

Exploring Differentiated Economic Adaptation and Adaptability of Old Industrial Areas in Transitional China

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For Chanjuan and Jiachen

without whose love, company and support this book would have been an impossibility

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Preface

- How did I choose this topic of my dissertation? -

My initial idea of selecting a PhD topic was quite simple. That is, just to find a topic that I am really interested in. But the selection process, which started from October 2011, was much longer and tougher than my expectations. There were two questions (also at that time I viewed them as difficulties) that confused me for a long time: 1). What Western (or one can argue as mainstream) concepts could be appropriate to tackle highly contextualized Chinese questions that at that time had not been well answered yet? 2). From an operationalization perspective, to what extent can the feasibility of conducting in-depth fieldwork warrant the quality of my PhD project? Although I had read considerable literature in economic geography, these questions still remained unsolved until one chance came.

My first academic visit to the Geographical Institute of the Chinese Academy of Sciences (CAS) of Beijing was supported by my supervisor Robert Hassink. This visit inspired me to get in touch with the topic on the restructuring of China's old industrial areas. Not merely because with CAS assistances I could access key informants in fieldwork. But, rather, the question of how these less-favored regions evolve and adapt in the context of post-crisis era had been very much under-explored, particularly compared to the prevailing research on China's most economically vibrant and fast globalizing coastal belts, namely the Beijing-Shanghai-Guangzhou metropolitan regions.

I would say that this visit truly opened up the door that led me to get into the topic. Prof. Wenzhong Zhang engaged me into the National Planning Program of "the 12th Five-year Plan on the Transformation of Resource-based Cities (2015-2030)" (see NDRC (2014)). On the basis of this national project platform, since April in 2012, I have been very much involved in related research events, and by which I really benefited a lot. It also enlightened me that doing a PhD itself is an evolutionary process in nature. Sometimes, unexpected chances can play a significant role in (re) directing your research paths.

Summary

My dissertation is concerned with *uneven economic adaptation and adaptability* of old industrial areas in an evolutionary and institutional, as well as a human agency perspective. There is a considerable literature in economic geography (EG), focusing on the role of firms and industry dynamics in affecting the evolution of old industrial areas (OIAs). However, little work has been done, both empirically and theoretically, on the role of state, multi-scalar institutions, politics and policies. Moreover, the majority of the research on the topic is very much based on single-case studies, whose evidence and knowledge is mainly derived from European and American contexts. Therefore, the key aim of the doctoral dissertation are to: 1) theoretically, integrate an institutional and geographical political economy perspective with the Evolutionary Economic Geography (EEG) approach, in order to give a better understanding of the evolutionary processes and mechanisms of OIAs. And 2) empirically, to examine the nature of uneven regional economic evolution, based on an in-depth comparison of two coal-mining regions in a post-crisis and non-western context.

My book pays more attention to how the state, more precisely, how the people within the state and state owned enterprises (SOEs) of OIAs, response and enact to changing environment for long-run industrial adaptation and adaptability. It does not simply focus on the micro behaviors of firms, states and people, but more on their embedded positions and relationships of multi-scalar political-institutional frameworks and policy fields. The empirical research is based on in-depth case studies on two Chinese coal-mining regions (Zaozhuang in Shandong Province and Fuxin in Liaoning Province) both facing the 'slow burn' crisis of local coal resource exhaustion since 2000. The findings are mainly derived from a qualitative method of semi-structured interviews and evaluated by context analysis and statistical data description.

In this book, first and foremost, the concepts of path dependence, path creation and lock-ins are critically examined. The empirical evidence suggests that the effects of lock-ins in Chinese contexts are more politically constituted, due to the Chinese-specific administrative hierarchy system among SOEs and governments. Despite strong industrial path dependence and negative regional lock-ins, new paths are not restricted to emerge. Based on the notion of path plasticity, I conclude that the Chinese local state and its

state leaders in OIAs are aware of how to balance the interests among multi-scalar political economies, and of how to flexibly read and enact locally according to multi-scalar institutional and policy conditions for potential industrial change.

Secondly, given the ubiquitous influences of state elites in China, the book takes a closer look at how state officials mold specific institutional environment for industrial dynamics. The notion of place leadership has been critically adopted in the Chinese authoritarian context. It well explains the micro-level dynamics and characteristics of people on the evolution of Chinese OIAs. The book finds that although Chinese state elites do have formal power to effectively make and implement fast economic decisions and policy-fix, local institutional change still critically calls for informal leadership, such as interpretive and network leadership. New paths might be created quickly by local state leaders. But, without forming solid new supporting institutions, they may not generate positive impact for long-term regional development.

The most important contribution of the book is the comparison of two Chinese mining regions. A new conceptual framework on analyzing and understanding uneven resilience of regions has been developed. It is built upon an in-depth conceptualization that deconstructs the dualism idea between adaptation and adaptability. And it redefines them in an interactive, dialectical and evolutionary way. The comparative study in China highlights the importance of multi-scalar institutions and national political economy change in coordinating the behaviors of firms, local states and, the micro dynamics of their constitutive human agents in OIAs. The historically conditioned political distance between localities and the central state is essential. It can help to fundamentally understand the differentiated resilience of China's OIAs. It should be placed at the core to explore the question of why some regions in China are able to manage endogenous place-based development of economies, while others fail to do such but mostly at the mercy of exogenous forces and assets.

In the end, this book provides new evidence that EEG needs to be integrated into other related paradigms in EG, when it comes to understand the complex restructuring of OIAs. Besides the theoretical contributions, the book also put several policy recommendations for future development of OIAs in China and beyond.

Zusammenfassung

Die vorliegende Dissertation befasst sich mit ungleicher ökonomischer Anpassung und Anpassungsfähigkeit altindustrieller Gebiete aus einer evolutionären, institutionellen und akteurszentrierten Perspektive. In der wirtschaftsgeographischen Literatur gibt es bereits zahlreiche Beiträge die sich mit den Rollen von Unternehmen und industriellen Dynamiken für den Aufstieg und Niedergang altindustrieller Gebiete befassen. Wenige Beiträge haben sich allerdings sowohl empirisch als auch konzeptionell mit den Einflüssen von Staaten, multiskalaren Institutionen oder unterschiedlichen Strategien und Politiken befasst. Zudem fokussiert der Großteil der bisherigen Arbeiten Einzelfälle in Europa oder Nordamerika. Daraus ergeben sich die zwei Hauptziele dieser Doktorarbeit. 1) Theoretisch werden eine institutionelle Perspektive und Ansätzen der Politischen Ökonomie mit der Evolutionären Wirtschaftsgeographie in Verbindung gebracht, um zu einem tieferen Verständnis evolutionärer Prozesse und Mechanismen in altindustriellen Gebieten zu kommen. 2) Empirisch werden Facetten ungleicher regionaler Wirtschaftsentwicklung am Beispiel zweier Kohlebergbaugebiete untersucht, die sich beide in einer Nachkrisensituation befinden und einem nicht-westlichen Kontext zugehören.

Die Arbeit beleuchtet, wie der Staat - verstanden als handelnde Akteure in Staat und staatlichen Betrieben in altindustriellen Regionen - auf Umfeldänderungen reagiert, um langfristige industrielle Anpassung zu erreichen. Dabei geht die Arbeit über einen Fokus auf unternehmerische, staatliche oder individuelle Einzelhandlungen hinaus und konzentriert sich auf deren Einbettung und Beziehungen in einem multiskalaren, politisch-institutionellen Rahmen und Politikfeld. Die empirische Untersuchung basiert auf Tiefenstudien zweier chinesischer Kohlebergbauregionen (Zaozhuang in der Provinz Shandong und Fuxin in der Provinz Liaoning), die beide vom schleichenden Niedergang der lokalen Kohlereserven seit dem Jahr 2000 geprägt sind. Die Forschungsergebnisse beruhen größtenteils auf qualitativen Daten (halbstandardisierte Interviews), die durch eine Kontextanalyse ausgewertet und um eine deskriptive Analyse sekundärstatistischer Daten ergänzt wurden.

Der erste Beitrag dieser Doktorarbeit liegt in einer kritischen Bestandsaufnahme der

Konzepte von Pfadabhängigkeiten, Pfadentstehungen und Lock-Ins. Die empirischen Einblicke deuten darauf hin, dass Lock-Ins im chinesischen Kontext stark politisch bedingt sind. Dies ist auf das spezifische administrative Hierarchiesystem zwischen staatseigenen Betrieben und Staaten zurückzuführen. Trotz starker industrieller Pfadabhängigkeit und negativer regionaler Lock-In-Effekte steht der Entstehung neuer Pfade nichts entgegen. Aufbauend auf dem Konzept der Pfadplastizität kommt die Arbeit zu dem Ergebnis, dass sich die chinesischen lokalen Staatsbehörden und die staatliche Führung in staatseigenen Betrieben der Interessenkonflikte zwischen den multiskalaren politischen Ökonomien bewusst sind, diese flexibel auslegen und gemäß der multiskalaren institutionellen und politischen Bedingungen hinsichtlich potentieller lokaler industrieller Veränderung auslegen.

Der zweite Beitrag liegt darin, dass der ubiquitäre Einfluss staatlicher Eliten in China auf industrielle Dynamiken genauer analysiert wird. Dazu wird untersucht, wie Staatsbeamte und lokale Führungspersonlichkeiten die entsprechenden institutionellen Kontexte formen. Der Gedanke der „Place Leadership“ wird kritisch an den autoritären chinesischen Kontext angepasst. So können die kleinmaßstäblichen Dynamiken und Charakteristika im Zusammenhang mit der Entstehung altindustrieller Regionen in China erläutert werden. Wie sich zeigt, verfügen die staatlichen Eliten über ein hohes Maß an formeller und exekutiver Macht, um wirtschaftliche und politische Entscheidungen zu fällen. Dennoch verdeutlichen die empirischen Ergebnisse, dass für institutionellen Wandel informelle Führungsformen wie interpretative oder netzwerkartige Führung nötig sind. Neue Pfade können zwar von lokalen staatlichen Anführern schneller erzeugt werden, aber ohne neue, unterstützende Institutionen bestehen kaum Aussichten darauf, langfristige Veränderungspotenziale der regionalen Entwicklung aufrechtzuerhalten.

Der Hauptbeitrag der Arbeit liegt im Vergleich der zwei chinesischen Bergbauregionen. Um deren ungleiche regionale Resilienz zu analysieren und zu verstehen wird ein neuartiger konzeptuelle Ansatz vorgeschlagen. In einer interaktiven, dialektischen und evolutionären Art überwindet dieser den Dualismus von Anpassung und Anpassungsfähigkeit und hebt die Rolle von multiskalaren Institutionen sowie von nationalem politisch-ökonomischem Wandel für die Koordination unternehmerischen und lokal-staatlichen Handelns und derer Akteure in staatseigenen Betrieben hervor. Die historisch bedingte politische Distanz zwischen lokaler und nationaler Verwaltung und

Regierung ist dabei grundlegend, um die verschiedenen Resilienzen und Anpassungsfähigkeiten chinesischer staatseigener Betriebe zu verstehen. Diese werden in das Zentrum der vergleichenden Fallstudie gerückt, um besser zu verstehen, warum einige Regionen in China dazu in der Lage sind endogene wirtschaftliche Entwicklungspotenziale zu steuern, während andere daran – zumeist aufgrund exogener Kräfte – scheitern.

Insgesamt leistet die vorliegende Dissertation einen Beitrag zur Erweiterung der Evolutionären Wirtschaftsgeographie, indem andere wirtschaftsgeographische Paradigmen und Perspektiven eingebunden werden und somit komplexe Restrukturierungsprozesse staatseigener Betriebe verstanden werden können. Neben diesem theoretischen Beitrag liefert die Arbeit politische Empfehlungen für die zukünftige Entwicklung altindustrieller Industrieregionen in China und andernorts.

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Abbreviations

CCP	Chinese Communist Party
EEG	Evolutionary Economic Geography
EG	Economic Geography
FDRC	Fuxin Development and Reform Commission
GPE	Geographical Political Economy
GPNs	Global Production Networks
IEG	Institutional Economic Geography
M&As	Mergers and Acquisitions
NDRC	National Development and Reform Commission
NEA	National Energy Administration
OIAs	Old Industrial Areas
RECs	Resource-exhausted Cities
REG	Relational Economic Geography
SOEs	State-owned Enterprises
TVEs	Township and Village Enterprises
VoC	Varieties of Capitalism
ZDRC	Zaozhuang Development and Reform Commission

1 Introduction

The introductory chapter starts with a background of recent conceptual discourses and concerns on regional economic restructuring and evolution under an increasingly uncertain and post-crisis context in economic geography (from here on EG). Within this background, two general research gaps are identified that motivate me to fill the gaps by setting main aims and several research questions in Chapter 1.2. Followed by Chapter 1.3, it presents an outline of how this book is structured and what kind of paper contribution I made to answer the research questions.

1.1 Background

1.1.1 Resilience, adaptation and adaptability: problems and limitations

In recent years, the term of '*adaptation*' and '*adaptability*' has become a conceptual fashion in the EG literature (Boschma, 2014; Hassink, 2010a; Martin, 2012; Pike, *et al.* 2010). Along with the '*resilience*' concept, these terms have been increasingly engaged with the analysis of how regional economies response and adapt in face of varieties of shocks and disturbances in a post-crisis, globalized and uncertain context (see two special issues: 'The Resilient Region', 2010, 3(1) in *Cambridge Journal of Regions, Economy and Society*, and recently, 'Recession, Recovery and Resilience 2014, 48(11) in *Regional Studies*). With the evolutionary 'turn' in EG in general, and also with the policy agendas for sub-national economic recovery in the wake of the 2008 global crisis in particular, evolutionary economic geographers have paid much attention to the notion of resilience, adaptation and adaptability in understanding the geographical differentiation of response and redevelopment of regions (Pike *et al.*, 2010; Boschma, 2014; Martin and Sunley, 2015).

The question of "why do regions differ in resilience", inquired by Martin and Sunley (2015, p.25), is at the core, but an under-explored, question in (E)EG. Although the resilience concept itself bears inherent deficits, primarily concerning its '*rebound back*' (multi-) equilibrium thinking, it does shed some light on the uneven mechanisms of long-run regional development, by explaining differences in how regions react to a succession

of shocks and challenges (Martin and Sunley, 2015, p.37). With this respect, resilience can be regarded as contextually sensitive and dynamic capabilities of regional economies. It ought to be understood not only as short-term recoverability, but also as long-run transformability and sustainability.

In the light of Grabher and Stark (1997)'s early work, Pike *et al.*, (2010) claimed "adaptation and adaptability as central causal concepts in explaining the geographically uneven resilience of places" (p.60). In general, adaptation is considered as an ability of changes within existing structures and paths in order to fit/adapt to the changing environment. It is, to some extent, similar to the notion of '*adjustment*' featured by slow, incremental and path-dependent development (Grabher, 1993; Chapman, *et al.*, 2004). Adaptability, however, is more subject to a capability of firms, people and states purposively seeking for alternative developmental options, and being dedicated to innovation and structural change. It can be largely associated with the so-called '*reorientation*' process in regional economies that has been claimed by leading scholars (Grabher and Stark, 1997; Martin, 2012a; Boschma, 2014).

The existing accounts on adaptation and adaptability relating to regional economic uneven evolution have tended to draw a divide between the two. That is, there is a *trade-off* conceptualization between adaptation and adaptability. It has been argued that adaptation (characterized by tightly connected agents primarily focusing on pre-conceived paths/industries) basically undermines adaptability (featured by loosely tied agents endeavoring on path creation/renewal) (Grabher, 1993; Pike *et al.*, 2010). Martin and Sunley (2006)'s seminal work on path dependence and regional economic evolution, again, highlights this idea, by saying "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).

However, in my thesis, especially in Chapter 8, I argue that this trade-off idea of adaptation and adaptability is an inappropriate, dualistic and reductionist conceptualization. Because, in reality, regional agents often act in a heterogeneous way. These actions are embedded in, and affected by, incoherent power relations due to overlapped economic, social and political interests (Ibert and Schmidt, 2014). It is thus possible that adaptation and adaptability co-exist, and even compete in a certain region (see details in Chapter 8).

Moreover, Boschma (2014) stresses that in an evolutionary view regional resilience can be conceptualized as a long-term ability to overcome the trade-off between adaptation and adaptability.

I take this point seriously, as EEG, in general, and the resilience notion, in particular, has tended to suffer from a lack of critical rigor and conceptual clarity. They seem to have been in danger of becoming a sort of ‘fuzzy concepts’, both in academia and policy fields (Markusen, 2003; Christopherson *et al.*, 2010; MacKinnon and Derickson, 2013). As stated by Martin and Sunley (2015), no matter single-case or comparative studies on geographies of regional resilience, “...without some agreed and meaningful concepts we have no way of assessing whether and to what extent regional economies are resilient.” (p.36). Thus, the starting point of departure of my research remains critical about the yet highly contested concept of regional resilience. This thesis thus particularly focuses on the notion of adaptation and adaptability, and their explanations in the understanding of regionally differentiated evolution of economies.

Hence, the term ‘*adaptability*’ is adopted as a keyword in my doctoral thesis. Because, I do not merely view it as an ability to create regional new growth paths. But, beyond it, adaptability here refers to a dynamic and evolutionary *ability of process* that is internally and logically linked to, mutually inclusive with, rather than separated from ‘*adaptation*’. Precisely, adaptability should be perceived as an integral part of potentials for long-term regional economic development. On the basis of the above addressed limitation, one of my research tasks is to contribute to a thorough conceptualization of regional economic adaptation and adaptability.

Therefore, the core questions to be addressed are: How can adaptation and adaptability in a regional context be better defined? What are the impact factors affecting the nature and form of regional economic adaptability? How and why do different regional economies, in a relatively long-term context, adapt differently, leading to uneven geographies of economic evolution?

1.1.2 What is missing in the research of the restructuring of old industrial regions?

In existing literature on regional adaptability, old industrial areas (from here OIAs in short) have drawn considerable attention by economic geographers. Because OIAs often confront a dilemma of coping with the problem of being locked in old existing mature industrial specializations, and seeking for new resources and opportunities toward economic renewal and diversification.

Much work on OIAs has been done on the role of path dependence and lock-ins in constraining the restructuring process. It mainly emphasizes rigid firm-based *organizational* inter-relations and subsequent *cognitive* and *political* factors protecting existing structures (Grabher, 1993; Eich-Born and Hassink, 2005). However, evidence has proven that path dependence does not necessarily lead to lock-in. And lock-in itself does not necessarily refer to path stability and continuity as well. Hassink (2007) well articulates that OIAs with (relatively) 'weak ties' of local actors have 'strengths' to avoid lock-ins. Such kind of tie structures can lead to high adaptability for future new industry formation. In this respect, lock-in can be conceptualized as a process of change instead of static stage. It means that under certain conditions lock-ins can turn out to be possibilities or sources for regional renewal and path creation (Martin, 2010; 2012b). Many studies have also shown that new paths do not emerge from scratch, but tend to draw assets from existing competences, networks, and structures (Martin and Sunley, 2006; Martin and Simmie, 2008; Neffke *et al.*, 2011). In other words, adaptation (affected by the effect of path dependence) can lead to or mutate into a stage that facilitates adaptability, through the process of '*related variety*' (Frenken *et al.*, 2007) or '*regional branching*' (Boschma, 2011) enabled by local actors' entrepreneurial actions (Malecki, 2009; Garud *et al.*, 2010).

The co-existence of adaptation and adaptability in OIAs has been emphasized, albeit in an implicit sense. Strambach and Halkier (2013), for instance, state that development paths in regions are not coherent in themselves, and there is, always, a degree of *plasticity*. This means that even in a well-established institutional setting there remains leeway for actors to adopt strategic actions. New growth paths can be fostered without a need of breaking the existing paths/structures. Drawing upon evidence in Wales, UK, Morgan (2012)'s work, for instance, shows that under the context of particular politics and state interventions, local actors were not merely involved in adaptation relating to path exten-

sion or persistence. They, also, at the same time, tried to cultivate adaptability by fashioning new paths. These studies show that adaptation and adaptability can co-exist in parallel. Adaptation may be not at the expense of adaptability and *vice versa*. Besides these studies, more and more evidence shows that the nature of adaptability and its relation with adaptation vary from one OIA to another. They tend to be more related to the role of social agency, institutions, politics and policies, rather than to traditional forces of firms and industries (Hudson, 2005; Dawley, 2013; Hu, 2014; Isaksen, 2014).

However, by far, the existing literature on the restructuring of OIAs has been relatively weak on how adaptation and adaptability are defined in a dynamic and interactive perspective. In general, three research gaps can be identified: First and foremost, the human agency perspective is insufficiently integrated into the concept of path dependence, lock-in and path creation in the OIA context. We are still not clear about how different actors, particularly key individuals or groups play a role in enabling or hindering adaptation and adaptability, and who they are? An in-depth investigation on the role of entrepreneurship and place leadership might be potentially useful to articulate the dynamics of adaptability, as well as the inter-relationship concerning to adaptation between institutions, politics and policies.

Secondly, too much work has been done on the role of local endogenous firm forces in affecting the restructuring of OIAs. However, multi-scalar and system-wide forces, and agents that interactively work together on the organization of adaptation and the possibilities of adaptability are far from well explored.

Last but not least, the role of institutions and related broader political economies in the adaptability of OIAs is under researched. In particular, the role of the state, institutions and policy at several spatial levels should be placed as a crucial point in understanding the dynamics and the interplay between adaptation and adaptability. It is the very case in the context of OIAs. As local economic actors in OIAs are relatively weak in promoting new paths, the state may play an active role in introducing external forces for re-gional industrial change.

To sum up, the existing research weaknesses and gaps need to be coped with by a systematic and comparative in-depth research. As Boschma and Martin (2010) noted that “to understand the nature of uneven evolution of regions, we need to first understand

how the processes of path creation and path dependence interact to shape geographies of economic development and transformation” (p. 7). This research thus seeks to shed some light on the understanding of regional uneven economic evolution, by a particular focus on the interactions and relations between adaptation and adaptability in a regionally comparative perspective.

1.2 Research aims and questions

Based on the research gaps I have identified, the dissertation thus aims to advance the understanding of differentiated economic evolutionary geographies. By acknowledging the potential limitations of using single explanatory concepts (Hassink *et al.*, 2014; MacKinnon, *et al.*, 2009), this book synthesizes several evolutionary, institutional and human-agency approaches in investigating the restructuring of OIAs in the Chinese context. Moreover, although the primary research aim is not to ‘theorize back’ on EG based on Chinese experiences (Yeung and Lin, 2003), I do realize the importance and specificities of the Chinese context. Studies in a non-Western context have potentials to generate new insights to the existing knowledge, but also can help to critically reflect on the mainstream Anglophone theories (Yeung, 2007). Therefore, my aims are not only simply to address the questions by providing some ‘Chinese’ empirical stories on the topic. But also, to shed some light on the very fundamental issue in EG – namely the nature of regionally uneven economic evolution – by a systematic comparison of two Chinese mining regions closely related to adaptation and adaptability.

In doing so, two main research questions are posed as follows:

RQ 1: *How do OIAs evolve and adapt with crises/challenges, and to what extent are they able to change old industries and create new ones?*

Given the complexity of the ‘*how*’ question relating to the process and mechanism, as noted above, I will adopt a more integrated and multi-scalar view to explore this question. To do so, I will focus on three key issues at different but interlinked scales: 1) at the *micro* level, the (re)actions of individuals from firms and institutions for the change and continuity of OIAs over time; 2) at the *meso* level, both *indus-*

trial-sectorial and *political-institutional* agencies in varied forms of networks, institutions and policies that shape and reshape the adaptation and broader evolutionary trajectories of OIAs; 3) at the *macro* level, national and supranational forces including investments, policy interventions, market changes that impact on regional adaptability. I am convinced that these three issues combined can help to better understand the nature of how OIAs adapt to crises and how they manage for future development. In line with this multi-scalar view, and an integrated conceptual perspective, the question is explored in Chapter 5, 6 and 7 with a focus on two Chinese coal-mining regions (namely Zaozhuang and Fuxin). In these three chapters, the roles of multi-scalar political economies, states and human agencies are emphasized, respectively.

RQ 2: why do OIAs adapt differently in terms of process, mechanism and effectiveness? Precisely, why are some OIAs more capable of renewing existing old industries and creating new growth paths while others are less able to or even fail to do that?

This question indeed has been one of the most intriguing issues in EG (Martin and Sunley, 2006). On the basis of the work on the first question, this question is related to Chapter 8. Although Chapter 5, 6 and 7 to some extent show how two different OIAs in China adapt differently, Chapter 8 aims to compare the adaptation and adaptability in a more systematic way. It is more directed to contribute to the 'why' question. More specifically, so far, the notion of adaptation and adaptability has been little conceptualized in a coherent way, and has not been empirically operationalized. The key aims of this dissertation thus are to engage the two notions into the critical question of uneven evolutionary geographies, trying to understand three sub-questions: 1) is adaptation just an action process of adjustment in old existing industries? To what extent and by what way does it involve with an ability of developing new growth paths? In other words, how to justify the inter-relations between adaptation and adaptability in the OIA context? 2) Conceptually, in a long-run perspective, how can we differentiate the quality and effectiveness of adaptation and adaptability among different regions? and 3) empirically, what are the impact factors affecting the differences in the adaptability in Chinese OIA? These questions will be dealt with in Chapter 8.

1.3 Book structure and overview of papers

This dissertation is organized by nine chapters (see Figure 1). In Chapter 1, I mainly introduce the recent concerns in the field of EEG. These concerns are about how regions adapt to a variety of challenges and why their adaptabilities are geographically different. Chapter 1.1 gives a conceptual overview of regional economic resilience, adaptation, and adaptability. Based on that, existing research limits/weaknesses, the aims of this book, research questions and structure are identified in the rest of Chapter 1.

After clarifying my research data setting and methodology in Chapter 2, the dissertation follows a paper-based collection, which consists of six articles. All of these articles (except Chapter 3 as a book chapter) were submitted to academic journals with a double blinded peer-review process, which deal with both my conceptual and empirical work.

Chapter 3 engages with a future conceptual reflection on economic adaptability in OIAs by synthesizing a variety of concepts. These concepts are not only from EEG, but also from an institutional perspective. Due to the origins of the adaptability notion and its related concepts that are mainly derived from Western experiences, it is highly needed to test their applicability when it comes to non-Western contexts. In this respect, Chapter 4 critically reviews a set of Chinese-speaking literature on the restructuring of OIAs in China. It clarifies the potentials of adopting several internationally recognized concepts and perspectives in the Chinese-specific context, and also suggests some avenues for future research on the topic.

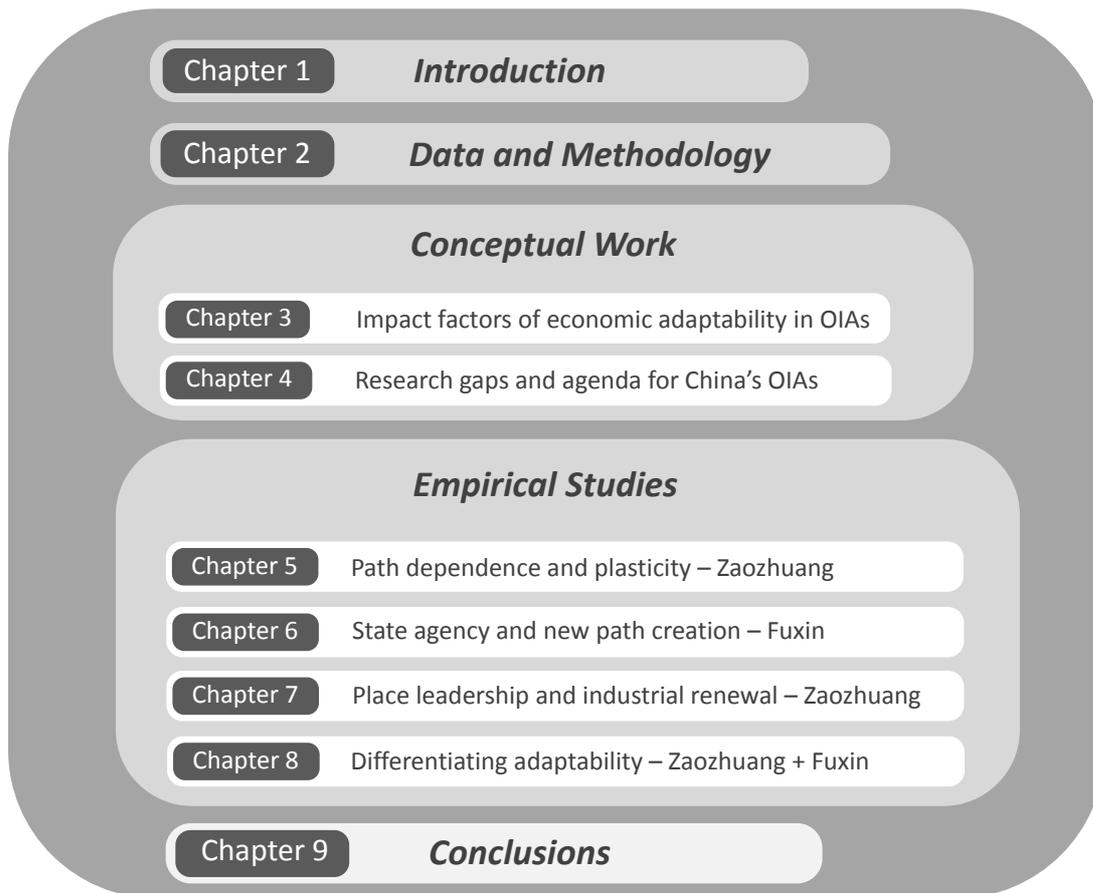


Figure 1. The chapter structure of the book

On the basis of the first four chapters, the empirical analyses are presented in Chapter 5 to 8, which serve to answer two interlinked main research questions: 1) how do OIAs in the context of transitional China adapt, in terms of how mature industries change, and how new ones emerge? And 2) why do different OIAs adapt differently, in terms of the ability to search, select and develop new growth paths in practice?

To be clear, Figure 2 is drawn to give detail (e.g. publication information, author contribution) to the each individual paper. Chapter 5, 6, and 7 are single-case based. They mainly explore the mechanisms of regional old path dependence and new path creations. But, each of them used different perspective with different focuses (Chapter 5 on SOEs and political economy; Chapter 6 on the role of multi-scalar states, Chapter 7 on the role of local state leaders and their leadership). In this sense, the first three empirical papers not only present a geographically uneven perspective of regional adaptation and adaptability by themselves. They also largely led to the more thorough comparative

account in Chapter 8. The conceptual and empirical part as a whole thus helps to generate conclusions in Chapter 9. In the following, I will go through each paper in brief:

Chapter 3: '*Explaining differences in the adaptability of old industrial areas*', co-authored with Robert Hassink, as a conceptual paper, mainly gives a in-depth literature review on the restructuring of old industrial areas with a particular focus on synthesizing a variety of impact factors affecting regional economic adaptability. It moves beyond the prevailing firm-based and endogenous focused EEG perspective on this topic, and explains, in a comprehensive way, the roles of both *industrial-sectorial* and *political-institutional* impact factors affecting the adaptability in OIAs. This paper therefore reiterates the recent argument in Hassink *et al* (2014), suggesting an encompassing, integrated '*engaged pluralism*' perspective to rethink the spatial divergence in the process and mechanism of regional adaptability.

Chapter 4: '*New perspective on the restructuring of old industrial areas in China: A critical review and research agenda*', co-authored with Robert Hassink, takes the Chinese-specific context seriously about the research on the restructuring of OIAs. The paper critically reviews the Chinese-speaking literature on the topic (Chapter 4.3), we found that there are many research deficits in the Chinese literature such as a severe lack of using internationally recognized concepts and theories. In spite of that, the Chinese experiences implicitly show a potential fit with the current conceptual debates in the field. The power of history in general, the explicit role of multi-scalar states, politics and policies are crucial for the adaptability of OIAs in China. This can be interpreted and analyzed by some modern concepts (perspectives), such as an Institutional Economic Geography (IEG) approach and a Geographical Political Economy (GPE) view. We suggest several potentially useful modern concepts for future research on China's OIA, such as path dependence, path creation/plasticity, lock-in and relatedness, as well as an institutional and human agency perspective (Chapter 4.5).

PAPER	PUBLICATION STATUS	OWN CONTRIBUTION			
		Intro	Theory	Empirics	Conclusion
Chapter 3 Explaining differences in the adaptability of old industrial areas	Published (book chapter) in <i>Routledge handbook of Politics and Technology</i>	●	●	not applicable	◐
Chapter 4 New perspective on the restructuring of old industrial areas in China: a critical review and research agenda	Accepted by <i>Chinese Geographical Science</i>	●	◐	not applicable	◐
Chapter 5 From coal-mining to coal chemicals? Unpacking new path creation in an old industrial region of transitional China	Accepted by <i>Growth and Change</i>	●	●	●	●
Chapter 6 State-led path creation in China's rustbelt: The case of Fuxin	Published in <i>Regional Studies, Regional Science</i>	●	●	●	●
Chapter 7 Place leadership with Chinese characteristics? A case study of Zaozhuang coal-mining region in transition	Accepted with minor revision by <i>Regional Studies</i>	●	◐	●	●
Chapter 8 Beyond the dualism of adaptation and adaptability: Exploring differentiated resilience of two Chinese mining regions	In preparation for <i>Journal of Economic Geography</i>	●	●	●	◐

own work
 joint work

Figure 2. Overview of individual papers and own contribution

Chapter 5: ‘From coal-mining to coal-chemicals? Unpacking new path creation in an old industrial region of transitional China’, single authored, focuses on a classical OIA in China, namely on the coal-mining region of Zaozhuang. It explores the mechanisms of the new path creation of coal chemicals in this region and its relations to the old path of coal mining. Although one would expect a strong relation, it has been shown that it is actually limited, and that both paths co-exist parallel to each other. The strong path dependence and extension of the coal-mining industry enabled by multi-scaled forces hindered diversification (Chapter 5.4). The findings echo the *path plasticity* notion (Strambach, 2010), highlighting that regional path creation can be achieved without breaking down or fundamentally reframing the existing old well-structured institutions. The chapter also emphasizes the important role of the local and national political economy of China, its incoherent power structure among states and SOEs, due to the Chinese admin-

istrative hierarchy system, in affecting the evolutionary trajectories of OIAs.

Chapter 6: *'State-led path creation of China's rustbelt: the case of Fuxin'*, single-authored, gives another pattern of new path creation in Fuxin. By taking one of the most typical coal-mining regions in China's rustbelt, namely the northeast as a case, it explores the evolutionary mechanism of the wind power industry in the region. In contrast to the existing path-creation literature in the framework of the firm-focused EEG, the paper reveals that state agencies at both local and national level collaboratively contributed the most to the emergence and growth of the wind power industry in Fuxin. I argue that state interventions, rather than firm dynamics, played a salient role in underpinning the making of the new path. Top-down state policy interventions are not random in China. They are indeed enabled by multi-scalar, historically conditioned institutions and varying broader socio-economic agendas. Fuxin's path creation can be regarded as a collective consequence of multi-scaled state interactive process in a transitional context.

Chapter 7: *'Place leadership with Chinese characteristics? A case study of the Zao-zhuang coal-mining region in transition'*, co-authored with Robert Hassink, adopts a human agency approach to investigate and explain how the tourism industry was well developed in a less-favored OIA, namely Zaozhuang. Critically exploring the Western notion of place leadership, this chapter launches the notion of *local state leadership*, as a specific Chinese form of place leadership (Chapter 7.3). By an in-depth case study of the tourism industry emergence and further development in Zaozhuang, it articulates how the municipal mayor, aligned with other local elites, effectively exercised varied styles of leadership, namely *interpretive*, *formal* and *network* leadership, which has cumulatively created an enabling institutional niche for local industrial change (Chapter 7.5). We thus argue that the idea of local state leadership is highly relevant and useful to understand the bottom-up logic of institutionalization and governance innovation (experiments) for endogenous economic (industrial) restructuring in China's OIAs.

The last paper, Chapter 8, *'Beyond the dualism between adaptation and adaptability: exploring differentiated economic resilience of two Chinese mining regions'*, co-authored with Robert Hassink, is devoted to the 'why' question of my dissertation. The article basically made a comparative account in regard with the notion of adaptation and adaptability, in order to understand uneven regional economic resilience. This chapter criticizes

the notion of regional economic resilience for conceptual fuzziness, particularly its dualism thinking, as well as a lack of empirical work on long-term regional evolution (Chapter 8.2). It has sought to address this gap by developing a conceptual framework of uneven economic resilience of regions in a long-term setting. This framework defines adaptation and adaptability in an evolutionary and coherent way that moves beyond the traditional trade-off idea (Chapter 8.3). It demonstrates how varied forms of adaptation-adaptability relationships may result in different patterns of processes and also different potentials of resilience. Based on an in-depth interview survey, the empirical analysis comparatively explores both adaptation and adaptability in two Chinese mining regions (Zaozhuang and Fuxin) under the circumstance of diminishing coal reserves over a period of 15 years (Chapter 8.5). Our study suggests that a higher resilience does not simply mean a stronger ability to create new growth paths/industries, but rather, a more *'endogenous'*, *'locally embedded'*, *'transformative'* and *'long-run oriented'* adaptation process of industrial restructuring.

2 Research design and methodology

According to Flyvbjerg (2006), “social science has not succeeded in producing general, content-independent theory...[but] can offer concrete, context-dependent knowledge. And the case study is especially well suited to produce this knowledge” (p.233). The use of the case study method in this research therefore is intended to generate concrete context-based knowledge that can in a cumulative way contribute to the theoretical advancement in the field. Indeed, the choice of using the case study method depends in large part on research questions. In particular, when the main research questions seek to explain a contemporary phenomenon (e.g. ‘how’ or/and ‘why’ some social phenomenon works), doing case study is the preferred method, compared to other methods (Yin 2014, p.4).

Moreover, as Flyvbjerg (2006) states, since “good social science is problem driven...[case study] best helps answer the research questions at hand” (p.254). My empirical analyses rely on case studies, aiming at exploring the key question that has been repeatedly enquired by many economic geographers. That is, why some regions are adaptive and able to manage to develop new growth paths while others are not (Hassink, 2010b; Martin and Sunley, 2006; MacKinnon *et al.*, 2009). I thus apply a *qualitative method* as it has advantages to not only deal with complex (regional economic adaptability) and highly contextualized phenomena (in the Chinese context), but also it has explicit potential to answer the ‘why’ and ‘how’ research questions (Baxter and Jack, 2008).

I choose to use *multiple cases* because, on the one hand, the evidence from multiple cases is considered as being more compelling and robust (Herriott and Firestone, 1983). In this research, by studying two different regions, research findings are mainly contributed to answer the ‘how’ question, such as how new path creations are achieved over time in Chinese OIAs. On the other hand, according to Baxter and Jack (2008), since “a multiple case study enables the researchers to explore differences within and between cases” (p.548), multiple cases (here cases could refer to regions) are used for a comparative study (see Chapter 8), in an attempt to contribute to the ‘why’ question relating to geographically uneven economic adaptation and adaptability.

