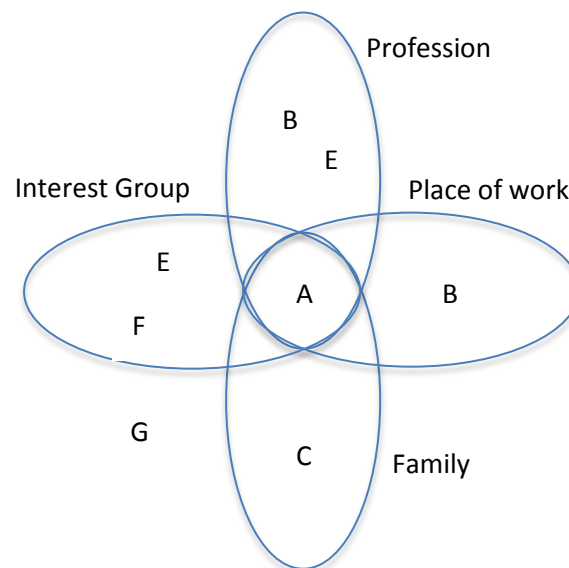
I define an institutional layer as the set of rules and constraints that govern the interactions between individuals belonging to a distinct social structure. Institutional layers can be associated with public administrative structures such as municipalities, regions or states. Institutional layers associated with administrative structures are usually codified in the form of laws and regulations and enforced by public authorities. Individuals and organizations registered or operating in the respective territory are subject to these institutional layers. Other institutional layers may be linked to non-administrative structures like firms, associations, nationalities, or churches. Such institutional layers are usually not bound to administrative territorial boundaries and can thus have a global reach. Frequently these institutional layers are to a large extent informal and not codified. Enforcement is exercised by actors belonging to the respective social structure using for instance incentives or pressures. Individuals who belong to a specific social structure are subject to the respective institutional layers. For instance employees of a firm are subject to the institutional layer associated with the firm (e.g. status, organisational culture, work routines). In case of non-compliance with the firms’ institutional layer, individuals risk being punished by e.g. not being promoted, stagnating salaries or being fired.

In addition, structures such as sectors or clusters may give rise to specific institutional layers. Such structures are characterised by interdependencies between the agents associated with these structures. As Storper (1995) points out, interdependencies can be traded, such as input-output relations or untraded. Untraded interdependencies include aspects like “labour markets, and ‘conventions’, or common languages and rules for developing, communicating and interpreting knowledge” (p. 206). These interdependencies, therefore, relate to a cognitive dimension but very importantly also an institutional dimension. Institutions adapt as agents interact and become increasingly specific for the respective structure, such as sectors or clusters (see also section 2 of this paper). Central to the proposed conceptualisation is the understanding that institutional layers do not exist independently from individual agents and the social structures with which the agents are associated. Whenever a social structure, characterised by interdependencies between agents, emerges, it is assumed that an institutional layer develops over time. This institutional layer will consequently provide direction, guide and govern the interactions and interdependencies of the agents belonging to the social structure. Hence, there is a clear conceptual distinction between agents, interactions, social structures and institutional layers.

Each institutional layer has normative characteristics as regards content, width (how many areas of life are concerned), depth (level of detail about how to behave in certain situations) and stringency (to what extent (re)interpretation is allowed). Each individual is born, grows into and switches between different institutional layers associated with e.g. upbringing/family, education, occupation or specific interest groups. Individuals have a (varying) capability to distinguish (consciously and/or unconsciously) between different institutional layers and adapt their interpretations about specific situations and thus behaviour accordingly. Individuals share institutional layers with other individuals

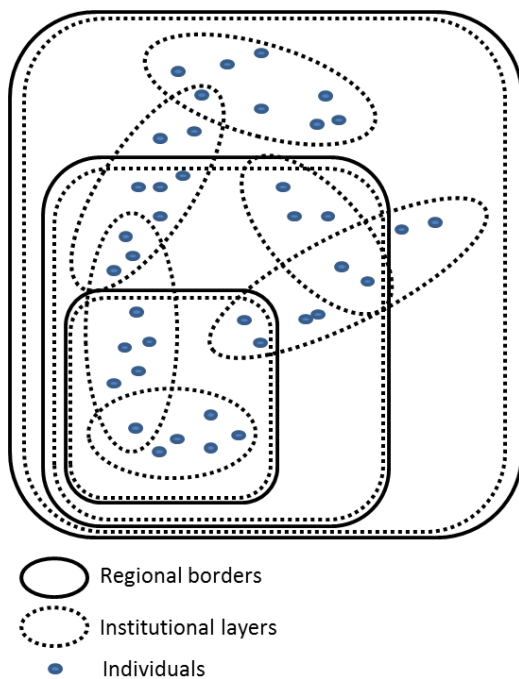
allowing for all sorts of overlaps, which is illustrated in figure 1. In this illustration, person A is embedded in four institutional layers mainly associated with its i) profession, ii) place of work, iii) family, and iv) interest group. Person A shares two institutional layers with B (related to its profession and work place) and E (related to its profession and interest group); one with F (related to its interest group) and C (related to its family); and non with G.

Figure 1: Illustration for institutional layering from the individual's perspective



This conceptualization of institutional layers has implications for analysing them on a local or regional level. The institutional framework of a given area is composed of the institutional layers present within. These layers are not necessarily confined to the region but will frequently reach out to national or international levels as shown in figure 2. The dots represent individuals, the uninterrupted lines administrative spatial boundaries and the dotted lines institutional layers. The individuals residing in a region belong to different, sometimes overlapping institutional layers. Some of these layers reach out to national or international levels. The institutional layers can be identified through the individuals and organizations located in the area. Individuals and organizations form part of the structures to which the institutional layers apply. From a structural perspective, each institutional layer is defined by the number of individuals who share it. The location of the individuals who share the respective institutional layer defines its geographic span. While some institutions are clearly defined by the administrative borders of regions and nations such as laws and regulations, others can be more scattered but span the whole globe following migration or spread (e.g. religious beliefs). The institutional layers are linked through individuals who are associated with overlapping institutional layers. In today's networked world, it can be assumed that all institutional layers around the globe are directly or indirectly linked except possibly very few exceptions like some tribal communities living ancient lifestyles. Finally institutional layers differ in their penetration, i.e. the percentage of individuals sharing an institutional layer in e.g. a region, nation or organization.

Figure 2: Illustration for institutional layering with a spatial dimension



The idea that a regional institutional framework is constructed by institutional layers implies the following: A regional institutional framework encompasses multiple institutional layers. Institutional layers are distinct and related to specific social structures. The concept of institutional layering clearly opposes tendencies to conflate and consequently obscure different types of institutions. Instead, it is suggested to clearly identify specific layers and keep them distinct. This allows conceptualising institutional variety within a region, which links for instance to Strambach's (2010) notion of path plasticity where individual agents actively explore institutional variety, potentially leading to new development paths. Moreover, the concept of institutional layering draws attention to the connectedness of different institutional layers and thus social structures. In general terms, connectedness refers to the extent to which different social structures are interrelated. High connectedness may even lead to the emergence of a new social structure with an identifiable institutional layer. Hence, connectedness is a question of degree that requires adequate empirical proxies. In a strict sense, connectedness relates to individual agents who are subject to two or more institutional layers (as shown in figure 2). Such agents understand the “rules of the game” in all the social structures with which they are associated and can thus mediate interests, translate behaviour and facilitate knowledge transfer. However, other more fluid and less strict forms of connectedness may exist too. Particularly, formal and informal networks, temporary project organisations and employment mobility are assumed to play an important role.

