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# Overcoming the Dualism between Adaptation and Adaptability in Regional Economic Resilience

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**Abstract:** Although regional resilience has come into fashion to understand how regional economies recover after shocks, it has suffered from dualistic thinking, which undermines its explanatory power. This article addresses this problem by developing a conceptual framework of uneven resilience of regions in a long-term perspective, on the basis of a comparative empirical analysis of adaptation and adaptability processes in two typical Chinese mining regions. This framework defines adaptation and adaptability in an evolutionary and mutually cohesive way that overcomes the traditional dualism. It also demonstrates how variations of adaptation-adaptability relationships can result in uneven regional resilience.

**Key words:** regional economic resilience; adaptation; adaptability; Chinese mining regions

“The wise adapt themselves to circumstances, as water moulds itself to the pitcher.”

—Chinese Proverb

## 1. Introduction

In recent few years, the notion of *resilience* has become a ‘buzzword’ in economic geography (Martin and Sunley, 2015). For one thing, the research enthusiasm on the notion has been largely fuelled by the on-going ‘recovery’ agenda since the 2008 global economic crisis. For another, regional resilience resonates with the ‘evolutionary turn’ in economic geography because both focus on the patterns and mechanisms of regional economic evolution. Leading economic geographers argue that regional resilience -albeit newly borrowed from other disciplines- should not be treated as a transient notion (Martin, 2012; Martin and Sunley, 2015), as it echoes, in a fundamental sense, “a very old and enduring question” in economic geography (Christpherson et al., 2010, 4): why some regional economies are more capable of overcoming all sorts of shocks towards long-term development than others (Hassink, 2010b; Simmie and Martin 2010). As Martin and Sunley (2015, 3) suggest, “resilience is part of the process of geographically uneven economic evolution and development, and should be theorized and analyzed as such”.

Recently, informed by the complex adaptive systems theory, several endeavors have been made to conceptualize resilience in urban and regional contexts. Of these endeavors,

*adaptation* and *adaptability* are the most debated notions (Pike, et al., 2010; Hassink, 2010b; Martin, 2012; Boschma, 2014). Adaptation is perceived as a path-dependent process maintaining existing paths or primary functions of a system. Adaptability often refers to an adaptive ability, in pursuit of new path creation and structural change. Despite some good reasons to support this idea (Grabher and Stark, 1997), it potentially draws a dualism, between adaptation and adaptability. A similar black-or-white dichotomy can also be found in the resilience literature. Many terms, such as change/continuity, adjustment/renewal and lock-in/lock-out, are used without sound examination and substantial elaboration.

Some scholars have begun to criticize this trade-off idea. They suggest that the tensions between adaptation and adaptability should be at the core to understanding the geographies of economic resilience. For example, Boschma (2014, 2) argues that resilience is about “how to secure adaptation and adaptability simultaneously”, and related variety is the key to make a region more resilient. Moreover, Pike et al (2010), among others, stress that the trade-off idea in fact stems from the neglect of policy and politics as forces of resilience. They highlight that a complex relationship between adaptation and adaptability is embedded in, and shaped by power relations, politics, and the heterogeneous interplay between the state, capital, labor and society in a broader multi-scalar environment (MacKinnon and Derickson, 2014). Rather, others think of adaptability as a product of history, and that the degree of resilience is contingent on the ways in which existing assets are utilized for new purposes (Bristow and Healy, 2014;

Martin and Sunley, 2015). Despite much difference of view, there is a consensus that multi-scalar factors shape the ways in which adaptation and adaptability interact.

However, so far, the debates on adaptation and adaptability are mainly conceptual; what is lacking are in-depth empirical, qualitative case studies. Moreover, the existing regional resilience literature tends to over-emphasize the regional ability to recover from one-off shocks; little attention has been paid to how regions adapt in a 'slow-burn' context, and why they adapt differently. There are several questions that need to be addressed by empirical endeavors: is there a trade-off between adaptation and adaptability in a long-run perspective? If yes, how can this trade-off be overcome and by whom and for what purpose? More precisely, in what conditions are adaptation and adaptability (or not) related? Do different patterns of adaptation-adaptability interaction matter for uneven regional resilience? And if yes, how can we understand it both conceptually and empirically?

Therefore, the purpose of this paper is to advance the understanding of regional economic resilience by exploring the relations between adaptation and adaptability. The paper (re)defines adaptation and adaptability in an interactive perspective by suggesting a typology of adaptation-adaptability relationships. Following this, impact factors are proposed in order to explain and analyze the unevenness of regional resilience. In the empirical studies, we take two Chinese coal-mining regions, as illustrations in order to show how changing multi-scalar factors shape out varieties of adaptation-adaptability relationships that matter for the differentiation of resilience.

Our article is organized as follows: Section 2 critically reviews the existing literature on regional economic resilience. It particularly focuses on the conceptual fuzziness and dualism of adaptation and adaptability. Based on this, the above-mentioned typology and impact factors are discussed in Section 3. Section 4 analyzes how and to what extent adaptation (the dynamism of the old mining path) and adaptability (the formation of new growth paths) are related in Zaozhuang and Fuxin over the past 15 years, and also addresses why the former region is more resilient than the latter. Finally, Section 5 summarizes the findings and highlights our key arguments, suggesting that adaptation and adaptability should not be understood separately. It is further argued that they are equally important to long-term regional economic evolution, and should be conceptualized as dialectical, dynamic, indicative dimensions of regional economic resilience.