Importantly, when it comes to multiple-case study, one needs to select each case care-

fully so that it either “(a) predicts similar results (a literal replication) or (b) predicts contrasting results but for anticipatable reasons (a theoretical replication)” (Yin 2014, p. 53). Drawing upon the research question, my results are predicted as contrasting results. In this regard, the cases that need to be selected are neither critical cases nor average cases, but rather are *extreme* cases with the richest information and in a highly comparable manner (See Chapter 2.1).

In sum, my doctoral research takes the multiple-case, comparative-oriented, question-led study methodology. Following Flick (2013) and Yin (2014)’s suggestions on qualitative case study design, three major steps were identified (see Figure 3). The first step is to clarify the selection of cases (Chapter 2.1), the second is to address how data was accessed (Chapter 2.2) and, particularly, how interview data was acquired in practice (Chapter 2.3), and the third step is to analyze data (Chapter 2.4).

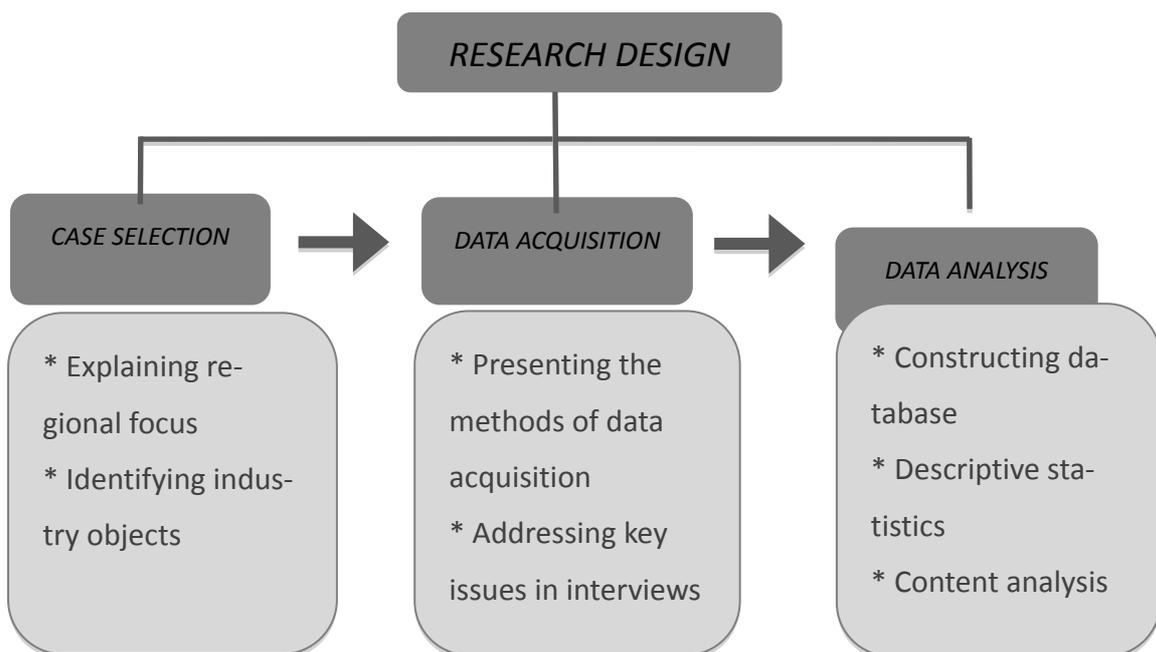


Figure 3. Three main steps of the case study in the research

2.1 Case selection

1) Why Zaozhuang and Fuxin?

The Zaozhuang region in Shandong Province and the Fuxin region in Liaoning Province were selected as case study areas (see Figure 4) out of three main reasons.

First, on the one hand, they are both coal-mining regions that have strongly contributed to the national economic growth in past decades. On the other hand, they have been widely regarded as less-favored mature industrial bases due to the long-term mining over-specialization and weak capability to adapt to marketization and institutional reforms. Since 2008, they are both qualified as resource-exhausted cities (RECs) by the State Council, given the diminishing coal resource reserves in the two regions. The general similarities, among others (Table 1), help to raise research interests, and also reflect the study significance to probe the *local* differences in the adaptability under the same *national* policy framework, with at least one similar regional crisis.



Figure 4. The location of the case regions in China

Table 1. General overview of Zaozhuang and Fuxin municipal region

Item Region	Area (Km ²)	Population (Million)	GDP (Billion \$)	GDP/capita (\$)	Employed coal miners	Coal reserves (year)*
Zaozhuang	4550	3.73	20.12	5439	45800	10
Fuxin	10445	1.82	5.60	3075	80000	20

Source: Statistic Yearbook of Zaozhuang and Fuxin in 2010. ‘*’ refers to expected coal exploration duration before coal reserves have been fully exhausted.

Secondly, despite the pointed similarities, the two regions situate in regionally (*provincially*) distinctive institutional backgrounds. Shandong Province is one of the east provinces in China, where local economies are more open and marketized compared to ones in inland provinces. Fuxin is a typical coal-mining region in Northeast China. The north-east region consisting of Liaoning, Jilin and Heilongjiang is China’s largest heavy industry based economy. It was the most economically stagnated region after China’s opening up and privatization in the 1980s. Although the central state has explicitly supported the industrial restructuring of the Northeast since 2003, many regions seem still not to be able to get rid of negative lock-in effects and return to the previous fast-growing state. The long-term central SOE-dominated industrial history has led to a unique institutional niche and political ecology in Northeast regions. Local actors have tended to rely on national policy support and presented strong resistance towards change. It has been assumed that the development model of Northeast China is highly different from the well-informed experiences in coastal regions, because of its specific historical roots (Wang, 2014). In this regard, the divergent *provincial-level* institutional contexts that Zaozhuang and Fuxin situated in made them worthwhile for a comparative analysis.

Thirdly, Zaozhuang and Fuxin represent two *extreme* cases characterized by several different place-based factors. For instance, Zaozhuang, according to NDRC (2011), is the only eastern region qualified as one of in total 69 Resource Exhausted Cities (RECs). And Fuxin was issued as China’s first ‘*resource-based pilot city*’, for which the region has directly received policy support from the central state since 2001 (State Council, 2001). Moreover, the two regional economies presented highly divergent development trajectories in the past two decades (Figure 5). Zaozhuang’ GDP grew apparently faster than Fuxin. And the GDP gap enlarged dramatically since 2001, although the latter received

more national inputs and much earlier than the former.

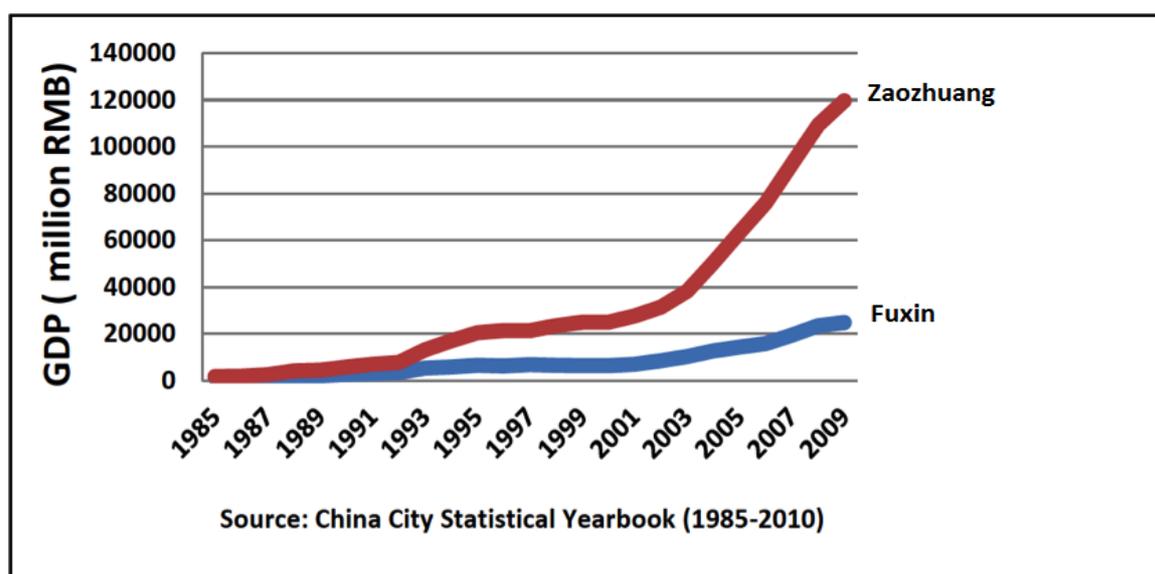


Figure 5. The GDP growth of Zaozhuang and Fuxin since 1985

The three reasons therefore bring several intriguing questions: To what extent do institutions affect their processes and patterns of industrial dynamics? How do local actors adapt and evolve over time and how do they come to being? And why do the two cities present different adaptability? The two case regions were selected not only because they are comparable. But also, because by comparing them we can generate new insights that fit to answer the proposed research questions.

2) How are the sector objectives of research selected?

As regional economic adaptability is not only about the ability of old industries to adapt and renew but also about the ability of new industries to emerge, the industry focus of this study lies on both old industries and newly emerging ones. Both Zaozhuang and Fuxin are well-known typical coal-mining regions, where mining as the pillar industry has contributed most to growth and development of the local economies. Studying the adaptation of the coal industry could shed important light on the potentials of old industrial assets for local economic change. The selection of new sectors in the two cities is mainly based on a dense process of information collection via Internet and public statis-

tical sources.

A considerable number (over a hundred) of newspapers, policy documents and statistical data were captured mainly from the Internet, in order to identify the most eye-catching sectors that have emerged in recent years.

In Zaozhuang, the recent industrial landscape can be characterized by the rapid development of the coal-chemical industry. By 2009, Zaozhuang had become one of six China's largest coal-chemical production bases, and it was estimated to become Asia's coal-chemical capital in 2015 (Zaozhuang Daily, 2011). In addition, the tourism industry was selected as a key research object. Between 2005 and 2011, the revenue of the industry soared from 372 to 1,816 million \$, with an exceptional annual growth rate of 25.4% (ZSB, 2012). In particular, after the local state rebuilt the Taierzhuang Ancient Town as a tourism theme park in 2009, this industry has grown rapidly, and has become a new growth path for the local economy.

The Fuxin region has been recently recognized as one of the China's most fast-growing wind power regions. From 2005 to 2011, the installed capacity skyrocketed from 49 MW to 2094 MW, which has accounted for almost half of the total capacity in Liaoning (CWEA, 2011). Additionally, between 2000 and 2006, the agriculture and food industry once became the second largest industry in Fuxin. This industry, however, has declined now. The number of food/agriculture employees decreased dramatically from 75,000 in 2002 to about 4,000 in 2013 (FSB, 2003, 2014). Therefore, I am interested in how this new path emerged and why it failed to grow further and locked in decline.

In the sector selection process, I considered that new industries might be of two main types. One is that new industries are closely related to the coal-mining industry, which means new industries may evolve out of old industries or partly by using old assets. This is why the coal-chemical industry was selected in Zaozhuang. The other is that new industries have no technological or production linkage with the old industry such as the tourism industry in Zaozhuang, the food & agriculture industry, and the wind power industry in Fuxin. With this respect, exploring how these new sectors emerge and to what extent they benefit from old industries could provide a better understanding of regional varieties of new path creation, and more broadly, of the uneven economic adaptation and adaptability in a long-term perspective.

2.2 Data acquisition and collection

- *How did I access the data and interviewees?* -

Although doing fieldwork in China has become feasible since the late 1970s, it still remains difficult and somehow highly uncertain in practice. The obstacles of getting access to data in China have been acknowledged by some Western scholars. For example, these obstacles can be related to a lack of *guanxi* networks, political constraints, ethical and/or cultural dilemmas (Heimer and Thøgersen, 2006; Lunn 2014). These problems, in my view, are not merely restricted to foreign scholars. Indeed, without the assistance of a '*mediator*' agent, even Chinese native scholars could be treated as '*outsiders*' by interviewees. Under these circumstances, it is hard to acquire high quality data (Wei, 2006).

However, it does exist the most effective way to access fieldwork in China. I would say that, the key is getting contact with the Chinese *government*. If the fieldwork is supported by official institutions, it will be much easier to have a higher accessibility of data and information. This is especially the case in the EG study, of which fieldwork often involves conducting interviews with individual elites from firms and public institutions. I thus was clearly aware of the salient role of the government in helping to get access to interviews before I started my fieldwork. This awareness led me to move beyond traditional methods, such as the usage of personal *guanxi* networks (actually I do not have any personal social capital in the case regions), snowballing, and old style telephone calling. Rather, I chose to seek for top official channels.

Fortunately, a scholarly visit, together with my supervisor in the Institute of Geographic Sciences and Natural Resources Research of Chinese Academy of Sciences (CAS) in early 2012, offered me an opportunity to get to know 'the key figure' of my fieldwork, Prof. Wenzhong Zhang. As a nation-wide expert on the restructuring of Chinese RECs, he has been extensively involved in providing policy recommendations to varied levels of gov-ernments. He therefore has very solid relationships with government elites in many Chinese RECs. After introducing him about my research interests that were highly relevant to his own, he showed full enthusiasm for my project, and guaranteed to assist me to conduct in-depth fieldworks. Here, I have to emphasize that because of his broad contact networks, I in fact enjoyed quite a lot of freedom to select where I wanted to do the

fieldwork.

Both in Zaozhuang and Fuxin, the officials from City Development and Reform Commission (*Fagaiwei* in short in Chinese) were well informed by Prof. Zhang in advance. They were in charge of guiding me to firms and institutions in their regions. Here, it is worthwhile to emphasize that although this ‘taking care’ and ‘guiding’ is formal and somehow in a top-down way, interviewees are by no means selected by the authorities. Instead, having a higher power position, namely being officially introduced from Beijing, I had full freedom to decide what kind of firms I would like to visit, how many interviews I would like to do, as well as how long I would like to stay in the regions. Under this situation, I was able to stay nine weeks in Zaozhuang and seven weeks in Fuxin between 2013 and 2014, and visited a total number of 56 institutions, ranging from firms, government bodies and other public organizations (see details in Appendix 1).

One may argue that this explicit existence of governmental influences would lead interviewees to remain cautious of giving criticism. To avoid this possible ‘single voice’ problem, I used *Weibo*, one of the most influential social media platforms in China, in an attempt to get contact with additional interviewees who can provide me more neutral information. The concrete method is firstly asking ‘big V’ (referred to influential users who have hundreds of thousands of followers) from my inter-connected friends to broadcast my requests via their *Weibo*. These requests were mainly about asking for help to find out possible informants who are based in the case regions. Surprisingly, it worked very well. For instance, through Dr. Jun Zhang (Economic Geographer at University of Toronto)’s *Weibo*, I reached one crucial referrer whose father shared a wide *guanxi* network in Zaozhuang. With the help of the father, several locals (e.g. former miners and retired government elites) were interviewed.

Moreover, it also allowed me to manage to do some interviews that the local state was not able to arrange. For instance, it is in principle impossible for the local (*municipal-level*) government to request a favor from *provincial* SOEs according to the Chinese bureaucratic hierarchical system. But with *Weibo*, I was able to eschew the formal, time-consuming and ‘top-down’ procedure of interview acquisition, and reached key informants in provincial SOEs by directly taking advantage of people’s *guanxi* networks.

Interviews were semi-structured. Standardized questions were quite general and were

designed in a strong comparative-case-study purpose. Open questions were more concrete, depending on the specific regional contexts. To prepare these open questions, a wide document searching (mainly via the internet) was conducted. A variety of local newspapers, media articles, government reports and policy documents, among others, was collected as important inputs for guiding the interviews. For instance, in Chapter 7, this preparation helped me to focus on the role of local state leaders. And during the interviews, this also helped opening up many mutual points of interest to discuss and to share ideas. To sum up, the above-mentioned methods I used in my thesis for data acquisition are presented in Figure 6. As Yeung (2003) stated, the combination of complementary methodological practices can move beyond the limitations of single research methodology and raise the quality of data and research arguments.

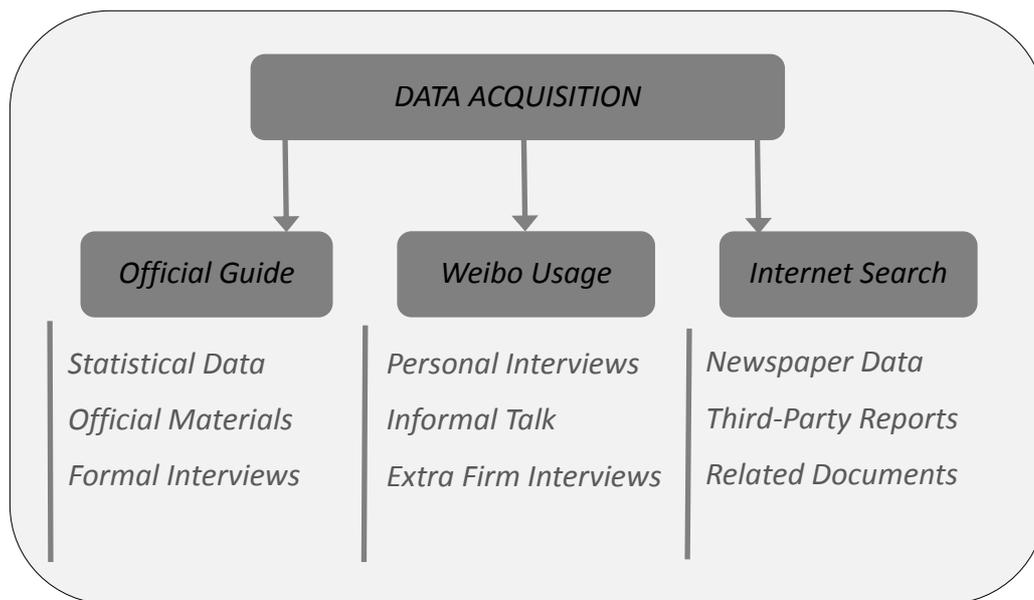


Figure 6. The methods for data acquisition

2.3 Interview proceeding

- *How did I proceed with the interviews?* -

This study is designed as *qualitative* and *comparative* research. It aims to explore on the one hand how local agents (e.g. firms, authorities, human actors) evolve and adapt to local and extra-local changing institutional contexts, and on the other hand what the differences in the adaptability (in terms of the ability of new industry formation and old industry renewal) between different old industrial regions.

Qualitative research is perceived as the best method to explain the complex, uncertain, non-equilibrium process of regional economic evolution. I view firms and other actors as an *evolutionary* and *relational* entity as their behavior is constantly affected by other actors and is socially and historically embedded in, but not constrained by, varied institutions. Qualitative methods therefore are thought to be useful to tackle the 'how' question in human geography research (Hay, 2010).

The interview objects were divided into three main different categories, namely old coal firms, newly emerged firms and public authorities. Despite different categories having different interview questions, the firm interview guides can be in general summarized by five big issues: (1) development history of firms, (2) current features of firms, (3) the changes/creation of inter-firm relations and firm institutions, (4) state/policy action and impact on firm adaptation, (5) firm strategies and future plans (See detail in Appendix 2). The authority-oriented interview questions mainly deal with how and to what extent local state actors impact on firm, industry and regional economic adaptation (Appendix 3). Almost all interviews with firms were scheduled by local officials. Although local officials tended to accompany me for the interviews for showing respect to me, I insisted on conducting interviews by myself (unless the interview location was exceptionally far from my place which needed a drive with the help of local government officials). This is mainly in order to avoid possible 'ambiguous' answers from the interviewees, due to the participation of local officials. Because of this, most of my firm-level interviews had relaxing atmospheres. The interviewees were open to talk and were willing to tell some 'inside' stories.

The *formal* office-based interviews were about 60 to 90 minutes in length and were either recorded by audio recorder or note taking. After that, many of the interviewees invited me for a meal (because the interviews were coordinated by the local government and interviewees wanted to send respect to the government by offering me meals, indeed). I often accepted their invitations, because it was a good opportunity to do some *informal* interviews during the meals, in which many critical questions were approached. These questions deal with firm-state relations/interplay, government policy implications, institutional problems and broader political economy issues. I would say, in some cases these restaurant talks were more informative than the *formal* office-based interviews.

2.4 Data evaluation

In order to evaluate the data two analytical tools were used in this study. First of all, *descriptive statistics* were applied for standardized questions in an attempt to better compare the general differences in the adaptation and adaptability of the two cases. For example, the changes of the (un) employment rate and production in the coal-mining industry can be used to reflect on the dynamics of the industry. Secondly, the data relating to the interplay between firm and government, and the role of geographical power relations in affecting the mechanisms of industrial evolution was analyzed by the *content analysis* method (Flick, 2013). In order to link the empirical materials to the existing theoretical debates, and also to fit for the research purpose and industry focus, the data was structured by three different concept-led and research objective-based categories (see Table 2).

Table 2 the construction of database for analysis

Questions	(1) How the coal industry adapts	Some potentially related concepts
Data Category	(2) How new industries emerge	
Individual level	The role of human agency (firm and state leaders)	Institutional entrepreneurship, place-leadership
Firm-level	Firm institutions, strategy, decision, action (absence of action)	Path dependence, lock-in, path creation, related variety
State-level	Multi-scalar state action, policy impact, politics, institutions	A geographical political economy approach

Each empirical chapter is built up based on its own set of data categories. Regarding to the fact that in the context of Chinese OIAs, SOEs often predominate local economies, the data set thus does not stay in separation, but is highly inter-linked. For instance, many actions from SOEs are indeed authorized or encouraged by the state, particularly by some key officials. In this regard, Chapter 5 deals with the relationship between old path development and new path creation. It demonstrates that the path expansion of the coal industry in Zaozhuang is not merely a result of firm strategies, but is more enabled by multi-scalar political economy and policy inputs. Chapter 6 is based on the clear contextualized data results in Fuxin. It addresses the key role of the state at both local and national level in nurturing and enhancing the creation and growth of the wind power industry. Chapter 7 confirms the salient role of the mayor in Zaozhuang in the emergence and rapid development of the tourism industry, based on the individual-focused data category. A concept-informed data categorization can facilitate the integration of appropriate concepts and perspectives into the specificities of Chinese contexts. Therefore, In Chapter 8, the comparison of the two cases in regard to the issue of uneven economic resilience is the result of a synthesis of previous data information, and is also built upon the previous empirical chapters.

3 Explaining differences in the adaptability of old industrial areas

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Abstract

The spatially uneven adaptation and adaptability of old industrial areas has become one of the most intriguing issues in the field of economic geography in the post-crisis era. This chapter contributes to a conceptual inspiration by synthesizing multi-dimensioned impact factors and their characteristics on the adaptability of old industrial areas. It suggests that despite some useful concepts in evolutionary economic geography, a more systematic and integrated conceptual framework is needed for a better understanding of the variegated geographies and mechanisms of regional economic adaptability.

1. Introduction

Explaining the causes and consequences of uneven economic development within and between regions is a core theme in economic geography. The research focus and conceptual frameworks related to this theme have been affected by several theoretical paradigm turns in the discipline, shifting from a material-centric and equilibrium way of thinking to a non-material cultural and institutional-evolutionary perspective (Scott 2000). In recent years, one of the most frequently asked questions in the discipline is why it is that some regional economies are able to adapt more positively and move onto new developmental trajectories, whereas others remain locked in decline over time. This question simultaneously mirrors the reality of increasing cross-region/border interactions and unpredictable crises in a globalizing economy, which raises a new topic of conceptualizing the nature of geographically uneven economic adaptability (Martin and

Sunley 2006; MacKinnon et al 2009; Hassink 2010a; Martin 2010; Cooke 2012). It has been shown that not only many modern theoretical concepts, such as path dependence and lock-in, are applied to help to understand long-term regional evolution, but also several newly imported notions (e.g. regional resilience) are adopted to assess short-lived mutation and adaptation (Pike et al 2010). This body of work tries to provide a much broader view by combining useful concepts from evolutionary economic geography and other related social sciences, in which not only the micro-level norms, routines and practices within firms and organizations are closely focused, but also multi-actors interactively involved networks, systems, institutions, power and politics beyond the narrow firm-based scale are taken into account in contributing to a better understanding of the spatial patterns of economic landscape evolution.

Old industrial areas, which are blighted by prolonged downturns of traditional industries (e.g. steel, textile, coal mining and shipbuilding etc.) and the lack of sufficient capital, advanced technologies and know-how, face greater challenges in adapting than other regions do. Many formerly prosperous old industrial areas in Western Europe and North America experienced painful processes of de-industrialization in the 1970s and 1980s. Similar industrial restructuring occurred in the first generation of newly industrializing countries in East Asia during the 1990s, and then in the second-generation economies after the 2000s. However, one of the most intriguing phenomena is that the outcomes of industrial restructuring vary remarkably from region to region. Pittsburgh, for instance, is regarded as a successful model of a transformative shift from a steel-producing region to a steel related technology and service center (Treado 2010), whilst Northeast England is still suffering from cyclical downturn due to the inflexibility of traditional and structured institutions, as well as the tensions of local-central power relations (Hudson 2005; Shaw and Robinson 2012). This spatially uneven phenomenon, in which old industrial regions evolve and adapt following divergent processes and with varying consequences, raises important questions: how can we explain the differences in the adaptability of old industrial areas? What are the inherent mechanisms driving the rise and fall of old industrial areas? What sort of evolutionary paths do different old industrial areas follow and how can we distinguish them? So far, economic geographers working on this topic have been busy in empirically investigating the various processes and causes mainly on the basis of individual cases with place-specific evolutionary features. Much less attention has been

paid to the types, mechanisms and patterns of evolutionary trajectories observable in the adaptability of old industrial areas. Furthermore, it still remains unclear how many factors/elements are involved in regional renewal and how to distinguish the features and roles of different factors in shaping the uneven trajectories in a broader context. Drawing upon these points, this chapter will attempt to critically assess impact factors on regional economic adaptability in old industrial areas aiming to promote further multi-dimensional thinking and disciplinary cross-fertilization in doing evolution in economic geography.

The remainder of this chapter is structured as follows. Section 2 distinguishes two main types of factors affecting the strengths and weaknesses of regional renewal based on a critical review of the literature on the restructuring of old industrial areas across various industries and nations. Section 3 seeks to synthesize positive and negative factors by employing notions from evolutionary economic geography and other sociopolitical sciences to cast greater light on the uneven dynamics of old industrial areas. In section 4 research gaps are identified and several hypotheses as well as research questions for future studies on this topic are proposed. Finally, conclusions are drawn.

2. What factors affecting the restructuring of old industrial areas? A literature review

Based on a series of cross-border comparative studies of industrial dynamics and regional restructuring, Hassink (2010b) initially proposed two types of impact factors (economic-structural impact factors and political-institutional impact factors) as an analytical framework for analyzing the differences in the ability of old industrial areas to restructure and reshape. Inspired by this work, we start with a critical review of the literature on the restructuring of old industrial areas with a particular focus on two main impact factors, namely industrial-sectoral impact factors and institutional-political impact factors.

Industrial-sectoral impact factors

Prior to the 2000s, the decline of old industrial areas was often linked to economic overspecialization and the maturity of the product life-cycle, emphasizing the inflexible eco-

conomic structure and rigid supply-demand linkages that incrementally generate obstacles for further regional growth (Steiner 1985). Grabher (1993) defines those structural obstacles as a “functional lock-in”, which refers to strict inter-firm relations, close trade interdependences and mature infrastructures that may lead to a “rigid specialization trap” and the absence of adaptation. A region with one specific dominating industry may have a strong potential for functional lock-in. Hassink (2010b) study of the shipbuilding region of Gyeongnam in South Korea, for example, demonstrates how the ‘*chaebol*’ (close-knit family corporations), coupled with strong ties to the central government contribute to high exit and entry barriers that impede industrial diversity. Similar examples can be captured in Northeast China, where state-owned enterprises (SOEs) and their subsidiaries are firmly embedded in the local economic system. In this sense, little space is left for the formation of new industries (paths), as SOEs dominate market, labor and financial resources (Hu and Lin 2013). In addition, the spatial unevenness in restructuring may also be associated with different types or characteristics of industries, such as firm ownership, size and number. For instance, large and capital intensive SOEs (such as the steel industry) tend to be committed to high sunk costs that make it hard for them to exit and change, whilst labor intensive and private SMEs (such as the textile industry) seem to be affected rather less due to the low entry barriers, flexible firm relations, and low sunk costs (Chapman 2005).

Additionally, the regional innovation system (RIS) approach, which highlights the power of cross-sector interactions for innovation, has been extensively regarded as a policy priority to foster or revitalize regional economies. Tödtling and Trippel (2005) reveal that the ‘lock-in’ effect in old industrial areas is highly relevant to their performance of RIS (links within industries and with other sectors). Several comparative studies on old industrial areas in Austria (Styria and Upper Austria) and Germany (Saarland) illustrate that regions with thick and networked RIS exhibit stronger dynamism for regional renewal than those with thin and fragmented RIS (Tödtling and Trippel 2004; Trippel and Otto 2009). Since regions differ in their preconditions in terms of university-industry relations, inter-industry networks and the density of supporting agencies, differentiated topologies of RIS as well as the quality of subsystems in old industrial areas influence the nature and geography of adaptation. In addition to the RIS approach, which very much emphasizes the endogenous industrial systemness for regional innovation and economic

change, exogenous economic factors such as the national innovation system, international industrial relocations and cross-border economic cooperation play an increasingly important role in helping old firms/industries absorb new technologies and complementary knowledge and, in turn, escape from the lock-in situation (Kaufmann and Tödting 2000; Hudson and Swanton 2011; Bathelt et al 2013).

More recently, the concept of path creation has contributed to a historical dialectic perspective for explaining where the sources support for creating new industries/paths, and how contingency and place dependence co-evolve and are geared to a certain path over time (Martin and Sunley 2006, Martin 2010). This concept indicates that the emergence of new industries and paths in old industrial areas is by no means without foundation, but is usually (pre)conditioned by the previous localized legacies and pre-existing paths. For instance, the environmental technology industry is built upon the pollution reduction activities of the coal mining industry in the Ruhr area of Germany, and the fashion design industry in 'Third Italy' districts developed from the established close relations between the global market and local specific assets of textile production (Hospers 2004; Sammarra and Belussi, 2006). However, it is not to say that all old industrial areas are able to renew themselves like a "phoenix from the ashes." The new path creation seems more likely to benefit from neighboring or technologically related sectors. Recently, related variety and regional branching have been seen as useful notions to understand endogenous processes of new firm formation and industrial transformation, as Boschma and Frenken (2011, 191) articulated "the higher the number of related industries in a region, the higher the number of possible recombination, and thus the higher the probability that regions will diversify successfully into related products". As for old industrial areas, Fornahl et al. (2012) examined the causality between the declining shipbuilding industry and the emerging offshore wind energy in Northern Germany, concluded that the offshore wind energy industry primarily benefits from related onshore wind firms and other branched sectors rather than from the shipbuilding industry. In contrast, new findings from several Scandinavian industrial regions reveal that new path creation may emerge from the process of interaction or combination based on different or unrelated people, firms and sectors (Cooke 2012). Therefore, industrial relatedness, variety and proximity can be seen as very important explanatory factors for regional path creation. Meanwhile, however, this has raised difficult questions about the extent

to which industrial proximity in a region can really facilitate invention and innovation, and why regions still act in different ways when restructuring, even though they have similar or the same conditions of industrial relatedness.

Institutional-political impact factors

With the theoretical paradigms changing from 'neoclassicism' to 'new regionalism', attention is increasingly being paid to the role of noneconomic factors in shaping the uneven landscapes of regional economies (Saxenian 1994; Amin and Thrift 1994; Cooke and Morgan 1998). One of the most cited references on the restructuring of old industrial areas shows that thick institutional tissues, together with a common world-view or mindset may lead to a political and cognitive lock-in that incrementally erodes the renewing processes of regional economies (Grabher 1993). This work opens up an alternative perspective for rethinking the continuity and change of old industrial areas by highlighting the role of local culture, institutions, politics and policies. For instance, there is wide agreement in the literature that the slow restructuring process in Northeast England is due to its localized industrial culture (e.g. strong labor unionism and the continuing legacy of recruitment traditions) and strong regional protectionism, which lead to the short sightedness of local actors and the inability to move on to new activities (Sadler and Thompson 2001). Although the political and cognitive lock-in concept has been used extensively to explain the failure or continuity of old industrial areas, this does not mean that lock-in is a cul-de-sac for the further development of old industrial areas. Hassink (2007) demonstrated how local actors in WestMünsterland in Germany took advantage of weak institutional lock-in to encourage diversification into new activities amongst textile complexes. Daegu, on the other hand, a textile city-region in South Korea, is regarded as an unsuccessful lesson in restructuring because of the strong regional protectionism of vested interests in textile production, and high institutional resistance to change (Cho and Hassink 2009). In this sense, regional political and cognitive lock-in actually provides varied possibilities for regional further evolution instead of only setting hindrances to stability. Old industrial areas may move beyond the lock-in situation and pave the way to regional renewal if the lock-in effect is relatively weak. In other words, the different paths of restructuring followed in old industrial areas are strongly asso-

ciated with the degree of regional institutional resistance for restructuring, namely the strength and weakness of political-cognitive lock-ins.

Several concrete political-institutional factors have been examined in an attempt to answer more detailed questions about the type of factor that plays the dominant role in shaping the leeway for regional renewal. Cao and Xi's (2007) study of China's coal-mining heartland, Shanxi province, articulates the pessimistic role of regional identity since the long-term coal-driven economy plays an important role in damaging the motivation and aspirations of local actors to attack existing old institutions protected by vested interests and initiate new ones. Likewise, a widely shared cultural (institutional) ideology of collectivism in *danwei* inherited from the centrally planned economy in the Mao era can be well observed in Northeast China, leading to a severe lack of commercialism and entrepreneurship (Zhang 2008). In the U.S., a comparative study of two Rustbelt regions indicates that social capital of the civic networking plays a pivotal role in accessing external resources for coping with external shocks, and encouraging collective action to form adaptive social orders for regional revitalization (Safford 2009). Moreover, there are many evidence presenting political impulses such as institutional reforms, industrial policies, and renewal initiatives provide tailor-made vehicles for enhancing the strength of regional restructuring. But more importantly, the formulation and implementation of those political impulses cannot be inseparable from the efforts of place-specific human actors. Especially, political leaders who have power to develop new institutions, initiate effective policies and nurture new visions can directly facilitate regional renewal of old industrial areas. Taking the examples of the mechanical industry of Prato (Italy) and the automotive industry of the West Midlands (UK), Bailey et al. (2010) explained how form of leadership vary from region to region in very different ways to influence the processes of decision-making, which led to divergent trajectories for industrial renewal.

The impact factors we discussed above tend to overemphasize the role of localized factors in hindering or enabling the restructuring of old industrial areas, which, indeed, remains problematic. Hassink (2010b) pointed out that regional adaptability is a multi-scaled evolutionary process and it is important to take into account the institutional context at all spatial levels. Evidence has also shown that extra-local political-institutional factors such as national political change, cross-state strategies, and international regulations affect or even determine the capacity for regional adaptation. Goodwin et al. (2002)

reviewed four British industrial regions and found that devolution altered the institutional architecture and exacerbated the uneven capacities of regional economic development within the UK. Birch et al. (2010) analyzed the different patterns of adaptation of old industrial areas across Western Europe and concluded that the varieties of capitalism among different nations play a salient role in shaping different favored 'paths' of regional adaptation. In addition, since several global agreements have been achieved on climate change, such as the Kyoto Protocol, many energy-intensive and manufacturing regions are required to reduce carbon emissions and speed up the processes of deindustrialization and transformation towards a low-carbon economy. Thus, the emergence of endogenous factors may be caused by exogenous triggers and vice versa. This means that political-institutional factors coming from all different spatial levels co-exist and co-evolve with each other and jointly affect regional restructuring.

As the above discussions have shown, it is obvious that factors affecting the restructuring of old industrial areas tend to be exceedingly complex. By drawing upon single spatial perspectives or applying one specific concept it may be possible to some extent to understand the evolutionary characteristics of some specialized industries or regions; however, it is hard to generate full and reliable insights into this question within the evolving context of a globalized economy. Therefore, we contend that it is crucial to rethink the restructuring of old industrial areas using an evolutionary, multi-scalar and complex perspective to regard the relationship between adaptation, adaptability and evolution in old industrial areas. This perspective needs to be oriented toward exploring some less well understood questions, such as: how do locally embedded institutional architectures, interacting with regional, national and international institutions, local political dynamics, and the differentiated agency of individuals and organizations, help to shape by particular evolutionary paths over time and how are they shaped by them? What is the role of the state in responding to all kinds of external shocks and internal crises, how does it coordinate local agents, power, and institutions to create an adaptive environment for regional restructuring and transformation? In general, how many factors are there and what are their roles in shaping distinctive developmental trajectories over time and space that help us to understand the uneven adaptability of economic landscapes in old industrial areas?

3. Synthesizing the impact factors of regional adaptability

The notion of adaptability, originally derived from biology, has been recently employed to explain the evolutionary reaction and response of old industrial areas in a rapidly changing world. It principally refers to the systemic capability to cope with unforeseen events in the future and also the dynamic ability to overcome long-term lock-ins for socio-economic evolution (Dawley et al 2014; Hassink 2010b). This section, therefore, will not only assess the features of varied impact factors on regional adaptability in old industrial areas, but also introduce related insights in evolutionary economic geography and other social sciences about the interpretation of these features. In particular, we attempt to shed light on two main unsolved issues: study on multi-dimensional impact factor that are closely associated with the nature of adaptability in old industrial areas; research on properties and features of the main factors that could give a direction of how to assess the strengths and weaknesses of regional adaptability. Informed by the existing impact factors discussed above, as all sorts of factors (e.g. logical and non-logical; local and trans-local, economic and institutional. etc.) interact together in shaping out different degrees of regional adaptability and, in turn, divergent paths of old industrial areas (Figure 1). These main impact factors also include the characteristics of sub-factors in different spatial levels as follows.

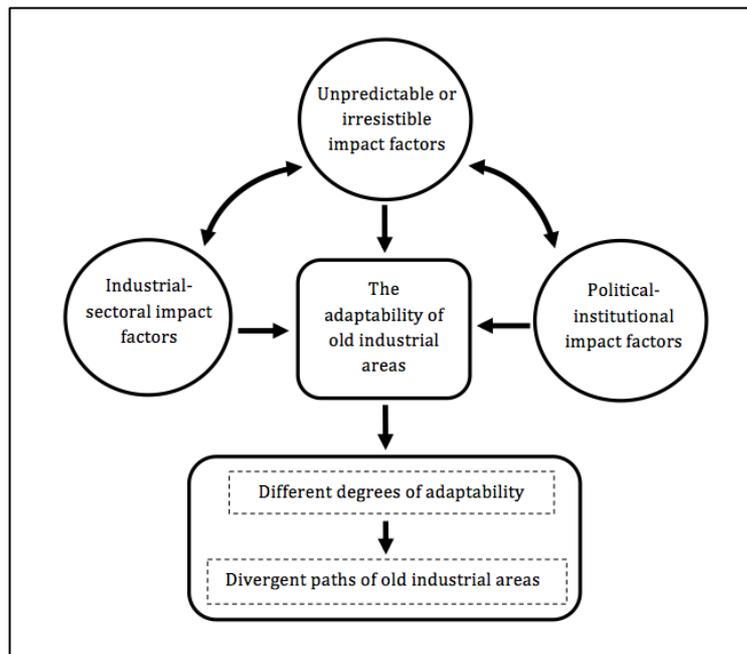


Figure 1 the process of multi-dimensional impact factors affecting on the adaptability in old industrial areas (Source: author own compilation)

Industrial-sectoral impact factors

1. Regional economic structure

(1) The extent of industrial specialization: whether there is an industrial mono-structure or not (indicators include the percentage of the total manufacturing employment made up by the dominant industry in a region; its share of total GDP growth; the extent of other sectors and subsidiaries supporting and serve the dominant industry).