Connectedness of institutional layers cannot be thought independently of individual agents, social structures or networks between agents. Social structures are characterised by interdependencies between agents that belong to these structures. In order for interdependencies to materialise, networks need to exist between the agents. Networks can describe for instance the positioning of an agent within a social structure, the density of a network, or changes in the network structure over time (Boschma & Ter Wal, 2007; Giuliani & Bell, 2005; Morrison, 2008; Ter Wal & Boschma, 2009). In contrast, institutional layers influence (but not determine) the behaviour of individual agents,

including for instance their willingness to collaborate and exchange knowledge over networks. Therefore, institutional layers have an effect on individual agents and networks. At the same time, the behaviour of individual agents and networks affect institutional layers because institutions are cognitive models shared between agents that are constantly aligned through interaction. Hence, while a conceptual distinction is made between agency, networks, social structures and institutional layers, these are interrelated. Conflating these different concepts obscures important mechanisms. For instance, the role of agency in institutional change has been debated (Gertler, 2010; Hodgson, 2009; MacKinnon *et al.*, 2009; Pike *et al.*, 2009). By making a clear distinction between institutional layers and agents who are subject to institutional layers, the bi-directional causation between agency and institutional layers can be analysed.

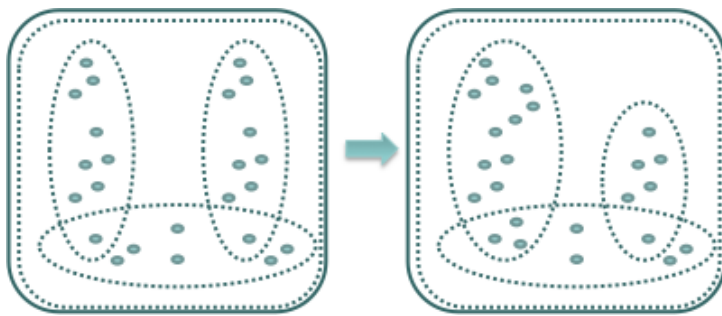
4 Institutional dynamics

The concept of institutional layering has several implications for analysing the dynamics of a regional institutional framework. As a first observation, institutional change can occur *within* or *between* institutional layers. Institutional change *within* institutional layers target normative characteristics and can be triggered by “the fact that the enactment of a social rule is never perfect and that there always is a gap between the ideal pattern of a rule and the real pattern of life under it.” (Streeck & Thelen, 2005a, p. 14). This gap can be caused by several reasons such as limited foresight and limited cognitive capacities of the agents involved in setting rules, attempts to avoid rules or deviate from them, the fact that rules usually result from political compromise, and the need to interpret institutions in a given context, which changes over time (Pierson, 2004; Streeck & Thelen, 2005a). Change *between* institutional layers frequently relates to changes in structural characteristics. Given that a regional institutional framework consists of several layers and that each layer has structural characteristics as regards overall size, penetration, geography, and connectedness, changes in the structural characteristics will have an effect on the overall institutional framework. Structural characteristics may be affected by factors exogenous to the regional institutional framework such as the emergence of new industries or technologies, or the change in the competitive landscape. This, in consequence, can weaken existing industries leading to job losses and firm exits and, thus, to a decrease of the size and penetration of the institutional layer associated with existing industries. At the same time, new institutional layers may emerge related to the new industries. However, structural change does not necessarily require triggers that are exogenous to the regional institutional framework. Actors may choose to join alternative social structures and thus become subject to different institutional layers for reasons like the appeal of strong figureheads associated with an institutional layer, better career prospects, or social ties. The dynamics of a regional institutional framework consequently relates to the interplay of changes within and between institutional layers.

As regards changes between institutional layers, a differentiation can be made in colliding and non-colliding institutional layers. Institutional layers collide when they regulate the same situations of life and when association with one obviates association with another (e.g. religious denominations, nationality). Non-colliding institutional layers are non-exclusive and cross-cutting. Individuals associated with colliding institutional layers can share other cross-cutting layers. For instance, individuals associated with a “protestant institutional layer” and individuals associated with a “catholic institutional layer” may share an institutional layer related to their profession. As regards colliding institutional layers, the growth in size and/or penetration of one institutional layer as

compared to another will lead to a change in the institutional framework in favour of the former (see figure 3). For instance, in Germany the proportion of employees covered by collective labour agreements has diminished because these agreements mainly pertain to manufacturing sectors, which have decreased in importance as compared to the service industry measured by, for instance, the share in employment (Thelen, 2009). Streeck and Thelen (2005a) label this mode of change “institutional drift”, where the normative content of the institutional layers remains stable but the shift in their relative importance as regards the number of individuals associated with them leads to a change in the institutional framework.

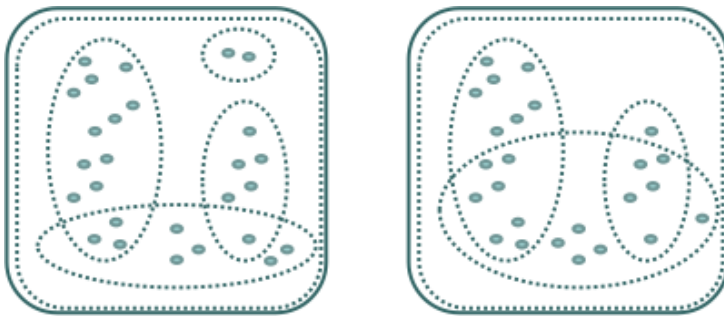
Figure 3: Institutional drift of two colliding layers



In situations where agents aim to spread institutions beneficial for them, structural characteristics also play an important role. As the size and penetration of an institutional layer increases, associated agents may be able to impose control mechanisms for certain rules and sanction deviating behaviour. Also lobbying and coalition building are mechanisms that may alter the importance of institutional layers. The probability that one institutional layer gains support will increase with its connectedness to other institutional layers through which lobbying and coalition building can be facilitated. Geography usually plays an intermediary role as it has an impact on the connectedness of institutional layers. Layers associated with agents located e.g. in suburbs are sometimes weakly connected with other layers and thus it is less likely that the respective norms and rules will spread. Figure 4 illustrates institutional frameworks with institutional layers characterised by a different degree of connectedness and penetration.

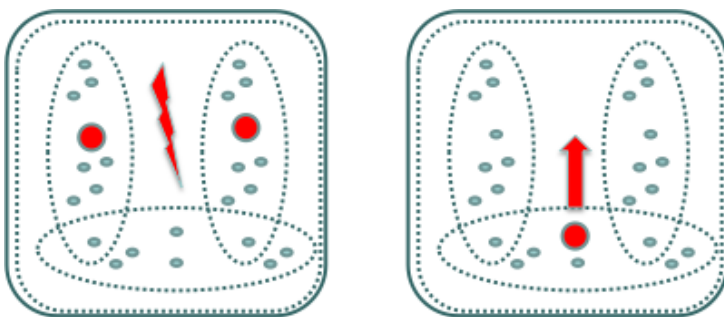
The effect of non-colliding regionally defined layers on the overall institutional framework depends largely on their size, penetration and connectedness to other layers. Strongly connected institutional layers with a large size and high penetration can have a fundamental influence on the institutional framework. A non-exclusive compulsory education system that also aims at promoting a shared set of values will impact in the medium- and long-run the institutional framework at large. Not only does such an education system exhibit a high penetration, it also cuts across professions as graduates take on different jobs. For instance, Glaeser et al. (2004) show that changes in institutions and economic development are robustly correlated with the historical levels of schooling. Also, in order to actively promote institutional transformation, it may thus be promising to identify/develop non-colliding, cross-cutting institutional layers with a high penetration and connectedness diffusing the “desired” rules, norms and beliefs.