## **2. The notion of regional economic resilience: still fuzzy?**

The notion of *regional economic resilience* can be seen as a result of the analogy between the workings of nature and those of man-made regional economic systems in a post-crisis context. Akin to ecological and engineering resilience, regional economic resilience, initially, was associated with a local economic recoverability from shocks (Foster, 2007; Hill et al., 2008). This understanding, however, has been increasingly criticized (Pike et

al., 2010; Hassink, 2010b). It is suggested that regional economic resilience needs to reject the (multi-) equilibrium thinking adopted by ecology, psychology and disaster management, and to embrace evolutionary and systematic complex theories. Yet, thus far, most studies consider resilience more as a metaphor, rather than a well-established concept (Pendall et al., 2010). And there is a tendency to use it as a policy instrument or a development agenda. Despite a few insightful conceptualizations (Martin and Sunley, 2015), the notion has suffered from fuzzy definitions and incoherent understandings.

In our reading, there are two main intertwined dimensions that have put the resilience notion in danger of becoming a ‘fuzzy concept’ (Markusen, 1999). They are, namely, 1) varieties of definitions and shifting understandings and 2) The use of dualistic terms.

Both are critically discussed as follows in an attempt to identify the shortcomings of the existing conceptualizations on resilience, and also to point out potential avenues for improvement.

#### *Varieties of definitions and shifting understandings*

Resilience is a contextualized idea, suggesting the centrality of the ‘recovery’ or ‘survival’ discourse. It has been generally accepted as an ability of a system responding to a shock, bearing a clear purpose of maintaining system stability and durability. From this point, the ‘bounce back’ thinking seems reasonable when applied into the regional economic system context. Because, of all tasks in a region after a shock, recovery, rather than others, is the first priority and also the most realistic agenda. Therefore, the original idea of resilience, by default, is based on particular conditions, restricted to a short-term,

recovery-oriented, and equilibrium setting. As Bristow and Healy (2014, 932) state, “resilience reflects particular agendas”. Thus, there is a high likelihood that the term might be replaced easily by some other terms, when a crisis ends, or a new context comes.

Economic geographers have not only defined regional resilience as an ability to cope with one-off shocks or disturbances, but also as a long-term ability to adapt to omnipresent uncertainties (Simmie and Martin, 2010; Martin, 2012; Martin and Sunley, 2015). One reason is that crises are not merely restricted to sudden shocks, but can also be chronic problems and challenges, such as deindustrialization, resource depletion and aging (Dawley et al., 2010). In a deeper sense, shocks have permanent effect in nature, and there is ‘memory’ of the shock imprinted itself in the economy, known as ‘remanence’ (Cross et al, 2009). In this regard, crises can be seen as an input of new conditions, making the context dynamic and evolving in a path-dependent way. Regional resilience therefore matters for how a region adapts to changing contexts other than merely to specific shocks/crises. This perspective shows that resilience makes sense for long-term *processes* of regional development (Martin and Sunley, 2015).

By drawing insights from complex adaptive systems theory, regional economic resilience has been further conceptualized as a dynamic adaptive ability. One strand of this direction centers on the four-phase adaptive cycle in which the degree of resilience varies according to the ‘connectedness’ of actors in a regional system (Pendall et al., 2010; Simmie and Martin, 2010). It is claimed that regional resilience evolves by following a



circular order from ‘conservation’ and ‘release’ to ‘reorganization’ and ‘exploitation’, and back. This conceptualization is however rigid, not only because it delivers a multiple equilibrium expression, but also, in reality, the factors shaping resilience are not bounded to local endogenous networks. As an improvement, Martin (2012) combines the idea of *hysteresis* with resilience, suggesting four dimensions, namely ‘resistance’, ‘recovery’, ‘reorientation’ and ‘renewal’. He highlights the varieties of reactions of regions to recessionary shocks, and the important roles of both shock characteristics and economic structural factors in the processes. Although, as Martin (2012) addressed, these dimensions are inter-related, the question, for example, how resistance is linked to renewal, and to what extent recovery can be turned into a source for reorientation is under-examined. To address this question, Martin and Sunley (2015) stress that resilience is a continuous process that consists of four main inter-connected types of abilities: ‘vulnerability’, ‘resistance’, ‘robustness’ and ‘recoverability’. Robustness, for example, conditioned by the former ones, are concerned with regaining key functions or performance of a system, but at the same time, flexibly allowing the changes of structural elements and ways of doing things (Martin and Sunley, 2015). However, the use of the term ‘recoverability’, again, in our view, reminds us of resilience for ‘short-term’ recovery rather than long-term adaptation.

All in all, the definition of resilience seems highly adaptable. It varies with the advancement of understandings of regional economies as on-going evolving, open-ended and complex systems. There is no coherently agreed meaning of regional

resilience. Although some have tended to detach regional resilience from the ‘recovery’ context, others would ask: what is the aim of resilience and how to operationalize it empirically? This question concerning the need of (de) contextualization for resilience is still under-explored. Moreover, the existing interpretations are heavily influenced by ecological thinking, resulting in a trend that new related terminologies are increasingly adopted, without clear or consensual explanations (MacKinnon and Derickson, 2013). Thus, in our view, the future conceptualization should strive to scrutinize the existing concepts by asking fundamental questions, instead of borrowing new ideas from other disciplines.

#### *The use of dualistic terms*

There have been a number of regional resilience studies in favor of adopting dualistic terms or parallel binary oppositions. Dualism terms, such as ‘bounce back’ or ‘move on’, ‘lock-in’ or ‘lock-out’, ‘recovery’ or ‘re-orientation’, among others, can be found in the literature (Cowell, 2013; Crespo et al, 2014; Martin, 2012). Despite the usefulness for characterizing regional resilience, most of them are utilized in a shallow way, lacking thorough concerns on the inter-relations between dualistic terms. It has been somehow common, not merely in the resilience research, but also in the broader urban and regional studies (Sayer, 1991). That is, when a specific term or notion is used, the opposite one is much likely to be coupled with it. Without further specific explanation, such dualism often gives us the impression that a regional economy as a homogenous entity evolves *either* in this way *or* in that way, as if there was nothing in between. Moreover, it seems

that once a dualism is introduced, it might have a long lasting effect that is difficult to be removed. This can be exemplified by one of the most used dualistic terms in the regional resilience literature, namely adaptation and adaptability.