(2) The characteristics of the dominant industry: ownership (State owned or private or hybrid?), types of capital (labor-intensive or capital-intensive), forms of organization and size (Oligopoly Companies or SMEs).

2. The industrial-sectoral proximity

(1) The quality of the regional innovation system: the systemic relations among the different industries, agencies and actors, such as university-industry linkages, the role of intermediates in bridging the gap between knowledge base and application sectors.

(2) Technologically industrial relatedness and unrelatedness: technologically related industries tend to foster new path creation and diversification as related variety, but unrelated variety can promote industrial portfolio that benefits from regional adaptability against external shocks.

3. International economic influences, consisting of international industrial relocation, labor mobility and circulation, mergers and acquisitions, and project-based technology transfers and science cooperation, which help local traditional industries integrating into global production networks and restructuring economic structures, technological bases, and institutions of regions.

Political-institutional impact factors

1. Regional political-institutional conditions

(1) Differentiated political status of regions (or the differences of central-local relations): politically decentralized regions have more autonomy than others as they are legally

able to formulate institutions such as laws, policies, regulations and other arrangements served for regional needs, which is a fundamental factor in leading to regionally uneven adaptability.

(2) The degree of regional cognitive and political lock-in. this factor is related to a number of concrete elements such as place-specific cultural traditions, written and unwritten rules of communities, regional identity of individuals and groups, social capital and trust, and so, they are often place-based and different in degrees across regions, which contribute to the regionally different extent of institutional lock-ins.

(3) The role of political leaders and their actions: particularly, the functions, aims, and incentives of political leadership in regions, namely, the different forms of regional political leadership, which play a key role in initiating and implementing policies, strategies, and visionary plans for regional restructuring.

2. A national political system and state strategies

(1) National varieties of capitalism: the notion of 'varieties of capitalism' provides a promising analytical framework to interpret why and how regions with different versions of institutional and political settings influence the degree of adaptive capacity (Peck and Theodore 2007).

(2) The asymmetric state strategies: many state strategies aiming at spatially bounded regions or specific industries without considering inter-regional coordination, which may enhance geographical differences of regional adaptation.

3. Supra-national institutional influences that strongly affect the conditions of industrial policy related to the dominant industry and main old industrial regions.

Unpredictable and Irresistible impact factors

1. Irresistible slow crises such as resource exhaustion, climate warming and environmental degradation, which influence the results of decision making in dealing with regional development in the future.

2. Unpredictable shocks such as financial crises, natural disasters, terrorism and man-

made emergencies have been regarded as important indicators to evaluate and test regional adaptability.

In the light of the listed impact factors above, we try to distinguish the key 'positive' and 'negative' factors for regional adaptability by identifying the different characters of the main generalized impact factors from multiple spatial levels (Table 1). In this section, we emphasize the positive impact factors of regional adaptability, as they can provide the potential avenues for regional renewal and show significant implications to policymakers. As we have discussed, the evolutionary school and some related social sciences seem to be useful to understand the evolving regional adaptability and its geographical nature of old industrial areas. On the one side, there are industrial-sectoral factors that fostering regional adaptability. First, the recently developed theoretical concepts in evolutionary economic geography (EEG), such as related variety (Frenken et al. 2007), regional branching (Boschma and Frenken 2011), regional innovation platforms (Harmakorpi et al. 2011) and transversality (Cooke 2012) pointing into the direction of industrial diversification show effective ways to break the functional lock-in and strengthen the extent of regional adaptability. In contrast to industrial specialization and mono-structure, a region with a diversified industrial structure can positively affect renewal process. Second, the notion of path creation and positive path dependence conceptualizes how new developmental paths can emerge out of old ones via recombining (pre)existing competences, knowledge, technologies and institutions. A higher degree of industrial relatedness in a region is more likely to develop positive feedback mechanisms of knowledge interaction and recombination that promote the potential of learning and innovation. Third, a thick and well-networked of RIS is endowed by regional multi-agent interactions, in which both codified and tacit knowledge can be effectively transferred and embedded into new technologies and products that foster regional transformation. According to the 'local buzz' and 'global pipelines' concept (Bathelt et al 2004), too much local buzz in RIS may generate inward-looking perspective that leads to regional industrial rigidity. In this case, developing appropriate number of extra-regional linkages or global pipelines may help local economic system to absorb new resources in order to avoid regional stagnation.

On the other hand, political-institutional factors can facilitate the process of regional adaptation. First, the use of an evolutionary perspective within a geographical political

economy approach seems to be a useful method to rethink spatially uneven evolution by emphasizing the role of the state, social agency and capital accumulation (MacKinnon et al 2009). A region that situating a higher political status in a country or having a close power relation with the central state is likely to gain more institutional advantages in driving regional economy. We also recognize the specific role of political leaders in affecting regional policy-making processes and planning, supervising and practicing the ways, modes, and speed of regional economic adaptation. For example, active leaders with transformative leadership can be seen as ‘initiators’ or ‘triggers’ who not only build up new regional images and concrete visions of regional growth and change, but also connect with varied actors to participate and take actions in reframing new organizations and widely shared institutions toward regional transformation. Second, the cognitive and political lock-in represents comprehensive institutional conditions that incorporate social relations, cultural norms, political ideologies, and all sorts of formal and informal institutions. A weak cognitive and political lock-in situation has been testified as a positive factor because it implies more room and possibilities for regional renewal than a strong one. Third, a regional economy that involved in national and international institutions such as national industrial strategies, international laws and policies, among others, might be more capable of strengthening regional economic adaptability.

Table 1 placing the key positive and negative factors of adaptability of old industrial areas

	Positive factors facilitating regional adaptability	Negative factors constraining regional adaptability
Industrial-sectoral impact factors	<ul style="list-style-type: none"> • A regional diversified industrial structure; • An absence of monopoly firms; • Technologically related firms and industries; • A good performance of RIS; • Adequate external economic linkages 	<ul style="list-style-type: none"> • A strong mono-structure; • A presence of large monopoly enterprises; • A poor performance of RIS; • A lack of external economic linkages

<p>Political-institutional impact factors</p>	<ul style="list-style-type: none"> • A high regional political status; • Active leaders and strong transformative leadership; • A weak cognitive and political lock-in; • Supporting national and international institutions 	<ul style="list-style-type: none"> • A low regional political status; • A weak or lack of transformative leaders and leadership; • A strong cognitive and political lock-in; • An absence of national and international institutions
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Source: Adapted from Hassink (2010b)

4. Conclusions

The idea of regional adaptability has rightly attracted increasing attentions from economic geography as part of their growing interest in the evolution and geography of regional and local economies in a complex environment. The question, however, is what impact factors affect the adaptability and how they evolve to shape the adaptive path in differences among old industrial areas. To address this question more clearly, the chapter contributes to a conceptual inspiration by synthesizing multi-scaled impact factors and their characters on the regional adaptability. It has shown that, first, impact factors affecting the adaptability are derived from all spatial levels (including local, regional, national and international) with varied features (e.g. economic and non-economic; positive and negative; unpredictable and foreseeable, etc.). Secondly, although EEG and other social sciences have provided several useful concepts such as lock-in, path dependence, relatedness, and transversality in helping to conceptualize how impact factors enable or constrain regional economic adaptability over time, it still remains several issues unsolved. More empirical research is needed to deal with those issues and a future research agenda should be centered on four broad themes: (1) conceptualizing the term of adaptation, adaptability and evolution in old industrial areas; (2) continuing to conceptualize the role of regional lock-in, path dependence, relatedness and complexity, and other concepts in affecting the strengths or weaknesses of regional adaptability; (3) Searching for complementary theoretical perspectives (e.g. relational and institutional perspective, global production networks, geographical political economy approach, etc.) and encouraging ‘engaged pluralism’, which is beneficial for further conceptualizing re-

gional adaptability and evolutionary economic geography (Barnes and Sheppard 2010); and (4) conducting more studies on regional adaptability in new contexts, and more cross-sector and intra-regional comparative research between the Western world and emerging economies, by carefully examine the role of 'varieties of capitalism' (VoC), power relations, and international labor divisions in different countries to advance the understanding of uneven economic adaptation and adaptability of old industrial areas.

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4 New perspectives on the restructuring of old industrial areas in China: a critical review and research agenda

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Abstract

The restructuring of old industrial areas has been receiving much attention in regional development studies both in industrialized and emerging economies. Although ample Chinese-speaking studies have been published on the topic, most of them suffer from paying too little attention to dynamic multi-scalar interactions between firms, institutions, policies and places, as well as a too strong focus on individual cases. They also mostly disregard internationally recognized concepts and theories in the field. Based on these internationally recognized modern concepts, this paper therefore puts forward some potential avenues for future research on the evolution of old industrial areas in China, which should overcome existing deficits in the Chinese-speaking literature. It suggests that some evolutionary economic geography concepts such as path dependence, lock-in, path creation, relatedness, as well as multi-scalar institutional and leadership approaches have useful potentials to better understand the evolutionary processes and mechanisms of old industrial areas in China.

1. Introduction

The economic revitalization of old industrial areas (OIAs) in China is not a new topic. Notably since 2003, this topic has been receiving much attention both from Chinese geographers, policy-makers and the media. This research theme, indeed, is largely stimulated by the national policy of 'Revitalize Northeast China' in 2003 and, more recently, by the top-down financial aid program of 'Transform Resources-exhausted Cities' since 2008. Although most studies are policy-oriented rather than process-focused, China's

OIAs have been generally recognized as typical ‘problem regions’ which ought to be at the core of China’s regional development research (Lu and Fan, 2010). On the one hand, many OIAs still suffer from long-term sluggish growth or even stagnation, due to ill-balanced economic and social structures inherited from the planned economy. On the other hand, these regional economies, characterized by a high degree of industrial monopolization and specificity, are vulnerable to all sorts of shocks in a transitional context, particularly when it comes to the changes of national strategies and institutions. Recently, the slowdown of China’s economy and the increasing emphasis on the quality rather than quantity of economic development have put OIAs in a dilemma: how to shift from the existing resource-based, highly contaminated and state-dominated regional economies to more market-oriented, green and sustainable ones, but in the meanwhile without being harmful to local economic growth and social harmony. Moreover, since the evolutionary characteristics and trajectories of OIAs seem to differ strongly from the ones of coastal regions, and in a theoretical sense, doing in-depth research on OIAs can contribute to the understanding of varieties of regional development ‘models’ in China (Wang et al., 2014; Zhang and Peck, 2014).

Although this topic is relevant in both policy and academic circles, existing research on it is weak. A main weakness is the neglect of using modern, sound and refreshing concepts to systematically analyze and explain the evolutionary nature of OIAs and, thus it fails to theorize Chinese practices and contribute to the international literature. This pitfall, indeed, is ascribed mainly to the Chinese distinct ‘practice-based’ characteristic of economic geographic research. That is, as some leading Chinese geographers critically reflected (Liu and Lu, 2002; Liu et al., 2011), the primary target and driving force of the discipline development are to fulfill the national policy demand, known as the ‘*renwu dai xueke*’ (任务带学科). As a result, many issues with regard to the restructuring of China’s OIAs remain poorly understood. For instance, little research has been devoted to unveil how OIAs evolve and adapt through time in an on-going market reforming and uncertain globalizing context. Who plays what role in affecting the processes and for what purpose? And why are some OIAs more economically adaptable while others are not? These questions, in our view, are crucial to understand the uneven development of OIAs, and need to be equipped by sound concepts and perspectives. As suggested by Liu (2009), it is badly needed for geographers to (critically) adopt mainstream theories to

rethink highly contextualized Chinese practices, as a useful channel to launch an intelligent 'bridge' with mainstream economic geography.

Internationally, there has been a paradigmatic shift of economic geography from orthodox neoclassical accounts to institutional, relational, evolutionary heterodox thinking (Hassink et al., 2014). On the one hand, a variety of evolutionary concepts such as path dependence, lock-in, path creation and related variety, as well as new metaphors such as resilience have been used in analyzing the (re) rise and fall of OIAs in Europe and North America (see Grabher, 1993; Hassink, 2010; Fornahl et al., 2012; Simmie and Martin, 2010). On the other hand, several refreshing perspectives provide complementary explanations to evolutionary approaches. It is argued that the state particularly in terms of governances and policies embedded in a dynamic and multi-leveled political economy, play a key role in changing the industrial profile of OIAs (Hudson, 2005; Dawley, 2013; Hu, 2014). Others demonstrate that integrating the role of human agency into the analyses can enrich the understanding of how micro-levelled dynamics work and how they collectively shape adaptation and adaptability (Bailey, 2010; MacNeil and Steiner, 2010). Taken together, these concepts have shown strong explanatory power to disentangle the complex evolution of OIA. However, hardly any of the above-mentioned concepts have been explicitly applied in research on Chinese OIAs, leaving a research gap that needs to be addressed.

This paper therefore will explore some potential research areas on restructuring studies on China's OIAs. It mainly focuses on which international concepts can be applied to understand the evolution and geographies of OIAs in China. In doing so, the paper is structured as follows: the next section gives an overview of OIAs in China in terms of developmental history, dynamics and new challenges. Section 3 identifies research characteristics and deficits of China's OIAs by critically reviewing the Chinese-speaking literature. After introducing several well-recognized modern concepts in the international literature on OIAs in Section 4, Section 5 presents a research agenda. The Section 6 summarizes the findings.

2. Old industrial areas in China: history and new trends

China's OIAs can be regarded as natural resource-based (e.g. mining, forestry, petroleum) and heavy industrial (steel, iron, machinery and shipbuilding, etc.) territorial complexes, as well as regions specialized in light industries (e.g. textile), which were developed under Mao's centralist regime and gradually became economically stagnated in the course of market reforms. Differed from many Western OIAs whose fortunes are closely connected to market competition and technological dynamics, China's OIAs have been evolving in a distinctive manner. Their evolutionary trajectories seem to be more influenced by national leadership and policy dynamics (Wei, 2000; Lin 2002; Ding and Sun, 2006). The development history of OIAs in China can be divided into three major phases according to different national leaderships, namely growth in Mao's era, stagnation in Deng's reform era, and restructuring under the Hu-Wen administration (see Table 1).

Table 1 National changing policies and their impact on OIAs in China

Phase	Leadership era and its OIA related policies	Major impact on OIAs
Expansion & Growth	Mao's centralization era (1949-76): <ul style="list-style-type: none"> • The 1st & 2nd Five-Year Plan • The Great Leap Forward • The Third Front Construction 	<ul style="list-style-type: none"> • Northeast became China's most industrialized region • A variety of military-specialized regions and natural resource-based cities and districts were extensively established in inland China.
Stagnation & Decline	Deng's neoliberalism and Zhu's radical state-owned enterprise (SOEs) reform era (1979-2002): <ul style="list-style-type: none"> • Rural privatization • Coastal centered policy • Radical Reform on SOEs • Go West 	<ul style="list-style-type: none"> • The rapid growth of coastal regions at the cost of the socio-economic decline of OIAs • The dramatic decrease of SOEs in market share. SOE-dominated OIAs suffered from economic stagnation and social unrest. • Western OIAs started to receive central investments.
Revitalization & Revival	The Hu-Wen administration (2003-2013): <ul style="list-style-type: none"> • Revitalizing the Northeast • The Rise of Central China • Transforming Resource-exhausted Cities 	<ul style="list-style-type: none"> • Northeast China underwent a fast-growing under national policy-led inputs • OIAs in central China benefited from supports for industrial upgrading. • A total of 69 resource-based cities received top-down financial aids to foster regional industrial transformation.

Source: Author's compilation based on official policy documents

2.1 The emergence and growth under the Maoist era (1949-1976)

Since 1949, to consolidate Mao's leadership and the new government after the civil war, a considerable number of military-related industries were initiated in the coastal region

under a defense-centered ideology. Meanwhile, the pro-Soviet national-state also prioritized to industrialize the northern border regions, which were endowed with plentiful mineral resources. The industrialization of Northeast China, for example, was primarily empowered by ‘the First and Second Five-year Plan’ (1953-1962), in which China as a new member of the communist alliance received numerous free investment projects (e.g. heavy, power and manufacturing) from the former Soviet Union (Zhang, 2008). Likewise, OIAs in Southwest China can be traced back to Mao’s radical defensive policy triggered by the Sino-Soviet split, namely the ‘Third Front Construction’ (1964-mid 1970s). In order to preserve military strengths for a potential war with the former Soviet Union, the central government undertook a large-scalar industrial transplantation, in which almost all military-related sectors, together with numerous workers in the coastal belt were mandatorily relocated to the western hinterland (Naughton, 1998). Consequently, this movement led to a large spatial expansion of heavy and mining industries, which outlined the general profile of China’s OIAs (Figure 1).

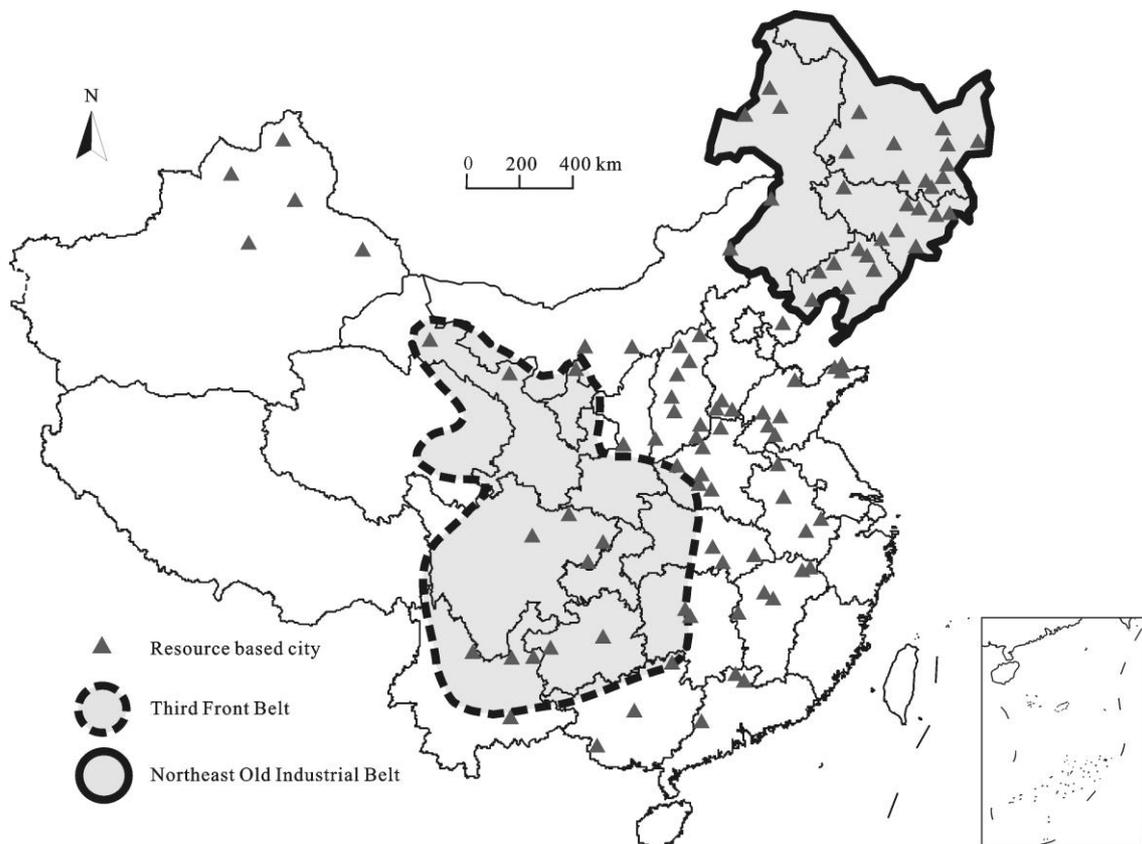


Figure 1. Geographical Distribution of China’s old industrial areas, Source: authors’ own design

2.2 The stagnation and decline in the reform era (1979-2002)

Since 1979, however, the formerly prosperous areas began to experience a painful stagnation. This can be explained by three inter-linked reasons: First, the SOE-based regional economies, where planned institutions, corporate bureaucracies and entrenched territorial input-output production systems were well preserved, presented many difficulties and even resistance to market reforms. Secondly, Deng's reform facilitating private and collective economies squeezed the market share of SOEs and thus negatively impacted on OIAs. Besides, his 'coastal centered' neoliberal policy broke Mao's egalitarianism for regional development, leading to a spatially unbalanced development (Dunford and Li, 2010). This 'benefiting some places but punishing others' policy, can be used to explain why industrial complexes in Northeast and Southwest China lost dynamics and mutated into less-favored OIAs (Wang et al., 2014). Thirdly, when the former Prime Minister Zhu Rongji came to power, the situation of OIAs became even worse. In 1998, the government tightened up the policies on SOE privatization by introducing so-called 'modern enterprise institutions'. In a short run, firm ownership, institutions and size were variegated, redesigned and diminished, respectively (Garnaut et al., 2006), which directly caused massive factory closures and economic downturn in OIAs. Although the central state became aware of the increasing development gap between the coast belt and inland OIAs and tried to bridge it by launching the 'Go West' strategy in 2000, OIAs still constrained to develop new industries.

2.3 The revitalization since the Hu-Wen administration (2003-2013)

It is fair to say that Deng's neoliberalism and his successors' radical SOE reforms relaxed the development of capitalism in coastal China. However, it is at the expense of the stagnation of OIAs. To combat this situation, the fourth generation leadership under the Hu-Wen administration initiated a new ideology, namely 'Scientific Development', in order to remedy the previous policy's inappropriateness and to alleviate increasing regional disparities. In this respect, revitalizing less-favored regions was legitimately put as a core issue on the national development agenda. This can be evidenced by a series of national policy portfolios, including '*Revitalizing Northeast China*' in 2003, the '*Rise of Central China*' in 2004, and the recent '*Transforming Resource-exhausted Cities*'¹ in 2008.

With these strong national inputs, many OIAs seem to have regained their vigor and some have embarked on rejuvenation trajectories (Wang *et al.*, 2014). The Economist (2012) published an article entitled 'Rustbelt revival', showing the remarkable growth of the northeast benefiting from massive state-led investments in housing and infrastructure. Similar evidence has been observed in Fuxin, a typical coal-mining region, where the central state purposively enacted a set of policy instruments that ignited local enthusiasm to develop a new growth industry, namely the wind power industry (Hu, 2014).

2.4 New development trends in new contexts (2013-now)

Although GDP in China's OIAs has been growing under the above-described national policy inputs, it does not mean they are successfully transforming. In fact, the policy-driven economic growth model generates an illusion that covers up the weak endogenous capacities in OIAs. This can be exemplified by the recent figures on GDP growth in the first half of 2014 (NBSC, 2014), showing that many mature industry-based provinces, such as Shanxi, Hebei, Heilongjiang, Jilin, ranked in the bottom of China's 31 provinces. The economic situation is particularly bad in the northeast, where old command-economy institutions dominate, the central-planning mentality of people persists, and young people are more likely to emigrate elsewhere for better jobs (Economist, 2015a). The recent downturn of GDP growth in OIAs is partly caused by that the so-called 'New Normal' national strategy (OECD, 2015). In this framework, new policies and regulations in pursuit of 'structural change' and 'innovation driven development model' are being enforced. In this sense, OIAs are in a tougher position for two reasons. First, it is difficult to change the dominant, geographically and historically well conditioned 'resource and investment-led development model' in OIAs. Secondly, when it comes to reforms, local actors are exercised about the potential economic loss and social insecurity that highly matter their political future.

Of course, the new normal state context can also provide opportunities such as new incentives, institutions and preferential policies for OIAs. A set of top-down industrial policies shortly called 'amalgamation and recombination' (*jianbing chongzu*) (兼并重组), for example, was released since 2008. It aims at maintaining the competitiveness of OIAs in the post-crisis context through fostering the spatial restructuring by cross-

regional/hierarchical mergers, agglomerations and acquisitions of SOEs. Additionally, large SOEs are incentivized to implement the so-called 'going-out' strategy. By doing so, domestic old industries can be transplanted to other emerging economies and/or absorbing foreign technologies and natural resources – as a way to revitalize SOEs (Moody, 2013). In particular, an accelerated internationalization of Chinese SOEs can be expected under the 'One (economic) Belt, One (silk) Road' (一帶一路) national strategy, which will be further integrated local economies of OIAs into global production networks and international markets, and thus be shaped in the future. The other way around, the global crisis has also accelerated a new round of global shift of traditional sectors from industrialized economies to China, which to some extent facilitate the integration of China's OIAs into global production networks that may lead to regional renewal (Hudson and Swandon, 2012).

To summarize, China's OIAs have three key characteristics: (1) geographically, they are mainly located in Northeast and Southwest China, and also consist of a considerable number of resource-based cities in Central China. (2) The current mature industrial space is a result of a combination of regional endowments, historical events and policy dynamics. (3) Recently, OIAs seem to be increasingly affected by national state-led rescaling and economic globalization, although local actors still play a role.

3. Old industrial area studies with Chinese characteristics? A critical review of the literature

In our quest to elaborate on the existing understanding of the restructuring of OIAs in China, we think Chinese-speaking journals could provide important input. We therefore selected six major Chinese-speaking geography journals, namely '*Acta Geographica Sinica*', '*Scientia Geographica Sinica*', '*Progress in Geography*', '*Economic Geography*', '*Areal Research and Development*' and '*Human Geography*'. We found and critically reviewed forty-three articles in these journals which referred to 'OIA' (such as 'old industrial bases' and 'resources-exhausted cities') and 'transformation or restructuring' in title or keywords.

One research strand is oriented to explaining why OIAs in China stagnated (Li and Li, 1996; Han et al., 2006; Sun and Ding, 2005). These studies mainly comprise of analyses of the constraining role of industrial-sectorial impact factors such as the power incoherence between centrally controlled SOEs and self-contented local states, the lack of regional integration, the specialization ‘trap’, etc. Other contributions have highlighted the salient role of historically inherited institutions in explaining the decline of OIAs. According to Ding and Sun (2006) the real problem of OIAs is “not economic, but an institutional problem” (p. 1). They argued that the strong resistance to change in OIAs was fundamentally ascribed to inappropriate national institutional arrangements, such as top-down controls and unfair tax policies. Xiao and Mao (2008), for instance, stressed that the stagnation of the northeast stems from the duplicate of the Soviet-style model of ‘territorial industrial complex’. Despite some advantages at the beginning stage of internationalization, this model, for a long term, is not favorable and competitive in a market economy. Because the model’s strong focus on the encompassing effects of territorially bounded and self-sufficient production systems has led to a prevailing social-industrial system in China. This system resulted in many rigid and harmful institutions, such as the idea of ‘*whatever size but being complete*’², and the ‘*danwei*’³ institution. Some researchers view these institutions as a ‘culture hindrance’ that can have a long-term negative impact on OIAs (Wang and Xiao, 2004; Dong and Zhang, 2008). In their studies, the danwei institution, for example, was defined as a cognitive barrier that avoid local actors from having new career visions, as working in a danwei stands for a symbol of higher social status and well-being. Zhang (2006) assumed that even if this institution was removed, the feelings of the ‘*iron rice bowl*’⁴ can be passed on from older to younger generations, which consistently play a role in undermining entrepreneurship and creativity in OIAs.

In summary, while these contributions have addressed a variety of constraining impact factors, particularly the planned institutional ‘inertias’ that led to the stagnation of OIAs, they are too general and lack thorough empirical evidence. Although history seems to have played an important role, it is still unclear how institutions have been embedded into place distinctive contexts, and why some regions have tended to stick stronger to old routines, networks and structures while others do less. Moreover, the studies strongly rely on a top-down, downward line of arguments, by emphasizing that it is top institu-

tional designs that made OIAs stagnant, but little attention has been paid to upward interactive processes of certain regions with old institutions. The people in metropolitan OIAs, for instance, tend to find new jobs not limited to SOEs, as large cities can offer more diversified job opportunities. The evidence in Shenyang has shown that inner-city labor mobility between SOEs and non-SOEs can reshape people's mindset on employment and thus affect the evolution of OIAs (Dong and Zhang, 2008).

Another research line deals with policy advices for directing the near-future restructuring of OIAs in China (Zhang, 2004; Chen et al., 2006; Wang et al., 2011). Although most advises are derived from individual cases, they have pretty much in common. Most scholars claim that the restructuring of OIAs is about either the extension of existing industrial chains or the recombination of local existing assets for new options. It has been argued, for example, that single-industry specialized regions, such as the forestry city Yichun and the petroleum city Kelamay, have little room to create entirely new industries, but can facilitate neighboring sectors related to the dominant industry (Zang et al., 2006; Wang et al., 2011). Similarly, based on a case study of Huangshi's tourism industry, Zhu et al. (2002) state that new growth paths in OIAs can be fostered by exploiting and commercializing place-specific uncommitted assets. Zhang et al. (2011)'s insightful contribution, however, suggests that developing new industries or extending existing ones is contingent on localized conditions and different types of OIAs. Another common focus is given to the role of the state. Given the economic devolution to the local state, much literature regards the local state as the 'initiator' and 'driving force' for industrial change, suggesting that the local state can take effective actions to make OIAs dynamic, such as through industrial relocation, tax reduction and land commercialization, etc. (Chen et al., 2006; Mao et al., 2008). In contrast to most policy-oriented studies, one process-focused contribution illustrated how local state entrepreneurship in the Ma'anshan steel city facilitated local experimentations that significantly restructured the institutional base, which led to industrial diversification (Yin et al., 2010). Others, however, argued that the central state, rather than the local state should bear the brunt to revitalize OIAs, as its past policy failures still negatively affect today's OIAs (Ding and Sun, 2006; Xiao and Mao, 2008).

The latter research stream explicitly resonates with Liu and Lu's (2002) argument that "...Chinese economic geographers have been involved in many consulting jobs for the

Chinese government” (p. 2123). In many studies, too much attention has been paid to analyzing general problems and drawing quick-fix policy recommendations. Despite much empirical research, the analyses mostly draw on secondary data rather than in-depth fieldwork-based primary data, which we consider as problematic particularly concerning the effects on the quality of arguments. Moreover, they lack a sound conceptualization, which means drawing empirical evidence for theorization is scant, and thus hardly yield general lessons. Some scholars highlight the salient role of the state in the restructuring of OIAs, implicitly suggesting a political economy approach to rethink the evolution of OIAs in China (see Ding and Sun, 2008). However, by far, these studies lack a dynamic, relational and multi-scalar account, both empirically and conceptually, and pay little attention to the restructuring processes and mechanisms of OIAs. In reality, no region evolves in a purely linear ‘top-down’ or ‘bottom-up’ way, there are always multi-agencies and multiple spatial levels involved.

To sum up, it is concluded that despite several useful contributions the existing accounts have shown some clear deficits. The existing literature well echoes Liu’s (2009) critique on the nature of economic geography in China being ‘policy-oriented’, ‘pragmatic’ and ‘lacking theorizing’, or as Coe et al. (2013, 512) have stated: “...Chinese economic geographers have tended to play the role of planners and consultants to state authorities rather than critical social scientists”. Although a variety of building blocks such as historical institutions, SOEs, state agency are highlighted; it is fair to say that nearly none of them are linked to corresponding international modern theories. The major weaknesses revolve around the limited concern on interactions between firms, institutions, policies and places, as well as for the underlying processes of key multi-scalar actors (e.g. individuals and agencies). Another explicit deficit is that too much work is based on single-case studies, with little concern for the spatial differences in the restructuring of OIAs and the underlying causes and outcomes.

4. An introduction to modern concepts on the restructuring of OIAs

Based on the current state of OIA restructuring-related international literature, we identify five main, not mutually exclusive, themes with a particular focus on the concepts used in dealing with the dynamics of OIAs in Europe and North America.

The first research theme is centered on why OIAs lose dynamics and fail to grow further. Initially, some theories from economics are applied to examine the mechanism of economic decline in OIAs, such as cumulative causation, long waves, over-specialization, and the product life cycle (Hassink and Shin, 2005). Many of these theories were developed out of criticism towards the neoclassical theory of regional development, which emphasize the equilibrium function of capitalism. Many of the problems in the OIAs seemed to be structural and were hence not solved by the invisible hand of the market economy, as has been suggested by neoclassical economists.

Secondly, later on studies started to concentrate more on the dynamics and mechanisms of the restructuring of OIAs by using the evolutionary concepts of path dependence and lock-ins. "A path-dependent process or system is one whose outcome evolves as a consequence of the process's or system's own history" (Martin and Sunley, 2006, 399), whereas Martin (2010, 3) defines lock-ins as the notion that "...most fully captures the idea that the combination of historical contingency and the emergence of self-reinforcing effects, steers a technology, industry or regional economy along one 'path' rather than another". Closely related to the discussion around path dependence and regional evolution is the issue of lock-ins hindering necessary restructuring processes in regional economies (Hassink 2010). Lock-in situations appear because specialized industrial regions endowed with particular resources, competences and institutional structures are unable to match changing market requirements. Grabher's study (1993) on the Ruhr area, Germany, uncovered that over-specialization is highly embedded in a place-specific environment, in which local inter-firm nexus, political frameworks, and key actors' cognitive mindsets are well developed and reinforced over time that locked in a hard-to-change situation. Building upon earlier analysis on (negative) path dependence from evolutionary economics (Arthur, 1994; David, 1985), his work has inspired many researchers to take history seriously in explaining the long-run stagnation of OIAs (Boschma and Lambooy, 1999; Hassink and Shin, 2005; Hassink, 2010). Political lock-ins, in particular, as a constraining impact factor that not only hinders novelties entering into old industries but also prevents local agents to interactively learn from elsewhere (Cho and Hassink, 2009; Hudson, 2005; Hassink and Shin, 2005; Hassink, 2010). Hassink (2007), in contrast, illustrated how the textile region of Westmünsterland in Germany took advantage of weak institutional lock-ins to foster industrial renewal.

Thirdly, the concepts of path creation and industrial relatedness are used to demonstrate how (pre) existing technologies, skills, networks and institutions are transferred to contribute to the emergence of new industries in a region. Path creation gives a historical view of how path contingency and place dependence co-evolve through time to generate 'creative destruction' that brings new developmental impetus. Evidence related to path creation can be found in many OIAs across the world: the new compound materials sector emerged out of the metal industry in Styria, Austria (Tödtling and Trippl, 2004), the microelectronics industry was built on the watch manufacturing in Jura of Switzerland (Maillat et al., 1997), and the formation of low-carbon technologies benefited from the pollution reduction activities in the steel and iron industry in China (Cooke, 2011). More recently, newly developed concepts in the evolutionary economic geography (EEG) literature, such as related variety (Frenken et al., 2007) and regional branching (Boschma and Frenken, 2011), emphasize the role of 'technological relatedness' in facilitating inter-firm/industry learning, technological spillovers and knowledge combinations that lead to innovation, job creation and diversification. Increasing evidence has shown that new industries are tended to branch from existing technologically proximate sectors (Boschma et al., 2013; Neffke et al., 2011).

Fourthly, EEG has recently been criticized for its narrow firm-based perspective and methodological reductionism (Martin, 2010; 2012). In a special issue in Economic Geography it is suggested to engage evolutionary thoughts into broader institutional contexts, in general, and to integrate a geographical political economy approach into EEG, in particular (MacKinnon et al., 2009). Some evidence has shown that path de-locking or creation in OIAs are not just about firm-based market-driven processes, but are rather influenced by extra-local, higher-level systems and actors, such as the state, politics and policies in multi-layered and changing socio-institutional environment (Dawley, 2013; Hudson, 2005; Hu 2015). Another complementary perspective to EEG approach is an agency view that rejects seeing firms as a whole behavioral agent but instead pays more attention to the role of human individuals or groups of individuals in the change of OIAs. By adopting the notion of place leadership, for example, MacNeill and Steiner (2010) emphasized the major influence of the Styrian Minister Herbert Paierl on the transformation of Styria in Austria. Similar evidence can be also found in Bailey et al. (2010)'s study, in which the original sources for industrial renewal of the West Midlands, UK and Tusca-

ny, Italy were derived from key political leaders.

Fifthly and strongly related to some above-mentioned concepts, recent research focuses on explaining why some OIAs are able to adapt more positively and move onto new paths whereas others remain locked in decline/slow growth over time. In contrast to other research themes focusing on single cases by single approaches, this theme aims at seeking an open-ended, multi-disciplinary and pluralist approach to explore the uneven restructuring of OIAs. By introducing a comparative framework, several impact factors affecting the restructuring of OIAs are identified, such as varieties of capitalism among nations (Birch et al., 2010), distinct degrees/types of political-institutional lock-ins which can lead to different regional adaptability (Hassink, 2010), and different configurations of place leadership and social capital which enable the (re)framing of (new) organizations and institutions in some OIAs but not in others (Safford, 2009; Bailey et al., 2010).

Based on the critical review in Section 3 and the overview of internationally recognized concepts in this section, Table 2 outlines which modern concepts might be used to overcome the three identified research deficits. The next section will explain in more detail how exactly the modern concepts can overcome existing research deficits and what kind of research questions can be derived from linking the deficits with the modern concepts.

Table 2. Modern concepts for overcoming main research deficits

Key questions	Existing deficits	Modern concepts (perspective)
<ul style="list-style-type: none"> • What impact factors cause OIAs to stagnate or make OIAs dynamic to change? 	<ul style="list-style-type: none"> • Focus on the constraining role of history but without in-depth accounts • Lacking concern for place distinctive history and its causal mechanisms. 	<ul style="list-style-type: none"> • An evolutionary perspective • An institutional perspective • Path dependence and lock-in • Relatedness and path creation
<ul style="list-style-type: none"> • Who plays what kind of role in restructuring OIAs in terms of new industry formation? 	<ul style="list-style-type: none"> • Over-emphasis on the role of the state • Lacking multi-scalar & -agent views • Ignoring the role of individuals (e.g. officials, entrepreneurs and stakeholders). 	<ul style="list-style-type: none"> • A human-agency perspective • A relational and multi-scalar view • Place leadership
<ul style="list-style-type: none"> • Why and how do OIAs adapt differently leading to regional-ly uneven adaptability? 	<ul style="list-style-type: none"> • Too many single case studies • Lacking knowledge of geographies of adaptation and adaptability 	<ul style="list-style-type: none"> • A comparative perspective • A geographically uneven thinking

5. Engaging new perspectives into old industrial area research in China: towards an agenda

Acknowledging the deficits of the Chinese-speaking literature as stressed in Section 3, and inspired by the modern concepts shown in Section 4, we are convinced that near-future studies on the evolution of OIAs in China need to embrace modern concepts and theories. In this section we are therefore able to map out the contours of an agenda for the study of restructuring Chinese OIAs at the interface between the two bodies of literature. In doing so, three intersections between modern concepts and the contexts of OIAs in China are proposed and some promising avenues are suggested:

First, since Chinese geographers have recognized the salient role of history, particularly concerning the institutions derived from the previous regimes that still affect many OIAs in China, the concepts of path dependence and lock-ins might be relevant, particularly when it comes to interpreting the difficulties for industrial change in an OIA (Table 2). For example, path dependence could be used to inform how previous *danwei* institutions and related organizational tissues are inherited and reproduced locally, and in what conditions old routines and habits are maintained that undermine the processes of regional diversification. A common policy advice for some OIAs to survive is to relocate existing mature sectors to elsewhere, but this can be read as an action of path extension which, from a long-term perspective, might be subject to a regional lock-in (Hu, 2015, in press). In this sense, Grabher's (1993) lock-in concept could be useful to help to identify the intrinsic sources and types of lock-ins in a certain OIA, and to examine how local and extra-local conditions play a role in the process.

