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Uta Wilkens\*

## **Towards a Regional Dynamic Capability View – Components of Macrofoundation**

**Abstract** - The paper outlines components of a regional dynamic capability view (RDCV) considering the interdependence between regional and firm development. It is aiming at enhancing the multilevel perspective of the dynamic capability view (DCV) with respect to upper-level dynamics and mechanisms of organizational renewal. For this macrofoundation components from new institutionalism and regional studies enrich the DCV. The outline treats the interconnected ecosystem of regional firms and institutions as the unit of analysis, gives emphasis to institutional entrepreneurs in their pivotal role for sensemaking and to the middleground as a supporting organizational form for enhancing enactment as the key prerequisites for allocating resources in a new manner. The RDCV especially outlines the process of seizing. The example of the recent transformation of the Ruhr area serves as an illustration for the relevance of the theoretical considerations. In order to prepare empirical analyses, the paper, moreover, outlines a research design for data collection and evaluation based on a mixed-method approach combining document analysis with participating observation aiming at an operationalization of second-order constructs during the process of data evaluation. The contribution is considered as an invitation to other researchers to build on an RDCV mutually.

**Keywords:** **Dynamic capabilities, new institutionalism, regional studies, regional innovation, institutional entrepreneur, sensemaking, weak ties, enactment, middleground, multilevel analysis, mixed-method approach**

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## 1. Introduction

Multilevel analyses in dynamic capability research (DCR) are considered as fruitful in order to better understand the underlying critical factors of organizational renewal and sustaining competitive advantages. The popularity of the multilevel perspective results from the microfoundation discussion in DCR. This discussion emphasizes lower-level entities, such as human agency and cognition, especially employees' motivation, skills and managerial decision-making. There is a high plausibility that they influence firms' dynamic capabilities (Teece 2012; Foss and Lindenberg 2013; Barney and Felin 2013; Salvato and Rerup 2011; Helfat and Peteraf 2015). Broadening the view in this direction opens the door for an organizational behavior perspective and psychological foundation (Hodgkinson and Healey 2011) that has to be thoroughly balanced with the conceptual roots of the dynamic capability view (DCV) in strategic management (Barney and Felin 2013). However, it is obvious that microfoundations increase actor-centricity in this field of research and help to explicate the sources of competitiveness.

Considering the potential of multilevel analysis also implies the organization as an entity of a higher-level construct, such as a region. The environmental factors defining the organizational ecology have, so far, been rather neglected in multilevel analyses of DCR (Salvato and Rerup 2011). Instead, regional studies with an interest in regional innovation and knowledge creation specify the organizational ecology (see Grabher 1993; Heidenreich 2005; Cohendet, Grandadam, and Simon 2010; Cohendet et al. 2014; Grandadam, Cohendet, and Simon 2013). The relevance of the sociopolitical, socioeconomic and sociocultural environment for regional innovation could be illustrated for certain cities, for example, Paris, Montreal, Barcelona or Bilbao, in terms of regional dynamics (Cohendet et al. 2014; Grandadam, Cohendet, and Simon 2013; Heidenreich and Plaza 2013). In other examples, the organizational ecology is considered as an obstacle to finding a new path. This is what Grabher (1993) illustrates for the Ruhr area in Germany. Regional studies (Cohendet et al. 2014) understand the upper-level as an ecosystem (see Adner and Kapoor 2010) and highlight the "ability of regions to reconfigure their socio-economic and institutional structures to develop new growth paths" (Boschma 2015, 733). This indicates that there are roots for a vivid discourse that can lead to a regional dynamic capability view (RDCV). Regional studies have not been linked explicitly to competitive theory so far, especially the DCV and its multilevel perspective. An exception is Heidenreich (2005), who made a reference to Teece, Pisano and Shuen (1997), but without building on the DCV any further.

As we can observe from certain examples that a firm's competitiveness is not an isolated issue, but is interdependent on the regional ability or disability to transform, it is worth aligning regional studies to the DCV in order to elaborate the upper-level perspective in competitive theory. This paper aims at enhancing the multilevel perspective of the DCV with respect to upper-level dynamics.

Whether there is already an upper-level perspective in competitive theory, one can say that there are at least some contributions going in this direction. The relational view underlines the importance of strategic networks when considering the uniqueness of interfirm resource combinations (Dyer and Singh 1998). In addition, there are ideas of open innovation as dynamic capabilities for sustaining competitive advantages (see Dagnino 2004; Salge et al. 2013; Gesing et al. 2015). These network perspectives do not necessarily have a regional focus, but they at least broaden the view in the direction of interfirm activities and sourcing strategies surrounding companies. There is also an interest in the vertical institutional structure of production considering the “distribution of productive capabilities along different parts of the value chain” (Jacobides and Winter 2005, 410). Jacobides and Winter (2005) highlight institutional organizational fields and the related institutional mechanisms (see Meyer and Rowan 1977; DiMaggio and Powell 1983) among the transacting firms in their description of the value chain. It becomes obvious that the constitution of networks and institutional thinking enter competitive theory when broadening the view beyond the single firm. The consideration of the surrounding network as a relevant institutional field for a firm’s competitiveness would be a further step in a multilevel approach with a clear link to regional studies. As microfoundations call for a psychological foundation of the DCV, the macrofoundations addressed here call for a regional and institutional foundation. This allows emphasis to be laid on regional institutional conditions, not as an industry structure, but as an institutionalized community-based network (Uotila, Melkas, and Harmaakorpi 2005; Heidenreich 2005; Harmaakorpi and Uotila 2006; Tura, Harmaakorpi, and Pekkola 2008). This is a promising way to better understand regional transformation as an interlinked specific renewal of companies within an ecosystem. A link between DCV and regional studies with the help of institutional theory for bridging basic assumptions is promising as it allows the interdependence between regional and firms’ renewal to be shown.