Originally stemming from Grabher (1993), Grabher and Stark (1997) conceptualized adaptation and adaptability for regional firm dynamics and emphasized that there is a strong trade-off idea between them. Drawing upon the idea of *'the weakness of strong ties'* from economic sociology, it is argued that strongly tied social agents with a cohesive action can facilitate adaptation in the short run, but hinder adaptability in the long run. Because adaptation involves “exploiting known territory at the cost of forgetting (or never learning) the skills of exploring for new solutions” (Grabher and Stark, 1997, .534). A similar point can be captured in Martin and Sunley (2006)'s argument: “there is a trade-off between specialization and a short-lived burst of fast regional growth on the one hand, and diversity and continual regional adaptability on the other” (p.421).

Adaptation does play a certain constraining role in adaptability and *vice versa*. But, such trade-off idea is creating a sharp dualism that adaptation is in opposition to adaptability. In many cases, for example, adaptation refers to short-term incremental changes within the old paths, while adaptability is more related to radical change, innovation and new path creation (Kirsh, 1996; Chapman et al., 2004).

When using adaptation and adaptability to conceptualize regional resilience, dualistic thinking has become a key cause for conceptual fuzziness. In the literature, adaptation tends to be automatically linked to low-level resilience, echoing with the term of

‘resistance’ and ‘recovery’. While, adaptability often means high-level resilience related to ‘reorientation’ and ‘renewal’. Even more, many argue that regional resilience is about a long-term capacity to foster structural change, “rather than to continue doing the same thing” (Adger, 2010, p.1; Folke et al., 2006). They therefore prefer using adaptability to indicate resilience, and reject adaptation for its *predestinated* pathway towards ‘equilibrium’ or ‘lock-in’. However, others, particularly evolutionary economic geographers, view resilience as a dynamic *process*. They argue, that, in some conditions, adaptation can turn out positive feedbacks for adaptability, leading to regional renewal and diversification (Martin and Sunley, 2006; Martin, 2012; Carlsson et al., 2014). Martin and Sunley (2015) further think that adaptation relating to coping with short run shocks should be regarded as important as adaptability for long-term economic evolution. Given this, it is suggested that the future conceptualization of regional resilience should center on understanding the interactions and relationships between adaptation and adaptability (Pike et al, 2010; Boschma, 2014).

However, dualistic thinking still plays a dominant role in understanding regional resilience. Such thinking is basically derived from a neglect of the dynamic role of history. Adaptation and adaptability were initially defined to serve for the rigid and static argument of ‘once locked-in, never get out’ (Grabher, 1993). This has led to a divergence that on the adaptation side, regional resilience means to stick to path dependence, while, on the adaptability side, to completely detach it from path dependence. Such understanding is highly problematic, as Sayer (1991) states, “the [dualistic] terms not only

*oppose* but *presuppose* one another in some respects...certain of their senses may be internally rather than externally related...[when] they are internally related they can justifiably be said to be *dialectical*' (p.287). This gives a hint that adaptation and adaptability are more or less inter-related in nature, and that they should be defined in a mutually coherent and interactive setting. Thus, it is important, and also highly needed, to deconstruct the adaptation-adaptability dualism, and to conceptualize them in a dialectical way.

### **3. Uneven resilience of regions: towards a conceptual framework**

#### **3.1 placing adaptation and adaptability: a typology of the relationship**

The dominant definition of adaptation is strongly preconditioned by a short-term development context. This however gives a false expression, as if adaptation did not persist for a long-term period, and as if it was merely about a responsive action or way of action. In our view, adaptation should be regarded as an integral part of long-term regional economic evolution. First, adaptation unfolds in a continuous rather than a punctuated way. Actors adapt not only to specific short-term shocks, but also to ubiquitous uncertainties in a changing context. Secondly, history is an important input for adaptation, but never plays a determinant role. It confers an *inherited characteristic*

seeking to maintain or restore the previous performance or functionality of a socio-economic system. But the ways in which adaptation unfolds are open-ended, which can lead to divergent developmental processes and pathways within a region.

Compared to adaptation, adaptability is often understood as the major indicator of, sometimes even equivalent to, resilience. A deficiency in this understanding is that adaptability is separated from adaptation, and always has positive impact on resilience. In our view, adaptability does not emerge from scratch. It is rather bred out of an adaptive evolutionary process. In other words, adaptability is not given, but is, to a greater or lesser extent, built upon the practices of adaptation. Adaptation and adaptability can co-exist and co-evolve in a dynamic way, and should be conceptualized as such (MacKinnon, et al., 2009).

We would therefore suggest an updated definition of adaptation and adaptability:

*Adaptation* is an on-going and never-ending process, by which a regional economic system responds to a succession of challenges and disturbances, in order to become fitted to its varying environment. It refers to both the current function/performance of being maintained and to the potentials for regional dynamics.

*Adaptability* is the ability to create new and/or change old actors, institutions and resources in a regional economy, which involves an action of innovation. It is a result of adaptation in which some actors intentionally or unintentionally adapt to environments. In a long-term perspective, adaptability should aim to strive for alternative modes of

doing things, rather than maintaining the existing functions and structures.