Figure 4: Different degree of connectedness and penetration of layers



Besides the normative and structural dynamics, figureheads and key representatives of specific institutional layers play an important role. Their influence can build on factors such as economic resourcefulness, political power or cultural appeal. Typical role models from these three areas are Steve Jobs, Margaret Thatcher or the Dalai Lama. They are associated with institutional layers, i.e. they represent specific norms and beliefs. Role models will have an influence on the pace and direction of institutional change. If strong role models are associated with colliding institutional layers, the described mechanisms will most probably intensify and may also lead to a strong polarization. On the other hand, non-colliding institutional layers represented by appealing figureheads will most likely grow in importance and transform the overall institutional framework as illustrated in figure 5.

Figure 5: Effect of strong figureheads associated with colliding and non-colliding layers



In addition to the above-discussed structural aspects, the normative characteristics of institutional layers need to be taken into account when discussing institutional dynamics. Institutional layers differ in content, width, depth and stringency. Institutional layers of high width (rules for most situations in life), depth (detailed rules of how to behave in certain situations) and stringency (rules are strictly binding with limited scope for interpretation) will be very resistant to change¹. Extreme examples are societies where religion is imposed in a dogmatic manner to all areas of society. Also old industrial regions often develop rigid institutional layers (Hassink, 2005; Tödtling & Trippel, 2004; Trippel & Otto, 2009). However, this does not imply that rigid institutional layers are necessarily constraints for regional economic development. Rather, as the literature on innovation systems and varieties of capitalism suggests, the configurations of institutional frameworks differ and thus promote different industrial sectors and economic outcomes. It has been argued, for instance, that liberal market economies such as the US and UK tend to perform better in science-driven, analytical industries and radical innovations while coordinated market economies such as Germany or Sweden

¹ Thelen (2009) identifies reinterpretation of existing rules as an important mode of institutional change.

have advantages in generating incremental innovations and industries focussing on quality production like engineering (Asheim & Gertler, 2005; Hall & Soskice, 2001). The institutions underlying these different systems seem to be surprisingly stable and usually change only incrementally. Thelen (2009) shows that e.g. the German vocational education and training system, which is deemed fundamental for Germany's success as a coordinated market economy, can be traced back to a legislation passed in 1897. It follows that also rigid institutional layers may exert an important driving force for innovation and regional development depending on the actual content of the institutional layer.

Above, I have shown that structural and normative characteristics of institutional layers as well as the connectedness between layers have an impact on institutional dynamics. An interesting aspect is to compare institutional connectedness with the concept of institutional complementarity. Institutional complementarity exists if the presence of one institution increases the returns of another (Hall & Gingerich, 2009; Höpner, 2005). Most studies on complementarity analyse the interdependencies between institutions of different domains, such as between a bank-centred financial system and lifetime employment in Japan (Aoki, 1994), market versus strategic coordination of corporate governance and industrial relations (Hall & Gingerich, 2009), time-horizons on capital markets and industrial relations (Amable *et al.*, 2005; Hall & Soskice, 2001), or income equality in industrial relations and relative importance of bank-based versus market-based financial systems (Vitols, 2001a). Complementarity results from functional interdependencies that are frequently based on economic pressures. One argument is, for instance, that strongly capital-market oriented corporate governance will require firms to focus on short-term profitability. Therefore firms strive for industrial relations that are also adaptable in the short-term, i.e. that allow reducing the workforce at short notice in phases of economic downturn (Hall & Soskice, 2001). The institutional layers related to capital-market oriented corporate governance and industrial relations are connected through firms, which are subject to both. Connectedness of two layers, however, does not necessarily mean that they are optimally aligned and complementary. It only means that the agents who are subject to the two will have an interest to increase complementarity and thus will use their influence and networks to achieve such complementarity. Therefore, the causality behind institutional complementarity can be better understood by examining how institutional layers (and the social structures with which they are associated) are connected.

This also implies that changes in one institutional layer will trigger changes in connected ones. These changes, however, can follow different paths and do not necessarily lead to the same institutional outcomes because of history-contingent processes. Höpner (2005) for instance argues that the increase of shareholder orientation in Germany has not replaced central collective bargaining and co-determination. Co-determination is based on a law from 1976 (Mitbestimmungsgesetz) that empowers employees to participate in firm management. The increasing shareholder orientation has led to more transparent accounting practices (including more frequent use of international accounting standards), the introduction of profitability goals and firm restructuring. These changes do not necessarily oppose the interests of work councils that are involved in the process of collective bargaining and co-determination. Increased transparency reduces information asymmetries and thus increases the potential of work councils to participate in and supervise management. Also, more flexible industrial relations at the fringes of an organisation (e.g. excess demand covered by labour leasing that can be reduced at short notice) potentially increase job security, benefits and wages for the core staff of an organisation. Hence, most restructuring processes have been implemented in

consensus with work councils (Höpner, 2005). In this case, we find that the content of the institutional layer related to the relations between firms and core staff, emphasising collective bargaining and co-determination, have remained relatively constant. At the same time, competing institutional layers, such as the one governing the relations between firms and recruitment agencies offering labour leasing, have increased in importance. At some point, the increase in importance of the institutional layer associated with labour leasing will create conflicts as it collides with traditional forms of employment. This will then trigger adjustment as recently agreed in the contract of the coalition government in Germany following the national elections in 2013 to avoid the misuse of labour leasing (Pennekamp *et al.*, 2013). In other words, we observe changes in structural characteristics, where the relative size and penetration of institutional layers change, as well as adaptive changes in the normative content of the layers. The concept of institutional layering, therefore, offers a systematic and differentiated view on institutional complementarities and provides an analytical framework for investigating institutional change.

In summary, central to the concept of institutional layering is a clear distinction between agents, social structures and institutional layers. An institutional layer is defined as a set of rules and constraints that govern the interactions between agents associated with a distinct social structure. The concept of institutional layering does not conflate individual layers at the regional level. Institutional layers are kept as distinct entities truly appreciating the multiple forms and scales of institutions. A regional institutional framework is then composed of various institutional layers, which differ in their normative and structural characteristics and in their degree of connectedness. Connectedness refers to the extent to which different social structures are interrelated. In a strict sense, connectedness relates to individual agents who are subject to two or more institutional layers. In a broad sense, however, connectedness materialises through mechanisms such as formal and informal networks, temporary project organisations and employment mobility. Furthermore, the concept of institutional layering provides an analytical framework for studying institutional dynamics. Institutional dynamics can be explained through changes in structural and normative characteristics of institutional layers and how they relate to each other while appreciating the role of agency and power. The concept of institutional layering also improves measurability and comparability because institutional layers are strictly linked to social structures and agents belonging to such social structures. Many of the social structures relevant for economic evolution are of formal nature and easily observable. Other relevant social structures such as clusters or industrial sectors may be more difficult to delineate exactly. However, combinations of industrial classifications and geographic location provide reasonable proxies. More informal social structures, related for instance to individuals' professions, family structures or belief systems, have become increasingly observable through micro data on the individual level. Also, qualitative methods can provide information about social structures and the characteristics of institutional layers. Overall, therefore, the concept of institutional layering appreciates the multiple shapes and scales of institutions, provides a framework for analysing institutional dynamics, and is tangible enough for operationalization in the context of empirical research.