A systematic foundation of the DCV on a macrolevel is still missing. There has been no systematic theoretical integration of the DCV with regional studies and institutional thinking so far in order to explain economic renewal as an interactive outcome of firm and regional development, even though the relatedness of these concepts is obvious and has at least been mentioned (see Jacobides and Winter 2005; Heidenreich 2005). There is the opportunity to elaborate on an RDCV by a thorough integration of existing concepts. There is a need for such outline, since regional transformation is a key issue of firms’ dynamic capabilities and competitiveness. An RDCV can serve as a framework for the better understanding of the upper-level dynamics of organizational renewal and the interdependence between regional and firm level.

In the following, I will outline components of an RDCV and for this purpose specify regional dynamic capabilities on the basis of the DCV, new institutionalism and regional studies. Corresponding to microfoundations, actor-centricity will be taken into consideration in this view as well, but on the institutional level. This

means that I emphasize new regional institutional actors, called institutional entrepreneurs, in their pivotal role of sensemaking and enhancing enactment. The idea is to systematically integrate theoretical components in order to invite other researchers to build on this fundament and further elaborate DCR.

In the next section, I introduce definitions and specify the unit of analysis. In the third section, I relate three theoretical components – the DCV, new institutionalism and regional studies – to the unit of analysis in order to explain the process of renewal in the interaction between firms and regional institutions. I use the example of the Ruhr area for an extended illustration of the theoretical outline. The fourth section suggests a design of analysis for future empirical research. Finally, in the fifth section, I summarize the research contribution of this article and give an outlook to future research.

## **2. Definitions and unit of analysis**

A region is normally smaller than a country, nation or state, but it goes beyond Porter's (1998) concept of industry clusters: "Clusters are geographic concentrations of interconnected companies and institutions in a particular field" (Porter 1998, 78). Typical examples are the California wine cluster or the automotive cluster in the south of Germany (Porter 1998). The advantages gained from the concentration and related infrastructure become obvious in the cluster concept. A region goes beyond this and does not necessarily have an industrial concentration. Regions can be considered as "the culture-cognitive, normative and regulative structures that provided stability and collective meaning to social behavior" (Wooten and Hoffman 2008, 131 with reference to Scott 1995). The socio-economic regulative structure includes industrial and labor policy (Heidenreich 2005). Resources, infrastructure components, histories or symbols that define the social identity and dominant behavioral pattern are part of a region. Specific industries might have a formative influence, but a region cannot be reduced to the industry structure in itself. Rather, a region, with its tangible and intangible resources and characteristics, creates an organizational field for business activities and influences organizational behavior. The influence of regional actors depends on their interrelatedness with key symbols and their ability to mirror those practices that are taken for granted. A typical example is the Ruhr area. It is based on symbols and practices from the eras of the coal and steel industry. Actors representing the collective meaning of these eras are especially powerful. The meanings are still living, even though the industries themselves disappeared nearly half a century ago (see Grabher 1993). Thus, the existing industry structure in itself cannot sufficiently define a region. Dominant institutional mechanisms resulting from collective actors are at least equally important.

With respect to recent research, especially in regional studies, a region can be understood as an ecosystem with its typical characteristics. According to

Cohendet et al. (2014), self-enforcing dynamics resulting from the power of attraction are key characteristics. The ecological resilience (Boschma 2015) is a further important issue. The resilience allows a new growth path and a reallocation of resources to be found, at least as a reaction to external shocks (Boschma 2015). In this regard, a region often has both path dependencies due to institutionalized structures and normative settings resulting from dominant industry structures with their dominant practices and unrequested routines (see Grabher 1993; Wenzel 2015), as well as some sources for finding new ways of adaptation in order to survive, not necessarily in a specific industry, but as an ecosystem. Within an ecosystem, there are different (institutional) actors defining the organizational environment and the rules of resource allocation. Their role might be more dominant or more subordinated and their influence more direct or more indirect (Adner and Kapoor 2010; Dagnino 2004). This means that alternatives do not necessarily disappear; rather they sustain in a niche and are less visible, but can be activated if routines of the past threaten survival in the ecosystem. Parallel ambiguous or paradox developments of acting according to the rules of the past and of creating new ideas are, thus, a consequence.

According to the resource-based view of the firm (Barney 1991), the resource allocation is of most interest. From the DCV (Teece, Pisano, and Shuen 1997), the decisive factor is the ability to renew the resource basis. Teece (2007) refers to the processes of sensing, seizing and reconfiguring resources in order to underline the mechanisms of these dynamic capabilities. With respect to a regional view, this means that shaping the ecosystem is most important. Regional capabilities “can be defined as a capacity to create and provide collective competition goods and to stimulate and stabilize communication and cooperation between regional companies, schools, universities, technology transfer, research and development facilities and political and administrative actors. These goods and networks support the innovative capability of regional firms, this is ‘the firm’s ability to integrate, build and reconfigure internal and external competences to address rapidly changing environments’” (Heidenreich 2005, 742 with reference to Teece, Pisano, and Shuen 1997, 516).

In this regard, the regional capability is a network-based source determining organizational competitiveness. Firms are collective actors in this network among other institutional players. Organizations influence regional capabilities and, vice versa, are influenced by these capabilities. The reconfiguration of resources is a process of enactment (see Weick 1995a), a collective interpretation of opportunities and related activities. The organizational capability is, thus, neither a purely influencing nor a purely dependent variable (see also Greenwood et al. 2008). The unit of analysis of an RDCV is the process leading to a rearrangement of resources among firms and institutions within an ecosystem. Going beyond the focus of network research that lies on value co-creation and collaboration-based innovation (e.g. Adner and Kapoor 2010), an RDCV has a broader perspective of the

ecosystem and addresses institutional actors, determining the socioeconomic environment in which the organization is embedded. It completes the perspective on industry factors by considering regional institutional factors as well.