The concept of path dependence and its related notion of path creation also provides a dialectical point of view to think to what extent place-specific existing assets can be recombined or transcended into a basis for new paths to emerge (Table 2). In fact, neither '*jiexu chanye*' (continued industries) nor '*tidai chanye*' (alternative industries) emerge from scratch; both of them draw more or less on regionally inherent assets, and are built on an existing institutional framework. A history-informed and place-based approach can allow policy-makers to see both local existing and latent assets as a source for regional change, and to help identifying which industry has the potential to grow that fits to the context. The 'relatedness' idea, for example, is promising in soundly identifying

whether it makes sense to foster existing or alternative industries, and then which particular sectors have most potential to become new growth paths. Adopting these concepts is thus essential for the formulation/implementation of locally embedded policies, which reject introducing policy panaceas merely based on some 'good practices' from elsewhere.

Based on the above discussions, some questions are proposed for future research: 1) how do place-based history and planned institutions generate (or not generate) path dependence mechanisms in OIAs? 2) How do local actors read, interpret and deal with local existing industrial, institutional and network structures? 3) To what extent can the mechanism of new path creation in the Chinese context of OIAs be linked to 'related variety' and 'regional branching'? And how to make sound, grounded policies for China's OIAs by using EEG concepts?

Secondly, given the on-going impacts of changing institutional regimes and corresponding policy arrangements on OIAs in China (Section 2), and the recent criticism on the EEG framework for over-emphasizing endogenous dynamics (see Section 3), we call a need to engage future research with a broader multi-scalar institutional perspective (Table 2). Two recent examples are presented as an illustration to support this need. First, Liu and Dunford (2010)'s study on the evolution of Chinese traditional medicine cluster in Tonghua moved beyond the narrow view of EEG, highlighting the key role China's macro institutional transitions played in enabling local corporate strategic behavior and cluster dynamics. It is suggested that industrial change of OIAs in the Chinese context is more likely to be influenced by macro, systematic, and collective socio-institutional forces, despite local impact factors. Secondly, Hu (2015) explored the path creation mechanism of coal-chemicals in Zaozhuang, by which he revealed that the ranking system of SOEs in the region, which resulted in a fragmented and conflicted local political economy, prevented local coal firms starting business in the coal-chemical industry but only focusing on the old ways of doing things – mining. The new industry was largely initiated by external market-led entrepreneurial discovery process. The two examples suggest that OIAs in China tend to have been strongly affected by political-institutional impact factors and have shown a multi-scalar 'noisy' process of industrial restructuring. The role of both the local and national political economy, and the underlying power interplay among SOEs, private and public institutions from multiple scales should be placed at the core of re-

search. This may be able to explain the contradiction with regard to the co-existence of multiple but incoherent institutions and paths, namely a region may present eagerness of maintaining old paths but simultaneously show interests in fostering alternative paths.

Therefore, the Chinese OIA context suggests taking the dynamic role of the state, policies and socio-political forces into account in addition to the firm-based perspective. In this respect, an encompassing approach that combines an institutional, relational and multi-scalar perspective can be relevant to explain the complexity of evolution in OIAs in China. There are three questions that need to be taken into analyses: 1) how do local, regional, national and global firms, stakeholders and authorities with a geographical political economy perspective change the local selection environment for new industry formation (or old industry exit) in Chinese OIAs? 2) Related to the first question and, given the fact that unfinished decentralization (such as the *tiao-kuai* hierarchical administrative system and the ranking system of SOEs) is not uncommon in Chinese OIAs, how does the institutional asymmetry and fragmentation affect local efficiency and quality for renewal? Precisely, how do local state actors interact with differentiated-ranking and multi-spatially embedded entities such as private firms, SOEs, public institutions and policy agencies, in combination, to influence regional adaptability? 3) It is recommended to scrutinize the varieties of path-renewal/creation in terms of process, mechanism and outcome, through conducting cross-regional/national comparative research, so as to explore why some OIAs more focus on developing continued industries while others are interested in initiating alternative ones.

Thirdly, the role of individuals is missing in the existing literature on the evolution of OIAs in China. It is strongly suggested that future research needs to pay more attention to the role of human actors in general and local state officials in particular in the restructuring of OIAs. As Ma (2002) has convincingly stated, “any conceptualization of local economic restructuring [in China] must humanize the state and take into consideration the role of the local leaders and their economic and political interests” (p.1552). This is because in the Chinese context local government leaders are endowed with sufficient decision-making power to mobilize locally controlled natural and public resources for certain economic purposes. They are also politically encouraged to act as ‘institutional entrepreneurs’ seeking for regional economic growth, as long as the expected results do not come into conflict with national political and economic agendas/aims. This fuzzy

boundary of states and enterprises has been apparent in the SOE-dominated OIAs, where local officials may take formal or informal positions in SOEs. We thus plea for future research to examine the role of human-based state agency, such as local state leadership in shaping the evolution of OIAs in China. Possible research questions can be 1) how and to what extent local government leaders and their leadership plays a role in facilitating industrial change? 2) What is the causal relationship between local key elites, institutional change and the formation of new industries? 3) How do state leaders in different OIAs read the same shock, and how do they interpret and react to the changing contexts, and why they might act differently on industrial restructuring? We strongly assume that using a human agency perspective, especially the idea of place leadership can provide a better understanding of the motive and logic of micro-scalar institutionalization for regional industrial change in China's OIAs.

Finally, linking to Section 2.4, research questions should be closely situated into the latest contexts in China. Particularly, in a post-crisis era Chinese OIAs are more vulnerable and thus confront more difficulties than other types of regions in terms of economic recovery and redevelopment (Hu, 2012). We suggest that future research needs to think of the resilience of China's OIAs, attention should be paid not only on how OIAs adaptively manage short-term recovery after one-off shocks, but also on how they act to cope with long-term adaptation for sustainable development, and why they adapt differently. One research avenue, for example, is to comparatively explore the adaptation and adaptability of different resource-exhausted cities in the face of a similar 'slow-burn' crisis, and the determinants behind this process. Regarding to the 'new normal state' context, a recent article shows that despite the implementation of strict top-down environment measures, – through compelling localities to shut down heavily polluting factories – different regions may interpret these measures differently and implement them pragmatically according to their own interests (Economist, 2015b). This, indeed, mirrors a widespread bureaucratic phenomenon in China, namely '*shang you zhengce, xia you duice*' (the top has policies while the bottom has countermeasures). Therefore, another research avenue might explore why some OIAs take national policies seriously and put them into action while others not. We argue that it may be useful to apply a geographical political perspective, focusing not merely on localized conditions, but more on local-central relations and the broader changing institutional environment. Last but not least, putting

China's OIA in transition into the changing global production networks, global value chains, and national/global labor mobility can also generate insightful findings.

6. Conclusions

In this paper we have made clear that ample research has been done on the restructuring OIAs in China. Doubtlessly the restructuring of OIAs in China is highly complex as it is not only affected by industrial-sectoral impact factors but also by political-institutional forces (Hu and Hassink, 2015). With the help of a critical review of Chinese-speaking articles in Chinese-speaking geography journals on this topic we have shown that the majority of papers focuses on policy-making recommendations related to the restructuring of OIAs in China. On a critical note, we identified some clear deficits, such as the limited attention paid to dynamic multi-scalar interactions between firms, institutions, policies and places, as well as a too strong focus on single cases. Most reviewed articles also disregard internationally recognized concepts and theories in the field, although much conceptual and theoretical work has been recently developed in English-speaking publications. On the basis of a review of these recently developed concepts and theories, we suggest some evolutionary economic geography concepts such as path dependence, lock-in, path creation and relatedness, as well as institutional and leadership approaches as useful concepts for a better understanding of the evolutionary processes and mechanisms of old industrial areas in China.

Using these concepts as a framework for future research on the restructuring of OIAs in China has in our view four main advantages. First, they help to overcome some of the identified deficits identified in this paper with the help of a critical literature review. Secondly, they will provide more in-depth and comprehensive explanations for the successes and failures of restructuring in different OIAs in China. Thirdly, by providing more in-depth and comprehensive explanations researchers will also be able to derive more accurate and tailor-made policy recommendations going beyond the blueprint solutions produced in many existent studies. Last but not least, using and testing these international concepts in the Chinese context helps to make clear their explanatory boundaries. It will help to advance theoretical fundamentals by reflecting on underlying weaknesses of international theories, that is, 'theorizing back' at economic geography (Yeung and Lin,

2003; Yeung, 2007). Moreover, using them helps to build more solid intellectual bridges between Chinese and international geographers (Liu, 2009).

Notes

1. According to the State Council, there are 118 resource-based cities widely distributed in China (see Figure 1). These regions have strongly contributed to national economic growth by delivering energies and raw materials. Yet recently many of them have been confronted with the increasingly depletion of local natural resources. The national-state therefore initiated a set of supporting policies since 2008, in which 69 municipal regions were qualified as 'resource-exhausted cities' and supported with national financial aids for economic restructuring.

2. It has been used to articulate the over-loaded social responsibilities of SOEs under Mao's regime. SOEs were ordered to develop encompassing industrial complexes for self-contented local economies, characterized by the Chinese term, namely '*da er quan, xiao er quan*' (大而全, 小而全) or '*chang ban da ji ti*' (厂办大集体) known as 'collectively-owned factories under the control of SOEs'.

3. There is no strict definition of *danwei*, it generally refers to a place of employment in the context of pre-reform China, where employees were economically and socially constrained and even determined by particular institutions (Lu and Perry, 1997). Today, the *danwei* phenomenon is diminished but far from completely vanished, as SOEs still dominate particular sectors and economies.

4. Iron rice bowl refers to a permanent position in SOEs, authorities, and universities. This ideology can have a negative impact on self-employment and entrepreneurial activities (Zhang, 2000).

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5 From coal-mining to coal-chemicals: unpacking new path creation in an old industrial region of transitional China

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Abstract

This paper examines the path-creation mechanism of the coal-chemical industry and its relations to the old path of the coal mining industry in an old industrial region of China. It reveals that the rise of the new path benefits from the old path to a limited extent. The strong multi-scalar structured path dependence upon the coal industry fundamentally constrained local actors to mobilize resources from the old path for new industrial options. The findings show that on the basis of local (pre)existing fertilizer-producing assets, the new path was created by a combination of market-oriented SOE ownership reform, market-induced trans-local entrepreneurship and local state-led strategic actions. This form of path creation contributes to the extant literature, presenting a complex, multi-scalar manner of industrial restructuring involving state agencies that is not merely historically conditioned by place-specific assets and structures but also affected by the changing extra-regional political-institutional environment.

1. Introduction

Ample research has been done on industrial dynamics and structural transformations in old industrial areas (OIAs in short) during the past two decades. Scholars focus on differentiated entities (e.g. firms, clusters, universities, governments) on multiple scales (organizational, local, national and global), and adopt various conceptual lenses (e.g. regional innovation system, geographical political economy, path dependence, lock-in and resilience) to identify impact factors and their functions affecting regional economic evo-

lution (Grabher, 1993; Tödtling and Tripl, 2004; Benneworth and Hospers, 2007; Pike et al., 2009; Hassink, 2010; Simmie and Martin, 2010). However, compared to reasons, the dynamic processes and causal mechanisms of the rise of new industries or the transformation of mature industries are far from being fully understood. Recently, several concepts in evolutionary economic geography (EEG), such as path creation (Martin and Sunley, 2006), related variety (Frenken et al., 2007) and alternative path dependence (Martin, 2010) have provided valuable insights on how regional agents adapt in a historically-causal and geographically-dependent way in order to facilitate regional economic development. Particularly, the concept of path dependence and path creation introduces 'historical dialectic' thinking, emphasizing that new paths often (not deterministically) evolve out of preexisting assets.

However, in practice the relation between 'oldness' and 'newness' is more complex than the interpretation provided by theories to date. In Europe, some new paths emerge mainly by enjoying the effects of related variety (Fornahl et al, 2012), while others are built upon old assets by re-organizing and re-combining components in regional innovation systems (Tödtling and Tripl, 2004). Rather, in some American regions where the Schumpeter-type 'creative destruction' of technological innovation often occurs, new paths may be generated that disconnect from existing local systems (Storper, 2010). These observations show that different contexts, especially different national contexts, matter the variegation of regional path creations.

China's OIAs can be defined as natural resource and heavy (military) industry based industrial complexes that planned and developed under Mao's centralism regime and that failed to adapt and gradually lost dynamics in the course of market reform. Since 2003, the ideological change of the national development model towards 'Scientific Development' in general and the launch of several regional developmental strategies such as 'Revitalizing Northeast Old Industrial Bases', in particular, are evidence of the explicit attempt of the central state to help to restructure mature industrial regions. According to a new national planning document, many OIAs seem to have overcome previous stagnant situations and returned to the fast-growing economic path (NDRC, 2013). However, there has been scant research on the process and mechanism of the dramatic recovery and redevelopment of Chinese OIAs in new contexts, leaving many crucial questions under-addressed. It is therefore worth to scrutinize whether and if so what are the differ-

ences in the restructuring mechanism of OIAs between China and the West, in general, and how new growth paths emerge and to what extent new paths are involved with (pre)existing mature paths in a Chinese context, in particular.

This paper aims to shed some light on the intrinsic mechanism of new path creation in Chinese OIAs by an in-depth case study on the coal-mining region, Zaozhuang, in Shandong Province. The paper is organized as follows. The next section discusses conceptual bases of regional new path creation. The contextual background of the empirical case and methodology are introduced in the third section. Section four turns to an examination of the restructuring of the coal mining industry, and then follows an analysis of the creation mechanism and process of the coal-chemical industry in section five. Section six unravels the relations between the two growth paths and the final section draws conclusions.

2. Regional new path creations: a conceptual framework

The question of where and how new developmental paths originate and evolve in a regional context has been increasingly examined (Martin 2010; Fornahl et al 2012; Neffke et al 2011; Cooke 2012). These studies indeed reflect the ‘evolutionary turn’ in economic geography, emphasizing the positive side of path dependence that could enable a channel to form through which old preexisting assets can be directed for the formation of new paths. Drawing upon behavioral theories, Garud et al. (2010), for example, contrasted with the David-type negative feedback self-reinforcing model of path dependence, and demonstrated that actors mobilize the past not necessarily to repeat, but, instead, to generate new options. Likewise, latent resources embedded in old paths can be, at least in part, transferred to the establishment of new paths by actors’ entrepreneurial behaviors (Garud and Karnøe 2001). This path-dependent manner of regional path creation has been further characterized by the processes of ‘layering’, ‘conversion’ and ‘recombination’, demonstrating that regional path dependence as an open-ended process in which local preexisting assets evolve and are changed by active actors can lead to an enabling environment for new path emergence (Martin, 2010).

However, this does not mean that new paths are always strongly related to old paths. For instance, new paths can be intentionally created by some wishful polices without

sufficient and in-depth consideration of place-specific conditions (Martin and Sunley, 2010). Accidental shocks may provide leeway for local actors to escape from old industrial structures and seek alternative development pathways. In reality, it is hard to say that a local economy as a whole follows a single path-dependent trajectory of evolution. As Strambach and Halkier (2013) pointed out, “paths are not coherent in themselves and there is always a degree of plasticity” (p.1), which means that new paths can be achieved in an appropriate manner without breaking down other paths. Path destruction or breaking does not necessarily lead to new path formation and vice versa (Garud et al, 2010). Regional path evolution is an ongoing never-ending process. Neither old paths nor new ones could exist solely, as multiple paths never evolve into equilibrium due to the heterogeneity of their constituent entities (Martin, 2010)

While EEG very much focuses on micro-scalar firm-led mechanisms of path creation by emphasizing positive path dependence, there is a lack of concern with the role of macro forces. Evidence has shown that path renewal (or de-locking) and path creation in OIAs are not just about firm-based market-driven processes, but are rather enabled or constrained by extra-local, higher-level systems and actors, such as national political economies (Hudson, 2005). In a similar vein, recently, it has been found that path creation in some OIAs is more associated with the action of social agents mediated by power relations and policy interventions in multi-layered and changing institutional contexts (Fornahl, et al 2012; Dawley, 2013). This observation echoes the plea for incorporating social agency, policies and multi-layered institutional architectures into regional economic evolution research, as a complement to the EEG framework (MacKinnon et al, 2009; Pike et al, 2009). Notably, some scholars also acknowledge the limits of the EEG framework in Chinese contexts, especially in OIAs. For example, Liu and Dunford (2012) illustrated that new paths do not simply result from firm strategies driven by market reforms, but are more related to macro forces such as national socio-political shifts. Moreover, new evidence points to the important role of geographical political-economic structures conditioned by Chinese-specific histories, (e.g. power geometrics of SOEs, firm-state nexus, as well as local-central politics) in affecting the adaptability of OIAs (Yang, 2012; Hu and Lin, 2013).

However, the extant emphasis on the role of macro influences on new path creation in Chinese OIAs does not reduce the importance of Chinese-distinctive micro-level beha-

vivors, structures and institutions of firms. For example, the power heterogeneity of SOEs prevails in OIAs due to the ranking system known as the 'tiao-kuai' system (Bai et al, 2006), which may generate divergent actions and conflicts of/among firms that obstruct the process of regional renewal and transformation. Moreover, despite the self-reproducing nature of planned institutions (Nee and Stark, 1989), planned institutions do not necessarily undermine the potential of new path creation. Instead, in certain conditions old routines may be subject to institutional self-revision so as to adapt to new opportunities (Tsai, 2006).

The above conceptual discussion shows the diverse processes and patterns of regional path creations, which are not only affected by incoherent (contested) actions of firms, social agency and their embedded specific micro and meso contextual conditions, but are also reshaped by macro societal-political-economic environments. The transition of China's OIAs is a complex matter in terms of the co-existence and interaction between market institutions and planned ones, as well as underlying multi-faceted and closely-tied economic and state agents (e.g. SOEs). This raises some critical questions. How do new growth paths emerge in Chinese OIAs in a transitional context? To what extent does the creation of new paths relate to the old paths?

3. Case selection and methodology

Zaozhuang: a coal-mining region in transition

Zaozhuang, a coal-mining region, consists of six counties in South Shandong (see Figure 1). Since the establishment of China's first private coal enterprise – Zhongxin Coal Company in 1878, the coal industry has made significant contributions to local economic growth (Li, 2010). In 2001, most of the counties were confronted with the problem of coal exhaustion, forcing Zaozhuang to deal with the crisis and seek to develop alternative paths for future industrial transformation (China Daily, 2010).

Interestingly, however, the GDP share of the coal industry soared from 14.75% to 37.51%, and the employment increased almost by 20,000 from 2001 to 2011 (ZSB, 2012). The change in industrial landscape is characterized by the rapid rise of the coal-chemical industry. By 2009, Zaozhuang had become one of China's largest coal-chemical producers,

and it was estimated that it will be Asia's coal-chemical capital in 2015 (Zaozhuang Daily, 2011). This raised two concrete questions that need to be addressed: (1) How to explain the persistence of the coal industry despite local coal exhaustion? (2) To what extent does the rise of the new path benefit from the coal industry?



Figure 1. The location of Zaozhuang municipality

Data and Methodology

To address these questions, the author conducted 36 in-depth interviews with a wide range of local authorities, firms and organizations, and also collected statistical data, government reports, policy documents and newspapers. The interviews were done in March and April 2013. The questions were semi-structured and directed at five aspects: (1) the developmental history of agencies; (2) past, present and future actions related to the local coal exhaustion; (3) inter-firm and firm-state relations and their changing trends; (4) the roles of local authorities in affecting industrial dynamics; (5) multi-scalar policy impacts. This paper focuses on the evolution of the coal-mining industry and the coal-chemical industry, for which representatives of 11 coal SOEs (of a total of 12) and 9 coal-chemical headquarters were interviewed.

4. Path dependence and the restructuring of the coal industry

Zaozhuang's coal reserves are increasingly dwindling, but the negative impacts on the coal-mining industry seem relatively weak. Statistical data suggest that the industry has grown rather faster than before and continues to maintain its leading role in regional economic development. There are two explanations for this phenomenon:

First, the heterogeneity of coal SOEs coupled with the GDP-oriented local authorities have led to strong path persistence of the coal industry. The industry remains state-owned but jurisdictionally separated, consisting of 1 provincial SOE, 1 municipal SOE and 10 county-level SOEs. The ownership differences caused by the Chinese ranking system have resulted in an uneven allocation of local coal reserves for SOEs (see Table 1). In the early 2000s, the provincial SOE, Zaozhuang Coal Group (ZCG), which was in possession of around 70% of the local coal reserves (mainly in Tengzhou), had no pressure to scale down its most profitable coal production, while local (municipal and county-level) SOEs with limited (or exhausted) coal reserves were confronted with critical conditions. Since it was in principle impossible for low-ranking SOEs to acquire coal from high-ranking ones, the municipal government had to regard Zaozhuang as a coal-exhausted region, though Tengzhou has rich coal resources. As the general manager of a county coal SOE put it:

“We describe the coal-mining industry as ‘1 adult and 11 children living in one room’ because of the domination of ZCG in local coal reserves. Since ZCG, being a provincial SOE, is out of the jurisdiction of Zaozhuang, to the municipal government, Zaozhuang is de facto a coal-exhausted city, though de jure it is not.”

Table 1. Basic character of coal firms in Zaozhuang

Name	Rank	State affiliation	Number of miners (2012)	Output (2012) (10 ⁴ ton)	Share of local coal reserves	Coal plants outside of Zaozhuang
ZCG	Provincial	Shangdong	28000	2617	70%*	Guizhou (2005)
Quanxing	Municipal	Zaozhuang	700	84.3	8%	Sichuan (2012)
Chenlong	County	Tengzhou	2200	550	12%*	Neimenggu (2007); Hebei (2012)
Fuxing	County	Yicheng	2800	500	0% (2006)	Guizhou (2008); Qinghai (2012)
Fengyuan	County	Yicheng	1980	360	5%*	Yunnan (2012)
Hannuo	County	Shanting	1200	200	<1%*	Shanxi (2007); Guizhou (2012)
Zhongtai	County	Shizhong	1300	120	3%*	Guizhou (2010, 2011, 2012)
Wangchao	County	Taier-zhuang	900	155	1.5%	Guizhou (2010)
Zhongxian	County	Shizhong	1000	106	0% (2005)	Jiangsu (2006); Yunnan (2009)
Huabang	County	Shanting	600	80	0% (2004)	Hebei (2005); Xinjiang (2008)
Anyang	County	Xuecheng	500	30	<1%	Not yet

Source: firm interviews and firm documentations in 2012. * refers to coal reserves only in Tengzhou.

Although local coal SOEs and the authorities behind them have been fully aware of the problem of local coal exhaustion since 2005, most of them made no attempt to reduce local coal production. They even accelerated the mining processes to gain more profits. This strong path stickiness is not merely attributable to the monopoly of ZCG in the coal industry, which limited the capacities of local coal firms to diversify into new activities. It is also largely underpinned by the prevailing institution of local GDP centrism. As the office director of a county-level coal SOE noted:

“First and foremost, it is simply impossible to give up what we are specialized in. Secondly, the local [county] authorities would not allow us to reduce coal production. As the GDP performance and tax revenue in every county strongly rely on the coal industry, which directly influence the promotion (demotion) of local political leaders.”

The local GDP-ism, which has been regarded as ‘China’s fundamental institution’ (Xu, 2011), motivates a locality to pursue the continuity of regional economic growth to the maximum. In this case, to prevent potential risks of economic downturn and social instability, and more importantly, to protect entrenched vested interests, local officials and firm leaders were determined to stabilize the old path.

Second, the match between national industrial policies and specific local needs not only rescued local coal SOEs but also reinforced the path-dependent effects of the coal industry. Since 2005, China has released a set of national spatial-coordinating policies for the coal industry (Table 2), in which cross-regional coal exploration and acquisition were legally approved. As a result, by 2013 almost all of the local coal SOEs in Zaozhuang had successfully established new coal plants in West China (Table 1).

However, these policies as macro guidelines or blueprints are neither tailor-made for localities nor can they necessarily be put into effect by all coal firms. In fact, each locality tends to reinterpret and flexibly implement national policies in accordance with its own place-based institutional structures and developmental interests (Segal and Thun, 2001). As the first point addressed, the strong tendency towards old path continuity can be seen as a place-specific need that fits in with the national policies. This local-central match indeed helped local coal SOEs to quickly initiate and implement the so-called ‘going-out’ (zou chu qu) strategy, namely acquiring extra-local coal resources and relocating local mining assets. This becomes the most efficient method to solve the problem

of local coal exhaustion and regain economic revenues as well. As the head of the City Coal Industry Bureau pointed out:

“Actually, many local coal SOEs had been in the process of negotiating with some coal-rich regions such as Guizhou before the release of the policies. So these national policies fit the place-specific needs well and helped those local SOEs to accelerate and enhance industrial relocation”

Table 2 Some notes regarding national coal-industrial policies

Policy name and source	Key note
‘Several indications on promoting the development of the coal industry’ (NDRC, no.18, 2005)	“In the next 5 years, China aims to establish big-sized coal enterprises by transforming township and village enterprises (TVEs) and private firms into SOEs. Cross-region mergers and acquisitions are encouraged.”
‘National industrial policy of the coal industry’ (NDRC, no.80, 2007)	“There are three principles for the scientific development of the coal industry: 1. Stabilize the production in Coast China; 2. Build up large complexes in Central China; 3. Enhance the coal investment in West China.”
‘Some indications on accelerating mergers and acquisitions of coal enterprises’ (NDRC, no.46, 2010)	“Competitive SOEs shall be encouraged to conduct resource exploration in Western China, particularly in Heilongjiang, Inner Mongolia, Hunan, Sichuan, Guizhou and Yunnan.”

Source: all notes were originally taken from policy documents of the National Development and Reform Commission (NDRC).

5. Creating the new path: process and mechanisms

Episode I: local assets, firm restructuring and early phase of path creation

Zaozhuang’s coal-chemical industry can be traced back to 1967 with the formation of Lunan Fertilizer Plant (LFP). For several decades, it created significant place-specific industrial assets that substantially contributed to local economic growth (ZSB, 2012). However, given the rapid rise of TVEs in the 1980s and large-scale privatization in the mid-1990s, LFP suffered from continuous turnover decline and financial shortage, eventually resulting in bankruptcy in 1999. Meanwhile, Shandong’s largest coal SOE, Yanzhou Coal Corporate (YCC), which had been ready for industrial diversification, regarded LFP’s bankruptcy as an opportunity and quickly acquired it.

In order to revitalize LFP, a series of strategies was conducted by YCC between 2000 and

2003: first, YCC decided that raw material (mainly coal) should be supplied only by YCC, for which it constructed a special-use railway to deliver its cheaper coal from Yanzhou to Zaozhuang. Second, YCC tried to diversify products from urea to high-valued gas and liquid fuel by fostering endogenous innovation (e.g. building up China’s first firm-affiliated national engineering research center for coal liquefaction and gasification) and absorbing cutting-edge technologies from foreign firms (e.g. together with Cathay-Chemical YCC founded a joint-stock company in 2003). Third, YCC carried out ‘gaizhi’ (market-oriented ownership SOE reform) of LFP by introducing a share-holding system, leading to two joint-stock spin-offs (spin-out) in 2003 (Table 3). As the office director of LFP stressed, “The ‘gaizhi’ largely aroused individual workers’ enthusiasm and encourage them to become shareholders, which liberated LFP from the previous linear and rigid top-down SOE structure, leading to the firm diversification for better embracing the market economy” (Interview, 2013).

Table 3 Features of key interviewed coal-chemical firms in Zaozhuang

Name	Investor(s)	Types of firm ownership	Year of birth	Employment (2012)	Revenue (Million \$) (2012)
LFP (YCC)	YCC	Provincial SOE	1999	3900	2400
Guotai	YCC/Cathay	Sino-US joint	2003	800	510
Tianjiu	LFP (YCC)	Joint-stock	2003	180	79
Haoyuan	LFP (YCC)	Joint-stock	2003	300	29
Tuobo	Individual	Domestic private	2004	1600	950
Yiyuan	Individual	Domestic private	2005	100	32
New Energy Phoenix	Legend/ OW/ENN/ Chenglong	Joint-stock	2009	1711	2100
Shenda	Legend	Domestic private	2012	700	730

Source: firm interviews and planning documents of the Lunan coal-chemical industrial park.

Episode II: market, industrial agglomeration and path development

Between 2003 and 2008, the market price of coal in China increased by over 400% (CNCA, 2009). This generated a chain reaction effect that led to a boost in price of coal-chemical products and the subsequent influx of capital into coal-rich areas (HIS Chemical, 2012). In Zaozhuang, the number of coal-chemical firms expanded from 4 in 2003 to 36 in 2008, almost all of them were founded by private entrepreneurs and co-located with LFP (YCC) in Tengzhou. Many of the interviewed coal-chemical firms preferred Tengzhou not because the region was rich in coal reserves, but rather because YCC could offer ‘ne-

gotiable' prices of raw materials (mainly methanol) that were lower than market prices. As a result of the incomplete market reform of SOEs, the dual-track price system (*jiage shuanggui*) adopted by YCC indeed played a positive role in creating a win-win situation. That is, YCC extended its economies of scale by collecting stable downstream buyers, and the newcomers cut most costs by taking advantage of YCC's cheaper and reliable raw materials. Evidence suggests that it was not uncommon for new investors to hold such kind of 'contracts' with YCC on raw materials supply. As one founder put it:

"It's true that Zaozhuang can provide cheaper land, skilled laborers and advantageous location, among others, but many other regions may have better conditions. The key reason we are here is that YCC can offer us cheaper, consistent, secure and high-quality raw materials."

Episode III: the local state, transforming strategy and new path reinforcement

Despite the absence of policy support from the local authorities during the first two phases, the potentially leading role of the coal-chemical industry in promoting local economic development had been increasingly recognized. In 2007, the local (municipal-level) state launched an urban-transforming strategy, in which the coal-chemical industry was formalized as "a significant alternative industry that can lead to urban transformation" (government work report in 2007). Subsequently, 'building China's coal-chemical city' was officially formalized as the key objective of Zaozhuang by the 11th five-year plan.

To deliver this strategy, the local state played a key role in enhancing the new path. The two main aspects reflect this role: (1) initiating and implementing supporting policies and services. In 2008, the local state established a new public agency, namely the coal-chemical industry office, with the aim of providing preferential policies (e.g. tax-cuts, land price reduction) and governmental services (e.g. one-stop enterprise registration). Consequently, not only new entrepreneurs came to invest but also many existing firms extended their business. Tuobo, a private amino-producing firm, for example, set up 4 subsidiaries in Zaozhuang after receiving a set of preferential treatments. (2) Attracting inward investment from leading shareholding firms in China. In so doing, first, the local state convinced Chenglong, the richest local SOE, that it can provide 'contract' coal to potential coal-chemical investors. Second, the mayor, leading a newly formed business-lobby team, harnessed *guanxi* networks and public resources to attract large-sized, reputable and professional investors. With these local state-led actions, two shareholding

giants (Legend and Oceanwide) and one green energy high-tech firm (ENN) were successfully recruited and, together with the local SOE (Chenglong) jointly established Zaozhuang's second largest coal-chemical firm (Table 3). As the vice CEO of New Energy Phoenix stressed:

"It is the municipal state who took the initiative. I remember that over 10 times, the mayor himself with the leaders of Chenglong came to Qingdao and Beijing, where the headquarters of Legend and ENN were located, respectively, trying to convince us to invest in Zaozhuang as soon as possible."

6. On the relationship between the new and the old path

Based on the above analysis, it has been shown that the path-creation process of coal-chemicals is related to the old path of coal mining (particularly in the reinforcement phase in which the local state mobilized local coal SOEs to support the new path). However, the extent to which the former benefits from the latter is limited and inadequate. Figure 2, which shows the characteristics of the two evolving paths, illustrates the argument (Figure 2).

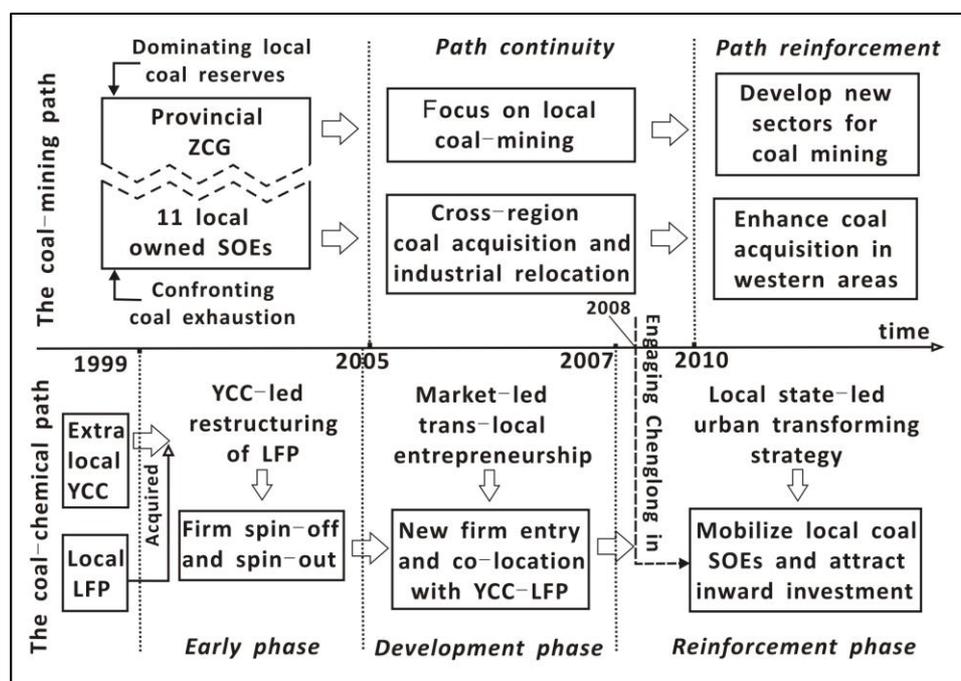


Figure 2. Characterizing the evolutionary trajectories of the old and new path

First and foremost, the strong multi-scalar path dependence within the coal industry impelled local actors to mobilize existing old assets for the development of the new path. On the one hand, ZCG itself had little motivation to change its pillar, the coal industry, due to its monopoly on local coal reserves. Besides, given the pre-occupation of YCC in the coal-chemical industry and its underlying political reasons (to avoid industrial homogenization and destructive competition between provincial SOEs), ZCG was also constrained to step into this industry. On the other hand, ZCG's monopoly in the coal industry undermines the ability of local coal SOEs to cultivate new sectors. Moreover, considering the mono-structural industrial system existing in each county-level region under the GDP-ism institution, state agents whose political performances relied on the coal economy had to give top priority to maintaining the old path. In short, the imbalance of firm power relations underpinned by the ranking system, coupled with the locally decentralized GDP-ism, generated a coherent need at every level of authorities and SOEs within Zaozhuang that seeks the continuity of the old growth path. Under this circumstance, the crisis of local coal exhaustion indeed failed to induce 'mindful deviation' of actors for industrial change. Rather, it aroused stronger desires to maintain the old growth path for survival. Furthermore, this strong already old path-dependent situation was rightly enhanced by the national industrial policies promoting cross-region coal acquisition, which, in turn, substantially eroded the intentions of local coal SOEs to step into new industries.

Second, the new path evolved through a three-fold process: namely, firm-led SOE restructuring, market-led firm agglomeration and local state-led strategic support. The early phase of the path creation is closely associated with the strategic actions of YCC - matching local preexisting assets with extra-local (Yanzhou) coal resources and international technologies - in conducting ownership reform of LFP for the industrial diversification of YCC per se. In the development phase, stimulated by the market and also attracted by LFP (YCC)'s dual-track price institution, trans-local entrepreneurs played a key role in expanding the new path. The raw materials needed by most private firms are LFP's main product, 'methanol'. Consequently the coal industry was hindered from providing coal resources to those chemical firms. In summary, both the early and the developmental phase of the new path evolution have little relation to the old path. This is partly because the entrenched path dependence of the coal economy prevents local coal firms from generating new visions, and partly because it is difficult (or even not neces-

sary) for YCC, an extra-local coal-rich provincial SOE, to harness local coal resources.

The reinforcement phase demonstrates the constructive role of the local (municipal) state in engaging local SOEs with the development of the new path. The connection between the old path and the new path was deliberately built up by strategic actions of the local authorities. Although, as has been argued above, the power capacity of the local state is largely limited by the bureaucratic ranking system within the coal industry (the higher-ranking SOE being ZCG), it still remains effective and has direct power to mobilize locally-owned resources to deliver its strategies. This is why Chenglong, as a local (county-level) coal SOE within Zaozhuang's jurisdiction, can be easily involved by the municipal state in the new path development.

7. Conclusions

This article examines the dynamism of the coal-mining industry and the coal-chemical industry in an old industrial region of China, with a particular focus on the mechanism of new path creation and its relations to the old path. It reveals that the restructuring of the coal-mining industry can be characterized by an adaptation process involving old path continuity and expansion. The heterogeneous structure of firms, local GDP-oriented institutions and national policies jointly and interactively promoted a strong and reinforced old path dependence that fundamentally hinders the transformability of the coal industry. Neither does the new path creation involve an industrial branching process based on the coal industry, nor does it result from technological innovation or accidental shocks. Rather, it developed by a mixed force of firm-based ownership reform, market-driven trans-regional entrepreneurship and local state-led strategic actions. It therefore concludes that the new path is related to the old path to a limited extent, and that the extent to which the new path benefits from the old path seems to be highly associated with the extent to which the local (municipal-level) state mobilize existing local actors and resources to engage in the process of path creation.