Based on these definitions, we would stress that the long-term evolution of a regional economy will most likely involve both adaptation and adaptability. And the ways in which they interact over time are indicative of the differentiation of regional resilience. Further, we identify at least five possible types of relationships between adaptation and adaptability, and address how different types of relationships affect regional resilience differently. These types are: (1) They are against each other, (2) They run in parallel, (3) Adaptation enables adaptability, (4) Adaptability facilitates Adaptation, (5) They are mutually complementary.

*Type (1): They are against each other*

Adaptability may not necessarily lead to structural change of a local economy. It is possible that regions achieve adaptability at the cost of adaptation, and such adaptability itself is compromised by adaptation. This situation may be more likely to occur in regions where old and new industries co-exist in a cutthroat competition relationship. These new industries may be fostered by local actors in response to external opportunities such as policy interventions or market dynamics, which are detached from local existing economic structures. They may face problems once the external environment changes, and tend to survive by occupying limited local assets. This may lead to a lose-lose situation in which adaptation and adaptability compete with each other with negative impacts. Although in this context adaptability may involve new path creation, it is however shortsighted, being difficult to trigger substantial change. This

relationship is subject to weak resilience, which would be harmful for long-term regional evolution.

*Type (2): Adaptation and adaptability run in parallel*

Some regions' adaptation may strongly involve introducing external technologies, capital and industries, rather than significant changes within existing industries or paths. This might perhaps be the case because of the difficulties or resistance to modernize old industries, also perhaps because of the eagerness to diversify regional economies in order to compensate for the loss of declining industries. Within this respect, adaptability may have a strong purpose: to introduce new industries from elsewhere that are not at the cost of local pillar industries but can be beneficial to the overall economy. One typical example is that regions achieve '*unrelated variety*' by mainly attracting new industries that are not technologically related to the existing ones (Frenken *et al.*, 2007). These industries are often vertically integrated, and thus horizontally separated from local economic systems. They basically run in parallel with the existing industries. Such adaptability may result in a highly incoherent regional evolution, resulting in multiple heterogeneous adaptive trajectories (Boschma, 2014). In such context, a local economy may diversify over time, but the core institutional base and its main functionality stay virtually unchanged. Therefore in the long run, regional resilience might be hindered, due to a lack of shared interest and coherently coordinated action.

*Type (3): Adaptation enables adaptability*



In comparison with the two relationships above, this type of relationship entails that local actors involved in adaptation consciously mobilize resources to facilitate adaptability. In general, two main mechanisms of practices can be distinguished. That is, adaptation can enable adaptability in an *endogenous* and *exogenous* way. The first mechanism involves constructive mobility from existing industrial assets to new uses. New industries or paths can be, for instance, primarily built upon place-specific resources, legacies and networks. In other words, they can branch out of local existing industrial domains. Such adaptability has a strong potential towards regional renewal (Neffke et al., 2011). In the second mechanism, however, adaptability may prove to depend on the ability of local actors to exploit and introduce extra-local forces for local economic dynamics. It may involve an action of attracting inward investment for building up new industries, or a process of turning external opportunities into local endogenous impetus for industrial dynamics. We do not deny that in some conditions adaptability supported by adaptation can generate positive feedbacks to reshape the previous form of adaptation. But, we want to emphasize that it is possible that adaptation merely enables adaptability, particularly when local actors purposively foster expected new industries, and lack efforts to restructure existing patterns and functionalities of economic development.

*Type (4): Adaptability facilitates adaptation*

Within this relationship, adaptability facilitates adaptation, but adaptation has limited impacts on adaptability. Adaptability may be initially triggered by one-off contingency, which is little related to purposive adaptation. For example, Schumpeterian radical

innovation may occur, albeit not on initial purpose. It may generate unexpected effects, leading to a path-breaking or de-locking process that fundamentally changes the whole ways of doing things (Martin and Sunley, 2006). This means, existing adaptation form itself can be reshaped by such kind of adaptability, and regional resilience thus would become stronger than before. However, adaptability, in some 'emergent' circumstances, may merely serve to sustain adaptation. Adaptability might be a part of adaptation story, for example, if it is aimed to fix old problems, or if it is designed by non-local actors to protect inherited institutional architectures. In this sense, adaptability may not necessarily beneficial to improve regional economic resilience.

*Type (5): They are mutually complementary*

This type stands for a benign relationship between adaptation and adaptability. That is, they are positively related and complement each other. Some empirical studies have proven that adaptation and adaptability can be harmonized in a reciprocal manner, which is conducive to long-term regional resilience (Ibert and Schmit, 2014; Tomlinson and Branston, 2014). In this relationship, local actors are aware of how to exploit existing assets for new uses, and how to take appropriate actions in order to fit to, and benefit from multi-scalar contexts. Moreover, they play a strategic role in engaging newly emerging elements and agencies into the existing dominant industries. In other words, adaptability not merely benefits from the existing adaptation process, but also pump transformative stimuli into the existing process of adaptation. It brings a co-evolution process towards coherent and incremental regional restructuring. Local old technologies,

labor structures and institutions are gradually transformed, at little cost of social, environmental and economic well beings (Arbuthnott et al., 2010). We think this is an ideal process of regional economic evolution, and can potentially form a healthy and sustainable resilience.

To sum up, these different patterns of adaptation-adaptability relationships can shed light on the unevenness of economic resilience among regions. In reality, the types of relationships might be more complex than we proposed above. They differ over time and space, which are shaped by multi-actors and multi-scalar impact factors in broader social, economic and institutional environments (Hassink, 2010a).

