Malte Lech

Institutions, Innovation and Regional Economic Change

Geographie

Megacities and Global Change
Megastädte und globaler Wandel
Band 18

Franz Steiner Verlag

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MEGACITIES AND GLOBAL CHANGE

MEGASTÄDTE UND GLOBALER WANDEL

herausgegeben von

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ABBREVIATION

ABC	Agricultural Bank of China
BOC	Bank of China
CAGR	Compound Annual Growth Rate
CCB	China Construction Bank
CCP	Chinese Communist Party
CCYL	China Communist Youth League
CEO	Chief Executive Officer
CEPA	Mainland and Hong Kong Closer Economic Partnership Arrangment
CM	Contract Manufacturing
CMC	Central Military Commission of the PRC
CNY	Chinese Yuan
CPI	Corruption Perception Index
DG	Dongguan
EMS	Electronic Manufacturing Service
FDI	Foreign Direct Investment
FIE	Foreign Invested Enterprise
FS	Foshan
GCR	Global Competitiveness Report
GD	Guangdong Province
GD PBS	Guangdong Provincial Bureau of Statistics
GDP	Gross Domestic Product
GOV	Gross Industrial Output Value
GPN	Global Production Network
GVC	Global Value Chain
HK	Hong Kong
HKMT	Hong Kong/ Macau/ Taiwan
HRS	Household Responsibility System
ICBC	Industrial and Commercial Bank of China
ICT	Information and Communication Technology
IPR	Intellectual Property Rights
ISIC	International Standard Industrial Classification
IT	Information Technology
IVS	Individual Visit Scheme
JV	Joint Venture
LED	Light-emitting Diode
MFA	Ministry of Foreign Affairs of the PRC
MOFCOM	Ministry of Commerce of the PRC
MOHRSS	Ministry of Human Resources and Social Security of the PRC
MOLSS	Ministry of Labor and Social Security of the PRC
MOD	Ministry of National Defense of the PRC
NBS	National Bureau of Statistics China
NDRC	National Development and Reform Commission
NIE	Newly Industrializing Economies

NIS	National Innovation System
NPC	National People's Congress
NPL	Non-performing Loan
OBM	Original Brand Manufacturer
ODM	Original Design Manufacturer
OECD	Organisation for Economic Co-operation and Development
OEM	Original Equipment Manufacturer
OLS	Ordinary least squares
PBC	People's Bank of China
PRC	People's Republic of China
PRD	Pearl River Delta
R&D	Research and Development
RIS	Regional Innovation System
SAR	Special Administrative Region
SARS	Severe Acute Respiratory Syndrome
SCM	Supply-Chain-Management
SEI	Strategic Emerging Industries
SEZ	Special Economic Zone
SI	System of Innovation
SME	Small and Medium Enterprises
SMT	Surface Mounted Technology
SOE	State-Owned Enterprise
SZ	Shenzhen
TAC	Transaction Cost
TFP	Total Factor Productivity
TI	Transparency International
TNC	Transnational Corporation
TVE	Township and Village Enterprises
TW	Taiwan (Republic of China)

1. INTRODUCTION

China's rise to become a new economic superpower spurred interest in the inner processes and developments taking place within the country. The driving forces behind the regional economic development within China are connected to the process of globalization, accompanied by changing regimes of production and international division of labor. The development of various forms of industrial districts (MARKUSEN 1996) and the massive trend toward urbanization and industrialization are some of the effects of these changes taking place on the local level. Thus, the future of many emerging economies such as China is a (mega-) urban future. It poses a host of challenges related to vulnerability, informality, as well as urban and regional governance (KRAAS & MERTINS 2008: 4ff.). In order to understand the 'Chinese miracle', it is crucial to understand the different and sometimes contradictory patterns of regional economic development taking place within the country. The Greater Pearl River Delta (PRD), commonly referred to as Hong Kong's manufacturing hinterland, can be considered as one prominent example of the abovementioned interaction between economic and urban development, and represents one example of the regional driving forces of China's economic rise. In order to investigate these regional economic hotspots, it is important to understand their inner functions and logic.