5 On the interplay between institutional change and economic evolution

In this section, I aim at answering why and how the concept of institutional layering contributes to our understanding about the interplay between institutional change and economic evolution at the regional scale. Economic evolution is characterised by quantitative and qualitative changes as regards the population of firms and individuals (Murmman, 2003; Schamp, 2010). This includes for instance a change in industrial structure where some industries increase or decrease in importance or where new industries appear. This may also relate to changes in the relative frequency of certain professions and occupations in a region. Furthermore, the population of firms may change as regards their capabilities and networks. Institutional change, on the other hand, has been discussed in the previous section building on the concept of institutional layering. While the concept of institutional layering can contribute to our understanding of the interplay between institutional change and economic evolution in many ways, I focus here, for illustration purposes, on two features: the variety and connectedness of institutional layers.

Two important questions arise upfront: i) what is a meaningful regional entity? and ii) what institutional layers should be included in the analysis? From a theoretical perspective, Boschma (2004) argues that a regional entity is meaningfully defined if this has implications for the competitiveness of the firms located in the region. Furthermore, seeing regions as static entities following administrative borders is problematic because institutional layers, knowledge and production networks are in most cases not confined to administrative borders. Hence, a multi-scalar approach, incorporating the local, regional and extra-regional scale, is required in order to understand how institutional change and economic evolution are interrelated. The concept of institutional layering embraces multiple scales. This concept demands, however, a thorough empirical examination about the institutional layers present within a specific region and their economic significance.

However, which institutional layers should be analysed? Soskice (1999) argues that all those institutions are relevant within which agents of capitalist systems are embedded, most importantly institutions relating to finance, industrial relations, education and training, and inter-firm relations. The literature on innovation systems suggests to focus on “all parts and aspects of the economic structure and the institutional set-up affecting learning as well as searching and exploring” (Lundvall, 1992, p. 12). Such a broad perspective of innovation systems encompasses knowledge exploration (universities, research and development, vocational education and training, etc.), knowledge exploitation (industrial sectors, value chains, competing firms), and policy (Asheim & Coenen, 2005; Asheim & Gertler, 2005; Lundvall, 1992; Tödtling & Trippl, 2005). It follows that all those institutional layers, which can be associated with the just mentioned domains, are potentially important and constitute the relevant regional institutional framework. The regional institutional framework, hence, is composed of distinct institutional layers whereby institutional variety describes the extent to which these layers relate to e.g. different geographies (local, regional, national, international), different sub-systems of regional innovation systems, different industrial sectors or different backgrounds of individuals. Which institutional layers matter for the interplay between institutional change and economic evolution in a specific regional context requires, however, careful empirical analysis.

There are several arguments, why variety and connectedness of institutional layers affect the interplay between economic evolution and institutional change in regions. First, institutional layers have an impact on knowledge exchange and learning. Knowledge exchange and learning are supported by institutional proximity and the embeddedness of the actors in a shared social, cultural and institutional context (Boschma, 2005; Gertler, 2003). Being subject to the same institutional layer implies institutional proximity and therefore facilitates knowledge exchange and learning. Also, institutional layers affect knowledge exchange indirectly. Sharing an institutional layer will tend to facilitate the establishment of networks and social ties. The probability to encounter other individuals belonging to the same social structure will be higher. Building social ties as result of such encounters will be supported by a sense of belonging to the same social structure and the trust that comes with it. Therefore, a high variety of institutional layers is conducive for knowledge exchange from different fields, contexts and locations.

Second, the connectedness of institutional layers increases the probability that regions will benefit from related variety. The concept of related variety builds on the idea that novelty frequently results from the combination of different types of knowledge. The larger the cognitive distance, however, the more difficult this will be. Therefore, the co-location of industries that employ related but still different types of knowledge is most conducive for innovation (Boschma & Iammarino, 2009; Frenken *et al.*, 2007). Connectedness of institutional layers promotes the exploitation of related variety as it supports the exchange of knowledge between and encounters of agents belonging to different social structures. Connectedness can exist directly between two institutional layers or indirectly through crosscutting institutional layers. Crosscutting institutional layers may relate for instance to an inclusive educational system, organisations for young entrepreneurs or associations for special interests such as culture or sports. Such crosscutting institutional layers will increase the likelihood that agents belonging to related industries meet, exchange knowledge and initiate joint activities. Connectedness of institutional layers within a region will therefore facilitate localised learning processes (Malmberg & Maskell, 2006; Maskell & Malmberg, 1999).

Third, the connectedness of institutional layers has an effect on the self-reinforcing processes that support the growth of industries. The growth of technologies, industries, sectors or clusters in a region usually relates to the accumulation of specialised resources, networks and institutions (Bergman, 2008; Malmberg & Maskell, 1997, 2002; Martin & Sunley, 2011; Maskell & Malmberg, 2007; Menzel & Fornahl, 2010; Porter, 1998, 2000; Ter Wal & Boschma, 2011). This requires that regional agents, comprising among others businesses, public bodies, educational and research organizations, and the civil society, coordinate their behaviour. A high connectedness will facilitate this coordination and thus the development of regional assets that support the growth of emerging technologies, industries or clusters. This includes for instance the adaptation of research and educational activities to the needs of emerging industries, the formation of associations that lobby for and promote the emerging sector, the collaboration between the public and private sector to realise large-scale investments, or the collaboration with other third parties and consumers in innovation processes. This will lead to the raise of traded and untraded interdependencies, the “latter include labour markets, public institutions, and locally- or nationally-derived rules of action, customs, understandings, and values” (Storper, 1995 p. 205).

Forth, according to the concept of path plasticity, firms actively experiment within an institutional framework by exploring and exploiting the flexibility in interpreting institutions as well as by

combining different types of institutions (Strambach, 2010). A larger variety of institutional layers opens-up more opportunities for this kind of experimentation and exploration. Variety in a regional context is important because geographic proximity increases the likelihood for unexpected encounters of agents belonging to different social structures (Strambach, 2010). Furthermore, geographic proximity helps in understanding different institutional layers, which is a prerequisite for successfully appropriating and applying them in new fields. As many aspects of institutional layers are not codified, interactive learning, which is strongly facilitated by geographic proximity, plays an important role in transferring relevant knowledge (Gertler, 2003; Lam, 2000; Lundvall, 1992; Malmberg & Maskell, 2002; Maskell & Malmberg, 2007; Morgan, 2004; Storper, 1995). In a similar manner, it is expected that the connectedness of institutional layers has an impact on the exploitation of path plasticity. Connectedness will increase the likelihood that agents will be exposed to different types of institutions and will facilitate the transfer of knowledge relevant to these institutions.

Fifth, as described in the preceding section, the normative and structural characteristics of institutional layers and their connectedness have important effects on institutional change. The effect of connectedness depends on the variety of institutional layers. Especially in regions with low variety, the risk is relatively high that connectedness will have a negative effect on institutional change. There will be limited stimulation for institutional change from within the regional institutional framework. Furthermore, dominant agents can defend vested interest and existing structures through well-connected layers. On the other hand, if the variety of institutional layers is high, there will be constant stimulation for institutional change, which can be absorbed on the regional level through high connectedness. Thus, a high degree of variety and connectedness implies that agents subject to different institutional layers are interdependent and interact, which should promote continuous institutional change.