### **3. Theoretical components of a regional dynamic capability view**

#### *Components from the dynamic capability view*

The basic underlying concept is the DCV. The DCV (Teece, Pisano, and Shuen 1997; Eisenhardt and Martin 2000) addresses those capabilities and organizational routines that determine how organizations rearrange their resources and activities with respect to changing customer needs. Teece (2007) specifies related mechanisms with respect to the relevant process of sensing, seizing and reconfiguring resources.

- The analytical system and capacity to learn, and to sense, filter, shape and calibrate opportunities by scanning and monitoring internal and external development supports sensing.
- The mobilization of resources in order to address opportunities and to capture value by making unbiased decisions, managing boundaries, communicating goals, and building loyalty and commitment refers to seizing.
- The continuous alignment and realignment of tangible and intangible assets for overcoming constraints and managing knowledge in a new manner by combining and reconfiguring these assets themselves describes transforming, respectively, reconfiguring.

A process perspective characterizes the DCV, not necessarily in the meaning of a sequence of three sub-processes but rather in the meaning of different interconnected activities. Thus, the DCV can build a starting point for an RDCV. The activities related to sensing, seizing and reconfiguring are activities initiated in or resulting from all firms and institutions participating in the regional ecosystem. While the DCV provides an overall process description, the approach has its limitations in explicating the critical processes and decisive actors. Considering ecosystems a macrofoundation seems to be helpful for explaining the interconnectiveness of collective actors within a region and why dynamics increase or not.

#### *Components from new institutionalism*

Considerations from new institutionalism (Meyer and Rowan 1977; DiMaggio and Powell 1983; Scott 1992) are helpful in order to describe in more depth what the process of renewal between the regional institutional actors looks like and who influences the process in what manner. According to institutional thinking, organizations that belong to a specific institutional field tend to mirror the institutional environment in organizational practices. Organizational policies and practices re-

sult from coercive, mimetic and normative isomorphism within their organizational field, which might be a region. As a consequence, criteria for industry policy or investments in infrastructure, for example, are taken for granted and tend to fulfill the expectations of powerful institutional actors within a field (DiMaggio and Powell, 1983; Greenwood et al. 2008). These policies and practices tend to become a manifestation; “even in the absence of hard evidence on the efficiency of conducting business in a particular way, pressures of institutional isomorphism tend to develop and soon restrict the menus of intra-firm organization of activity” (Jacobides and Winter 2005, 402). The explanation for organizational development given in new institutional thinking is that institutional actors primarily enforce rigidities and hinder the adoption of new movements. Isomorphism among actors reduces the scope of practices and might lead to path dependency (Sydow, Schreyögg, and Koch 2009). Grabher (1993) describes this process as the “weakness of strong ties” and shows how strong ties became an obstacle for the Ruhr area. In this regard, the approach explains the mechanisms of why regional institutional change is extremely challenging.

Even though new institutionalism gives explanations for path dependencies, its explanatory power goes further especially when applied to an ecosystem instead of an industry. It also explains the formation of new activities leading to a process of renewal. Alternatives to act might disappear if one considers a specific industry (e.g. Wenzel 2015), but with respect to a region, alternative options do not normally disappear completely. They sustain in niches or less influential sub-communities. There are also silent and, in the words of new institutionalism, partially decoupled fields in an ecosystem. This also implies that new institutionalism, even though it originally only had a poor capacity to explain change (Greenwood et al. 2008), can contribute to a better understanding of regional dynamics. The specific value of this explanation is that it allows one to understand renewal under the conditions of inertia. Oliver (1991) shifted the discourse into this direction by arguing that institutional change is possible through strategic action and new dependencies of critical resources. It is the actor-centered direction in this approach that allows one to refer to questions such as: “How are new organizational forms created and legitimated? Who has the power to legitimate a novel form? Who are the institutional entrepreneurs?” (Greenwood et al. 2008, 13). In this regard, Leblebici et al. (1991) highlight the role of peripheral actors less embedded in the institutional network. Powell and Colyvas (2008) address these actors on a collective and individual level. They give emphasis to universities in their capacity for regional change and they reflect on the role of institutional entrepreneurs. Powell and Colyvas (2008) outline that an institutional entrepreneur cannot be described analogously to the entrepreneurship literature as a heroic person in the center. They rather consider actors involved in everyday activities who have the capability to bring in new interpretations, to resist others and “transform logics and alter identities” (Powell and Colyvas 2008, 277). Other key features of actor-centricity in new institutionalism are cognitive work, the creation of social order and especially relational activities of sensemaking (Powell and Colyvas 2008).

With reference to Weick (1995b), sensemaking implies that “conceptions of identity and logics of action are relational, constructed not only through projections of self and others’ perceptions, but also through scripted interactions in relation to what others are ‘supposed to do’” (Powell and Colyvas 2008, 282).

### *Interim conclusion*

So far, actor-centricity in the DCV came from the psychological foundation in the microfoundations movement. A combination of the DCV with new institutionalism enhances the macrofoundation and allows to outline institutional actors’ influence on organizational renewal. It becomes obvious with the actor-perspective of new institutionalism that renewal is a process of enactment in day-to-day work in a rather persistent collective institutional setting. This gives specific attention to the actions in the process of seizing: Communicating new goals and increasing commitment towards these goals is a challenge for sensemaking. Sensemaking across certain organizations and authorities of decision-making within a region is the key activity among the interacting institutional representatives. The relevance of opening actors’ minds to new ways of resource allocation can be underlined as a key activity and understood as a collective movement. Initiatives for these movements do not result from the key institutional players, but from new actors, such as institutional entrepreneurs or universities. The change of routines results from their increasing influence. Seizing is not the rational consequence from sensing, as supposed in the DCV, it is a separate field of interaction with its own rules of enactment where change might be the outcome.