While many geographers focus on questions of mega-urban livelihood (KRAAS & STERLY 2009), or risk and resilience (KECK & ETZOLD 2013), several economic and social geographers have shifted the lens to processes associated with the development of firms, production networks, inter-firm governance as well as processes of agility on various scales and to entities (MEYER 2011; FU 2011; HARTMANN 2013; SCHILLER 2013). One feature commonly identified for mega-urban regions is the existence of informal structures and arrangements (KRAAS 2007: 81) which exist encompass both the business and the interpersonal sphere.

Despite the visible economic success of many mega-urban regions in China, it is important to remember that the strong embeddedness of these regions into global production and trade regimes exposes these regions to significant risks. For the PRD, the global economic crisis of 2008 demonstrated that the decline in external demand does exert a substantial backlash on the regional economy, thus negatively affecting the local population. The upgrading of industrial and economic structures to a higher degree of economic self-dependency, innovativeness and domestic market orientation can thus reduce the dangers of a predominantly export-dominated development model and enhance regional resilience. Local firms are the main driving force of this change. Besides, technological and industrial upgrading are necessary steps to be taken to ensure persistent economic growth rates which, in turn, allow larger parts of the population of developing economies to

take part in the process of economic progress and the generation of wealth – a key promise for the population in developing economies. The risk of being stuck in the so-called 'middle income trap' (OHNO 2009), a developmental stage where the leap towards self-dependent innovation is not achieved, thus poses a threat to many developing economies and their future development trajectories at large. To gain a better understanding of the process of regional economic change, an analysis of the economic growth models of mega-urban regions is considered a successful approach.

1.1 INSTITUTIONS IN A REGIONAL ECONOMIC GROWTH MODEL

What does the phrase 'regional economic growth model' imply? Unlike neoclassical growth economics, the term 'growth model' is not related to, nor it should be confused with, the mathematical formulations of functions to explain economic growth (growth accounting). It is a conceptual umbrella term to capture various economic processes on different analytical levels from a regional perspective. For this thesis, I propose the following working definition: 'A growth model is the prevalent form of industrial organization and economic interaction in a specified regional context within institutional boundaries aimed at generating economic growth.'

A growth-model, thus, aims to describe the dominant agents and identify the driving forces and organization of economic growth in a particular region. By nature, a 'growth model' cannot be static but is constantly changing and developing over time. Institutions, understood as systems of rules and norms that structure individual behavior, are the core analytical concept to understand social interaction within a growth model, and have proven to be effective for understanding their inner structures and functions. Two main actors for a regional economic growth model can be identified – local firms, and local as well as regional policymakers.

What role do institutions play in the debate over regional economic change?

All social processes and interactions subsumed within the growth model are structured, organized, or guided by institutions or institutional arrangements which can be understood as the 'rules of the game' as Douglas NORTH (1990) emphasizes. The way people engage in economic exchange, and the rules and norms of behavior that guide or even enable their interaction influences how regional economies work. In turn, these patterns of interaction are shaped by cultural practices and differ depending on history, traditions, or the stage of development. The informal institutions in China influence almost all forms of economic exchange and interaction; however, their role in the processes of firm-based innovation and regional economic change remains unclear, or at least ambiguous. By taking a firm- as well as a policy-level perspective, this thesis contributes to a better understanding of the mutually dependent processes of institutional and regional economic change. Nevertheless, research on economic development has showed that economic and institutional developments do not necessarily keep

pace. In contrast, institutional theory revealed that institutions can be slow- or fast-moving (ROLAND 2004), and that 'obsolete' (often informal) institutions might remain intact despite maturing as economic or governmental structures. The complex interaction between institutional and regional economic change thus raises further questions as to how individual economic actors can contribute to regional economic change. What are their incentive structures? What factors might limit the potential for regional economic change?

The conceptual integration of institutional and economic change allows for a process-oriented perspective on the changing regional economic development model. The present thesis seeks to contribute to a better understanding of the mutual interaction of institutional and economic change in the Greater PRD in China by adopting a context and cultural sensitive theoretical approach as proposed by YEUNG & LIN 2003) or PECK & ZHANG (2013: 386) who claim that: *'The Chinese model may indeed frustrate and exceed […] many 'imported' theories.'*

In the following subsection, I will introduce the selected case-study region, sketch its regional economic development path, and demonstrate the limits of the current regional economic development model which provides the motive for this thesis.