6 Towards a typology of regions

As shown above, the degree of variety and connectedness of institutional layers influences the interplay between institutional change and economic evolution. Using these two dimensions of a regional institutional framework, this section moves towards a typology of regions. This typology identifies four types of regions depending on the degree of variety and connectedness of institutional layers. Clearly there are limitations in the proposed typology because regional change processes also depend on other factors such as regional knowledge bases, industrial specialisations, infrastructural characteristics or the endowment with natural resources. However, as discussed in the previous section, institutional variety and connectedness have an effect on knowledge exchange and learning processes, the probability to benefit from related variety, the forming of collective interests and resources, the exploration of path plasticity as well as institutional dynamics. Therefore, condensing the arguments into four distinct regional types has the advantage of making the theoretical discussion more concrete and tangible. Figure 6 summarises for each of the four types the implications for regional transformation.

Figure 6: Towards a typology of regions

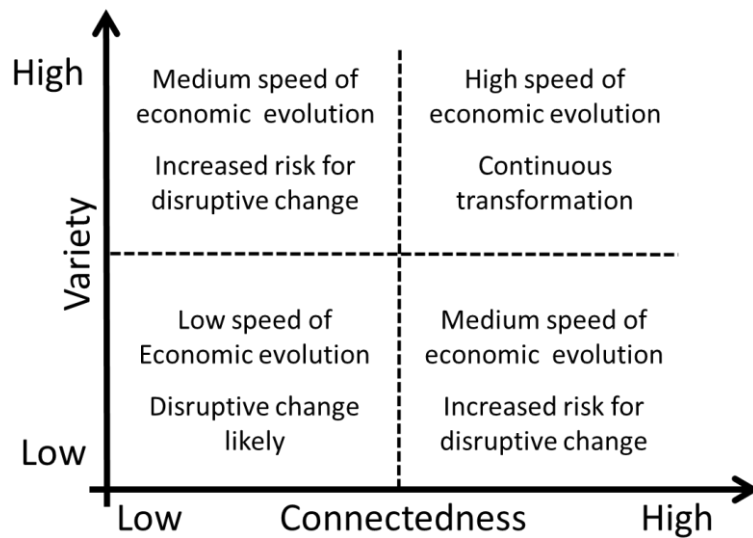


Figure 6 refers to the speed of economic evolution, which describes the rate of quantitative and qualitative changes to the population of firms and individuals in a region (Murmman, 2003; Schamp, 2010). This rate of change is expected to be high in regions with a high degree of variety and connectedness in their institutional framework because all the arguments apply that have been developed in the previous section: the creation of a conducive environment for localised learning as well as knowledge exchange from diverse sources, contexts and regions; the higher probability of benefiting from related variety; the capacity to create a supporting environment for emerging and growing industries through collective action; the higher likelihood that firms exploit path plasticity; and the combined effect of connectedness and variety promoting a continuous transformation of the institutional framework.

Regions characterised by high variety but lacking connectedness will experience a medium pace of economic evolution and face an increased risk for disruptive change. While knowledge exchange from diverse sources, contexts and regions is supported through variety of institutional layers, localised learning processes are impeded because of a lack of connectedness. While related industries may exist, the probability of benefiting from related variety will be lower. While potential for the emergence of new industries and clusters arises from firm heterogeneity, collective responses, that create a supportive environment for these new industries and clusters, will be more difficult to achieve. While firms in principle could benefit from institutional variety to exploit path plasticity, the likelihood that they are exposed to and learn about different institutions will be lower due to lacking connectedness. As regards institutional dynamics, low connectedness implies that institutional layers hardly “talk” to each other (through agents subject to different layers). While each institutional layer may exhibit relatively strong change, feedback mechanisms between the institutional layers and in consequence continuous adaptations of the institutional framework are obstructed. This will increase the probability for disruptive changes when differences and colliding interests become apparent and problematic.

Regions with a high connectedness but low variety of institutional layers are equally expected to exhibit a medium pace of economic evolution and an increased risk for disruptive change. However,

the reasoning is different. When opportunities emerge in such regions, the likelihood that these opportunities will be exploited is relatively high. Relevant knowledge will circulate fast within the region. The connectedness of institutional layers will facilitate collective action to create a supportive environment for the emerging industry or cluster and thus promote growth. However, such regions will find it more difficult to acquire knowledge from other domains, which means that it becomes less likely that firms branch out into new niches, create new development paths or renew existing ones. Hence, the probability for lock-ins increases. When lock-ins arise and dominant industries decline, there will be an increased risk for disruptive changes in the region relating to e.g. the industrial structure, prevailing knowledge bases, networks, or the institutional framework.

Regions that combine a low variety of institutional layers with low connectedness will usually show a low speed of economic evolution and a high likelihood for disruptive changes. Agents active in such regions will find it more difficult to acquire knowledge from regional and global sources as compared to agents located in regions with a higher degree of variety or connectedness. This will consequently have a negative impact on the development of their competencies and networks, reducing their competitiveness and innovativeness. The likelihood that such regions will benefit from related variety or path plasticity will be low because of a lack of connectedness and variety in the institutional framework as well as a lack of diversification and competitiveness of the regional economy. Collective action is obstructed. Even worse, negative regional externalities such as conflicts and innovation disincentives can result. This may be the case if for instance opposing families, tribes or groups undermine innovative activities for a variety of possible reasons like jealousy, conservatism or balancing interests between groups. Such regions will often fail to develop promising development paths and are vulnerable to lock-ins and fragmentation. Existing industries are expected to have low capabilities to adapt to changes in market or technological conditions. The institutional framework is often rigid because of colliding interests and region-internal struggles. It follows that a low-level of economic performance and development may persist for a long period of time. If changes are to happen, these are expected to frequently be of disruptive nature following disputes with the dominant elites.

The proposed typology relates well to existing research on certain types of regions and their characteristics. As regards agglomerations, there is evidence that cultural diversity measured by migrants or foreign languages spoken in cities, which can be considered as a proxy for a high variety of institutional layers, has a positive impact on economic performance in the US and the EU (Bellini *et al.*, 2013; Ottaviano & Peri, 2005, 2006). Samila and Sorenson (2013) find that the effectiveness of venture capital is highest in regions exhibiting a high integration of various ethnicities suggesting that the “melting pot” model is most conducive for innovation and growth. Literature on system failures examines the other side of the coin and has identified that in particular agglomerations often fail to exploit their economic potential because of fragmentation (Fritsch, 2003; Isaksen, 2001; Tödtling & Trippl, 2005). In contrast, many empirical cases studied on industrial districts, innovative milieus, local production systems and old-industrial regions exemplify an institutional framework characterised by low variety and high connectedness (see e.g. Asheim, 2000; Camagni, 1995; Cooke, 1995; Hassink & Shin, 2005; Pyke *et al.*, 1990). Such regions may be more prone to follow a typical cluster life-cycle where emergence and growth is succeeded by maturity and decline (see, for instance, Bergman, 2008; Menzel & Fornahl, 2010). On the other hand, low connectedness and low variety of institutional layers relates to lagging regions like the south of Italy or developing countries (see e.g. Evangelista *et al.*, 2002; Rodrik *et al.*, 2004; Woolcock & Narayan, 2000). Finally, the

proposed typology resonates well with established typologies where for instance certain types of regions (agglomerations, old industrial regions and peripheral regions) are associated with typical system failures (namely fragmentation, lock-in and institutional thinness) (Isaksen, 2001; Tödtling & Trippl, 2005).