The case resonates with the notion of *path plasticity* and emphasizes that regional new paths can emerge with little support from old local resources (Strambach and Halkier, 2013). The co-existence of less-related multiple paths indeed reflects the multi-faced

action of the state in a transitional context, namely a combination of protecting (expanding) vested interests from old paths and pursuing new economic profits from new paths. More importantly, this paper implies, on the one hand, that Zaozhuang's economic system might undergo a slow, incremental and less-substantial restructuring. As Boschma (2014) argues, regional transformation is about how regions strike an appropriate coherence (or trade-off) of adaptation (changes within old paths) and adaptability (ability to form new paths). A situation of less complementary but inter-overlapped multiple development paths within a region, perhaps caused by the power fragmentation and contestations of differentiated ranking states and SOEs, may undermine the endogenous capabilities and motives for regional transformation. On the other hand, a proper combination of planned institutions (e.g. the dual-track price system) and market incentives (opportunities) can, in a way, play an enabling role in cultivating new industries and sectors in transitional contexts. Moreover, the paper reaffirms that local states in Chinese OIAs are able to play an entrepreneurial role - mobilizing available resources that are locally controlled - in engaging with the mechanism of new path creation. Beyond the conventional EEG views of firm-based accounts, this research suggests that not only the role of power relations (conflicts) embedded in differentiated-ranking state and state-involved entities, but also multi-scalar history-conditioned and changing institutional contexts need to be closely examined in future analyses of the restructuring of OIAs in China and beyond.

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6 State-led path creation in China's rustbelt: the case of Fuxin

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Abstract

The role of state agencies in regional new path creation has been largely neglected and underexplored to date. This article aims to contribute to these debates by a case study of the wind power industry from China's rustbelt, where local economies have been strongly influenced by the state. It demonstrates how a new growth industry was created over time by combined forces of the national and local state. This article suggests that the strategic actions and the interplay of multileveled state actors in a changing national political economy should be taken into account when analyzing path creation mechanisms in old industrial regions.

1. Introduction

The restructuring of regional economies is a key research topic in economic geography. Recently, the question of how regional new growth paths emerge has become one of the most intriguing issues (Neffke *et al.*, 2011). The evolutionary economic geography (EEG) framework tied conceptual accounts of regional path creation to regional positive path-dependent mechanisms. Martin and Simmie (2008, p. 186) stated: 'New paths do not emerge in a vacuum, but always in the contexts of existing structures and paths of technology, industry and institutional arrangements.' The core argument is that past regional development leaves imprints in today's development that set the scope for future paths. A growing literature on 'related variety' addresses how new industries branch from technologically similar sectors (Boschma *et al.*, 2013). Despite EEG's explanatory power, it is not universally applicable, seemingly relevant for advanced, organiza-

tionally thick and diversified regions, where local actors have much leeway to create new combinations based on local existing resources and structures (Tödtling and Trippel, 2004). However, it may fail to explain path-creation mechanisms in old industrial areas (OIAs). OIAs often exhibit difficulties in path renewal and creation by being locked-into heavy specialization in mature sectors. Evidence showed OIA path creation is less affected by local firm-oriented actions and more by multi-scaled, systematic and collective socio-political forces. Hudson (2005) emphasizes that the changing role of the state and *governmentality* should be considered to understand OIAs' dynamics. Likewise, Morgan (2012) claims that industrial 'novelty' in OIAs is more or less fostered by state initiatives, where the state can mobilize policy leverage to underpin an enabling environment by encouraging cross-regional industrial transplantation and knowledge transfer (Dawley, 2013; Hu, 2015). Nevertheless, previous studies overemphasize the role of the local state in regional path-creation process, overlooking the state's several spatial levels, particularly the national state. Additionally, existing state-related accounts have tended to ignore state agents' relational and collective power in broader institutional and political economy contexts (MacKinnon *et al.*, 2009). This article, therefore, aims to contribute to OIAs' path creation literature by asking the following questions:

- How do states from both local and national levels play a role in creating new growth industries?

- In what conditions may OIAs form state-led path creation?

It explores how multi-scalar states work collaboratively to create new growth paths in lock-in situations, focusing on one specific case where that appears to have taken place, namely the state-led creation of wind power in Fuxin, a typical coal-mining region in North-east China. This research is based on face-to-face key informant interviews undertaken between December 2013 and January 2014, from eight power developers, three equipment manufactures and seven government departments in Fuxin and Shenyang. It concludes that the wind power path was created over time by a combined force of the national and the local state¹. This research highlights that multi-scalar state interaction is embedded in a historically conditioned and changing national political economy, and that should be taken into account in analyses of OIAs' path creation.

2. China's changing regional development

China's regional economic evolution is closely linked to the changing role of the state (Wei, 2000). The early industrialization of resource-rich regions was primarily empowered by Mao's centralized policies, whilst strong central-state control on sub-national development was relaxed by Deng's neoliberalism 'coastal centered' policy. This inevitably caused uneven development between coastal regions and previously industrialized inland areas (Fan and Sun, 2008). Under this circumstance, in 2003 China adopted a new development ideology, namely 'Scientific Development', seeking to achieve a more spatially balanced development model by mainly restructuring mature industrial economies in a top-down manner. This approach inspired the 2003 national strategy 'Revitalizing the Old Northeast Industrial Bases'.

China's OIAs can be regarded as once-prosperous natural resource and heavy (military) industry regions (in Mao's era), which failed to adapt to market-oriented reforms, thus losing economic momentum in the 1980s and 1990s. Compared with other OIAs, the North-east (known as China's rustbelt) has experienced the most severe economic stagnation. That stagnation in fact is a consequence of the long-term centralized development model with state-owned enterprises (SOEs) alongside top-down command institutions, which resulted in a lack of and/or resistance to adaptation to marketization.

More recently, by receiving explicit central state preferential policies, the region has been significantly revitalized (The Economist, 2012). Fuxin, a mining region in Liaoning Province (Figure 1), has embarked on a new industrial path of wind energy dating to the 2005 introduction of the Renewable Energy Law. Fuxin's economy was previously severely stagnated following the depletion of local coal reserves, regressing into one of the North-east's poorest regions. Although the local state sought to cultivate alternative industries, these efforts were hindered by a lack of local non-mining resources and external linkages. Based on the general questions raised in this paper, it poses the following specific operational questions:

- To what extent does the national state influence the formation of a wind power industry in Fuxin?
- What role does the local state play in responding to top-down actions?

○ What general lessons can be learnt from this case to reflect on the theorizing of regional path creation?

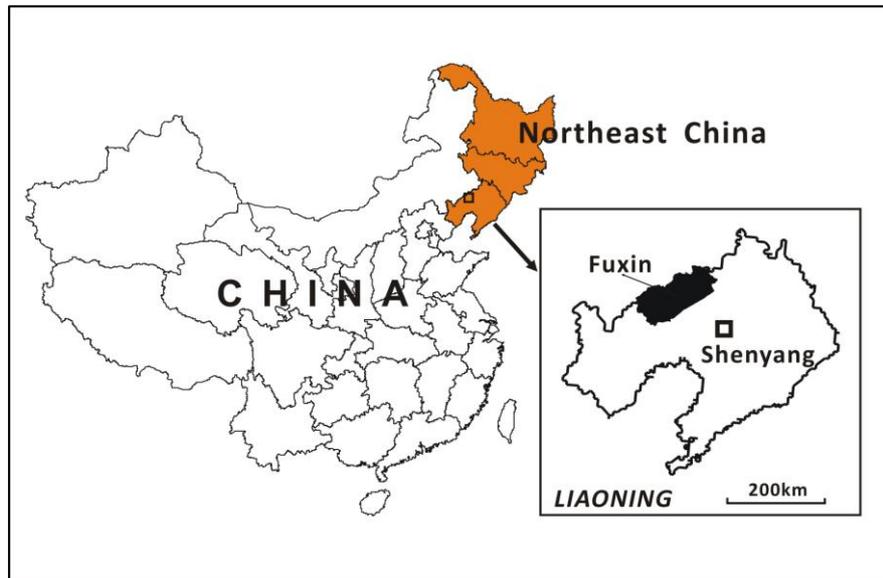


Figure 1. Location of Fuxin and North-east China.

3. Empirical evidence of Fuxin' s new path creation

Fuxin has been recently recognized as one of the China's fastest-growing wind power regions. Between 2005 and 2011, its installed capacity leapt from 49 to 2094 MW, accounting for almost half of the total in Liaoning (Figure 2). This remarkable growth took place across two periods, one of selection/initiation, and then consolidation.

3.1 The path (pre) emergence period (1998–2005)

In 1998, the national state initiated a radical ownership reform of SOEs that caused massive layoffs and consequent social unrest in Fuxin, with rising social tensions driving the local state to seek national emergency aid. Between 1998 and 2001, Fuxin' s leadership put full effort into lobbying national authorities, repeatedly reporting local crises and making policy enquiries. This interactive process helped establish a close local-central relation. Consequently, the State Council qualified Fuxin in 2001 as a 'Resource-exhausted Pilot City', deploying 23 investment projects for local job creation and social security (State Council, 2001). Fuxin's experience, namely, the bottom-up lobbying for national direct intervention, inspired other OIAs in North-east China, such as Fushun,

Liaoyang and Daqing, to mimic this *'asking for'* strategy, eventually leading to the larger-scale *'Revitalizing Northeast China'* policy.

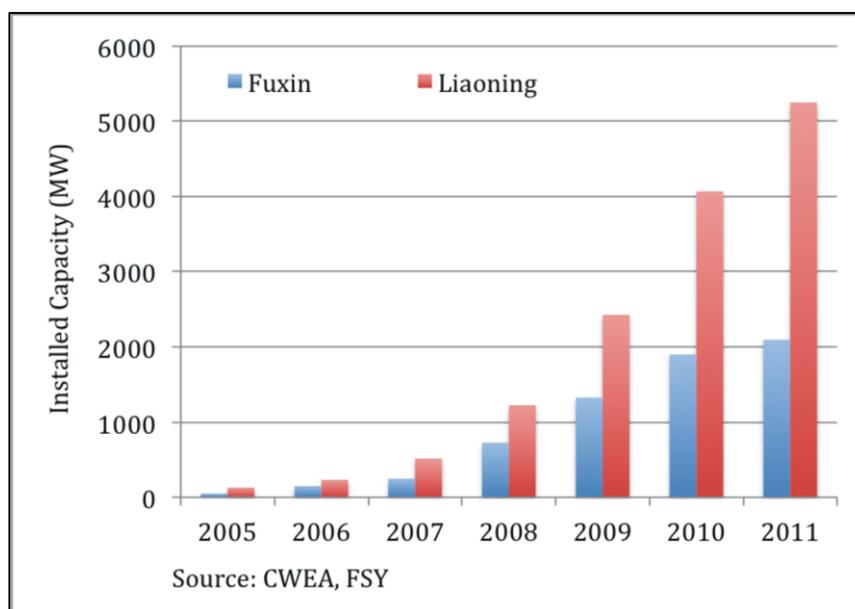


Figure 2. Growth of installed capacity of wind power in Fuxin and Liaoning.

Despite having considerable inward investment from the national state since 2001, Fuxin still failed to diversify its economy. This reality, which deviated from the centrally expected 'pilot' city, led Beijing to drive more effective action in Fuxin. In 2005, the Minister of the National Energy Bureau (NEB), Guobao Zhang, visited Fuxin to identify whether and which renewable industries could develop there. Given Fuxin's rich endowment of wind resource, combined with explicit local political enthusiasm for new industries, the NEB issued a mandatory arrangement following Zhang's return to Beijing, with China Huaneng – China's largest state-run wind power developer – designated to deploy a 500-MW project in Fuxin (NEB, 2005).

This central decision quickly spurred the local state into strategic action. The municipal mayor set up a new organization, the Wind Power Taskforce (WPT), to provide Huaneng with tailored public services. More significantly, local authorities proactively co-opted local agents into the project by conveying forthcoming preferential policy information (e.g., local content requirements), and guaranteeing long-term policy support from the local state. Dajin, for example, shifted its main production from steel to wind turbine

towers, thereby becoming a key local equipment supplier for Huaneng².

3.2 The path development period (2006–present)

Since 2006, the national state initiated a policy portfolio of domestic trade protection, price regulations and tax incentives for wind power. The adoption of feed-in tariffs in 2009 has supported a large-scale concentration of firms and capital to wind-rich regions, including in Fuxin. Under this central policy approach, by 2009 five central state-owned developers (e.g. Datang, Guodian), two private developers (e.g., China Wind Power Group), and one leading turbine manufacturer (Goldwind) reached contract agreements on investment with Fuxin³.

This top-down policy promotion (portrayed by some as the Great Leap Forward of wind power) helped Fuxin clarify clear developmental goals and reframe governance institutions for enhancing wind power. First, the Fuxin Communist Party Committee urged an organizational reform with the WPT upgraded in 2010 into a more important Fuxin New Energy Bureau (FNEB). It played an instrumental role in attracting new wind capital: ‘FNEB is a unique institution that you cannot find elsewhere. Our decision to be here is mainly due to the clear-cut government attitude towards wind power’⁴. Second, FNEB introduced an informal institution of ‘construction first, authorization second’, helping new developers to simplify administrative procedures, thereby accelerating project construction processes. Drawing upon a national regulation⁵, investment projects over 50 MW must follow a strict authorization process before accessing the state grid. ‘This could delay and even constrain the development of large-sized project in Fuxin’⁶. The informal approach allowed developers to avoid reporting a large project as a whole to NEB, but permitting its division into several small schemes (often of 49.5 MW) for separate reporting to the provincial state. This facilitated the approval of large projects and allowed developers to accelerate project construction and reap profits earlier than usual. Third, state elites developed the ‘resource brings industries, wind farms brings factories’ concept. To implement this, the local state formulated a specific policy for wind farmland requisition, subsidizing local peasants (e.g., with higher prices for land acquisition and free electricity usage) to solicit inward investment from central SOEs. Meanwhile, the local state-owned financial system was regulated to provide low-interest bank loans and tax exemptions to local entrepreneurs starting wind power-related businesses⁷. Conse-

quently, Fuxin's state not only attracted five extra wind SOEs in 2013, but also gave birth to seven local companies in wind power manufacturing, logistics and related sectors.

4. Analysis and discussion

Drawing upon this evidence, the rise of wind power in Fuxin cannot simply be understood as a top-down, mono-directional, single-scalar state-led path-creation process. Rather the interplay of the local and the central state led to new industry formation. Prior to the path emergence, North-east regions lacked sufficient power to manage local economic affairs resulting from long-term economic centralization and incomplete SOE reforms. Fuxin's inability to tackle local crises drove direct contact with the national state, with local crises not merely caused by localized problems, but ascribed to national actors' past policy errors. This has made the '*deng, kao, yao*' idea (waiting, asking, depending) ubiquitous in North-east China; and why local states decided to 'go [to] Beijing and ask for help' once a crisis occurs. This 'asking for' approach inspired the central state to be (more) aware of its responsibility for previous policy failures, cumulatively leading to national interventions in Fuxin (alongside other North-east China OIAs).

Zhang's visit may be driven by the introduction of the renewable energy law. But without the initial local enquiry and interaction with the central state, this visit may not have happened. The initial impetus to develop wind power in Fuxin did not emerge in a vacuum but emerged from the already close central–local nexus developed in the previous '*asking for*' process. New industry creation was driven by the combined force of a mutual match of national top-down green economy policies and local bottom-up attempts to address industrial lock-in.

The new industry was further developed in the second period, within a stronger national policy pressure for Chinese wind power (Liu and Kokko, 2010). Fuxin's wind power grew faster and earlier than elsewhere because the local state played a constructive role in embracing external opportunities, implementing new governance and corresponding measures to reinforce the new path. A deep awareness of the problems and barriers of industrial locking led local officials to have a higher sensitivity to national policies. Conversely, the history of explicit dependence on national policies led to a quick and active

local response, demonstrated by the recent project-based local–central collaboration on wind power. Fuxin’s specific political economy desires under external policy interventions became a source for generating local endogenous capabilities. Such path creation can thus be understood as a localized process where the local state played a vital role in turning external stimuli into internal transformative forces.

5. Conclusions

This investigation explores how local and national states jointly fostered a new growth path in an old industrial region. This form of path creation is neither related to the recombination process of local existing assets, nor the result of market-selected firm actions as claimed in the EEG literature. Rather, path creation has benefitted from the collective and combined effect of national policy actions and local needs-based reactions. This paper observes the explicit ‘visible hand’ of the national state in the restructuring of North-east China, partly because of the past centrally planned history in the region and partly because of the current national agenda focusing on OIA revitalization. Despite a lack of appropriate industrial assets for launching new paths in China’s rustbelt, the latent entrepreneurial role of the local state for new governance capacity-building and policy-incentive inputs should not be underestimated. National intervention can be understood in this way as activating and catalyzing the rise of local state entrepreneurship for change.

From this analysis, three overarching conclusions can be drawn concerning new path creation in OIAs. First, OIAs bear limited endogenous ability when it comes to path creation. New industries are more inclined to be initiated by external interventions. Second, the national state can play an enabling role in introducing new firms, knowledge and technologies into OIAs by policy-driven inward investments. Top-down policy incentives may improve OIAs resilience, such as stimulating local actors to put forward new institutions for engaging with a new activity. Third, and relatedly, OIAs are not like passive ‘receivers’ completely at the mercy of external forces. Local agency, related to political and policy factors, remains dynamic, and in certain conditions can make a contribution in encouraging path creation.

In summary, the existing OIA literature on path creation has developed a critique of the endogenous economic factor-based EEG approach, calling for a multi-scalar, context-sensitive and state (policy) agency engaged encompassing perspective. This paper hereby confirms the critique, and further argues that a multi-agency and multi-spatiality perspective is urgently needed to explain path creation in OIAs. It particularly suggests that future related research should pay more attention to the role of the state and its relational power in a broader institutional environment when affecting the geographies and mechanisms of regional path creation.

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Notes

1. China's local state could refer to provincial, municipal, county or township level of government. To avoid possible confusion, the 'local' in this paper only refers to the municipal-level state of Fuxin.
2. Interview with the founder of Dajin, 2013.
3. Interviews with four SOE wind developers in Shenyang, 2013.
4. Interview with a SOE developer, 2014.
5. This regulation gives a fairly high national control on wind power investment entry in locality. It aims not only to prevent local redundant construction and environmental issues, but also to balance total installed national wind power capacity with capacity-limited electricity grid systems.
6. Interview with the FNEB Deputy Director, 2014.
7. Interview with the Director of Fuxin Development and Reform Commission, 2013.

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7 Place leadership with Chinese characteristics? A case study of the Zaozhuang coal-mining region in transition

Manuscript accepted with minor revision by *Regional Studies*, as a contribution to the special issue on '*Leadership in Urban and Regional Development*': Hu, X. H. and Hassink, R. (2015): Place leadership with Chinese characteristics? A case study of the Zaozhuang coal-mining region in transition

Abstract

Although the role of the local state in China's regional development has been regarded as important, individual local state actors and their relation with institutional change have been under-explored. Critically exploring the Western idea of place leadership, this paper launches the notion of local state leadership as a specific Chinese form of place leadership. Through a case study of the coal-mining region, Zaozhuang, Shandong, it articulates how *interpretive*, *formal* and *network* leadership are exercised by the municipal mayor in institutionalization processes. These processes collectively shape broader enabling conditions for local industrial change. We argue that the notion of local state leadership is useful to better understand the bottom-up source of institutionalization and governance innovation for endogenous development in Chinese regions.

“Any conceptualization of local economic restructuring [in China] must humanize the state and take into consideration the role of the local leaders and their economic and political interests.”

(Ma, 2002, p.1552)

1. Introduction

Although the important role of firm-based routines, norms, and habits in shaping regional economics has been recognized, the relationship between institutions and regional economic change is poorly understood (Gertler, 2010). Recently, inspired by institutional theory and institutional economics, there is a growing awareness of the need to conceptualize the role of institutions in regional economic evolution (MacKinnon et al., 2009; Bathelt and Glückler, 2013; Martin, 2000; Hassink et al., 2014). These scholars call for an institutional agency focused, multi-scalar and integrated relational-evolutionary approach, reasserting institutions as “the humanly devised constraints that shape human interaction” (North, 1990, p.3). Nevertheless, the causal mechanism between micro-level, individual agency institutionalization and collective action for regional renewal has been under-explored to date.

One approach to tackle this issue is by focusing on the role of leadership in regional development and by bringing ‘people’ back into the core of urban and regional development studies (Stimson et al., 2009; Collinge and Gibney, 2010; Sotarauta et al., 2012). This research strand takes an agency perspective that regards the ability of human actors as critical for regional development. It has been argued that leadership is not just about individual or grouped leaders’ capabilities detached from context, but that it is rather about relational, collaborative capabilities that interactively shape and are shaped by a place-specific and broader institutional environment (Gibney et al., 2009; Collinge and Gibney, 2010). Place leaders can act as *institutional entrepreneurs*, attacking old institutions, initiating new ones, and turning new visions into action for regional renewal (Sotarauta, 2011). The notion of leadership focusing on the dynamic role of human actors as embedded agency “might provide us with an additional approach to complement the conceptual tool kit traditionally used in regional development studies” (Sotarauta, 2009, p. 904).

Despite some first valuable insights, research on place leadership is still in its infancy, conceptually vague and empirically insufficient. One important shortcoming is the prevailing focus on case studies in Anglo-American and European democratic countries. Little related research has been done yet in autocratic or authoritarian contexts. This research gap is recently hinted at by Beer and Clower (2014). They emphasize that different national contexts may result in highly divergent patterns and effectiveness of place leadership.

Therefore this paper, which is submitted in the framework of the special issue on Leadership in Urban and Regional Development, seeks to extend existing place-leadership literature by addressing place leadership in the Chinese context. Ample work has highlighted the entrepreneurial role of the local state¹ in China in regional economic development (Xu, 2011). Moreover, it is contended that China's elite-based *nomenklatura* system has provided a political basis that enables the formation of sub-national government leadership. Chinese local state leaders are in fact endowed with actual power to (re)direct economic trajectories of regions (Chan, 2004). However, previous accounts often regard the whole local state as one behavioral agency, leaving the role of local state leaders in regional development under-conceptualized (Oi, 1995; Wei, 2000; Huang, 2008). Arguably because of political sensitiveness, they have not sufficiently scrutinized the role of its constituent individual (group) agents, namely local state leaders – through the exercise of formal and informal power, skills and practices in effecting regional economic dynamics.

The main purpose of this paper therefore is to examine the role of place leadership in the Chinese context, with a particular focus on how a political leader enacts leadership to refresh the institutional environment for local industrial dynamics. Certainly, this article is not intended to raise the importance of individuals solely. We view them, rather, as a starting point of research that can help to articulate *why* local state leadership is essential to China's regional development, and to explain *how* it impacts on institutionalization in practice.

The paper is organized as follows. In the second section some conceptual building blocks are presented on leadership, institutions and regional economic change. The third section contextualizes the notion of place leadership in China by addressing its main differ-

ences from the West. After a brief introduction of the case region and methodology in the fourth section, the fifth section illustrates how local state leadership in Zaozhuang, a typical coal-mining region of Shandong Province, was used to contribute to institutional reform which in turn led to a remarkable change of the local industrial structure. The sixth section draws conclusions.

2. Institutions, leadership and regional economic change

The recent discussion about institutions, leadership and regional economic change is embedded in a paradigmatic discourse of economic geography, in which different paradigms, such as evolutionary, institutional, relational economic geography and geographical political economy, are discussed (Hassink et al., 2014). These paradigms have different views on the role of institutions and individual agents and take them seriously to different degrees. Evolutionary economic geographers, for instance, view institutions as firm and organizational routines (Boschma and Frenken, 2009; Martin and Sunley, 2006). Although institutions are historically conditioned and locally embedded, they can be changed through potential mutation, adaptation and novelty of firm entities in an uncertain environment. Evolutionary economic geography has been criticized for being weak on explaining social agency, power relations and multi-scalar governance, whereas the other paradigms partly compensate for these deficits (Hassink et al., 2014).

No matter what paradigmatic background they have, most economic geographers see institutions as highly spatially embedded, performing in different forms and hence causing and maintaining the unevenness of economic development. Some treat institutions as firm-based relational assets or untraded interdependencies, which enable spatially-bounded tacit knowledge sharing, interactive learning and trust-based cooperation. They reduce transactional costs and sustain local competitiveness (Cooke and Morgan, 1998). Others rather emphasize the constraining role of institutions in regional economies by employing the evolutionary concepts of lock-in and path dependence to reinterpret the stagnation and decline of old industrial areas (Grabher, 1993; Hassink, 2010). Grabher (1993) stressed that long-term rigid inter-firm relations inclined to generate mindfully conservative and self-sustaining coalitions. These coalitions consisted of regional economic and non-economic actors in the Ruhr Area, Germany, which hindered

industrial restructuring.

These studies therefore tend to show that institutions either play an enabling or a constraining role in regional economic change. They lead to a linear, static and dualistic perspective that overlooks the realm of institutional evolution itself. Moreover, they seem to over-emphasize the 'institutions to actors' downward causality. They ignore the upward process of institutionalization in which multi-actors are able to self-adapt and proactively interact in order to foster local institutional change.

There are nevertheless some studies available recognizing and highlighting the importance of individual human actors in restructuring regional economics in a Western context. Arrospide et al., (2011), for instance, show that in the Basque Country transformational leaders communicated a clear vision, inspired commitment through this vision, as well as created confidence and motivation among subordinates. Parker (2010) stressed in the case of Sophia Antipolis, France, the key role played by Pierre Laffitte, a political entrepreneur who developed a vision for the region. MacNeill and Steiner (2010) emphasized in the case of Styria, Austria, the major influence of the Styrian Minister Herbert Paiarl on the region's transformation. Finally, Bathelt (2013) in the case of Bitterfeld-Wolfen, Germany, clearly indicated the strong influence and guidance of certain economic leaders, network builders or 'altruistic managers', on the corporate re-bundling processes in the chemical industry and their regional effects.

Our paper contributes to this line of research by incorporating place leadership. The leadership concept could be useful to compensate for existing research deficits in terms of a lack of individual agency accounts in regional development research, particularly in non-Western context. It can also help to further re-conceptualize leadership itself by dealing with the change of institutions in regional economies. Collinge and Gibney (2010) argued that leadership is a relational phenomenon. It provides a channel to link micro-processes of individual interactions and institutionalization with macro-processes of institutional change and transformation (Sotarauta and Pulkkinen, 2011). Place leadership can be seen as a group action for the purpose of either achieving short-term tasks or developing leader-follower relationships for far-reaching change. It is characterized by both emergent and shared action, formal and informal processes/styles, as well as influenced by multi-level governance interaction between variegated types of agencies. Based on

the recent literature on place leadership we propose three main styles of leadership as building blocks of the empirical part of this paper. First, interpretive leadership is an interactive and integrative process by which a leader uses skills and capabilities to affect existing actors' perceptions and knowledge for institutional change. It reflects a building-up process of an entrepreneurial culture (Feldman, 2001) or new resources of social capital (Purdue, 2001), by the inspirational and entrepreneurial actions of pioneering leaders. These actions aim to renew actors' cognitions, inviting them into a new visionary context for future change. Secondly, formal leadership can be merely exercised by leaders who are endowed with positional and authorized power (Bass and Bass, 2008). In general, it is a top-down process oriented to quick/short-term goals and achievements. It seems to be widely agreed, at least in European regions, that formal leadership needs to be complemented by shared power and responsibility when it comes to effective institutional change (Sotarauta, 2009). However, the role of formal leadership in affecting institutions and economic development may be different in Asian contexts (Gibney, 2011). Thirdly, network leadership "... is an action, which directs all the operations and resources of the network to the desired direction" (Harmaakorpi and Niukkanen, 2007, p. 82). This leadership should try to help interaction between different actors and institutions. In addition, it is closely related to an emergent, strategic and adaptive capability of leaders in a fast changing context. And such capability should mobilize and collect multi-scaled resources, and align multiple actors with common goals for network-driving innovation (Sotarauta, 2010) and institutional entrepreneurship (Sotarauta and Pulkkinen, 2011).

Despite some differences between the three styles of leadership, they all share at least one characteristic if situating them into place. That is, they can be seen as a 'leadership of context' (Schreiber and Carley, 2008), because the nature of place leadership, regardless of which style, is highly sensitive to the context. It is shaped by both the place-specific and macro national context. In this paper, we therefore do not only view place leadership as a highly place contextualized process, but also take the national context into consideration. Putting place leadership into a non-Western context, and examining its differences from the existing accounts would, as Beer and Clower (2014) suggested, bring new insights into the theorizing of place leadership.

3. The context: why local state leadership in China?

The institutional foundations of local state leadership

Much of the existing literature on China's regional development highlights the crucial role of national political leaders (Li, 2001; Jones and Olken, 2005). For example, the early industrialization in Northeast China was designed and also empowered by Mao's pro-Soviet ideology, while the rapid economic growth of coastal regions is strongly tied to Deng's neoliberal policies (Fan and Sun, 2008). However, sub-national leaders now have emerged as key promoters for regional economic change. Qiu He and Bo Xilai, for example, marked as 'officials with personality' (*gexing guanyuan*), have been much studied as representative cases to illuminate the logic of China's bottom-up institutionalization and gradualism reform (Fewsmith, 2013). The former is known for his leadership in local governance capacity building aiming at socio-economic restructuring of Suyang County in Jiangsu. The latter has raised even more attention due to his socialism economic experimentalism in Chongqing, which has led to a regionally distinctive development model (Zhang and Peck, 2014). One may associate this phenomenon with the 'princelings' enjoying wide inherited political capital from their 'red' families. Grass-rooted cadres, however, have also shown powerful capabilities in local bureaucratic reforms and economic experimentations (Eaton and Kostka, 2013). We argue that these cases do not emerge by coincidence, but are logical and systematic outcomes of Chinese-specific political arrangements and institutional settings. Two main institutional fundamentals can be identified that matter for local state leadership in the Chinese context.

The first institutional fundamental is the *sui generis* version of decentralization, namely the Chinese-style federalism (Montinola et al., 1995). This form of federalism ensures that each sub-national state is autonomous in its own sphere of authority. But such authority is highly limited to the economy, as the one-party national political system and its legitimacy could only be sustained by economic growth. It has been argued that China's economic success is mainly attributed to the dynamic role of local states under this 'market preserving federalism' system (Montinola et al., 1995; Qian and Weingast, 1997). Further accounts have been given to the entrepreneurial role of local officials (or cadres) in regional development (Edin, 2003; Landry, 2008). By emphasizing China's 'asymmetric decentralization' (Chien, 2007) or 'regionally decentralized authoritarian' (Xu, 2011), the

Chinese form of decentralization is regarded as a combination of economic decentralization and political centralization of cadre control. It not only endows local officials with actual power to govern economic affairs within their jurisdictions. But it also mobilizes them to be economic 'innovators' and 'reformists' who can potentially reward a personal 'political bonus'. More specifically, the Cadre Evaluation System (CES) under the Chinese Communist Party (CCP), as an integral part of political centralization, incentivizes local officials to compete in so-called inter-regional GDP 'tournaments' whose results strongly matter for the political future of officials (Li and Zhou, 2005; Zhou, 2007). Therefore, the Chinese-style decentralization suggests that it is not simply the local state, but is the people from the local state that make good sense for regional development.

The second institutional fundamental refers to the trans-regional cadre rotation institution. Such institution generates a particular cadre community, which has been widely labeled as 'airborne cadres'² by the Chinese bureaucracy. Airborne cadres are highly dynamic government leaders of regions. They should perform better than his/her immediate predecessors in a fixed tenure (often five years), given the 'regional official's promotion championship' (Zhang and Gao, 2008). Moreover, they are expected, by upper authorities, to do something different in new locations, so that the CCP can test them for future political purposes. For instance, some are deliberately assigned to transfer 'good practices' developed in one working place to another (Li, 2012). Others are sent directly from Beijing to certain localities with clear missions, such as to implement new national initiatives (e.g. developing renewable industries) and regulations (e.g. energy cost per GDP instead of conventional GDP) (Chien, 2010). In a deeper view, since the Chinese federalism has led to many regional problems, such as environmental deterioration and bureaucratic protectionism, the central state is attempting to realign incentives of local governments by distributing airborne cadres and holding them accountable for institutional experimentation. In this sense, China's cadre rotation can be seen as an enabling institution for the rise of place leadership. Because it not only resembles a relay (Sotara and Mustikkamäki, 2012), in which new leaders are subject to new activity in new places by introducing different sets of visions and governances. But, more fundamentally, it constructs a dialectical relationship between local state leaders and regional economic dynamics, making the leadership and capacity of state leaders particularly essential.

Characterizing local state leadership in China

Based on China's distinct institutions, we thus propose the notion of local state leadership, as the Chinese form of place leadership. This notion sympathizes with the main point in a bulk of literature, namely the strong entrepreneurialism of the local state in China (Duckett, 1996; Wu, 2003; Zhu, 2004). But, beyond that, it is extended with a people-oriented perspective and pays greater attention to human agency – the capability of local cadres. We argue that local state leadership is a contextualized term rather than another new concept, because its implications and attributes in China substantially differ from what it stands for in the West (mainly Anglo-America and Western Europe). To illustrate this, Table 1 shows differences in several characteristics of place leadership between the West and China.

Table 1. Different characteristics of place leadership between the West and China

Item	Context	
	Western democratic context	Chinese authoritarian context
Leaders	Elected Mayor, Councilor, Party leader	Appointed Mayor and CCP secretary (Mainly at municipal and county level)
Potential followers	Local governors, residents, communities, non-state organizations	Local subordinates, state-backed individuals and organizations
Civic engagement	Strong and active	Weak or even absent
Accountability	Voters, affiliated party, council	Upper states and higher-ranked officials
Decision-making	Shared, open, collective, slow process, with a variety of purposes	Less-shared, non- or semi-transparent, fast process, with a coherent purpose of economic development
Power exercise	Formal and based on rules of the law	Formal and informal (with a flexible, emergent and tentative manner)
Orientation	Relationship-oriented	Task-oriented

Source: author own compilation

First, in a democratic context, local state leaders generally consist of elected mayors, councilors and party leaders, etc. They represent heterogeneous interests due to multi-party and democratic systems. However, Chinese local leaders mainly refer to mayors or party secretaries at the sub-national government level, who are designated by the ruling CCP. They do not necessarily influence the general public, only being accountable to upper authorities that entrust power to them. Secondly, democratic leaders aim at achieving distributed power by seeking for interest cohesion in the broader society. This may

result in a diversified objective of leadership, ranging from political and social advancement to economic and environmental issues. While in China local state leadership appears to be strongly (economically) task-oriented, without much concern about political reform and civic well-being. Thirdly, constitutionalism in the West restricts local leaders to enact power in a formal and legal way, which generates open, shared and collective leadership. But it may also cause less-effective leadership with slow decision-making processes. On the contrary, in China's authoritarian context, local leaders enjoy a less-structured institutional framework. This allows them to adopt a mixture of formal and informal power so that target-oriented leadership can be effectively achieved (Tsai, 2007). Such regime encourages leaders to behave in a flexible and tentative way, leaving much room for local experimentations and thus 'adaptive' leadership. While China's institutional advantages seem favorable to local state leadership, relevant in-depth empirical research has been scant. Some concrete questions guiding our analysis are as follows: What do local cadres actually do to affect institutions for regional development in China? What kind of power and leadership do local cadres enact when pursuing industrial change? And how a new growth path can be created under the Chinese local state leadership in a less-favored region?

4. Case selection and methodology

Zaozhuang is a municipal region located in the south of Shandong Province, with a population of 3.83 million (Figure 1). This region is not only famous for its long-history (over a hundred years) coal-based economy, but also is widely known as a 'Hero City' of China. It was the site of 'the Battle of Taierzhuang', where China won the first major victory against Japan of the Second World War. However, due to the single-industry structure, and the depletion of local coal resources since 2000, Zaozhuang's economy confronted many difficulties and often ranked at the bottom of growth rates in Shandong during the past decades. Surprisingly, since 2006, the region has exhibited a strong industrial revitalization in two pathways, namely the path creation of coal-chemical sectors (Hu, 2015) and the rise of the tourism industry. For instance, between 2005 and 2011, the revenue of the tourism industry soared from 372 to 1816 million \$, with a remarkable annual growth rate of 25.4% (ZSB, 2012). In particular, after rebuilding Taierzhuang as ancient

tourism town by the local state in 2009, this industry has become a significant new growth path for the local economy. The tourism industry coupled with rising service sectors created over 100,000 new jobs, which contributed to a successful reemployment of a large part of the laid-off workers from the coal industry (China Daily, 2012). This eye-catching transition is labeled as ‘Zaozhuang practice’, being widely broadcasted over China by the media in recent years. In general, this can be related to the national policy programme of ‘Transforming Recourse-exhausted Cities’ since 2009. In this programme, Zaozhuang is privileged from transferring its local tax to the central state, meaning that the local state gains more financial resources to improve its economy. But the focus of the media was often on the dynamic role of the municipal state, especially the leadership of the mayor, Mr. Chen Wei (see Table 2). These newspaper accounts, indeed, not only enabled us to identify Zaozhuang as an ideal case for research, but also guided to design grounded questions for our fieldwork. Although Chen was suddenly removed from his post early 2015, there has been no clear evidence so far showing that his remove is because of his leadership on economic development, but, certainly, related to Xi Jinping’s nationwide anti-corruption movement.