### **3.2 Impact factors**

To better understand adaptation-adaptability relationships, we need to capture what factors affect them. Scholars have sought to identify main determinants of adaptation and adaptability, albeit with different perspectives. Evolutionary economic geographers argue that endogenous factors such as the connectedness of social agents, local firm characteristics ((un)related variety), and institutional structures should be the core factors (Simmie and Martin, 2010; Boschma, 2014). Others, however, state that uneven resilience is shaped by the position and relationship of local actors within multi-scalar institutional environments and changing political economy frameworks (Chapman et al, 2004; Pike et al., 2010; MacKinnon and Derickson, 2014). In our view, resilience is shaped by mixed

impact factors, including economic-structural and political-institutional factors, characterized by endogenous and exogenous dynamics. These factors can be path (place) dependent, but can also be context-sensitive and emergent (Martin and Sunley, 2015).

Two major impact factors can be identified, namely *structural* impact factors and *contextual* impact factors (Figure 1). First, structural factors provide the bounded scope and set the constraints for the operation of embedded actors. For example, at the *local* level, economic structure, labor profile, governance framework and political ecology render local agents rational, pressuring them to practice a path-dependent adaptation process. Besides, local decision-making and actions are also affected by *trans-local* structural factors. A region's position in the global division of labor, for instance, may hinder the economy to upgrade or reorient into an advanced one in the short run, despite strong local advantages. Secondly, contextual factors refer to a current of dynamics, ranging from unpredictable shocks and events, to systemically (re)produced consequences. These factors involving the emergence of new elements and stimuli can make the previous selection environment dynamic. Agents may be able to identify new opportunities, and extend their scope and vision accordingly to nurture adaptability.

However, the two major impact factors are not in isolation. Rather, and indeed, they are not only horizontally entwined, but also are vertically related across space in a logical way (Figure 1). These factors do not necessarily directly affect adaptation and adaptability, but always, through influencing the actions of local agents and communities (Davidson, 2010; Robinson and Carson, 2015). Regions differ in resilience not merely because of the

spatial differentiation of impact factors themselves, but largely depending on how local agents read, translate and value varied impact factors, and on how they act in practice accordingly (Bristow and Healy, 2014). In other words, the ways in which adaptation relates to adaptability are strongly linked to how local actors comprehensively scan a complex multi-scalar environment, and to the adaptive action they carry out. Therefore, we surmise that regional economic resilience is about *local agencies* appropriately responding to particular factors.

- Insert Figure 1 here -

Among all impact factors of regional resilience, determinants are the most critical ones that can potentially answer the question of “adaptation to what” or “adaptation for what” (Smit *et al.*, 2000). They play a key role in making a region’s adaptation-adaptability relationship specific. They are, from an agency perspective, strongly linked to the interests of individuals and groups (e.g. entrepreneurs, government officials and stakeholders) (Bristow and Healy, 2014). Determinants differ in space, because local actors weigh the importance of impact factors differently. A national policy initiative, for example, may lead to different regional reactions: Some regions may take it as an opportunity and turn it into impetus for industrial renewal, perhaps because local actors view the initiative matches with local specific conditions. Others may be less enthusiastic about it, and rather stick to old growth paths, because local actors might be more

motivated by other factors, such as vested interests. Our conceptual framework, therefore, highlights the role of spatially differentiated agency in constituting varieties of adaptation-adaptability relationships explaining uneven resilience.

However, so far, existing accounts on the impact factors and determinants of regional resilience remain under-explored, and lack in-depth empirical evidence. More empirical work is needed to understand, in a long term perspective, 1) who adapts to/for what and 2) how adaptation interacts with adaptability and 3) why the diversity in adaptation-adaptability relationships leads to uneven regional resilience. To address these questions, this conceptual framework is applied to analyze and compare the adaptation and adaptability of two coal-mining regions in China.

#### **4. Applying the conceptual framework: two Chinese mining regions in comparison**

To apply the conceptual framework in a long-term and comparative setting, two representative regions in China, namely Zaozhuang in Shandong Province and Fuxin in Liaoning Province (Figure 2) were selected for three reasons. First, both economies have been strongly dominated by state owned enterprises (SOEs) and highly specialized in coal-mining for decades. Moreover, in 2000, they began to suffer from a ‘slow burn’ crisis of coal depletion, and recently were officially defined as ‘*Resource-exhausted Regions*’ by

central authorities (State Council, 2013). This means that they share similar adaptation agenda of coping with this chronic crisis. Secondly, besides the similarities, adaptability can be observed in both regions, particularly in the form of developing new industries. Zaozhuang recently has diversified its economy through boosting the coal-chemical and tourism sectors (Hu, 2015). Fuxin seems to have locked out of the previous coal-based mono-structural economy, embarking on several new industrial paths, such as agriculture/food (Wang *et al.*, 2014), and wind power (Hu, 2014). Thirdly, despite the co-existence of adaptation and adaptability, significant regional gaps exist in economic growth rate and performance. Figure 3 shows how the disparities in the employment capacity of the two regions have increased since 1985. In 1985, the regions had nearly identical employment and GDP levels (around 870,000 and 1.5 billion RMB, respectively). Although they both experienced economic stagnation in the 1980s and 1990s due to market reforms, the economic momentum in Zaozhuang was much stronger than it was in Fuxin. The 1998 radical reforms of SOEs as a shock negatively impacted more severely Fuxin than they did Zaozhuang. In particular, the Zaozhuang economy has been growing rapidly since 2000, and its employment was double the size of Fuxin's by 2013. Fuxin, however, seems to be trapped into a low-speed development mode, lacking robust and sustained dynamisms.

Putting together, this raises several concrete questions: 1. despite newly emerged paths in both regions, why is Zaozhuang more capable of reviving its economy than Fuxin? 2. Do they have different types of adaptation-adaptability relationships? 3. What are the

determinants that affect the ways in which adaptation and adaptation are related? In sum, how to explain differences in the economic resilience of the two regions?