### *Components from regional studies*

At this point of the theoretical outline, the considerations from regional studies can be aligned to the perspective developed. Regional studies tell us that new actors are decisive, but often have only weak ties with the consequence that new forms of organizing are decisive in order to enhance their influence. Regional studies refer to Granovetter (1973), who shows “the strength of weak ties” in order to further develop a social network. He argues that loosely coupled actors rather than dominant actors have the ability to irritate and further develop cohesive networks with rather homogeneous mindsets by building bridges in new directions. It is actors with weak ties who open the eyes of a target group to new perspectives and, thus, increase the probability of a new movement. This is the reason why Grabher (1993) came to the conclusion that the Ruhr area suffers from the “weakness of strong ties”. Inspired by Granovetter’s (1973) description of networks, Grabher exposes the problem that there are only dominant traditional actors hindering new regional developments.

Going further, Cohendet et al. (2010; 2014) demonstrate, with the examples of Montreal, Paris and Barcelona, that a specific form of organization is a further prerequisite for fruitful regional development. They call this organizational form

consisting of three interdependent levels the “anatomy of the creative city” (Cohendet et al. 2010). The first level is the creative “underground,” consisting of actors with a focus on the exploration of new ideas and opportunities – this is the creative class (see Florida 2002) with its potential for building new ties and bringing in new impulses. These actors are creative, but normally only have a little power. They need further institutional embeddedness in order to gain influence on the regional development. The institutional “upperground,” with a stronger focus on exploitation, also belongs to this system. This level includes universities and other comparable institutions. Single actors from this field can be part of the underground or are, at least, in continuous exchange. The pivotal “middleground”, with its focus on the management of exploitation–exploration tensions, is between the underground and the upperground. The middleground bundles energy and contributions of individual and collective actors in order to drive forward the regional economic development via visible projects indicating new directions of development. The power of attraction leading to self-enforcing dynamics results from the middleground (Cohendet et al. 2014). It organizes and sustains the exchange between underground and upperground in order to make sure that the actors who have the potential to enforce regions in new directions have enough influence and continuous drive. This results from specific events, places and spaces representing the middleground in order to convert ideas into projects and solutions. The middleground activities enhance the identity among participants (Grandadam, Cohendet, and Simon 2013).

These descriptions are in line with and specify Florida’s (2002; 2005) analysis of regional innovation. According to his comparisons between regions, respectively cities, in the USA, Florida argues that three factors have to converge: talent, tolerance and new technologies. Talent is a necessary, but not a sufficient prerequisite. It is always a configuration with tolerant attitudes and technological development that makes the difference in economic prosperity.

*Summary: Integrating components of three approaches for an RDCV*

The combination of the DCV with new institutionalism and regional studies allows a better understanding of the process of renewal within a region and its relevance for organizational competitiveness. The mechanisms on the upper-level of the organization that are supportive or hindering for new ways of allocating resources can thus be specified. An RDCV draws a picture from the organization as embedded in a regional ecosystem. The processes of interaction between the organization and the surrounding ecosystem are the unit of analysis for describing renewal within and among organizations – a perspective that goes beyond the DCV and the relational view.

According to the RDCV renewal depends on “institutional entrepreneurs” (Powell and Colyvas 2008) with only weak ties to dominant institutional actors who have the potential for initiating change and inspire the reconfiguration of resources al-

located. They gain increasing impact from sensemaking activities aiming at transforming logics and altering identities within the regional ecosystem. Even though and since these actors have only weak ties to the dominant actors, they can shift mindsets into new directions and request taken-for-granted routines of other members of the community. These institutional entrepreneurs might belong to the regional creative class, but need the backing of an organizational form – a middleground platform with places, events and projects – that helps to attract new actors and sustain activities and ways of exchange between creative actors and supportive institutions. Universities can, thus, play a pivotal role, since they have good prerequisites for initiating and organizing projects where creative people and institutional actors meet and exchange ideas continuously. Whether a region crystallizes a new direction for its further development and generates the capability for purposefully bundling activities in new directions, depends on the power of the middleground to also attract representatives from regional firms and institutions to be involved in alternative settings, open their minds for new subjects of dialogue and to change their policy patterns. High standards in technology that can be reached by referring to the middleground seem to be advantageous. Then, there is the power necessary for also affecting the decision-making processes and activities within regional firms. As Boschma (2015) outlines for ecosystems, an external shock or regional crises can be considered as a typical matter for activating these new dynamics.

In reference to the DCV, it becomes obvious that seizing is the most critical part of the process of regional renewal, since the dynamics described meet dominant institutional actors who aim at protecting taken-for-granted policies and practices of resource allocation. It can be assumed that sensing is based on different perceptions in different groups of actors who come to different conclusions about strategic consequences. Thus, it is not the decisive field for regional renewal. It is more important to find ways in which to bring specific perceptions into action. Seizing is a process of enactment among certain institutional representatives, where new institutional actors enter the community, bring in their ideas and suggestions, and realize projects to prove these ideas. In this regard, the middleground is essential for sustaining the entrepreneurial impact.