7 Conclusions and further research questions

There is widespread agreement that institutions play a fundamental role in regional transformation. Also, awareness exists about the multiplicity of institutional forms and spatial scales. However, exactly how institutions of different forms and scales are related remains rather obscure. This paper addresses this research gap by proposing a concept of institutional layering, which focusses in particular on the interdependencies between different layers. An institutional layer is defined as a set of rules and constraints that govern the interactions between agents associated with a distinct social structure. The link between distinct social structures and institutional layers is important as it allows for a strict delineation of institutional layers. Only those individuals that belong to a specific social structure are subject to the respective institutional layer. Each institutional layer can be defined by normative and structural characteristics. In any region, a variety of clearly defined institutional layers can therefore co-exist. Moreover, the concept of institutional layering specifies how different institutional layers are connected. In a strict sense, two institutional layers are connected through individuals who are subject to both. In a broad sense, however, connectedness materialises also through mechanisms such as formal and informal networks, temporary project organisations and employment mobility.

The concept of institutional layering contributes to the literature on institutional change and institutional complementarity. Important mechanisms and drivers of institutional change within and between institutional layers are discussed. The emphasis in this paper lies on the dynamic interplay between institutional layers. One of the main advantages of the concept of institutional layering is that it illuminates the causality of institutional change. It demands to identify which institutional layer changes how and because of what reason, appreciating also the role of agency and power. In this context, the literature on institutional complementarity underlines the importance of interdependencies between different types of institutions for institutional change as well as economic outcomes. The concept of institutional layering contributes by providing an analytical framework for studying these interdependencies.

Furthermore, several reasons and mechanisms are identified why the concept of institutional layering contributes to our understanding of the interplay between institutional change and economic evolution. The variety and connectedness of institutional layers in a region have an effect on learning and knowledge exchange, the probability to benefit from related variety, the forming of collective interests and resources, the exploration of path plasticity as well as institutional dynamics. Depending on the degree of variety and connectedness of institutional layers, regions will therefore experience differences in the speed of economic evolution and the likelihood for continuous or disruptive changes. Using the two dimensions, variety and connectedness of institutional layers, the paper moves towards a typology of regions and relates it to existing empirical literature.

The concept of institutional layering invites for further empirical research and the development of methodologies to systematically analyse regional institutional frameworks. One of the main

strengths of this concept is that institutional layers can be identified through social structures. Empirical studies can draw on data about formal social structures such as organisations or administrative regions. Even less formal social structures can increasingly be identified in statistical databases using proxies and linking indicators such as individuals' place of birth, origin, education, and occupation, with firm indicators, location and industry codes. Furthermore, normative characteristics about institutional layers can be gathered using qualitative methods. One research avenue is to systematically investigate, which configurations of institutional layers support or hinder economic development considering territorial context conditions. Another interesting aspect is to research in more depth the causal mechanisms for change within and between institutional layers as well as the linkages between institutional change and economic evolution. Besides providing a systematic framework for empirical analysis, the concept of institutional layering also invites to further develop and integrate the role of agency and power. While this paper has introduced how agency and power affect institutional dynamics, potential for further development exists by drawing for instance on insights from political science and sociology. Lastly, it will be interesting to study the policy implications arising from an improved and more systematic understanding of the interplay between institutional and evolutionary economic processes as they are expected to be fundamental for the transformation of regions.

References

- Amable, B., Ernst, E., & Palombarini, S. (2005). How do financial markets affect industrial relations: an institutional complementarity approach. *Socio-Economic Review*, 3(2), 311-330.
- Aoki, M. (1994). The Contingent Governance of Teams: Analysis of Institutional Complementarity. *International Economic Review*, 35(3), 657-676.
- Asheim, B. T. (1996). Industrial districts as 'learning regions': A condition for prosperity. *European Planning Studies*, 4(4), 379-400.
- Asheim, B. T. (2000). Industrial districts: The contributions of Marshall and beyond. In G. L. Clark, M. P. Feldman & M. S. Gertler (Eds.), *The Oxford handbook of economic geography* (pp. 413-431). Oxford ; New York: Oxford University Press.
- Asheim, B. T., & Coenen, L. (2005). Knowledge bases and regional innovation systems: Comparing Nordic clusters. *Research Policy*, 34(8), 1173-1190.
- Asheim, B. T., & Coenen, L. (2006). Contextualising Regional Innovation Systems in a Globalising Learning Economy: On Knowledge Bases and Institutional Frameworks. *The Journal of Technology Transfer*, 31(1), 163-173.
- Asheim, B. T., & Gertler, M. S. (2005). The geography of innovation: regional innovation systems. In J. Fagerberg, D. C. Mowery & R. R. Nelson (Eds.), *The Oxford handbook of innovation* (pp. 291-317). Oxford: Oxford University Press.
- Asheim, B. T., & Isaksen, A. (2002). Regional Innovation Systems: The Integration of Local 'Sticky' and Global 'Ubiquitous' Knowledge. *Journal of Technology Transfer*, 27(1), 77-86.
- Bellini, E., Ottaviano, G. P., Pinelli, D., & Prarolo, G. (2013). Cultural Diversity and Economic Performance: Evidence from European Regions. In R. Crescenzi & M. Percoco (Eds.), *Geography, Institutions and Regional Economic Performance* (pp. 121-141): Springer Berlin Heidelberg.
- Bergman, E. M. (2008). Cluster life-cycles: an emerging synthesis. *Handbook of research on cluster theory*, 1, 114.
- Boschma, R. (2004). Competitiveness of Regions from an Evolutionary Perspective. *Regional Studies*, 38(9), 1001-1014.
- Boschma, R. (2005). Proximity and Innovation: A Critical Assessment. *Regional Studies*, 39(1), 61-75.
- Boschma, R., & Frenken, K. (2009). Some Notes on Institutions in Evolutionary Economic Geography. *Economic Geography*, 85(2), 151-158.
- Boschma, R., & Iammarino, S. (2009). Related Variety, Trade Linkages, and Regional Growth in Italy. *Economic Geography*, 85(3), 289-311.
- Boschma, R., & Ter Wal, A. L. J. (2007). Knowledge Networks and Innovative Performance in an Industrial District: The Case of a Footwear District in the South of Italy. *Industry and Innovation*, 14(2), 177-199.
- Breschi, S. (2000). The geography of innovation: A cross-sector analysis. *Regional Studies*, 34(3), 213-229.
- Camagni, R. P. (1995). The concept of *innovative milieu* and its relevance for public policies in european lagging regions. *Papers in Regional Science*, 74(4), 317-340.
- Cooke, P. (2001). Regional Innovation Systems, Clusters, and the Knowledge Economy. *Industrial and Corporate Change*, 10(4), 945-974.
- Cooke, P. (Ed.). (1995). *The Rise of the Rustbelt: Revitalizing Older Industrial Regions*. London: UCL Press.
- Cooke, P., Uranga, M. G., & Etxebarria, G. (1997). Regional innovation systems: Institutional and organisational dimensions. *Research Policy*, 26(4-5), 475-491.
- Crevoisier, O. (2004). The Innovative Milieus Approach: Toward a Territorialized Understanding of the Economy? *Economic Geography*, 80(4), 367-379.
- Edquist, C. (2005). Systems of innovation: Perspectives and Challenges. In J. Fagerberg, D. C. Mowery & R. R. Nelson (Eds.), *The Oxford handbook of innovation* (pp. 181-208). Oxford: Oxford University Press.