- Insert Figure 2 here –

- Insert Figure 3 here –

In the remaining part of this section, we will comparatively examine the adaptation and adaptability of the two regions since 2000. We mainly focus on the interplays between the mining industry and newly emerged industries in the regions; the tourism industry in Zaozhuang, the agriculture & food industry and the wind power industry in Fuxin. The findings are based on in-depth fieldwork in 2013 and 2014, with a time length of five months. Our research method is qualitative in nature and is based on in total 80 semi-structured interviews with firms and officials (for more detailed accounts see Hu, 2014, 2015).

What are differences in the adaptation, adaptability and their relationship between Zaozhuang and Fuxin? First, both regions' adaptation is characterized by persistent path dependence on the coal economy. Thanks to changes in national regulations for cross-regional mergers and acquisitions of coal firms since 2005, coal firms in both regions



could geographically extend their market and supply bases beyond the local. Secondly, however, the mechanisms of adaptation in the two regions are highly different. In Zaozhuang, adaptation unfolds in an endogenous and bottom-up way, predominately operated by local actors mobilizing local assets, while Fuxin's adaptation involves a combined force of the local and national state. The latter, in particular, has taken a dominating part in local decision-making and new industry selection. Thirdly and more importantly, Zaozhuang's coal SOEs, directly mediated by local officials, supports the emergence of adaptability toward tourism. The newly established tourism industry, in turn, improved Zaozhuang's image which helped to attract inward investment in tourism related services, which supported the diversification of the local coal SOEs into the tourism industry. Adaptation here is a source of adaptability, and the other way around, adaptability, for a long-term view, facilitates adaptation, having a potential to incrementally transform the existing trajectories of adaptation. However, in Fuxin, new paths (agriculture/food industries) were created not for structural change. They are merely as a remedy, resulted from a fast policy prescription, to rescue the unemployment symptom caused by the old path (coal-mining). Similarly, the path creation of wind power can be seen as a product of the post-2005 national '*Great-Leap-Forward-Like*' policy on renewable industries. This adaptability is mainly enabled by exogenous forces, for which the new industry runs parallel to the old path. In this sense, Fuxin's adaptability is vulnerable and unsustainable.

The second research question in the paper was to work out impact factors to explain the

differences found: why is Zaozhuang more resilient than Fuxin? On the basis of empirical studies, we are able to identify what kind of impact factors shape out the differentiated resilience of regions (Table 1). The empirical results confirm our argument proposed Section 3 that how adaptation and adaptability are (un) related is depending on how local agents read, interpret and act in the face of multi-scalar structural and contextual impact factors. In Fuxin, the central state did play a direct role in affecting the ways of adaptation and the potentials of adaptability, but without the supportive commitment of the local state, new paths could not have been developed. Why were national interventions fully welcomed without any resistance in Fuxin? It is because of local awareness of the limited local capacity, in terms of decision-making and resource mobility. This awareness stems from both local and trans-local structural factors, such as the monopoly of higher-ranking Fuxin Coal Mine Company, the well-preserved ‘top-down’ institutions, and even ‘centrally-planned’ ideological mindsets of local officials. Such institutionally constrained local agency prevents local state entrepreneurship to emerge. It merely allows local actors to stick to ‘top’ policies, without sufficient place-based concerns for long-term development. In this respect, Fuxin’s adaptability only involves adding new elements onto the adaptation domain. It detaches from the existing adaptation on coal mining, being not only not meant to, but also not able to change adaptation.

- Insert Table 1 -

In contrast to Fuxin, Zaozhuang's *local* actors played a key role in affecting adaptation and adaptability. Given the local state ownership of the available coal resources, local agency is stronger than in Fuxin, leading to an endogenous adaptation. Such strong local agency is underpinned by particular historically conditioned central-local politics.

Compared to Fuxin, Zaozhuang is both geographically and politically far from the central state. As a result, on the one hand, the distant local-central relationship provides an institutional freedom for the local state to try out new measures and governances. On the other hand, it prevents local economic affairs from being directly intervened by national institutions, making the region independent and self-healing when it comes to problems. Local officials and firm actors are fully aware of the region's '*positionality*' within the macro political nexuses. Such trans-local structured *positionality*, combined with the local specificities of impact factors, constitute an important institutional environment that shape the patterns of adaptation and adaptability. The creation of the tourism industry in Zaozhuang, for instance, is a combinational result of effective local state leadership by the newly appointed mayor and positional advantages of the particular local-central politics. By enjoying the loose institutional structure, new state agencies were able to exercise innovative measures to strategically graft the new industry onto the old mining path. Since the adaptability is well rooted in the existing local industrial system, it is expected to have a strong and long-term potential to transform the local economy in the future.

To be clear, Zaozhuang has a strong and sustained resilience, as adaptation and adaptability are well harmonized. This means that local legacies and competences (at least in part) are mobilized endogenously to feed new path development. Meanwhile, new paths are conducive to the change of the way of existing (old path) adaptation (referring to *Type 5* in Section 3). Why is Fuxin less resilient? Adaptability is primarily derived from exogenous forces. The close local-central relationship, conditioned by the long-term centrally planned economy in Fuxin, has led to a well-recognized tradition of top-down direct policy interventions in the region. The central state continually managed, planned and operated local development, which constrained the local endogenous capacity and creativity, leading to an institutionally and industrially incoherent situation in Fuxin. In such a situation, adaptation and adaptability tend to be mutually disjoint, running in danger of conflicts that might undermine the whole restructuring process (referring to *Type 1* and *2*).