The explanation given enriches the DCV and goes beyond new institutionalism and regional studies as it has a clear focus on renewing the resource basis. It also goes beyond resembling concepts such as path dependence theory (Sydow; Schreyögg, and Koch 2009), which is of high explanatory value for understanding why regional transformation fails (Grabher 1993) or how path-breaking can look like (Wenzel 2015). The broader view of the RDCV addresses the ecosystem with its endogenous mechanisms of renewal and illuminates the niches where dynamics for new forms of resource allocation can be initiated. This perspective comes from regional innovation literature especially searching for the mechanisms that are supportive for regional change (Cohendet; Grandadam, and Simon 2010;

2014). An RDCV integrates complementary views, describes the ambiguous dynamics and allows these descriptions to align to the framework of competitive theory.

The approach also goes beyond the relational view; while the relational view has a focus on transactions and new sourcing strategies on the upper-level, but rather neglects other institutional dynamics, the RDCV contributes to a political institutional perspective as a relevant issue of allocating resources.

Figure 1 summarizes the approach developed. Some ideas of the RDCV show similarities to writings from regional innovation, especially the outline of transformation. However, the approach goes further, as it also reflects the counteracting mechanisms and considers the process in the light of new ways of resource allocation. An RDCV is rooted in competitive and organizational theory. A validation of the assumptions outlined is a task for future empirical research.

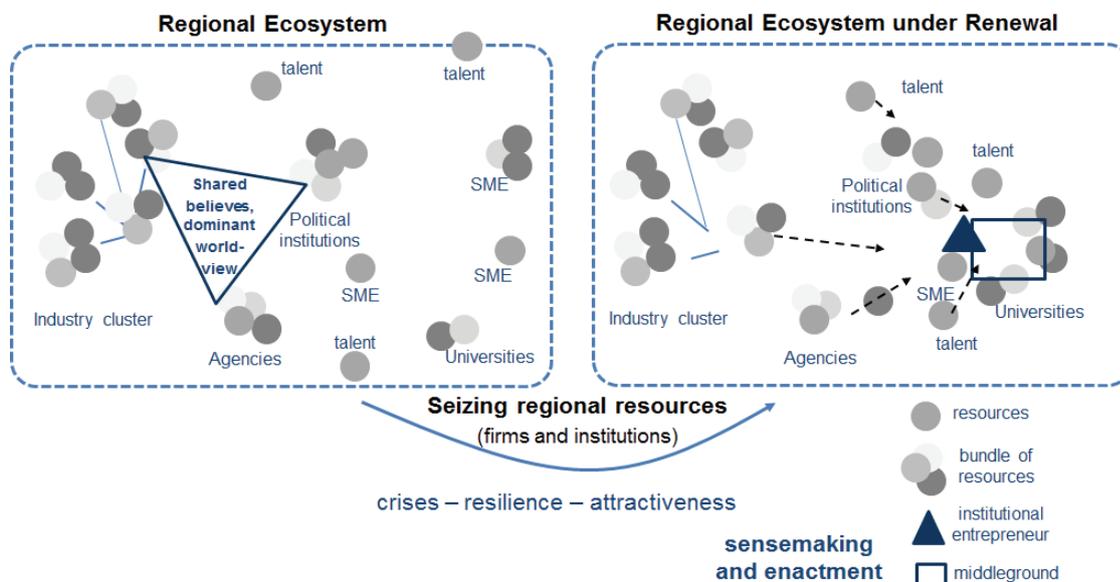


Figure 1: RDCV – Understanding the renewal of regional resource allocation

#### 4. Illustration: Processes of regional transformation in the ecosystem Ruhr area

I have taken the example of the Ruhr area as an illustration of the theoretical outline since its development has already been the subject of research in regional studies. Grabher (1993) showed that the Ruhr region suffered a lock-in regarding development until the beginning of the 1990s and is not able to develop further due to the dominant role of traditional institutional actors. As there has been a higher dynamic during the last few years, it is worth analyzing the reasons and mechanisms behind this. For this illustration I refer to newspaper articles, online documents, public regional statistics and regional project reports (see Appendix).

The Ruhr area is one of the weakest economic areas in Germany even now, with a comparatively high rate of unemployment: 10.8 % in the Ruhr area in comparison to 6.7 % in the whole of Germany in January 2016 (Bundesagentur für Arbeit 2016). The region suffers from a severe brain drain, especially among young graduates. The region has a high concentration of universities and applied universities educating primarily young talents who grew up in the region. More than 50 % of the latter leave the region after their graduation due to the lack of attractive employment opportunities (Kriegesmann, Böttcher, and Lippmann 2015). As a further consequence, the age of the region's population is above the German average (Regionalverband Ruhr, Ref. 3 2016). Although the universities in the region are important employers and count more than 160,000 students (Regionalverband Ruhr, Studierendenzahlen 2016), they have a rather isolated position instead of being closely linked to other institutional actors.

As documented, there have been certain economic crises and severe structural transitions in the Ruhr area since the beginning of industrialization in Germany. The transitions followed the same dominant pattern, but did not lead to a transformation until the beginning of this decade. The Ruhr area is often considered the most industrialized region in Germany. It was so in the past, but nowadays, the structural change becomes obvious. Exemplarily, 26 % are employed in industries, which is below the German average, while 73 % are employed in the tertiary sector, which is above the German average (Mikrozensus 2014).

An important characteristic and a reason why the renewal of the resources allocated is a most challenging subject is the monoculture in industry – the degree of specialization, respectively focus on only one industry cluster. The first era in the Ruhr was the coal industry, especially important during the 19th century, succeeded by the era of the steel industry until the middle of the 20th century, followed by related industries from mechanical engineering and automotive manufacturing with the surrounding supplier industries. The third and latter era that was especially relevant in the second half of the 20th century was already in crisis during the 1980s (Grabher 1993) and came to an end with General Motor (GM)'s decision to close the Opel automobile manufacturing plant at the end of 2014 (<https://www.youtube.com/watch?v=69SiAw28aKM>).