- Ernst, E. (2002). Financial Systems, Industrial Relations, and Industry Specialization. An econometric analysis of institutional complementarities (pp. 42). Paris: OECD.
- Evangelista, R., Iammarino, S., Mastrostefano, V., & Silvani, A. (2002). Looking for Regional Systems of Innovation: Evidence from the Italian Innovation Survey. *Regional Studies*, 36(2), 173-186.
- Freeman, C. (1995). The 'national system of innovation' in historical perspective. *Cambridge Journal of Economics*, 19(1), 5-25.
- Frenken, K., & Boschma, R. A. (2007). A theoretical framework for evolutionary economic geography: industrial dynamics and urban growth as a branching process. *Journal of Economic Geography*, 7(5), 635-649.
- Frenken, K., Van Oort, F., & Verburg, T. (2007). Related Variety, Unrelated Variety and Regional Economic Growth. *Regional Studies*, 41(5), 685-697.
- Fritsch, M. (2003). Does R&D-cooperation behavior differ between regions? *Industry and Innovation*, 10(1), 25-39.
- Gertler, M. S. (2003). Tacit knowledge and the economic geography of context, or The undefinable tacitness of being (there). *Journal of Economic Geography*, 3(1), 75-99.
- Gertler, M. S. (2010). Rules of the Game: The Place of Institutions in Regional Economic Change. *Regional Studies*, 44(1), 1-15.
- Giuliani, E. (2007). The selective nature of knowledge networks in clusters: evidence from the wine industry. *Journal of Economic Geography*, 7(2), 139-168.
- Giuliani, E., & Bell, M. (2005). The micro-determinants of meso-level learning and innovation: evidence from a Chilean wine cluster. *Research Policy*, 34(1), 47-68.
- Glaeser, E., La Porta, R., Lopez-de-Silanes, F., & Shleifer, A. (2004). Do Institutions Cause Growth? *Journal of Economic Growth*, 9(3), 271-303.
- Grabher, G. (1993). The weakness of strong ties; the lock-in of regional development in the Ruhr area. In G. Grabher (Ed.), *The Embedded Firm: On the Socioeconomics of Industrial Networks* (pp. 255-277). London & New York: Routledge.
- Hall, P. A., & Gingerich, D. W. (2009). Varieties of Capitalism and Institutional Complementarities in the Political Economy: An Empirical Analysis. *British Journal of Political Science*, 39(03), 449-482.
- Hall, P. A., & Soskice, D. W. (2001). *Varieties of capitalism: The institutional foundations of comparative advantage* (Vol. 8): Wiley Online Library.
- Harrison, B. (1992). Industrial Districts: Old Wine in New Bottles? *Regional Studies*, 26(5), 469-483.
- Hassink, R. (2005). How to unlock regional economies from path dependency? From learning region to learning cluster. *European Planning Studies*, 13(4), 521-535.
- Hassink, R. (2010). Locked in decline? On the role of regional lock-ins in old industrial areas. *The Handbook of Evolutionary Economic Geography*, 450-468.
- Hassink, R., & Shin, D. H. (2005). The restructuring of old industrial areas in Europe and Asia. *Environment and Planning A*, 37(4), 571-580.
- Hodgson, G. M. (1998). The Approach of Institutional Economics. *Journal of Economic Literature*, 36(1), 166-192.
- Hodgson, G. M. (2006). What Are Institutions? *Journal of Economic Issues*, 11(1), 25.
- Hodgson, G. M. (2009). Agency, Institutions, and Darwinism in Evolutionary Economic Geography. *Economic Geography*, 85(2), 167-173.
- Hollingsworth, J. R. (2000). Doing institutional analysis: implications for the study of innovations. *Review of International Political Economy*, 7(4), 595-644.
- Höpner, M. (2005). What connects industrial relations and corporate governance? Explaining institutional complementarity. *Socio-Economic Review*, 3(2), 331-358.
- Isaksen, A. (2001). Building Regional Innovation Systems: Is Endogenous Industrial Development Possible in the Global Economy? *Canadian Journal of Regional Science*, 1, 101-120.
- Lam, A. (2000). Tacit knowledge, organizational learning and societal institutions: An integrated framework. *Organization Studies*, 21(3), 487-513.

- Lam, A. (2002). New regulations Alternative societal models of learning and innovation in the knowledge economy. *International Social Science Journal*, 54(171), 67-82.
- Lundvall, B.-A. (1988). Innovation as an interactive process: from user-producer interaction to the national system of innovation. In G. Dosi, C. Freeman, R. Nelson, G. Silverberg & L. L. Soete (Eds.), *Technical change and economic theory* (pp. 349-369). London: Frances Pinter.
- Lundvall, B.-A. (1992). *National systems of innovation : towards a theory of innovation and interactive learning*. London: Pinter.
- Lundvall, B.-A., Johnson, B., Andersen, E. S., & Dalum, B. (2002). National systems of production, innovation and competence building. *Research Policy*, 31(2), 213-231.
- MacKinnon, D., Cumbers, A., Pike, A., Birch, K., & McMaster, R. (2009). Evolution in Economic Geography: Institutions, Political Economy, and Adaptation. *Economic Geography*, 85(2), 129-150.
- Mahoney, J. (2000). Path dependence in historical sociology. *Theory and Society*, 29(4), 507-548.
- Maillat, D. (1998). Interactions between urban systems and localized productive systems: an approach to endogenous regional development in terms of innovative milieu. *European Planning Studies*, 6(2), 117-130.
- Malerba, F. (2002). Sectoral systems of innovation and production. *Research Policy*, 31(2), 247-264.
- Malerba, F. (2005). Sectoral Systems: How and Why Innovation Differs Across Sectors. In J. Fagerberg, D. C. Mowery & R. R. Nelson (Eds.), *The Oxford Handbook of Innovation* (pp. 380-406). Oxford: Oxford University Press.
- Malmberg, A., & Maskell, P. (1997). Towards an explanation of regional specialization and industry agglomeration. *European Planning Studies*, 5(1), 25.
- Malmberg, A., & Maskell, P. (2002). The elusive concept of localization economies: towards a knowledge-based theory of spatial clustering. *Environment and Planning A*, 34(3), 429-449.
- Malmberg, A., & Maskell, P. (2006). Localized Learning Revisited. *Growth & Change*, 37(1), 1-19.
- Markusen, A. (1996). Sticky Places in Slippery Space: A Typology of Industrial Districts. *Economic Geography*, 72(3), 293-313.
- Marshall, A. (1920). *Principles of economics : an introductory volume* (8. ed.). London: Macmillan.
- Martin, R., & Sunley, P. (2006). Path dependence and regional economic evolution. *Journal of Economic Geography*, 6(4), 395-437.
- Martin, R., & Sunley, P. (2010). The place of path dependence in an evolutionary perspective on the economic landscape. *Handbook of Evolutionary Economic Geography*, 62-92.
- Martin, R., & Sunley, P. (2011). Conceptualizing Cluster Evolution: Beyond the Life Cycle Model? *Regional Studies*, 45(10), 1299-1318.
- Maskell, P., & Malmberg, A. (1999). Localised learning and industrial competitiveness. *Cambridge Journal of Economics*, 23(2), 167-185.
- Maskell, P., & Malmberg, A. (2007). Myopia, knowledge development and cluster evolution. *Journal of Economic Geography*, 7(5), 603-618.
- Menzel, M.-P., & Fornahl, D. (2010). Cluster life cycles—dimensions and rationales of cluster evolution. *Industrial and Corporate Change*, 19(1), 205-238.
- Morgan, K. (2004). The exaggerated death of geography: learning, proximity and territorial innovation systems. *Journal of Economic Geography*, 4(1), 3-21.
- Morrison, A. (2008). Gatekeepers of Knowledge within Industrial Districts: Who They Are, How They Interact. *Regional Studies*, 42(6), 817-835.
- Murmann, J. P. (2003). *Knowledge and competitive advantage: the coevolution of firms, technology, and national institutions*. Cambridge, U.K.: Cambridge University Press.
- Nelson, R. R. (1995). Co-evolution of Industry Structure, Technology and Supporting Institutions, and the Making of Comparative Advantage. *International Journal of the Economics of Business*, 2(2), 171-184.
- Nelson, R. R. (Ed.). (1993). *National Innovation Systems: A Comparative Analysis*. Oxford: Oxford University Press.