Our empirical findings call for a multi-scalar political economy and evolutionary view on analyzing regional resilience. We highlight that the mechanism of adaptability is the outcome of path-dependent processes and the power interactions/relations among different actors between multiple scales (Essletzbichler, 2012). In the Chinese context, particularly in old industrial economies where SOEs (previously) dominate, the role of the state, at both the central and local level, seems to be the core to shape the relationship between adaptation and adaptability. Some regions, such as Fuxin, fail to generate new visions and take initiatives by their own. Their regional dynamics tend to be

mainly at the mercy of top-down policy support and direct interference. Others, like Zaozhuang, enjoy more institutional flexibility and are able to purposely manage adaptation based on their own localized conditions and interests (Garud et al., 2010). In other words, local actors tend to be more entrepreneurial, and adaptability is more likely to be fostered in a more place-based and industrially inclusive way. We thus argue that the ways in which adaptation and adaptability interact is contingent upon how local officials read and interpret their situated particular positionalities of local-central relations, as well as on how they adapt the local political economy to changing national strategic agendas. This echoes Strambach and Halkier (2013)'s argument, in which the scope and the concrete solution for adaptability are dependent on the assessment of actors on their embedded institutions and changing impact factors. The more '*institutional ambiguity*' they enjoy, the more '*interpretive flexibility*' of their meanings they have, which implies more potentials for adaptability.

The spatial heterogeneities of local-central politics commonly appear over China, but have not been well examined yet. Such heterogeneities can be well reflected by the Chinese government norm of local responses to national policies, namely "the top has policies, while the locality has countermeasures" (*shangyou zhengce, xiayou duice*) (Economist, 2015). We think that China's local-central politics can be seen an important set of 'relational geometry', as suggested by Yeung (2005). Local actors embedded in different forms of local-central politics tend to demonstrate their power and identities, and (re) produce spatially differentiated outcomes. Such local-central politics is a product

of history, characterized by strong path dependency. A certain form of local-central relationship is molded cumulatively, and thus difficult to be changed. It would basically influence a region's scope and capability of development for a long term and can therefore be seen as a core determinant for resilience (see Table 1) and an answer to question 3 we posed at the beginning of this section. Although we recognize that local contextual factors, among others, play a role in affecting a region's resilience, we think that in an authoritarian context macro, structured institutional impact factors matter more for the spatial patterns of adaptation-adaptability interaction. These factors, in our view, should be put at the core of uneven regional evolution studies in China.

## **5. Conclusions**

This article has sought to develop a more comprehensive understanding of long-term regional economic resilience. We argue that in the conceptualization of regional resilience there is a need to avoid dualistic thinking and adopt an ontologically coherent evolutionary perspective. In doing so, a new conceptual framework for explaining uneven regional resilience is developed. In this framework, we reject the trade-off idea of adaptation and adaptability, and redefine them in a dialectical and interactive way.

It is argued that regional economic resilience should not be restricted to short-term recoverability after shocks or ability related to resistance. It can be, and should be

regarded as a long-term process of adaptation. Such adaptation consists of varieties of heterogeneous actions and interests within a regional economy. Adaptability is a result, and also an integral part of an adaptation process. It can refer to path creation for temporary purpose serving to old structures. It can also refer to the ability to develop long-term regional economic sustainability and transformability.

A further conceptualization has been made in this paper, suggesting that there are varieties of adaptation-adaptability relationships. These relationships are indicative of the geographically uneven processes, patterns and degrees of resilience. Following these arguments, we turned to an in-depth discussion of what impact factors affect and mold certain specific forms of adaptation-adaptability relationships in regions. It is stressed that the adaptation-adaptability relationship varies from region to region, and is shaped by both contextual and structural impact factors at multi-scalar spatial levels.

To illustrate possible explanations for uneven resilience of regions, we applied this conceptual framework to two Chinese coal-mining regions both facing a 'slow-burn' resource crisis. Based on a comparison, we found the Zaozhuang region to be more resilient over the past 15-year period. Its adaptability is derived from a local endogenous adaptation process, and is oriented to change the existing form of adaptation. New paths were not created for merely coping with crisis and shocks. They were however purposively designed to integrate into the local industrial system, and thus had potentials to foster structural change. We conclude that due to the mutually complementary relationship between adaptation and adaptability, the Zaozhuang economy has been able

to transform.

The resilience of Fuxin, however, has been quite different and far less strong. The Fuxin economy seems to be very much dependent on top-down policy interventions. Despite newly emerged industries, they were mainly planned and managed by exogenous institutions. Such kind of adaptability disregards the needs of the existing adaptation process, and hence had limited impacts on long-term industrial change. The wind power industry, for example, seems fragile as a result of macro industrial deployment by the central state. It might run into problems when national policies change. In this sense, in Fuxin adaptation and adaptability do not only run in parallel, but also might be in danger of leading to a mutually harmful relationship. It is therefore expected that Fuxin's restructuring will be much tougher, painful and slower than Zaozhuang.

We suggest that the definition of adaptation in relation to changes within pre-existing paths and adaptability involving new path creation needs to be revisited. In a long-term perspective, new paths may be created as a strategic response to cope with old problems. These new paths might be disconnected to existing paths, and might not sustain for a long-term period. Therefore new path creations should not always be regarded as positive to regional evolution. Whether being positive or not should be contingent on how they are related to old existing structures of adaptation and, to what extent they are embedded to the whole industrial system. In our view, high-quality regional resilience refers to a complementary, symbiotic, place-based relationship between adaptation and adaptability. Regional resilience is not merely about the ability and performance of



overcoming shocks. It is rather about long-term endogenous quality, transformability and sustainability of regional evolution and development.