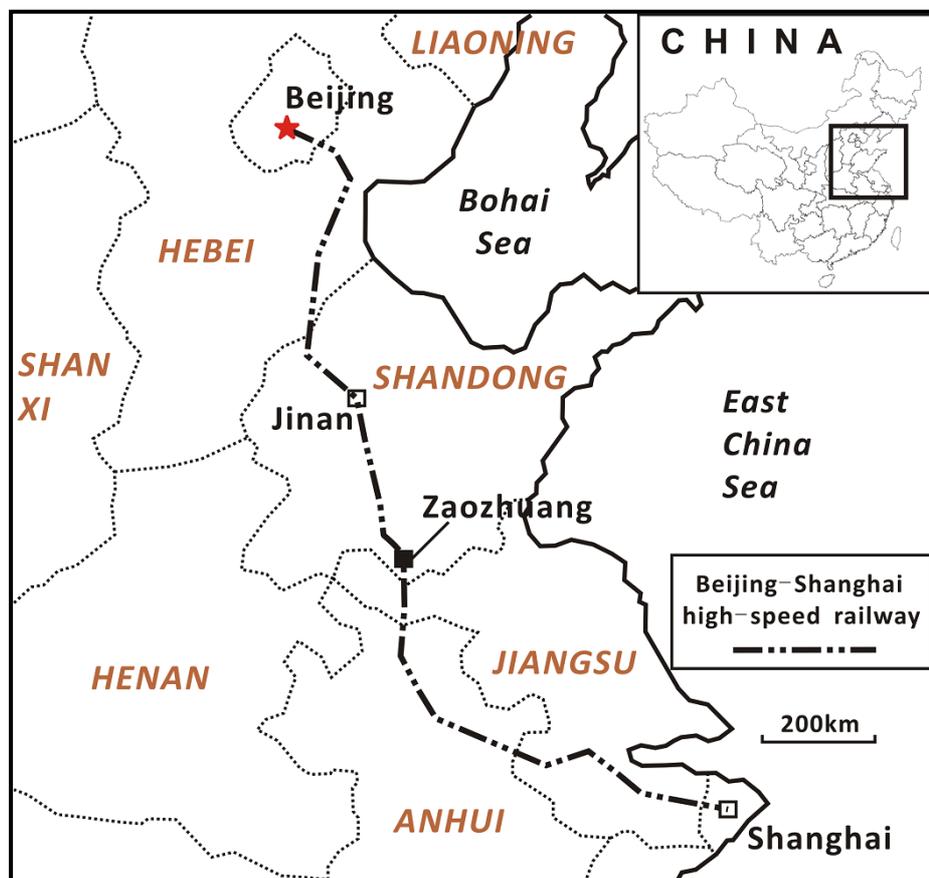


Figure 1: The location of Zaozhuang in East China

Table 2: Chinese key media concerning mayor Chen Wei of Zaozhuang

Media Name	Article Title	Publication Date
Wenweipo (<i>wen hui bao</i>)	Zaozhuang's 'sea turtle' mayor is ready to show capability	2008-03-07
People's Daily (<i>ren min ri bao</i>)	Mayor Chen Wei disentangles the restructuring of the Coal City Zaozhuang	2009-03-13
China Tourism News (<i>zhongguo lvyou bao</i>)	Zaozhuang's mayor Chen Wei - the best tourism ambassador in China	2010-10-25
China Daily (<i>zhongguo ribao</i>)	Seeking for scientific paths in resource cities: proactive transformation in Zaozhuang	2012-04-15

The empirical study is based on in-depth interviews with firms, authorities and universities. Moreover, secondary data were collected from statistical yearbooks, government reports, policy documents, and newspaper sources. The fieldwork was conducted in March and April 2013, and was supported by the National Planning Project 'Sustainable Development Planning of Resource-exhausted Cities' (2013-2020). This top-down support helped us to forge trustful *guanxi* relations with local authorities. Most interviews lasted about two hours and were held with 37 informants in 25 organizations (including 11 coal SOEs and one tourism SOE, 10 government authorities and three vocational colleges). We realize here that due to the top-down introduction as well as the authoritarian, non-democratic system, interview results might be biased. Critical non-governmental organizations have no voice and could hence not be interviewed. To avoid potential biases such as flattering comments on the mayor, the interviews were deliberately operated in line with two principles. First, we urged the interviewees to provide detailed story-based examples when it comes to Chen's actions. Secondly, we asked the interviewees to emphasize 'how' rather than 'what' the mayor did for the tourism industry. The questions remained open-ended and were asked in a relaxing atmosphere, geared to three main focal points: (1) What are the characteristics of the mayor in terms of personality, work style, developmental visions, etc.?; (2) How did Chen encourage existing agents to get involved into the new industry?; and (3) How did Chen influence prevailing institutions in this process?

5. Empirical analysis: local state leadership for industrial change

Given the long-term over-specialization on the coal industry, there has been a fair deal of difficulties and resistance against new industry formation in Zaozhuang in the past. By 2006, policy-makers still lacked visions and also motives to break the existing industrial structure. In late 2006, when Chen became mayor, the local economy began to undergo a striking shift towards tourism. This process is closely aligned with the contribution of three interrelated styles of leadership enacted mainly by the mayor, namely *interpretive leadership*, *formal leadership* and *network leadership*, which have been introduced in Section 2.

Interpretive leadership: bringing a shared vision for local development

Unlike other airborne cadres who are more likely to inquire about local conditions from experienced subordinates, Chen rather preferred to do this on his own. As the deputy director of the municipality office put, “he visited nearly every town, and interviewed with about a hundred of firms”. Perhaps one may link his novel behavior to the Chinese bureaucratic convention, namely ‘new cadres, new laws’³. Evidence however shows that it cannot simply be applied to Chen because he pursues ‘long-perspective’ and ‘far-reaching’ benefits rather than ‘statutory’ and ‘contractual’ interests (Gibney et al., 2009). For example, he rejected Taierzhuang’s largest-ever housing inward investment project in early 2007. Almost all local officials were enthusiastic about this project as it could have been an opportunity to reconstruct the urban shantytowns, and increase local government revenues. Chen, by contrast, declined it by emphasizing the need of reserving “the unique and invaluable historical assets of Taierzhuang that have once been destroyed can never come again into being” (Interview with Taierzhuang Development and Reform Commission, 2013). In this context, fierce tensions emerged within the local state. Coping with such tensions is essential to new leaders, as it matters for the efficiency of the whole local governance in the next few years. It requires the ability of new leaders to convince their subordinates to accept new ideas, and beyond that, to inspire them to become followers.

In doing so, first, the mayor engaged local officials with an in-depth investigation to explore what unique advantages the region has. A mayor-led workforce was initiated in order to explore place-based historical legacies (e.g. the war history). This work, which

lasted for nearly two years, raised local officials' awareness of protecting intangible heritages. Moreover, it enabled them to realize that latent, uncommitted and place-specific assets can be exploited properly for economic use.

Secondly, the 'a tank of fuel' concept was introduced by Chen to explain why tourism needs to be cultivated. In this concept, Chen compared Zaozhuang's economy with a driving car, and stated, "in the past, it only focused pursuit of speed, regardless of how much fuel it costs; now, there is only one tank of fuel left due to local coal exhaustion, impelling us to change the way of driving and foster low-energy-costing sectors" (translated from the original, the Government Annual Report, 2008). Based on this concept, Chen convinced five local coal SOEs to financially contribute to the rebuilding strategy of Taierzhuang as a tourism destination. One of the interviewed managers from a coal SOE praised his leadership ability in engaging people into the new agenda:

"Unlike other airborne cadres who might just give a fuzzy vision or direct orders, Chen offered a sound vision with understandable and reciprocal concerns. He chose the right time (when China's coal price was at a high point and thus coal firms gained sizeable profits), for instance, to lobby with us, by asking each coal SOE to contribute 10-ton coal instead of money. As such, we of course followed his new plan."

Thirdly, Chen proposed a well-defined roadmap for industrial restructuring - 'One target, Three pathways'. It systematically clarifies how the local industrial system can be transformed through three inter-related pathways: (1) improve urban infrastructures, (2) promote coal-chemical industries and (3) cultivate tourism. The leader further rationalized this idea in a more easy-to-understand setting, that is, "the first way answers why investors come here; the second resolves how to increase local government revenues (by investment) and, the last guides where people (laid-off miners) can be reemployed. These pathways bear a reciprocal relationship that will generate a positive step-by-step mechanism leading to industrial change" (interview with the Secretary of Mayor, 2013). Through this 'visualization' process of solutions (Stimson et al., 2009), the concepts were accepted by most local cadres, and eventually, turned into a core formal policy guideline in the next five years (ZBS, 2012).

To be clear, the evidence above demonstrates how the mayor exercised interpretive leadership to influence local elites, in an attempt to create a new and shared local gover-

nance climate for industrial change. This leadership emerged from the mayor's ability to read, analyze and translate the local context. It is consciously constructed by the leader's place-grounded investigation, more precisely, by a process in which the leader as an 'airborne cadre' got deeply embedded into the local context. Moreover, the mayor not just cast a new vision, but a vision with meanings and feasibility. All his actions centered on inspiring others to view the existing context differently and engaging them with a shared belief for a new task/aim. While interpretive leadership here may, to some extent, be associated with Chen's personal charisma, it cannot be equated with charismatic leadership. The former involves developing followership involving institutional adaptation for a new and well-defined mission. The latter however refers to creating an attractive self-image of leaders, lacking an interaction with potential followers.

In summary, our evidence shows that even in an authoritarian context interpretive leadership is still essential, particularly to airborne cadres who are not locally rooted. It can play a key role in realigning people with "a new vocabulary and a new way of seeing things" (Sotarauta and Mustikkamäki, 2014, p.3). Such kind of leadership involves a time-consuming 'reinterpretation' process to unlock existing governmental norms and traditions. It can contribute to a new agreement among local stakeholders, which is highly essential for further progress of institutions.

Formal leadership: reshaping governmental institutions by power and authority

Despite a visionary consensus within the local state for developing the tourism industry, there were several obstacles to put the ideas into action. The main obstacle is that "as a mining region it fundamentally lacks tourism facilities, competences and institutions. For instance, there was no authority relating to tourism until 2009" (Interview with Zaozhuang Tourism and Service Commission, 2013). To overcome the 'institutional absence' for new industry formation, the mayor utilized formal leadership with two types of power, namely legitimate authority and coercive power.

First, legitimate authority was enacted to foster new organizational tissues for tourism development. This authority does not refer to arbitrary decision-making, but to administrative measures and policy initiatives. In 2009, just after Taierzhuang ancient town was

rebuilt, Chen issued a series of tailor-made policy initiatives for tourism development, of which one core aim was to set up a special government agency for tourism. These formal policies triggered a reallocation of governmental resources and subsequent organizational innovation. For instance, by merging two sub-municipal previously independent agencies, the local state established a very unique municipal authority - the Zaozhuang Tourism and Service Industry Commission. Besides, all local state sponsored vocational colleges were instrumented by Chen's administrative power to introduce tourism-related training programs. In line with the 'one target, three pathways' strategy, and upon the administrative instructions of the mayor, "those programs were free of charge for young locals who are from mining families (Interview with the Vice Chancellor of Zaozhuang Vocational College, 2013).

Moreover, formal authority was also enacted to change the 'soft' institution, namely the local Cadre Evaluation System (CES). In 2008, new criteria were incorporated into Zaozhuang's CES. This triggered a critical ideological shift among local officials, away from the prevailing GDP-ism to the socio-economic 'green' transition-ism. As a government document states: "Our [government] work focuses on urban industrial transformation. The work on labor mobility from old sectors to new ones, particularly, to low-carbon industries...is considered as critical and core for all levels of cadres"(translated from original, Zaozhuang Municipal Government Document, No.19, 2008). Although CESs are in principle difficult to be revised locally without approval from upper states, the mayor in Zaozhuang managed to update a new CES and put it in effect. Because making local officials more accountable to developing green industries was not only locally needed, but also is politically encouraged by the national policy agenda toward structural change. This 'doing before approving' example shows that the leader had a clear awareness of what institutions are most critical to the action of local officials, and how to strategically turn them into a momentum for industrial change. As the director of the Zaozhuang Development and Reform Commission put it:

"The need of changing the local CES was emphasized repeatedly by mayor Chen, he clarified that CES is the 'code of conduct'. It thus must be redesigned so that our way of doing things can be changed. And he also realized that new rules in the CES must be legalized so that local cadres would take them seriously and work in line with them in practice."

Secondly, coercive power was employed in an attempt to give local state agencies and SOEs compulsory tasks. To expand new markets for tourism, the mayor released an initiative within the state, namely the 'Zaozhuang Two-day Trip'. This measure urged local authorities to meet fixed, compulsory quota of attracting overnight government personnel as tourists from their duikou authorities (persons within the same vertical administrative system) elsewhere. One of the interviewed officials provided a good example: "All of the 59 municipal governmental units, I mean, even the family planning commission, had to carry out the Zaozhuang Two-day Trip. For example, we received an assigned quota of 2,500 tourists per year". Driven by this coercive initiative, about 1.5 million state-affiliated tourists from all over China were attracted between 2009 and 2011 (ZSB, 2012) in a planned way, giving an explicit push to the expansion of service sectors in the region, such as catering, hospitality and tour-guide businesses.

To be clear, it is suggested that formal leadership in Zaozhuang has made a great contribution to the early development of tourism institutions and markets, through redistributing public resources and realigning incentives/tasks of economic governance. The mayor can be regarded as an institutional entrepreneur who had a well-developed leadership capacity. He took advantage of his 'positional', 'legitimate' and 'authorized' power to ingeniously construct a desired institutional niche specifically for tourism, without harming the broader 'economy-oriented' institutional framework. This may be a good example to illustrate that institutions in Chinese local states are not static and merely used to restrict (or sustain) existing economic actions and structures. They are rather highly dynamic and can be adapted locally to new economic strategies. In our view, formal leadership here does not merely refer to the leader's capability giving mandate to his subordinates. It also embraces incentive-introducing tactics that aim to reshape 'core' institutions affecting the behavior of each local official. We argue that formal leadership can be understood as an important source for 'institutional entrepreneurship', and Chinese local state leaders are coordinators in adapting existing institutional frameworks in order to better serve new economic tasks.

Network leadership: creating a broader facilitative environment

Although the tourism market was initiated by formal leadership, this state-sponsored

model did not prove to be sustainable. Overloading local officials with compulsory tasks undermined the efficiency of local governance as a whole, and the 'planned' model was not favored by the central state in a transitional context. Since early 2012, Chen therefore started to lighten the government control and allowed the market to play a predominant role in promoting tourism. However, this did not mean the local state adopted a laissez-faire policy, "because the coal-mining region itself was not able to generate a stable and sustainable tourist market" (Interview with the director of the municipality office, 2013). Our observations show that with the help of powerful network leadership the local state coupled local tourism resources with broader national programs.

A key example is the strategic action of the leader in response to the emerging 'high-speed railway economy' (gaotie jingji). Before the Shanghai-Beijing high-speed railway was operated in 2011, Chen had been aware of the opportunity to establish a high-speed station close to the Taierzhuang's tourism area. He implemented an advertising initiative to draw wider attention from the public to the improved accessibility, so that the scale of tourism markets could be expanded. Soon, the Taierzhuang tourism advertising appeared in all high-speed railway stations along the Shanghai-Beijing line (see Figure 2). Furthermore, since 2012, the rapid growth of the tourism industry in Zaozhuang has been receiving an extraordinary coverage by Chinese media, particularly by China's most influential TV station, namely China Central Television (CCTV) (Figure 3). Most coverage involved interviews with the mayor, who was keen to share his experiences in boosting the tourism economy from scratch in this less-favored region. These mayor-involved activities contributed to both regional image rebuilding and creating an enabling external environment for local tourism development. This network leadership, empowered by the mayor, emerged from a strategic leader-context interaction, which in a way reshaped the context itself. This can be illustrated by the following notes from the general manager of the tourism advertisement SOE:

"Owing to our 'railway station' marketing project, Zaozhuang was selected as the only 'resource-exhausted pilot city' along the Coast by the State Council, showing that Zaozhuang would benefit from national preferential policies in the next five years."



Figure 2: Huge tourism advertisements of Taierhuzang in Beijing South Railway Station (left) and Shanghai Hongqiao Railway Station (right). Source: author, March and May, 2013.



Figure 3: Examples of mayor-participated tourism promotion in CCTV programs. Notes: upper left: the mayor explains how the region embarked onto the new path of the cultural-tourism industry (2012-11-24); upper left: the mayor calls for more Chinese traditional culture artisans to work in Taierhuang by saying “the government only charges 1 RMB/month rent for running a store”. (2012-09-27); below left: the mayors from Zaozhuang and Warsaw share experiences of the revival of cultural heritages (2012-04-28); below right: Xinwen Lianbo as China’s most-watched programme reports Zaozhuang’s ‘ecological’ transition under Chen’s leadership (2012-12-18). Source: captured by the authors from CCTV Online.

Moreover, this can be illuminated by another relevant example. Given the fact that Taierzhuang is the place where the Kuomintang (the current ruling party in Taiwan) army triumphed over the Japanese in 1938, in the mayor's view the place *per se* could be exploited to improve the political relationships with Taiwan. The local state thus took Chen's viewpoints as a rationale for engaging both Taiwanese politicians and investors into the local tourism industry. This eventually contributed to China's first official Mainland-Taiwan 'cultural'-based agency, which has helped to attract many Taiwanese tourists (50,000 per year) and entrepreneurs to Zaozhuang (Interview with the Director of Taierzhuang Cross-strait Culture Exchange Base, 2013). In a local newspaper article in 2012, the mayor made a statement reflecting the key role of leadership in networking Taiwanese resources:

"In two years, I personally visited the National Taiwan Affairs Office five times. We also invited high-ranked KMT politicians (e.g. Lian Zhan and Wu Boxiong) to visit Taierzhuang. Our intention clearly is to show that we respect the historical facts, and we expect Taiwanese to see this, join us, and make a greater contribution together with us."

(Qilu Evening News, 23 April 2012)

These examples demonstrate the mayor's strong, strategy-oriented network leadership, which took advantage of multi-scalar contexts to support the growth of a new industry. Furthermore, they also illustrate how institutions, such as government tasks and aims, were reshaped by the endeavors of leader-involved public marketing and city branding. Finally, this network leadership involves institutional adaptation in order to turn external stimulants and elements into a local development momentum.

6. Conclusions

This paper contributes to recent advances in the role of leadership as an important driving force for local institutional change and regional industrial dynamics (see Stimson et al., 2009). More specifically, its findings provide a set of important insights into understanding the interactive processes between leadership, institutions and industrial restructuring at a regional level. We argue that place leadership does not produce imme-

diate effects on local industrial dynamics, but rather through influencing and shaping institutions as '*mediators*' of economic practice and interaction (Bathelt and Glückler, 2013). Moreover, we acknowledge that both internal and external institutional contexts, such as national institutions, matter for place leadership. The article moves beyond the mainstream accounts of place leadership in democracies by investigating an in-depth case study in a non-Western, authoritarian context. Given the lack of civic engagement in China, place leadership is rarely enacted by citizens, communities and other non-state groups. It is rather strongly contingent on the local state and political leaders. Following this reality, we propose the notion of *local state leadership*, as a specific Chinese form of place leadership. Differing from the Western context, it emphasizes Chinese local cadres as key initiators, promoters, and entrepreneurs in institutional change for new economic tasks. We argue that this notion should be treated as fundamental to analyze and explain the driving forces of local institutionalization and experimentation and its upward causation in China.

In the empirical study, we adopted the notion of local state leadership in a typical coal mining region in China. We explored how it changed the multi-scalar institutional environment that facilitated the new path creation of the tourism industry. From 2006 until early 2015 the newly appointed mayor played a key role in reinventing local governance structures and creating broader enabling institutions by exercising interpretive, formal and network leadership. Despite the authoritarian context, interpretive leadership is critically needed for those leaders who are not locally embedded. It can induce an important process of 'defection' and 'reinterpretation', which helps to build mutual trust and to shift to new and shared visions 'from below' (Hall and Thelen, 2009). Moreover, interpretive leadership provided a sound basis for the high-efficient exercise of formal leadership. In the framework of this formal leadership, both authorized and coercive power were purposely used to revise existing structures of governance and to devise new regulations for tourism. The third style, network leadership, is associated with multi-scalar contextual opportunities. By responding to changes in the macro context, the mayor initiated new institutions geared towards local development issues. These three styles of leadership found in Zaozhuang can all be characterized by human agent-based relational action, confirming the argument that leadership is about relational agency (Collinge and Gibney, 2010) and institutional entrepreneurship (Sotarauta and Pulkkinen,

2011).

Furthermore, our evidence supports the view of Sotarauta (2009, p. 904) that, “network power and interpretive power have become central in the regional development activities”. In fact, this case study – albeit rather singly discussed – proves that local economic development in an authoritarian context is, in contrast to what one would expect, not solely driven by formal leadership, but also by interpretive and network leadership. We therefore are critical of the claims that place leadership in non-democratic countries is less effective due to a too strong emphasis on formal power and authority (Parkinson et al., 2012; Normann, 2013). Rather, our case shows that effective and shared place leadership can be found in the Chinese context of political authoritarianism and economic reformism. On the one hand, Chinese local state leaders do enjoy ‘positional’ power to reshape decision-making processes and to restructure governance settings for supporting certain ‘new’ economies. On the other hand, the national transitional context (particularly since 2005) encouraging ‘changing the ways of economic development’ provides legitimacy for local state leaders to enact ‘adaptive, informal, emergent’ leadership. It allows local state leaders to operate outside of the existing institutional box, particularly the traditional GDP-centric institutional establishments. In this sense, Chinese place leadership can be constructive for economic transformation and sustainability, albeit under the control of the CCP and without the participation of critical voices (Florini et al., 2012). Hence, we think that the dichotomy between ‘effective place leadership in democratic countries’ and ‘less-effective place leadership in non-democratic countries’ needs to be further clarified via additional empirical studies in non-democratic contexts (Parkinson et al., 2012).

Finally, we consider the role of newly appointed local political leaders, particularly ‘airborne cadres’, in creating new institutional spaces for economic change as a promising topic for future research. Even though the rotation of local cadres may contribute to inter-regional policy borrowing and institutional imitation, regional economic trajectories still remain highly uneven due to the heterogeneity of place-specific histories, resources, as well as broader local-central political nexuses. Place leadership does not only matter for place and human actors ‘over there’, but it can also both shape and be shaped by the broader social and institutional context. Since there are more varieties of place leadership in China than we were able to show in this paper, further examination on the diffe-

rentiation of leadership mechanisms and qualities between regions in China is highly needed. It can namely contribute to a better understanding of uneven economic geographies in terms of processes and intrinsic logics. Moreover, we also plead for conducting more cross-national comparative studies of place leadership, particularly within Asia where both authoritarian and democratic nations exist and the governance and institutional practices of/for regional economies strongly differ. In doing so, we will be able to better answer the more fundamental question of why some regions are able to generate effective leadership while others are not.

Notes

1. In general, the Chinese local state refers to subnational governments, which includes four levels: provincial, municipal, county and township.
2. The term 'airborne cadres', known as 'kongjiang ganbu' in Chinese, is widespread slang in Chinese local bureaucracies. They are basically top leaders of municipal or provincial governments (leaders in county and township governments are almost locals). Their positions are not locally elected and rooted, but instead, are appointed by upper authorities in a fixed time of period.
3. This convention, known as '*xinguan shangren san ba huo*' in Chinese, has its solid cultural and historical roots relating to China's imperial civil examination system. It means that newly appointed local leaders are subject to new governance or task so as to solidify their positions of leadership.

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8 Beyond the dualism between adaptation and adaptability: Exploring differentiated economic resilience of two Chinese mining regions

Abstract

In recent years, regional resilience has become a fashion mainly used to understand how regional economies recover after 'sudden' shocks. However, little attention has been paid to how regions adapt to a 'slow-burn' crisis in a long-term perspective, and why they adapt differently. Moreover, the notion of resilience has suffered from conceptual fuzziness and dualism thinking, which undermines its explanatory power in empirical studies. This article addresses this gap by developing a conceptual framework of uneven resilience of regions in a long-term perspective. This framework defines adaptation and adaptability in an evolutionary and mutually cohesive way that goes beyond the traditional trade-off idea. It also demonstrates how different types of adaptation-adaptability relationships result in uneven regional resilience. Based on an in-depth interview survey, the empirical analysis comparatively explores adaptation and adaptability in two typical Chinese mining regions (Zaozhuang and Fuxin) with diminishing coal reserves over a period of 15 years. Our study reveals that a stronger resilience does not simply mean a stronger adaptability in terms of creating new growth paths, but rather a more 'endogenous', 'locally embedded' and 'transformative' adaptation process of industrial restructuring. In future research more attention should be paid to the differentiated processes and qualities of regional long-term economic evolution both from the adaptation and adaptability perspective.

“The wise adapt themselves to circumstances, as water molds 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 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). Because resilience 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, 2010a; 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, 2010a; Martin, 2012; Boschma, 2014). Adaptation is generally 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. This understanding, however, is lack of rigor, which potentially draws a dualism between adaptation and adaptability, despite some good reasons to support this idea (Grabher and Stark, 1997). Besides the adaptation-adaptability dualism, similar black-or-white dichotomy can be found in the regional resilience literature. Many dualism terms, such as change/continuity, adjustment/renewal and lock-in/lock-out, are used without sound examination and substantial elaboration.

At a good note, some economic geographers 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) argues that resilience is about “how to secure adaptation and adaptability simultaneously” (p.2), and related variety is the key to make a region more resilient. However, according to Pike et al (2010), and among others, the trade-off idea in fact stems from the neglect of policy and politics factors of resilience. They highlight that a complex relationship between adaptation and adaptability is embedded in, and shaped by power relations, politics, and 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 therefore the degree of resilience is contingent on the extent to which and the ways 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 impact factors shape the ways in which adaptation and adaptability are related. However, so far, the debates on adaptation and adaptability are almost conceptual-based, lacking in-depth empirical, qualitative case studies. Moreover, the existing regional resilience literature have very much focused on how regional economies manage to recover from short-term shocks, little has been paid to how they adapt in a ‘slow-burn’ context, and why they adapt differently. There are several questions that need to be addressed by empirical endeavors: whether 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. To avoid raising the fuzziness of the notion, the paper engages conceptualization with the existing accounts on adaptation and adaptability, instead of suggesting alternative terms or notions. We argue that the current definitions of adaptation and adaptability have been suffering from the conventional wisdom of path dependence and lock-in (Graber, 1993; Graber and Stark, 1997), which need to be critically revisited. In doing so, the paper (re)defines the two concepts, by an interactively coherent perspective. We suggest a typology of the adaptation-adaptability relationship. Following this, a conceptual framework is proposed in order to explain and understand the unevenness of regional resilience. In the empirical studies, we take two Chinese coal-mining regions,

namely Zaozhaung and Fuxin, as illustrations to show how changing multi-scalar impact factors shape out different patterns of adaptation-adaptability relationship that manifest the differentiation of resilience.

Our article is organized as follows: Section 2 critically reviews the existing literature on regional economic resilience by pointing out problems and deficiencies. It particularly focuses on the conceptual fuzziness and dualism of adaptation and adaptability. Based on this, a typology of the relationships between adaptation and adaptability is suggested and a subsequent set of impact factors affecting regional economic resilience is discussed in Section 3. After an introduction of the research context and methodology presented in Section 4, Section 5 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 is more resilient than the latter. Finally, Section 6 summarizes the findings and highlights our key arguments, suggesting that adaptation and adaptability should not be understood separately in any cases. It is further argued that they are equally important to long-term regional economic evolution, and ought to be conceptualized as dialectical, dynamic, indicative dimensions of regional economic resilience.

2. The notion of regional economic resilience: yet 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 regarded as an ability of a local economic system to recover from shocks (Foster, 2007; Hill et al., 2008). This understanding, however, has been increasingly criticized. In a special issue on “The Regional Resilience” (Cambridge Journal of Regions, Economy, and Society, vol.3, 2010), 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-equipped concept (Pendall et al., 2010). And there is a tendency to simply use the term as a policy instrument or a development agenda. Despite a few of insightful con-

ceptualizations, the notion has suffered from fuzzy definitions and incoherent understandings.

In our reading, there are two main intertwined dimensions that have put the notion of regional economic resilience 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 with an aim to identify the shortcomings of the existing conceptualizations on regional 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 'bound 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) state, "resilience reflects particular agendas" (p.932). Thus, there is a high likelihood that the term will be replaced easily by some other terms, particularly when a crisis ends, or an entirely new context comes.

Many economic geographers have tried to decontextualize regional resilience and put it into a broader sense. It is defined as not only an ability to cope with one-off shocks or disturbances, but also 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 of long-term regional development.

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 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 of regional economic resilience, namely 'resistance', 'recovery', 'reorientation' and 'renewal'. He highlights the varieties of possibilities about the reactions of regions to recessionary shocks, and the important roles of both shock characteristics and economic structural factors in the processes. Although, as Martin 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 maintaining 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 regional economic resilience varies and adapts, along with the advancement of understanding on regional economies as on-going evolving, open-ended and complex systems. There is no coherently agreed meaning of regional resilience. The definition itself seems highly adaptable, which varies according to different contexts. 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 have heavily influenced by eco-

logical thinking, resulting in a trend that new related terminologies are increasingly adopted, while 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. As warned by Hassink (2010a), “we should be careful to take up another fashionable concept without first carefully scrutinizing the value of it in answering key questions of our subject.” (p.55).

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 ‘bound 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, without 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. That is, when a specific term or notion is used, the opposite one is much likely to be coupled with it. If without specific explanation, such dualism often gives us an 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.” (p.534). 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 vics versa. But, such trade-off idea is creating a clear-cut dualism that adaptation is in opposition to adaptability. In many cases, adaptation refers to short-term incremental changes within the old paths and structures, 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, the dualism thinking has become a key cause for conceptual fuzziness. In the literature, adaptation tends to be automatically linked to a low-level resilience, echoing with the notion of ‘resistance’ and ‘recovery’. While, adaptability often means high-level resilience related to ‘reorientation’ and ‘renewal’. Even more, many scholars 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. 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). Given this, some scholars have stressed that the future conceptualization on regional resilience should center on understanding the interactions and relationships between adaptation and adaptability (Pike et al, 2010; Boschma, 2014). Meanwhile, adaptation relating to coping with short run shocks should be regarded as important as adaptability for long-term economic evolution (Martin and Sunley, 2015).

However, so far, the dualistic thinking of adaptation and adaptability still plays a dominant role in understanding regional resilience. Such kind of 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 sticks 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 re-

lated...[when] they are internally related they can justifiably be said to be dialectical” (p.287). It gives a board hint that adaptation and adaptability are more or less inter-related by nature, and that they should be defined in a coherent and interactive setting. Thus, it is important, and also highly needed, to deconstruct the adaptation-adaptability dualism, and to define 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 was just about a responsive action or way of action. In our view, adaptation should be decontextualized, fitting to the character of long-term regional economic evolution with normative meanings. First, adaptation goes 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 determinate role. It confers an inherited characteristic seeking to maintain 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 processes and outcomes.

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 defined 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 positively adapt to environments by searching for alternative modes of doing things, rather than maintaining the (pre) existing functions and structures. Adaptability in some conditions can help the upgrading of adaptation.

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

Type (1): They against each other

Adaptability may not necessarily lead to structural change of a local economy. It is possible that regions achieve adaptability at a 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 largely fostered by local actors in response to external opportunities such as policy interventions or market dynamics, which are detached from the local existing economic structure. They may face problems once external environment change, and tend to survive by occupying local assets. This may lead to a lose-lose situation that adaptation and adaptability negatively against with each other. Although in this context adaptability may generate new developmental paths and industries, it is however short-sighted, and difficult to trigger regional structural 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. Per-

haps 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 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 (Boschma, 2014). 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. In such context, a local economy may diversify over time, but the core institutional base and its main functionality remain virtually unchanged. It can be expected that in a long run regional resilience will 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, the relationship that adaptation enables adaptability contributes to a higher potential of regional resilience. It entails that local actors involved in adaptation consciously harness resources to facilitate adaptability. In general, two main mechanisms of practices can be distinguished about this type of relationship. One is that adaptation enables adaptability in an endogenous way. The other is, to the contrary, that the former enables the latter in an exogenous way. The first mechanism involves constructive mobility from existing industrial assets to new realm. New industries or paths are, for instance, primarily built upon place-specific resources, legacies and networks. In other words, they are more likely to branch out of local existing industrial domains. Such adaptability has a strong potential towards regional industrial renewal (Neffke et al., 2011). In the second mechanism, however, adaptability may prove to depend on the ability of local actors to exploit and turn external opportunities into local stimuli for new industry formation. We thus think the endogenous way can make regions more resilient than regions undergoing the exogenous way. Because, compared to the latter, adaptation in the former is more locally embedded, gearing to structural dynamics. And at the same time adaptation itself can be cumulatively improved by adaptability. However, both mechanisms share a characteristic that adapta-

tion very much involves local institutional layering for the development of expected new industries, lacking efforts to change existing economic structures.

Type (4): Adaptability benefits adaptation

Within this relationship, adaptability benefits adaptation, but adaptation has limited impacts on adaptability. Adaptability may initially emerge from adaptation by one-off contingency. But, it may generate unexpected innovation and, in turn, lead to a path-breaking process that radically changes the whole system. For example, a technological breakthrough may occur in the course of adaptation, albeit not on purpose. Such occasional event can lead to a chain reaction that, even in a powerful way, break down old institutional bases, and reframe new industrial organizations and networks. Following this, adaptation itself can be upgraded to a new form, and regional resilience thus would become stronger than before. However, adaptability, in some 'emergent' circumstances, may only serve to adaptation. Adaptability might be a part of adaptation 'story', for example, if it is aimed to fix old problems, or if it is designed to protect inherited institutional architectures. In this sense, adaptability is more likely to last for a short term, which is not necessarily beneficial to regional economic resilience.

Type (5): They are mutually complementary

The last type stands for a benign relationship between adaptation and adaptability. That is, they are positively related and complementary each other. Some empirical studies have proven that adaptation and adaptability can be harmonized with a reciprocal relationship, which is conducive to industrial transformation and long-term regional resilience (Ibert and Schmit, 2014; Tomlison and Branston, 2014). In this relationship, local actors are aware of how to exploit existing assets for new uses, and to take advantage of multi-scalar environments to implement it. Moreover, they play a strategic role in engaging newly emerged elements and agencies into the existing dominant industries. In other words, adaptability not merely benefits from the existing adaptation process, but also has a potential to change the existing main functions of adaptation. It can be regarded as a co-evolution towards coherent regional restructuring, in which local old technologies, labor structures and institutions are gradually transformed, at a 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 form a healthy and sustainable regional

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. It not only differs from region to region, but also varies over time in a particular region, which shapes and is shaped by multi-actors and multi-scalar impact factors in broader social, economic and institutional, political environments (Hassink, 2010b).

3.2 Impact factors and determinants

The varieties of adaptation-adaptability relationships provide a useful perspective to measure regional resilience. But, to better understand it, we need to capture what impact factors and how they mold adaptation-adaptability relationships differently among different regions. A number of authors have sought to identify main determinants of adaptation and adaptability, despite by different perspectives. Evolutionary economic geographers argue that endogenous impact factors such as the connectedness of social agents, local firm characteristics ((un)related variety), and institutional structures should be at the core of impact factors (Simmie and Martin, 2010; Boschma, 2014). Others, however, adopt a geographical political economy approach, and 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 a result of mixed impact factors, including both economic-structural and political-institutional factors, characterized by both endogenous and exogenous dynamics. These factors can be path (place) dependent, but also can be context-sensitive and emergent. They are different in effectiveness and significance from region to region (Martin and Sunley, 2015).

There are 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 adapta-

tion 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 a short run, despite strong local advantages. Second, contextual factors refer to a current of changes and 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 thus extend their scope and vision accordingly for adaptability.

However, we are not suggesting that the two major impact factors are in isolation. Rather, and indeed, they are not only horizontally entwined, but also are vertically related across space in a logical way (Figure 1). More importantly, these factors do not necessarily give a direct impact on adaptation and adaptability, but always, through influencing the actions of local agents. 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. We argue that local agents play a crucial role in dealing with the interplay between structural and contextual factors at both local and trans-local scales. The ways in which adaptation relates adaptability are strongly linked to how local actors comprehensively scan a mixed contextual environment and to the strategic action they carry out. Therefore, we surmise that regional economic resilience is about local agency of consistently responding to and appropriately adapting to multi-scalar factors.

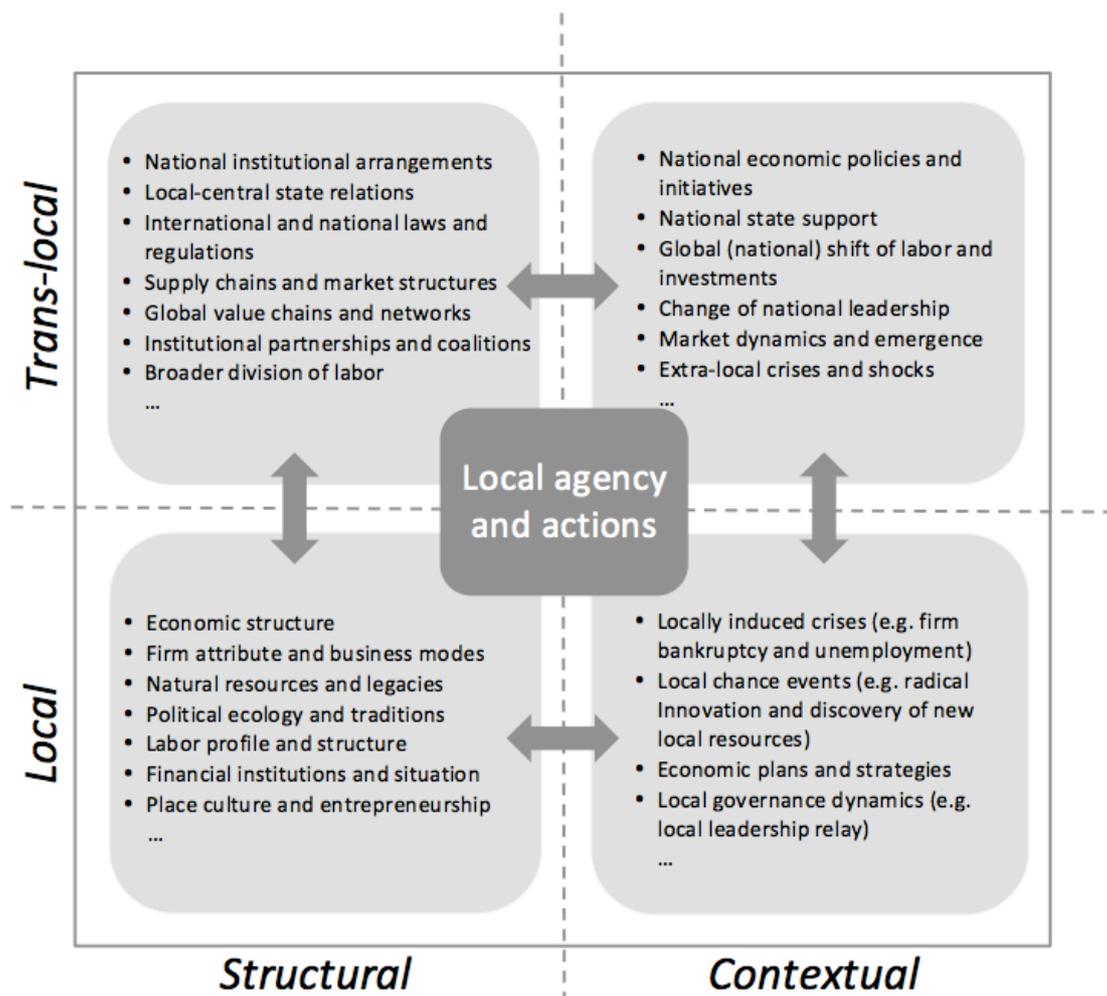


Figure 1. Some impact factors of regional economic resilience
 (Source: adapted from Martin and Sunley, 2015)

Of all impact factors of regional resilience, the determinants are the most important ones that make a region's adaptation-adaptability relationship specific. They are, from an agency perspective, the critical factors related to the interests of local individuals and groups (e.g. entrepreneurs, government officials and stakeholders) (Bristow and Healy, 2014). Determinants vary from region to region, since local actors weigh the importance of impact factors differently. A national 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 conditions. Others may be less enthusiastic about it, and rather stick to old growth paths, because local actors might be more interested in or be incentivized by other factors. Our conceptual framework, therefore, highlights the role of local agency in constituting par-

ticular adaptation and adaptability relationships explaining uneven resilience. It also recognizes that a certain form of relationship between adaptation and adaptability is molded by a co-evolution process of local actions and multi-scalar impact factors.