When GM announced in December 2012, after five years of deep crisis, that it would close down its automotive production plant in Bochum – a decision that could have been foreseen – the major institutional actors reacted according to their dominant logic that was decisive in former processes of regional transition. Labor unions and their scientific partners started to protect employment with an initiative for a new perspective of the automotive industry in the region. However, their survey indicated that most people do not believe in the future of the automotive industry (Blöcker, Palomo, and Wannlöffel 2013). A public fight between the GM work council and the GM board of directors attracted a lot of attention in the newspapers (Handelsblatt 15.08.2013). Politicians particularly tried to attract industries based on low skilled labor and a high demand for extended areas (Laurin,

ruhrbarone 29.04.2013). All suggestions tried to implement quick gain solutions in order to moderate the crisis, but without giving a new orientation for the future. The dominant institutional actors showed problem solving activities according to their experiences and behavioral patterns of the past. Their practices were taken for granted.

From the perspective of the universities in the Ruhr region, the crisis also entailed an opportunity. At the beginning of the crisis, their main representatives were not deeply involved in the search for solutions, since the regional attitude rather avoided an academic-based style. The academic institutions did not have a specific role in overcoming economic crises. Under the leadership of Bochum University, which is the largest regional university with 42,000 students and 5,600 employees, the actors involved in higher education agreed upon an alliance called “UniverCity” (<http://www.univercity-bochum.de/hochschulen>). The alliance convinced the mayor of Bochum and certain politicians that education and science could and should build the future of the region. The rector of Bochum University played a considerably important role in this process, since he was the speaker of the group and gained more and more confidence from the mayor, influencing the language and sensemaking activities of other actors as well (Kühlem, Ruhr-Nachrichten.de 11.04.2014; [www.youtube.com/watch?v=xFy4-ZGdFAM](http://www.youtube.com/watch?v=xFy4-ZGdFAM)). Engaged actors imitated the rector’s language and interpretation. The rector, for example, created a vision under the label “Bochum 4.0” and encouraged the mayor to adopt and to announce a new era superseding former industrial eras. The politicians made use of it in their own sensemaking activities and protected the label as a trademark. It is nowadays taken for granted in public day-to-day communication (Kühlem, RuhrNachrichten.de 11.04.2014).

Following this, university representatives participated in working groups with representatives from local administration, political parties, employer organizations and unions. The rector of Bochum University became a member of the mayor’s inner circle of a small group of advisors and the initiative of certain corporate institutions for regional development called “Perspektive 2022” (<http://www.bochum2022.de/>). This shows that the rector increasingly took over the role of an institutional entrepreneur. At the beginning, there were only weak ties to the dominant groups, but these ties allowed new perspectives to be introduced and a new vision to be opened up. There was an identity shift from the former industrial eras to the belief that education and science can be a sustainable foundation for future regional prosperity that avoids a monocultural industry, but is the breeding ground for new ventures in certain fields of business.

In addition, two initiatives were established that can be considered as middle-ground. The first came from the creative underground, especially the actors and the artistic director of the local theater. They established the “Detroit” project, connecting regions worldwide that had suffered from the GM crises. The intention was to increase the consciousness regarding what happens to regions and the people living there when they depend greatly on major industries such as GM. The

organizers also wanted to make an appeal to GM to take a different responsibility in firm policy. Moreover, they wanted to create a vision for the future. Certain discussion groups and special acts followed (e.g. *Neue Züricher Zeitung* 14.06.2014; Kühlem, *RuhrNachrichten.de* 11.04.2014). The second activity was established by the regional universities, again under the leadership of the rector of Bochum University. The academics established the concept of the World-Factory®, which defines a project-based platform for a continuous exchange among economic actors, local institutional players and highly engaged academics from certain disciplines in higher education (<http://aktuell.ruhr-uni-bochum.de/mam/content/worldfactory-workshop-ub.pdf>; [www.youtube.com/watch?v=xFy4-ZGd-FAM](http://www.youtube.com/watch?v=xFy4-ZGd-FAM)). The name refers to the regional mindset of being an industrialized area – which is rather a myth, as public statistics clearly indicate that industry in the city is below the German average – and combines this taken-for-granted assumption with a new worldview opening the mindset for new developments. The initiative came up under the conditions of a regional crisis but had a clear focus on future development. The WorldFactory® concept gained support from entrepreneurs of small and medium-sized enterprises (SMEs), especially those companies working in the digital community, and from business associations. They embraced the exchange basis where company representatives, lectures, researchers and advanced students define challenging projects for future development, explore business fields for future growth and develop solutions “outside the box.” The concept especially supports the alliance between SMEs, academics and achievement-oriented students. It also provides a mentor-based infrastructure for start-up activities and an extended platform for technology transfer. There are certain buildings where the followers of the WorldFactory® join each other and establish new projects. The next steps will be a further building on the former GM ground surrounded by other research buildings attached to Bochum University. While the “Detroit” project stopped in 2015 (Lokalkompass 2014), the WorldFactory® is still growing continuously. It became a middleground attracting regional firms and enhancing new co-operations. The power of attractiveness was high enough to sustain engagement and build new business alliances independently from the dominant players of the past.

The example shows that the Ruhr area can be considered as an ecosystem with dominant institutions as well as loosely coupled actors who play an important role in regional transformation. The key characteristics of an ecosystem are fulfilled: (1) The resilience that allows a new growth path to be found and resources to be reallocated results from institutional entrepreneurship and middleground initiatives. These could be activated in reaction to external shocks (see Boschma 2015). (2) It is the interdependence of institutional entrepreneurship and middleground activities which enhances the attractiveness and openness for new regional perspectives. The concept of the WorldFactory® provides a project-based platform for technology development and continuous exchange among economic actors and local institutional players, including the institutions of higher education. Participants define specific projects and supply their own resources, especially in

terms of intellectual, creative and technological capital. The attractiveness for young talents increases. New bundles of resources emerge.