- North, D. C. (1990). *Institutions, Institutional Change and Economic Performance*. Cambridge: Cambridge University Press.
- North, D. C. (1991). Institutions. *The Journal of Economic Perspectives*, 5(1), 97-112.
- North, D. C. (2008). Institutions and the Performance of Economies over Time. In C. Ménard & M. Shirley (Eds.), *Handbook of New Institutional Economics* (pp. 21-30): Springer Berlin Heidelberg.
- Ottaviano, G. I. P., & Peri, G. (2005). Cities and cultures. *Journal of Urban Economics*, 58(2), 304-337.
- Ottaviano, G. I. P., & Peri, G. (2006). The economic value of cultural diversity: evidence from US cities. *Journal of Economic Geography*, 6(1), 9-44.
- Pennekamp, J., Burdas, C., & Bündler, H. (2013, 28.11.2013). Koalitionsvertrag: Deutsche Telekom sortiert Leiharbeiter aus, *Frankfurter Allgemeine Zeitung*.
- Pierson, P. (2004). *Politics in time: History, institutions, and social analysis*: Princeton University Press.
- Pike, A., Birch, K., Cumbers, A., MacKinnon, D., & McMaster, R. (2009). A Geographical Political Economy of Evolution in Economic Geography. *Economic Geography*, 85(2), 175-182.
- Porter, M. E. (1998). Clusters and the new economics of competition. *Harvard Business Review*, 76(6), 77-90.
- Porter, M. E. (2000). Location, Competition, and Economic Development: Local Clusters in a Global Economy. *Economic Development Quarterly*, 14(1), 15-35.
- Pyke, F., Becattini, G., & Sengenberger, W. (1990). *Industrial districts and inter-firm co-operation in Italy*. Geneva: International Institute for Labour Studies.
- Rodríguez-Pose, A. (2013). Do Institutions Matter for Regional Development? *Regional Studies*, 47(7), 1034-1047.
- Rodrik, D., Subramanian, A., & Trebbi, F. (2004). Institutions Rule: The Primacy of Institutions Over Geography and Integration in Economic Development. *Journal of Economic Growth*, 9(2), 131-165.
- Samila, S., & Sorenson, O. (2013). *Community and Capital in Entrepreneurship*. Paper presented at the 35th DRUID Celebration Conference, Barcelona.
- Schamp, E. W. (2010). On the notion of co-evolution in economic geography. In R. Boschma & R. Martin (Eds.), *The Handbook of Evolutionary Economic Geography* (pp. 432-449). Cheltenham: Edward Elgar Publishing.
- Schickler, E. (2001). *Disjointed pluralism: Institutional innovation and the development of the US Congress*: Princeton University Press.
- Scott, R. W. (2001). *Institutions and Organizations* (2nd ed.). London: Sage Publications.
- Soskice, D. (1999). Divergent production regimes: coordinated and uncoordinated market economies in the 1980s and 1990s. In H. Kitschelt, P. Lange, G. Marks & J. D. Stephens (Eds.), *Continuity and Change in Contemporary Capitalism* (pp. 101-134). Cambridge: Cambridge University Press.
- Srholec, M., & Verspagen, B. (2012). The Voyage of the Beagle into innovation: explorations on heterogeneity, selection, and sectors. *Industrial and Corporate Change*, 21(5), 1221-1253.
- Storper, M. (1995). The resurgence of regional economies, ten years later: the region as a nexus of untraded interdependencies. *European Urban and Regional Studies*, 2(3), 191-221.
- Strambach, S. (2010). Path dependence and path plasticity: the co-evolution of institutions and innovation—the German customized business software industry. *The Handbook of Evolutionary Economic Geography*, 406.
- Streeck, W., & Thelen, K. (2005a). Introduction: Institutional change in advanced political economies. In W. Streeck & K. Thelen (Eds.), *Beyond continuity: Institutional change in advanced political economies* (pp. 1-39). Oxford: Oxford University Press.
- Streeck, W., & Thelen, K. (Eds.). (2005b). *Beyond Continuity: Institutional Change in Advanced Political Economies*. Oxford: Oxford University Press.
- Sturgeon, T., Van Biesebroeck, J., & Gereffi, G. (2008). Value chains, networks and clusters: reframing the global automotive industry. *Journal of Economic Geography*, 8(3), 297-321.

- Ter Wal, A. L. J., & Boschma, R. (2009). Applying social network analysis in economic geography: framing some key analytic issues. *The Annals of Regional Science*, 43(3), 739-756.
- Ter Wal, A. L. J., & Boschma, R. (2011). Co-evolution of Firms, Industries and Networks in Space. *Regional Studies*, 45(7), 919-933.
- Thelen, K. (2009). Institutional Change in Advanced Political Economies. *British Journal of Industrial Relations*, 47(3), 471-498.
- Tödtling, F., & Trippel, M. (2004). Like Phoenix from the Ashes? The Renewal of Clusters in Old Industrial Areas. *Urban Studies*, 41(5-6), 1175-1195.
- Tödtling, F., & Trippel, M. (2005). One size fits all? Towards a differentiated regional innovation policy approach. *Research Policy*, 34(8), 1203-1219.
- Trippel, M., & Otto, A. (2009). How to turn the fate of old industrial areas: a comparison of cluster-based renewal processes in Styria and the Saarland. *Environment and planning. A*, 41(5), 1217-1233.
- van der Heijden, J. (2011). Institutional Layering: A Review of the Use of the Concept. *Politics*, 31(1), 9-18.
- Vitols, S. (2001a). The origins of bank-based and market-based financial systems: Germany, Japan, and the United States. In W. Streeck & K. Yamamura (Eds.), *The origins of nonliberal capitalism: Germany and Japan in comparison* (pp. 171-199). Ithaca and London: Cornell University Press.
- Vitols, S. (2001b). Varieties of corporate governance: Comparing Germany and the UK. In P. A. Hall & D. Soskice (Eds.), *Varieties of capitalism : the institutional foundations of comparative advantage* (pp. 337-360). Oxford ; New York: Oxford University Press.
- Williamson, O. E. (2000). The New Institutional Economics: Taking Stock, Looking Ahead. *Journal of Economic Literature*, 38(3), 595-613.
- Woolcock, M., & Narayan, D. (2000). Social Capital: Implications for Development Theory, Research, and Policy. *The World Bank Research Observer*, 15(2), 225-249.
- Zukauskaitė, E. (2013). *Institutions and the Geography of Innovation: A Regional Perspective*. Ph.D. Thesis, Lund University, Lund.