However, so far, existing accounts on the impact factors and determinants of regional resilience remain at the conceptual level, lacking in-depth empirical evidence. More empirical work is needed to understand how regions deal with both structural and contextual impact factors in a long run, what determinants they shape micro-level processes and behaviors for economic dynamics, as well as how different types of adaptation-adaptability relationships lead to uneven regional resilience. To address these questions, this conceptual framework is operationalized to analyze and compare the adaptation and adaptability of two coal-mining regions in China. The comparative analysis will therefore contribute to our understanding about the processes, mechanisms and determinants of uneven regional economic resilience.

4. Context and methodology

In order to fit to the conceptual framework of regional resilience 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 regional economies have been strongly denominated by state owned enterprises (SOEs) and highly specialized in coal-mining for decades. Moreover, in 2000, both began to suffer from the 'slow burn' crisis of coal depletion, and recently were officially defined as 'Resource-exhausted Regions' by the central state (State Council, 2013). This means that they share similar adaptation agenda of coping with chronic crisis. Secondly, besides the similar adaptation, adaptability can be found in both regions, particularly in terms of developing new industries. Zaozhuang recently has diversified its local economy by boosting the coal-chemical industry and tourism sectors (Hu, 2015, in press). In the similar vein, Fuxin seem to have locked out of the coal-based mono-structure economy, embanking on to several new trajectories, such as the agriculture and food industry (Wang et al., 2014), as well as the wind power industry (Hu, 2014). Thirdly, despite the co-existence of adaptation and adaptability, significant regional gaps remain in terms of the economic growth rate and performance. Figure 3 shows how the disparities in the

employment capacity of the two regions have significantly increased since 1985. In 1985, the two 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 and privatization, the economic impetus in Zaozhuang presented much stronger than it in Fuxin. The 1998 radical reforms on SOEs as a shock negatively impacted more severely on Fuxin than it did on Zaozhuang. In particular, Zaozhuang's economy grows rapidly since 2000, and its employment was reached as more than twice as much it was in Fuxin in 2013. Fuxin, however, seems trapped in a low-speed development mode, lacking robust and sustained dynamisms.

Putting together, it raises several concrete questions: despite new path creation in both regions, why is Zaozhuang more capable of reviving its economy than Fuxin? How do regional actors actually do in the adaptation confronting the local coal depletion? Do they have different types of adaptation-adaptability relationships? If so, how do adaptation and adaptability in the two regions interact with each other? And what are the determinants that affect the ways in which adaptation and adaptation are related? In sum, how to understand differences in the economic resilience of the two regions?

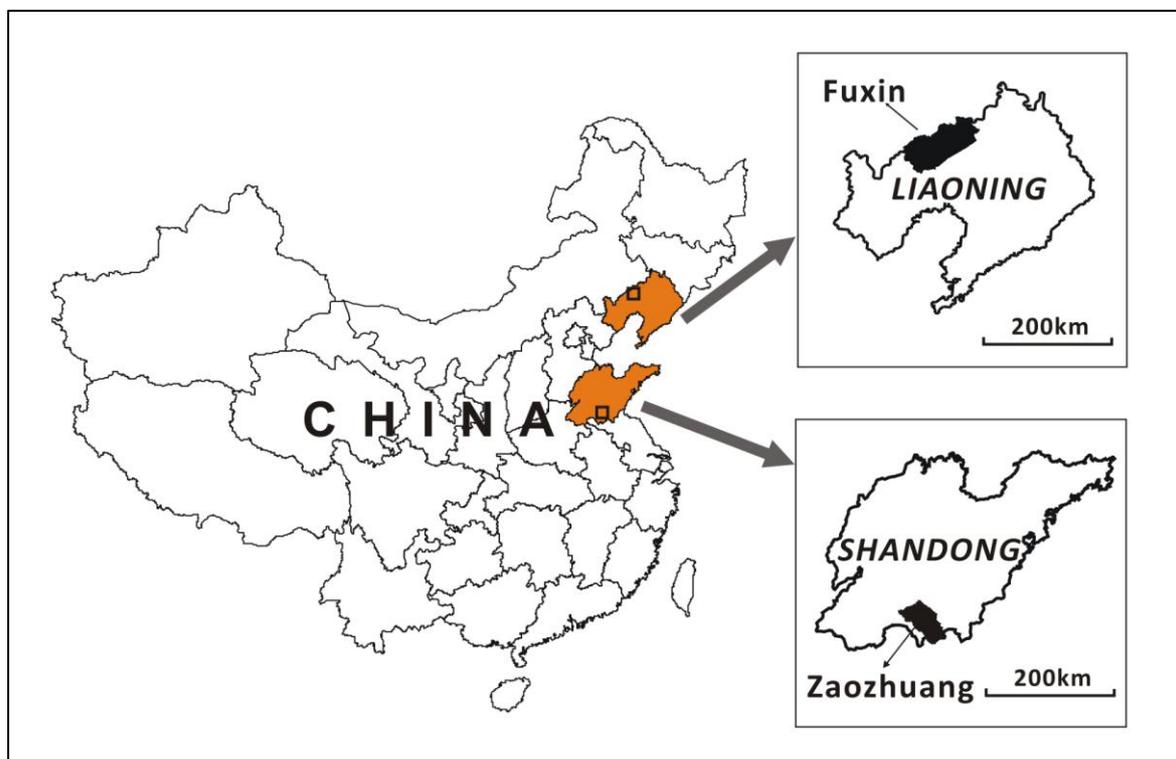


Figure 2. The geographical location of Zaozhuang and Fuxin

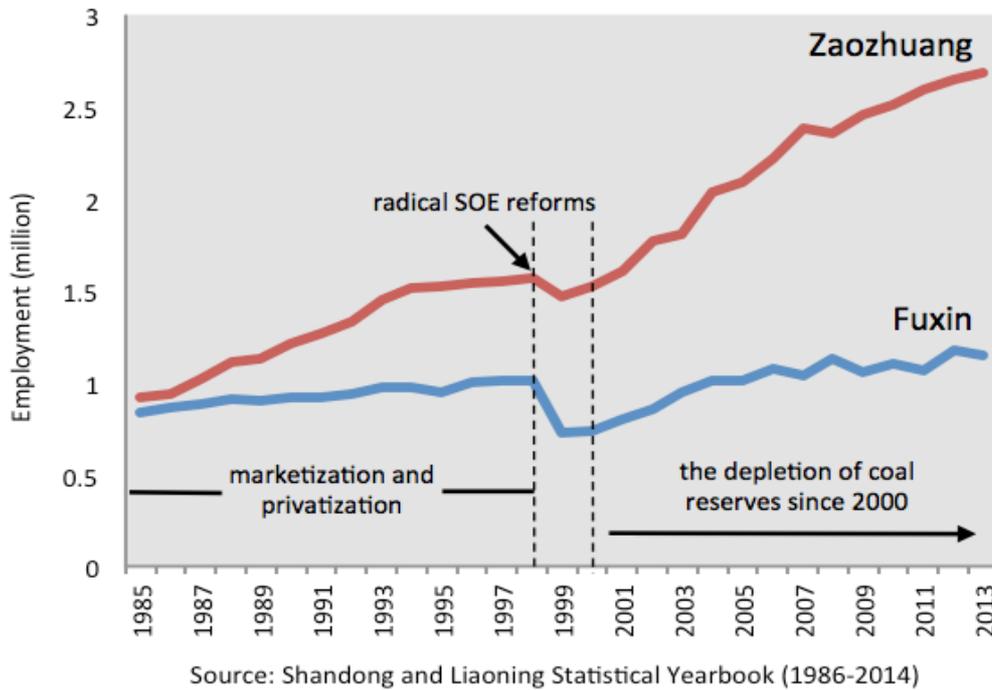


Figure 3. Employment developmental paths in Fuxin and Zaozhuang, 1985-2013

The empirical part of the article therefore aims to comparatively examine the adaptation and adaptability of the two regions since 2000. In doing so, it mainly focuses on the interplays between the old mining industry and newly emerged industries in each region. The tourism industry in Zaozhuang and the agriculture & food industry and the wind power industry in Fuxin were selected as main research objects related to adaptability. The empirical findings are based on two in-depth fieldworks in 2013 and 2014, with a total time length of five months. Our research method is based on semi-structured interviews and qualitative in nature.

Being research participants in the ‘National Transformation Planning Programme on Resource-exhausted Cities (2013-2020)’, the authors were able to gain many conveniences to conduct in-depth interviews. At the firm level, a total of 14 interviews (11 coal SOEs and three tourism SOEs) were conducted with 22 entrepreneurs in Zaozhuang, while 20 interviews (including two coal SOEs, 10 wind power SOEs developers and eight agriculture/food companies) with 26 entrepreneurs in Fuxin (some of wind power companies in Shenyang). Moreover, 36 municipal government officials were interviewed, involving nine government departments in Zaozhuang and seven in Fuxin were involved. For the

purpose of comparison, several structured questions were asked in the first stage of interviews, of which the core interest was the interplay between the coal industry and the newly emerged industries. In subsequent state of the interviews, questions were more open, and strongly oriented to the processes of how firms and institutions adapted since 2000. Regarding to the interviews with local officials, questions were different from those for firms. Acknowledged the strong role of the Chinese local state, our questions focused on what and how polices involved in the adaptation (on the coal path) and adaptability (on new growth paths), as well as what local officials actually did, particularly how they coordinated with other multi-scalar stakeholders for local industrial dynamics. In addition, a variety of secondary data such as statistical yearbooks, governmental reports, policy documents and newspapers were collected, in order to draw general histories and socio-economic images of the two regions. All the data we acquired was analyzed in line with the conceptual framework, in which the interactive processes of adaptation and adaptability and impact factors behind were particularly focused. Based on these efforts, the empirical studies can be assumed to be useful to shed important light on the geographies of regional economic resilience.

5. Empirical analysis: two Chinese mining regions in comparison

5.1 Zaozhuang

The Zaozhuang municipal region very early became a typical ‘meicheng’ (coal city), due to the abundance of coal resources and the birthplace of China’s first domestic coal company since 1878. Over decades the mining industry significantly contributed to local economic and demographic growth. When the market reform started in the 1980s, Zaozhuang’s SOE-dominated economy, however, began to experience a long-lasting low-speed development. In 1998, it was severely hit by a top-down radical ownership reform program on almost all levels of SOEs. The monopoly SOE – Zaozhuang Coal Mine (ZCM), which was owned by the Shandong Provincial Government, was forced to privatize its SOE system. This caused hundreds of thousands of job losses. The sudden economic downturn raised a priority agenda for local actors, particularly for local officials, to revitalize its economy and secure social stability. Surprisingly, only within two years, Zaozhuang quickly recovered from the reform shock (See Figure 3). Such quick recovery was

strongly credited to the local government strategy fostering new coal SOEs. A total of eight municipal/county-level SOEs were established between 1999 and 2000 in order to recruit lay-off miners from ZCM. This local strategy – albeit against the national champion of privatization – as the most pragmatic option, avoided the region from possible economic decline. More importantly, as many interviewees suggested, that in doing so, namely running locally owned ‘businesses’, the local state was able to gain more independent power to influence the local economy for future’s adaptation.

Certainly, this government strategy was not at loss of ZCM’s profits, as ZCM still had over 90% of coal reserves in the region. Since the newly established local SOEs accessed only 10% of coal reserves, to the municipal state, the Zaozhuang region de facto suffered from the depletion of coal resources. In spite of that, the regional adaptation continued to follow a path-dependent logic, in which local officials were continually keen on further exploiting the locally limited coal resources. Until 2004, some local SOEs started to confront the ‘resource crisis’, which forced them to think of new options for survive. However, this potential adaptability was eroded by a series of national policies deregulating cross-regional/border mergers and acquisitions (M&As) of coal SOEs since 2005 (Hu, 2015, in press). Given the critical local needs on coal resources, Zaozhuang actively implemented these national policies, which has led to a new round of adaptation characterized by old path spatial extension (Hu, 2015, in press). As the general manager of one local coal SOE put:

“The national policy temporarily eliminated our anxiety about the coal exhaustion, but it also, to a large extent, demotivated coal entrepreneurs to try new things. With the increase of coal prices between 2005 and 2008, there was no reason for us to do something else. We only focused on the mining business which, at that time, was highly profitable.” (Interview, 2013, translated from Chinese)

The fast growth of GDP and employment between 2000 and 2007 can be attributed to the strategic action of the local state in timely response to national policies. However, such mode of adaptation was challenged when it came to a macro slump in the coal market affected by the 2008 global crisis. At the same time, a new mayor came to power and viewed the existing adaptation mode as unsustainable that needed to be changed. By using formal and informal tactics and power, the mayor aligned the majority of local

officials and SOE entrepreneurs to change ‘the old way of thinking’, through fostering green and sustainable sectors (Interview with a senior official in the municipal state, 2013). Based on that, a state-led industrial strategy in 2008, namely Cultivating Cultural-Tourism Industries, was launched. This strategy did not come from scratch. Rather, it was deliberately designed to fulfill local specific conditions, and simultaneously to echo to national policy directions. As one senior official in the Municipal State Office put:

“Tourism, in fact, contributes less to GDP, compared manufacturing, but it can increase employment level, and improve regional image for attracting investment. More importantly, developing tourism fits well to the national policies supporting ‘Red Tourism.’” (Interview, 2013, translated from Chinese)

Despite the new strategy, the local state lacked initial funds to implement it. Economically dominated by the provincial company ZCM, the municipal state had a tough financial position. Local officials were only able to mobilize resources from its own controlled (municipal and country-level) coal SOEs. To do so the new mayor exercised coercive power to engage local coal SOEs into the tourism industry, but, simultaneously, fully supported them to conduct cross-regional M&As. By doing that, a win-win situation was created that the new industry formation is not at expense of the old mining industry. Consequently, in 2009 a huge tourism theme park – the ‘Taierzhuang Ancient Town’ was established. And every local coal SOE was co-opted to finance tourism related businesses, such as investing scenic spots or hotels (Interviews with several local coal SOEs, 2013). Followed by a series of state-led programmes on local labor training and national-wide market promotion, the revenue of the tourism industry nearly five-folded from 563.6 in 2007 to 2, 559.4 million \$ in 2013 (ZSB, 2014). It is reported that the whole industry created over 100, 000 new jobs since 2008, and the Zaozhuang region as coal region, surprisingly, became one of the most attractive tourism areas in China (China Daily, 2012).

Since 2012, the coal industry began to benefit from the tourism boom. The emerging industry eased the social burden on local coal SOEs. A considerable number of laid-off workers from the coal industry made their new jobs in service sectors. With the improvement of regional images, the tourism industry, as well as its stakeholders – local coal SOEs – started to benefit from the influx of inward investment. The general manag-

er of one interviewed coal SOE put an example, “because of the tourism, many related firms, such as real estates, hotels and transportation, have cooperated with us, and now we are not a typical coal firm anymore, as our businesses are quiet diverse” (Interview, 2013, translated from Chinese). With the growth of local coal SOEs, the local state can, therefore, continue to draw capital and resources from the coal industry to support the new industry. In this sense, Zaozhuang strategically struck a balance between new path creation and old path expansion, meaning that adaptation and adaptability are not harmful to each other, but are intertwined each other with mutual benefits.

5.2 Fuxin

The Fuxin economy was strongly characterized by the mono-structural socialist economy, solely based on coal mining, and organizationally monopolized by one single central SOE – Fuxin Coal Mine (FCM) – during the Mao’s era. Given this, Fuxin suffered from economic structural vulnerability and failed to grow in the face of the market reforms after the opening up. In the 1990s, its annual GDP growth rate was only 1.1%, significantly lagging behind the national 7.2% as a whole (FDRC, 2012). The 1998 SOE reform therefore negatively impacted much worse on Fuxin than Zaozhuang, caused over 50% employment loss of all residents in 1999 and many severe social unrest. Meanwhile, the verge of local coal exhaustion aggravated the already bad situation, which even raised anxieties among many national-state leaders. In this context, to re-employ laid-off workers and to maintain their necessary livelihood became not only the first priority task for the region, but also the bounden duty for the central state. Accordingly, Fuxin initiated an emergent strategy, aiming at fostering agriculture and food sectors. It is partly because of Fuxin’s rich endowment of both arable land and grassland resources. Partly because of relatively low skill barriers of these labor-intensive industries that could effectively absorb the unemployed coal workers. Both local and national state were involved into the implementation of this strategy. The former provided preferential policies such as tax-free allowance, cheap land prices, and free labor training programs. The latter used top-down political influences, steering domestic leading food companies such as Shuanghui and Yili to invest in Fuxin. In a three-year time of period since 2000, about 50 agriculture-related firms set up their factories in Fuxin, and a total of 41, 500 miners were systematically re-

employed under this strategy (Interview with Fuxin Development and Reform Commission, 2014).

However, this new industry proved too difficult to be sustainable. The relax of cross-regional M&As on coal resources since 2005, as we mentioned before, has triggered an opportunity for (former) mining stakeholders to re-embark onto the old mining path. For instance, FCM acquired a huge open cast mine plant in Inner Mongolia, with an estimated annual coal output of 31 million-ton. This, consequently, sparked an unprecedented return of massive former miners from the agriculture and food industry, back into the coal industry. Because mining basically offered more incomes than farming, it also had particular occupational and social meanings to miners. Almost all interviewed miners who previously worked in farming/food factories emphasized, that “mining embodies our unique skills and values” and “working in SOEs stands for stable career and high social status”, which “do not exist in agriculture and food industries” (Interview, 2014, translated from Chinese). The newly created industry, soon, ended up in a dramatic decline, and contributed little to the local economy. From this point, this adaptability generated a temporary effect merely for tackling emergent social problems. It, therefore, failed to induce a sustainable process towards economic structural change.

The path continuity on mining saved the Fuxin regional economy from collapse. But the coal-based specialization continued, presenting a severe lack of momentum to diversify its economy. This, again, raised the worries of the central state. These worries stem from the close local-central relationship (Hu, 2014), but also strongly reflect the national policy emphasis on ‘structural transformation’ of northeast old industrial regions since 2003. In order to pave the way for its future transformation, the central state, aligned with China’s largest power SOE developer Huaneng, planned a huge wind power project there in 2005 (NEB, 2005). This top-down decision triggered a quick corresponding reform in Fuxin. New government agencies and policy initiatives serving to wind power were created. Besides the national preferential subsidies, Fuxin quickly became a hot spot in China for wind power investors. An unprecedented firm agglomeration occurred, that all China’s centrally owned power developers, together with leading wind equipment manufactures (e.g. Goldwind), operated their businesses in Fuxin (Interview, 2014). Within a few years, the Fuxin region has significantly transformed its source structure of electricity production, from nearly 100% reliance on coal before 2005 to about 30% from wind in

2012 (FDRC, 2012).

Thought a new development path has emerged, evidence shows that it seems to be at a high cost of environment and land resources. Large-scale wind farms were built, in an environment unfriendly way, by which a lot of farmlands and forests were destroyed. On the one hand, farmers are more and more reluctant to sell off their lands to wind power companies because of low compensations. On the other hand, the rising contestations between national environmental regulations and local enthusiasm on wind power have played a role in slowing down the development process. As a senior manager in one interviewed wind power developer addressed:

“The tightening of forestry protection regulations are making us in a harsh situation. Every step we move needs to be authorized by upper authorities, we need to carefully ‘dance’ in-between National Energy Administration and State Forestry Administration” (Interview, 2014, translated from Chinese)

More importantly, the new path gives little impact on the dominating coal industry. The wind power industry is vertically controlled and operated by central SOEs, and its market is barely local-based. The localization of wind power is limited due to a lack of wind-related local skills and technologies. Detached from both local economic and governance system, the new path is, to a large extent, running in danger of being a ‘cathedral in the desert’ (Grabher, 1995). As a policy-driven and central-state-sponsored industry, it is particularly vulnerable to policy changes. It would be “gone with the [policy] wind”, as one municipal senior official critically pointed, and “would be a waste of local public resources and undermine our own local economic order” (Interview, 2014, translated from Chinese). Nevertheless, local officials are fully supportive to this industry with two main reasons: First and foremost, it does not come into conflict of interests with the development of the old coal path. Secondly, fostering wind power echoes to the national agenda emphasizing ‘green economy’. It, indeed, conveys a political metaphor that can help to construct a closer local-central relationship for future policy benefits. This is evidenced by the vivid articulations of the Director of Fuxin New Energy Bureau:

“The coal industry is our pillar industry, which contributes over 70% of GDP growth, while wind power is like a dessert. Despite little impact on the local economy, it [wind power] means a lot. It is a clue originally from Beijing, we have to do it and turn it into a success. Only by doing so the

central state can trust us [the local state] and we could enjoy more national preferential policies in the future.” (Interview, 2014, translated from Chinese)

5.3 why Zaozhuang is more resilient than Fuxin

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, despite local coal depletion. This can be proven by the convergent old path cross-spatial extension, as a result of quick local response to the national policies since 2005. Secondly, however, the process and function of adaptation in the two regions are highly different. In Zaozhuang, adaptation unfolds in an endogenous and bottom-up way. That is, the ways in which firms and institutions adapt to changing contexts are predominately influenced and operated by local actors. While, Fuxin’s adaptation involves a combined force of the local and national state. The central state, in particular, has taken a dominating and leading part in local decision-making and new industry selection. Thirdly and related to the above two points, Zaozhuang’s adaptation, directly mediated by local key officials, supports the emergence of adaptability. Adaptation here is a source of adaptability, and the other way around, adaptability, for a long-term view, benefits for adaptation, having a potential to fundamentally transform the existing trajectories or patterns of adaptation. However, in Fuxin, new paths (agriculture/food industries) were created not aiming at structural change and future development. They are merely as a remedy, resulted from a fast policy prescription, to rescue the unemployment problems caused by the old path (coal-mining). Similarly, the wind power industry can be seen as a product of national ‘Great-Leap-Forward-Like’ contextual policy on renewable industries. The adaptability is mainly enabled by exogenous forces, for which the new industry runs parallel to the old path, and is detached from the local industrial system. In this sense, Fuxin’s adaptability is vulnerable and unsustainable. It can, indeed, be regarded as a strategy of adaptation.

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

	Adaptation	Adaptability	Relationship
Zaozhuang	Strong path dependence, old path continuity and extension	Endogenously emerged, benefits adaptation, towards 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)

The second research question in the paper was to work out impact factors to explain the differences found: why is Zaozhuang economically resilience than Fuxin? Derived from the conceptual framework in the paper, four interlinked types of impact factors were listed, that is local contextual, structural, trans-local contextual, trans-local structural factors. On the basis of empirical studies, we are able to identify what kind of impact factors shaping out the differentiated resilience of regions (Table 1). The empirical results confirm our argument 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 have not 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 FCM, the well-preserved ‘top-down’ institutions, and even ‘centrally-planned’ ideological mindsets of local officials. Such institutionally constrained local agency prevents local state entrepreneurship and governance experimentalism to

emerge. It however 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 domains. It detaches from the existing adaptation on coal mining, which is not only not meant to, but also not able to change it.

Differed from Fuxin, Zaozhuang's local actors played a key role in affecting adaptation and adaptability. Given available coal resources endowed by the local state, local agency is stronger than Fuxin, with its endogenously organized adaptation. Such strong local agency is underpinned by, and embedded in 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 self-supporting and self-fixing when it comes to crisis and problems. Local officials and firm actors are aware of their 'positionality' within the macro political nexuses. Such trans-local structured positionality, combined with the specificity of local impact factors, constitute the most 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 the local new leadership and the positional advantages of local-central politics. By enjoying the loose institutional structure, new government leaders were able to exercise innovative measures to strategically graft the new industry onto the old coal-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 utilized and mobilized endogenously to support new path development. Meanwhile, new paths are conducive to the progress 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, underpinned by long-term centrally planned economy in Fuxin, has led to strong national policy interventions. 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 such situation, adaptation and adaptability are tended to be mutually exclusive with each other, running in a danger of conflicts that might undermine the 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 process 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 state, at both the central and local level, is a highly critical factor in shaping 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). Local actors are potentially more entrepreneurial, and adaptability is more likely to be fostered in a more endogenous and inclusive way. We thus argue that the ways in which adaptation and adaptability interact is contingent upon how local officials read and interpret particular positionality of local-central relations, as well as on how they play a role in combining the local political economy with 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 can provide more potentials for path plasticity.

The geographical heterogeneities of local-central politics commonly appear over China, but not 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. Moreover, we highlight that 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 different to be changed. It would influence a region's scope and potential of development for a long term. Although we recognize that local contextual factors, among others, play a role in affecting a region's resilience, we argue that in an authoritarian context macro, structured institutional impact factors strongly matter 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 and beyond.

6. Conclusions

This article has sought to develop a more comprehensive definition and understanding of long-term regional economic resilience. We argue that in the conceptualization of regional resilience there is a need to avoid dualism thinking and adopt an ontologically coherent evolutionary perspective. In doing so, a new conceptual framework for explaining uneven regional resilience has been 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 interest within a regional economy. Adaptability is a result, and also an integral part of adaptation process. It can refer to path creation for temporary purpose serving to old structures. It also can refer to ability towards 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 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 into two case studies, namely two Chinese coal-mining regions both facing 'slow-burn' resource crisis. Based on an in-depth comparison, what we found was that over the past 15-year period, the Zaozhuang region is potentially more resilient. As its adaptability is derived from local endogenous adaptation process, and is oriented to benefit the existing form of adaptation. Zaozhuang's new paths were not created for merely coping with crisis and shocks. They were however purposively designed to embed into the local industrial system, and thus had potentials to foster endogenous structural change. We conclude that due to the mutually complementary relationship between adaptation and adaptability, the Zaozhuang economy may be able to transform itself.

The resilience of Fuxin, however, has been quite different and far less positive. The Fuxin economy seems to have very much depended on the top-down policy interventions. Despite newly emerged industries, they were planned, owned and managed by exogenous institutions. Such kind of adaptability was arguably detached from the adaptation process, which had limited impacts on the coal-based economy. Moreover, the wind power industry, for example, as a result of macro industrial deployment by the central state seems fragile. It might confront problems when national policies change. In this sense, in Fuxin adaptation and adaptability do not only run in parallel, but might be in danger of leading to a mutually harmful relationship. It is expected that for a long term perspective Fuxin's restructuring would be much tougher, painful and slower than Zaozhuang.

Of course, the uneven resilience of the two regional economies is not simply about their differentiated relationships between adaptation and adaptability. In the Chinese context, it is indeed more about different agencies of local officials according to multi-scalar political economic changing environment. A politically distant relation between the locality and the central state might be an asset for local institutionalization and place-based development. However, a politically close relation may potentially limit the ability and vision of local actors for endogenous institutional reform and market dynamics (Huang, 1996). Regional economies might be trapped in an exogenous model of evolution heavily

at the mercy of top-down policies, invest investment and so on.

We argue that the historically conditioned political distance between the localities and the central state is essential for regional development in China. The geographical differentiation of local-central politics should be at the core that needs to be future explored, when analyzing and explaining uneven regional economic evolution in China. Our comparative study confirms the argument that in China's OIAs the adaptation strategies and practices of firms and industries are not merely affected by specific local socio-economic contexts, but are largely shaped by the historically embedded central-local politics (Hu and Lin, 2013).

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 sustain for a long-term period of time. Therefore new path creations should not always be regarded as a 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 systems. In our view, high-quality regional resilience refers to a complementary, symbiotic, endogenous relationship between adaptation and adaptability. Regional resilience is not merely about ability and performance of overcoming shocks. It is rather about long-term endogenous (or endogenously and exogenously well balanced) quality, transformability and sustainability of regional evolution and development.

To end up, this research generates several policy advices regarding to the restructuring of OIAs. Differed from other types of regions, OIAs bear much heavier historical burdens, often following a path-dependent and incremental nature of 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). An EEG perspective could be useful for national policy-makers to refine their existing preferential policies on mature regional economies. Future policies should focus more on how to cultivate endogenous ability of firms and industries to develop place-specific strategies, rather than to directly transplant new 'planned' industries/paths. For instance, policies do not neces-

sarily have to develop a completely new economic make-up in OIAs, but may be able to remain competitive drawing on existing assets, institutions and competencies (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 needed, to make sure that new paths are not only related to, but also beneficial to old paths and structures.

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9 Conclusions and Discussions

As the last chapter of the thesis, Chapter 9 concludes the whole book. Chapter 9.1 systematically summarizes the key findings of the study. The main aim of Chapter 9.1 is, drawing upon the empirical findings, to try to answer the research questions posed in Chapter 1.2. Chapter 9.2 addresses theoretical contributions of this study to EG and related fields. The following Chapter 9.3 engages with a discussion on policy implications for the long-term evolution and development of OIAs in China and beyond. Finally, Chapter 9.4 suggests some research questions and potential avenues for future research.

9.1 Key findings of the study

Throughout the whole book the core aim is to scrutinize the geographies of adaptation and adaptability of OIAs in a Chinese context. Besides the two general questions posed in Chapter 2.1, I continually asked myself a two-dimensional question throughout the whole PhD study: that is, on the one hand, to what extent and how can Chinese-specific stories be scientifically explained, by using appropriate modern EG concepts/approaches? On the other hand, what are the evolutionary characteristics of Chinese OIAs that differ from Western OIAs?

Regarding to the first dimension, Chapter 3 and 4 provided two in-depth reviews of literature on the topic. Chapter 3 outlined how scholars have dealt with the restructuring of OIAs in the West based on a variety of concepts, ranging from evolutionary to relational and institutional perspectives. This chapter highlights the complexity of OIA evolution, suggesting that there is a critical need of adopting a multi-disciplinary and ‘cross-fertilization’ method in doing research on this topic.

Chapter 4 took ‘national contexts’ seriously. It comparatively examined the characteristics of the adaptation and adaptability of OIAs between China and West Europe. The literature review played an important role in helping me to preliminarily identify the research focuses and objects. It particularly helped me to pay attention to the role of the state, power relations and the embedded actions of state leaders and their leadership in my empirical studies.

I have to emphasize that doing any kind of research on China's OIAs should not neglect the important role of the state. If going deeper into this direction, the role of local officials, particularly state leaders, is the key to systematically understand how and why industries evolve through time in China's OIAs. This point has been empirically highlighted in the Chinese-speaking literature (Chapter 4.3), albeit theoretically under-explored. The empirical part, which refers to four chapters (Chapter 5, 6, 7 and 8), not only confirmed this point, but, furthermore, explored this role in a systematic way. Particularly, Chapter 7 proposed the notion of *local state leadership* for the Chinese context, which helped to articulate how a new industry was developed in Zaozhuang through which local political leaders enacted a variety of leadership styles for industrial renewal.

More importantly, in Chapter 3 and 4, it has been shown that some EEG concepts (such as lock-ins, path dependence and path plasticity) and the IEG approach (the role of institutions, power, politics and policies) are powerful to explain Chinese experiences. For instance, history can partially explain why China's OIAs are not economically as dynamic as coastal regions. Because the former has a longer history of a SOE-based and centrally planned economy, while the latter much earlier enjoyed neoliberalism policies toward the market economy. In addition, in China, the national state has been playing a certain role in supervising, planning and directing the development paths of OIAs. Chapter 4 presented that every macro 'turning point' of evolution for China's OIAs is more or less associated with the change of national leadership and its subsequent policy agendas (Chapter 4.2). Therefore, how local actors respond to national policies is a key and yet under-explored question. This led me to think of the role of local-central relations in affecting the adaptation and adaptability of OIAs in China.

The second dimension of the question can be answered by the empirical part of the thesis (Chapter 5, 6, 7 and 8). The answers for this dimension are indeed related to the two research questions posed in Chapter 2.1. In the following, given the empirical analyses, I highlight the key findings in response to the two main questions. What I want to say is that, the answers are more as a sort of complementary 'knowledge' derived from Chinese experiences. Thus they may not be universally acceptable and applicable. But, the answers can give a new angle to better understand some fundamental questions in EG.

RQ 1: *How do OIAs evolve and adapt with crises/challenges, and to what extent are they able to change old industries and create new ones?*

First of all, local actors in China's OIAs tend to regard crises/challenges as context inputs. In Chinese philosophy, for instance, crisis (危机) is a neutral term. It refers to a mixture context with dangers (危) and opportunities (机). Therefore, the question of how local economies adapt to crises, in a Chinese context, is firstly about the question of how local actors read and interpret changing contexts. For example, in Fuxin, local key actors viewed the crisis of the local coal exhaustion as a danger or a problem. All strategies and actions were oriented to fix it, but without awareness to see the crisis as a 'chance' for change (see details in Chapter 6). On the contrary, as presented in Chapter 7, local actors in Zaozhuang not only interpreted the crisis as a 'starting point' for industrial diversification, but also positively contextualized it as an advantage into new policy strategies.

Of course, changing contexts, such as natural crises, market changes, policy and political dynamics (as I defined them as *contextual* factors in Chapter 8.3) are part of impact factors affecting the ways and processes of OIAs for adaptation (also see Chapter 5 and 6). Besides the contextual contexts, *structural* factors play a fundamental role in the adaptability and adaptation of Chinese OIAs.

I found out that the '*positionality*' of an OIA in a specific and history-conditioned local-central relation strongly affects the motivation of local actors. Chinese local officials and SOE leaders are not only embedded in local institutional contexts, but also, to a large extent, are affected and coordinated by top-down political and policy forces. This can be exemplified by the analyses in Chapter 6 and 8. It has shown that local stakeholders in both regions shared a strong awareness of the political relationship between the central state and the locality. They knew very well of what they could do, what they could not do, according to the macro institutional structures. For instance, since Fuxin's economy for a long run has been predominated by upper governments, there is a recognized institution that the power scope for the local state is limited. Such institution is well accepted by local officials, allowing them only to depend on the top-down policy interventions when it comes to crises (Chapter 6). The close local-central relation between Beijing and Fuxin, which is highlighted in Chapter 8, basically undermines the capacity and creativity of local stakeholders to foster industrial change. This relation only put them in

a narrow position that they tended to welcome and implement all sorts of national policy actions. There is thus a lack of concern among Fuxin's actors about whether national policies were suitable to local-specific conditions (see Chapter 8).

Secondly, in general, China's OIAs are more likely to evolve in a cumulative process. The concept of path dependence can partially explain the path continuity of the coal-mining industry in the case regions. Basically, due to the coal-based structure of China's energy production and consumption, the industry will continually keep growing. The deregulation of cross-regional mergers and acquisitions (M&As) for coal SOEs well manifests the robustness of this industry. From Chapter 5 to Chapter 8, I found that the coal industry in both case regions followed a strong path-dependent way of development. Although new growth industries emerged, they were, indeed, strategically facilitated without harming the coal industry. The empirical evidence suggests that China's OIAs are not in a hurry to radically transform their economies. Simply because the energy-based economic structures are not, and will not be, meant to be completely changed due to multi-scalar and structural factors. It is expected that in the future many China's OIAs may diversify over time, but the mining industry, and other energy industries, will remain growing, and will last for a long-time period.

In terms of new path creation, we observed that no new industry is created from scratch in both case regions. Either (pre-) existing industrial legacies and assets or uncommitted local resources are more or less exploited and utilized to support new path creation. For instance, Chapter 5 articulated that the coal-chemical industry in Zaozhuang was initially built upon the pre-existing production base of fertilizer. Likewise, the tourism industry in Zaozhuang was selected not merely because of the new mayor implementing the national policies of developing '*Red Tourism*' locally. It is also because of the rich historical tourism-related assets in the region (Chapter 7). Even the wind power industry in Fuxin, which seemed to be detached from the local industrial system, was settled due basically to the rich local wind resources. Therefore, it is concluded that China's OIAs are more likely to evolve by drawing upon pre-existing assets. I argue that no matter how new paths are fostered (in an endogenously or exogenously way), place-based history often sets a scope or provide initial conditions for new paths to emerge.

Thirdly, I argue that the adaptability of OIAs in China is, basically, about the ability of the

local government and its constitutive officials to foster industrial change. There are several positive impact factors identified in the thesis that enabled regional adaptability: 1). As shown in Chapter 5, 7 and 8, the replacement of local state leadership may result in a high likelihood of local institutionalization for new industry formation. Moreover, Chapter 7 stated that ‘airborne cadres’, compared to other types of officials, are incentivized by upper authorities to ‘make changes’ in new localities. This means that OIAs with ‘airborne cadres’ might have a higher potential of adaptability than OIAs with ‘localized cadres’. 2). Adaptability is contingent on the ability of local state actors to mobilize multi-scalar resources, and to timely and strategically link local conditions to macro national new policy agendas. In other words, adaptability in China’s OIAs is very much related to the sensitivity and resourcefulness of local officials (as mainly addressed in Chapter 7).

However, there are also some negative factors that make local officials both cognitively and behaviorally constrained, when it comes to high-quality and long-term adaptability. Chapter 5, for instance, clearly demonstrated that the Chinese hierarchical SOE ranking system in OIAs – namely the co-existence of SOEs with different ownership in one region – gave rise to the incoherent form of local institutional structure. This incoherence thus led to a situation of inner-regional power segmentation and conflicts. And it prevented local officials to fully and efficiently manage the whole local economic system. All economic governances of the local state must make sure that there would be no harm to the vested interests of higher-hierarchy institutional bodies in the region.

In a deeper sense, both Chapter 6 and 8 pointed that the long run centrally planned history cumulatively contributed to a close local-central relationship between Fuxin and Beijing. Fuxin’s local actors were politically and historically constrained by such rigidly structured relationship. With continued top-down national policy interventions in Fuxin, many local officials were pressured to be conservative and act with the utmost care. In this sense, even if there will be a new and innovative state leader coming into the power, Fuxin would still confront huge difficulties to transform its economy.

RQ 2: why do OIAs adapt differently in terms of process, mechanism and effectiveness? Precisely, why are some OIAs more capable of renewing existing old industries and creating new growth paths while others are less able to or even fail to do that?

Chapter 8, in my view, as the most important chapter in the whole thesis, is mainly oriented to answer the 'why' question. Chapters 5, 6 and 7 to some extent have contributed to this question, with different research emphases, and by using a variety of concepts and perspectives. But they lack a coherent framework to comparatively understand why some OIAs are more resilient than others. Therefore, Chapter 8 developed a conceptual framework that deconstructs the dualism between adaptation and adaptability (as discussed in Chapter 1.1 and 8.3). It redefined the notion of adaptation and adaptability in a co-evolving and dialectical way, and suggested a typology of relationships between the two. I again emphasize that:

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 varying environment. It refers to both the current function and performance of being maintained, and the potentials for regional dynamics.

Adaptability is the ability to foster new (or/and renew old) actors, institutions, networks and resources in a regional economy. For a long-term perspective, it is a result of adaptation in which some actors purposively adapt to environments by searching for alternative ways of doing things. Adaptability in some conditions can lead to a new or upgraded form of adaptation.

In terms of the typology, I argue that varieties of the relationships between adaptation and adaptability are indicative of geographically uneven resilience in a long-run perspective. It is further illustrated that a combination of multi-scalar contextual and structural impact factors lead to a certain form of adaptation-adaptability relationship that makes a region's resilience specific.