During this process, other actors apart from the dominant institutional players of the past moved to the foreground, especially representatives of higher education and of less organized SMEs. They became part of the scenery, even though they were only loosely coupled weak ties beforehand. The reorganization of regional institutions and the identification of new organizational forms of interaction seem to be of high relevance for gaining dynamic capabilities.

In the example of the Ruhr area, the influence of institutional entrepreneurs with rather weak ties beforehand is crucial. They have a considerable influence in sensemaking and altering regional identities. The second decisive point is a new organizational form for attracting people from academia and business, binding and backing their creative and entrepreneurial activities. Moreover, it becomes obvious that organizational and regional renewal are twins: they are interdependent and cannot be separated from each other. In sum, the factors described can be considered as indicators to treat the components of an RDCV seriously and to find a suitable design for deeper empirical analysis in the future.

## **5. Methodological implications**

As for all empirical investigations, the guiding principles are a high quality of unbiased data and evaluation criteria that help to maximize the insights that can be deduced from a set of data. The methodology has to mirror the state of the art in the field of research and the type of constructs and variables that are in the focus of analysis.

Referring to the three approaches on which the RDCV is based, the heterogeneity of methods in use becomes obvious. The illustration at the end of the former paragraph is a typical example of how to present empirical data in regional studies. Regional dynamics in resource allocation build the unit of analysis in this type of case description (see also Cohendet et al. 2014; Grandadam, Cohendet, and Simon 2013). The analysis of documents describing these dynamics are a key source for data evaluation.

Referring to new institutionalism authors suggest ethnomethodology as a suitable approach for field work (Powell and Colyvas 2008). According to Zucker (1977), participating interaction allows the exploration of taken-for-granted practices and routines. This type of fieldwork needs a time span for data collection. Both regional studies and new institutionalism emphasize qualitative research.

There is an intensive discussion in the DCV on empirical analysis and, so far, two parallel directions can be identified (Easterby-Smith, Lyles, and Peteraf 2009). The first direction also belongs to qualitative research based on case studies analysis (e.g. Jantunen, Ellonen and Johansson 2012; Teece 2012). The second direction is quantitative research making use of industry statistics and longitudinal data often based on proxy variables (e.g. Macher and Mowery 2009, see also Eggers

and Kaplan 2013). A current issue of methodological discourse in DCR is the specification of the unit of analysis in multilevel research (e.g. Eggers and Kaplan 2013).

Regional dynamic capabilities are more a field for exploration than of hypotheses testing when the current state of knowledge is taken into account. It is hard to afford a complete *ex ante* operationalization of relevant constructs and variables. While there are some proxy variables, for example, for talent or technology (see Florida 2005), and regional-specific indicators for new ways of resource allocation (e.g. public spending for infrastructure related to new industries, new public–private partnerships or the start-up founding rate), an *ex ante* operationalization of practices that are taken for granted, or of institutional entrepreneurship, the strength or weakness of ties, sensemaking, enactment and middleground activities, is rather impossible. Thus, a pure quantitative approach is not yet reasonable. Those factors that particularly specify seizing are more a phenomenon that has to be explored with the help of qualitative data. Informant bias has to be avoided while collecting these data. Longitudinal data are advantageous because of the process perspective of the RDCV. In addition to the methods in use in the three grounding theories of the RDCV, a reflection of approaches that have to cope with similar challenges is helpful in order to gain more specific insights for a design of analysis that mirrors the methodological state of the art.

Considering path dependence theory with a focus on analyzing path creating and path breaking mechanisms (Dobusch and Schüßler 2013; Wenzel, Schmidt and Fuerstenau 2015) authors set standards in the way how self-reinforcing dynamics between different levels can be analyzed (Wenzel, Schmidt, and Fuerstenau 2015). As Wenzel and colleagues (2015, 3) argue, “single-level methodologies may be inclined to miss those self-reinforcing mechanisms.” Their access to multilevel analysis is process-oriented and avoids a separation between different levels, since this would not allow one to explore phenomenon such as enactment. This is why Wenzel and colleagues (2015) suggest a “Path Biography Methodology.” This “is a qualitative approach explicitly designed to draw researchers’ attention to self-reinforcing mechanisms on and between” different levels (Wenzel, Schmidt, and Fuerstenau 2015, 3). Even though the methodology refers to technology and structure as different levels of path creation, the basic idea of how to conduct a multilevel process analysis can be transferred to the RDCV. In this case, the self-reinforcing mechanisms result from sensemaking activities leading to enactment within a region.

Since a methodological view that does not separate the different levels while conducting a multilevel analysis is rather untypical for DCR, it is worth mentioning that there are at least some similar thoughts in the microfoundations literature. Salvato and Rerup (2011) as well as Rerup and Feldmann (2012) distinguish between sensemaking and action, respectively sensemaking and enactment, as mechanisms and units of analysis for indicating the progress of renewal.

Further methodological implications can be deduced from current discussions and standards in social network research (Williams and Sheperd 2015) where the unit of analysis goes beyond a single organization. This perspective gives ideas how to treat the ecosystem as the core unit and how to gain unbiased data. Williams and Sheperd (2015) plead for a mixed-method approach and converting qualitative data into quantitative statements by making use of the Gioia method (see Corley and Gioia 2004; Clark et al. 2010; Gioia, Corley, and Hamilton 2013). Gioia's standards allow first and second order constructs to be deduced from qualitative data (Corley and Gioia 2004; Clark et al. 2010; Gioia, Corley, and Hamilton 2013). This type of data evaluation has been applied especially in the analysis of organizational identity shift and seems to be suitable for analyzing the identity shift in ecosystems as well by transferring "qualitative material (i.e., organizational histories) to analyzable data for the quantitative analysis of network content and structure" (Williams and Sheperd 2015, 9). Thus, a successful mixed-method analysis conducts content analysis from certain data, while making great use of secondary data in order to avoid informant bias. It contributes continuously to the specification of first and second order constructs during the process of data evaluation (Williams and Sheperd 2015).