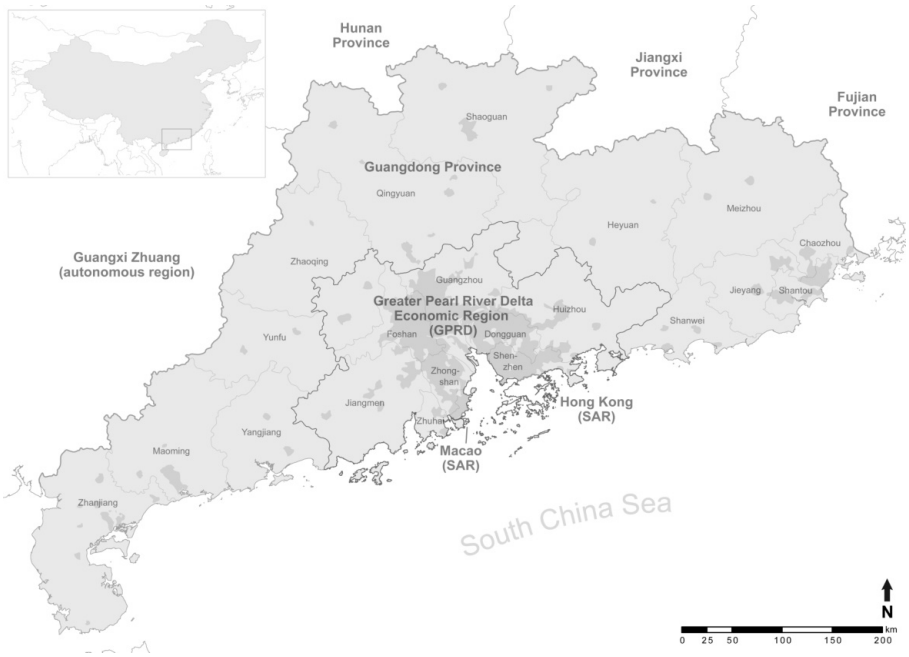

Fig. 1.1: The Greater Pearl River Delta mega-urban region in Guangdong. Own draft.

1.2 A CHINESE SUCCESS STORY: THE GREATER PEARL RIVER DELTA

The PRD is the economic core of Guangdong Province located in southern China (see Fig. 1.1). Despite problematic economic conditions during the pre-reform period (prior to 1978) and serving largely as China's 'rice bowl' and 'orchard,' the region developed a strong and competitive manufacturing base following Deng Xiaoping's reform agenda (HERRLE et al. 2008: 39). Today, the GPRD consists of nine Chinese municipalities of different administrative power as well as the special administrative regions of Hong Kong and Macao. Guangdong is home to approximately 85 million people, let alone the 56 million living in the economic core of the GPRD (registered population 2010); out of these, 83% live in urban settlements (GD PBS 2012). Due to the large number of unregistered population living outside of the household registration system (*hukou*) and the dynamic migration regime, the actual population figures are most likely significantly higher. Governmental estimates (2009) report approximately 27 million rural migrant workers; out of these, 19 million are from outside of Guangdong and eight million from within provincial boundaries (OECD 2010: 50). But how could the province characterized as *'different, often marginal to the interest of the Chinese state, and typically troublesome and unruly'* (JOHNSON 2002: 125) make so much progress as to become one of China's most important economic centers?

The answer lies specifically in the exemption of the province from large-scale regional development programs, such as the 'Third-Front'[1] as well as its geographical conditions – far away from the centers of political power and adjacent to Hong Kong and its potentially 'corrupting' foreign influence.

Just before the beginning of the reform-period in Guangdong, the economic state of the province was rather problematic. This was not so much caused by material damage inflicted during the Cultural Revolution, but rather by the fact that built infrastructure remained neglected for a long time and there was virtually no long-term development planning (VOGEL 1989: 35). The relatively weak presence of state-owned and heavy industry in Guangdong Province proved to be advantageous as it lightened the burdens associated with industrial readjustments that many provinces experienced during this period.

The 'Post-Mao' reform period led by Deng Xiaoping marked a break in economic policy, but it was not until the 6th Five-Year Plan (FYP), agreed upon in 1981, that the equity-based economic policy in China was officially abolished. This was a political reaction to the first promising results of deliberate policy ex-

1 The 'Third-Front' (*San Xian*) was a large-scale industrial policy aimed at developing heavy- and defense-related industries in remote areas of China's interior provinces making them potentially inaccessible for hostile powers. The policy was introduced as a reaction to the United States' involvement in the Vietnam War (NAUGHTON 2006: 73f.). Coastal regions like Guangdong Province were considered vulnerable to hostile attacks and were thus largely exempt from national industrial allocation. Third-front projects in Guangdong were related to naval shipbuilding, uranium mining, and defense electronics. 'Local third-front' projects were established on the provincial periphery of coastal areas, aimed at providing industrial goods for local defense capabilities (BACHMAN 2001: 273ff.)

perimentation in some of China's coastal provinces such as Guangdong (GU et al. 2001: 102). Besides the traditional economic center in the province's capital, Guangzhou, as well as the cities of Shaoguan in the mountainous north, and Shantou in the eastern and Zhanjiang in the western periphery, large areas of the province lagged behind in industrial development (GU et al. 2001: 99). Measures taken during the reform and opening-up period were the relaxation of the state's influence on pricing, the introduction of the rural household responsibility system, and the program of rural industrialization through the introduction of township and village enterprises (TVE) (LIN 1997: 49ff.). The TVEs, commonly operated by local village committees, were the main engine of the first wave of urban and industrial growth in the previously agrarian economy of the PRD (HERRLE et al. 2008: 41). At the same time, policy changes such as the introduction of special economic zones[2] and open cities[3] as well as the development of the open-zone economy in the Zhujiang Delta (1985), allowed for the increasing inflow of foreign direct investment (FDI) through export processing agreements (*san lai yi bu*) (VOGEL 1989: 175, WENG 1998: 431, FAN 1995: 441). While many of these reform measures appear to be centrally established, XU (2011) emphasizes that many measures were actually enforced by local policy-makers owing to personal efforts in interregional competition. Higher-ranking officials often opposed the proposed policy measures and agreed only later as the success of policy measures became visible. The reform period thus did not follow a centrally planned script, but rather favored small-scale policy experimentation by individual actors.

The first two decades of the 'open-door policy' led to growth in the special economic zones of Shenzhen and Zhuhai. Especially, the formally underdeveloped city of Shenzhen and adjacent city of Bao'an (later incorporated in Shenzhen) grew substantially with its beneficial location in direct proximity of Hong Kong (GU et al. 2001: 106). While Shenzhen listed approximately 300,000 inhabitants in 1979, a surge of population inflow, especially during the 1990s, caused the population to rise to approximately 10 million in 2010 (GD PBS 2011). However, the development in Shenzhen was not solely driven by geographic proximity, but also by kinship ties in the local Chinese population with Hong Kong and Taiwan, which helped to reduce institutional weaknesses present in the Chinese mainland and reduced the risk of foreign investment (FAN 1995: 442). PECK & ZHANG (2013: 381f.), thus, argue that:

> 'the (re)formation of Chinese capitalism was a cross-border and in some senses extra-territorial phenomenon from the start, as diasporic capital exploited a range of localized (and liberalized) openings.'

In the Western PRD during the 1990s, growth started to concentrate in the secondary cities of the PRD such as Shunde, Nanhai, Foshan, Zhogshan, while formerly important centers like Shaoguan, Shantou and Zhanjiang gradually lost importance, thereby leading to an increase in spatial inequality in the province (GU

2 Shenzen, Zhuhai, Shantou (1979)
3 Guangzhou (1984)

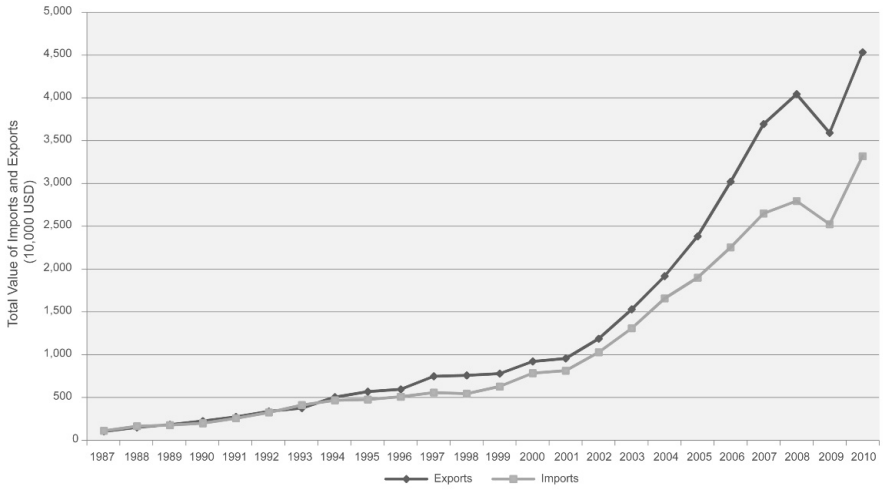

Fig. 1.2: Total Value of Imports and Exports in Guangdong Province (1987-2010). Own compilation based on GD PBS (2010)

et al. 2001: 109). The development in Foshan and Shunde are special, insofar as their development was not primarily driven by external economic assets, but also by a strong localized entrepreneurial culture and a relatively advantageous position of the local commune, as well as brigade production units and a strong subsequent development in a more diversified industrial structure. Today, Shunde is home to a competitive manufacturing base of the Chinese household appliance industry (LIU & YANG 2014: 448ff.). While Shenzhen was able to maintain its position as the new provincial growth pole, in the Eastern PRD, development impulses started spilling over to the adjacent cities of Dongguan and Huizhou, which established themselves as important manufacturing hubs of light industries throughout the 1990s. This process of transforming the increasingly uncompetitive TVE-based economy was driven by FDI largely from Hong Kong and increasingly from Taiwan. The cross-border production regime, as a new driving force of the region's economic development, was conceptualized by SIT (2004: 820) as the so-called *'front-shop-back-factory'* model, in which Hong Kong served as the headquarters (front shop) with international connectivity and the PRD as local branch plant (back factory).

The late 1990s marked a beginning of a period of substantial institutional reform which contributed to a further intensification of economic and industrial growth. The economic integration between Hong Kong and the mainland intensified, and has become increasingly institutionalized since Hong Kong's political return to China in 1997. The introduction of the 'Closer Economic Partnership Arrangement' (CEPA) until Supplement VIII, signed in 2011, increased the mobility of people and goods between the two regions (CHIU 2006: 294). In addition, China's accession to the World Trade Organization (WTO) in 2001 contrib-

uted significantly to additional economic development of the regional economy (OECD 2010: 126, ENRIGHT et al. 2005: 136ff.), which is visible in the provincial trade statistic (see Fig. 1.2).

During this phase, first policy measures, aimed at upgrading the regional industrial base toward higher value-added activities, were formulated (HUANG & CHEN 2010: 76f.), as the first negative effects (e.g. increasing environmental pollution, rising wages, and prices, etc.) of the continuous regional polarization of economic activities became visible.

1.3 TOWARD A NEW ECONOMIC GROWTH MODEL?

While the 'old' growth model of the PRD has indisputably contributed to impressive economic and urban expansion, the period of unbowed economic growth during the 2000s demonstrated the weaknesses of the front-shop-back-factory growth model that relied on a foreign-guided production regime and limited domestic value-added. During this period, the province experienced a slowdown in productivity growth (OECD 2010: 18). The double-digit gross domestic product (GDP) growth during the pre-crisis period, accompanied by a high rate of investment in the GDP ratio, created excess capacities in housing and manufacturing (DOLLAR 2014: 10). Land and labor shortages were among the first indications that the current economic growth model was reaching its sustainability threshold (HARTMANN 2013, OECD 2010: 107). Besides shortages of production staff, the region experiences a general lack of highly qualified human capital. In a comparison of the number of people with college or higher education, Guangdong ranks below the national average in China (OECD 2010: 104f.).

Additionally, the environmental and living conditions of the local population were showing clear signs of degeneration. Between 1997 and 2007, the total energy consumption in the province almost tripled, and crude oil and coal accounted for approximately 76% of the main energy sources in 2007. Urban sprawl and industrial expansion caused a decrease in arable land, strongly contributing to the degeneration of water quality (OECD 2010: 20; ZHOU et al. 2012). The degeneration of air quality, as recent results presented by TAO et al. (2012: 395ff.) show, indicate high concentrations of ozone and nitrogen dioxide, originating from industrial and traffic exhaust, among PRD's cities with a significant impact on the local mortality rate. These developments did not remain unnoticed by local policy-makers. Before the crisis, national and local government officials were engaged in the implementation of various policy measures aimed at upgrading the economic structure of the PRD toward higher value-added activities. Rising minimum-wage standards as well as the implementation of the new labor contract law in 2008 were supposed to ease labor-related problems and help to retain migrant workers within the province. In turn, they led to an increase in prices for local manufacturing firms (YANG 2012).

Regional authorities attempted to encourage firm relocation, especially of polluting industries, to the provincial periphery. At the same time, high value-added

manufacturing was supposed to be strengthened in the PRD by supporting their technological development. In this regard, the OECD (2010: 128ff.) stresses the importance of the development of technological capabilities to sustain future growth in Guangdong's SME- and MNE-driven regional innovation system, and to emphasize the role of absorptive capacity among the region's SMEs which even today largely operate on the competitive edge and low profit margins.

The global economic crisis, starting in 2008, with massive lay-offs and firm closures in the province, served as a strong reminder of the previously mentioned upgrading efforts (OECD 2010: 18). The decline in economic dynamics is visible in the figures of provincial and national GDP growth (Fig. 1.3). While the economic decline caused by the global economic crisis was significant and steep, the region recovered fairly quickly from the crisis. This was caused, on the one hand, by an increasing demand in the export markets, which started to pick up in late 2009, as well as the strong governmental stimulus package of the Chinese national government (approximately 4 trillion RMB). While the post-crisis period in the PRD and China is characterized by slower growth, the implications of the crisis for the development of a more sustainable growth path remain questionable (SCHÜLLER & SCHÜLER-ZHOU 2009: 381ff.). The global economic crisis, thus, marks the starting point for this investigation into the post-crisis economy of the PRD and its potential changing development model.

1.4 AIM AND SCOPE

This thesis aims to shed light on the qualitative and quantitative dimension of change of the regional economic growth model of the Greater PRD. In particular, I will try to elaborate on the effect and influence of (external) institutional factors on the changing production regime in the regional manufacturing base, especially

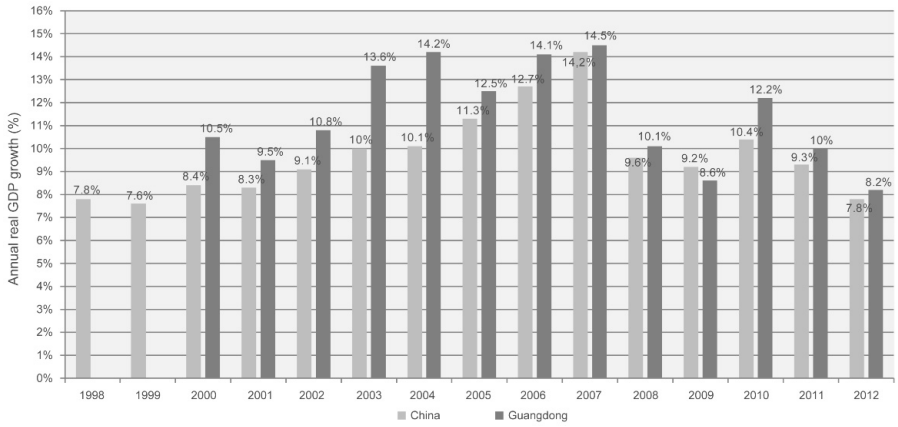

Fig. 1.3: GDP-growth in China and Guangdong province (1998-2012).
Own compilation based on GD PBS (2014) and UN NSD (2014)

toward the process of technological and industrial upgrading among local firms which has been identified as an important factor to sustain the region's economic competitiveness (SCHILLER 2013; FU 2011). As a comprehensive account of institutional factors influencing the process of economic upgrading would overstretch the scale of this thesis, I will concentrate on selected economic fields and processes that are of central relevance to the abovementioned restructuring process.

The global economic crisis marks the starting point for this investigation; however, as I seek to embrace a process-oriented understanding, I will also look back at the development taking place in the previous decade and will attempt to integrate my findings into a careful prognosis of potential future development. The empirical sections can be read as self-contained chapters, as they encompass brief theoretical and methodological remarks. Nevertheless, I would suggest reading this thesis in its entirety as the chapters on theory and concepts will help to clarify the adopted conceptual and methodological approach.

In *Chapter 2*, I will give an overview of the two basic theoretical foundations of this thesis, namely the field of institutional analysis and innovation research. The chapter will deal with the following research questions:

- How do formal and informal institutions develop and interact in the process of institutional change in China?
- How do firms in China engage in knowledge transfer and innovation and what strategic approaches exist for firms for the aforementioned processes?
- What potentials for technological upgrading exist, considering the stage of development of the regional innovation system in Guangdong?
- How can the process of industrial upgrading be conceptualized regarding the role of institutions?

In the following (*Chapter 3*), I will introduce the reader to the utilized data sources and the applied research design. By using a primarily quantitative approach supported by qualitative data and secondary statistics, I will present and discuss the critical strengths, weaknesses, and conceptual limitations of the available data and of the methodological approach. Later, I will present some preliminary survey results embedded in a discussion of measurements concepts of institutions and innovation.

In the first empirical section (*Chapter 4*) the reader will be confronted with the question of how a changing institutional environment drives firms to adapt themselves to the new environmental conditions by means of strategic reorientation. The main research questions for this chapter are:

- Does the pressure that forces firms to adapt to new environmental conditions derive from political sources, or is it based on the changing competitive situation?
- How can firms' individual responses be differentiated and systematically conceptualized? What are the factors that influence firms' strategic responses?

– Did the economic crisis of 2008 encourage a strategic reorientation toward innovation and upgrading?

Chapter 5 will be concerned with an analysis of a specific institutional field, namely the financial market and its influence on firms' innovation efforts and performance. The chapter will conceptualize the interplay of formal and informal institutions in the process of institutional change, and question the sustainability of the existing structure of institutional arrangements governing firms' financing in China. The main research questions are:

– What sources of firm financing can be accessed and utilized by local firms and what different functions do different sources have?
– Do formal or informal financial sources contribute to an increase in innovation activities among firms?
– Is the reliance on informal financial sources leading to a situation where short-term orientation prevails over a long-term structural readjustment towards innovation activities?

In *Chapter 6,* I will focus on the role of institutional arrangements in the process of knowledge exchange in supply-chain relations. The chapter challenges the contemporary view of a self-dependent regional innovation system in Guangdong Province, by exemplifying the continuous importance of external knowledge assets for the process of industrial upgrading. The specific research questions raised are:

– Do formal or informal modes of inter-firm interaction contribute to the exchange of innovation-related information?
– What role do specific forms of proximity (spatial and institutional proximity) play in the process of knowledge exchange?
– What differences can be observed regarding up- and downstream supply-chain partners?
– What effect do different modes of interaction have on the implementation of innovation-related knowledge in the supply-chain interaction?

Finally, in *Chapter 7* I will try to scale up the analytical view into an industry-level perspective on the political potential for the implementation of a new national and regional economic growth model. I will discuss the role and governance of Chinese party politics concerning the implementation of economic development policy. Using secondary statistical data, I will assess the large-scale trends of industrial development in the previous decade as well as future development potential under the new leadership regime. The main research questions that form part of this chapter are:

– Are political incentive structures aligned with the goal of a reorientation or rebalancing of the Chinese economic development model?