To end up, this research generates several policy advices regarding to the restructuring of OIAs. Compared to other types of regions, OIAs bear much heavier historical burdens, often following a path-dependent, incremental evolutionary process. Policy-makers should avoid a quick policy fix by, for instance, instrumentally adding new industries onto the old industrial systems (Coenen et al, 2015). Future policies should focus more on how to intentionally cultivate the endogenous ability of local firms and industries to develop place-specific strategies, rather than to directly transplant new ‘planned’ industries/paths. Policies do not necessarily have to develop a completely new economic make-up in OIAs, but may be able to remain competitive by drawing on existing assets, institutions and competencies, if they are promising (Boschma and Lambooy, 1999; Bathelt et al., 2013). If national policies try to promote healthy and robust industrial diversification in regions, fine-tuning policies are critically needed, to ensure that new paths are related to, but also beneficial to the dynamics of old paths and structures.

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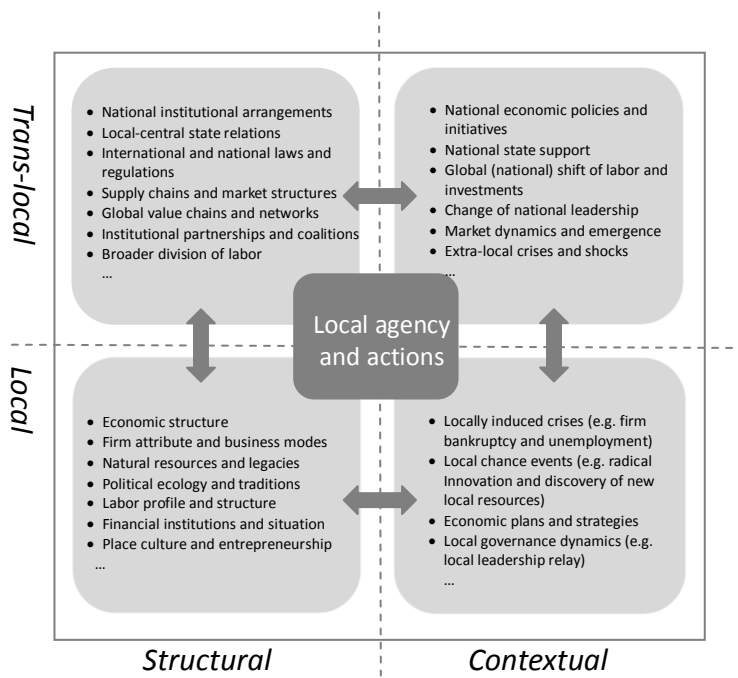


Figure 1. Impact factors of regional economic resilience (Source: adapted from Martin and Sunley, 2015)

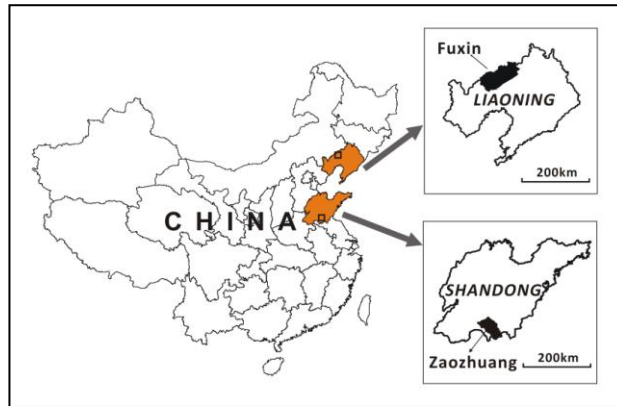


Figure 2. The geographical location of Zaozhuang and Fuxin

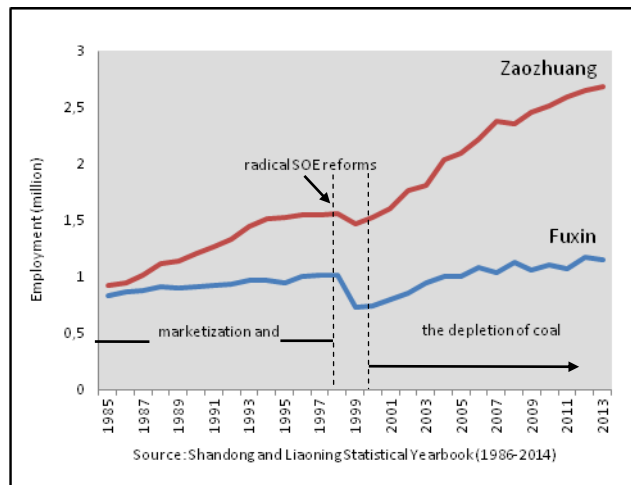


Figure 3. Employment developmental paths in Fuxin and Zaozhuang, 1985-2013



Table 1. Comparative analysis of adaptation and adaptability in Zaozhuang and Fuxin since 1998

	Adaptation	Adaptability	Relationship
Zaozhuang	Strong path dependence, old path continuity and extension	Endogenously emerged, benefits adaptation, towards long-run structural change	Mutually complementary; Transformative and robust ( <i>Type 5</i> in section 3)
	Impact factors: both local structural and national contextual factors	Impact factors: mainly local contextual, combined with national contextual factors	Determinants: Strong local agency and loose institutional structure (distant local- central relationship)
Fuxin	Short-term new path creation (1998-2004) and soon locked in old path continuity (2005-present)	Emergent and temporary (agricultural/food); mainly exogenously enabled; disconnected with adaptation; little impacts on long-term structural change	Adaptation and adaptability generally run in parallel ( <i>Type 2</i> ). Adaptability (wind power) and adaptation tend to harm each other ( <i>Type 1</i> in Section 3)
	Impact factors: local structural factors, and trans-local structural and contextual factors	Impact factors: mainly trans-local structural and national contextual factors	Determinants: Weak local agency and tight institutional structure (close local-central relationship)