To resume, the parameters for an empirical exploration of the RDCV are the necessity to conduct a process-based multilevel analysis within a regional ecosystem, including variables with different states in construct development. A mixed-method approach could be the method of choice in the design of analysis since it allows a reflection of the different methodological standards of the three underlying approaches of the RDCV and a reference to the current state in the overall methodological discourse. Both, data collection and data evaluation are crucial during this process. While data collection should make extensive use of secondary data, data evaluation should try to end up with a complete operationalization of relevant variables by converting qualitative data into quantitative statements, respectively, to move from first order constructs to second order constructs.

An example related to the illustration of the Ruhr area is as follows: The note in protocols that the mayor protects a new label "Bochum 4.0" that originally came from a university representative is a first order construct deduced from document analysis that indicates enactment of traditional actors and new actors (second order construct) and gives evidence – together with other indicators – that institutional entrepreneurship is an antecedent of regional renewal (second order construct).

Table 1 summarizes what variables constitute the RDCV and makes suggestions of how to gain empirical access to these variables. It becomes obvious that document analysis and participating observation in regional board meetings or panels are fruitful methods of data collection. In order to complete the picture, data collection might be extended to expert interviews or discussion groups based on

storytelling about the influence of certain actors. A primary interview-based research approach should be avoided, because there is a high risk of informant bias resulting from tendencies of self-attribution of regional actors.

<b>Variable</b>	<b>Operationalization / indicator</b>	<b>Research method</b>
Region	Geographic area with homogeneous cultural-cognitive and regulative structure in industrial and labor policy	Document analysis
Institutional actors	Groups involved in regional industrial decision-making Degree of organization within these groups	Document analysis; esp. protocols from regional decision boards and about board elections Public statistics
Taken-for-granted practices and routines	Regulations and spending that are updated continuously without any critical discussion	Document analysis of budget plans; participating observation in board meetings of city council and firms
Regional identity	Symbols and stories in use	Observation of representative events
Crisis	Perceived and communicated decline in a field of business	Industry reports; newspaper reports
Institutional entrepreneurs/ underground	Accentuation of formerly uninvolved actors	Participating observation of regional board meetings, storytelling in the regional community, attribution of influence among members of the regional community; newspaper reports
Strength/ weakness of ties	Number of actors/followers supporting specific positions	Analysis of former and current coalitions in decision-making processes; protocols from board meetings: identification of top ten actors in the past and present by the number of followers
Sensemaking	New arguments and perspectives becoming dominant subjects in the regional discourse	Participating observation of regional board meetings, storytelling in the regional community, newspaper reports
Enactment	Change in the constitution of members and boards; the continuous involvement of new actors in relevant discussion boards and panels; change of routines according to the content of sensemaking	Participating observation in regional discussion groups and panels; decision-making protocols; groups adapting a specific wording
Middleground	New projects established for new ways of resource allocation	Document analysis, expert interviews
Upperground	Universities connected to underground and middleground: development of mutual projects	Document analysis, expert interviews

(New) resource allocation	<p><i>Budgeting</i> public spending for infrastructure related to new industries firm investments in regional collaborative R&amp;D projects</p> <p><i>Foundation</i> number of public–private partnerships start-up founding rate</p> <p><i>Talent</i> Talent Index: percentage of academics/ highly educated people among the regional population compared to the national index (see Florida 2005, 119) Brain drain index: percentage of university graduates grown up in the region compared to percentage of graduates leaving the region after graduation</p> <p><i>New technology</i> Share of digital industry, growth of digital industries in comparison to national development</p>	<p>Document analysis</p> <p>Company reports</p> <p>Regional statistics</p> <p>National statistics</p> <p>Regional statistics</p> <p>Industry reports</p>
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*Table 1:* Relevant variables, indicators and methods for analyzing key constructs of the RDCV

## 6. Summary and Outlook

The outline of components of an RDCV is considered as enrichment of the DCV as it allows a better understanding of upper-level dynamics for firms' renewal and sustainability in competitiveness. It leads to a more precise description why resources are allocated in a new manner or why not. It becomes obvious that the region is the decisive entity to understand the mechanisms for changes in resource allocation. The RDCV emphasizes constructs and variables that were not in the focus of DCR before. Most critical factors for renewal are institutional entrepreneurs and middleground activities, respectively, their interconnectedness. The first of these key variables is deduced from new institutionalism and the second from regional studies. Their consideration under the umbrella of the DCV underlines the relevance of institutional mechanisms for organizational renewal and how sustainability can be enhanced if new dynamics occur.

Using the example of the Ruhr area, including the WorldFactory® concept and interaction between academics and entrepreneurs, as an illustration shows that it is worth conducting deeper empirical analysis on the theoretical outline. This analysis should aim at a specification of second order constructs deduced from primarily qualitative data. It can also make use of public and regional statistics in a mixed-method approach. A thorough data evaluation can help to further specify the constructs identified and, if possible, reduce the components of the RDCV to key concepts.

An empirical analysis of regional dynamic capabilities requires a long-term approach in order to compare institutional constellations at different points in time. This will be especially insightful if also comparing different regions with each other in order to estimate whether regional dynamic capabilities are idiosyncrasies or commonalities.

This contribution is considered to be an invitation to other researchers to build on an RDCV mutually.

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