Drawing on the comparative case study in Chapter 9, I concluded that, firstly, the adaptation in both regions underwent a solid old path continuity and extension process. This identical adaptation was mainly enabled by both the top-down national policy and local inherent need for development. However, the adaptability of the two regions evolved in a very divergent way:

The Zaozhuang region: new industries (e.g. the tourism industry) were fostered and operated mainly through local actors mobilizing local assets. In other words, the adaptability

ty in Zaozhuang is derived from the adaptation process in an endogenous way. Moreover, adaptability seemed to have a positive impact on adaptation. The rise of the tourism industry changed regional images, which facilitated the investment niche and in turn helped the business diversification of local coal firms. It is proven that adaptability and adaptation mutually benefited from each other and, had a complementary relationship.

The Fuxin region: new industries (e.g. the wind power industry) were planned and managed by extra-local actors. The long-term centrally planned economy in Fuxin has led to a severe lack of bottom-up economic accountability for local actors. This planned history, however, still plays an important role in Fuxin, partly because of the mentality of local actors relying on top-down helps, and partly because of the central state itself recently trying to reshape the industrial landscape of northeast China. Thus, the evidence tells that the adaptability in Fuxin is mostly detached from the local coal adaptation system. Adaptability was developed by national-state forces in an exogenous way. The adaptation and adaptability are not related, and evolve in parallel. Since the newly emerged industries are operated by policy-driven external actors, it is expected that such adaptability might undermine the adaptation process from a long-term perspective, when it comes to national leadership replacement or macro national policy shifts.

One important finding in my thesis is the role of local-central relations. It is suggested as essential to understand the varieties of institutional settings in Chinese OIAs. I argue that this trans-local, structured and hard-to-change factor fundamentally coordinates local behavior enabling or constraining industrial change in China's OIAs. Chapter 8 concluded that Zaozhuang is more economically resilient than Fuxin, not only because of contingent contextual factors, but, more because of the region's loose institutional environment underpinned by the distant local-central political relationship.

Given the long history of a planned economy in almost every OIA in China, I argue that the local-central politics need to be taken into account when analyzing the ability and scope for industrial change. A close set of local-central relations may lead to an inflexible local institutional environment. In this context, local agents lack endogenous motives and creativity for industrial renewal and branching. On the contrary, a distant set of local-central relations refers to a decentralized power structure to localities. It provides a loose institutional environment in which local stakeholders gain (relatively) uninter-

rupted power and, also have high accountability on local economic issues. In this sense, new industries may be more related to old industrial structures, and be more inclusive to existing institutional frameworks.

One may compare local-central relations to ‘decentralization’ of power. But, here, local-central relations seem to last for a long-term, regardless of how a regional economy is decentralized. Fuxin’s economy, for instance, has been decentralized very much to sub-national agents, but the relationship between Fuxin and Beijing stays strong due to the past planned economic history. It is also suggested that why OIAs in China are more likely to undergo a slow and cumulative process of industrial restructuring. As such kind of macro history-conditioned factors are not easily be changed, and that will continually play an important role for a long term.

On the basis of the empirical study, the following section summarizes the main contributions of my thesis to economic geography, in order to constructively reflect on the current concepts and approaches in the field.

9.2 Contributions to economic geography

9.2.1 Contributions to the literature of the restructuring of OIAs

First and foremost, my study applied western modern concepts and theories, such as EEG, IEG and GPE, in a non-western OIA context. The existing literature on the restructuring of OIAs has been intended to focus on the role of firms and industries, and within a strong single-case study setting. However, my thesis focuses more on how multi-scalar states and institutions play roles in affecting adaptation and adaptability of OIAs in the Chinese authoritarian context. The Chinese experiences provide some refreshing findings and complementary perspectives to the existing literature about how OIAs evolve and adapt over time in a post-crisis era.

Secondly, many scholars suggested that the role of institutions should be more explored when analyzing the evolution of OIAs (Hudson, 2005; Morgan, 2012; Dawley, 2013). My research has mainly contributed to this direction. Chapter 5 highlighted the role of hie-

rarchical political economies among different SOEs and states in leading to a specific mechanism of path creation. This mechanism differs from what the existing literature usually tells. Furthermore, Chapter 6 explored how multi-scalar states are devoted to new path creation in an OIA of Northeast China. On the one hand, it shows how powerful and efficient the Chinese states are in terms of fostering new growth paths in OIAs. On the other hand, it states that every state-led path creation occurs with reasons. The history of inter-state interaction and relational activities can explain why new paths emerge in certain regions, and why certain paths but not others are selected to emerge.

Thirdly, Chapter 7 contributes to the understanding of the role of human agency in affecting the restructuring of OIAs. It systematically articulated how Chinese local state elites consciously managed to cultivate and facilitate new path creation in an OIA, by critically using the notion of place leadership. The evidence from Zaozhuang rejects the traditional perception, that in an authoritarian context local leadership is inefficient and does not lead to innovative governance on economic evolution. I argue that Chinese local state leadership does not simply refer to some sort of formal and conceive power to get things done. Local institutionalization in China's OIAs is indeed fostered by both informal and formal leadership. Interpretative leadership, for instance, is necessary for newly appointed local leaders ('airborne cadres' - 空降领导), if they attempt to use formal power efficiently, and if they want to change traditional institutions for new economic purposes. This contribution to the OIA literature is significant. It provides a new perspective of how micro-level dynamics – particularly human-based individuals (groups of individuals) – matter for local institutionalization and governance innovation for endogenous industrial change.

Last but not least, the whole thesis is organized into a comparative-study setting. It not only deals with how single OIAs evolve in new contexts, but also brings a geographical perspective. Differing from existing literature on the restructuring of OIAs, the study does not merely focus on the adaptation of mature industries/paths, but is more concerned with varieties of new industry emergence, as well as the interactions and relations with (pre) existing old industries. Moreover, this research widely embraces several new ideas in EG and related fields such as path plasticity (Chapter 5), multi-scalarity of state (Chapter 6), place leadership (Chapter 7) and regional economic resilience (Chapter 8). On the basis of different regional contexts, but under the same national authoritarian

context of China, this comparative endeavor sheds some valuable light on how OIAs in an emerging and transitional economy adapt, and why they adapt differently.

9.2.2 Theoretical contributions to (E)EG

(1) Path dependence and lock-ins

As addressed in Chapter 3.3, there are hardly any in-depth studies based on modern EG concepts and theories related to the restructuring of Chinese OIAs. So, as one main aim, this study has narrowed the gap by explicitly adopting the concept of path dependence and lock-ins to analyze the restructuring of Chinese OIAs.

First, the concept of path dependence has shown explanatory power in the Chinese OIA context. In the Chinese context, the effects of path dependence are mainly derived from the long history of economic and political centralization. These effects have penetrated into local firm institutional networks and bureaucratic systems. The Chinese experiences, to a large extent, go beyond the effects of *'place dependence'*. Because, both in Zaozhong and Fuxin, the extension of the old mining path is not only enabled by local specific forces, but more affected by trans-local forces related to macro policy changes.

Secondly, the concept of lock-ins, which has been extensively used in explaining the decline and stagnation of OIAs in the literature, is partly applicable to the Chinese cases. The three types of lock-ins (namely functional, cognitive and political lock-in) can be observed both in the Zaozhong and Fuxin region. The SOE-dominated and highly specialized economies have led to a high degree of functional lock-in. More importantly, the reason why the coal industry is maintained and extended is that local officials were both cognitively and politically locked into the coal-driven political economy. The so-called *'GDPism'* pressured local actors to firmly protect their *'money tree'* – the mining industry. Not only the industry contributes most to local economic benefits, but also it fundamentally matters the career prospect for each individual local official. So the lock-in concept seems useful and meaningful to explain the path-dependent feature of regional adaptation in Chinese OIAs.

However, the Chinese evidence critically shows that the effects of lock-ins are not mere-

ly restricted at the firm level or local social/political context as Grabher (1993) suggested. The lock-in concept needs to be put into a multi-scalar and non-firm centric context. In Chinese OIAs, lock-in effects are not only locally built, but, basically, are conditioned by multi-scalar institutions, politics and economies. Moreover, the findings support Martin's (2010) dynamic idea on lock-in. lock-in is not a static stage that follows the law of 'once locked-in, never get out'. It evolves with changing contexts. For example, the lock-in effects on the coal-mining industry in both case regions were reinforced by new national policies. The other way around, lock-in does not necessarily mean that local actors who are firmly locked in certain old industries have no (or few) potential to foster new industries. The lock-in situation in some circumstances can be turned into positive sources for industrial renewal and diversification (Hassink, 2010b).

(2) Path creation and path plasticity

To examine the adaptability of Chinese OIAs, the thesis (Chapter 5, 6, 7) puts quite a lot of efforts on exploring the characteristics of path creations. In Chapter 5, it is proven that new paths can be largely built upon extra-local assets, not necessarily following a place-dependent, endogenous and branching process. The results have shown that an endogenous process of industrial diversification – namely local existing related assets are used to enable new path formation – can be undermined and interpreted by local incoherent political economies. My key argument is that the Chinese administrative ranking system among SOEs and states in a regional economy has led to a high heterogeneity of agents, which might distort the rational ways for new path creation.

Thus, I argue the firm-centric endogenous EEG approach, in terms of the concept of 'related variety' and 'regional branching', is not sufficient to explain the complexity of path creation in Chinese OIA contexts. In my research, institutions, policies and politics both from local and extra-local spatial levels are the keys to thoroughly understand the processes of regional path creations in China.

An incomplete form of power decentralization and marketization gives rise to varieties of agents and power incoherence within an OIA. On the one hand, planned economies and top-down institutions and, even their legacies stay firm, and continually frustrate

the change of regional economies. On the other hand, local stakeholders are politically incentivized to do something new on economic development. In this context, the ways of path creation are largely related to how local elites balance the power and interest in-between.

In this sense, the concept of *path plasticity* seems applicable to analyze and explain the Chinese-specific stories. As Strambach and Halkier (2013) stated, “there is always a degree of plasticity which enables also that innovation with a minor degree of complementarity within the well-established institutional setting of paths may come into being” (p.1), and “[there is] always a limited range of choice of a well-established setting in creative ways for the development of innovation without breaking out of the path” (p.1). My case studies (e.g. Chapter 6 and 8) confirm these arguments. The evidence further suggests that new path creation in China’s OIAs is very much about the resourcefulness of the local state and its constitutive state elites. Path creation in a Chinese OIA context must be, more or less, a result of power and interest coordination among varied stakeholders from multi-level geographical and administrative spaces. This coordination can be seen as an achievement that local actors maintain (or at least no harm to) old institutions and simultaneously facilitate new industries for their own interests. This is why in both empirical regions old path extension and new path creation can co-exist harmoniously, but, not in a mutually cohesive and inclusive way. Therefore, I think the idea of path plasticity is potentially useful to explain why Chinese OIAs diversify over time, but still with a slow and problematic restructuring process.

At last, the evidence also suggests that regional path creation does not always lead to a positive and long-lasting impact on regional development. New paths might be created on temporary purpose, and thus may exist for only a short period of time. This has been evidenced by the creation of the agriculture and food industry in Fuxin in Chapter 8. This industry was fostered merely in order to radically provide a low-skill required labor pool for coping with unemployment caused by the declining mining industry. Therefore, I argue that the question of ‘new path creation for what?’ (Pike *et al*, 2010) needs to be paid more attention to in future path creation research. There is a need to keep the term of ‘new path creation’ conceptually neutral. Exploring the purposes and motivations of path creation should be placed at the core to understand regional varieties of path creation and subsequent consequences.

(3) Adaptation, adaptability and regional economic resilience

As many newly introduced terms in EG, adaptation, adaptability and regional resilience are still fuzzy in definition, and both conceptually and empirically in its infancy. Chapter 8 has tried to conceptualize these terms in a systematic way. The dualistic idea, inherited from Grabher's traditional static lock-in concept (Grabher, 1993), has been criticized in the chapter. Adaptation and adaptability cannot be discussed or analyzed separately, as they are internally related. They should be understood and conceptualized dialectically. Because adaptation as process indeed incorporates dynamics and sources for adaptability. And adaptability as a changing ability is an integral part of the process of adaptation. They not only co-exist in many contexts, but also co-evolve with each other.

Instead of introducing new thoughts from other related social sciences to conceptualize resilience, this thesis mainly deepens the understanding of this notion by discussing the relationship between adaptation and adaptability. It is also emphasized that regional resilience should be conceptualized and operationalized with an economic geographical perspective. The key contribution in the thesis is that there are varieties of adaptation-adaptability relationships in regions. Different forms of relationships are highly indicative of the uneven economic resilience of regions.

I also argue that regional resilience is not just about capacities and capabilities for a short-term recovery agenda, it is about functionality, transformability and long-term sustainability of regional development. Although this understanding, of course, is not universally applicable, it does provide a new vision to further scrutinize the idea and to make sense of it in future conceptual and empirical work.

(4) Institutional Economic Geography (IEG), Relational Economic Geography (REG)

Geographical Political Economy (GPE), towards 'engaged pluralism'

This comparative study also reminds us the importance of regionally differentiated institutions in understanding the geographies of OIAs. Much work has been done, by using the concept of 'varieties of capitalism' (VOC), to articulate why the evolutionary nature of OIAs differs from nation to nation (e.g. Birch *et al*, 2010). My research, however, highlights that there are varieties of regional models within China. These models are shaped

by regionally varied institutional settings. In Chapter 8, the question of why Zaozhuang is more resilient than Fuxin, is indeed the question of why the institutional environment (including micro niches and macro contexts) differs between the two regions.

Moreover, Chapter 7's emphasis on the role of human agency is actually very much related to the question of why individuals in some regions are more capable while individuals in others are not. This question is, also, about the role of geographically differentiated institutions. In fact, the whole empirical part highlights that institutions play a consistent role in coordinating the motivations and behaviors of firms, states and people for industrial dynamics. Therefore, the contributions to IEG can be summarized as: 1) the study provides new evidence to argue that there is a need to take an IEG perspective when doing research on China's OIAs. 2) Institutions seem to vary from region to region, despite being under one identical national context. 3) A multi-scalar evolutionary perspective as a compliment to IEG is called for. Because it can help to clarify what and why impact factors are spatially specific, and what are the determinants affecting regional evolution.

In addition, this thesis, particularly in Chapter 6 and 8, paid much attention to the relations and behind the 'power geometrics' (Yeung, 2005) among states. It is argued that the political distance between the local and the central state is essential for the human agency of economic change in China's OIAs. This argument seems not only applicable to OIAs, but also to other types of regions within China (Economist, 2015). Therefore, in terms of the contributions to REG, the study moves beyond the focus on the local relations and networks of firms, suggesting that historically informed multi-scalar geographical politics and power relations can be the core to better understand uneven regional development and evolution. It thus further argues that the focus of EG research should shift from relational assets/behaviors within and beyond firms, to their embedded position and relationship attributes among multi-scalar political-institutional environment and frameworks (Martin, 2010; Bristow and Healy, 2014).

In the end, as Barnes and Sheppard (2010) argued, 'nothing includes everything', each chapter in the thesis can only partially answer certain specific questions, but cannot fully understand them. As questions themselves are multi-faceted and cannot be explained by one or two concepts and perspectives. Although each chapter draws different theo-

retical sources to try to deal with the same topic, the collection of work as a whole, in fact, shows a combination of different perspectives and concepts – a sort of ‘engaged pluralism’ to explore the topic of the restructuring of OIAs. Here, I have to confess that doing research on the evolution of China’s OIAs is challenging because:

1) A hybrid economy consisting of highly heterogeneous but intertwined actors and institutions needs us to pay more attention to the interactions and relationships between them. These relations are dynamic in form but also are conditioned by the past, consistently shape and are shaped by multi-scalar institutions and power configurations. In this sense, REG, IEG and EEG approaches should not be separated when it comes to analyzing the evolution of OIAs.

2) the EEG approach may, to a large extent, fail to explain the evolution of China’s OIAs. Due to the planned and centralization history and the uncompleted decentralization, Chinese OIAs lack endogenous ability for industrial change. The dynamics for industrial change are more likely to be fostered by exogenous actors. Thus, EEG may have strong explanatory power to address why old industries/paths continue to stay, but may fail to explain why and how new paths emerge and evolve.

In order to better understand the question of geographically uneven regional economic evolution, we need to carefully choose appropriate concepts in EEG according to specific contexts, and integrate them with IEG, REG and GPE ideas, being theoretically ‘pluralist’.

9.3 Policy implications for old industrial area development in China

Chinese OIAs, particularly in terms of resource-based regions, have already been the core regions supported by national policies. Besides the scientific objects, one important aim of this research is to generate some policy implications. I thus propose three points, which firstly identify crucial deficiencies/problems and then put policy-related comments in regard to the restructuring and future development of China’s OIAs, as follows:

(1) Throughout the empirical work the most constraining factor of OIAs for change, in my view, is the situation of incomplete decentralization. There is a consistent existence of

administratively incoherent local economic systems, made up by different ownerships and ranks. Particularly in terms of energy and natural resource sectors, national or provincial states still keep them under control for strategic reasons. This can be well evidenced by the coal-mining industry in the case regions. They are mostly owned and operated by the provincial state, rather than the local state. Given this, China's OIAs have suffered from a lack of administrative freedom and self-reliance ability for place-based endogenous development.

I argue that the incomplete decentralization of SOEs in OIAs caused by the Chinese rigid ranking system strongly prevents the restructuring process of OIAs from going smoothly and forward. The power games among different bodies of interests, which created and (re)produced by this system, result in unnecessarily high costs. Such costs make local agents limited in vision and action. Therefore, future policies should be geared to the decentralization of SOEs to the locality. The top-down political and administrative 'hands' need to be removed from local/regional economic systems. If the local state of OIAs gains full autonomy on economic development, it is expected that local agents may be able to make more place-based and self-benefiting policies for industrial change.

Of course, I am not suggesting a radical reform on SOEs in OIAs. Because many economies of OIAs in China are still relying on, and even surviving on national policy support. A radical change would be harmful to the economies of OIAs. I am therefore suggesting an incremental process of decentralization with steady step-by-step reforms that are not at the expense of both local and extra-local actors.

(2) The second point I want to address is about the ways of national policy interventions. I cannot deny the importance and necessity of national preferential policies for China's OIAs, particularly in the current post-crisis time. However, the Fuxin case has shown that national policy interventions seem to focus more on deploying 'strategic' new industries mainly with national macro interests. These policy interventions lack concerns with local conditions and demands. In some conditions, new industries are fostered quickly in OIAs merely to meet macro industrial planning aims, and may be not well embedded into local economic systems. In my view, such kind of path creation mainly driven by top-down fast policies in OIAs is problematic and should be avoided.

It is suggested that the national state should pay more attention to place-specific condi-

tions and needs of OIAs. National policy-makers should carefully examine whether top-down policies are able to facilitate the endogenous ability of OIAs for industrial localization and relatedness. In my view, the traditional policy idea of ‘taking care’ or ‘helping to fix problems’ for less-favored areas needs to be revisited. Helping to launch new industries in OIAs does not mean to solve long-lasting structural problems in regions. Thus, my key policy advice is that national policies should be inclusive, sustainable and flexible in terms of aims and operationalization in the locality. A good national policy is a policy that can be well integrated to local existing policy and institutional frameworks. It is oriented to long-run industrial structure transformation, rather than temporary new path creation.

3) Last but not least, relating to the Chinese cadre cross-region reshuffling system, there is a dilemma that on the one hand newly appointed local leaders are subject to change, while on the other such change may be temporary. Without this system, it may have another dilemma: are locally rooted leaders more able to generate more down-to-ground industrial development policies with a long-term perspective? Or are they also more likely to be locked into certain paths. As proven clearly in Chapter 7, Chinese local state leaders are the key actors to make changes in OIAs. I think these dilemmas should be regarded as important aspects for future policy considerations. I would suggest the national and provincial state to ‘drop’ more young, educated ‘airborne cadres’ in those OIAs where regional economies have confronted long-lasting problems and challenges. However, it is also needed for upper states to consider whether it is worthwhile to update new ones when the five or ten-year tenure of the presence of local cadres come into the end. If a current ‘airborne cadre’ performs well, and is dedicated to a long-term incremental transformation rather than a ‘temporary’ record. Then an extension of his or her stay in existing region should be encouraged.

In general, I claim that China’s OIAs critically need continued, incremental and long-term plans and strategies for restructuring, rather than technological breakthroughs or radical reforms or any other fast policy fix. Basically, these regions’ real problems are institutional, which need time and patience to get resolved.

9.4 Limitations and future research directions

9.4.1 Research limitations

The thesis presents the first steps towards the understanding of the complex characteristics of OIA restructuring in China. This work has provided new evidence based on original fieldworks. The analyses and results not only have empirical implications but also can lead to critical theoretical reflections in the field of EG. But, this research has also encountered several limits, which can be outlined with three major points as follows:

First, the research methodology of this work is very much qualitative in nature. The majority of research evidence is derived from face-to-face interviews with firm representatives and government officials. This may to some extent lead to result biases and fuzziness. As I mentioned in Chapter 7, particularly when it comes to questions on the role of leadership and state agency in new path creation, answers tend to be 'positive' and thus the 'successful' roles of local officials would be exaggerated. Although several interviews out of the public system were arranged, the quantity of non-state interviews is still limited. If future interviews on the topic could combine official voices and non-public voices, it is expected that some new evidence and new stories can be obtained.

Secondly, I think a comparative study with two case studies in EG can be regarded as a good asset, as it can contribute to the core issue in this field – uneven development and evolution. However, this initial purpose might lead me to deliberately select some 'extreme cases' that are highly comparable. However, such kind of case selection is not unproblematic, as it may generate some extreme results (Flyvbjerg, 2006). One may claim that this is about geography, and it is natural that every case is unique and we cannot generalize it. But my point is not the case. The limit of my work is that I put preconceived ideas for the reasons why the cases were selected. These preconceived ideas are about varieties of regional development models within China (In Chapter 2 I claim that the two regions are comparable partly because they are based in different larger-scalar areas whose development models are distinctive), which might allow me to narrowly link this under-explored 'varieties of models' idea to my analyses. The question of to what extent the 'varieties' idea is related to the uneven restructuring of OIAs in China needs to be further clarified. And two-case comparative research, regarding to this point, is not suffi-

cient to address this problem. I think this point is highly important, and should be dealt with in a logical way. I also think multiple-case based comparative studies can improve the understanding in future related work.

Last but not least, in terms of the main research industry, namely the coal-mining industry, the research lacks an in-depth examination of labor issues such as mobility, politics, and rights when analyzing the OIA adaptation processes. It is arguably the case that labor-capital relations, structures and characteristics in Chinese coal-mining areas play an important role in the process of old industrial change. Thus, an in-depth research on the attributes and specificities of the mining industry in China is needed.

9.4.2 Future research directions

Based on the research limitations, but also beyond them, I propose several near-future research avenues related to this topic.

First and foremost, in general, future research needs to focus more on the evolution of OIAs in emerging economies. The current theoretical accounts are very much centered on, derived from, and limited to Western contexts (mainly Europe and North America). The endogenous model of restructuring may not work in explaining the adaptability of OIAs in emerging economies in the globalized and uncertain context. In my view, for example, China's OIAs can be seen as 'battle grounds', where old style planned institutions and new market-based economies co-exist, and both endogenous and exogenous forces are mixed in a complex way. A combination of path dependence and creation, or put it in other words, a situation of divergent multiple paths in OIAs provides promising 'fertile grounds' for testing and theorizing back on EEG in particular, and EG in general.

Secondly, the role of the state needs to be placed at the core for future OIA research. The question of how people in the state do is poorly understood and also under-theorized in the OIA literature. Particularly in an authoritarian context, local officials, rather than grass-rooted entrepreneurs, are actual decision-makers, business operators, policy practitioners and institutional designers. Within this context, how economies of OIAs are restructured is largely dependent on the visions and actions of local officials. I suggest that the notion of *place-based leadership* and *institutional entrepreneurship* might be useful to the analysis on the topic. Regarding to the Chinese context, future

research questions can be: (1) how do local officials scan multi-scalar contexts and how do they act accordingly? And why do some OIAs put top-down policies in action more quickly than others? (2) What are the differences of regional restructuring between OIAs with 'airborne cadres' and OIAs without? (3) How do multi-scalar institutions play a role in affecting the motives and behaviors of human agents on regional industrial change? And how are institutions themselves established and molded by local actors, for what and for whom?

In the end, to fully understand the evolution of OIAs, an *engaged pluralist approach* is needed. Research objects including enterprises, states and human actors, among others, need to be put into a relational, evolutionary and institutional context. Firm actions are not isolated from their relational assets. They are also embedded in multi-scalar institutions, and consistently performing with more or less political meanings. Precisely, firms and states themselves do not act, it is the people within them who do act. At the micro level, it is people who consciously maintain and change rules and institutions, who do things that are impacted by and also shape meso and macro industrial relations, business networks and political-institutional frameworks. Future research thus should combine with various theoretical approaches in a complementary way to ask more thorough questions.

Methodologically, cross-national comparison with multiple cases, based on both qualitative and quantitative methods is encouraged. Future research avenues can be: (1) geographically varied nature of path dependence, lock-ins and path creation by examining the mechanisms, multi-scalar institutional contexts and global production network dynamics involved. (2) Linking institution theories to IEG and REG to understand how institutions and strategies evolve, and how they logically affect the adaptation and adaptability dynamics of the people in OIAs and *vice versa*. (3) An in-depth examination of the relationship between historically conditioned varieties of regional capitalism, macro social-political structures (versions of political arrangements) and the nature of OIA development trajectories and characteristics.

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Appendix

Appendix 1: Overview of main interviewees in the fieldworks

Name of Institutions interviewed (Zaozhuang)	Key Informant	Date
Anyang Coal Industry Group 安阳矿业集团	Office Director	08-03-2013
Zhongtai Coal Industry Group 中泰矿业集团	Office Director	15-03-2015
Zhongxiang Coal Industry Group 中翔矿业集团	Vice General Manager	15-03-2013
Fengyuan Coal & Electricity Group (Ltd) 丰源煤电集团	General Manager	19-03-2013
Fuxing Coal Group 福兴集团	General Manager	19-03-2013
Huabang Energy Group 华邦能源集团	Vice General Manager	20-03-2013
Tengzhou Chenglong Energy Group 滕州辰龙能源集团	Office Director	29-03-2013
Wangchao Coal & Electricity Group 王晁煤电集团	Office Director	09-04-2013
Zaozhuang Coal Mine Group 枣庄矿业集团	Office Director	09-04-2013
Quanxing Energy Group 泉兴能源集团	Vice General Manager	11-04-2013
Shandong Weijiao Group 山东潍焦集团	General Manager	08-03-2013
Shengyuan Hongda Chemicals 盛源宏达化工	Office Director	29-03-2013
Shenglong Coal Chemicals 盛隆煤焦化工	Vice General Manager	29-03-2013
Yanzhou Coal Mine – Lunan chemicals 兖矿鲁南化工厂	Vice General Manager	01-04-2013
New Phoenix Energy Group (Ltd) 新能凤凰能源集团	General Manager	01-04-2013
Yiyuan Petrochemicals 亿源石化	Vice General Manager	02-04-2013
Tuobo Deep-processed Coal Chemicals 拓博精细化工	Office Director	02-04-2013

Luhua Tianjiu Coal Chemicals 鲁化天九化工	Vice General Manager	03-04-2013
Shenda Coal Chemicals 神达化工	Vice General Manager	05-04-2013
Yancon Cathay Coal Chemicals 兖矿集团国泰化工	Office Director	08-04-2013
Zaozhuang Development and Reform Commission 枣庄发展与改革委员会	Head	05-03-2013
Zaozhuang Resource-exhausted City Transformation Office 枣庄资源枯竭型城市转型办公室	Deputy Director	05-03-2013
Zaozhuang Tourism and Service Development Commission 枣庄旅游与服务发展委员会	Deputy Director	11-03-2013
The Taierzhuang Ancient Town Development Commission 台儿庄古城发展委员会	Deputy Director	11-03-2013
The Taierzhuang Ancient Town Tourism Development Enterprise 台儿庄古城旅游发展有限公司	General Manager	12-03-2013
Zaozhuang Coal Industry Bureau 枣庄煤炭工业局	Director	08-04-2013
Zaozhuang Vocational College 枣庄职业学院	Vice President	07-04-2013
Zaozhuang Tech Vocational College 枣庄科技职业学院	Vice President	28-03-2013
Zhejiang Economic Association of Zaozhuang 枣庄浙商协会	Secretary-General	21-03-2013

Name of Institutions interviewed (Fuxin)	Key Informant	Date
Fuxin Coal Mine Group (FCMG) 阜新矿业集团	Office Director	24-12-2013
FCMG – Diversified Company 阜矿多种经营公司	Vice General Manager	26-12-2013

Liaoning Chuncheng Coal Group 辽宁春成集团	Office Director	28-12-2013
Haizhou Coal Mine Group 海州矿业集团	Senior Manager	03-01-2014
GoldWind (Fuxin) 金风风机装配厂(阜新)	Factory Director	16-12-2013
Dajin Heavy Industry Group (Ltd) 大金重工集团	Founder and CEO	17-12-2013
Wuhan Kaidi New Energy Group (Fuxin) 武汉凯迪新能源	General Manager	17-12-2013
China Huaneng (Fuxin) 中国华能(阜新)	Senior Manager	18-12-2013
China Huaneng New Energy Group (Liaoning) 华能辽宁*	General Manager	19-12-2013
China General Nuclear Power Group New Energy (Liaoning)* 中广核集团—辽宁新能源公司	Vice General Manager	20-12-2013
Fuxin Guoli Wind Power Company 阜新国力风电	Office Director	20-12-2013
China Datang New Energy Group (Liaoning)* 大唐新能源	Vice General Manager	23-12-2013
China Wind Power Group (Liaoning)* 中国风电集团(辽宁)	General Manager	24-12-2013
Longyuan Electricity Group (Liaoning)* 龙源电力集团(辽宁)	Office Secretary	24-12-2013
Ming Yang Wind Power Industry Group (Fuxin) 明阳风电	Office Director	03-01-2014
Fuxin Resource-exhausted City Transformation Office 阜新资源枯竭型城市转型办公室	Deputy Director	12-12-2013
Fuxin Development and Reform Commission 阜新发改委	Deputy Director	12-12-2013
Fuxin Coal Chemical Office 阜新煤化工产业办公室	Office Director	07-01-2014
Fuxin City New Energy Bureau 阜新市新能源局	Office Director	09-01-2014
Fuxin Wind Power Industry Association 阜新风电产业协会	Secretary-General	09-01-2014
Fuxin Coal Industry Bureau 阜新市煤炭工业局	Director	13-01-2014

Fuxin Shuanghui Meat Processing Company 阜新双汇肉类加工有限公司	Office Director	17-01-2014
Fuxin Yili Dairy Industry Co.,Ltd. 阜新伊利乳业有限公司	Senior Manager	19-01-2014
Fuxin Luhua Fragrant Peanut Oil Co.,Ltd. 阜新鲁花浓香花生油有限责任公司	Vice General Manager	22-01-2014
Liaoning (Fuxin) Pastoral Industry Co.,Ltd. 辽宁田园实业有限公司	General Manager	22-01-2014
Liaoning Sunshine Food Group Co.,Ltd. 辽宁香香(集团)食品有限公司	Office Director	24-01-2014
Dong'e Ejiao Fuxin Food Development Co.,Ltd. 东阿阿胶阜新食品发展有限公司	Vice General Manager	27-01-2014

Note: The firms with * refer to regional headquarters who have invested wind power industries in Fuxin, therefore it also means that the interviews were conducted in Shenyang, the capital of Liaoning Province.

Appendix 2: Questions for firm interviews

Firm-based Interview Guide 1– for the Coal-mining Industry

Date of interview: _____

Name of firm: _____

Address: _____

Function of respondent: _____

Work period of respondent: _____

A. Basic information of firm

1. When was your company established?
2. What is the ownership of your firm? Is there any change of ownership in the past decade?
3. Whether is the headquarter or a branch? If is the headquarter, how many branches do you have?
4. How many coal-miners are employed currently? Please describe the change of mining employment in the past decade?
5. How about the turnovers of coal production? Please describe the change of turnover in the past decade.
6. In which geographical markets did your company sell coal during the last three years?
7. Did your firm set up any branches? If yes, how many branches were established? And when and in which geographical scale they locate? What kind of business do the branches do?
8. What are the reasons of initiating new branches in a certain time and place?

B. Development history of firm and coal industry

1. Please describe the development history of your company
2. Can you outline some big events or some key persons that affected or even determined the birth, growth, decline and transformation of your company (e.g. adopting new institution, rules or system; change of macro-regime)
3. After being qualifying as a 'resource-exhausted pilot city' by the State Council, Did any substantial changes happen in your firm and the whole coal-mining industry? (in terms of institution, administration, and strategy)
4. Whether you are going to eliminate the coal production or give up coal-mining business in the next few years? If not, then why?

C. Firm and organizations relationship

1. Where are supplier firms located?
2. What are the main customers for your coal product? And where do they come from?
3. Please identify the 5 most important business partners of your firm?
4. How does the relationship between your company and local government change over time? (e.g. administrative structures, governance forms and autonomy space)
5. Is your company cooperating with universities or research institutes? If yes, when did you start to cooperate with each other? Which geographical scale are these universities or research institutes mainly from? In what kind of field or subject you are cooperating with?
6. Is your company involved in any labor union / industry association / non-state organization? If yes, what the motivation of your firm get involved in these agencies?

D. Policy and political impact

1. What was/is/will be the impact of public intervention to your company?
2. What are the key policy measures that have substantially shaped the local coal industry?
3. At what scale was public intervention the most relevant for the development of your activity in the past? And how about now?
4. Did your company receive any specific public supporting from the local state? to what extent it influenced your firm institutions and strategies?
5. Please exemplify the role of local political leaders in changing evolutionary trajectory of your firm, and the local coal-mining industry?

E. Industrial restructuring and response

1. What were/are /will be the main constrains for the change of the local coal-mining industry?
2. What do you expect potentials of new developmental paths for the coal mining industry in your region? What role did your company played/is playing/will play in this process?
3. Has your company get involved in any non-coal industries? If yes, do they run well in terms of turnover, employment, and market? And what the contribution to the local coal industry?
4. How do firm decisions and strategies make out to response to crisis (resource exhaustion)?
5. Has your firm affected by the nation policy recently released by the State Council, namely “accelerating the restructuring process of coal mining enterprises”?
6. Please show the directions and plans of your company in terms of industrial development in the next 5-10 years.

*** Firm-based Interview Guide 2 – for the Newly Emerged Industry**

Date of interview: _____

Name of firm: _____

Address: _____

Function of respondent: _____

Work period of respondent: _____

A. Basic information of firm

1. When did your firm founded? How many employees does your firm have when it was established? And how many now?
2. Do you have any branch firms? If yes, what kind of business do the branches do? And why initiated new branches in a certain time and place?
3. What are the main products of your company? And how about 5 or 10 years ago, are there any differences?
4. In which geographical markets did your company sell products and services during the last three years?
5. What kind of factors that gave birth to your firm here rather than other places?

B. Development history of firm and industry

1. Whether your current company was formed based on a former company? If so, to what extent the previous one was related to the coal-mining industry?
2. Did you ever employ any workers who were previously worked in the coal mining industry? If yes, how many? How about this situation in other peer companies?
3. What was the very initial driving force for your company's establishment, development, and transformation over time? which geographical level did these driving force come from?
4. Who played or have been playing the most crucial role in making this driving force?

C. Firm relatedness and institutions

1. What kind of firm has the closest relationship with your company? and also, specify the main geographical scale they come from?
2. Does your company have any connections with coal companies? Do these coal-mining firms support the establishment/development of your company? If yes, how they support it?
3. Do you think the establishment of your company benefited from the (re) use of local assets? If yes, please specify how?
4. Does your company collaborate with universities or research institutes? If yes, in what kind of field or subject you are cooperating with?
5. As a newly established firm, to what extent does your firm share local relations and networks?

D. Policy impact and state

1. Have your company enjoyed any specific public supporting programs? Have these supporting made any changes in your company?
2. What is the most important public intervention recently that fuels the evolutionary process of the industry and your company?
3. At what geographical scale was state intervention the most relevant for your company in the past? And how about now?
4. Would you give us some significant examples linking to the local state leadership behaviors and thoughts that help facilitate the growth of the new industry you belong?
5. Comparing to the past generations of local government, how do you think about the performance and role of the current local government in trying to transform the coal-exhausting cities into more diversified city?

E. Industrial transformation and response

1. What competitive advantages does this region have for developing the new industry?
2. What the role of your company played/ is playing/ will play in the process of industrial restructuring?
3. What kind of concrete work has your firm done in purpose of promoting the dynamics of industrial transformation?
4. How did these transformative actions and responses of your company originally emerge?
5. How are these actions implemented and evaluated over time?

Appendix 3: Questions for authority interviews

Interview Guide – for Public Authorities

Date of interview: _____

Agency Name: _____

Function of respondent: _____

Work period of respondent: _____

A. Basic Information

1. When was this agency established? What is the main function of your agency?
2. What authority is your agency accountable for?
3. What is the primary purpose of setting up this agency? To what extent the establishment of this agency is to do with “resource-exhausted city transformation”?
4. What kind of and how many firms are under your administration / supervision / collaboration? How does your agency govern/manage them?
5. What are the five most important public agencies your agency cooperates with? How about 10 years ago? And for what reasons?
6. What kind of industry your agency generally supports most? And what kind of industry your agency support least, generally?

B. Industry Policy and Institutions

1. Do you have any supporting funding for the local industrial restructuring? If yes, which level of government did financially support your agency?
2. Besides, how does the upper authority support your agency in terms of the economic transformation and change?
3. Have your agency make specific policies orientating to the transformation of the resource-exhausted city? If yes, please talk about the main content of these policies.
4. How and to what extent your agency supported the development of new industries? Why your agency chose to support specific industries to support not others? how exactly the selection of new industries was taken place? Who played what kind of role in the process?
5. Would your agency continue to support the development of the newly emerged industries? And what is the plan for future development?
6. Are your involved in supporting the development of the old coal-mining industry, if yes, how does your agency support and why? If no, what your agency has done on restructuring the industry?
7. After this region was issued as a ‘resource exhausted city’, what kind of change occurred in your agency in terms of governances and institutions and for what specific purpose?
8. How do you think about the “*tiao-kuai*” administrative system (vertical and horizontal power relations) in the region? Does this multilayered and diversified administrative framework really enable or constrain the local industrial transformation process? Does your agency meet any conflicts or paradox in your work due to the “*tiao-kuai*” system? If yes, on what aspects?

C. Prospects for the Future

1. Please give some concrete examples about efforts of local elites to the change of the local industrial base? What are the current local leadership think of the restructuring and its future direction?
2. Does your agency have a very clear vision of how to contribute to the transformation of step by step? Who built this vision and how this vision/prospect come to being?

3. What your agency have done for the restructuring of coal-mining industry, and what are your agency doing / going to do on this industry?
4. To your agency's opinion, what kinds of industry are more likely to transform the regional economy in the future? What reason?
5. What the blueprint for your agency in regard to the development of new growth industries? And what kind of industries?

Erklärung

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person no material which has been accepted for the award of any other degree or diploma from the university or other institute of higher learning, except where due acknowledgement has been made in the text.

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Name: XIAOHUI HU

Signature:

Place: Kiel

Date: