

‘GO UP’, ‘GO WEST’, AND ‘GO OUT’: CHANGING INDUSTRIAL POLICY AND FIRM
STRATEGIES IN CHINA’S APPAREL INDUSTRY

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ABSTRACT

Shengjun Zhu: ‘Go Up’, ‘Go West’, and ‘Go Out’: Changing Industrial Policy and Firm Strategies in China’s Apparel Industry
(Under the direction of John Pickles)

The rise of China’s export-oriented apparel industry since the 1990s has been driven largely by global sourcing practices intent on capturing the cost advantages of a development model predicated, in part, on unskilled or semi-skilled migratory labor flows linking western and central labor pools to coastal production sites. Until recently, the dominance of this model of development has fuelled growth in low-wage employment in the coastal regions and has provided few opportunities for economic and social upgrading. Since the early 2000s, coastal factories have increasingly had to confront difficulties generated by the increasing social and economic costs of this regionally concentrated low wage growth model. This research focuses on the role of the apparel industry in this process. It documents the major changes in organization and geographies of economic activity in the industry, and demonstrates how the central and local state, domestic and international capital, and Chinese and other Asian workers are shaping the changing organization and geography of China’s apparel industry. By focusing on a case study from China and a firm-level database on China’s apparel industry, the research pays particular attention to firm strategies and state policies that have arisen in response to upward pressure on wages from workers, increased materials and energy costs, and competition from other low-cost producers in Asia.

TABLE OF CONTENTS

LIST OF TABLES	vii
LIST OF FIGURES	viii
LIST OF ABBREVIATION	x
CHAPTER 1 INTRODUCTION	1
Background	1
The case of Ningbo	4
Overview of the chapters.....	9
Methodology	13
CHAPTER 2 BRING IN, GO UP, GO WEST, GO OUT: UPGRADING, REGIONALIZATION AND DELOCALIZATION IN CHINA'S APPAREL PRODUCTION NETWORKS.....	16
Introduction	16
Bring in: export-led assembly and the rise of China in global apparel value chains	17
The limits of export-led, low-wage industrialization	22
Upgrading, regionalization and delocalization.....	26
Conclusion.....	52
CHAPTER 3 GLOBAL, REGIONAL AND LOCAL: NEW FIRM FORMATION AND SPATIAL RESTRUCTURING IN CHINA'S APPAREL INDUSTRY	55
Introduction	55
Conceptual Framework and Research Hypotheses	57

Research Design	63
Industrial Relocation and Transforming Pattern of New Firm Formation	68
Statistical Results	71
Conclusion and Discussion	80
CHAPTER 4 GEOGRAPHICAL DYNAMICS AND INDUSTRIAL RELOCATION: SPATIAL STRATEGIES OF APPAREL FIRMS IN NINGBO, CHINA	84
Introduction	84
Conceptualization of spatial dynamics: towards an analytical framework	85
Geographical dynamics and firm relocation	92
Relocation in the global, regional and local context	100
Conclusion and discussion	106
CHAPTER 5 PROCESS, PRODUCT, AND FUNCTIONAL UPGRADING IN A GLOBALIZED AND LOCALIZED WORLD: FIRM-LEVEL EVIDENCE FROM CHINA’S APPAREL INDUSTRY	110
Introduction	110
Process, product, and functional upgrading in a globalized and localized world.....	113
Research design.....	117
Statistical results.....	125
Conclusion.....	141
CHAPTER 6 UPGRADING IN APPAREL GLOBAL VALUE CHAINS: A HEURISTIC ANALYTICAL FRAMEWORK	144
Introduction	144
Different firms, different upgrading trajectories	155
A tentative analytical framework of upgrading.....	165
Conclusion and discussion	175

CHAPTER 7 PATH DEPENDENT AND PATH BREAKING: AN AGENT-BASED MODEL OF EVOLUTION, CO-EVOLUTION, AND LOCK-IN IN A CHINESE APPAREL CLUSTER.....	178
Introduction	178
Lock-in and lock-out	181
Pipelines to external knowledge and negative lock-in	187
Harmonies and disharmonies in the processes of co-evolution	192
Conclusion.....	202
CHAPTER 8 SUMMARY AND CONCLUSION	206
Changing industrial policies from various levels of governments.....	207
Firm strategies to increasing competitive pressures.....	208
Articulation between changing industrial policies and firm strategies	211
REFERENCES	214

LIST OF TABLES

Table 1 Export of apparel products (1994-2010).....	18
Table 2 Key Points of China's New Labor Contract Law	33
Table 3 Policy Initiatives Launched by Chinese Governments on GO WEST	36
Table 4 Policy Initiatives Offered by Inland Provinces/Cities to Entice Relocating Enterprises	42
Table 5 Estimation Results from the Tobit Model for New Firm Formation during 1999-2009.....	72
Table 6 Estimation Results from the Tobit Model based on Temporal Expansion (1999-2009)	75
Table 7 Estimation Results for High- and Low-Capability New Entrants (2009)	77
Table 8 Types of Firm Relocation	86
Table 9 Comparison of Apparel Firms in Ningbo	102
Table 10 Firm Entry and Exit in China's Apparel Industry (1998-2007).....	118
Table 11 Temporal Change of the Mean Value of Process, Product and Functional Upgrading Indicators at the Firm Level in China's Apparel Industry (1998-2007).....	122
Table 12(a) Determinants of Firm Upgrading (1998-2001)	126
Table 13 Determinants of Upgrading of Domestic-owned Firm	133
Table 14(a) Determinants of Upgrading of Small Domestic-owned Firms.....	138

LIST OF FIGURES

Figure 1 Location of Ningbo.....	5
Figure 2 Output and Export Delivery Value of Ningbo's Apparel Industry	7
Figure 3 Spatial Distribution of Gross Industrial Output in Garments by County	20
Figure 4 Chinese Provinces and Centrally Administered Municipalities	21
Figure 5 Temporal Changes of Distribution of Employment in Garments by Province.....	25
Figure 6 Restructuring Strategies Adopted by the Export-oriented Apparel Firms.....	29
Figure 7 Economic Regions in China	37
Figure 8 Priority Relocation Destinations of the Processing Industry Identified by the Ministry of Commerce (2007 and 2008).....	38
Figure 9 Industrial Transfer Demonstration Zone of the Wanjiang River Urban Belt	39
Figure 10 Distribution of Investment in Textile and Apparel Industry (2005 and 2010).....	41
Figure 11 Annual Growth Rate (YOY) of the Number of Newly- commenced Projects in Textile and Apparel Industry (2006-2010)	41
Figure 12 A Tri-polar Analytical Framework of Industrial Relocation and New Firm Formation	61
Figure 13 Temporal Changes of Distribution of Employment in Garments by Province (1992, 1998, 2004, and 2010)	69
Figure 14 Changes in Regional Shares of the Number of Newly Established Apparel Firms (1998-2009)	70
Figure 15 A Tri-polar Analytical Framework of Firm Relocation	87
Figure 16 Peace Bird's Production Networks.....	95
Figure 17 Import and Export of China's Apparel Products (1994-2010).....	112
Figure 18 Growth Rate of the Number of Firms in China's Apparel Industry.....	119

Figure 19 Is there a hierarchy of upgrading?	149
Figure 20 Horizontal and vertical upgrading framework	158
Figure 21 Upgrading trajectories of Peace Bird	160
Figure 22 Upgrading trajectories of GXG	161
Figure 23 Upgrading trajectories of Seduno	163
Figure 24 Upgrading trajectories of Baimu	165
Figure 25 Trans-local Pipeline and Local Buzz of Firms in Ningbo's Apparel Cluster.....	191

LIST OF ABBREVIATION

EEG	Evolutionary economic geography
GPN	Global production network
GVC	Global value chain
OBM	Original branding manufacturing
ODM	Original design manufacturing
OEM	Original equipment manufacturing

CHAPTER 1 INTRODUCTION

Background

The central question of this research is: how, since the early 2000s, the Chinese state and private firms are dealing with negative consequences of low-wage export-oriented production in apparel. Specifically, my research seeks to understand how, as competitive pressures increase, new government policies and emerging firm strategies are restructuring the geography and organization of the Chinese apparel industry in conflicting and/or complementary ways. This research builds on recent insights in economic geography and economic sociology on industrial relocation/delocalization, upgrading, governance, global value chains and global production networks (Bair, 2009; Coe et al., 2008a; Gereffi et al., 2005; Pickles and Smith, 2011).

Following the Reform and Opening-Up Policies of the late 1970s, China has achieved dramatic economic growth and experienced three fundamental transformations: (1) from a planned to an increasingly market-based economy; (2) from a state-owned, collective economy to one with growing level of private ownership; and (3) from a partially closed economy to one oriented towards export markets (He and Zhu, 2007; Wei, 2001a). The combination of internal reforms and international demand led to a rapid expansion in private sector-led export growth (Gereffi, 1999, 2009)—the so-called BRING IN Policy—which in turn generated average annual GDP growth of approximately 9.8%, and export expansion of 12.4% annually throughout the 1990s, growing to more than 20% a year in the 2000s before the outbreak of global financial tsunami in 2008 (National Bureau of Statistics of China, 2011). Dependence on foreign trade (calculated as the sum of exports and imports divided by GDP) grew from 30% in 1980 to 60%

in 2008. China had become the leading global exporter in 774 items by 2005 and the world's largest exporter with a world export share of 8% in 2009 (Inman, 2010; Yang et al., 2006).

With the shift from import substitution to export-oriented strategies, producers dependent on low-wage and unskilled or semi-skilled labor and the leveraging of domestic advantages, including China's large potential market and the comparatively low cost of its other factor inputs, land, electricity and other raw materials were able to expand their role in export markets (Gereffi, 2009). One notable example has been the apparel industry, which accounts for a considerable part of China's economic growth and job creation during this period. China has the largest apparel industry in the world with more than 3.82 million workers in 2011, predominantly focused on assembly or OEM (Original Equipment Manufacturing) production for global buyers (Feenstra and Hamilton, 2006; Hamilton and Petrovic, 2006). Between 1995 and 2008, China more than doubled its share of global apparel exports from 15.2% to 33.2% (Gereffi and Frederick, 2010). Production and employment of the apparel industry have become heavily concentrated in the coastal regions of East and Southeast China (Fujita and Hu, 2001; He et al., 2008; Wen, 2004).

In recent years this model of industrialization has encountered serious limits. These limits are now forcing major changes in the organization and geography of economic activity in the industry (Wang and Mei, 2009; Yang, 2012). Most Chinese apparel factories have focused on assembly or OEM (Original Equipment Manufacturing) production supplying global buyers and few have been able to establish a strong position in high-value-added, high-tech, and high-end products (Feenstra and Hamilton, 2006; Hamilton and Petrovic, 2006). As with general manufacturing expansion, growth in apparel has been driven, at least until recently, by low wage and unskilled or semi-skilled workers who migrate from western and central to coastal regions

(Appelbaum et al., 2005; Arnold and Pickles, 2011). As billions of workers and consumers have become more direct participants in the global economy as workers and consumers (Gereffi, 2009), this process has increasingly come to drive China's rapidly changing economic geography creating upward pressure on wages and working conditions that are beginning to challenge the "China price" and the "race to the bottom" it has created (Appelbaum, 2004; Appelbaum et al., 2005; Henderson and Nadvi, 2011).

While China has traditionally been seen as a cheap labor pool, with an almost infinite supply of labor, workers have responded quickly to new opportunities, forcing wages up and encouraging better work by exiting low paying and low quality jobs (Drewry Supply Chain Advisors, 2007). Other factors have also been important, including labor shortages fuelled by low wages and poor working conditions, the appreciation of China's currency, slackening global demand especially after the outbreak of the financial crisis and new regulations dealing with environment, labor law and an expanded role for corporate social responsibility (CSR). These factors have squeezed profit margins to such a degree that some manufacturers have been forced to shed labor or shut down altogether, creating a dilemma for policy makers particularly in regions that are highly dependent on the industry for employment (Wang and Mei, 2009).

The "race to the bottom" that typified the "China price" and the rapid rise of China as a global supplier of clothing over the past decade is thus now changing in ways that are having profound effects on the industrial organization and spatial structure of production and employment, and will change the ways in which we understand China's role in global and regional export markets in the coming years (Chan, 2010a, 2010b; Lee, 2007). In this research, I focus on the apparel industry and ask: as competitive pressures increase, how government policies and firm strategies are affecting the spatial patterns, organizational structure, and value

segments of the Chinese apparel industry. I shall focus on the interaction between the different and related roles of governments and firms and their complementary and/or conflicting effects in restructuring the geography and organization of the Chinese apparel industry. I seek to demonstrate that the model of inward investment, global sourcing, and export orientation is already undergoing fundamental restructuring, producing new geographies of production and employment, with the consequent need to re-assess the policy implications of China in the global production networks.

The case of Ningbo

The impact of the transforming business environment and the subsequent intensification of competitive pressures is especially marked in the main manufacturing centers of Chinese apparel industry, such as Zhejiang, Guangdong, and other coastal provinces. I have selected Ningbo city as the primary case study for this research (Figure 1). Ningbo is one of the biggest clothing industrial clusters in China—it produces around 1.3 billion pieces of apparel products each year, which accounts for 40% of the provincial production capacity and 12% of the national total domestic garment production (Li & Fung Research Centre, 2006). By the end of 2006, there were around 131,600 workers employed directly in Ningbo's more than 2,000 apparel enterprises, accounting for about 5% of the national total (Ningbo Economy Committee, 2007). Major products manufactured in Ningbo includes men's suits, knitted garments and children's wear, which account for 44%, 65% and 76% of the province's total production respectively (Li & Fung Research Centre, 2006; Tan, 2006).

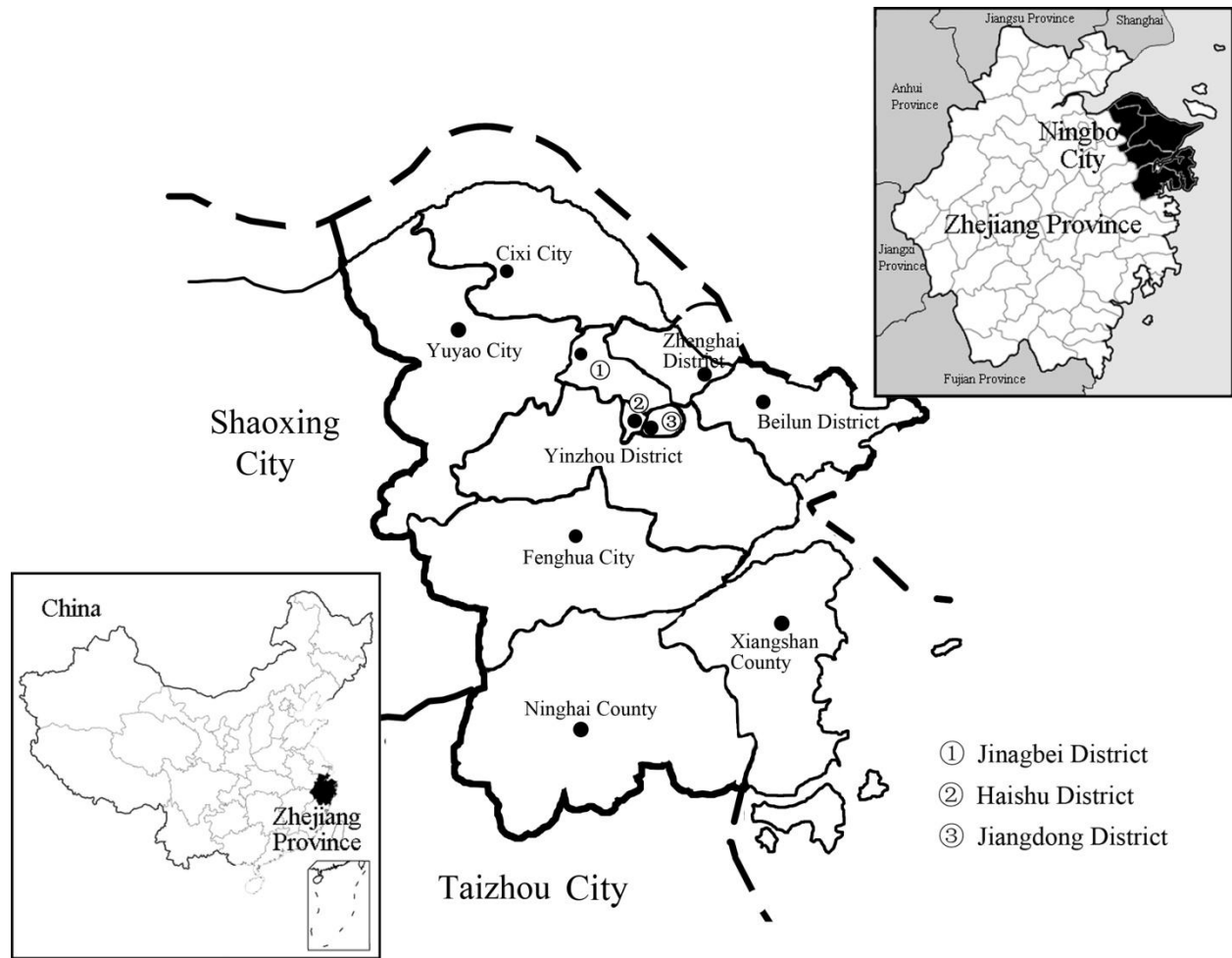


Figure 1 Location of Ningbo
Source: compiled by authors

The traditional Ningbo model was a system of production centered on family workshops and embedded in dense, historically rooted local institutions. Families typically formed the main productions units, relying on social networks and sale agents which bridged producers in Ningbo and domestic-oriented retailers in Shanghai (Chen and Zhang, 2008). Ningbo was a leading region in reforming its economy: when China was still dominated by state-owned enterprises, family business units and town and village enterprises had already become the backbone of Ningbo's apparel industry. At this stage, development of its apparel industry was largely driven by its supplier-buyer links with Shanghai based on geographical and social proximity on the one hand, and its historical legacies of craft production and trading on the other (Chen and

Zhang, 2008). Ningbo's apparel products began to penetrate the domestic markets, which were still dominated by central and regional planning and its shortage economy.

Since the initiation of Reform and Opening-Up Policies in the late 1970s, Ningbo's apparel industry has experienced two rounds of industrial restructuring. The first round, catalyzed by the Reform, was centered on a process of transformation from small family business units to real registered enterprises (shareholding enterprises or limited liability corporations) and a process of privatization from state-owned enterprises to private or joint-venture enterprises. From 1980s to 1990s, the first generation of apparel enterprises emerged. As marketization, privatization and globalization deepened, firms also developed their own brands for domestic markets while taking on export contracts as global buyers increasingly relocated apparel production from Hong Kong, Taiwan and South Korea to mainland China. In 1990s, export-oriented production surpassed domestic-oriented production and soon comprised the bulk of Ningbo's apparel industry. In the late 1990s and early 2000s, nearly two-thirds of Ningbo's apparel firms export over 90% of their production, making Ningbo one of the largest apparel manufacturing and marketing bases in Asia (Li & Fung Research Centre, 2006; Zhao and Gu, 2009). This first round of restructuring was stimulated by an enormous increase in international demand for export goods, especially those dependent on low-wage and unskilled or semi-skilled labor and low-cost factor inputs. As a result, Ningbo's apparel firms quickly improved productivity, expanded their capacity and captured economies of scale, and tied their production process more closely to the demands of global buyers (Gereffi, 2009).

In the mid-to late-2000s, this export-oriented, low-wage model started to be challenged by the rising cost of labor and labor shortages in China's coastal region (Wang and Mei, 2009). Alongside the significant and rapidly changing labor market dynamics, other factors

have also been important, including the appreciation of China's currency, slackening global demand especially after the effects of the Asian financial crisis in the late 1990s and the global financial crisis of 2008, new environment regulations, the effects of China's new Labor Law, and the spread of expanded Corporate Social Responsibility (CSR) requirements in the industry (Li & Fung Research Centre, 2008; Yang, 2012). Dwindling international demand and rising production costs together formed an exogenous shock and further led to the second round of industrial restructuring in Ningbo's apparel firms (Figure 2), as many more took advantages of the new opportunities generated by a booming domestic market to adjust to weakening export orders.

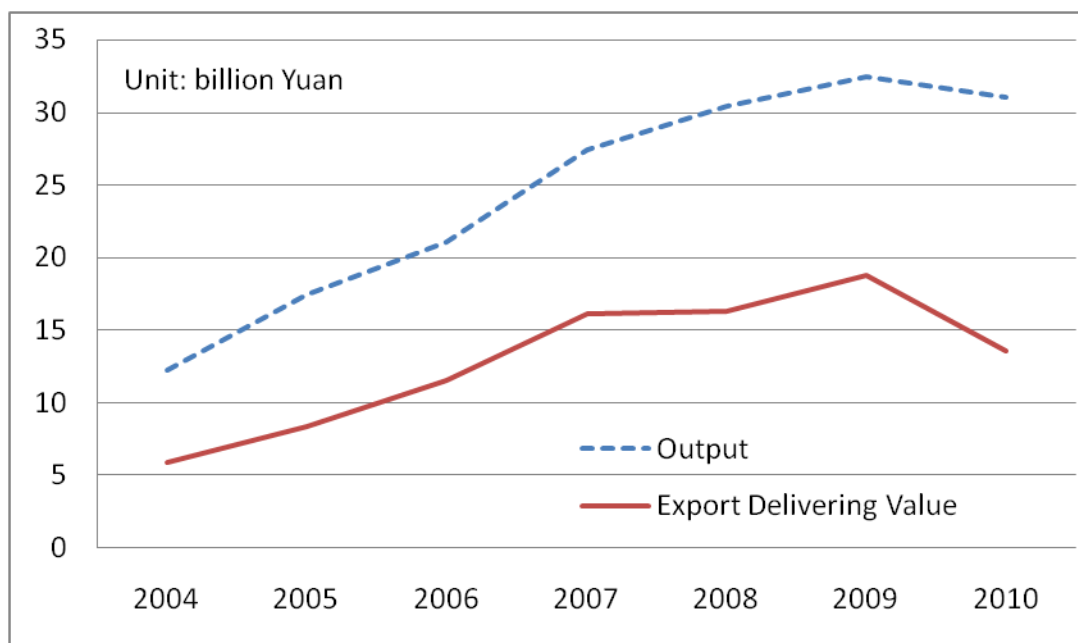


Figure 2 Output and Export Delivery Value of Ningbo's Apparel Industry

Data Source: Annual Report of Ningbo's Apparel Industry (2011)

(Note: Export Delivery Value refers to the value of exported goods on delivery. It is an indicator widely used by the China Statistical Bureau.)

This second round of restructuring has been characterized by a growing domestic-orientation, particularly in new firms. As costs rose and competitive pressures increased, apparel manufacturers recognized the unsustainability of labor-intensive, low-value and low-end OEM

production, and sought to establish core competencies in high-value OEM, ODM and OBM production. Ningbo's entrepreneurs either opted for upgrading to high-value OEM, ODM and OBM production after years of supplying global brands, or started new businesses directly with high-value OEM, ODM or OBM production. As a result, from the mid-to late-2000s a second generation of enterprises emerged whose characteristics were increasingly related to medium- and high-value production for domestic markets. In recent years, a third generation of enterprise is emerging. These focus on providing industrial intermediary services. They either receive orders from global brands and then outsource to competent subcontractors, or perform integrated product development, sourcing, shipping and logistics for global buyers. Their number and impacts are still limited, but their emergence signals a new way to participate in GVCs where the capture of rents is heavily dependent on the ability of an actor to pull apart the GVC, mediate transactions among its parts, and optimize each step.

This evolution of Ningbo's apparel industry has been shaped by the broader context of economic regulations and policies; the parallel and linked transformation of other manufacturing, agricultural, and service sectors in the region; and by the ways in which locally rooted institutions operated under state socialism and continue to do so (see (Pickles and Smith, 1998) for a similar argument about post-socialist European transformations). First, firms benefit from labor pools and inter-firm synergies they have cultivated over time, resulting in complicated vertical and horizontal linkages within the cluster. Far from the independent producers assumed to typify many export processing platforms, Ningbo's apparel enterprises emerged within locally-based intensely interwoven networks of trust and personal relationship (also see (Begg et al., 2005; Pickles, 1995, 1998) for analyses of these social networks in European socialist economies). Second, between the first and second round of industrial restructuring, the rapid

economic growth and export boom in Ningbo had been partly driven by China's central government's commitment to encouraging private sector-led export-oriented industrialization (He et al., 2008; Wei, 2000). Furthermore, China's decentralization has also empowered local governments to get involved in shaping the regional economy as planners, developers and policy-makers, and some of them have become heavy-handed actors that are ever more convinced of the importance of their 'steering' role (He et al., 2008; Wei, 2001b; Wei et al., 2007). The Ningbo Government has been especially active in pushing forward its apparel industry by offering generous financial and technological support to key enterprises, supporting the Annual Ningbo International Fashion Fair (ANIFF), and coordinating between large and small firms. Industry-based local institutions have flourished in recent years, exemplified by the Ningbo Garment Association (NGA). Established in 1998, NGA is one of the most influential business associations in Ningbo and it took over the running of the ANIFF since its initiation. In addition, it has been organizing visits of Ningbo's apparel firm managers to successful enterprises in China and abroad each year, often including factory tours and experience exchange. It represents the apparel industry in negotiating resource allocation, as well as helping local firms to establish design centers and training facilities. NGA has also lobbied nationally and regionally for industry supports for land, bank loans, and tax rebates.

Overview of the chapters

Chapter 2, "Bring In, Go Up, Go West, Go Out: Upgrading, Regionalization and Delocalization in China's Apparel Production Networks." The rise of China's export-oriented apparel industry since the 1990s has been driven largely by global sourcing practices intent on capturing the cost advantages of a development model predicated, in part, on unskilled or semi-skilled migratory labor flows, linking western and central labor pools to coastal production sites.

Until recently, the dominance of this model has fuelled growth in low-wage employment in the coastal regions and has provided few opportunities for economic and social upgrading. Since the early 2000s, coastal factories have increasingly had to confront difficulties generated by the increasing social and economic costs of this regionally concentrated low wage growth model. Specifically, Chapter 2 focuses on the role of the apparel industry in this process. It documents the major changes in organization and geographies of economic activity in the industry, and demonstrates how the central and local state, domestic and international capital and Chinese and other Asian workers are shaping the changing organization and geography of China's apparel industry. This chapter focuses particularly on firm strategies and state policies that have arisen in response to pressure to increase wages from workers, rising materials and energy costs and competition from other low-cost producers in Asia.

Chapter 3, "Global, Regional and Local: New Firm Formation and Spatial Restructuring in China's Apparel Industry." Using a large firm-level dataset on new firm formation, this chapter shows the articulation of global, regional and local factors are shaping the new firm formation pattern and industrial relocation in interactional and collective ways. The econometric estimations indicate the ways in which and the extents to which these factors affect firm location choice are highly determined by firm-specific capability.

Chapter 4, "Geographical Dynamics and Industrial Relocation: Spatial Strategies of Apparel Firms in Ningbo, China." This chapter examines the diverse trajectories of firm relocation. As many studies on the driving mechanism of firm relocation have lagged or failed to disclose the full view, I develop a comprehensive tri-polar analytical framework, which allows me to analyze the diversity of trajectories of firm relocation in the global, regional and local context. The empirical analysis applies this framework to the apparel industry in the city of

Ningbo. Through an analysis of several case studies I show the articulation of global, regional and local factors are co-shaping firm's relocation processes and the extent to which these factors affect firm's spatial strategies is highly dependent on firm's characteristic. The chapter also examines the opportunities for local suppliers generated by firm relocation.

Chapter 5, "Process, Product, and Functional Upgrading in a Globalized and Localized World: Firm-level Evidence from China's Apparel Industry." In this chapter, I focus on one of the central analytical heuristics in GVC research: the concept of upgrading, particularly as it has been used to highlight paths for developing countries firms to 'move up the value chain' usually through the lenses of four categories—product, process, functional, and inter-sectoral upgrading. While process and product upgrading have been linked to 'learning from *global* buyers', the sources of capabilities that lead to functional upgrading, are conventionally understood to derive from *local* knowledge transmission and *local* institutional context. This chapter seeks to test these findings and it does so by using an empirical, firm-level approach to measure upgrading at the firm level, which allows me not only to evaluate the extent of upgrading in the industry as a whole and to compare its extent among individual firms and selected groups of firms, but also to differentiate and measure different types of upgrading (i.e., functional, process and product upgrading). Empirical results confirm that the heterogeneity of firms, complexity of the effects of global and local linkages over firm upgrading, and the wider historical, political, institutional, economic and social context have all played a critical role in the process of firm upgrading and its articulation with global and local factors.

Chapter 6, "Upgrading in Apparel Global Value Chains: A Heuristic Analytical Framework." Recent literature dealing with economic upgrading has increasingly been problematized as the limits of dualistic claims about economic upgrading and downgrading, and

assumptions about linear, unidirectional upgrading trajectories have been brought into question. As trajectories and sources of upgrading have changed in recent years, the model of the global value chain has itself been adjusted to focus on emerging and new power relationships and upgrading trajectories, particularly with its emerging focus on social as well as economic upgrading. After a discussion of some limits to the treatment of upgrading in the global value chain literature, the chapter interrogates three key assumptions in the GVC model of economic upgrading and the development models it works with. These assumptions have become more problematic with the further development of GVCs. They relate to how we understand functional upgrading and GVC success, the binary of high and low roads to upgrading, and differential learning paths that presuppose specific forms of agency for local and global actors. The chapter concludes by outlining a tentative analytical framework to better guide innovative empirical research and policy making.

Chapter 7, “Path dependent and path breaking: An agent-based model of evolution, co-evolution, and lock-in in a Chinese apparel cluster.” In recent years, former assumptions about the flexibility industrial clusters provide to firms within them has been questioned as inter-firm linkages have, in some cases, locked-in path dependent practices thereby increasing economic rigidities. Not only has the canonical path dependence model overlooked other trajectories of cluster evolution, but it also rarely pays attention to the role of individual agency in affecting path-dependent processes. In this chapter, I build on this critique which has largely been developed in evolutionary economic geography and explore how a cluster becomes progressively locked-in and how the knowledge-base of an industry becomes homogenized resulting in a loss of innovative dynamism and a slowdown in the growth, or even stasis, of the cluster. These rigidities and inflexibilities amongst a cluster’s firms become especially apparent once the cluster

is subjected to an external shock, leading to a round of far-reaching restructuring. The chapter then investigates some of the ways in which different kinds of agents are co-evolving in response to the external shock and the dilemmas it pose. It does so by portraying the co-evolution of governments and firms as a process fraught with tensions and divergences.

Methodology

Data sources

One database on firm-specific economic and financial variables is central to the firm level analysis in this research: China's Annual Survey of Industrial Firms (ASIF) (1998-2009). The study time period from 1998 to 2009 is critical in terms of the development of China's apparel industry as well as its entire manufacturing. This time period is often described as a turning point laden with a variety of far-reaching events which have potentially transformed China's apparel industry in fundamental ways, such as China's entry into the WTO in 2001, the removal of quotas on apparel exports to the developed countries in 2005, the appreciation of China's currency since 2005, and the emerging labor shortage and rising production costs along China's coastal area since the early 2000s. The 2007/8 global financial crisis which has stimulated Chinese apparel restructuring, upgrading and relocation also falls into this time period, though its complete effects may take more than two or three years to be seen.

The ASIF is administered by the National Bureau of Statistics of China and covers all Chinese industrial state-owned enterprises and non-state-owned enterprises with annual sales of 5 million RMB or more. The database provides firm-level data on firm structure and operation, including firm identification, location, capital structure, total profits, total shipments, exported shipments, intermediary inputs, asset value, inventory, employment, sales value, type of investment, output, value added, R&D expenses, education and training of staff, and wages, social insurance, and benefits paid. This research will only focus on the apparel industry

(Number 18 two-digit industry in the Industrial Classification for National Economic Activities GB/T 4754-1994 and GB/T 4754-2002).

Fieldwork

The empirical study was undertaken based also on recent field investigation during the periods of 2011 and 2012. The interviews were carried out with four groups of agents to understand the firm's geographical and organizational strategies in the face of intensified competitive pressures. A total of twenty-two face-to-face interviews were conducted with twenty firms. Each interview was with a senior manager, and was accompanied by a shop floor visit to see the plant in operation. In addition, two interviews were conducted with local government officials. Three interviews were conducted with representatives from the local apparel industry association (i.e. Ningbo Garment Association) and another two interviews with representatives from national apparel industry association (China National Textile & Apparel Council and China Textile Planning Institute of Construction). Moreover, four interviews were conducted with the leading scholars of the apparel industry in China, including professors from Peking University, Zhejiang Normal University and Zhejiang Textile & Fashion College. Each interviews lasted at least two hours, and those with key interviewees such as representatives from apparel association and government officials, and several leading entrepreneurs took half a day. Local government and apparel association were first contacted and interviewed, to understand the general structure of Ningbo's apparel industry. After this, interviews with local apparel entrepreneurs were organized with the guidance of local government and apparel association.

In the first hour of interview, I used a semi-structured method, conversed with respondents based on some prepared questions. The second hour of interview was conducted in an open-ended method with no predetermined questions. This informal and semi-structured interview methodology allowed respondents to transcend the confinement of researcher-

dominated conversation and unconsciously mentioned something of importance. For example, the extent to which his/her firm was embedded into local cluster might highly depend on how close he/she was with other entrepreneurs in the same cluster. Discussion of such personal information cannot be explored thoroughly with predefined specific questions. Sometimes, entrepreneurs who were unwilling to evaluate their own geographical and organizational strategy if it was not a great success, however, would likely mention and judge other firms' strategies. This enabled me to triangulate key information of one firm based on the comments from other entrepreneurs, and sometimes from government officials and apparel association representatives.

The interviews were enriched with secondary information collected from sector-specific publications, company reports, and websites. This research was indebted to Ningbo Garment Association and Zhejiang Textile & Fashion College which generously shared materials and documents with us, such as Blue Book of Ningbo's Apparel Industry and Annual Report of Ningbo's Apparel Industry (2009-2012). The overview of Ningbo's apparel industry presented above is based on these secondary materials, which also allowed me to triangulate between different sources and to verify information collected from interviews.

CHAPTER 2 BRING IN, GO UP, GO WEST, GO OUT: UPGRADING, REGIONALIZATION AND DELOCALIZATION IN CHINA'S APPAREL PRODUCTION NETWORKS

Introduction

In recent years, a great deal of research in economic sociology, political economy, international studies and economic geography has focused on the globalization, governance and rapidly changing geographies of Global Commodity Chains (GCCs), Global Value Chains (GVCs) and Global Production Networks (GPNs) (Bair, 2009; Gereffi, 1999; Gereffi et al., 2005; Henderson et al., 2002; Smith, 2012). These attempts to account for the shifting patterns of manufacturing and work and the state and its industrial and regional policies are seen to be playing an increasingly important role in mediating the potentially destabilizing effects of what Gereffi and Mayer (2006) refer to as the “governance deficit.” In this process, a reconsideration of the role of national industrial policies, trade policies and labor regulations is emerging. This is particularly the case in China, where, despite the apparent retreat of the state since its market-oriented reforms, the state has continued to be an active participant not only in strategically critical industries such as the manufacture of transport equipment, but also in the “most globalized” and least protected industries such as apparel. In this chapter, I focus on the apparel industry and argue that – after a period of liberalization, globalization and marketization – state policies, social pressures on low-wage manufacturing and changing demands of different end markets are becoming important drivers of industrial upgrading in eastern China and crucial drivers of the relocation of low value-added segments of the industry to other regions and countries.

I focus on these industrial and regional dynamics and the various adaptations the apparel industry is undergoing in response. The chapter documents some of the ways in which different levels of government and different kinds of firms are attempting to deal with these limits and the dilemmas they pose. It does so by focusing specifically on spatial and organizational responses including factory consolidation, plant closure, product, process chain upgrading and geographical relocation (Liao and Chan, 2011; Yang, 2012). I draw on fieldwork in China in 2011 and 2012, interviews with firm managers, CSR officers, labor organizations, regional administration and central government officials and industry association officials, as well as firm-level data to assess spatial changes over time. I seek to demonstrate that the model of inward investment, global sourcing and export orientation is already undergoing fundamental restructuring, producing new geographies of production and employment, with the consequent need to re-assess the policy implications of China in global production networks. Section II contextualizes the development of the apparel industry in terms of a specific export-led model of industrialization (its spatial distribution, export, output value, employment and the temporal changes of these indicators), with a particular focus on the pressures that have cut manufacturers' profit margins and are now forcing the government and manufacturers to implement new strategies to manage competitiveness and the social costs of growth. Section III outlines the emerging limits of this model of industrialization. Section IV deals explicitly with three policies and enterprise responses to these pressures: *upgrading*, *westernization* (or regionalization) and *delocalization* (or outsourcing). The chapter concludes with an analysis of the impacts of these policy initiatives on apparel production networks and global value chains.

Bring in: export-led assembly and the rise of China in global apparel value chains

The integration of the Chinese apparel industry into GVCs deepened greatly after 1990.

Between 1994 and 2010, despite declines in 1998 and 1999 as a result of the Asian Financial Crisis, China increased its apparel exports from US\$24.3 billion to US\$149.5 billion (Table 1). In the 1990s, apparel exports were driven largely by demand from US markets, but with entry into the WTO in 2001 and the removal of quotas worldwide after 2004, Chinese apparel exports expanded to all world markets.

Table 1 Export of apparel products (1994-2010)¹

Year	Exports (US\$ Million)	Import (US\$ Million)	% of total exports	% of total imports
1994	24,281	1,439	20.1%	1.2%
1995	21,947	1,934	14.8%	1.5%
1996	25,439	2,146	16.8%	1.5%
1997	32,142	2,300	17.6%	1.6%
1998	30,681	2,227	16.7%	1.6%
1999	31,185	2,274	16.0%	1.4%
2000	37,029	2,508	14.9%	1.1%
2001	37,474	2,584	14.1%	1.1%
2002	42,968	2,764	13.2%	0.9%
2003	54,434	3,047	12.4%	0.7%
2004	65,561	3,335	11.0%	0.6%
2005	79,890	3,507	10.5%	0.5%
2006	105,340	3,876	10.9%	0.5%
2007	127,930	4,313	10.5%	0.5%
2008	136,510	4,667	9.5%	0.4%
2009	123,792	4,032	10.3%	0.4%
2010	149,482	4,846	9.5%	0.3%

Source: (National Bureau of Statistics of China, 2011)

Between 1995 and 2008, China more than doubled its share of global apparel exports, from 15.2% to 33.2%, and it experienced a fivefold increase in the value of its apparel exports, from US\$24 billion to US\$120 billion. With expanded exports, dependence on specific markets was reduced (Gereffi and Frederick, 2010). Thus, while China's top ten export destinations accounted for 91.5% of apparel exports in 1996, the top ten markets accounted for only 79.1% in

¹Data on exports of apparel products are calculated by adding up four categories of Textile and Apparel Articles: 1. Knitted or Crocheted Fabrics. 2. Articles of Apparel and Clothing Accessories, Knitted or Crocheted. 3. Articles of Apparel and Clothing Accessories, not Knitted or Crocheted. 4. Other Made Up Textile Articles; Sets; Worn Clothing And Worn Textile Articles; Rags Articles; Rags. These four labor-intensive sectors have increased faster than other categories of Textile and Apparel Articles and represented 76% of China's export of Textile and Apparel Articles in 2010, compared to 71% in 1994.

2008. In 1996, Japan alone accounted for 32.6% of China's apparel exports and the US and the EU-15 accounted for another 22% (Hong Kong's 26.4% of exports was largely for re-export). While by 2008 the EU-15 and the US had become the top two export destinations, they then accounted for less than 40% of total apparel exports and exports to Japan had dropped from 32.6% to 14.7%.

As the structure of China's industry changed and as producers shifted their comparative advantages from low-wage labor and low-end technology to medium technology and higher quality goods, the apparel share of total exports, particularly manufacturing exports, continued to decline. As a share of total exports, apparel declined from 20.1% in 1994 to 9.5% in 2010 and the value of apparel imports (always relatively small) declined from 1.2% to 0.3%, but as an employment generator apparel remained important, accounting for more than 5% of employment in all industrial sectors in 2009.

The resulting geographies of apparel manufacture and employment were shaped increasingly – at least until recently – by these shifts in global sourcing for export markets. Export production was concentrated in eastern coastal regions, with primary concentrations in Shandong, Jiangsu, Zhejiang and Guangdong provinces and some outliers in regional centers such as those in central China along the Yangtze River (Figure 3). The three planning regions in Figure 4 – Western, Central, and Eastern – are China's formal administrative planning regions. I introduce them here to provide a clearer picture of patterns of employment growth and change beyond the provincial level and to provide a name locator for the specific regions, some of which are referred to in the following sections. With regional concentration and the emergence of industrial clusters and city regions devoted to specific products, the demand for labor rapidly out-stripped local labor market capacities. As a result, manufacturers became increasingly

dependent on expanded flows of low-wage migrant workers from the countryside, particularly from inland regions.

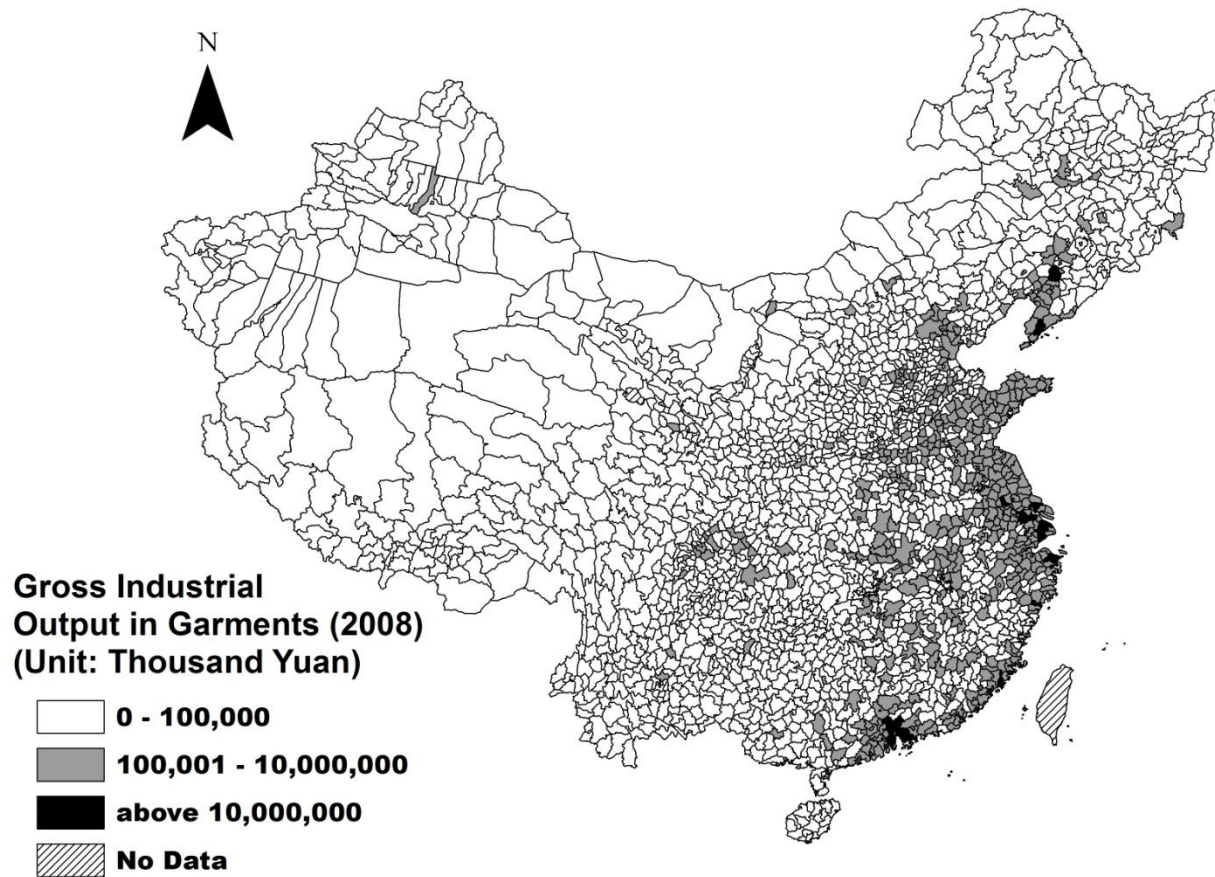


Figure 3 Spatial Distribution of Gross Industrial Output in Garments by County
Source: Compiled by authors from China's Economic Census in 2008.

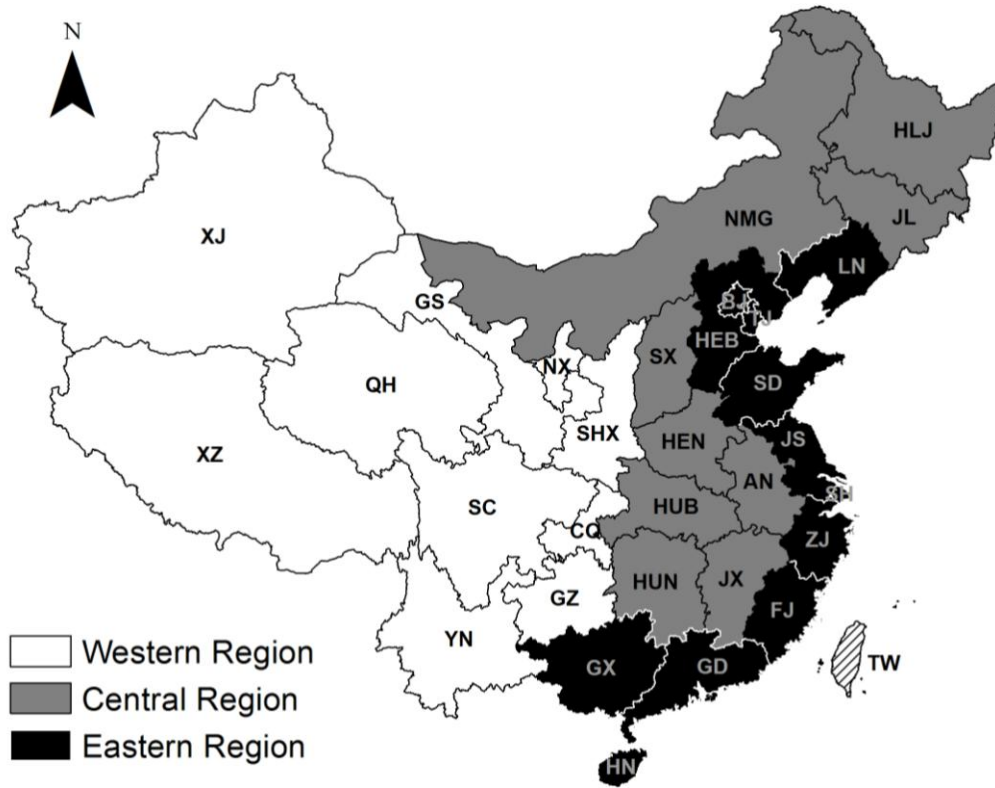


Figure 4 Chinese Provinces and Centrally Administered Municipalities

(Note: AH: Anhui, BJ: Beijing, CQ: Chongqing, FJ: Fujian, GD: Guangdong, GS: Gansu, GZ: Guizhou, GX: Guangxi, HEB: Hebei, HEN: Henan, HLJ: Heilongjiang, HN: Hainan, HUB: Hubei, HUN: Hunan, JL: Jilin, JS: Jiangsu, JX: Jiangxi, LN: Liaoning, NMG: Neimenggu (Inner Mongolia), NX: Ningxia, QH: Qinghai, SC: Sichuan, SD: Shandong, SH: Shanghai, SHX: Shaanxi, SX: Shanxi, TJ: Tianjin, TW: Taiwan, XJ: Xinjiang, XZ: Xizang (Tibet), YN: Yunnan, ZJ: Zhejiang)

For many, this was a “race to the bottom” with intensification of the labor process, low wages, poor labor and environmental standards and weak enforcement of national and local laws (Appelbaum et al., 2005). For others, China is simultaneously engaged in a “race to the top,” with some enterprises aggressively trying to move up the value chain through investments in R&D, design and advanced manufacturing, with an emphasis on domestic innovation. This export boom – officially referred to as the BRING IN policy – was predicated on low-wage assembly production, but has quickly generated greater capacity, vertical and horizontal integration, higher utilization rates, product specialization, increasing familiarity with technology and large learning-by-doing effects. As a consequence, producers have been able to sustain

internationally competitive prices while offering progressively higher quality products in expanded economies of scope and scale.

The limits of export-led, low-wage industrialization

Since the early 2000s, factories in eastern China have increasingly confronted difficulties generated by this export-led low-wage growth model. The first dramatic transformation was driven by appreciation of China's currency, inflation, increased raw materials costs, lack of water and electricity as industrial capacity expanded, and increasing labor costs and labor shortages as local and migrant workers shifted away from jobs with low wages and poor working conditions, prevalent in the industry. Export-oriented firms, in particular, found themselves squeezed between low contract prices, rising input costs and the struggles of migrant workers for better wages and working conditions, increasing numbers of whom have found it progressively easier to shift into other industries and occupations (Inagaki, 2006). According to the Ministry of Human Resources and Social Security of China, the average monthly salary for the country's migrant workers reached 2,049 Yuan (\$325) in 2011, up 21.2% from 2010 (*China Daily*, February 29, 2012). Currency exchange rates were also important with – in the case of Zhejiang province for example – every 1% rise in the value of the RMB leading to 3.19%, 2.27% and 6.18% declines in profit margins for cotton textiles, wool textiles and apparel, respectively (*Global Textiles*, December 1, 2004). As a result, in 2008, two thirds of textile and apparel enterprises in six provinces (including Jiangsu, Zhejiang and Shandong) were operating with profit margins as low as 0.62%, and the profit margins for the remaining enterprises were only 6-10%, with an average as low as 3.9% for all textile and apparel enterprises (*First Financial Daily*, March 27, 2008).

The second transformation was driven by policy changes which indirectly increased

production costs. Labor costs have been affected by the 2008/9 new Labor Contract Law (LCL) and by China's Social Compliance 9000 for the Textile & Apparel Industry (CSC9000T). These have extended labor rights, particularly concerning overtime, delayed wage payment and job security. As one firm manager in Ningbo commented:

The new labor law did lead to a substantial increase of production costs, in particular for small firms which only do OEM production and work on low margins. They had difficulties in absorbing such costs as easily as firms doing OBM and ODM
(General Manager of Peace Bird, translated from Chinese)

At the same time, the apparel industry has been confronted by more environmental regulations, particularly those based on the 2007 State Council *Comprehensive Work Plan of Saving Energy and Diminishing Pollution*, which increased the expense of pollution control for producers.

Apparel manufacturers have also been hit hard by the third transition of the business environment; global demand declined, especially after the outbreak of the financial crisis and the foreign trade disputes and anti-dumping suits. China ranked first worldwide with 338 anti-dumping cases between 1995 and 2005. Of the 169 anti-dumping cases concerning textile and apparel products between 1995 and 2007, 32 were against China, the highest number among all countries (*Textile and Apparel Weekly*, February 22, 2008). These problems, combined with upward pressure on wages, low labor productivity, and increasing demands from customers for higher quality, faster runs and expanded services, have squeezed the coastal apparel producers who expanded in the 1990s and early 2000s. They now face much tighter margins on contracts, challenges in managing workforce recruitment, retention, development and competition from other lower cost coastal areas, central and western regions of China, and other countries of southeast and south Asia (Interview, firm managers and industry association officials, Beijing and Ningbo, August 2012). As a result, export growth for garments fell sharply to 1.8% year-on-year in the first three quarters of 2008, compared to 20.9% for 2007.

During the 1990s, apparel employment became increasingly concentrated in coastal regions (see Figure 5).² Since the early 2000s, the pressures on coastal apparel manufacturers have forced drastic changes in firm behavior, leading to upgrading, expansion of operations to new products or centers or relocation to lower cost locations. Guangdong has succeeded in keeping its dominant position with about 12.8% of the market share in 1988 and 24.2% in 2007. Zhejiang nearly tripled its share, from 6.7% in 1988 to 17.2% in 2007. Jiangsu significantly increased its share, from 11.2% in 1988 to 17.1% in 2007 and maintained one of the dominant positions. The apparel industry in Shanghai was the first to experience these pressures, with some firms investing in new forms of product, process, functional or market upgrading and others relocating production to regions with lower costs. As a consequence, apparel employment in Shanghai declined from 603,000 in 1998 to 146,000 in 2007. As the 2007 map of employment shows, apparel employment has already started to shift westward to Henan and Jiangxi provinces.

²Longitudinal analysis of industrial employment in textiles and apparel has to take into account the administrative change between 1988 and 2007 when Chongqing was upgraded to a centrally administered municipality in 1997, adding an additional administrative region to the 30 spatial units that existed before 1997.

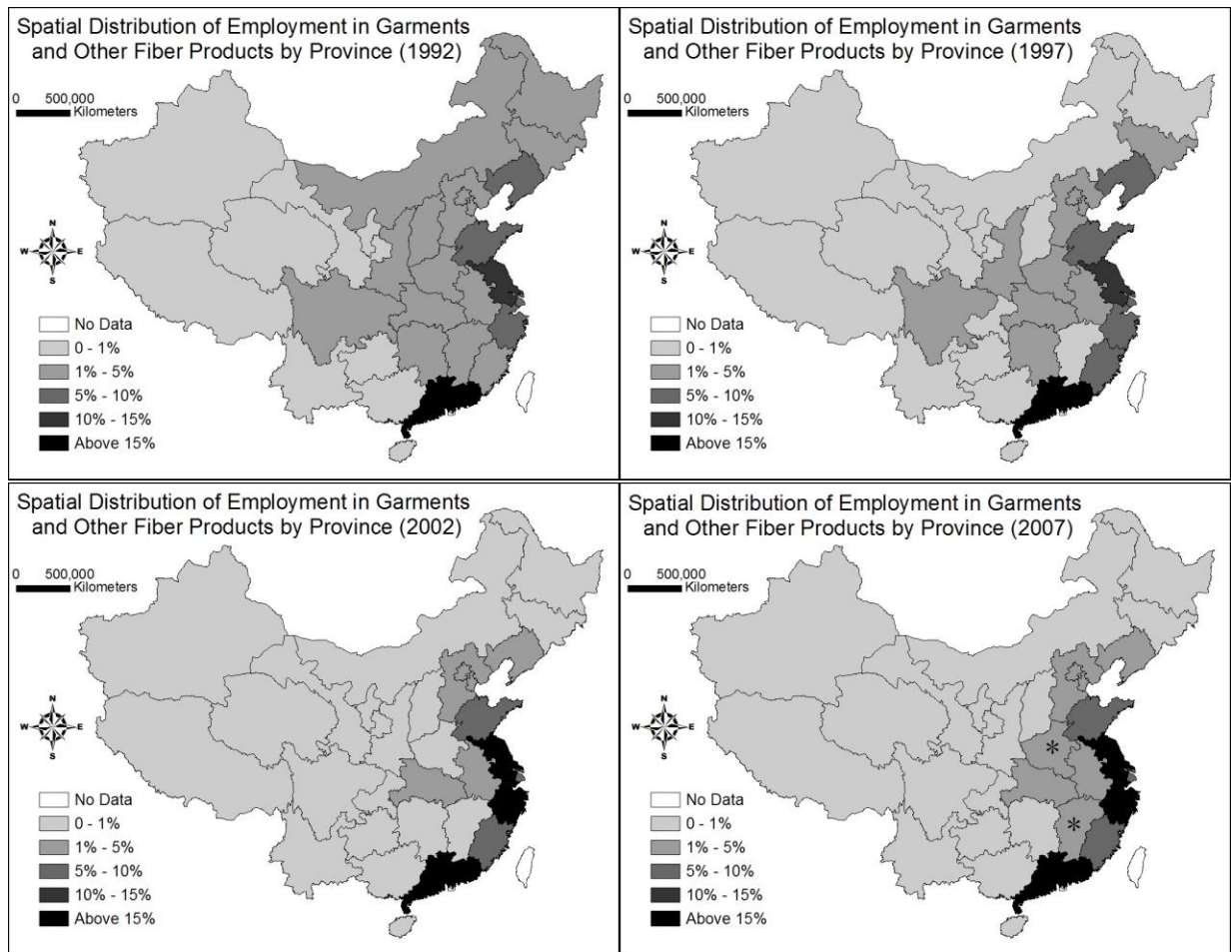


Figure 5 Temporal Changes of Distribution of Employment in Garments by Province
Source: Compiled by authors from annual issues of China Industry Economy Statistical Yearbook

China's exceptional export performance in labor-intensive manufacturing (particularly apparel) has long been associated with the specific industrial organization and spatial structure typified by these coastal zones. The detailed division of labor and sectoral specialization in its apparel clusters and its supply chain cities ("sock cities" and "button cities") produced locations that were efficient and dynamic centers of expanded and intensified production in large part because of the ways in which the agglomeration economies of their locally and regionally embedded institutions, thick labor markets and tacit knowledge and practices were able to foster dynamic growth, innovation and economic competitiveness. As apparel firms begin to struggle with some of the diseconomies of scale once offered by these locations, and increasingly

experience competition for workers and upward pressure on wages, different organizational and spatial strategies have emerged with some firms investing rapidly in various forms of industrial upgrading and labor market development, while others are moving out of these clusters and seeking to agglomerate in new geographies. The challenge facing the resulting delocalization of apparel production will be the extent to which new competitive advantages emerge or can be built in these new spaces, and the extent to which “thick ties,” embedded institutions and deep labor markets can be reproduced in the emerging geographies of production. Who is moving and who is staying, and to what extent is the re-institutionalization of new productive spaces being driven by firms and by government policy?

Upgrading, regionalization and delocalization

While most studies of GVCs and GPNs have focused on the diversity of forms of governance within the value chain, rather than on the role of state actions and government policies, recent work on GVCs and production networks has stressed the significant role that state action plays in the international, national and sub-national formation, constitution and restructuring of firms in global production networks (Gereffi et al., 2005). In this section I analyze upgrading, regionalization and delocalization strategies in the context of national economic regulation and policies. The state, in particular, has played an important role through national economic regulation and policies in shaping patterns of industrial upgrading, regionalization and delocalization (Coe et al., 2008a; Dicken, 2007; Liu and Dicken, 2006).

GVC analysis defines “governance” as the functional integration and coordination of internationally dispersed activities (Gereffi, 1999) and often argues that the action and motivations of global buyers are the key causal forces in the organization of global contracting systems (Gereffi, 1999; Schmitz and Knorrninga, 2000). While GVC analysis does not exclude

possibilities for local institutions to affect outcomes, state policies and institutional context have been under-estimated (Gereffi et al., 2005). Bair (2009) has argued that in such analyses institutional context was too often added later and still remains the least developed dimension of value chain analyses. Most recently, Adrian Smith (2012) has called for a much fuller engagement within GVC analysis with state theory and the role of institutional actors and regulations. Because globalization destabilized the governance of nation state and local institutions through its footloose sourcing practices, an increasing proportion of work for the global market took place in locations where governance capacities were weak, if developed at all (Mayer and Pickles, 2010). As a result, the absence of public and private regulation – the global “governance deficit” – has been the focus of much subsequent political, economic and non-governmental analyses and interventions (Gereffi and Mayer, 2006). GPN analysis has been more explicit in its attention to the importance of institutional context and the whole range of factors that contribute to shaping global production and focuses on moving away from the firm- and chain-centered claims of GVC work, but even here the state is theorized in a limited sense as a single institutional ensemble wielding uneven forms of power over global production networks (Coe et al., 2004; Dicken and Henderson, 2003; Henderson et al., 2002).

It is increasingly acknowledged that developing economies need to embed private initiatives in a framework of public action that encourages industrial restructuring, diversification, and technological dynamism beyond what private governance would generate on their own (Bair and Dussel Peters, 2006; Dussel Peters, 2008). This recognition is now particularly widely perceived in those countries where market-oriented reforms were taken the farthest and the disappointment about the outcomes caused by market failures is correspondingly the greatest. In China, the social consequences of low-value, low-wage export production have become

increasingly serious, forcing the central government and regional administrations to become more active in regulating the trajectories and geographies of change in the industry.

After a period of liberalization during which the direct role of the state in shaping industrial locational and organizational decisions was diminished in apparel firms, government strategies are now playing an increasingly leading role in shaping industrial policy in labor-intensive and low-value enterprises, pushing and encouraging them to relocate from the higher-cost eastern regions to release space and resources for higher-value apparel and other industries while simultaneously encouraging economic development in less developed inland locations, particularly in areas from which migrant workers have been drawn. Thus, in addition to China's continued commitment to encouraging inward investment (BRING IN policy), these adjustments have given rise to three broad additional state policies: upgrading (GO UP policy), regionalization or westernization (GO WEST policy) and delocalization (GO OUT policy). The GO UP policy refers to Chinese manufacturers that are being encouraged to upgrade production and working conditions *in situ* with the goal of branding Chinese goods for national and increasingly for international markets. The GO WEST policy refers to low-wage assembly industries that are being encouraged through subsidies, contracts, and infrastructural development to relocate to or expand in new lower-cost and less developed locations *inside China* (mainly, but not limited to, Western and Central provinces), often regions from which migrant workers have traditionally been drawn. The GO OUT policy refers to low-wage assembly work that is being encouraged to outsource to low-cost producing centers *outside China*, particularly under the auspices of emerging, large-scale Chinese manufacturers and network organizers.

The business environment and government policy to support upgrading, regionalization

and delocalization have emerged as major drivers of industrial upgrading, regionalization, and delocalization in many traditional manufacturing and export hubs for apparel products, particularly in the coastal region. Manufacturers have responded in four ways (Figure 6).³ In the subsequent sections I describe each in turn.

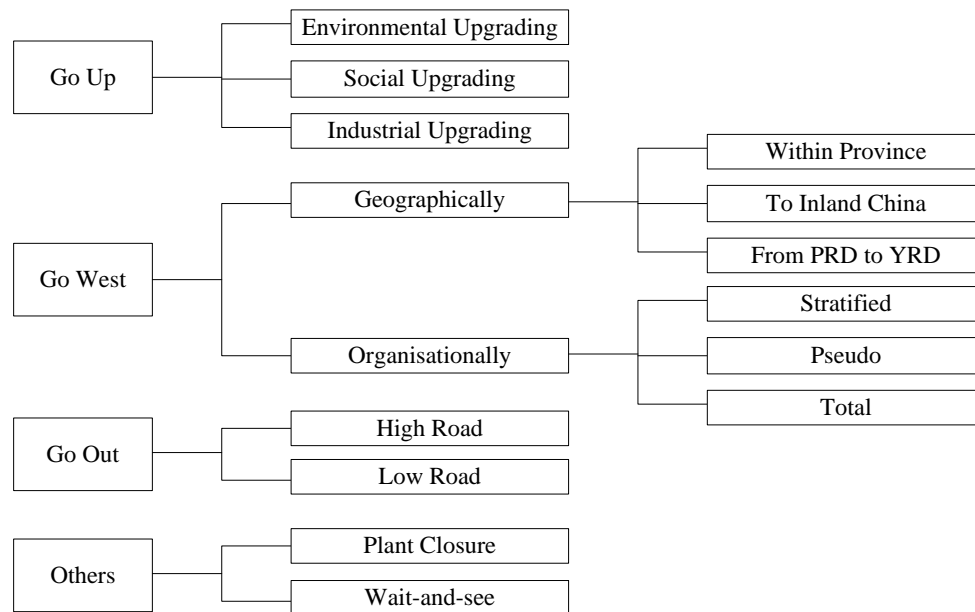


Figure 6 Restructuring Strategies Adopted by the Export-oriented Apparel Firms
Source: Compiled by Authors.

GO UP: policies initiatives on industrial upgrading

One of the key drivers of the complex regional production network dynamics is the role of industrial and value chain upgrading. Upgrading involves producers' capability "to make better products, to make products more efficiently, or to move into more skilled activities" (Kaplinsky, 2000; Pietrobelli and Rabellotti, 2006: 1; Porter, 1990). It is an increasingly central

³GO WEST here refers to one general tendency to expand or relocate from the Pearl River Delta (PRD), Yangtze River Delta (YRD) and Shandong Province to other lower cost regions, including intra-provincial shifting of production (e.g., to the outskirts of Guangdong and west across the Pearl River). This policy also covers the sub-contracting and outsourcing of production to the informal sector and SMEs in less-developed areas inside China as firms attempt to lower their costs. Also within what I refer to as GO WEST the specific locational patterns of individual firms may, of course, be more complex. Besides these general trends, there are also reasons for factories in PRD to move to YRD or Jiangxi (go-north), while some factories prefer to relocate within or near to their existing locations.

element in shaping new geographies of production, as economic actors (countries, firms, workers and regional economies) shed low-value activities, and the social and economic problems they can generate, in favor of higher-value activities (Bair, 2005; Gereffi, 2005; Humphrey and Schmitz, 2002b; Ponte, 2002).

Industrial upgrading is central to the state's central planning mechanism. In China's Eleventh Five-Year Plan, the upgrading and optimization of industrial structure ranks second among the main goals of economic development from 2006 to 2010, aiming at increasing industrial competitiveness through expanded R&D, branding, and expansion of tertiary industries, accelerating development of high tech industries, improving efficiency in energy use, encouraging independent innovation and supporting advanced technical education. Between 2000 and 2005, the proportion of expenditure on R&D to the total GDP increased from 0.9% to 1.3%. According to the Eleventh Five-Year Plan, more than 100 national engineering laboratories were to be built between 2006 and 2010. Education and skill training for labor are being promoted at both national and local levels. Many local governments also offer free training for migrant workers, such as the "Sunshine Project: Training for Labor Transferred from Rural Areas" (The State Council of the PRC, 2004).

In order to variously support and compel apparel firms to upgrade, the *Adjustment and Revitalization Plan of Textile and Apparel Industry* released by the State Council in 2009, identified several adjustment and revitalization tasks for the textile and apparel industry in 2009-11. These tasks included an increase in the export tax rebate rate from 14% to 15%, support for expansion of domestic consumption, new investments in autonomous innovation and independent brand development, support for key enterprises and consolidation in the small and medium-sized enterprise sector (SME), recapitalization schemes to replace outdated equipment,

optimization of the regional structure of production to promote industrial upgrading in the eastern coastal areas and enhanced credit and other financial support for SMEs. The Plan placed particular emphasis on building a strong textile and apparel industry to survive the financial crisis and shifts in global demand.

As a result, in recent years apparel enterprises have rapidly been adopting new technologies and experimenting with product development, environmentally friendly methods, focusing more on brand building and product design and exploring international markets for higher value products and domestic markets to stabilize production runs (Mayer and Pickles, 2009). One such company is the Hongdou Group. In 1980s, Hongdou began hiring engineers and technicians, and investing in new technology and product innovation. In 1993, it made the decision to extend its production capacity and industrial chain, producing suits, shirts and other apparel products of much higher quality and value. In 1995, Hongdou also adopted a strategy of chain upgrading by annexing capital intensive motorcycle and tire manufacturing enterprises, as well as investing 90 million Yuan in the pharmaceutical industry. Meanwhile, with growing skilled labor shortages, Hongdou changed its recruitment policy in its apparel factories. Instead of attempting to recruit skilled labor in increasingly tight labor markets, it built up its own Wuxi Hongdou Vocational School and trained workers internally. In addition, Hongdou upgraded this vocational school to Hongdou College so as to teach not only production and manufacturing tasks but also R&D, marketing and design (*Hongdou Group News*, June 7, 2010).

Firms who have had difficulty upgrading in these ways have had to struggle with increased competition and downward pressure on contract prices while being pushed by buyers to accept increased requirements for volume, quality, and delivery. As a result, industrial upgrading is not an unambiguous good, with these added demands being transferred to workers

through increased discipline, extended hours and speeding-up of production lines, with the unfortunate consequence that technical and organizational upgrading has resulted in the downgrading of social conditions and, in some cases, job loss (Mayer and Pickles, 2009; Pickles et al., 2006). The relationships between industrial upgrading/downgrading and social upgrading/downgrading are not linear and one form does not easily follow another within any specific regional economy (Pickles and Smith, 2011).

Recognizing the importance of this issue and the need for explicit state action to support social upgrading, the 2007 National People's Congress of China promulgated a new Labor Contract Law (LCL), which took effect on 1 January, 2008, with the objective of improving working conditions. Labor law is a relatively new phenomenon. The first comprehensive labor law was passed in 1994. Prior to the LCL's passage, most employees in SMEs did not have employment contracts. Even those with contracts often only had short-term agreements, providing employers with the flexibility to bring in new, often cheaper, workers as needed. Employers often refused to pay overtime and some even relied on forced labor (Interview, textile association staff, Beijing, June 2011). The new LCL has made many changes to prevailing contracting and employment practices (Table 2). The main intention of the new LCL was to expand protection to employees by offering an "employee-friendly" environment (*BMU Service*, January 1, 2008). One consequence has been the formalization of labor contracts and the enforcement of worker rights after specific periods of employment. The indirect effect in many factories has been the adoption of a more cautious hiring policy and the consolidation of work contracts around key technical personnel, with a parallel increase in short-term and temporary work contracts. As one firm manager in Ningbo commented

Firms which rely on short-term and temporary workers and fire them before the probationary period ends are stupid, because workers hardly contribute to their firms in

the first few month. Firing them before they can really create profits is like killing the goose before it can lay eggs. A smart employer should get through this challenge through upgrading his firm.

(Founder of Baimu, translated from Chinese)

It remains too early to draw any determinate conclusions about the effect of the new labor law on firm strategies, but initial evidence points to a range of responses from workforce upgrading to the outsourcing of production (Lan and Pickles, 2011).

Table 2 Key Points of China's New Labor Contract Law

	Key Provisions
1	In drafting or revising work rules and regulations, an employer must consult with the applicable labor union, employee representatives or the employees. If the work rules are deemed to be inappropriate, the labor union, employee representatives or the employees may raise issues during the consultation process.
2	Employers are required to execute a written labor contract with an employee within one month of hiring or face statutory penalties.
3	The probationary period of an employee is determined according to the length of term of the labor contract.
4	An employer may require an employee to sign a service agreement requiring a period of service for, and imposing an early termination penalty on, an employee who receives training at the employer's expense. Only senior management personnel, senior technical employees or other employees who have access to an employer's trade secrets may be required to sign confidentiality and non-compete agreements, which may extend for a period of up to two years.
5	Three types of labor contracts are authorized: fixed-term contracts, non-fixed-term contracts and project-based contracts.
6	Severance payments are required in many circumstances under which an employee is terminated.

Source: BMU Service (2008).

The former Ministry of Textiles and Clothing, now organized as a series of public-private associations, has also actively responded to the need to improve workplace and product standards by creating standards and codes “designed to fit Chinese conditions” (Interview, China National Textile and Apparel Council, Beijing, June 2011). The China Social Compliance 9000 for Textile & Apparel Industry (CSC9000T⁴) was developed in 2005 by the China National Textile and Apparel Council with the co-operation of the China Federation of Labor Unions

⁴China's CSR standard, CSC9000T, so far only applies to the textile and apparel industry (hence the 'T')

which is the only lawful trade union. It is a combination of the management standard ISO 9000 and the CSR standard SA8000 (*Asia Portal*, July 13, 2008). SA8000 is based on international labor and human rights law, while CSC9000T is based on China's labor law. The latter refers to an extensive list of international human and labor rights declarations and conventions, such as the United Nations Conventions on the Rights of the Child, the Universal Declaration of Human Rights, the International Covenant on Social, Economic and Political Rights, the UN Convention on the Elimination of all Forms of Discrimination Against Women and the International Covenant on Civil and Political Rights. Also important are ILO Conventions on weekly rest, accident compensation, minimum age, tripartite consultation and equal remuneration. The CSC9000T contains three main sets of principles: (i) Enterprises are required to set up a CSR management system based on the Plan-Do-Check-Act model; (ii) Employees must be offered written employment contracts and employers must not use child or forced labor, observe legally stipulated working hours, and pay legally required wages; and (iii) Employers are required to respect the rights of employees to form and join the trade union and to bargain collectively, not to discriminate against workers, to prohibit harassment and abuse and to pay attention to occupation health (*Responsible Supply Chain Association*, November 14, 2010).

CSC9000T and LCL aim to contribute to the promotion of employee well-being and social upgrading, but they too are not without their limits. Thus, while China's LCL allows employees to establish local or industrial branches of the official trade union, it does not allow independent trade unions. As a result claims that the LCL provides better protection for employees than ILO conventions in a number of areas cannot be tested (*Asia Portal*, July 13, 2008). Also, absent independent labor organization, employers' enforcement of existing regulations has been uneven, hampered in some cases by conflicts between central authorities

pushing social upgrading and local authorities focusing more on enterprise competitiveness and potential job loss resulting from enterprises relocation.

GO WEST: regionalization policies and inter-regional competition

Driven by the export-oriented industrialization, the coastal regions expanded their production capacity much more rapidly than central and western regions. The development gap between eastern and central/western China have been widening, with attendant political, social and even security problems. In order to encourage the west and central regions to catch up with the east, a series of development plans have been launched (Table 3).

Table 3 Policy Initiatives Launched by Chinese Governments on GO WEST

Time	Organisation	Policy Initiatives	Summary
2000	State Council	“China Western Development”	The main policies of the plan include ⁵ : (1) the development of infrastructure (transport, hydropower plants, and telecommunications), such as the “West-East Gas Pipeline” and Qinghai-Tibet Railway (from Beijing to Tibet); (2) adjustment of industrial structure; and (3) deepening the reform and increasing openness of the economy to entice foreign investment to the western region (Figure 7).
2001	State Council	“Outline of National Economic and Social Development of the Tenth Five-Year Plan from 2001-2005”	
2006	State Council	“Eleventh Five-Year Plan on Western Region Development”	
2006 - 2009	Ministry of Commerce	“10,000 Businesses Go West” program	To encourage about 10,000 companies located in eastern areas to invest in central and western China
2008 - 2010	Ministry of Commerce	Priority Relocation Destinations of the Processing Industry	The Ministry of Commerce set a goal for 2010 of the creation of 50 priority relocation destinations in central and western China to attract processing enterprises that would relocate from coastal regions (Figure 8). The State Development Bank provided loans, tax incentives, and building supporting facilities to encourage relocation, including investments in water and electricity supply, waste management, education, warehousing and transportation.
2010	National Development and Reform Commission	Industrial Transfer Demonstration Zone of the Wanjiang River Urban Belt	This is China’s first national-level industrial transfer zone to encourage the relocation of low-end industries from coastal to inland areas (Figure 9). The zone is part of the government’s project to help eastern China move up the value chain while keeping low-end and low-value-added manufacturers inside the country. In the plan priority is given to equipment manufacturing, raw materials, textile and apparel, high-technologies, services and agriculture.

⁵The same policies motivate the “Revitalize Northeast China” program, which is intended to rejuvenate the old industrial bases in north-eastern China in 2003. In March 2004, the “Rise of Central China” plan was announced to accelerate the development of central region.

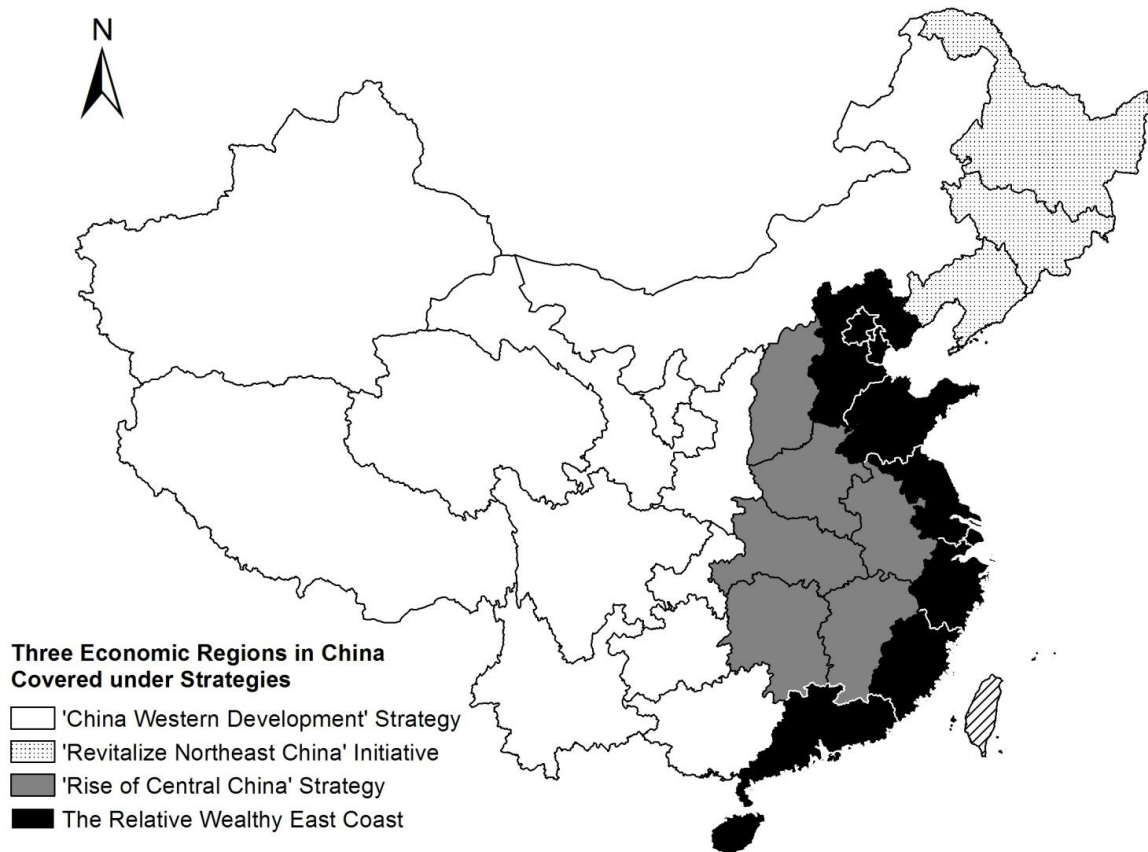


Figure 7 Economic Regions in China
Source: Compiled by authors.



Figure 8 Priority Relocation Destinations of the Processing Industry Identified by the Ministry of Commerce (2007 and 2008)

Note: The third batch issued in 2010 is not shown on this map.

Source: Compiled by authors, using data from (Li & Fung Research Centre, 2008).

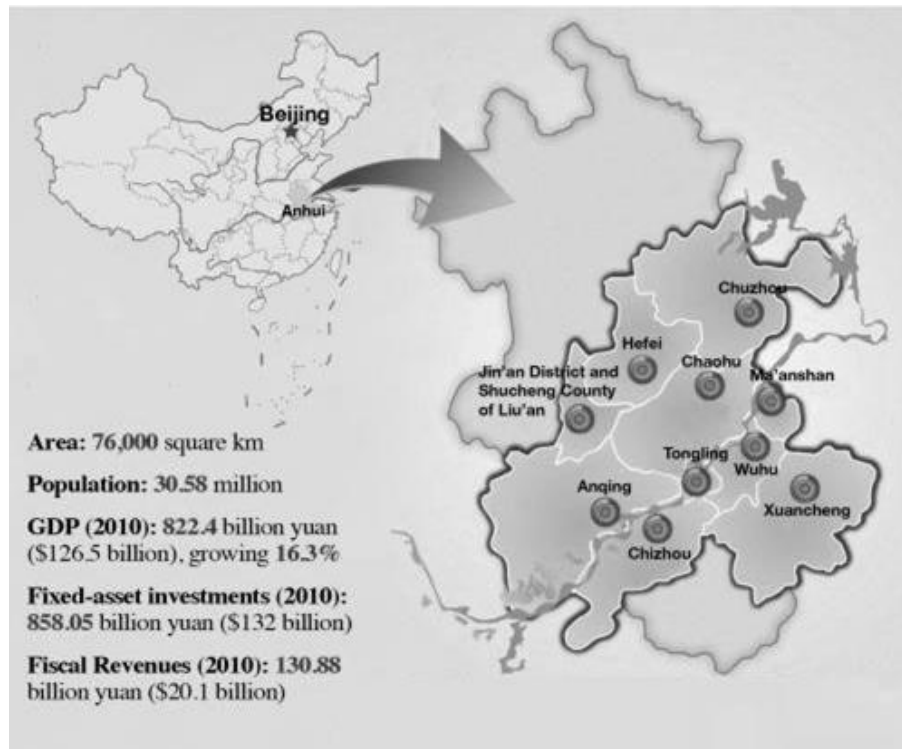


Figure 9 Industrial Transfer Demonstration Zone of the Wanjiang River Urban Belt
 Source: Anhui Provincial Development and Reform Commission reproduced from *China.org.cn*,
 March 14, 2011
http://www.china.org.cn/china/anhui_media_tour/2011-03/14/content_22135889.htm

For the apparel industry, in 2010 the Ministry of Industry and Information Technology released the *Guideline on Pushing Forward Relocation of Textile and Apparel Industry* (Ministry of Industry and Information Technology of China 2010). According to the *Guideline*, there are several industrial relocation tasks for the textile and apparel industry in order to integrate industrial location with upgrading strategies. In the eastern coastal region, state policies are to be aimed at accelerating industrial upgrading and the shift to high-end textiles and apparel, developing brands and strengthening design and marketing capacities, the relocation of spinning, silk reeling, weaving, and other labor-intensive or/and low-tech production activities to western, central and north-western regions by means of mergers and enterprise reorganization or reinvestment, providing support to enterprises in the eastern region to outsource to inland locations, and to strengthen the business co-operation and supply chains between coastal and

inland regions. In central China the *Guideline* is aimed at strengthening the textile and apparel manufacturing system, actively facilitating the shift of textiles from east to west, and developing an integrated cotton textile, wool textile, knitting, garment, home textile and industrial textile manufacturing system in the region. In the western region, the Western Development strategy encourages the development of the textile and apparel industries, especially those with local characteristics such as cotton textile, silk, and garment industries. In the north-eastern region, the policy aims to develop chemical fiber, flax, garment and other labor-intensive processes which have some comparative advantage there. In all these policy environments, a key aim is to prevent the unwarranted transfer of discarded, obsolete industrial equipment and polluting enterprises from the east to other regions.

In 2007, China's Ministry of Commerce and China Customs promulgated the "List of Restricted Commodities in Processing Trade," differentiating between allowed labor-intensive processes inland and those that are now restricted in the east. Importantly for my purposes, textile and apparel products made up most of the restricted labor-intensive processes and products. As a result, apparel enterprises in coastal regions (which account for 85% of apparel industry) had little option but to upgrade or to relocate inland.⁶

The impacts of these policies on the industrial geography of textiles and apparel are marked. By 2010, investment in central and western regions accounted for 39.13% and 7.90%, respectively, of the total investment in textiles and apparel, an increase of 19.71% and 1.29%

⁶The government has also actively encouraged and, in some cases, compelled textile and apparel enterprises to reduce their operating costs and their environmental impacts by moving from polluted coastal provinces to inland areas closer to their cotton and wool input suppliers and to extensive and low cost regional labor markets. Central government inducements have been particularly strong in urging textile manufacturers to move to Inner Mongolia, Xinjiang, Ningxia and Qinghai, silk production to Sichuan, Guangxi and Yunnan, and fiber dependent industries to Henan and Hubei. Large successful export-oriented apparel firms were also targeted in this endeavor. In 2008, the China Chamber of Commerce for Importers and Exporters of Textiles organized a trip to visit the Western provinces for operators of more than 120 export-oriented textile and garment enterprises, including the firms *Silique* from Guangdong, *Shenda* from Shanghai and *Weiqiao* from Shandong. (*China Wool Textile Association*, April 2008), "Great Industrial Relocation." Accessed 10 August 2011. <http://www.cwta.org.cn/news080423e.htm>.

from 2005 (Figure 10). The global financial crisis has further stimulated Chinese textile and apparel restructuring and relocation. For example, annual growth rates of new textile and apparel projects have continued to decline in eastern and central regions, but in the western region growth rates have rebounded after a dramatic decrease in 2008-09 (Figure 11).

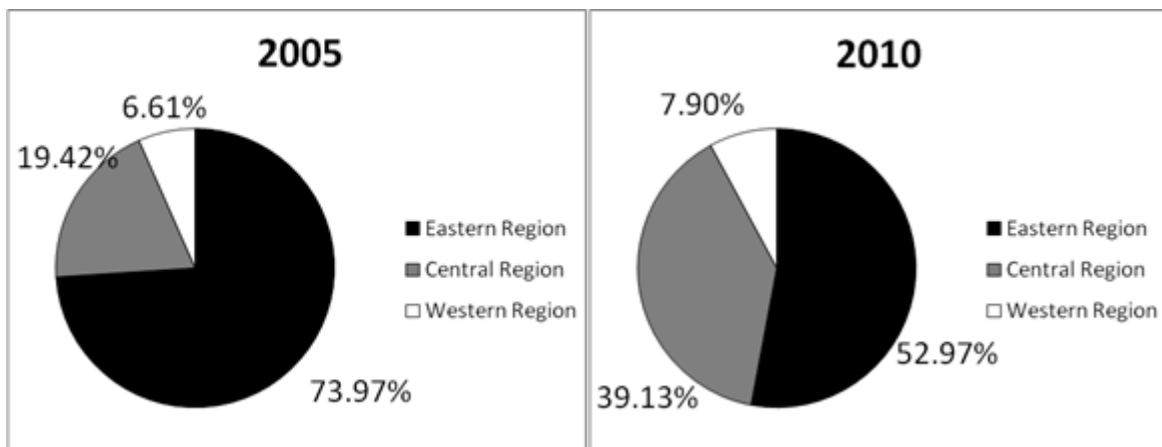


Figure 10 Distribution of Investment in Textile and Apparel Industry (2005 and 2010)
Source: Adapted by the authors from Annual Report on Corporate Social Responsibility in Chinese Textile and Apparel Industry-2010/2011 (CNTAC 2011)

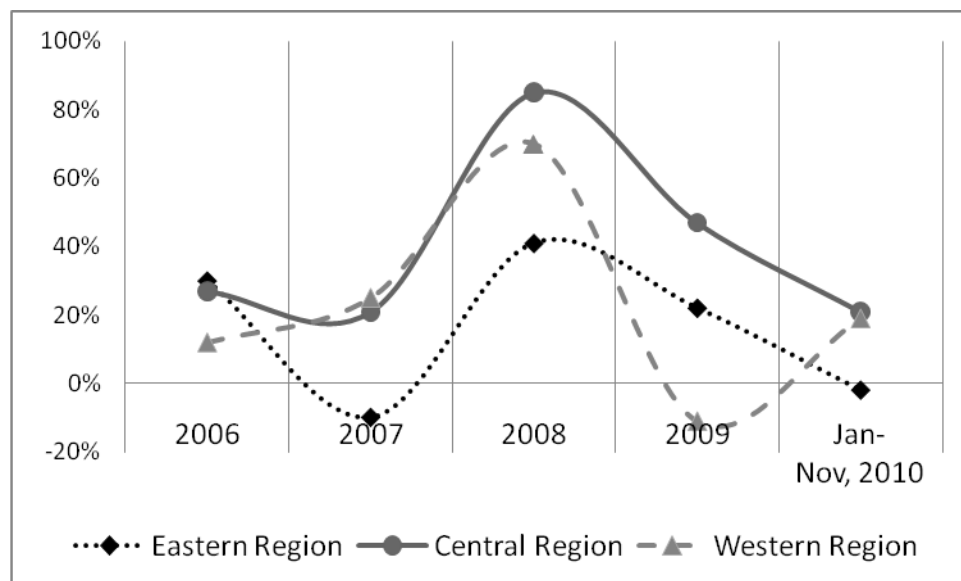


Figure 11 Annual Growth Rate (YOY) of the Number of Newly-commenced Projects in Textile and Apparel Industry (2006-2010)
Source: Adapted by the authors from Annual Report on Corporate Social Responsibility in Chinese Textile and Apparel Industry-2010/2011 (CNTAC 2011)

Local Government Policy: Inter-regional Competition for New Investments

Local administrations in the coastal and inland regions have remained active in promulgating their own policies based on local needs to attract investment and create jobs (Wang and Mei, 2009). Local governments in the less-developed inland regions regard industrial relocation policy as an opportunity to attract investment and boost economic development. As a regional administration officer in Anhui expressed it, “The coastal provinces became wealthy and their economy took off by developing labor-intensive industries like apparel. Now it is our turn and we should be prepared in the new round of industrial relocation” (Interview, regional administration, Anhui, July 2011). These local administrations lobby firms and offer low land rent and other favorable policies, which – they claim – make their enterprises competitive with those in other provinces and even with emerging export production in Southeast Asian countries (see Table 4).

Table 4 Policy Initiatives Offered by Inland Provinces/Cities to Entice Relocating Enterprises

Provinces/Cities	Examples of Policy Initiatives
Anhui	Industrial relocation park, designated funds to support relocation, improving infrastructure, simplifying custom procedures, improving job training
Hunan	Financial support for relocation, improving services in logistics centers and customs, simplifying the approval procedures of relocation projects
Hubei	Designated funds to support relocation, improving transport infrastructure
Yueyang (Hunan)	Tax breaks, simplifying customs procedures
Chenzhou (Hunan)	Subsidies on construction of production plants, improving transport infrastructure
Ganzhou (Jiangxi)	Tax breaks, subsidies on usage of electricity and water
Wuhu (Anhui)	Improved government services, waiving of administration fees of some of the government services during the course of relocation, providing financial support, developing industrial relocation park, strengthening collaboration with Shanghai

Source: Compiled by authors from data in (Li & Fung Research Centre, 2008).

The result of these practices is increasing inter-regional competition for new investments, with local governments in coastal provinces seeing aggressive relocation to other provinces as

weakening their own plans for local economic development. In the view of a Ningbo regional administration official: “It is all about GDP” (Interview, firm manager, Ningbo, August 2012). Consequently, they too have become increasingly active in encouraging enterprises to adopt one of three policies: (i) to upgrade locally, (ii) to maintain their headquarters and R&D centers while relocating only low-end and labor-intensive activities to inland China, or (iii) to relocate but *within* the province. For instance, Jiangsu announced the “Relocation across the Yangtze River” plan to provide financial support, offer acres of cheap land and favorable investment policies to firms in South Jiangsu that are willing to relocate to North Jiangsu. Similarly, by issuing “173 Plan,” Shanghai collaborated with neighboring areas to prevent firms from relocating out of the province. In 2008, Guangdong announced the *Decision on Encouraging Industry and Labor Relocation* (also known as “Double Relocation”) in which measures and funds are designated to facilitate industry and labor relocation within the province. These include inducements for labor-intensive, resource-consuming, processing industries to move from the central Pearl River Delta (PRD) to less developed areas, such as northern, western and eastern Guangdong. Provincial policies also support the relocation of labor from agriculture to the secondary and tertiary sectors in order to concentrate the skilled labor force in the central PRD, as a way to favor the technological upgrading of industry. In addition, 24 government-driven “Industrial Relocation Parks” have been set up within Guangdong province, mostly located in less developed areas, to encourage internal relocation (Interview, China National Textile and Apparel Council, Beijing, June 2011).

Regionalization of Enterprises

For many enterprises, going west is more easily achieved than going out. Going west has several advantages. First, coastal and inland regions share similar cultures, conventions,

traditions and laws, and these are perceived to offer lower relocation risks. By contrast, going out requires relocating apparel enterprises and training staff to become familiar with local culture and laws, which might lead to high operational risks. Second, as long as the importance of domestic markets continues to grow, going west also provides opportunities for market capture as well as reducing production costs. Third, as technical demands increase, technical and managerial workers become an increasingly important asset and one for which westernization is more easily managed than overseas relocation, especially for smaller firms with more limited capacities.

For example, the Youngor Group, China's leading menswear manufacturer based in the eastern region, Ningbo, Zhejiang province, has turned to a delocalization strategy. Youngor started to go west in 2004, when a manufacturing base was built in Chongqing for 100 million Yuan (US\$14.65 million). The labor force and energy resources in Chongqing are relatively cheap compared with Zhejiang province. Subsequently, Youngor invested an additional 100 million Yuan (US\$14.65 million) to increase productivity in the Chongqing plant and now this base can produce 15,000 shirts every day, with a planned increase to 24,000 per day by 2011. As domestic markets have grown, Youngor has been increasingly able to sell most of its products locally in the western region, further saving Youngor on transportation and logistics costs.⁷ In 2005, Youngor established a cotton textile company in Xinjiang, and has now begun to expand its value chain into raw material production. More than 2,000 employees were hired locally in Chongqing and over 1,000 employees in Xinjiang.

Not all enterprises find these policy and cost incentives sufficient to induce them to

⁷The rise of China's domestic market for manufactured goods is a crucial driver of many of these changes, allowing firms to manage export market risk by leveraging domestic markets, by establishing domestic brands for that market, and for selling into a local market that saves on the logistical and tariff costs of increasingly competitive and low-cost export markets (Henderson and Nadvi, 2011; Kaplinsky and Farooki, 2010b).

relocate. Many apparel enterprises have adopted a wait-and-see attitude (see Figure 6). For some enterprises, relocation to underdeveloped regions is not commercially viable unless the entire supply chain moves and, even then, they indicate that they would only relocate if enough government incentives were offered (Li & Fung Research Centre, 2008). A 2008 Federation of Hong Kong Industries survey of 200 enterprises in the PRD found that shortage of labor, high logistics costs and inadequate support from local governments in less developed regions were major obstacles preventing enterprises from relocating to western and central China (Federation of Hong Kong Industries, 2008). On the other hand, the Yangtze River Delta (YRD) region, with well-developed infrastructure, abundant skilled labor, strong support from local governments, good business environment and access to global markets, was seen as an optimal destination for such relocation. For some firms, relocation from PRD to YRD is considered to be the first step to the further possible relocation to and expansion in less developed inland regions. The Industrial Cluster Research Group from the China National Garment Association interviewed children's wear enterprises in Huzhou, Zhejiang (in the YRD) in February 2009 and found that most of the 800 new enterprises had moved from PRD in this way (*China Apparel (EFU)*, September 14, 2009).

While some firms in the traditional manufacturing centers in the coastal provinces may see the advantages of partial or full industrial relocation, others are more cautious and are implementing forms of stratified relocation (relocating the labor-intensive and low-end parts of production) or they are outsourcing parts of their production to inland enterprises (Liao and Chan, 2009). Large firms are more predisposed to maintain their production base in the coastal region, while setting up or off-shoring to satellite factories in western and central region. The high-end and high-value-added activities such as R&D and design are increasingly important in factory

operations in the coastal region, while the subsidiary factories focus more on assembly and other lower-value operations. In this way, the coastal and inland regions increasingly complement each other in expanded regional production networks with overall gains in competitiveness. Among the large leading firms in coastal regions that have already moved part of their labor-intensive or resource-intensive activities to western and central regions, some are now finding that supporting facilities in inland region have improved sufficiently for them to consider relocating more complicated and sophisticated processes (Interview, firm managers, Ningbo, August 2012).

In other cases, relocation within the province has become common as provincial government incentives have grown. Apparel enterprises in southern Jiangsu have relocated their plants to the northern part of the province to take advantage of the provincial incentives under the “Relocation across the Yangtze River” plan. For instance, the Hengli Group in southern Jiangsu invested 7.5 billion Yuan to establish an industrial park in the northern part of the province. Another firm, Bosideng in southern Jiangsu, set up a manufacturing base in northern Jiangsu (*Xinhua News*, December 10, 2009). Although an increasing number of inter-provincial enterprise relocations (GO WEST) are now occurring, most of the relocations actually still take place within a province.

Similar shifts of factories and employment have occurred in the central PRD to less developed areas, such as northern Guangdong and western and eastern PRD. One result has been a shift from agriculture into secondary and tertiary industries in these regions, stimulated in particular between 2008 and 2012 by provincial government allocations of nearly 50 billion RMB to encourage Double Relocation, which provided investments in transport infrastructural development, industrial relocation parks, backward linkages, workforce development, opening

up new land for industrial plants and strengthening environmental protection to ensure that relocation does not reproduce the degradation of the regions from which industry is moving.

The less developed areas within the province have, as a result, become the first choice for apparel firm relocation. In Guangdong, GDP in the PRD is five times larger than in Northern Guangdong and nearly three times larger than Guangdong's western and eastern regions (*China Apparel (EFU)*, September 14, 2009). Intra-provincial relocation is intended to invest in less-developed regions, reduce regional disparities between the PRD and its northern, eastern and western less developed hinterlands, and allows firms in the PRD to adjust to increasing cost pressure and upgrade their production facilities in core plants.

GO OUT: from bringing-in to outsourcing

China's economic opening or the BRING IN policy began in 1978 and was accelerated with WTO accession in 2001. Since that time, China has been successful in attracting foreign investment and building up its own industrial export and domestic market capacities. To participate further in international markets, GO OUT was proposed after the social tensions and economic challenges resulting from the BRING IN policy became clearer. The idea of GO OUT or GO GLOBAL was formed in the mid-1990s. GO OUT was formally written into the Tenth Five-Year Plan in 2001 and reasserted in the Eleventh Plan in 2005 as a part of a national strategy working together with BRING IN, not replacing it.

Apart from encouraging relocation within the country, the central government and regional coastal administrations also support the outsourcing of labor-intensive, low-wage parts of the value chain as another way to deal with the financial and social problems facing low value-added industries. These are referred to as the GO OUT policies. To date, the program has five key components: (i) to utilize raw materials that are scarce in China through overseas co-operation and investment, in order to improve the industrial structure and optimize the re-

allocation of resources in China while also encouraging enterprises to set up R&D abroad to actively make use of raw materials worldwide (Lan and Pickles, 2011); (ii) to increase Chinese FDI and overseas processing trade to spur exports; (iii) to improve supporting systems of finance, insurance, tax, foreign exchange, human capital, law and entry-exit management for overseas foreign investment; (iv) to co-operate with adjacent countries economically and politically and to encourage the regionalization of Chinese-owned enterprises and investments; and (v) to promote brand recognition for Chinese enterprises in global markets.

In a parallel context in post-socialist central and eastern Europe, Pickles and Smith (2011) have recently shown how, from the late 1970s and early 1980s, the process of delocalization within the EU increasingly encouraged European manufacturers and brands to reduce production costs in the face of increasing global competition by delocalizing assembly work into central Europe to access surplus skilled labor pools, socialist technical infrastructures and know-how and quick turnaround capacities. In this way, the need to reduce labor costs, minimize delivery times, and guarantee quality could all be met – for some firms – without the additional transaction costs of global sourcing. In China, industrial delocalization is still not the primary strategy for the central government, regional administrations or enterprises, even though the GO OUT strategy was written into the Tenth and Eleventh Plans as a national strategy. While China is still focusing more on BRING IN, GO OUT incentives and pressures, particularly labor cost, geographic proximity and the stability of trading relations that Pickles and Smith (2011) discuss for post-socialist Central Europe are also at work in the process of Chinese enterprises' GO OUT. Chinese overseas investment between 2002 and 2005 amounted to US\$17.9 billion, with an average annual growth rate of 36%. In the same period, the cumulative turnover of Foreign Project Contracting was US\$72.6 billion with an average annual growth rate of 24%, and that of

Labor Services Co-operation was US\$17.3 billion, with an average annual growth rate of 6%. Chinese FDI reached US\$92 billion in 2007.

The GO OUT strategy caters to the interests of both central government and enterprises. The government seeks to acquire scarce and strategic resources by means of foreign investment to satisfy China's increasing demand for resources. For example, in 1993, China changed from a petroleum-exporting to importing country. Outsourcing or delocalization to Southeast Asian locations also assists with the criticisms of anti-dumping (338 cases between 1995 and 2005) and other invisible trade barriers where re-export trade through third-party countries is one way to resolve the difficulties in exports and escape from trade or non-trade barriers. China's "earn foreign exchange through export" policy has allowed it to accumulate a large amount of foreign exchange. The resulting economic bubble and criticism from developed countries about RMB's slow appreciation has led the government to release the pressure of these enormous foreign exchange reserves through outward investment and the GO OUT policy is an important release valve for this (Lan and Pickles, 2011). In these ways, the administration intends to address its production capacity surplus by investing overseas, obtaining access to scarce natural resources, expanding opportunities to access advanced technology and managerial experience from successful enterprises in other countries and off-shoring low-wage and low value-added production (with all its negative social and political consequences).⁸

In 2003-2004, the Ministry of Commerce issued the *Guiding Directory in Country for China's Investment of Textile and Apparel Processing Trade in Asia* (Ministry of Commerce of China 2003). In 2004, the Ministry of Commerce and Ministry of Foreign Affairs jointly released the *Guiding Directory in Country and Industry for China's FDI* (Ministry of Commerce of China

⁸See Pickles and Woods (1989) for examples of an earlier round of the GO OUT policy pursued by Taiwan enterprises in the 1970s and 1980s.

and Ministry of Foreign Affairs of China 2004). These *Directories* recommended specific destinations for outsourcing Chinese apparel production; six were in Asia (Pakistan, Nepal, Thailand, Vietnam, Cambodia and Turkey), eight in Latin America (Mexico, Colombia, Trinidad and Tobago, Jamaica, Chile, Argentina, Ecuador and Uruguay) and six in Southeast Africa (Kenya, Ethiopia, Madagascar, Lesotho, Namibia and Botswana) for Chinese apparel enterprises which are going out.

Outsourcing of Chinese Firms

By 2009, nearly 1,000 Chinese apparel enterprises had set up factories in Cambodia and Vietnam and another 100 (or more) Chinese apparel enterprises had invested in Bangladesh (*China Textile and Economic Information (CETI)*, September 24, 2009). The receiving countries in Southeast and South Asia have largely been those that have trade preferences and preferential access agreements for EU and US markets, while also offering favorable enticements to foreign apparel enterprises. For instance, Bangladesh offers ten-year income tax deduction to foreign apparel enterprises relocating their factories. Cambodia offers low-wage costs, cheap land and a liberal market economy, but it also has the Generalized System of Preferences from 28 countries including the US and some EU countries, and exports from Cambodia have preferential access and tax reductions and exemptions to most countries (*China Apparel (EFU)*, September 14, 2009).

One company that has taken advantage of outsourcing is the Hongdou Group, the second largest garment manufacturer in Jiangsu province. In 2007, Hongdou approved a plan for investing about 300 million Yuan to set up a production base in Cambodia as an attempt to avoid US and EU Safeguards (*Fibre2Fashion News Desk*, February 5, 2007). In addition, as the costs of land, water and labor have continued to increase in China, Cambodia and other countries have

gained distinct cost advantages. In 2008, Hongdou invested in the development of a Special Economic Zone (SEZ) in the port city Sihanoukville in Cambodia on more than five square kilometers. This SEZ was approved by the Ministry of Commerce of China as the first foreign trade zone, and, upon completion, will be Cambodia's largest SEZ. In order to encourage the SEZ, the Ministry of Commerce approved financial support of more than 0.3 billion Yuan to the SEZ and promised a further 2 billion Yuan loan (*China Apparel (EFU)*, September 14, 2009). In 2007, China's fixed asset investment in Cambodia amounted to US\$461 million, a more than tenfold increase from 2003 (*Shanghai Overseas Chinese News*, May 26, 2008). With leading apparel firms like Hongdou relocating to Sihanoukville SEZ, more upstream and downstream suppliers have also relocated there so that an entire industrial chain has gradually formed inside the SEZ (Arnold and Pickles, 2011).

Besides the "low road" delocalization where low-wage assembly work is being outsourced or relocated to low-cost producing centers like south-eastern Asia, "high road" delocalization has also emerged. As GO OUT policies seek to promote the brand recognition of Chinese enterprises in global markets, large leading Chinese-owned apparel firms have already begun to move part of their R&D, marketing and designing activities so as to have better access to overseas markets. Bosideng, China's largest down clothing manufacturer, started its co-operation with Greenwoods Menswear, a British retailer of men's garment, in 2005. This business relationship finally led to Bosideng's acquisition of a 50% stake in Greenwoods for £50 million in 2009. Bosideng seeks to leverage Greenwood's expertise in the UK retail market to develop a chain with up to 100 stores between 2009 and 2014. Two such outlets, which are selling Bosideng-branded clothing, were opened in 2009. Since 2005, Bosideng-branded products have made up 33% of Greenwoods's total sales. In 2011, Bosideng bought a £20

million six-story property in London for both its flagship store and European headquarters.

Bosideng's high road overseas investment was described by its CEO as a hybrid of GO OUT and GO UP approaches (*China Daily*, February 1, 2009).

Conclusion

Output, employment, value-added, and the number of enterprises in China's apparel industry continue to increase in absolute terms, although each accounts for a declining proportion of total manufacturing and of exports. China has become the dominant apparel supplier to nearly all of the major industrial economies (the US, the EU and Japan). It has also diversified its export reach by gaining ground in many of the world's emerging economies as well, including Russia, India and Brazil. As the apparel industry gets stronger and more diversified, China is not only a supplier of cheap and low quality apparel products, but it is also becoming a major hub and manufacturing base for high-end products. China's coastal regions have become the pre-eminent global center of apparel manufacturing, but as the share of production inland increases and with expanded infrastructural investment, the presence of abundant skilled and cheap labor and tens of thousands of clustered enterprises,⁹ the emerging configuration of apparel production networks seems to be increasing, not decreasing the overall competitiveness of the industry.

As competitive pressures, production costs and social pressures on working conditions and wages have increased in recent years, apparel enterprises have been hit hard by slackening global demand, production cost hikes, RMB appreciation and rising labor cost due to the shortage of skilled labor and approval of the Labor Contract Law and the CSC9000T.

Rising labor costs have been particularly important in forcing China's apparel enterprises

⁹“According to the CNTAC, there were 48 major apparel clusters in China. Each of these clusters specializes in the production on one or more textile or apparel products.... [as of 2005] All of these [major] clusters are located along the coastal provinces, namely Zhejiang, Guangdong, Jiangsu, Fujian, Shandong and Hebei”. As of 2009, the number of firms with revenue 5 million Yuan or greater is 18265 (apparel).

to restructure their value chains. Labor shortages are crucial and pose deep-seated economic and social challenges for the apparel industry, particularly because of its dependence on migrant labor. Presently, a great deal of attention is directed toward enticing investment, stimulating economic development and promoting economic upgrading, while concern for the well-being of labor and social upgrading along with economic upgrading has lagged. My analysis has highlighted the signal importance of policy initiatives launched by local and central governments and the way apparel enterprises are responding to this changing landscape, either by upgrading or through geographical relocation.

The central government has been extremely pro-active in responding to these pressures and has approved a series of policy initiatives to encourage and support enterprises to implement industrial upgrading and relocation in three ways: GO UP (industrial upgrading), GO WEST (relocation to inland China) and GO OUT (relocation overseas). The central government has designated funds to support relocation, improve infrastructure, simplify relocation approval procedures, provide information about foreign apparel markets, increase investments and support for technological transformation, increase financial support and provide subsidies and support research on apparel-related technological innovations. The central government also seems to be paying increasing attention to the well-being of labor. I have noted the many cautions one needs to exercise in reading these emerging labor regimes, especially in the absence of free and independent trade unions, but the new LCL and CSC9000T have, at least, been significant symbols of the recognition by both state and private actors of the need to address working conditions and the social instabilities they have produced.

Local governments do not always share the concerns that motivate central government policies and as a result, they have, at times, responded differently. In recognizing that aggressive

relocation to other provinces could harm the local economy and affect employment, local governments in coastal provinces creatively adapt relocation incentives to impede inter-provincial relocation in favor of relocation within a province or upgrading locally. By contrast, Western regions increasingly offer competitive advantages on wages, infrastructural costs and logistical support and their governments actively recruit enterprises away from established production centers to often well-provisioned green-field industrial parks by offering incentives and supports, such as tax breaks and subsidies. The result is the emergence of a much more spatially extended and functionally articulated series of regional production networks. Whether these regional production networks – with their higher-value cores, regionally extended assembly plants, and overseas outsourcing of low-value added contracts – will resolve the challenges of China's dominant role in GVCs remains an open question. For the moment, the rapid expansion of domestic consumption acts as a stimulus and subsidy while global markets remain turbulent and price sensitive.

CHAPTER 3 GLOBAL, REGIONAL AND LOCAL: NEW FIRM FORMATION AND SPATIAL RESTRUCTURING IN CHINA'S APPAREL INDUSTRY

Introduction

The promising development of China's export-oriented apparel firms has been largely attributed to (1) the flexible business environment including cheap peasant workers who migrate from western and central region to coastal China, and China's other low cost factor inputs, land electricity and raw materials; (2) loose inspection on import materials and export products in customs; (3) half-hearted implementation of environmental and labor regulations; and (4) preferential tax policies (He et al., 2008; Hsing, 1998; Hsueh, 2011; Yang, 2012). As production costs and competitive pressures both rise, the flexible business environment that export-led production used to embed in has undergone dramatic restructuring and this has further pushed forward new rounds of spatial restructuring and industrial relocation, especially in China's highly export-oriented apparel industry (Wei et al., 2007; Wei et al., 2009).

In this chapter, I focus on the apparel industry in China and investigate the geographical and organizational restructuring in response to the transforming business environment since late 1990s. This chapter documents the changing geographical patterns of new firm formation so as to disclose inter-regional shifts of new investment, production and employment, i.e. industrial relocation. It does so by examining spatial variation and temporal evolution in the processes of new firm formation and a set of potential determinants contributing to this dynamics. While efforts to explain new firm formation and industrial relocation have attracted increased scholarly attention in recent years, the incomplete and disparate analytical frameworks they have applied

have resisted attempts to develop a coherent accounting for this vitally important economic process. In large part this difficulty reflects the fact that extant studies have only examined new firm formation's relationship with either global, regional or local factors, whereas failed to encompass all three aspects which inter-connectedly play a pivotal role in the processes of industrial relocation and new firm creation. Specifically, they have either tested conceptually the linkage between agglomeration economies and new firm location choice (Jo and Lee, 2012; Moral, 2009), or focused on impacts of external multinational enterprises over new firm creation (Lee et al., 2012), or studied the ways in which firm-specific factors (for example, firm size and plant types) and place-specific factors (for example, human capital and local wage) influence entrepreneurs' decision-making processes (Armington and Acs, 2002; Lin et al., 2011; Sutaria and Hicks, 2004; Wang et al., 2010). An all-encompassing tri-polar analytical framework is, therefore, developed in the next section to analyze new firm formation and industrial relocation in the global, regional and local context. I also seek to argue that the heterogeneity in new firms' characteristics affect their location decision and the extent to which new firm formation and industrial relocation are affected by global, regional and local factors is determined by idiosyncratic firm-specific capability. The next section teases out key hypotheses on new firm formation in relation to my tri-polar analytical framework. After an introduction of the data, variables and specifications for empirical analysis in section three, the fourth section offers a brief overview of the new firm formation in China's apparel industry. Section five presents and discusses the results. The last section concludes the chapter by summarizing main findings and discussing theoretical and policy implications.

Conceptual Framework and Research Hypotheses

Embedding in a Localized Cluster

Competitiveness of firm partly hinges on its embeddedness into local clusters made up by heterogeneous and homogenous firms (Granovetter, 1985; Porter, 1990). Clusters mainly focus on the local sources of competitiveness driven by local economic agents and their vertical and horizontal relationships which generate collective efficiency and knowledge spillovers (Barnes and Gertler, 1999; Storper, 1997). Local industrial clusters tend to intensify in a self-reinforcing way by further attracting new entrants until economies of agglomeration turn into diseconomies from congestion (He and Wang, 2012). Several hypotheses have been proposed concerning conditions under which local clusters and economies of agglomeration affect economic growth and new firm formation. One hypothesis, developed by Marshall (1920 [1890]), contends that knowledge is predominantly industry-specific and therefore local specialization will foster economic growth and new firm formation. The other hypothesis, proposed by Jacobs (1969), claims that regional diversity in economic activity will result in agglomeration externalities as knowledge developed by one industry can also be fruitfully applied in other industries.

As marketization, privatization and globalization proceed in China, the growth of export-oriented production has driven the geographical distribution of the apparel industry from a broadly-based industry to one concentrated in export-processing zones in coastal regions (He et al., 2008; Wen, 2004). China's apparel enterprises agglomerate to benefit from the Marshallian and Jacobsian externalities (Fan and Scott, 2003; He et al., 2008; He and Zhu, 2009; Ke, 2010). However, over-agglomeration may turn positive externalities into diseconomies of congestion and further trigger spatial restructuring of industries (Broersma and Oosterhaven, 2009; He and Wang, 2012). The congestion effects are often associated with rising costs of labor, land, energy and environment (Wang, 2010). Intensive and excessive intra- and inter-industry competition

within local clusters would lead to diseconomies of congestion as well. This indicates an inverted ‘U’-shaped relationship between industrial clustering and new firm creation, which means that despite industrial clustering fosters economic growth and new firm formation, too much agglomeration would generate congestion effects that frighten away new entrants. Ideas developed in this section leads to the following testable hypothesis:

Hypothesis 1: There is an inverted ‘U’-shaped relationship between the degree of agglomeration and the magnitude of new firm formation.

Racing to the Bottom in a Globalized Value Chain

Studies on the articulation between local cluster and new firm formation tend to overlook the significance of external linkages. The underestimation of global factors sometimes weakens their explanatory framework or makes their findings problematic, especially as local clusters are often integrated into globally organized value chains in a world characterized by ‘integration of trade’ and ‘disintegration of production’ (Gereffi, 2005). The apparel industry is such a case in point. The apparel trade has long figured prominently in discussions of globalization, given the well-deserved reputation of apparel manufacturing as one of the most globalized, dynamic and geographically mobile industries; virtually the relocation of labor-intensive elements of the production process to lower cost locations has been central aspects of the industry whereas core competencies, like R&D, design, and brand ownership, are considered to be less spatially flexible, tied more closely with human capital resources and knowledge networks (Evans and Smith, 2006a; Rantisi, 2004; Scott, 2006). For instance, the last few decades have witnessed a significant relocation of clothing production away from the main producing regions in Europe and North America, through Japan, Taiwan, South Korea, Hong Kong and Singapore, to coastal China (Evans and Smith, 2006a); and now we expect to see another round of relocation towards inland China as production costs rise in China’s coastal regions (Zhu and Pickles, 2014). This

geographical dynamics of production and sourcing must be reflected by the spatial transformation of new firm formation.

The process of ‘race to the bottom’ deepens as newly established apparel firms are often integrated into ‘captive’ GVC where the action and motivations of global buyers are the key causal forces in the organization of global contracting systems (Gereffi, 1999; Schmitz and Knorringa, 2000). Access for new apparel firms to global markets is increasingly seen to depend on their capability to race to the lower bottom; and locating in lower cost regions is sometimes the prerequisite to receive orders from global buyers. However, it is still questionable to pre-determine that regions with lower cost are likely to witness larger extent of new firm formation since lower labor cost also reflects low labor quality and low labor productivity to some extent. This reasoning leads to the following hypothesis:

Hypothesis 2: In the buyer-driven apparel GVC characterized by a process of ‘race to the bottom’, newly established firms are likely to locate in lower cost regions due to their own needs or global buyers’ requirement. However, low labor-quality associated with low labor-cost may frighten off new entrants.

Relocating in a Regionalized Way

Rather than focusing one-sidedly on factor costs, in particular wage levels, I also take into account geographical proximity, the specific demands created by the needs of particular products in relation to short production cycles or rapid replenishment (Pickles and Smith, 2011). The fact that logistical and policy costs (e.g. tariff) derived from geographical remoteness can easily outstrip the advantages based on low labor cost, results in more nuanced sourcing decisions than is predicted based simply on factor costs (Abernathy et al., 2006). The rise of lean-retailing is shaping the sourcing pattern in a way where, under certain conditions, speedy

delivery, geographical proximity and quick response are privileged over considerations of labor costs (Abernathy et al., 2006; Tewari, 2006).

When analyzing China's apparel industry, it is therefore important to recognize a model of industrial relocation and new firm formation based exclusively on labor cost may be inadequate to an understanding of the imperatives towards regionalization of sourcing and production (Abernathy et al., 2006). Specifically, this regional sourcing pattern at work in China unfolds in the form of relocation of low-wage apparel productions to lower-cost inland China, often regions from which migrant workers have traditionally been drawn (Zhu and Pickles, 2014). Geographical proximity obviously plays a fundamental role in the industrial relocation from China's coastal regions to inland provinces. Thanks for the geographical proximity to Hong Kong, Taiwan and South Korea, China's coastal regions has boomed and become the largest destination of the transplantation of the export-oriented and labor-intensive manufacturing from Hong Kong and Taiwan in 1980s and 1990s (Yang, 2012). As competitive pressures intensified in coastal region, I expect that, due to geographical proximity, central China will become a rising destination for new firm formation and is likely to attract more new entrants than western China, though the latter has even lower labor cost. Thus, Hypothesis 3 is established:

Hypothesis 3: There is an inverted 'U'-shaped relationship between the magnitude of new firm formation in a given host region and its geographical distance from China's coastline.

The geographical distance between one given host region and China's coastline describes not only the host region's proximity to current apparel manufacturing bases, but also its distance to ports for exports which determines the possibility for new entrants in this given host region to achieve short lead time and to contain logistical costs. An inverted 'U'-shaped relationship

suggests China's central region, which is moderately distant to coastline, is assumed to attract larger extent of new entrants than western and coastal regions which are geographically farther and closer to coastline respectively.

Firm Capability and Different Location Choices

The above analysis has developed a tri-polar framework of spatial restructuring where new firm formation and industrial relocation has been organized globally, regionally and locally (Figure 12). However, it is questionable to assume that new entrants should be affected by the global, regional and local factors to the same degree. The extent to which new entrant's location choices are affected by global, regional and local factors is determined by firm's characteristic.

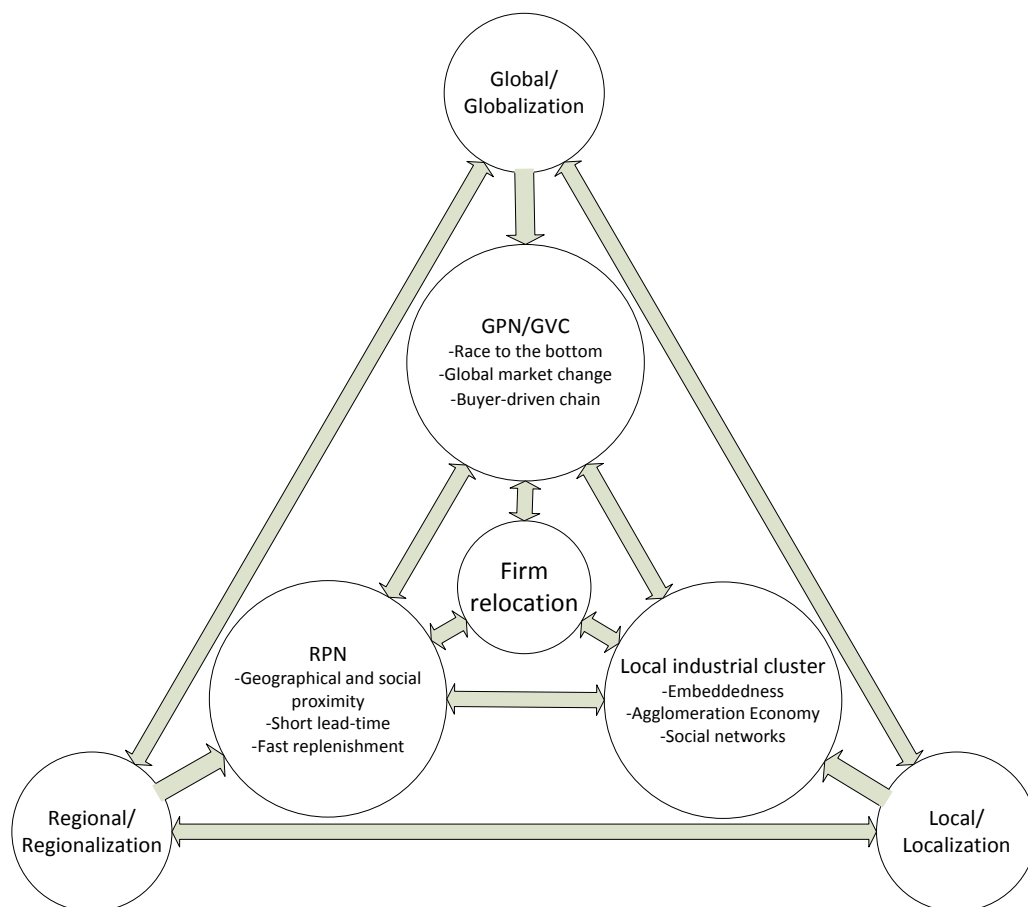


Figure 12 A Tri-polar Analytical Framework of Industrial Relocation and New Firm Formation (RPN: Regional Production Network)

Source: Compiled by authors.

The fact that some low-capability new apparel firms have been focusing on assembly or OEM production and failed to establish a strong position in high-value-added and high-tech products reinforces their dependence on low-cost unskilled or semi-skilled workers rather than high-quality ones. In contrast, high-capability new firms may build up their core competencies on medium- or high-value-added ODM (Original Design Manufacturing) and OBM (Original Brand Manufacturing) production. In this scenario, high-capability new firms are able to withstand the rise of production costs and locate in coastal regions since their core competencies on high-value-added production force them to embrace high labor quality rather than low labor cost.

By the same token, high-capability new firms' focus on ODM and OBM production often means they are manufacturing time-sensitive and quick-selling apparel products. As a result, they may locate in high-cost coastal regions to embrace not only high-quality labor, but also the easiness to realize quick response and short lead time. On the contrary low-capability new firms which are not able to stand increased labor costs opt for locating in inland China, as their products are neither time-sensitive nor quick-selling.

Firm-specific capability also affects the net benefits firm can receive from local industrial clusters (Lin et al., 2011; Myles Shaver and Flyer, 2000; Wang et al., 2010). Firm's capability to identify, assimilate and utilize knowledge spillovers and externalities hinges on its absorptive capacity (Jo and Lee, 2012). High-capability firms are often better able to absorb distant and even unrelated external knowledge and externality than their low-capability counterparts (Teece, 2007). Low-capability firms, by contrast, focus on imitating neighboring successful predecessors in the same industry before they become full-fledged. If attributing the Marshallian agglomeration economies to externalities among firms operating in the same industry and

employing similar technologies, and characterizing the Jacobsian agglomeration economies as externalities from different complementary industries, I assume that high-capability new entrants' location choices are likely affected by both Marshallian and Jacobsian externalities while the location choice of new entrants with low-capability may only be shaped by Marshallian agglomeration economies. To sum up, the idea developed in this section leads to the following hypothesis:

H4: The impacts of global, regional and local factors over new entrants differ due in large part to firm-specific capability.

Research Design

Variables

To test these hypotheses I use an important database on new firm formation and firm-specific economic and financial variables: China's Annual Survey of Industrial Firms (ASIF) (1998-2009). The dependent variable is the density of new entrants in region i and year t ($NewFirm_{i,t}$), which is measured as the ratio of the number of new entrants in region i and year t to the national total number of new entrants in year t ; it is presented in percentage terms. The geographical unit of analysis is China's prefectural level city (excluding Taiwan, Hong Kong and Macau).

The adoption of a one-year lag is a natural accommodation to the fact that the impacts of global, regional and local factors take time. The first group of key independent variables is to evaluate the level of agglomeration effects derived from local industrial clusters. To test the 'local' Hypothesis (H1), Marshallian and Jacobsian externalities are quantified separately. The degree of Marshallian externalities ($Marshall_{i,t-1}$) for new entrants represents the employment density in the same industry (i.e. apparel), measured as the total employment of the apparel industry in region i and year $t-1$ divided by the total area of region i . Likewise, the degree of

Jacobsian agglomeration effects ($Jacobs_{i,t-1}$) is measured as the total employment of other complementary manufacturing industries in region i and year $t-1$ divided by the total area of region i . Here, by ‘other complementary manufacturing industries’, I refer only to the textile industry, since its high-level input-output linkages with the apparel industry and the generally-acknowledged upstream-downstream relationship between those two. As a result, $Jacobs_{i,t-1}$ particularly refers to the total employment of the textile industry in region i and year $t-1$ divided by the total area of region i .

To test the ‘global’ hypothesis (H2), the level of labor cost in region i and year $t-1$ is included ($LCost_{i,t-1}$). Some studies have used GDP per capita or per capita personal income to measure labor cost (Sutaria and Hicks, 2004). This type of indicator becomes flawed in the context of China where the temporary migrant population without household registration (*hukou*) is often excluded in the population statistics. Due in large part to the unique *hukou* system in China, the population data in coastal provinces with massive inflow of migrant workers tend to be underestimated, while the population data for inland region from which migrant workers have traditionally been drawn can be easily overestimated. The inaccuracy in population data further makes the calculation of GDP per capita and labor cost erroneous. In this chapter, instead, $LCost_{i,t-1}$ is measured as the total expense on wages and welfare benefits for workers of all apparel firms in region i and year $t-1$ divided by the total employment of the apparel industry in region i and year $t-1$. This method is not only unaffected by the inaccuracy of population data, but also quantifies specifically labor cost of the apparel industry. Labor productivity ($LQuality_{i,t-1}$) is applied to capture labor quality, measured as the gross output value of the apparel industry in region i and year $t-1$ divided by the total employment of the apparel industry in region i and year $t-1$.

To test the ‘regional’ hypothesis (H3), the geographical distance between a given host region and China’s coastline is defined as the shortest distance to the major link port city in the coastal China (He and Wang, 2012):

$$Port_i = \begin{cases} \min(d_{ip}), & \text{if } i \in p \\ \sqrt{S_i/\pi}, & \text{if } i \notin p \end{cases} \dots\dots\dots(1)$$

where p represents the eight link port cities in the coastal China, including Dalian, Tianjin, Qingdao, Shanghai, Ningbo, Xiamen, Guangzhou and Shenzhen. Chinese manufacturing products are largely exported through these major link ports. S_i is the total area of the port city p and d_{ip} is the distance between region i and port city p .

Model Specifications

According to variables discussed above, the following empirical model is estimated:

$$NewFirm_{i,t} = \beta_0 + \beta_1 LCost_{i,t-1} + \beta_2 LQuality_{i,t-1} + \beta_3 LnPort_i + \beta_4 LnPort_i^2 + \beta_5 Marshall_{i,t-1} + \beta_6 Marshall_{i,t-1}^2 + \beta_7 Jacobs_{i,t-1} + \beta_8 Jacobs_{i,t-1}^2 + \varepsilon_{i,t} \dots\dots\dots(2)$$

where i and t denote region and year, respectively. In the estimation equation, natural logarithm for $Port_i$ and a one-year lag for all other independent variables are taken. To test the inverted ‘U’-shaped relationship between the magnitude of new firm formation in a given host region with (1) its geographical distance from China’s coastline (H3), and (2) its degree of agglomeration (H1), I introduce the squared $LnPort_i$, $Marshall_{i,t-1}$, and $Jacobs_{i,t-1}$ in the models.

The theoretical insights discussed in the second section suggest that a new entrant may decide to locate in regions that guarantee the highest expected profits. From the empirical viewpoint, expected profits are not directly observable, but the new firms established in each region each year can be observed. In these circumstances, data are censored and the appropriate statistical model for estimating the new firm formation is the TOBIT estimated by the maximum likelihood method (Tobin, 1958):

$$y_{i,t}^* = \beta_0 + \beta' X_{i,t-1} + \varepsilon_{i,t} \dots\dots\dots(3)$$

$$NewFirm_{i,t} = \begin{cases} y_{i,t}^*, & \text{if } y_{i,t}^* > 0 \\ 0, & \text{if } y_{i,t}^* \leq 0 \end{cases} \dots\dots\dots(4)$$

where i and t denote region and year, respectively; y^* is a latent variable not directly observable; β_0 denotes the regional and temporal fixed effects; $X_{i,t-1}$ represents a vector of explanatory variables; β' indicates a vector of corresponding parameters to be estimated; $\varepsilon_{i,t} \sim N(0, \sigma_\varepsilon)$ is a stochastic normal error.

Tobit models (i.e. censored regression models) are employed when there is either left- or right-censoring in the dependent variables, which can violate the linearity and normality assumption of an ordinary least squares (OLS) regression and potentially lead to biased OLS coefficient estimates (McDonald and Moffitt, 1980). In my case, there is a left-censoring in the dependent variable, and values that fall at or below a threshold (i.e. 0) are censored. The tobit model uses a maximum likelihood estimation method to generate a censored regression equation, and have been designed specifically to solve problems when the dependent variable has been censored to a range from 0% to 100%. The coefficient of the Tobit model simultaneously measure two different effects: the impact of the corresponding regressor on the probability that the region attracts new entrants and the impact of the corresponding regressor on the level of new firm formation in the regions where it is positive (McDonald and Moffitt, 1980).

I run three sets of regressions to test my four hypoetheses. The first set uses a Tobit model for each year in the study time period 1998-2009, with $NewFirm_{i,t}$ as the dependent variables against explanatory variables. Since a one-year lag for all independent variables except $LnPort_i$ are applied, there are eleven regressions (from 1999 to 2009). The second set examines the temporal variation of the new firm formation model using Casetti's expansion method (Casetti, 1972; Casetti and Fan, 1991). The parameters (i.e. β) of my model will be tested for

temporal stability and drift. The expansion method specifies ‘expansion equations’ that redefine some or all parameters of the ‘initial model’ (i.e. Equation (2)) as functions of substantively relevant variables. Substitution of the expanded parameters for their counterparts in the ‘initial model’ forms the ‘terminal model’.

The parameters in Equation (2) are expanded as functions of temporal variables (Casetti, 1972; Casetti and Fan, 1991). Parameter variation in Equation (2) over time (t) can be denoted as follows:

$$\beta_0 = \beta_{00} + \beta_{01}t \dots\dots\dots(5)$$

$$\beta_1 = \beta_{10} + \beta_{11}t \dots\dots\dots(6)$$

$$\beta_2 = \beta_{20} + \beta_{21}t \dots\dots\dots(7)$$

$$\beta_3 = \beta_{30} + \beta_{31}t \dots\dots\dots(8)$$

$$\beta_4 = \beta_{40} + \beta_{41}t \dots\dots\dots(9)$$

$$\beta_5 = \beta_{50} + \beta_{51}t \dots\dots\dots(10)$$

$$\beta_6 = \beta_{60} + \beta_{61}t \dots\dots\dots(11)$$

$$\beta_7 = \beta_{70} + \beta_{71}t \dots\dots\dots(12)$$

$$\beta_8 = \beta_{80} + \beta_{81}t \dots\dots\dots(13)$$

Where t is a dummy variable measured as time difference between each year and the base year 1998 (e.g., $t = 1$ in 1999 and $t = 11$ in 2009). The terminal model is as follows:

$$\begin{aligned} \text{NewFirm}_{i,t} = & \beta_{00} + \beta_{01}t + \beta_{10}L\text{Cost}_{i,t-1} + \beta_{11}tL\text{Cost}_{i,t-1} + \beta_{20}L\text{Quality}_{i,t-1} + \\ & \beta_{21}tL\text{Quality}_{i,t-1} + \beta_{30}Ln\text{Port}_i + \beta_{31}tLn\text{Port}_i + \beta_{40}Ln\text{Port}_i^2 + \beta_{41}tLn\text{Port}_i^2 + \\ & \beta_{50}Marshall_{i,t-1} + \beta_{51}tMarshall_{i,t-1} + \beta_{60}Marshall_{i,t-1}^2 + \beta_{61}tMarshall_{i,t-1}^2 + \dots\dots\dots(14) \\ & \beta_{70}Jacobs_{i,t-1} + \beta_{71}tJacobs_{i,t-1} + \beta_{80}Jacobs_{i,t-1}^2 + \beta_{81}tJacobs_{i,t-1}^2 + \varepsilon_{i,t} \end{aligned}$$

The terminal model incorporates the same structure as the initial relationship, and a specification of its potential drift across a substantively relevant context (time t). When the terminal model is estimated and tests of statistical hypotheses are carried out upon its coefficients, conclusion about the occurrence of contextual drift or temporal variation in my case may be reached.

Specifically, if only β_{00} , β_{10} , β_{20} , β_{30} , β_{40} , β_{50} , β_{60} , β_{70} , or β_{80} are significantly different

from zero, the estimated model will imply parameter stability. Otherwise, I can conclude the temporal variation in the parameters of the ‘initial model’. Finally, the third set of regressions tests the firm capability hypothesis (H4).

Industrial Relocation and Transforming Pattern of New Firm Formation

The past few decades have seen a two-stage inter-regional shift in apparel employment. First, during the 1990s, the apparel industry became increasingly agglomerated in China’s coastal region. Second, since the early 2000s, the intensified competitive pressures have forced dramatic changes in firm behavior and firm location choice, leading to industrial relocation to lower cost places, and changing the pattern of new firm formation and new investment. In Figure 13 I first show the progressive regional concentration of apparel employment in 1990s and early 2000s driven by the export-oriented industrialization. Guangdong succeeded in keeping its dominant position with about 17.8% of national employment share in 1992 and 24.3% in 2004. Zhejiang nearly doubled its share, from 8.0% in 1992 to 15.7% in 2004. Jiangsu also significantly increased its share, from 11.0% in 1992 to 18.1% in 2004 and maintained its position as one of the top producing bases.

In the late 2000s, however, a reverse diffusion of industry emerged. On the one hand, dominant manufacturing bases started to shrink, as Guangdong declined from 24.3% in 2004 to 23.6% in 2010, Shandong’s share decreased from 8.3% to 7.3%, and Zhejiang also downsized from 15.7% to 14.7%. Among them, Shanghai, as a highly urbanized and populated metropolis, was the first to experience the intensified competitive pressures. Apparel employment in Shanghai declined from 228,434 in 2004 to 168,000 in 2010. On the other hand, as the 2010 map shows, apparel employment has already started to shift inward in particular to China’s central region. Some rising provinces include Anhui, Jiangxi, Henan and Hunan. This new trend of

industrial relocation also echoes with Hypothesis 3 that central region is expected to become a rising destination for industrial relocation and is more likely to attract new entrants than western region.

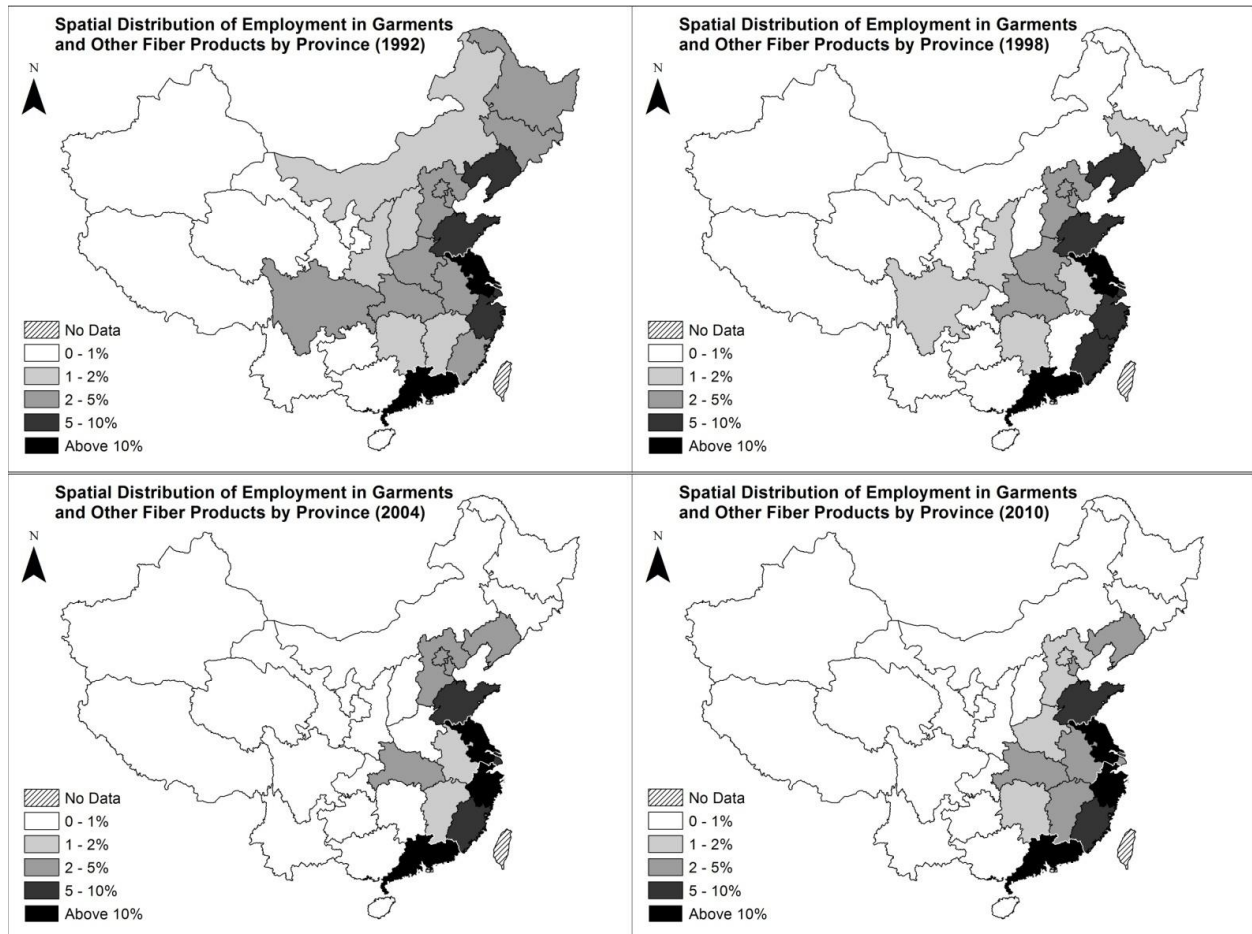


Figure 13 Temporal Changes of Distribution of Employment in Garments by Province¹⁰ (1992, 1998, 2004, and 2010)

Source: Compiled by authors, from various annual issues of China Industry Economy Statistical Yearbook

The rapid inter-regional shifts are also reflected by the temporal changes of regional shares of new firm formation in the apparel industry (Figure 14). The impacts of the reverse and diffusive industrial relocation on industrial geography of apparel are marked. Central region kept growing at the expense of eastern region, though the latter rebounded slightly after China's entry

¹⁰Longitudinal analysis of industrial employment in apparel has to take into account the administrative change between 1992 and 2010 when Chongqing was upgraded to a centrally administered municipality in 1997, adding an additional administrative region.

into the WTO in 2001 and the removal of quotas on apparel exports to the developed countries in 2005 because sudden increases in global demand to some extent eased the difficulties derived from intensified competitive pressures. Specifically, by 2009, the number of newly established firms in central region accounted for 23.5% of the total newly established firms in the apparel industry, an increase of 17.5% over 1998, while eastern region saw a decline from 90.0% to 75.1% in the same period. This geographical shift implies central region has become a hotspot for attracting new entrants.

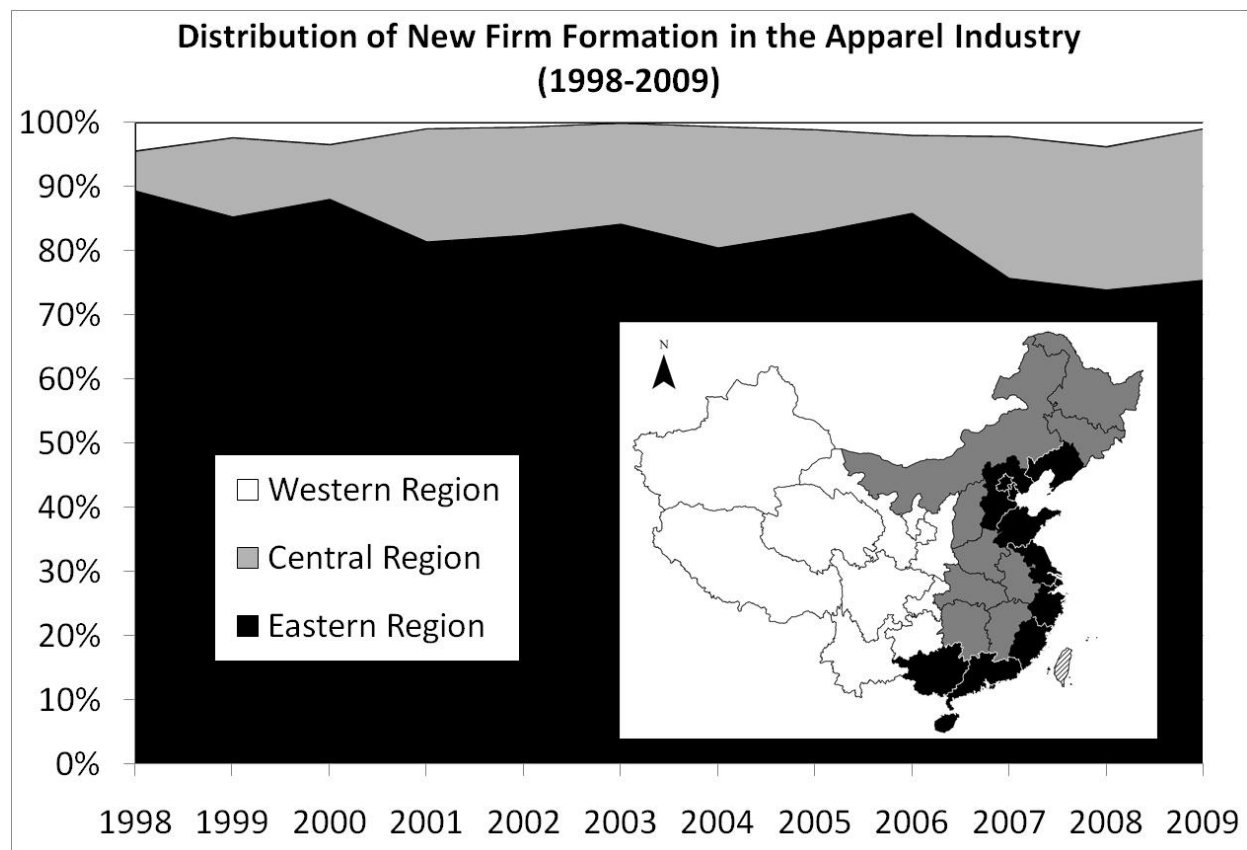


Figure 14 Changes in Regional Shares of the Number of Newly Established Apparel Firms¹¹ (1998-2009)

Source: Compiled by authors, from the Annual Survey of Industrial Firms 1998-2009

¹¹Eastern (Coastal) Region includes Liaoning, Hebei, Beijing, Tianjin, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, Hainan, Guangxi; Central Region includes Heilongjiang, Jilin, Shanxi, Neimenggu, Henan, Hubei, Hunan, Anhui, Jiangxi; Western Region includes Chongqing, Sichuan, Guizhou, Yunnan, Shaanxi, Xizang, Ningxia, Gansu, Qinghai and Xinjiang.

Statistical Results

Correlation analysis indicates that $LCost_{i,t-1}$ is highly correlated with $LQuality_{i,t-1}$, since wages and welfare benefits per worker, to some extent, reflects the level of labor productivity and labor quality. The Pearson's coefficient is around 0.90 for each year of the study time period (1999-2009). Other explanatory variables do not strongly correlate with each other. To alleviate the multi-collinearity, the interaction of $LCost_{i,t-1}$ and $LQuality_{i,t-1}$ is introduced in the model.

Transforming New firm Formation Pattern

The Tobit regression model estimates for each year of the study time period are reported in Table 5. I first look at the coefficients of $Marshall_{i,t-1}$, $Marshall_{i,t-1}^2$, $Jacobs_{i,t-1}$, and $Jacobs_{i,t-1}^2$, the key concern of Hypothesis 1. On the one hand, the coefficient of $Marshall_{i,t-1}$ is mostly positive and highly significant from 1999 to 2009 model, while that of $Marshall_{i,t-1}^2$ is negative and changes from being of no significance towards being highly significant. The consistency in the coefficient of $Marshall_{i,t-1}$ and inconsistency of the coefficient of $Marshall_{i,t-1}^2$ indicate that the relationship between the magnitude of new entrants and Marshallian externalities has transformed from a linear one towards an inverted 'U'-shaped one. On the other hand, the study time period has witnessed a more complicated evolution of the coefficients of $Jacobs_{i,t-1}$ and $Jacobs_{i,t-1}^2$, showing the relationship between the magnitude of new entrants and Jacobsian agglomeration effects has undergone three distinct stages. In the first stage, neither $Jacobs_{i,t-1}$ nor $Jacobs_{i,t-1}^2$ is significant, suggesting that the Jacobsian agglomeration economies as externalities from different complementary industries have had a relatively weak impact over new firm formation in the late 1990s and early 2000s. Then, shortly after the second stage where the relationship between the magnitude of new entrants and Jacobsian agglomeration

economies became positive, linear and highly significant in 2004, an inverted ‘U’-shaped relationship between those two emerged.

Table 5 Estimation Results from the Tobit Model for New Firm Formation during 1999-2009¹²

Variable	1999	2000	2001	2002	2003	2004
$LCost_{i,t-1} * LQuality_{i,t-1}$	0.0002	0.0017**	0.0004	0.0021**	0.0004	0.0001
$LnPort_i$	-0.0704**	-0.0091	0.0121	0.1126***	0.0829***	0.0229**
$LnPort_i^2$	0.0048	-0.0007	-0.0018	-0.0106***	-0.0082***	-0.0023***
$Marshall_{i,t-1}$	0.0031*	0.0041**	0.0037***	0.0033**	0.0025**	0.0013***
$Marshall_{i,t-1}^2$	-0.0001	-0.0001	-0.0001***	-0.0005	-0.0001	-0.0001***
$Jacobs_{i,t-1}$	-0.0002	-0.0019	0.0018*	0.0018	0.0009	0.0011***
$Jacobs_{i,t-1}^2$	0.0001	0.0006	-0.0001	-0.0001	-0.0001	-0.0001
Number of observation	321	321	321	321	321	321
LR χ^2	69.02***	63.80***	102.29***	74.79***	79.99***	142.38***
Pseudo R ²	-0.8397	-2.4128	-0.6082	-0.9092	-0.3797	-0.2712
Log likelihood	75.610	45.118	135.238	78.528	145.337	333.685

Notes: *significant at the 10% level; **significant at the 5% level; and ***significant at the 1% level.

Table 5 Estimation Results from the Tobit Model for New Firm Formation during 1999-2009 (Cont.)

Variable	2005	2006	2007	2008	2009
$LCost_{i,t-1} * LQuality_{i,t-1}$	0.0001	-0.0003*	-0.0002	-0.0001**	-0.0002
$LnPort_i$	0.0339**	0.0228	0.0491***	0.0143*	0.0350**
$LnPort_i^2$	-0.0038**	-0.0029*	-0.0048***	-0.0015*	-0.0035**
$Marshall_{i,t-1}$	0.0010*	0.0004	0.0009*	0.0010***	0.0014***
$Marshall_{i,t-1}^2$	-0.0001**	-0.0001	0.0002***	-0.0001***	-0.0001***
$Jacobs_{i,t-1}$	0.0011**	0.0010**	0.0018***	0.0004	0.0003*
$Jacobs_{i,t-1}^2$	-0.0001**	-0.0001*	-0.0001***	-0.0001	-0.0001*
Number of observation	321	321	321	321	321
LR χ^2	72.75***	89.70***	104.34***	94.73***	65.25***
Pseudo R ²	-0.2250	-0.2931	-0.2358	-0.1365	-0.1364
Log likelihood	198.050	197.839	273.446	394.243	271.801

Notes: *significant at the 10% level; **significant at the 5% level; and ***significant at the 1% level.

As expected, new entrants tended to locate in regions with high level of Marshallian externalities at first. However, as the growth of export-oriented production drove the geographical distribution of the apparel industry from a broadly-based industry to one concentrated in coastal region, over-agglomeration which turned positive externalities into

¹²Pseudo-R² can be above 1 or below 0 for continuous or mixed continuous/discrete likelihoods like Tobit. So, it makes no sense. For models like Tobit, the Pseudo-R² has no real meaning. The formula for Pseudo-R² is nothing more than a reworking of the model chi-squared. Thus, it is better to pay attention to the model chi-squared and its *p*-value rather than the pseudo-R² (see also Stata FAQ: <http://www.stata.com/support/faqs/statistics/pseudo-r2/>).

diseconomies of congestion started to repel further entry of new entrants. The changes of the coefficient of $Jacobs_{i,t-1}$ and $Jacobs_{i,t-1}^2$ tell a two-fold story. On the one hand, high-capability firms are often better able to absorb distant and even unrelated Jacobsian externalities than their low-capability counterparts (Teece, 2007). This suggests a gradual upgrading of the average capability of new entrants, as the weak and insignificant relationship between Jacobsian externalities and the magnitude of new entrants turns into a strong and highly significant one in 2004 model. On the other hand, the relationship between the Jacobsian externalities and magnitude of new entrants has transformed from a linear, positive and significant one, to an inverted ‘U’-shaped one after 2004, indicating complicated shifts from agglomeration to over-agglomeration, in particular in China’s coastal region.

There are unexpected and apparently contradictory signs of the coefficient of $LCost_{i,t-1} * LQuality_{i,t-1}$ from 1999 to 2009 model. This interaction of explanatory variables first presents positive signs before 2005 model and then changes into negative signs afterwards. This inconsistency could be reconciled by the following possible explanation. New entrants have to balance labor costs and labor quality. In the late 1990s and early 2000s, inland China’s backward labor quality ruled it out as a candidate location for industrial relocation and large-scale new firm formation, in spite of its relatively low labor cost. The apparel industry is footloose as apparel firms globally search for low-cost production sites, but it is not footloose in a way where a ‘race to the bottom’ can be unrestrictedly performed regardless of poor labor-quality and its associated low labor-costs.

As inland China caught up, the gap between inland and coastal regions narrowed in terms of not only labor quality *per se* but also infrastructure and supporting facilities which contributed to labor productivity as well. Labor quality hence quit being a main concern in a firm’s location

choice; and medium-quality and relatively low-wage labor in inland China started to be valued over its high-quality and high-wage counterpart in coastal region, particularly for new entrants reliant on low-wage assembly and OEM production which, at least until recently, accounted for a considerable part of China's apparel industry. In summary, driven by the complexity of 'race to the bottom', the pattern of new firm formation has unfolded in an inconsistent way as new entrants balance labor cost with labor quality.

The same 'agglomeration first, diffusion later' pattern is also supported by empirical estimations of 'regional' factors: $LnPort_i$ and $LnPort_i^2$. $LnPort_i$ is negative and $LnPort_i^2$ is insignificant in 1999 model, suggesting that coastal regions likely attract more new entrants than inland regions. Subsequently, an inverted 'U'- relationship emerges in 2002 model between the magnitude of new entrants in a given region and its geographical distance to a coastline, suggesting that regions which are moderately distant from China's coastline are likely to attract more new entrants. Global, regional and local factors have been collectively shaping the new firm formation pattern in ways which that have generated two distinct stages of spatial restructuring (see also Figure 13). First, the apparel industry boomed and new entrants flooded into China's coastal region so as to take advantage of its high-quality labor, positive agglomeration effects and geographical proximity to end markets in the North. As inland China caught up and labor cost surged in coastal areas, labor quality became less a concern than labor cost. In addition, positive externalities turned into diseconomies of congestion, which further frightened new entrants off coastal regions to search for new low-cost sites. In the process of industrial relocation, new entrants started to value central China as a favorable location over not only coastal region, but also over the western region where additional costs derived from

geographical remoteness could potentially outstrip the advantage based on low labor costs. An inverted ‘U’-shaped relationship between $LnPort_i$ and $NewFirm_{i,t}$ was therefore generated.

Temporal Variation

The temporally expanded terminal model (Equation 14) is estimated using Tobit regression model (Table 6). The estimation results indicate that the model varies temporally, as the cross products of the temporal variable t are statistically significant. The temporal expansion shows that the coefficients for $LCost_{i,t-1} * LQuality_{i,t-1}$, $Marshall_{i,t-1}$, and $Marshall_{i,t-1}^2$ are temporally unstable and can be expressed as functions of time (t) in Model 7. Coefficients for some variables in Model 1 to 6 also present temporal instability.

Table 6 Estimation Results from the Tobit Model based on Temporal Expansion (1999-2009)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
$LCost_{i,t-1}$	0.0013***					0.0006***	0.0007***
$*LQuality_{i,t-1}$							
$LCost_{i,t-1} * LQuality_{i,t-1}$	-0.0001***					-0.0001***	-0.0001***
$*t$							
$LnPort_i$		0.0014***	-0.0137***			-0.0113***	0.0267***
$LnPort_i * t$		0.0005	0.0002***			0.0003***	0.0002
$LnPort_i^2$		-0.0014***					-0.0032***
$LnPort_i^2 * t$		0.0001					0.0001
$Marshall_{i,t-1}$				0.0036***	0.0013***	0.0003*	0.0023***
$Marshall_{i,t-1} * t$				-0.0003***	-0.0001***	-0.0001	-0.0002***
$Marshall_{i,t-1}^2$				-0.0001***			-0.0001***
$Marshall_{i,t-1}^2 * t$				0.0001***			0.0001***
$Jacobs_{i,t-1}$				0.0005***	0.0008***	0.0008***	0.0010**
$Jacobs_{i,t-1} * t$				0.0001	-0.0001	-0.0001***	-0.0001
$Jacobs_{i,t-1}^2$				-0.0001**			-0.0001*
$Jacobs_{i,t-1}^2 * t$				-0.0001			-0.0001
Number of observation	3531	3531	3531	3531	3531	3531	3531
LR χ^2	132.01***	648.79***	648.79***	561.58***	381.45***	742.08***	829.19***
Pseudo R ²	-0.0433	-0.2129	-0.2129	-0.1842	-0.1251	-0.2431	-0.2720
Log likelihood	1590.030	1848.417	1848.417	1804.813	1714.749	1894.512	1938.620

Notes: *significant at the 10% level; **significant at the 5% level; and ***significant at the 1% level.

Despite the fact that regions with a high level of labor quality are more attractive investment locations for new entrants as the coefficients for $LCost_{i,t-1} * LQuality_{i,t-1}$ are positive and significant, the effect of high labor quality over new firm formation is declining as the coefficients for $LCost_{i,t-1} * LQuality_{i,t-1} * t$ is negative and significant (Model 1, 6 and 7 in Table 6). This is also supported by findings from the last section that the concern of new entrants gradually move away from high labor quality to low labor cost as the coefficient for $LCost_{i,t-1} * LQuality_{i,t-1}$ changes from positive to negative in Table 5. As a result, the positive effect of high labor quality over new firm formation has been declining and potentially becomes negative effect once it reaches a certain threshold where disadvantages of high labor quality (i.e. high labor cost) start to outweigh its advantages.

The effect of ‘regional’ factors over new firm formation, however, has been stable over time, as the interaction terms ($LnPort_i * t$ and $LnPort_i^2 * t$) are all insignificant (Model 2 and 7 in Table 6). Without the quadratic term ($LnPort_i^2$), $LnPort_i$ has a negative effect on the magnitude of new entrants, but its influence is decreasing (Model 3 and 6 in Table 6). While a negative effect suggests that the eastern region --which is most geographically proximate to end export markets-- tends to be more attractive investment location for new entrants, the weakening tendency tells a more nuanced story where new entrants become less agglomerated in the eastern region and start to diffuse to inland China. Finally, it generates an inverted ‘U’-shaped relationship between $LnPort_i$ and $NewFirm_{i,t}$.

The diffusion of new entrants narrows the disparity between the eastern region and central region in terms of the degree of industrial agglomeration in the industry. The relative convergence, with respect to the Marshallian agglomeration effects, taking place among central and coastal regions is potentially decreasing the impacts of Marshallian externalities over firm

location choice, despite it still presenting a significant inverted ‘U’-shaped relationship (Model 4 and 7 in Table 6). The textile industry as a capital-intensive industry, however, is less footloose with lower levels of geographical mobility compared with the apparel industry. Its spatial distribution is still uneven and a disproportionate number of textile enterprises still concentrate in coastal regions, such as Shandong, Jiangsu and Guangdong. As new entrants in the apparel industry undergo a process of gradual upgrading (see analysis on Table 5), they are increasingly capable of absorbing distant and unrelated Jacobsian externalities (Jo and Lee, 2012; Teece, 2007). As a result, the uneven distribution of the textile industry and the growing capability of new apparel entrants to absorb Jacobsian externalities have been co-structuring the apparel firm’s location choice and resulting in a relatively stable inverted ‘U’-shaped relationship between Jacobsian externalities and new firm formation (Model 4 and 7 in Table 6). This is also partially supported by findings from the next section that new entrants with distinct capability differ in their preference in terms of Marshallian and Jacobsian externalities, to which I now turn.

Firm Capability and Different Location Choices

This section reports the empirical results on whether firm capability influences the ways in which global, regional and local factors affect firm location choice (Hypothesis 4). An entrant is classified as having high capability if it successfully introduces new products shortly after its entry. Otherwise, it is labeled as a low-capability firm. Based on this standard, I divided new entrants into two groups, high- and low-capability group, and ran regressions separately. Due to the availability of data on new products introduction at firm-level, I only modeled the location choice of high- and low-capability new firms in 2009 (Table 7).

Table 7 Estimation Results for High- and Low-Capability New Entrants (2009)

Variables	Group I: High-Capability				Group II: Low Capability			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
$LCost_{i,t-1} * LQuality_{i,t-1}$	0.0004			0.0003 [*]	-0.0002			-0.0001 [*]
$LnPort_i$		-0.0082 ^{**}		-0.0247 [*]		0.0175		0.0567 ^{***}
$LnPort_i^2$		-0.0004		-0.0027		-0.0024 [*]		-0.0055 ^{**}
$Marshall_{i,t-1}$			0.0014 ^{***}	0.0013 ^{**}			0.0012 ^{***}	0.0016 ^{***}
$Marshall_{i,t-1}^2$			-0.0001 ^{***}	-0.0001 ^{**}			-0.0001 ^{***}	-0.0001 ^{***}
$Jacobs_{i,t-1}$			0.0015 ^{***}	0.0011 ^{**}			0.0005	0.0001
$Jacobs_{i,t-1}^2$			-0.0001 ^{***}	-0.0001 ^{**}			-0.0001	-0.0001
Number of observation	321	321	321	321	321	321	321	321
LR χ^2	2.94 ^{**}	39.48 ^{***}	49.05 ^{***}	57.52 ^{***}	3.02 ^{**}	41.36 ^{***}	37.74 ^{***}	58.92 ^{***}
Pseudo R²	-0.0128	-0.1714	-0.2130	-0.2497	-0.0054	-0.1155	-0.1054	-0.1645
Log likelihood	116.634	134.901	139.691	143.921	180.043	199.757	197.948	208.537

Notes: *significant at the 10% level; **significant at the 5% level; and ***significant at the 1% level.

First, while a tendency that new entrants' preference has moved from labor quality towards labor cost is observed above, location choices of new entrants still diverge in terms of how they balance labor quality with labor cost. Specifically, high-capability new entrants are more likely to locate in regions with high-quality labor while their low-capability counterparts tend to locate in low labor-cost regions. These results provide supportive evidence for Hypothesis 4, that high-capability new firms reliant on skilled labor and low-capability new firms reliant on unskilled or semi-skilled labor have distinct location strategies in terms of 'local' factors.

Second, only $LnPort_i$ presents a negative and moderately significant sign in Group I, while an inverted 'U'-shaped relationship between $LnPort_i$ and $NewFirm_{i,t}$ are observed in Group II. In other words, high-capability new entrants still disproportionately locate in coastal region, whereas their low-capability counterparts start to diffuse from coastal to central regions. It may therefore be assumed that the former --which often produces high-end, time-sensitive and quick-selling items-- values geographical proximity, while the latter --dependent on low-value, low-tech and low-end production-- has to compromise geographical proximity so that it can reap low labor-costs by locating in the central region.

Third, although in Table 5 we observe that the relationship between Jacobsian externalities and new firm formation evolves from a weak one, to a linear and significant one, finally to an inverted 'U'-shaped one as new entrants in apparel industry gradually upgrade, firm-specific capability affects the net benefits firms can reap from the Jacobsian externalities (Myles Shaver and Flyer, 2000). The high-capability new entrants which are able to identify, assimilate and utilize distant and unrelated external knowledge can therefore benefit from not only Marshallian externalities but also knowledge spillovers based on Jacobsian agglomeration,

while low-capability ones do not have the absorptive capacity to take advantage of externalities from complementary industries. High-capability new entrants which manufacture high-end, high-tech and high-value items constantly seek to explore new products and highly invest in R&D activities. Their core competitiveness ties them closely with local textile firms since a large amount of new apparel products cannot be realized without supports from textile firms which provide tailored and premium fabrics. The visible input-output linkages and invisible knowledge spillovers among complementary industries drive high-capability apparel firms to follow their potential partners in the textile industry. The co-location of sportswear firms and textile firms specialized in advanced, waterproof and breathable fabrics exemplifies this type of symbiotic, reciprocal relationship. On the other hand, low-capability new entrants striving to survive are more likely to focus on imitating successful predecessors in the same industry and same locale, at least until they become full-fledged. In this scenario, Marshallian externalities are valued over Jacobsian externalities. In sum, both Marshallian and Jacobsian externalities have impacts over high-capability new entrants, whereas the low-capability new entrants may only be affected by the Marshallian externalities.

Conclusion and Discussion

This chapter has examined the ways in which spatial restructuring and industrial relocation have unfolded in China's export-oriented manufacturing in general and the most footloose, globalized and geographically mobile apparel industry in particular. At the present time, while efforts to explain new firm formation and industrial relocation have attracted increasing scholarly attention, a great deal of attention is directed towards analyzing industrial relocation and new firm formation in either global, regional or local context and most extant studies have fallen short in disclosing the full picture where all three aspects (global, regional

and local) have profound impacts over the processes of industrial relocation and new firm formation in interactional and collective ways. To deal with this lacuna I have used a tri-polar analytical framework that combines all three aspects, and have further demonstrated its usefulness by using it to interpret the geographical dynamics and industrial relocation in China's apparel industry.

To make my theoretical insights testable, four hypotheses are proposed. The empirical estimations support my hypotheses. It therefore can be assumed that first, the positive effects of Marshallian and Jacobsian externalities would be stronger at lower levels, but they start to diminish after the density of agglomeration passes a certain threshold. In contrast, the negative effects of diseconomies of congestion can be negligible at lower levels of agglomeration, but become increasingly cumbersome for new entrants once the level of agglomeration becomes excessively high. The inverted 'U'-shaped benefit minus the increasing cost indicates an inverted 'U'-shaped relationship between new firm formation and the degree of agglomeration. Second, labor quality and labor cost are two sides of the same coin which new entrants have to balance. As gap between coastal regions and inland China narrows in terms of not only labor quality but also supporting facilities and infrastructure which contribute to the total labor productivity as well, labor cost has gradually become a more important concern than labor quality. Third, in the process of industrial relocation, new entrants started to value central China as a favorable investment location over not only coastal region, but also western region where additional costs derived from geographical remoteness could potentially outweigh the advantage based on low labor cost. Finally, the ways in which and the extents to which new entrants could be affected global, regional and local factors are determined by firm-specific capabilities.

In sum, as labor cost surges and competitive pressures intensify in coastal regions apparel employment and production start to diffuse from over-concentrated coastal regions towards the central region which is moderately distant from China's coastline. While the vast majority of low-capability new entrants follow this trend, their high-capability counterparts which manufacture high-end and time-sensitive items are resistant to the intensified competitive pressures in general and rising labor cost in particular. The latter's persistent preference for coastal regions over the central region is due in large part to its strong dependence on high-quality labor, the Jacobsian externalities, as well as geographical proximity to overseas end markets, all of which can only be realized by locating in coastal region.

Three policy implications can be derived from these empirical findings. First, efforts oriented towards regional disparity alleviation should pay attention to the improvement of transportation as well as development of regional logistical and distribution system, which can lubricate industrial relocation by lowering spatial barriers and increasing geographical proximity. Second, labor training and education programs should be conducted with respect to the current division of labor. Specifically, in the case of China's apparel industry, relevant policies in coastal region should encourage high-level training and education programs in order to provide highly-skilled, managerial or R&D labor force, whereas those in inland China should aim to impart workers practical and operational techniques. Third, at the national level policies should strive to maintain a balance between economies of agglomeration and diseconomies of over-agglomeration. To release the excessive concentration along the coastal region, one possible approach is to nurture Jacobsian agglomeration in coastal regions and Marshallian agglomeration in the central region, since the relatively capital-intensive textile industry is less footloose and unevenly distributed.

In drawing from analysis of firm-level data from 1998 to 2009, I realize the potential limitations of my analysis. First, the 2007/8 global financial crisis must have stimulated Chinese apparel restructuring and relocation, but its complete effects, which may take more than two or three years to be seen, span beyond my study time period. Second, the firm-level data, ASIF, which covers all Chinese industrial state-owned enterprises and non-state-owned enterprises with annual sales of 5 million RMB or more, do not enable me to examine the geographical dynamics of small enterprises. In the next chapter on firm location choice and industrial relocation, I have employed results from semi-structured firm-level interviews to overcome these limitation, since the interviews were conducted with apparel entrepreneurs in late 2012 (four years after the outbreak of global financial crisis) and covered both small and large apparel enterprises.

CHAPTER 4 GEOGRAPHICAL DYNAMICS AND INDUSTRIAL RELOCATION: SPATIAL STRATEGIES OF APPAREL FIRMS IN NINGBO, CHINA

Introduction

China's emergence as a key exporter to the world has relied on low-wage and unskilled or semi-skilled labor and industrial clustering. The apparel industry exemplifies this export-oriented development model. Production and employment have become heavily concentrated in the coastal regions of East and Southeast China. With growth in other sectors, prices, land costs, wages, and competitive pressures have all risen. The model of 'race to the bottom', global sourcing, and export-oriented strategy over the past decades is already undergoing fundamental restructuring, producing new geographies of production and employment, with the consequent need to re-assess the China's role in global productions networks in the coming years (Chan, 2010a, 2010b; Lee, 2007).

In this chapter, I focus on the apparel industry in Ningbo, China and investigate the spatial strategy—especially relocation—that has been adopted by Ningbo's apparel firms. This chapter documents the diversity of trajectories in which different kinds of firms are attempting to deal with increasing competitive pressures and the dilemmas they pose, and it does so by focusing specifically on apparel firms' spatial strategy, i.e. relocation. At the present time, a great deal of attention is directed toward industrial relocation *per se*, while concern for the underlying mechanism driving firm relocation and geographical restructuring has lagged or failed to disclose the full view. A tri-polar analytical framework is, therefore, developed in the next section to analyze firm relocation in the global, regional and local context. Section three

seeks to examine various forms of relocation Ningbo's apparel industry is undergoing to point out the diversity of relocation trajectories. Section four analyzes the relocation processes in the global, regional and local context, based on my tri-polar analytical framework. The fifth section brings together the main arguments and concludes with an analysis of the impacts of these spatial strategies over apparel production networks and opportunities co-existing with firm relocation.

Conceptualization of spatial dynamics: towards an analytical framework

Firm relocation

Firms tend to remain at their present location. Firm relocation is not a goal *per se* but a particular form of locational adjustment that leads to a spatial reallocation of economic activities (Van Dijk and Pellenbarg, 2000). The concept of 'relocation' needs to be clarified first. Most studies on firm relocation identify at least two types of relocation: complete relocation and partial relocation (Table 8) (Liao and Chan, 2011; Yang, 2012). Complete relocation refers to entirely relocating from old location to a new one. Partial relocation usually refers to the relocation of labor-intensive and low-end parts of production to lower cost locations, while core competencies, like R&D, design, and brand ownership, are considered to be less spatially flexible and tied more closely with the old location (Evans and Smith, 2006b; Scott, 2006). While some firms in the traditional manufacturing centers in the coastal provinces may see the advantages of partial or full industrial relocation, others are more cautious and are implementing forms of expansionary relocation (establishment of branch plants or acquisition of other firm's plants usually smaller scale for test in the destination location) or they are outsourcing parts of their production to inland enterprises (i.e. Firm B in Type IV).

Table 8 Types of Firm Relocation

Types	Before	After	
		New Location	Old Location
I. Complete Relocation	A → A	A	A
II. Partial Relocation	A → A	A	A
III. Acquisition or Expansion	A → A	A	A
IV. Outsourcing or Subcontracting	A → B	B	A

Source: Compiled by Authors

A tri-polar analytical framework

Firm location and relocation has been interpreted in terms of three main location theories: neo-classical, behavioral and institutional theory (Hayter, 1997). The neo-classical approach is based on explanatory models where ‘location factors’ (e.g. transportation cost, labor cost and market size) are the main forces driving firm relocation; the behavioral approach explores ‘internal factors’ (e.g. firm age and size) that are important in the decision-making process of the firm and that lead to a particular location; the institutional approach interprets relocation based on ‘external’ or ‘institutional factors’ (e.g. social trust, reciprocity, cooperation and convention) (Brouwer et al., 2004; Van Dijk and Pellenbarg, 2000). Instead of understanding these factors as deriving from seemingly isolated and separate theoretical frameworks, I develop a tri-polar analytical framework whereby different strands of theoretical debates and their corresponding factors become interrelated and overlapped. Based on Coe, Dicken and Hess’s effort on conceptualizing the complexities of the contemporary global economy as a multi-scalar and relational framework heavily laden with dynamically interactional and simultaneous processes (Coe et al., 2008b), I seek to establish a tri-polar structure of firm’s spatial strategy where relocation has been organized globally, regionally and locally (Figure 15). This framework

is built from a geographical perspective and the tri-polar structure is designed to eschew the traditionally hierarchical understanding which predetermines power can only be exerted in a top-down way. In other words, it implies factors from global, regional and local arena have been affecting firm relocation collectively and inter-connectedly.

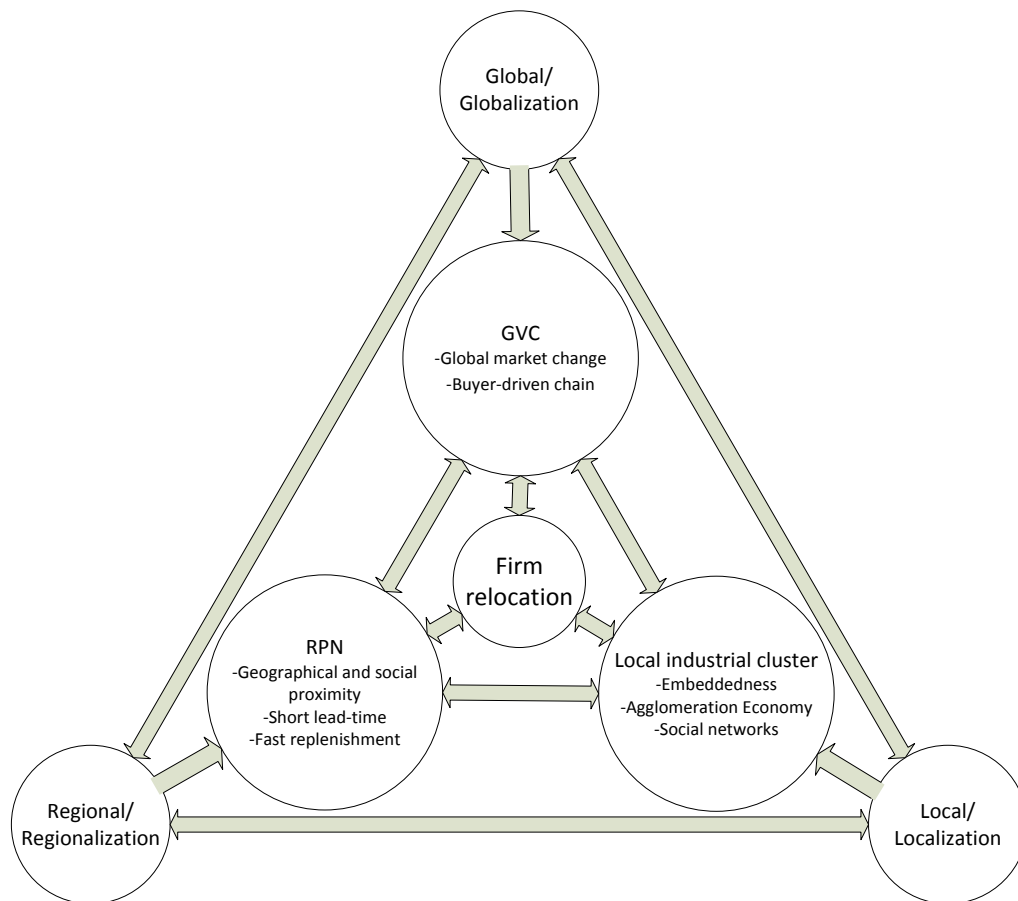


Figure 15 A Tri-polar Analytical Framework of Firm Relocation
(GVC: Global Value Chain, RPN: Regional Production Network)

Industrial clustering and path dependence are important in social networks since actors are likely to enhance ties with partners that they have the most interactions with and are geographical close to, especially if those ties involve complicated interactions and trust (Barnes and Gertler, 1999; Storper, 1997). “Such network features are created and reinforced by geographic proximity and as a result, economic activity often has an important *local* dimension” (Sturgeon et al., 2008) (emphasis added). Specialized labor markets and exchanges of tacit

knowledge are especially dense, efficient and vibrant when it is possible for agents to have face-to-face interaction. Competitiveness of firm partly hinges on its embeddedness into local clusters (Granovetter, 1985; Porter, 1990). Interpretations on how industrial location and relocation choice are shaped by clusters therefore focus on the local sources of competitiveness driven by local economic agents and their vertical and horizontal relationships which generate collective efficiency and knowledge spillovers (Marshall, 1920 [1890]), institutional thickness (Amin and Thrift, 1994), embeddedness (Granovetter, 1985) and traded and untraded interdependencies (Scott, 1988; Storper, 1997).

Nevertheless, studies of industrial relocation based exclusively on local clusters tend to overlook the significance of external linkages. The underestimation of global factors sometimes weakens their explanatory framework or makes their findings problematic, especially as local clusters are often integrated into globally organized value chains in a world characterized by ‘integration of trade’ and ‘disintegration of production’ (Gereffi, 1994, 1999). By highlighting the asymmetric power relationship between suppliers and buyers, the literature on GVCs calls attention to the fact that the organization of global contracting and sourcing systems are heavily affected by the actions and motivations of global buyers, as the latter firmly controls the access to end market in the North (Gereffi, 1999; Schmitz and Knorringa, 2000). In the face of intensified competition for export contracts many firms must struggle with downward pressure on contract prices while being pushed by buyers to accept increased requirements for volume, quality, and delivery. Suppliers have been told to ‘do more with less’ by global buyers and had to shift some of their production to lower-cost locations, which potentially affects suppliers’ decision-making with respect to firm relocation (Tokatli and Kizilgun, 2010).

The focus on ‘global’ is not saying the geographical proximity will quit being a lens through which geographical, social, and economic phenomena can be explored and interpreted. On the contrary, geographical proximity still matters not only in terms of industrial clusters based on face-to-face interaction at the *local* level, but also because the so-called ‘modern’ factors at the *regional* level proposed by Abernathy *et al.* (2006), further developed by Pickles *et al.* (2006) and Tokatli (2008), in their interpretation of the emergence of regional production networks.

The conventional understanding of global apparel trade hinges on basic economic principles of international trade: factor prices, exchange rates, shipping costs, and tariff rates. Abernathy *et al.* (2006) suggests that factors driving apparel sourcing decisions are much more nuanced than is predicted based on these traditional factors. Additional costs derived from geographical remoteness can potentially outstrip the advantage based on low labor and input costs. The emergence of new considerations in sourcing such as the importance of ‘short-cycle replenishment’ or short turnaround times in the procurement of time-sensitive, quick-selling items has added further stickiness to the flow of apparel trade, reinforce the importance of geographical proximity (Tewari, 2006). The rise of lean-retailing is shaping the sourcing pattern in a way where, under certain conditions, speedy delivery and quick response are privileged over considerations of input and labor costs (Abernathy *et al.*, 2006; Tewari, 2006).

However, the ways in which geographical proximity shapes localization and regionalization differ. The former contends that geographical proximity matters as specialized labor markets and knowledge spillovers are especially dense, efficient and vibrant when it is possible for agents to have face-to-face interaction. On the other hand, the latter are driven by geographical proximity at a larger scale, i.e. regional scale. As sourcing pattern is increasingly

shaped by speedy delivery and quick response, supply chain needs to be shortened in terms of geographical distance and rationalized to contain both logistical costs and lead time. The fact that EU buyers sometimes prefer East Europe and North Africa over lower cost China and India for the supply of time-sensitive items exemplifies how geographical proximity generates a regionalization of production. In a word, geographical proximity acts as a centripetal force in the form of localization and regionalization, whereas globalization, as a centrifugal force, tends to encourage industrial relocation as suppliers are often told to ‘do more with less’ by global buyers and have to shift some of their production to lower-cost locations.

Application to China’s apparel industry

As one of the most globalized, dynamic, and geographically mobile industries, the apparel industry has often been seen as an exemplar of supply chain and production flexibility, driven either by manufacturing or branded buyer lead-firms predominantly supplying Northern markets (i.e. buyer-driven GVC) (Dicken, 2007; Gereffi, 1999). Relocation and delocalization of production have long been central aspects of the industry involving the fragmentation of tasks and the division of labor across geographical space, usually with the relocation of labor-intensive elements of the production process to lower cost locations, while core competencies, like R&D, design, and brand ownership, are considered to be less spatially flexible, tied more closely with human capital resources and knowledge networks (Evans and Smith, 2006b; Scott, 2006). For instance, the last few decades have witnessed a significant relocation of clothing production away from the former producing regions in Europe and North America, through Japan, Taiwan, South Korea, Hong Kong and Singapore, to coastal China (Evans and Smith, 2006b); and now we expect to see another round of relocation as production costs rise in China’s coastal regions (Zhu and Pickles, 2014).

At the heart of these changing geographies of production and sourcing are the twin processes of globalization and regionalization. Within these patterns of global sourcing Abernathy *et al.* (2004) and Pickles *et al.* (2006) have shown how geographically proximate regional production continues to play a crucial role. In this view, the globalization of sourcing thus simultaneously fuels the need for regionalized production systems to supply proximate markets with shorter lead-time for orders, faster replenishment, and greater flexibility to adjust orders, styles, and colors in the face of uncertain market demand (see (Tokatli, 2008) on the importance of regionalized replenishment in Zara's sourcing for fast fashion).

In analyzing the rise of China in GVCs it is important, therefore, to show how these processes of regionalization structure the complex geographies of competitiveness and cost regionally, particularly in regions close to major markets, but also to assess how these processes are also at work in China's own apparel production networks. The regionalization processes in China unfolds in two directions: one is the 'Go-in' (or intra-national relocation) which refers to the relocation of low-wage apparel production to lower-cost inland China, often regions from which migrant workers have traditionally been drawn; the other is the 'Go-out' (inter-national relocation) which refers to the outsourcing of low-wage assembly production from China's coastal region to low-cost producing centers in Southeast Asia. In both cases, the division of labor among US or EU, China's coastal region, and China's inland region (or low-cost Southeast Asian countries) generates a new pattern of "triangular trade" where US or EU buyers send orders to the first-tier full-package suppliers located in China's coastal region who may subsequently outsource the assembly production to the second-tier suppliers located in China's inland region or Southeast Asian countries (Lyberaki, 2010). Geographical proximity obviously plays a fundamental role in firm's decision-making with respect to industrial relocation. China's

current configuration is rapidly changing from one dominated by assembly for export markets to one that comprises more organizationally and geographically complex global and regional production networks.

The process of relocation is a complex issue, and one that is not only mediated through the twin processes of globalization and regionalization, but also inflected by locally specific systems of social interaction and trust. I argue that the capacity of apparel firms to relocate must be understood within local institutional contexts in which inter-firm learning, social network, government policies, labor market and conventions create a dynamic field of opportunities and constraints (Dicken and Henderson, 2003; Pickles et al., 2006; Storper, 1997). The local dimension becomes more important as Ningbo apparel industry exists in the form of cluster with local characteristics. The aggregate economic advantages from industrial clusters and social networks on the one hand offset the impact of rising cost and increasing competitive pressures, reduce the operating costs in recruitment and sales. On the other hand they delayed or inflected the need for industrial relocation considerably (Huang et al., 2011).

Geographical dynamics and firm relocation

This section presents case study on relocating Ningbo apparel manufacturers. Examining concrete cases is important in order to understand the underlying mechanisms that affect individual relocation strategies. The firms included in the sample are mostly active in industrial relocation in distinct ways. Most of them started as subcontractors performing assembly work for large foreign firms. Some of them are developing their own brands, and most of them have implemented at least one type of relocation. What makes these firms interesting is that they all have been affected by various factors from the global, regional and local arena therefore made distinct decisions.

Case A: relocating as a lead firm

Peace Bird started as a family workshop in the 1980s and expanded drastically in 1990s as domestic demand for garments rocketed in China's transition to a market economy. After its transformation from a small family workshop to a real registered enterprise in 1995, the strong competitiveness of being a private firm and the founder's farseeing decision to focus on casual shirts gave Peace Bird a competitive advantage over other state-owned and private apparel enterprises, a majority of which still relied on mass production and established competitiveness on low-cost strategy. In 1999, Peace Bird was the avant-garde to start ladies' wear production in a men's-wear-production-dominated apparel cluster. Unlike many of the companies in Ningbo's apparel industry, its history in subcontracting is very limited. Production was first carried in-house and targeted the niche of medium or high-quality, own brand products. Over the past three decades it invested intensively on innovation and upgrading, gradually became a lead firm focusing on OBM production. It now concentrates on its core competences (R&D, branding, marketing and sales), while the rest of production (cutting, sewing, ironing, and trimming) are increasingly carried out in smaller factories in Ningbo and elsewhere (Figure 16). In 2006, it still directly owned 80% of production, while today outsourced production makes up no less than 80% of the total output. The share of outsourcing is likely to increase in the near future as the company's focus has been increasingly switching towards R&D, branding and marketing.

As the competitive pressures intensified, Peace Bird also wanted to seize the opportunity. Although the fluctuation of global demand rarely affected the domestic-market-oriented Peace Bird, the rise of labor cost to some extent inflected its strategy. As the general manager of Peace Bird commented:

We only supply domestic market, so appreciation of currency and global financial crisis have not caused a lot of damage on us. But the labor issue is real. Some of my friends

already moved to Bangladesh or inland China. Wage here is 3000 Yuan a month, while it is 2000 or less in inland regions.

(General Manager of Peace Bird, translated from Chinese)

Peace Bird's relocation strategy unfolded in two ways. One is Type III relocation. In Oct 2003, it invested 0.1 billion Yuan to build up a new manufacturing base located in Yichang, Hubei. On the one hand, it was thus able to access the market of inland China, compensating its previous underinvestment in this area. On the other hand, this relocation enabled Peace Bird to take advantage of the low labor cost in inland China. In addition, Yichang is located along the Yangtze River so that products can be easily shipped back to Ningbo, which is at the end of Yangtze River, at little expense. The other strategy is Type IV relocation. As Peace Bird shed off its non-core parts, it let the invisible hand of market to take care of the process of outsourcing. It announced its order on apparel market and let subcontractors bid. Whoever offered the best deal became its subcontractors. Local subcontractors used to win as they were able to provide high-quality service and geographically proximate to Peace Bird. However, as competitive pressures intensified and subcontractors outside Ningbo matured, production outsourced by Peace Bird gradually moved outside the local cluster, at first relocated to nearby areas within the same province, and recently reached the neighboring provinces. However, Peace Bird was also aware of the accompanying uncertainty and risk.

We are not going to move any further, since long supply chain is difficult to manage and potentially generates some substantial costs which might outnumber the profit.

(General Manager of Peace Bird, translated from Chinese)

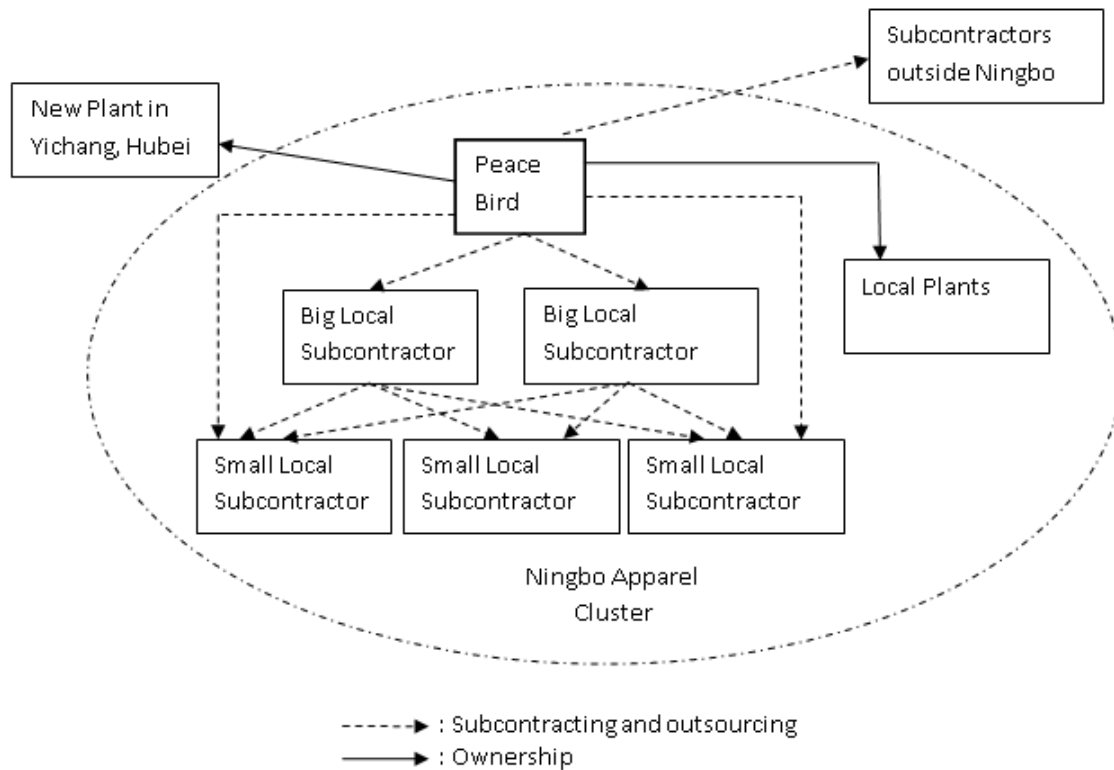


Figure 16 Peace Bird's Production Networks
(Source: compiled by authors)

Case B: going out

Peace Bird represents one extreme of Chinese apparel firms which already became the lead firm and concentrated on OBM production. Unlike the domestic-oriented Peace Bird which is barely affected by 'global' factors, Seduno stands for the other extreme where dominant interpretation of the 'big picture' stresses the asymmetric relationships between global buyers and local suppliers, and the captive role of suppliers in low-wage economies (Gereffi, 1994; Humphrey and Schmitz, 2002b). Emerging out of a state-owned enterprise (Zhejiang Dongfang), Seduno underwent a process of partial privatization and became joint-venture in late 1990s. Starting with assembly production, Seduno is stilling focusing on assembly and OEM production, though it began to develop its own brand—C.O. — in 2012. No less than 90% of its production

is carried out in-house, which makes Seduno the second largest apparel producers in Ningbo.

Seduno is weak in OBM production, but it builds up its strength in production stage. Seduno's more than 150 clients are made up by two categories: one is fast fashion retailers like H&M and Zara accounting for 70% of its output; the rest 30% is sportswear lead firms such as Adidas and Reebok. The concentration on OEM production makes Seduno vulnerable to the intensification of competitive pressures in general and rising labor cost in particular. As its general manager argued:

The increase of costs is eroding the profit margin drastically. First, the price of cotton increased 100% in 2009; second, Chinese currency appreciated 20%; third, labor cost increased from 1000 Yuan a month [in 2000] to 3000 [in the coastal regions in 2012]. Since cotton price and exchange rate are relatively stable this year, the biggest concern is the rising labor cost. Ningbo's labor cost has already increased 15% in 2012.

(General Manager of Seduno, translated from Chinese)

He also emphasized owning oversea manufacturing base was already the prerequisite to receive orders from global buyers. Global buyers, based on their expertise on global sourcing, compel their suppliers to relocate to lower cost locations. As a captive producer, Seduno had to comply with the 'command' from global buyers. Its new manufacturing base in Cambodia was employing 500 local workers in 2012 and planned to recruit another 1500 workers within five years. Although wage in Cambodia was only one fourth of that in China, the backwardness of local supporting facilities in Cambodia forced Seduno to relocate only CMT (cutting, making and trimming) production oversea, while leaving the OEM production in Ningbo.

Case C: staying and going nowhere

The third firm is Baimu, which like Seduno also got its start from supplying global brand firms. Established in 1998 as a small family business performing assembly and OEM production on behalf of large global lead firms, the enterprises gradually scrambled along the GVC and established strong position in ODM production. Like Seduno, it started with OEM production;

unlike Seduno, it stopped taking low-end and low-value-added orders from global buyers like Wal-Mart as it started to upgrade. Now, it only supplies medium- and high-end brand firms, such as Abercrombie, VANS, Tommy Hilfiger and Diesel. As its founder disclosed, “otherwise, we are not competitive compared with low-cost suppliers in Bangladesh and Vietnam”.

The impact of increasing competitive pressures on Baimu has been limited, since Baimu initiated the ‘irreplaceable’ strategy in 2006. Baimu’s irreplaceable strategy refers to not only rejecting low-end and low-value-added orders from global buyers like Wal-Mart, but also upgrading from assembly to ODM production while supplying medium- and high-end brand firms. First, fewer subcontractors can meet the requirement of Abercrombie and Tommy Hilfiger as they demand higher-quality of service, quicker response and shorter lead time. This has ruled out numerous suppliers with low capacity. In other words, Abercrombie and Tommy Hilfiger cannot play off Baimu and other low-cost suppliers against each other. Second, apart from supplying medium- and high-end brand firms, Baimu actively invested in upgrading. Its new automatic assembly line enabled Baimu to raise the productivity level 30% higher with the same amount of labor input. In addition, its cooperation with Abercrombie and Tommy Hilfiger has evolved towards a model where Baimu, as a high-end supplier, completes all processes except branding. In the face of the changing business environment, Baimu chose to stay and go nowhere. Its founder explained why:

On the one hand, we are irreplaceable. It is hard for Abercrombie and Tommy Hilfiger to find another supplier which can meet their high-level requirement on service and product quality. Last year, one client cut 50% of its outsourcing to China. We were not even affected because what he cut was basically orders for low-end suppliers. On the other hand, although costs in inland China and Southeast Asia are lower, suppliers over there are not capable to handle our high-end production. Plus, the supporting facilities are poor. We value quality rather than cost. So we stay in Ningbo and relocate nowhere.

(Founder of Baimu, translated from Chinese)

Case D: going along the coastline

The last two cases are in-betweens, compared with Seduno and Baimu. They are both subcontractors of leading multinationals. However, neither are they high-end subcontractors as Baimu which can stay and go nowhere, nor do they need to seeking for the lowest-cost locations as low-end suppliers Seduno. Take Rouse as an example. Rouse is a medium-sized OEM producer serving the buyers from the EU and US. In response to the rise of labor cost and new round of relocation, Rouse had to shut down some of its production lines in Ningbo and to relocate part of production elsewhere. Rouse's general managers ascribed their relocation to two types of changing business environment. One was the increasingly strict environment regulation in the coastal regions. The other was the rising labor cost, which referred to not only continuous growth of minimum wage set by national and local governments but also potential welfare-related costs for employees.

The mandatory minimum wage increased from 1360 Yuan per month to 1680 [Yuan] this year [2012]. Last year, the life insurance alone cost me 32 thousand [Yuan] per worker. It was only one type of numerous welfare-related costs. In contrast, they do not have this kind of welfare-related costs in Southeast Asia. In inland China, the supervision system is loose. Our customers are unwilling to take this cost increase and they have been urging us to relocate to lower-cost locations.

(General Manager of Rouse, translated from Chinese)

When it comes to relocation, Rouse has pioneered in this effort by partially relocating to Zigui, Hubei in central China in 2001. The relocation was driven by the corporate strategy to lower the cost of production. However, now the Rouse considers this relocation as not a great success. Their original relocation decisions were made exclusively on the basis of the traditional factors, regardless of the fact that additional costs derived from other aspects can potentially outstrip the advantage based on low labor and input costs. Although Rouse was not a high-end supplier like Baimu who can provide high-quality service, it was also not a low-end supplier like Seduno whose competitive advantage was mainly reliant on low cost. As a medium-end subcontractor,

Rouse is supplying customers who are retailing time-sensitive and quick-selling items and stress quick response and short lead time more than low costs. However, the time, it takes to transport finished products from Rouse's Zigui plant to the nearest harbor for export, exceeds the required delivery time. Drawing a lesson from failure, Rouse's next step of relocation has been planned as 'going along the coastline', to reach a balance between low cost and fast delivery. Coastal cities such as Qufu, Shandong and Yongkang, Zhejiang have been investigated as candidates. Rouse's goal is to ensure the delivery time from plant to harbor is less than five hours.

Case E: going in but not far away

Mobi-garden is also a medium-end producer supplying global buyers. Being from the outset of an outdoor sportswear subcontractor of leading multinationals such as Decathlon, Intersports and Coolmax, it started to upgrade since its birth. First, the company pursued more than just 'narrow subcontracting'. Its participation in the GVC was mainly driven by its resolution to achieve process and product upgrading, so as to be a qualified supplier in outdoor sportswear industry, which was characterized by high-tech fabric and high-performance wear. Moreover, Mobi-garden ensured that each buyer accounted for no more than 30% of total outputs, to avoid becoming a captive supplier. As its founder argued:

The 'no more than 30%' rule is set to give us more bargaining power against each of our customers. Wal-Mart has contacted us many times to discuss about subcontracting. We said no. Wal-Mart is so big that its demand easily outstrips half of our production. We do not want to be like those firms who 'live on Wal-Mart'.

(Founder of Mobi-garden, translated from Chinese)

The company was also aware of the changing business environment and had been a pioneer in relocation. In response to the new round of relocation, it established a plant and a logistics center in Quzhou, Zhejiang (the same province as Ningbo) and another plant in Shangshao, Jiangxi (the neighboring province). Both of two locations were geographically close to Ningbo so that delivery time and costs were manageable, and risk and uncertainty could be minimized. This also

partly explains why Mobi-garden has not gone further west or to Southeast Asia. Supporting facilities and supply chain are so backward in Southeast Asia that materials like accessories (buttons and zippers) have to be shipped from Ningbo, and finished products have to be shipped back to logistics distribution centers located in Ningbo. Unlike Seduno whose products are mainly made up by low-cost and low-end T-shirts, Mobi-garden's high-tech, medium- and high-end outdoor sportswear entails high-skilled labor and advanced supply chain management. Neither of them can be met by Southeast Asian countries. Other reasons keep Mobi-garden from relocating to Southeast Asia include bureaucratic costs, volatile political situation and unacquainted legal and cultural circumstances.

Other less prevalent spatial strategies include reversed relocation and resource-oriented relocation. The former one refers to relocating R&D and designing department, which are normally tied closely with human capital resources and knowledge networks, to high-cost regions. Shanshan's relocation of its designing department to Shanghai is a case in point. Giant eagle's acquisition of a manufacturing base in Xinjiang, to take advantage of nearby cotton resources, exemplifies the resource-oriented relocation. Finally, the above-listed cases are not implying that one firm only implements one spatial strategy or one type of relocation. On the contrary, firms, in particular medium and large ones, have been experimenting with a complex array of spatial and industrial responses including factory consolidation, plant closure and geographical relocation, and sometimes launching a combination of various types of relocation. Peace Bird's simultaneous focus on Type III and Type IV relocation is a case in point.

Relocation in the global, regional and local context

The ways in which the above-listed firms have been affected by global factors to different extents can be perfectly interpreted by the GVC analysis, which investigates the inter-firm, often

cross-border, relationships. Particular attention, especially in the buyer-driven apparel GVC, has been given to the role of powerful lead firms that “undertake the functional integration and coordination of internationally dispersed activities” (Gereffi, 1999), and to governance structures, defined as “authority and power relationships that determine how financial, material, and human resources are allocated and flow within a chain” (Gereffi, 1994). In this research, I shall argue that by exercising this governance, global lead firms also play an important role in determining the relocation processes of their suppliers. The extent to which suppliers’ relocation is influenced by their global buyers is dependent on the type of GVC and the asymmetry of power it creates. Gereffi *et al.* (2005) identified five modes of GVC governance: market, modular, relational, captive and hierarchy (vertical integration). The first one is market type of governance where price is paramount and transactions are arms-length. When buyer-driven industries require more intense interactions between lead firms and suppliers, governance takes on a relational or modular form as lead firms and suppliers develop close and mutually dependent relations with a high degree of trust, or a captive form which enables lead firms to maintain tighter control over production and sourcing. The degree of power asymmetry increases from the market to hierarchy.

The GVC-based explanation partially reveals the logic behind the divergence of Chinese apparel firms’ relocation (Table 9). Seduno represents OEM producer whose core competencies are low-cost and volume production. It is trapped in a captive governance structure where producers are dependent on one or a few large customers for the bulk of their sales and also dependent on these customers for the designing and branding of the garments they manufacture. In this case, Seduno cannot make relocation decision independently as its customers keep imposing their sourcing strategies on it. It had to relocate to Southeast Asia if its customers consider oversea manufacturing bases as necessary. At the other end of the spectrum stands

Baimu, whose relationship with global buyers is more symmetrical. Baimu, as a relatively independent supplier, is able to provide access to specialized assets and complementary competences which buyers may find difficult to develop or manage cost-effectively. The fact that competent suppliers cannot be easily found and therefore the switching costs are high for both parties makes Baimu's relationship with its customers more symmetrical and stable.

Consequently, it can make the relocation decision more independently. In between, there are Rouse and Mobi-garden who cannot make relocation as independently as Baimu and also are not as captive as Seduno in the GVC. Their spatial strategies are therefore co-shaped by both parties. Peace Bird is an exception because it is a domestic-oriented lead firm which is not in a GVC. It can make relocation decision entirely independently as impact from global factors is negligible.

Table 9 Comparison of Apparel Firms in Ningbo

	Peace Bird	Baimu	Rouse and Mobi-Garden	Seduno
Governance structure	Domestic-oriented lead firm, not in a GVC	Relational/ Modular	↔	Captive
Business Mode	OBM	ODM	↔	OEM, assembly
Core competencies	Branding, R&D, Marketing, innovation	Designing, full-package production	↔	Low-cost and volume production
Products	Medium-end garments for domestic markets	Intricate, medium- and high-quality garments for global buyers	↔	Mostly basics (t-shirts and low-cost shirts) for global buyers
Degree of power asymmetry	N/A	low	↔	high
Global Buyer's impact	No impact	weak	↔	strong

(Source: compiled by authors)

However, the GVC analysis leaves many open questions. First, Baimu can make relocation decision relatively independently does not mean it has to stay, if relocation can bring cost-saving and profit. As the global factors are pushing firms to relocate as a centrifugal force,

what is the centripetal force that fixates firms? Second, even though some firms relocate, why are they only implementing Type II, III, and IV relocation? In other words, why is complete relocation rare? To clarify these questions, local factors are explored to offer a second angle of explanation. The development and rapid diffusion of knowledge within the cluster are not only the result of incidental synergies, the industrial atmosphere, but also are fostered by local institutional, cultural and societal contexts. Firms that are deeply embedded in their original locations may continue to benefit from labor pools, knowledge spillover and inter-firm synergies that have cultivated over time.

Cluster analysis that relies on transaction costs, knowledge, institutions and social perspectives stresses the key importance of vertical character of linkages (Piore and Sabel, 1984; Scott, 1988; Storper, 1997). Vertical linkages in Ningbo's apparel cluster unfold in two ways. The intra-industry linkage refers to a multi-tier local production networks where large first-tier subcontractors or lead firms outsource to local small second-tier subcontractors (Figure 16). The inter-industry linkage shows the linkages between apparel firms and local supporting facilities, which bundles both accessories manufacturing (e.g. buttons and zippers) and a powerful localized textile industry. For instance, Guangyuan Fabric's specialization in R&D, designing, production and sales of knitted fabrics ties it closely with local apparel firms, such as GXG and Tonlion, as spatial proximity between partners with input-output linkages minimizes transaction costs. Cluster analysis not only values the producer-user vertical relations, but also draws attention towards knowledge flows through horizontal networks (Porter, 1990). The local social network, characteristic with common cultural background and friendship ties, could make the information exchange, communication and cooperation between enterprises much easier.

We were only able to manufacture suits before. But as we are embedded in Ningbo's apparel cluster, we imitated local lead firms' success to diversify production. We

cooperate with local coat firms to learn how to make coats; we work with local shirt firms to learn how to make shirts; we have also learnt how to make woolen overcoats through collaboration with local firms. The inter-firm linkages remain, even after we have mastered the new know-how. We outsource part of production to them in rush season.

(Chairman of Kangnan, translated from Chinese)

Surrounding organizations, such as a supportive apparel association and sophisticated professional and vocational schools or training institutes, further reinforce the local vertical and horizontal linkages. These characteristics of clusters generate many benefits for enterprises and counteract the rising costs to certain extent, on the one hand, alleviate the urgency for firm relocation on the other.

Geographical proximity not only acts as a centripetal force in the form of localization based on knowledge spillover and externalities within local cluster, but also plays an effective role in shaping relocation processes towards a regionalized direction. The importance of geographically proximate regional production is due largely to the specific demands created by the needs of particular products in relation to short production cycles, quick response, and rapid replenishment (Pickles and Smith, 2011) (also see Rouse's first unsuccessful relocation to Zigui). Supply chain needs to be shortened in terms of geographical distance, as geographically long supply chain incurs logistical costs which violate the rule of 'supply chain rationalization'. Consequently, as apparel firms in Ningbo have to partially relocate away from local clusters, neighboring regions are often privileged. Second, geographical remoteness come with a variety of risks and uncertainties, especially as firms relocates to deep inland China or Southeast Asia where political, cultural and societal contexts are entirely different. Finally, the backwardness of labor quality, supporting facilities, infrastructure, and local suppliers' capability in deep inland China and Southeast Asia also frighten relocating firms off.

To sum up, firms stuck in captive GVCs have to relocate to Southeast Asia if global buyers consider overseas manufacturing bases to be necessary (Seduno). However, inter-national relocation becomes problematic for firms manufacturing time-sensitive and quick-selling items, because logistical costs generated by geographically long supply chain can potentially outweigh the advantage based on low labor and input costs. Other reasons prevent firms from relocating inter-nationally (e.g. to Southeast Asia) include bureaucratic costs, volatile political situation and unacquainted legal and cultural circumstances. As a result, nearby areas within the same province and neighboring provinces in central China are privileged over Southeast Asia by firms which supply time-sensitive items with short lead-time, fast replenishment, and quick response. Unlike Seduno's 'going-out', certain firms' relocation, therefore, unfolds in an intra-national way (Mobi-garden and Rouse), especially as they can make relocation decisions more independently in less captive GVCs. Both inter-national and intra-national relocation are the result of the complex balance in relocation processes between regionalization and globalization. Firms which manufacture medium- or high-end, time-sensitive and quick-selling items tend to relocate intra-nationally, while suppliers dependent on low-wage and low-cost production is more likely to conduct inter-national relocation. In both cases, regional and global factors co-shape firm's decision-making with respect to relocation but to different extents. Localization plays as a centripetal force since benefits generated by clusters counteract the rising costs to certain extent and allow some firms to withstand the intensified pressures (Baimu), on the one hand, and entice relocating firms to leave their headquarters and core departments at home (Mobi-garden, Rouse, Seduno, and Peace Bird), on the other hand.

Conclusion and discussion

This chapter formulates a tri-polar analytical framework that combines ‘global’, ‘regional’ and ‘local’ in an interactional way. The usefulness of this framework is illustrated in a case study about relocation of Ningbo’s apparel firms. The rise of China’s export-oriented apparel industry since the 1990s has been driven largely by global sourcing practices intent on capturing the cost advantages of a development model predicated, in part, on unskilled or semi-skilled migratory labor flows linking inland labor pools to coastal production sites. Since the early 2000s, coastal factories have increasingly had to confront difficulties generated by the increasing social and economic costs of this regionally concentrated low-wage growth model. As competitive pressures, production costs, and wages have increased in recent years, apparel enterprises have been hit hard by slackening global demand, production cost hikes, RMB appreciation, rising labor cost and approval of new policies. Rising labor costs have been particularly important in forcing China’s apparel enterprises to restructure their value chains. At the present time, a great deal of attention is directed toward industrial relocation, while concern for the underlying mechanism driving firm relocation and geographical restructuring has lagged or failed to disclose the full view.

In drawing from a single case study, I realize the potential limitations of my analysis. However, the case of Ningbo provides a number of insights to the interpretation of relocation. First, firms are deeply embedded in their original locations and keep benefiting from local vertical and horizontal linkages they have cultivated over time in cluster. Second, the global factors emphasize cross-border linkages between global buyers from the North and local suppliers from Ningbo, and have been acting as a centrifugal force while driving firms to delocalize and relocate to lower-cost locations. Third, regionalization draws attention to the

assemblage of a range of forces including geographical proximity, delivery time, supply chain management as well as labor costs, all impacting on the geographies of sourcing decisions and production networks. Combining these important pillars, my tri-polar framework interprets industrial relocation through systematic interrelationships and ongoing interaction between globalization, regionalization and localization.

In addition, the extent to which firm relocation processes are affected by globalization, regionalization and localization is determined by firm's characteristic. For instance, firm's embeddedness into local cluster, its horizontal and vertical linkages with other firms co-locating in the same cluster, and reliance on local supporting facilities largely explains its degree of localization and capability to resist relocation. Furthermore, firm's core competencies, main products, and business mode disclose its position in GVC and extent to which global buyers are able to affect its sourcing strategy and relocation processes. These characteristics also decide firm's need to handle quick response, short lead time, quick replenishment and therefore its tendency to embrace geographical proximity and regional production network. My argument is, therefore, not only simply about industrial relocation in the global, regional and local context where advantages of some untraditional factors can outweigh profit generated by lower labor cost, but about also the diversity of trajectories of relocation, some of which may not be reducible to a singular logic. Likewise, the extent to which firm relocation processes are affected by globalization, regionalization and localization is also determined by sector-specific characteristics, which deserves further investigation.

This research also engages with debates on 'opportunities for suppliers' in GVC analysis. In a buyer-driven chain as apparel which is often characterized by the asymmetric relationships and the captive role of producers in low-wage economies, particular attention has been drawn

towards how global buyers both contribute to process and product upgrading of local suppliers and also place limits on functional upgrading and market diversifications (Humphrey and Schmitz, 2002b). Much existing literature on GVC emphasizes the action and motivation of global buyers are the key causal forces in the organization of global contracting systems (Gereffi, 1999; Schmitz and Knorringa, 2000) which makes suppliers' prospect seems dimmed, whereas reality may be more complex and changes over time may lead to the emergence of more symmetrical relationships among actors and diversity of trajectories.

What is happening in Ningbo's apparel industry is that intensified competition propels a variety of relocation responses. The sector appears to be 'stuck in the middle' and the trend favoring the relocation of production towards lower wage economies appears to be accelerating. Although this trend is often portrayed as a sign of danger leading to desperate exodus, this explanation has overlooked the fact that rising labor cost is only part of the story. I have suggested in this chapter that we need to be sensitive in any analytical work to the complex balance in relocation processes between a range of forces derived from regionalization, localization as well as globalization. The five different examples of relocation in apparel suppliers exhibit five different trajectories, but they also have something in common. Having previous experience with supplying global brands, at some stage they opted for relocation of the labor-intensive low-end processes to lower-wage locations. In the process of relocation, they either developed their own brand or evolved towards a triangular trade mode where the former producers became the intermediaries or full-package producers while they further outsource global buyers' order to second tier subcontractors in lower-cost locations. Therefore, relocation of production may offer local suppliers some opportunities in the direction of upgrading within a buyer-driven GVC. In terms of policy implications, it appears that participating in a GVC is an

‘effort-intensive’ process involving risks and unanticipated traps but also opportunities.

Opportunities exist not in relocation *per se*, especially if firms only conduct complete relocation with a pure purpose to chase for lower-cost locations, but in specific types of relocation which come with upgrading hand in hand.

CHAPTER 5 PROCESS, PRODUCT, AND FUNCTIONAL UPGRADING IN A GLOBALIZED AND LOCALIZED WORLD: FIRM-LEVEL EVIDENCE FROM CHINA'S APPAREL INDUSTRY

Introduction

One of the feasible responses of firms to maintain or increase their competitiveness in the increasingly globalized economy is to upgrade their production. Upgrading involves producers' capability to make better products, to make products more efficiently, or to move into more skilled activities (Kaplinsky, 2000; Pietrobelli and Rabellotti, 2006; Porter, 1990). In Global Value Chain (GVC) approach, the concept of industrial upgrading is defined in a similar way as "the process by which economic actors—nations, firms, and workers—move from low-value to relatively high-value activities in global production networks" (Gereffi, 2005: 171). Upgrading is an increasingly central element in shaping new geographies of production, as economic actors strive to shed low-value activities and the social and economic problems they can generate in favor of higher-value activities (Bair, 2005; Gereffi, 2005; Humphrey and Schmitz, 2002b; Ponte, 2002). Here a primary focus has been on the mechanisms whereby firms and industries engineer a process of industrial upgrading within GVCs to capture additional functions in supply chains which generate higher value added. Humphrey and Schmitz (2002a), for example, distinguish between four types of upgrading in global value chains: product, process, functional and chain/inter-sectoral upgrading.

- *functional* (moving to higher-value functions);
- *product* (producing higher-value products);

- *process* (incorporation of more sophisticated technologies into production and/or re-engineering production lines, such as in lean manufacturing); and
- *chain/inter-sectoral* (leveraging expertise gained in one industrial sector to enter a new sector).

In a buyer-driven chain such as apparel, which is often characterized by the captive role of suppliers in low-wage economies, particular attention has been drawn to how global buyers both contribute to process and product upgrading of local suppliers and place limits on functional upgrading and market diversifications (Humphrey and Schmitz, 2002b). Process and product upgrading have thus been related to ‘learning from *global* buyers’, while the sources of capabilities that lead to functional upgrading, as conventionally conceived, derive from *local* knowledge transmission and *local* institutional context¹³ (Giuliani et al., 2005; Humphrey and Schmitz, 2002b). In this chapter, I test and extend these findings using a large firm-level dataset on China’s apparel industry. Specifically, this chapter focuses on the development and dynamism of functional, process and product upgrading in China’s apparel industry, and investigates the ways in which and the extent to which different types of upgrading have been co-shaped by both global and local forces.

China’s apparel industry provides a rich context. On the one hand, the impressive economic growth of China has been driven to a large extent by an export-oriented industrialization model and China’s inclusion into GVCs (Gereffi, 2009). The integration of the Chinese apparel industry into global production and trade networks deepened greatly after 1990. Between 1994 and 2010, China increased its exports of apparel products from US\$ 24.3 billion to US\$ 149.5 billion (Figure 17). Despite declines in 1998-1999 and 2009 as a result of the 1998

¹³For Ponte and Ewert (2009: 1639) “The status of inter-sectoral upgrading is unclear, as it relates to a trajectory of upgrading, while the other three categories describe what aspect of a given business is being upgraded”. For similar reasons I do not consider chain upgrading in this chapter.

Asian Financial Crisis and 2008 Global Financial Crisis respectively, Chinese apparel exports surged, driven largely by export to the US market in the early 2000s and by the removal of quotas on apparel exports to the developed countries in 2005. China's export orientation of labor-intensive products has generated greater capacity utilization, vertical and horizontal integration, product specialization, increasing familiarity with technology, and large learning-by-doing effects.

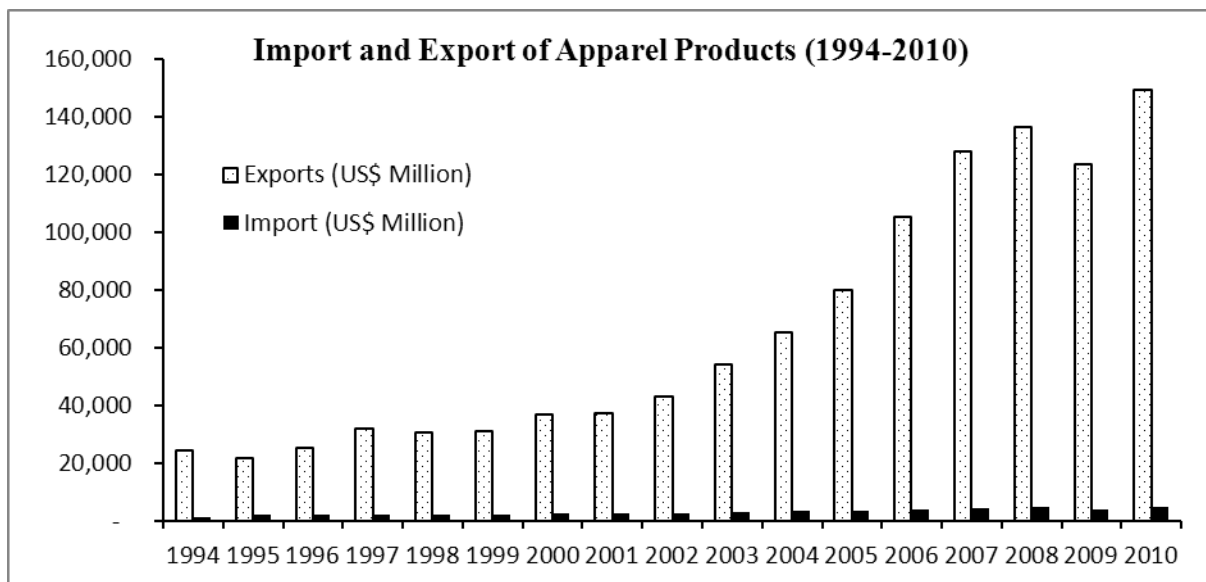


Figure 17 Import and Export of China's Apparel Products (1994-2010)¹⁴
Data Source: China Statistical Yearbook, 1995-2011.

On the other hand, besides global linkages, another important and enduring basis for competitive advantages is predicated on firm's localness. The capacity of Chinese apparel firms to upgrade must also be understood within local institutional contexts in which inter-firm learning, social network, government policies, labor market, and conventions create a dynamic field of opportunities and constraints (Dicken and Henderson, 2003; Pickles et al., 2006; Storper,

¹⁴Based on China's classification of exports in the statistical yearbook, I have calculated the data on exports of apparel products by adding up four categories of Textile and Apparel Articles: 1. Knitted or Crocheted Fabrics. 2. Articles of Apparel and Clothing Accessories, Knitted or Crocheted. 3. Articles of Apparel and Clothing Accessories, not Knitted or Crocheted. 4. Other Made Up Textile Articles; Sets; Worn Clothing And Worn Textile Articles; Rags Articles; Rags. These four labor-intensive sectors has increased faster than other categories of Textile and Apparel Articles and represented 76% of China's export of Textile and Apparel Articles in 2010, compared to 71% in 1994.

1997). The local dimension becomes more important in this scenario, as China's apparel industry, in most cases, exists in the form of cluster with local characteristics (Wei, 2011; Wei et al., 2007; Wei et al., 2009). Apparel production and employment has heavily concentrated in the coastal regions of east and southeast China in general, and in a series of apparel clusters in coastal provinces in particular (Figure 3) (Fujita and Hu, 2001; He et al., 2008; Wen, 2004).

Upgrading is a complex process, and one that is not only mediated through globalization and global linkages, but also shaped by what Storper (1997) refers to as the locally specific untraded interdependencies and systems of social interaction and trust. Due to its increasing integration into GVCs and heavy reliance on industrial clustering, China's apparel industry provides an ideal case to research the dynamism of various types of upgrading and their relationship with both global and local linkages. Specifically, this chapter pays attention to the fluidity, complexity, variety, contingency, heterogeneity and dynamism of this relationship, by documenting the diverse effects global and local linkages have had over firm upgrading and the ways in which such effects have been constantly evolving over time. Section two presents a conceptual account on the articulation between firm upgrading, global and local forces. The third section introduces the data, variables and specifications for empirical analysis. Section five discusses the empirical results. The last section concludes the chapter by summarizing main findings and discussing theoretical and policy implications.

Process, product, and functional upgrading in a globalized and localized world

In this chapter, I focus on one of the central analytical heuristics in GVC research: the concept of upgrading, particularly as it has been used to highlight paths for developing countries firms to 'move up the value chain' usually through the lenses of four categories—product, process, functional, and inter-sectoral upgrading (Gereffi, 1999; Humphrey and Schmitz, 2002b).

Product and process upgrading involve firms retaining their position in a chain by enhancing productivity gains through adopting new production processes or new configurations of product mix. Functional upgrading involves a movement ‘up’ the chain into newer, higher value added activity, such as full package and own design/own brand manufacturing in the clothing sector. Chain upgrading involves a movement into new activity which may also imply higher skills and capital requirement and value added (Humphrey and Schmitz, 2002a; Milberg and Winkler, 2010). The implicit expectation in this work is that firms that upgrade produce higher value-added products and/or take on more sophisticated functions along a value chain over time.

By focusing on the array of network relations that structure the production and circulation of value, GVC scholars have been able to assess the asymmetries of power between lead-firms and suppliers (Gereffi, 1994, 1999), different forms of governance that marshal and exercise this power (Gereffi, 2005; Gereffi et al., 2005), and their consequences for work-place conditions and wages (Barrientos et al., 2008, 2010; Gereffi et al., 2011; Mayer and Pickles, 2010). As a greater proportion of global commodities are increasingly traded through GVCs, analyzing their structure and practices becomes even more crucial. The integration of clothing producers and workers in various parts of the world economy into export-oriented production networks has produced an extensive literature (see for example (Bair, 2005, 2009; Begg et al., 2003; Leslie and Reimer, 1999; Smith, 2003; Smith et al., 2003; Smith et al., 2005)). But, as Bair (2005) notes, the earlier focus of much of this work on global commodity chains has more recently shifted towards analysis of the way that value chains are organized and governed, and a consideration of the implications for industrial upgrading (also see (Gereffi et al., 2005)).

The upgrading process has been attributed to the acquiring of new capabilities and increasing competencies through participating in particular chains, a process that generates

knowledge and information flows from lead firms to their suppliers. Although the knowledge and information flow within GVCs has high value for local firms, the role played by the global buyers in fostering and supporting local firms' upgrading process is less clear. Mainly focusing on East Asia, Gereffi (1999), has stressed the role of global lead firms in promoting process upgrading, product upgrading and functional upgrading among local producers. However, more recently Gereffi (2005) and others such as Schmitz and Knorringa (2000) and Humphrey and Schmitz (2002b) have stressed that global buyers both contribute to process and product upgrading of local suppliers and place limits on functional upgrading and market diversifications, especially in a quasi-hierarchical chain (e.g., apparel). To achieve functional upgrading, supplier firms in developing countries have to rely to a greater extent on local sources of innovations, which are not only the result of knowledge spillovers and inter-firm synergies within local cluster but are also fostered by policy networks of public and private actors (Barnes and Gertler, 1999; Scott, 1996; Storper, 1997). Therefore, while process and product upgrading have been linked to 'learning from *global* buyers', the sources of capabilities that lead to functional upgrading, are conventionally understood to derive from *local* knowledge transmission and *local* institutional context (Giuliani et al., 2005; Humphrey and Schmitz, 2002b). This chapter seeks to test these findings and to argue that this tendency to attribute functional upgrading to 'local' factors and process/product upgrading to 'global' factors has become problematic as the global sourcing system and GVCs have been constantly transformed in the past few decades.

Work on upgrading requires an engagement with the wider historical, political, institutional, economic and social context within which production networks are embedded. While process, product and functional upgrading may be apparent in China's apparel industry (Zhu and Pickles, 2014), these have been articulated with a range of other causal mechanisms

that relate to wider and changing economic, institutional and historical conditions which are central in assessing the extent to which a process of upgrading is even possible (Smith et al., 2014). In other words, there is a need to move beyond a firm-centered approach to upgrading towards a framework which recognizes the embeddedness of firm and sector-level change within the context of wider historical economies and institutional arrangements. This suggests the need for a framework that seriously takes into account the forces external to the chain that structure (enable and limit) what actors in the chain do (Bair, 2009; Pickles et al., 2006; Smith, 2003; Smith et al., 2003). In my case, this means the articulation between various types of firm upgrading and global/local factors needs to be not only understood as dynamic, contingent, and fluid, but also interpreted in ways which take into account the specific historical development of China's apparel industry, the evolution of institutional arrangements for apparel, and the ups and downs of globalization and global economy.

Furthermore, in these debates on upgrading, it is also important that we take seriously the heterogeneity, complexity and variety of the relationship between upgrading and global/local factors. First, given the fact that firms are actually heterogeneous with different attributes and capabilities and firm upgrading decisions are normally made based on firm attributes, it may be inappropriate to examine the articulation between various types of firm upgrading and global/local factors only through meso- or macro-level analysis without paying special attention to micro- or firm-level features (Wang et al., 2010; Wang and Lin, 2013). Second, there also needs to be consideration of the heterogeneity and complexity of the effects of global and local linkages over firm upgrading, since such effects are, in most instances, materialized through interactions between heterogeneous firms in global and regional production networks.

The heterogeneity of firms, complexity of the effects of global and local linkages over firm upgrading, and the wider historical, political, institutional, economic and social context have all played a critical role in the process of firm upgrading and its articulation with global and local factors. They suggest that a focus on dynamics of firm upgrading alone is insufficient. Specifically, this chapter pays attention to the fluidity, complexity, variety, contingency, heterogeneity and dynamism of the relationship between firm upgrading and global/local forces, by documenting the diverse effects global and local linkages have had over firm upgrading and the ways in which such effects have been constantly evolving over time.

Research design

Firm entry and firm exit

One database on firm-specific economic and financial variables is used to test the debates on upgrading: China's Annual Survey of Industrial Firms (ASIF) (1998-2009)¹⁵. Table 10 presents the temporal change of firm entry and exit in China's apparel industry. If firm i is reported in the ASIF in year t but not in year $t-1$, this firm is considered as a new firm in year t . Likewise, if firm i is reported in the ASIF in year t but not in year $t+1$, it is assumed that firm i exits in year t . Firm entry rate is thereafter calculated as the ratio of the number of new firms to the number of all firms in a specific year, and firm exit rate is the share of the number of exiting firms. Since ASIF dataset only includes non-state-owned enterprises with annual sales of 5 million RMB or more besides state-owned enterprises, firm exit and entry rate are likely to be overestimated to some extent due to the fact that: (1) non-state-owned enterprise that passes the threshold (annual sales of 5 million RMB or more) in year t but fails to do so in year $t+1$ will be treated as an exiting firm; (2) non-state-owned enterprise that passes the threshold in year t but is

¹⁵2004 and 2008 are also China's census years, indicating inconsistent statistical criteria in these two years. In addition, firm identification information (i.e., legal person code) is incomplete in 2008 and 2009. As a result, ASIF 2004, 2008 and 2009 will be excluded or investigated separately in the following analysis.

not big enough in year $t-1$ will be considered as a new firm. However, the goal here is to roughly see the temporal change and evolution of China's apparel industry, rather than the magnitude of individual indicator.

Table 10 Firm Entry and Exit in China's Apparel Industry (1998-2007)

Year	Number of Firms	New Firms	Firm Entry Rate (%)	Exiting Firms	Firm Exit Rate (%)	Surviving Firms
1998	5,685			1,369	24.8%	4,316
1999	5,909	1,593	26.9%	1,399	23.7%	4,510
2000	6,155	1,645	26.7%	1,734	28.2%	4,421
2001	7,295	2,874	39.4%	1,253	17.2%	6,042
2002	8,214	2,172	26.4%	1,484	18.1%	6,730
2003	9,252	2,522	27.3%	3,673	39.7%	5,579
2004	11,226	5,647	50.3%	2,050	18.3%	9,176
2005	11,339	2,163	19.1%	1,568	13.8%	9,771
2006	12,358	2,587	20.9%	1,507	12.2%	10,851
2007	13,968	3,117	22.3%			

Data Source: Compiled by authors, from the Annual Survey of Industrial Firms 1998-2007

The number of apparel firms has increased from 5,685 to 13,968 during 1998-2007, with an average firm entry rate of 26.1% and an average firm exit rate of 19.5%¹⁶. The time period of 1998-2007 can be roughly divided into three stages based on the development of the apparel industry:

(1) 1998-2001 represents a recovery stage after the 1998 Asian Financial Crisis. At this stage, on the one hand, the number of firms was increasing, on the other, firm exit and exit rate were both high, suggesting the co-existence of industrial recuperation and reorganization/restructuring.

(2) 2001-2004 could be considered as a post-WTO stage. The growth of China's apparel industry was accelerated with WTO accession in 2001. In 2002, firm entry rate was as high as 26.4% while exit rate was less than 20%. However, the growth rate has been decreasing during 2001-2003, as China's apparel industry started to feel the constraints caused by the MFA.

¹⁶Firm exit and entry rates calculated based on the ASIF 2004 data have been excluded.

(3) China's apparel industry boomed again during 2005-2007, a post-MFA stage, where firm entry rate rebounded while exit rate kept declining. Although firm entry rate was relatively lower during 2005-2007 than before, so was the firm exit rate, resulting in an overall increment in the absolute value of the number of firms as well as its growth rate. Relatively lower exit and entry rate also signaled the maturation and stabilization of Chinese apparel firms as well as the entire industry.

Such a three-stage development of China's apparel industry during 1998-2007 is also supported by the temporal change of growth rate (Figure 18).

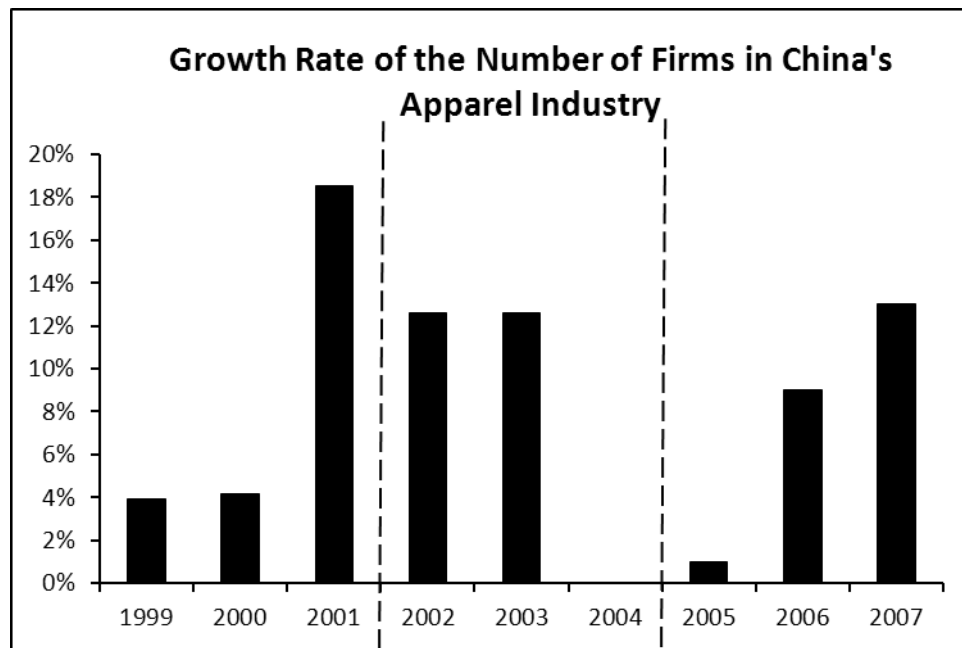


Figure 18 Growth Rate of the Number of Firms in China's Apparel Industry
Data Source: Compiled by authors, from the Annual Survey of Industrial Firms 1998-2007

Measuring process, product and functional upgrading at the firm level

Most of the massive amount of research done on upgrading has focused on the study of individual cases of countries, firms, regions or sectors (Giuliani et al., 2005; Neidik and Gereffi, 2006; Pickles et al., 2006; Ponte and Ewert, 2009; Tokatli and Kizilgun, 2004). Case studies bring a deeper understanding of the process of upgrading, the role of each of the key

actors and the obstacles that upgrading firms face in GVCs. However, qualitative studies based on case studies and key informant interviews tend to focus on success stories and/or the most important firms, indicating a bias problem that would skew any generalizations one might draw from the overall literature (Milberg and Winkler, 2011; Pavlínek and Ženka, 2010). In addition, their results are in some instances difficult to generalize due to the limited sample size. On the other hand, in quantitative analyses, upgrading is often measured by analyzing export values, quantities, and unit values using macroeconomic trade data at the country, or at best regional, level, due to the unavailability of firm-level data (Gereffi, 1999, 2009; Pickles and Smith, 2011). These data are difficult to interpret because higher unit values can signify either upgrading or higher costs (e.g., higher wages), and the high level of aggregation makes it hard to understand firm dynamics.

In this chapter, to overcome the limitations of export value analysis based on trade data and qualitative analysis based on company interviews, I use an empirical, firm-level approach, developed by Pavlínek and Ženka (2010), to measure upgrading at the firm level. This allows me not only to evaluate the extent of upgrading in the industry as a whole and to compare its extent among individual firms and selected groups of firms, but also to differentiate and measure different types of upgrading (i.e., functional, process and product upgrading). In doing so, I formulate a comprehensive yet nuanced approach to measure upgrading at the firm level, which complements current qualitative and quantitative methods.

To analyze industrial upgrading, I have employed three indicators¹⁷. Capital intensity of production (fixed asset per employee) reflects a firm's investment into buildings, machinery and equipment. This type of investment can lead to an increase in labor productivity, through the

¹⁷All variables have been deflated and expressed according to 1998 prices using appropriate price indexes, unless stated otherwise.

materialized technological progress, as a result of process upgrading (Pavlínek and Ženka, 2010; Sakellaris and Wilson, 2004). A firm is classified as having a product upgrading if it successfully introduces new products. Finally, the share of value-added in output reflects the firm's capability to produce and retain value, therefore is employed as an indicator of functional upgrading. Although process upgrading (increasing production efficiency) and product upgrading (introducing higher value-added products) enable firms to capture more value in absolute terms, the share of value-added in output is mostly determined by the power asymmetry, firms' position, and the specific functions firms perform in the apparel GVCs.

Table 11 shows the temporal change of the mean value of process, product and functional upgrading indicators at the firm level in China's apparel industry during 1998 and 2007. My data suggests that while the number of firms has been growing consistently from 1998 to 2007 (Table 10), resulting in continuous job creation and output increment, the temporal change of industrial upgrading indicators indicate a more complicated situation where upgrading is not always the case (Table 11). All three indicators went downhill after the 1998 Asian Financial Crisis, and bounced back a little due partly to China's accession into the WTO in 2001. The removal of quotas in 2005 suddenly liberated Chinese apparel industry and took the dynamics of industrial upgrading to an entirely new level. These findings also echo with my statement above with respect to the three-stage development of China's apparel industry.

Table 11 Temporal Change of the Mean Value of Process, Product and Functional Upgrading Indicators at the Firm Level in China's Apparel Industry (1998-2007)

	Process Upgrading Indicator ^a	Product Upgrading Indicator ^b	Functional Upgrading Indicator ^c
1998	36.1	1.6%	26.7%
1999	25.1	1.4%	27.5%
2000	29.4	1.2%	27.9%
2001	24.1	1.0%	28.1%
2002	22.5	0.8%	27.6%
2003	21.7	0.9%	27.9%
2005	21.8	2.7%	29.9%
2006	24.1	2.8%	30.4%
2007	26.1	3.1%	30.5%

Data Source: Compiled by authors, from the Annual Survey of Industrial Firms 1998-2007

Notes: ^a fixed asset per employee, unit: thousand Yuan per capita; ^b the ratio of new product output to total output; ^c the share of value-added in output.

Variables and model specifications

The following three equations for three types of upgrading are estimated:

$$Process_{i,t2} - Process_{i,t1} = \beta_0 + \beta_1 Process_{i,t1} + \beta_2 Age_{i,t1} + \beta_3 Zone_{i,t1} + \beta_4 Size_{i,t1} + \beta_5 Ownership_{i,t1} + \beta_6 Export_{i,t1} + \beta_7 Export_{i,t1}^2 + \beta_8 Marshall_{i,t1} + \beta_9 Jacobs_{i,t1} \quad (1)$$

$$Product_{i,t2} = \beta_0 + \beta_1 Product_{i,t1} + \beta_2 Age_{i,t1} + \beta_3 Zone_{i,t1} + \beta_4 Size_{i,t1} + \beta_5 Ownership_{i,t1} + \beta_6 Export_{i,t1} + \beta_7 Export_{i,t1}^2 + \beta_8 Marshall_{i,t1} + \beta_9 Jacobs_{i,t1} \quad (2)$$

$$Functional_{i,t2} - Functional_{i,t1} = \beta_0 + \beta_1 Functional_{i,t1} + \beta_2 Age_{i,t1} + \beta_3 Zone_{i,t1} + \beta_4 Size_{i,t1} + \beta_5 Ownership_{i,t1} + \beta_6 Export_{i,t1} + \beta_7 Export_{i,t1}^2 + \beta_8 Marshall_{i,t1} + \beta_9 Jacobs_{i,t1} \quad (3)$$

where i is the firm. Based on the three-stage development of China's apparel industry, I define $t1$ and $t2$ as (1998, 2001), (2001, 2003) and (2005, 2007) so as to analyze industrial upgrading in all three stages separately. Process upgrading indicator ($Process_{i,t}$) is defined as the fixed asset per employee of firm i in year t . Dependent variable in equation (1) is the difference of $Process_{i,t}$ in $t1$ and $t2$. Process upgrading will be indicated when $Process_{i,t2} - Process_{i,t1}$ is positive. Likewise, functional upgrading indicator ($Functional_{i,t}$) is measured as the share of value-added in output of firm i in year t . Dependent variable in equation (3) is the difference of $Functional_{i,t}$ in $t1$ and $t2$. A positive $Functional_{i,t2} - Functional_{i,t1}$ suggests firm i has achieved functional upgrading during $t1$ and $t2$. Finally, product upgrading indicator ($Product_{i,t}$) is a dummy, taking the value of

1 if the firm i has introduced new products in year t . In other words, if dependent variable in equation (2) ($Product_{i,t2}$) is 1, it means firm i has accomplished product upgrading in year $t2$.

The first group of key independent variables is to evaluate the effects of ‘learning from global buyers’ over firm upgrading. $Export_{i,t}$ is export intensity of firm i in year t , indicating the extent to which a firm is linked to international market and global lead firms. $Export_{i,t}$ and its squared term in all three equations test the hypothesis that global factors both contribute to process and product upgrading of local suppliers in developing countries and place limits on functional upgrading, especially in the quasi-hierarchical apparel GVC.

$Marshall_{i,t}$ and $Jacobs_{i,t}$ are introduced to assess the relationship between firm upgrading and its reliance on local sources of innovations derived from knowledge spillover and inter-firm synergies within local clusters. Several hypotheses have been proposed concerning conditions under which local clusters and economies of agglomeration affect regional development and firm growth. One hypothesis, developed by Marshall (1920 [1890]), contends that knowledge is predominantly industry-specific and therefore local specialization will foster regional development and firm growth. The other hypothesis, formulated by Jacobs (1969), claims that regional diversity in economic activity will result in agglomeration externalities as knowledge developed by one industry can also be fruitfully applied in other industries. In this chapter, the degree of Marshallian externalities ($Marshall_{i,t}$) for firm i represents the employment density in the same industry (i.e. apparel) in the city where firm i is located, measured as the total employment of the apparel industry in this city in year t divided by the total area of the city. Similarly, the degree of Jacobsian agglomeration effects ($Jacobs_{i,t}$) is measured as the total employment of other manufacturing industries in year t in the city where firm i is located divided by the total area of the city.

Political intervention and state institutional action are of central importance particularly in the context of China where the state remains a heavy-handed actor in regulating industries activities (Wei, 2000, 2001b). Dummy variable $Zone_{i,t}$ is therefore introduced to control the effects of political intervention over firm upgrading, taking the value of 1 if firm i is located in government-designated economic development zones in year t . It is also important that we take seriously the heterogeneity and variety of firms, given the fact that firms are actually heterogeneous with different attributes and capabilities and firm upgrading decisions are normally made based on firm attributes (Wang and Lin, 2013). I control several firm-specific variables, which are likely to affect firm upgrading. $Age_{i,t}$ is the log of firm age (years), and $Size_{i,t}$ is the log of number of employees. Ownership may also make significant difference in firm innovation and upgrading. Dummy variable $Ownership_{i,t}$ is therefore included, taking a value of 1 if firm i is a domestic-owned firm. Finally, Process and functional upgrading are measured as the difference of firm upgrading indicators in year $t1$ and $t2$, while product upgrading is defined as a dummy, taking the value of 1 if the a firm has introduced new products at the end of the year $t2$. As a result, $Process_{i,t1}$ and $Functional_{i,t1}$ are introduced to control the dependence of process and functional upgrading on the initial value, while the significance of the coefficient of $Product_{i,t1}$ would imply product upgrading persistence.

In the estimation equations, the adoption of lagged terms is to accommodate the time consumed by firms between benefiting from global and local sources and accomplishing real upgrading. The geographical unit of analysis is China's prefectural level city (excluding Taiwan, Hong Kong and Macau).

Statistical results

Process, product and functional upgrading in a globalized and localized world

Correlation analysis indicates that correlations of independent variables are moderate or low, suggesting no serious problem of multi-colinearity. Table 12(a)-(c) reports the results of the estimations of equations (1), (2) and (3). Only firms that existed during the entire 1998-2001, 2001-2003 and 2005-2007 periods are included in models in Table 12(a), (b) and (c) respectively, while entering and exiting firms during the 1998-2001, 2001-2003 and 2005-2007 periods are excluded. Process and functional upgrading are measured as the change of firm upgrading indicators throughout a specific time period, while product upgrading is defined as a dummy, taking the value of 1 if the a firm has introduced new products at the end of the time period. As a result, equation (1) and (3) are estimated by the OLS model, while equation (2) is estimated by the LOGIT regression model.

The first finding is related to the dependence of process and functional upgrading on the initial value. In all cases (Model 1-6 in all three tables), upgrading is negatively related to the initial value of process and functional upgrading indicators, with a significance level not lower than 1%. In other words, as firms move upward, it becomes increasingly difficult to keep upgrading. On the other hand, estimates of the coefficient of $Y_{i,t}$ for product upgrading (Model 7-9) indicate positive statistically significant upgrading persistence, suggesting firms that have already accomplished product upgrading are more likely to have product innovation in the future.

Table 12(a) Determinants of Firm Upgrading (1998-2001)

1998-2001	Process upgrading			Functional upgrading			Product upgrading		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Constant	33.108***	26.811***	33.211***	0.188***	0.176***	0.183***	-5.272***	-5.124***	-5.461***
$Y_{i,1998}$	-0.933***	-0.931***	-0.932***	-0.676***	-0.669***	-0.672***	4.210***	4.321***	4.211***
$Age_{i,1998}$	2.161*	2.050*	1.909*	0.004*	0.004*	0.005*	0.097	0.773	0.128
$Zone_{i,1998}$	5.111*	5.192*	5.758**	0.003	0.008	0.008	-0.907	-0.712	-0.726
$Size_{i,1998}$	0.002	0.003*	0.003*	0.001*	0.001*	0.001*	0.001**	0.001***	0.001**
$Ownership_{i,1998}$	-1.886***	0.179	-1.660***	-0.004	-0.004	-0.006	-0.147	-0.288	-0.169
$Export_{i,1998}$	36.581***		33.811***	0.032		0.017	4.432***		3.927**
$Export^2_{i,1998}$	-45.838***		-43.356***	-0.004		-0.030	-3.972***		-3.546**
$Marshall_{i,1998}$		-0.107	-0.044		-0.001***	-0.001***		-0.027	-0.025
$Jacobs_{i,1998}$		0.206**	0.176*		0.001***	0.001***		0.039**	0.033**
No. of Obs.	3688	3688	3688	3688	3688	3688	3688	3688	3688
R^2 (or Pseudo R^2)	0.8910	0.8906	0.8921	0.3847	0.3874	0.3886	0.3568	0.3540	0.3618
F-value (or LR χ^2)	4307.8***	4272.2***	3352.0***	328.9***	332.5***	259.8***	296.7***	294.3***	300.8***

Table 12(b) Determinants of Firm Upgrading (2001-2003)

2001-2003	Process upgrading			Functional upgrading			Product upgrading		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Constant	16.344	13.691	16.843	0.173	0.157	0.166	-4.926	-4.528	-4.566
$Y_{i,2001}$	-0.750***	-0.746***	-0.750***	-0.619***	-0.616***	-0.620***	3.512***	3.552***	3.529***
$Age_{i,2001}$	1.023*	0.844*	1.038*	0.003*	0.003*	0.004**	0.083	0.077	0.068
$Zone_{i,2001}$	3.549**	3.966***	4.376***	0.008	0.009*	0.009**	0.372	0.300	0.302
$Size_{i,2001}$	0.003	0.003	0.003	0.001	0.001*	0.001**	0.001***	0.001***	0.001**
$Ownership_{i,2001}$	-0.104	0.807	-0.513	-0.003	0.001	-0.002	0.420*	0.339*	0.352*
$Export_{i,2001}$	1.558		-0.819	-0.055**		-0.062***	0.606		0.996
$Export^2_{i,2001}$	-7.078		-4.904	0.046		0.052	-0.648		-0.953
$Marshall_{i,2001}$		-0.227***	-0.236***		0.001**	-0.001***		-0.006*	-0.005
$Jacobs_{i,2001}$		0.198	0.222		0.001**	0.001***		0.032*	0.033*
No. of Obs.	5166	5166	5166	5166	5166	5166	5166	5166	5166
R^2 (or Pseudo R^2)	0.5808	0.5796	0.5818	0.2991	0.2993	0.3020	0.1868	0.1947	0.1952
F-value (or LR χ^2)	1020.9***	1015.9***	797.1***	315.9***	316.2***	247.9***	193.1***	201.3***	201.8***

Table 12(c) Determinants of Firm Upgrading (2005-2007)

2005-2007	Process upgrading			Functional upgrading			Product upgrading		
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9
Constant	10.519***	9.345***	10.651***	0.181***	0.185***	0.183***	-3.878***	-3.991***	-4.110***
$Y_{i,2005}$	-0.357***	-0.356***	-0.358***	-0.619***	-0.621***	-0.620***	3.086***	3.088***	3.040***
$Age_{i,2005}$	1.197*	1.021*	1.217*	0.007***	0.008***	0.007***	0.137***	0.181***	0.157***
$Zone_{i,2005}$	5.968**	5.974**	5.920**	0.006***	0.005***	0.006***	0.060***	0.154***	0.153***
$Size_{i,2005}$	0.003***	0.003***	0.003***	0.001***	0.001***	0.001***	0.001***	0.001***	0.001***
$Ownership_{i,2005}$	-0.506	-0.077	-0.734	-0.015***	-0.014***	-0.013***	0.272***	0.187**	0.245**
$Export_{i,2005}$	-4.890		-5.533	-0.003		0.001	1.855***		1.667***
$Export^2_{i,2005}$	2.399		3.064	0.007		0.002	-1.660***		-1.525***
$Marshall_{i,2005}$		-0.067*	-0.066*		0.001***	0.001***		-0.006*	-0.005***
$Jacobs_{i,2005}$		0.063	0.067		0.001***	0.001***		0.021***	0.019***
No. of Obs.	8850	8850	8850	8850	8850	8850	8850	8850	8850
R^2 (or Pseudo R^2)	0.0666	0.0664	0.0668	0.3256	0.3272	0.3273	0.2064	0.2114	0.2134
F-value (or LR χ^2)	90.1***	89.9***	70.3***	609.7***	614.2***	477.7***	889.5***	910.9***	919.3***

Notes: 1. *significant at the 10% level; **significant at the 5% level; and ***significant at the 1% level.

2. $Y_{i,t}$ represents $Process_{i,t}$, $Functional_{i,t}$ and $Product_{i,t}$ in Model 1-3, 4-6 and 7-9 respectively.

In almost all models, the control variables $Age_{i,t}$ and $Size_{i,t}$ show a relationship with firm upgrading that is consistent with theoretical predictions: the heterogeneity of firms and firm attributes have played a critical role in the process of firm upgrading. In particular, the regressions confirm that firm age and size positively affect the propensity to upgrade, as, in most instances, firm's upgrading decisions are made based on how many experiences and resources it possess.

Economic development zone variable ($Zone_{i,t}$) has a positive and statistically significant effect on firm process upgrading, while its effect on product and functional upgrading is statistically insignificant and, in some cases, negative (Model 7-9 in Table 12(a)). This inconsistency could be reconciled by the following explanation. During this period, the vast majority of China's economic development zones have been export processing zones concentrating in China's coastal regions, filled with export-oriented firms conducting processing activities with supplied materials for re-export (Hsing, 1998; Yang, 2012), especially in the apparel industry (Zhu and Pickles, 2014). Financial aid and tax incentives have therefore been disproportionately assigned to support production process improvement, while less attention was directed towards product innovation and functional upgrading. In addition, as intellectual property laws were half-heartedly implemented before China's entry into the WTO, imitation practices within the zones could be prevalent and resulted not only in little product innovation and creativity, but also—in some instances—in low quality products, particularly where the opportunities generated by export growth encouraged firms to mimic other firms' products rather than develop their own products (see Model 7-9 in Table 12(a)).

Ownership variable ($Ownership_{i,t}$) presents negative and insignificant sign in almost all process and functional upgrading models and is significant in 2005-2007 functional upgrading

models. On the other hand, although its sign is negative and insignificant in 1998-2001 product upgrading models, it turns positive and significant in 2001-2003 and 2005-2007 product upgrading models. Such a temporal change reflects a process of maturation of domestic-owned apparel firms. In the late 1990s, foreign-owned firms were more likely to conduct process, product and functional upgrading. In the early and mid-2000s, domestic-owned apparel firms caught up and became more inclined to upgrade in terms of product innovation. However, they still lagged behind their foreign-owned counterparts not only in production efficiency, automation and mechanization, but also in moving up the chain into newer, higher value-added activities, such as full package and own design/own brand manufacturing in the clothing sector.

Moving on to the results connected more closely with the central argument, note that in almost all models Jacobsian externalities ($Jacobs_{i,t}$) have a positive and statistically significant effect on all three types of upgrading, suggesting firm upgrading has benefited substantially from Jacobsian externalities derived from other complementary industries throughout my study time period. For instance, firms' resolution to achieve product upgrading ties them closely with local textile firms since a large amount of new apparel products cannot be manufactured without supports from textile firms which provide tailored and premium fabrics. Backward linkages into extensive local textile base also facilitate apparel firm to upgrade functionally from assembly production to full-package supply and branded manufacturing (Tewari, 2006). Finally, apparel firms' process upgrading and adoption of more advanced production lines or technologies may be dependent on their co-location with machinery and equipment enterprises. On the other hand, Marshall externalities ($Marshall_{i,t}$), counterintuitively, have a negative impact on firm upgrading in most cases, with the exception of functional upgrading models in 2005-2007. The unexpected signs of $Marshall_{i,t}$ might be attributable to the rampant firm imitation practices that

compromised the Marshallian agglomeration effects and industry-specific externalities. The situation were further compounded as over-agglomeration of the apparel industry, especially in China's coastal regions, might turn positive externalities into diseconomies of congestion (Broersma and Oosterhaven, 2009; He and Wang, 2012), even though intellectual property enforcement became more strictly pursued after China's entry into the WTO. However, co-location with firms in the same industry is particularly important in firm functional upgrading during 2005-2007. In the mid-2000s, after years of supplying global lead firms, Chinese apparel firms started to upgrade from low-value-added production (e.g., assembly and cut-make-trim (CMT) production) to higher-value-added activities, such as original equipment manufacturing (OEM), original design manufacturing (ODM) and original brand manufacturing (OBM) production. However, prior to the early and mid-2000s, firms lacked knowledge about OEM, OBM and ODM production and, as a result, imitation practices were crucial for aggressive apparel firms that sought to climb up the chain. Local social network made information exchange and knowledge spillover between apparel firms within a cluster much easier and enabled firms to imitate strategies and learn from local pioneers.

In all 1998-2001 models, global factor ($Export_{i,t}$) shows a relationship with firm upgrading that is consistent with traditional understanding: global buyers both contribute to process and product upgrading of local suppliers and place limits on functional upgrading and market diversifications (Giuliani et al., 2005; Humphrey and Schmitz, 2002b). More important is that the introduction of the squared term ($Export_{i,t}^2$) suggests that there is an inverted 'U'-shaped relationship between global linkages and firm process and product upgrading during 1998-2001. The non-linear relationship highlights the fact an organizational and production mode not fully reliant on either foreign or domestic market may be optimal. This means over-dependence on

overseas end market might (or domestic market) is likely to put product and process upgrading in check. In the next two stages, results from functional upgrading models are consistent with previous studies and the coefficients of ‘global’ variables are either negative and significant or statistically insignificant. Results in Table 12(b) show that the effect of global linkages over product and process upgrading changes from statistically significant to insignificant, possibly due to the constraints imposed by the MFA on China’s apparel exports during 2003-2005. After 2005, a positive and significant relationship between product upgrading and global linkages re-emerged, as a result of not only the removal of quota but also the strategy change of global lead firms, which, in the mid-2000s, increasingly encouraged (or forced) their Chinese partners to supply more sophisticated and medium- and high-end products as the latter’s capability increased dramatically. However, ‘global’ variables remain statistically insignificant in 2005-2007 process upgrading models. One possible explanation is that Chinese apparel firms have been already efficient enough in the mid-2000s, and resources and investment were therefore increasingly transferred to meet global lead firms’ new requirements on products.

Upgrading of domestic-owned apparel firms

Recent research has shown that to understand the relationship between firm upgrading and global/local linkages, more attention should be paid to different firms’ learning and absorptive capability and how this capability interacted with different types of global and local linkages to generate a complicated influence on firm upgrading (Staritz and Morris, 2013a, 2013b). In this section, I focus on China’s domestic-owned apparel firms and examine the heterogeneity and complexity of the effects of local linkages. In the next section, the ways in which the articulation between firm upgrading and global/local linkages is inflected by firm heterogeneity and firm attributes will be further explored. Table 13 presents the estimation results for domestic-owned apparel firms. Ownership variable ($Ownership_{i,t}$) has been excluded,

while $Marshall_{i,t}$ and $Jacobs_{i,t}$ have been decomposed into $FoeMarshall_{i,t}$ and $DoeMarshall_{i,t}$, $FoeJacobs_{i,t}$ and $DoeJacobs_{i,t}$, respectively, to differentiate the Marshallian and Jacobsian agglomeration effects derived from foreign-owned and domestic-owned firms.

Table 13 Determinants of Upgrading of Domestic-owned Firm

	1998-2001			2001-2003			2005-2007		
	Process upgrading	Functional upgrading	Product upgrading	Process upgrading	Functional upgrading	Product upgrading	Process upgrading	Functional upgrading	Product upgrading
Constant	30.309***	0.201***	-5.741***	15.520***	0.154***	-4.151***	12.717***	0.187***	-3.994***
$Y_{i,t}$	-0.953***	-0.669***	4.022***	-0.655***	-0.579***	3.794***	-0.421***	-0.660***	2.698***
$Age_{i,t}$	1.705	0.002	0.126	0.511	0.004*	0.040	1.044*	0.005***	0.178**
$Zone_{i,t}$	0.856	0.006	0.001	3.713*	0.002	0.329	5.108*	0.008	0.191
$Size_{i,t}$	0.004*	0.001	0.001	0.005	0.001	0.001**	0.004***	0.001**	0.001***
$Export_{i,t}$	25.604*	-0.019	5.971***	0.550	-0.027	1.206	-2.311	0.036	2.233***
$Export^2_{i,t}$	-37.751**	-0.005	-5.539***	-5.424	0.017	-1.229	-2.310	-0.035	-2.030***
$DoeMarshall_{i,t}$	1.851*	-0.008	-0.018	-0.341	-0.001	-0.110	0.070	0.002***	0.067***
$FoeMarshall_{i,t}$	1.251*	0.007***	-0.007	-1.932***	-0.001	0.050	0.217	0.001	0.008
$DoeJacobs_{i,t}$	-0.109	0.008	0.011	-0.234	0.001	-0.039	0.142**	0.001***	0.011*
$FoeJacobs_{i,t}$	-3.706	-0.009*	0.091	-4.691***	0.002	-0.001	-0.763***	-0.003**	-0.080***
No. of Obs.	1885	1885	1885	2835	2835	2835	4973	4973	4973
R^2 (or Pseudo R^2)	0.9168	0.3678	0.4003	0.4172	0.2443	0.2401	0.1950	0.3551	0.2276
F-value (or LR χ^2)	2064.7***	109.0***	179.9***	202.2***	91.3***	150.5***	120.2***	273.2***	584.47***

Notes: 1. *significant at the 10% level; **significant at the 5% level; and ***significant at the 1% level.

2. $Y_{i,t}$ represents $Process_{i,t}$, $Functional_{i,t}$ or $Product_{i,t}$.

In table 13 the estimated parameters of the control variables and ‘global’ variables are mostly unaltered, with the exception of $Age_{i,t}$ and $Zone_{i,t}$ that lose significance in some cases. More important is that the introduction of four new variables confirms that, on the one hand, the effects of local linkages could be heterogeneous and, on the other hand, ownership affects the net benefits firm can receive from local sources. In the late 1990s, although co-locating with other domestic-owned apparel firms ($DoeMarshall_{i,t}$) might be helpful for process upgrading and production efficiency improvement, concomitant imitation practices could be detrimental to functional and product upgrading. In the meantime, foreign-owned apparel firms might already be experienced in higher-value-added activities (e.g., full-package, OEM and ODM production) whereas the vast majority of Chinese domestic-owned firms still struggled in low-value-added assembly and CMT production. As a result, $FoeMarshall_{i,t}$ could be valuable, due not only to a consideration of functional upgrading by learning from successful and geographically proximate foreign-owned firms, but also to the fact that foreign-owned apparel firms specialized in higher value-added activities, in some instances, outsourced to domestic-owned firms specialized in low-value-added activities in the vicinity, especially in rush seasons. This situation was soon reversed during 2005-2007. On the one hand, the coefficient of $DoeMarshall_{i,t}$ became positive and significant, in particular in product and functional upgrading models, due partly to China’s increasingly strict enforcement of intellectual property. More importantly, domestic-owned firms become more competent in the mid-2000s, and sought to upgrade functionally or was forced by their global buyers to manufacture more sophisticated products. Learning from local pioneers was crucial for the survival and functional/product upgrading of domestic-owned apparel firms, as they were marching into entirely new areas. On the other hand, $FoeMarshall_{i,t}$ lost significance during 2005-2007, suggesting Marshallian

agglomeration effects derived from foreign-owned apparel firms faded as domestic-owned firms grew up.

At first, $DoeJacobs_{i,t}$ is statistically insignificant, indicating that the Jacobsian agglomeration effects derived from domestic-owned firms had a relatively weak impact over firm upgrading in the late 1990s and early 2000s. After 2005, the relationship between all three types of upgrading and $DoeJacobs_{i,t}$ became positive and significant. Firm's capability to identify, assimilate and utilize knowledge spillovers and externalities hinges on its absorptive capacity (Jo and Lee, 2012). High-capability firms are often better able to absorb relatively distant and even unrelated external knowledge and externalities from different complementary industries (Teece, 2007). As a result, this indicates a gradual promotion of absorptive capability of domestic-owned firms, as the weak and insignificant relationship between $DoeJacobs_{i,t}$ and firm upgrading turns into a positive and significant one in 2005-2007 model. Finally, the entire study time period has witnessed a weak and, in some cases, negative and significant relationship between $FoeJacobs_{i,t}$ and upgrading of domestic-owned apparel firms, possibly due to the crowding-out effects caused by foreign-owned firms in other industries. My findings also resonate with recent studies on weak embeddedness of foreign-owned firms and their weak local linkages in China (Wei et al., 2009; Yang, 2009).

In this section, I have examined the heterogeneity of the effects of local linkages over firm upgrading, and recent GVC analyses have also pointed out that end market destination clearly plays a critical role in firm upgrading and heterogeneous export end markets may have distinct effects over firm upgrading (Kaplinsky and Farooki, 2010a; Staritz and Morris, 2013a), which, due to data unavailability, I leave for future research.

Different firms and different upgrading trajectories

This section reports the empirical results on whether firm attributes influence the ways in which global and local linkages affect firm upgrading. A firm with employment less than 300 is classified as a small firm; otherwise it is labeled as a large firm¹⁸. Based on this standard, I divide all domestic-owned apparel firms into two groups and run regressions separately (Table 14). In Table 14(a), the parameters of the control variables are almost unchanged but the estimates of some parameters become statistically insignificant in some cases. However, in Table 14(b), coefficients of $Age_{i,t}$ and $Size_{i,t}$ not only lose significance but also turn negative in some cases, suggesting once firm size passes a threshold value the effects of firm size and age over firm upgrading become mixed. So is the effect of economic development zone.

¹⁸Such division standard of large/small sized industrial enterprises is defined by China's National Bureau of Statistics.

Table 14(a) Determinants of Upgrading of Small Domestic-owned Firms

	1998-2001			2001-2003			2005-2007		
	Process upgrading	Functional upgrading	Product upgrading	Process upgrading	Functional upgrading	Product upgrading	Process upgrading	Functional upgrading	Product upgrading
Constant	29.938***	0.195***	-6.331***	17.161***	0.158***	-4.285***	15.650***	0.186***	-3.852***
$Y_{i,t}$	-0.956***	-0.671***	4.327***	-0.719***	-0.595***	3.931***	-0.439***	-0.710***	2.769***
$Age_{i,t}$	1.107	0.003	0.015	0.191	0.006**	0.089	1.468**	0.004*	0.129
$Zone_{i,t}$	0.022	0.012	0.001	4.057*	0.003	0.011	5.792*	0.009	0.107
$Size_{i,t}$	0.046**	0.001	0.002	0.004	0.001	0.001	0.015*	0.001***	0.001
$Export_{i,t}$	30.579*	-0.028	7.891***	-4.108	-0.016	3.251	0.499	0.031	1.380
$Export^2_{i,t}$	-40.783*	0.006	-7.663***	-0.909	0.002	-3.070**	-5.544	-0.033	-1.003
$DoeMarshall_{i,t}$	1.354	-0.011	-0.012	0.042	-0.001	-0.231**	0.109	0.001	0.062**
$FoeMarshall_{i,t}$	0.400	0.005*	0.171	-2.860***	0.001	0.409**	0.359**	0.002	0.011
$DoeJacobs_{i,t}$	-0.154	0.001	0.037	-0.440**	0.001	-0.052	0.086***	-0.001	0.015
$FoeJacobs_{i,t}$	-1.058	-0.002	-0.218	6.825***	-0.004	-0.708*	-1.006***	-0.004**	-0.093***
No. of Obs.	1269	1269	1269	2021	2021	2021	3775	3775	3775
R^2 (or Pseudo R^2)	0.9482	0.3535	0.3807	0.5573	0.2681	0.2351	0.2500	0.3851	0.1860
F-value (or LR χ^2)	2302.4***	68.7***	71.2***	253.1***	73.6***	79.2***	125.5***	235.7***	307.9***

Table 14(b) Determinants of Upgrading of Large Domestic-owned Firms

	1998-2001			2001-2003			2005-2007		
	Process upgrading	Functional upgrading	Product upgrading	Process upgrading	Functional upgrading	Product upgrading	Process upgrading	Functional upgrading	Product upgrading
Constant	28.909***	0.222***	-5.039***	9.018***	0.163***	-3.891***	10.436***	0.185***	-3.974***
$Y_{i,t}$	-0.178	-0.684***	3.766***	0.083	-0.553***	3.641***	-0.306***	-0.574***	2.656***
$Age_{i,t}$	5.596**	-0.002	0.155	-0.638	-0.001	-0.076	0.119	0.002	0.260*
$Zone_{i,t}$	3.251	-0.013	0.001	-4.361	-0.001	0.555	3.020	-0.001	0.305
$Size_{i,t}$	0.001	-0.001	0.001*	0.002	-0.001	0.001*	0.003**	-0.001	0.001***
$Export_{i,t}$	16.944	-0.022	3.802	-30.926*	-0.056	0.465	-4.988	0.025	3.102***
$Export^2_{i,t}$	-26.393	-0.011	-3.517	31.878	0.044	-0.832	3.234	-0.022	-3.273***
$DoeMarshall_{i,t}$	3.297*	-0.001	0.063	-1.439	0.001	0.130	0.055	0.002	0.079**
$FoeMarshall_{i,t}$	2.388*	0.011***	-0.339	0.967	-0.001	-0.371**	-0.053	-0.001	0.004
$DoeJacobs_{i,t}$	-0.119	0.001	-0.025	0.129	-0.001	-0.066	0.290*	0.002	0.004
$FoeJacobs_{i,t}$	-8.600**	-0.019**	0.562	-1.316	0.009	0.700**	-0.260	0.001	-0.065*
No. of Obs.	616	616	616	814	814	814	1198	1198	1198
R^2 (or Pseudo R^2)	0.0254	0.4117	0.3975	0.0139	0.2297	0.2750	0.0423	0.3081	0.2764
F-value (or LR χ^2)	1.58*	42.3***	96.7***	1.1	23.9***	75.9***	5.25***	52.8***	239.9***

Notes: 1. *significant at the 10% level; **significant at the 5% level; and ***significant at the 1% level.

2. $Y_{i,t}$ represents $Process_{i,t}$, $Functional_{i,t}$ or $Product_{i,t}$.

The key findings are as follows. First, consistent with my hypothesis, effects of global linkages over firm upgrading vary with firm attributes. Global linkages had a statistically significant, inverted ‘U’-shaped relationship with process and product upgrading in the case of small firms during 1998-2001, but lost significance in the next two stages. On the contrary, large domestic-owned apparel firms apparently were not strongly influenced by global factors in the first stage and the latter might even contribute to process downgrading during 2001-2003. Finally, in the last stage, $Export_{i,t}$ started to stimulate product upgrading in a non-linear way. To understand the divergent experiences of small and large domestic-owned apparel firms, we need to move away from a firm-level and agency-focused approach to upgrading towards a framework which recognizes embeddedness of firm and sectoral-level change within the context of wider political economies, and state and non-state institutional action. Late 1990s has been a crucial time period in China in terms of privatization from state-owned, collectively-owned and town-and-village enterprises to private and joint-venture enterprises, in particular in the apparel industry. As marketization, privatization and globalization proceeded in China, local apparel manufacturers gradually shifted from selling to the domestic market in a relatively planned and autarkic economy towards supplying global buyers as GVCs increasingly relocated their sourcing and production from Hong Kong, Taiwan and South Korea to mainland China (Evans and Smith, 2006b; Wei, 2001b; Zhu and He, 2013). Such process of privatization gave birth to most of China’s large apparel firms, which used to sell their own apparel brands in the domestic market for decades and, due to their socialist legacy, already possessed relatively skilled workers and high capital intensity before they supplied global brands. When they adjusted production processes and business strategies to international market, they were already competent in assembly or CMT production of low-value-added items. As a result, not only did global linkages

have weak impact over process and product upgrading of large domestic-owned apparel firms, but, in some extreme cases, large firms had to downgrade accordingly to fit the new market conditions (see also (Pickles et al., 2006) on the complexity of contingent nature of upgrading and its geographical and firm-specific unevenness in the apparel industry in post-socialist Eastern and Central Europe). In contrast, immature and small firms had to upgrade to meet the requirements of global lead firms and survive in the complicated international market. After 2005, a positive and significant relationship between product upgrading and global linkages emerged in the large firm model, as a result of not only the removal of quota but also the strategy change of global lead firms, which, in the mid-2000s, increasingly encouraged (or forced) their Chinese partners to supply more sophisticated and medium- and high-end products as the latter's production capability increased dramatically. However, small and less competent firms were still stuck in assembly and CMT production of low-value, low-end products and failed to (or were unable to) follow their large counterparts.

Second, the parameters of $DoeMarshall_{i,t}$ and $FoeJacobs_{i,t}$ in both large-firm and small-firm models are almost unaltered, except significance changes in a few cases. I therefore focus on the other two variables: $DoeJacobs_{i,t}$ and $FoeMarshall_{i,t}$. As interpreted above, $DoeJacobs_{i,t}$ has a relatively weak impact over firm upgrading in the first stage, due to firm's incapability to absorb relatively distant and even unrelated external knowledge and externalities from different complementary industries. In the same vein, results from 2005-2007 models suggest that firm-specific capability affects the net benefits firm can reap from the Jacobisan externalities. Large firms which are able to identify, assimilate and utilize distant and unrelated external knowledge can therefore benefit from not only Marshallian externalities but also knowledge spillovers derived from Jacobsian agglomeration, while small ones do not have the absorptive capacity to

take advantage of externalities from complementary industries. Especially in the case of functional upgrading (see Table 14(b) 2005-2007 functional upgrading model), backward linkages into extensive local textile base are often a necessary condition to upgrade functionally assembly production to full-package supply and branded manufacturing (Tewari, 2006).

The parameters of $FoeMarshall_{i,t}$ in large-firm model are almost unaltered, as notified above, indicating a fading effect of learning from foreign-owned apparel firms during the study time period. However, in the case of small-firm model, the impact of $FoeMarshall_{i,t}$ has become increasingly strong and significantly positive. One possible explanation is that whereas large firms became full-fledged and, in some instances, even began to compete head-to-head with foreign-owned apparel firms, small ones were still unqualified for such competition and instead often acted as subcontractors for foreign-owned apparel firms (as well as domestic-owned ones).

As a robustness check, equations (1), (2) and (3) are estimated by incorporating an alternative lag of one year (i.e., $t_2 - t_1 = 1$) and by using alternative proxies for process (total assets per employee) and functional upgrading (R&D intensity and R&D employment)¹⁹. Compared with the results presented above, these changes produce only minor effects.

Conclusion

In this chapter, I focus on one of the central analytical heuristics in GVC research: the concept of upgrading, particularly as it has been used to highlight paths for developing countries firms to ‘move up the value chain’ usually through the lenses of four categories—product, process, functional, and inter-sectoral upgrading. While process and product upgrading have been linked to ‘learning from *global* buyers’, the sources of capabilities that lead to functional upgrading, are conventionally understood to derive from *local* knowledge

¹⁹Data for these alternative indicators are missing in certain years, so they are only used for robustness check and not for analysis in this chapter.

transmission and *local* institutional context. This chapter seeks to test these findings and to argue that this tendency to attribute functional upgrading to ‘local’ factors and process/product upgrading to ‘global’ factors has become problematic as the global sourcing system and GVCs have been constantly transformed in the past few decades. It does so by using an empirical, firm-level approach to measure upgrading at the firm level, which allows us not only to evaluate the extent of upgrading in the industry as a whole and to compare its extent among individual firms and selected groups of firms, but also to differentiate and measure different types of upgrading (i.e., functional, process and product upgrading). This provides a more comprehensive yet nuanced approach to measure upgrading at the firm level, which complements current qualitative and quantitative methods.

Specifically, I focus on the development and dynamism of functional, process and product upgrading in China’s apparel industry, and investigate the ways in which and the extent to which different types of upgrading have been co-shaped by both global and local forces. I argue that while process, product and functional upgrading may be apparent in China’s apparel industry, these have been articulated with a range of other causal mechanisms that relate to wider and changing economic, institutional and historical conditions which are central in assessing the extent to which a process of upgrading is even possible. In my case, this means the articulation between various types of firm upgrading and global/local factors needs to be not only understood as dynamic, contingent, and fluid, but also interpreted in ways which take into account the specific historical development of China’s apparel industry, the evolution of institutional arrangements for apparel, and the ups and downs of globalization and global economy.

Furthermore, empirical results also confirm that, in these debates on upgrading, it is also important that we take seriously the heterogeneity, complexity and variety of the relationship between upgrading and global/local factors. First, given the fact that firms are actually heterogeneous with different attributes and capabilities and firm upgrading decisions are normally made based on firm attributes, it may be inappropriate to examine the articulation between various types of firm upgrading and global/local factors only through meso- or macro-level analysis without paying special attention to micro- or firm-level features. Second, there also needs to be consideration of the heterogeneity and complexity of the effects of global and local linkages over firm upgrading, since such effects are, in most instances, materialized through interactions between heterogeneous firms in global and regional production networks. In summary, the heterogeneity of firms, complexity of the effects of global and local linkages over firm upgrading, and the wider historical, political, institutional, economic and social context have all played a critical role in the process of firm upgrading and its articulation with global and local factors.

CHAPTER 6 UPGRADING IN APPAREL GLOBAL VALUE CHAINS: A HEURISTIC ANALYTICAL FRAMEWORK

Introduction

In response to a question about the limits of global value chain (GVC) research at a recent presentation at Duke University, Gary Gereffi (2013) suggested that GVC research emerged to solve a problem in world-system research on commodity chains, namely its focus on inter-regional analyses of power in a world in which the governance of economic systems was increasingly shifting from national and regional systems of capital accumulation into and through value chains. Value chain research, therefore, emerged as a way of complementing the national focus of global commodity chain analysis and the firm-level focus of much economic sociology by focusing on the differential power exercised by actors across the value chain. This led subsequently to the consideration of forms of chain governance (Gereffi et al., 2005; Gereffi and Mayer, 2006; Humphrey and Schmitz, 2002a), to notions of economic upgrading (Gereffi, 1999; Milberg and Winkler, 2010), links with global production networks (Coe, 2011) and most recently to questions relating to working conditions and social upgrading in globally distributed production networks, and to the increasing role of new end markets in shaping their outcomes (Barrientos et al., 2010, 2011). It was, as Gereffi suggested, the nature of GVC research to adapt to both the rapidly changing forms of industrial organization and the geographies they produce, and to respond to the analytical limits each phase of GVC research has generated. In this sense, we might interpret GVC analysis as a heuristic process that constantly seeks to adjust its concepts and analyses to the changing structures of and actors in the global economy.

In this chapter, I focus on one central analytical heuristic of this approach: the concept of upgrading, particularly as it has been used to highlight paths for firms in developing countries to ‘move up the value chain’ usually through the lenses of four categories—product, process, functional, and inter-sectoral (or chain) upgrading (Gereffi, 1999; Humphrey and Schmitz, 2002b). The implicit normative expectation in this work has been that firms and countries that upgrade produce higher value-added products and/or take on more sophisticated functions over time and this captures a higher proportion of value in the chain, while firms and countries that are unable to add functions, change products, or change their relationship to others in the chain may see orders decline, their costs squeezed, and their employment prospects diminish.

This approach to global value chains has been exceptionally generative of analyses that avoid what Agnew (1994) called the territorial trap by moving beyond the national economy and the specific focus on national firm-behavior as foundational concepts for analysis. By focusing on the array of network relations that structure the production and circulation of value, GVC scholars have been able to assess the asymmetries of power between lead-firms and suppliers (Gereffi, 1994, 1999) and different forms of governance that marshal and exercise this power (Gereffi, 2005; Gereffi et al., 2005). As a greater proportion of global commodities are increasingly traded through GVCs, analyzing their structure and practices becomes even more crucial. But, while GVC analyses reacted against the national/regional focus in such commodity chain analyses, until recently GVC research has itself tended to freeze complex and diversified circuits of economic activity into fixed geographical frameworks where consumption is presumed to be largely located in the North and production has been increasingly out-sourced to cheap labor markets in the South (Leslie and Reimer, 1999). In other words, the GVC literature, which links local suppliers in the ‘periphery’ on the one end and global buyers in the ‘core’ on

the other, has implicitly portrayed the global sourcing system as made up mainly by two camps: lead firms from the advanced economies and ‘generally-acknowledged weak’ manufacturing suppliers from the developing countries. This focus reflected the structure of global sourcing relations and the relative power of actors in the value chain throughout the 1980s and 1990s. Recent GVC analysis is now focusing on the effects of the rising powers of Brazil, India, China, and South Africa (the BICS), new patterns of consumer demand in the South, the emergence of regional production networks, and the growing importance of domestic sourcing, further increasing the need to re-assess how this North-South dualism has shaped the model of the chain in ways that now make revision of the concept of upgrading necessary.

The recent shift in analytical focus in GVC research from an earlier emphasis on the significance for economic development of the difference between buyer-driven and producer-driven commodity chains (Gereffi, 1994), to one oriented towards understanding the mechanisms whereby industrial upgrading can be achieved has produced a series of rich contributions to exploring the developmental implications of upgrading (Bair, 2005, 2009; Cattaneo et al., 2010; Gereffi, 2005; Gereffi et al., 2005; Tokatli, 2007a, 2007b; Tokatli and Kizilgun, 2004). These contributions have paid particular attention to the increasingly expanded integration of producers and workers in various parts of the world into export-oriented production networks (see for example (Bair, 2005, 2009; Begg et al., 2003; Leslie and Reimer, 1999; Smith, 2003; Smith et al., 2003; Smith et al., 2005)). But, as Bair (2005) notes, the earlier focus of much of this work on global commodity chains has more recently shifted towards analysis of the ways in which value chains are organized and governed, and much of this work has focused specifically on the implications of GVC dynamics for industrial upgrading (also see (Gereffi et al., 2005)). Here a primary focus has been on the mechanisms whereby firms and industries engineer a process of

economic upgrading within GVCs to capture higher value. Humphrey and Schmitz (2002a), for example, distinguish between four types of upgrading in global value chains: product, process, functional and chain upgrading. Product and process upgrading involve firms retaining their position in a chain by enhancing productivity gains by adopting new production processes or new configurations of product mix. Functional upgrading involves a movement ‘up’ the chain into newer, higher value added activity, such as full package and own design/own brand manufacturing in the clothing sector. Chain upgrading involves a movement into new activity which may also imply higher skills and capital requirement and value added (see also (Milberg and Winkler, 2010)). In such analyses, the concept of ‘upgrading’ has often been used to highlight paths for developing country producers to move from low-value to relatively high-value activities in GVCs (Gereffi, 1999, 2005). As Gereffi (2005: 171) describes it:

“we can think about upgrading in a concrete way as linked to a series of economic roles associated with production and export activities, such as assembly, original equipment manufacturing (OEM), original brand name manufacturing (OBM), and original design manufacturing (ODM). This sequence of economic roles involves an expanding set of capabilities that developing countries must attain in pursuing an upgrading trajectory in diverse industries.”

While ‘upgrading’ models are, as Gereffi noted, heuristic to enable a focused analysis of a new kind of object; economic transformation through GVC dynamics, as a heuristic they also have limits. With the deepening and extending of global value chains and the entry of new actors from developing countries, three embedded assumptions about this process of upgrading need to be reconsidered. They are (i) how we understand functional upgrading and GVC success, (ii) the significance of high and low roads to upgrading, and (iii) the ways in which differential learning paths presuppose specific forms of agency for local and global actors.²⁰ I refer to these as

²⁰A further assumption relates to the way in which the upgrading literature continues to hold on to the belief that upgrading occurs in a largely linear, unidirectional trajectory. A handful of studies have already critiqued this assumption, pointing out the complexity and contingent nature of upgrading and the geographical and firm-specific

‘constraining assumptions’ because, despite their enormous analytical power and policy implications, they operate increasingly to constrain the ways in which the current dynamics of GVCs are understood. That is, with Gereffi, I seek to read the concept of upgrading heuristically.

The first constraining assumption in this body of work is the implicit normative expectation that functional upgrading equals success and that successful “developing country firms follow a ‘high road’ to upgrading, one eventually leading to performing *functions* in a value chain that have more skill and knowledge content (emphasis added)” (Ponte and Ewert, 2009: 1637). This point was made particularly forcefully by Gibbon (2008: 44) when he argued that:

“Additionally, while all four upgrading types are accorded a formally equivalent status, overwhelming attention in practice is paid to functional upgrading. In an early contribution to the discussion of upgrading, Gereffi (1999) focused almost exclusively on functional upgrading in the clothing sector, where firms can turn onto a ‘high road’ towards own-brand manufacturing. This implied that such a change was more optimal than other possible upgrading options. In fact, at least for new or subordinate players such as suppliers in developing countries, there are equally or more profitable positions available within value chains and other available forms of upgrading.”

In other words, although the definition of upgrading *per se* refers to both process/product upgrading and functional upgrading, most of the GVC literature on upgrading tends to privilege functional upgrading over other kinds (Gereffi, 1994, 1999, 2005; Giuliani et al., 2005; Ponte and Ewert, 2009). A hierarchy of upgrading is therefore generated (Figure 19), beginning with process upgrading, then moving to product upgrading, finally to functional upgrading and to chain upgrading (Kaplinsky and Farooki, 2010a, 2010b; Kaplinsky and Morris, 2001). Kaplinsky and Morris (2001) have further argued that this hierarchy accords with the common assertion that East Asian firms have made the transition from assembly to OEM, to ODM to OBM.

unevenness of upgrading (Pickles et al., 2006; Ponte and Ewert, 2009; Tokatli, 2013). I will not elaborate this assumption, but it will be accordingly analyzed when it intertwines with my treatment of the first three.

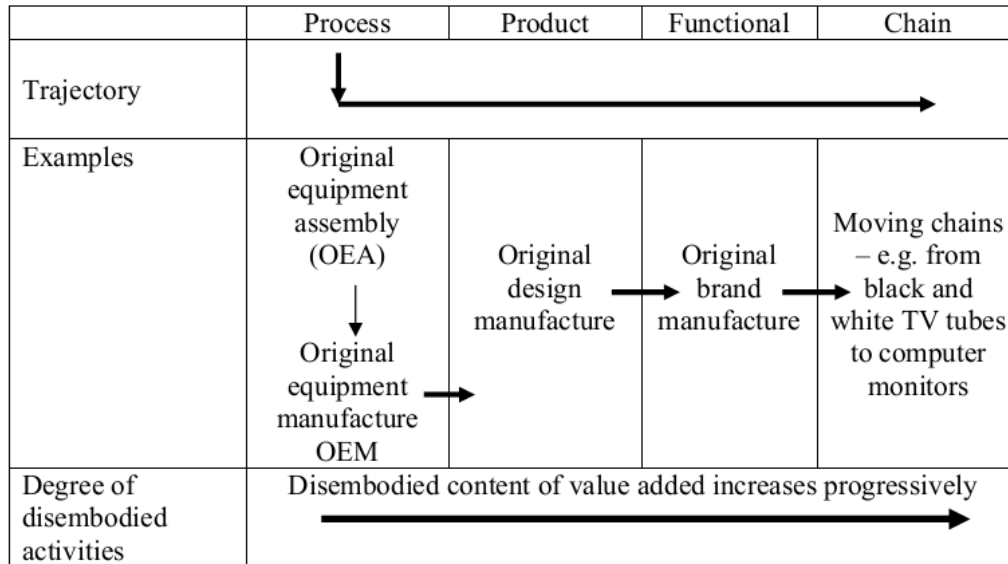


Figure 19 Is there a hierarchy of upgrading?

Source: (Kaplinsky and Morris, 2001)

Here firms in developing countries are conceived as ‘generally-acknowledged weak’ suppliers focusing on OEM and assembly production, reliant on lead firms from advanced economies (Gereffi, 1994, 1999; Humphrey and Schmitz, 2002b; Tokatli, 2007a). In this scenario, assembly and OEM production are assumed to be the starting points for economic upgrading and ODM and OBM manufacturing to be the pinnacle of upgrading success (Gereffi, 1999; Humphrey and Schmitz, 2002a, 2002b). For Gereffi and Bair (2003: 147) “industrial upgrading can be conceptualized as a series of role shifts involved in moving from export-oriented assembly to more integrated forms of manufacturing and marketing associated with the original equipment manufacturing (OEM) and original brand name manufacturing (OBM) export roles, respectively.” But, as Tokatli and Eldener (2004: 174) suggest, in this model:

“...it is expected that manufacturers working for global buyers enjoy upgrading along the dimensions of quality, flexibility and productivity but usually encounter barriers when it comes to moving into design, marketing, branding and retailing. What really enhances a firm’s position in the global market is the latter (functional upgrading) because activities such as branding and retailing are the most profitable areas.”

Indeed, Tokatli (2008) has subsequently shown that in the apparel industry supplier firms in countries such as China, India and Turkey are rapidly expanding their competencies into the manufacture of intricate high-quality garments and design, marketing and branding, and increasingly new entrants begin business from ODM and OBM production rather than as suppliers (Tokatli, 2008; Wei, 2011). Besides changing the starting point of upgrading, this also forces us to ask, what precisely do we mean by the end point of upgrading? Have new entrants that start from OBM production reached the end point of upgrading? Clearly, while they may begin operations at this point cannot mean that there is no further upgrading for them to undertake. But, if this is so, what then does the logic of upgrading actually say and what is its explanatory power? Thus, my first question is both about the changing structure and new actors in the GVCs, and the ways in which the concept of upgrading needs to be reworked to reflect the restructuring of North-South, lead-firm and supplier geographies.

The second assumption derives from the first and is that much GVC literature is still, more or less, haunted by certain type of ‘normative’ view characterized by a dichotomy between process/product upgrading and functional upgrading as well as the underestimation of the former. Here process and product upgrading are seen as ‘low road’, and functional upgrading as ‘high road’, an implicit assumption that generates several further problems. The privileging of functional upgrading and underestimation of process/product upgrading is also evident in another definition of ‘upgrading’, where upgrading is understood as: improving the position of firms or nations in international trade networks (Bair, 2005; Gereffi, 1999; Giuliani et al., 2005; Ponte, 2002) or moving up the value chains “from labor-intensive activities like export-oriented assembly, to more integrated forms of manufacturing like OEM and OBM production, to the most profitable and/or skill-intensive economic activities such as breakthrough innovations in

new goods and services, design, marketing, and finance” (Gereffi, 1999: 39). In summary, “upgrading within a value chain implies going up the value ladder, moving away from activities in which competition is of the ‘low road’ type and entry barriers are low” (Giuliani et al., 2005: 552), and developing country firms should “follow a ‘high road’ to upgrading, one eventually leading to performing *functions* in a value chain that have more skill and knowledge content (emphasis added)” (Ponte and Ewert, 2009: 1637). Such a definition captures well the gist of functional upgrading while paying less attention to process/product upgrading. In this perspective, economic actors (such as firms and nations) which have achieved functional upgrading are considered as role models (for example, see (Gereffi, 1999, 2005) the effects of participating in GVCs on the rise of East Asian suppliers). Here functional upgrading equals success. Even though process and product upgrading are well-defined and recognized in many studies (Humphrey and Schmitz, 2002a, 2002b), the normative expectation is that developing country firms will (or should) follow a ‘high road’ to upgrading by moving from OEM to ODM to OBM (Gereffi, 1999; Ponte and Ewert, 2009). Thus the second constraining assumption is about the ways in which high road (functional upgrading) and low road upgrading (process and product upgrading) are understood.

Tokatli (2013) in particular has pointed to several weaknesses of conventional GVC studies in this context. These include an inaccurate understanding of the diverse and somewhat complicated ways in which actual apparel firms try to upgrade; the limited success in showing precisely how upgrading is related to additional value capture in the industry; and the tendency in the literature to black-box so-called high-value functions like design, branding, marketing, and retailing (also see (Tokatli, 2007a; Tokatli and Kizilgun, 2004, 2009, 2010)). Tokatli (2007a, 2013) has further stressed that despite the focus on power asymmetries and chain governance

within the global apparel industry, questions about the exact manner in which global buyers make their suppliers act in certain ways and prevent the latter from encroaching on their core competencies have not yet been thoroughly answered. Plank and Staritz (2009: 66) have similarly argued that attention is needed beyond the black box of the firm to consider also who benefits from upgrading. And, as Pickles (2012) has documented, the recent history of trade preferences, rules of origin, and other trade rules has been one that locks-in southern markets for northern textile producers while constraining upgrading opportunities for many new entrants into CMT and OEM export production. From this perspective, opportunities for upgrading and a high-road to development are highly uneven.

Not only are the lead actors in the global value chain changing, but the ways in which they operate and the forms of business strategy they deploy are diversifying. One form of this change is the emergence of new relations between buyers and suppliers, changes which are refiguring the asymmetries of power on which so much upgrading arguments are based. This is not a new idea, indeed it was fundamental to the original concept of upgrading developed by scholars like Gereffi, Sturgeon, and Humphrey as they attempted to account for the shifting geographies of global value capture in industries like apparel. As supplier firms in developing countries upgrade into OBM and ODM production, there is increasing evidence that they are not withdrawing from OEM and assembly production activities. Instead, as I will show, they grow by the accretion of new functions such as branding, marketing, designing and retailing, while retaining their core competencies in production (Ozatagan, 2011; Tokatli and Kizilgun, 2004). They do not move up, but they become more diversified, both organizationally and geographically. The phenomenon where a supplier firm becomes a buyer/supplier firm becomes even more prevalent as firm size in developing countries grows through various strategies of

geographical and organizational restructuring, such as merger and acquisition, outsourcing/subcontracting, relocation, as well as upgrading. This blurs the line between buyer and supplier (Tokatli, 2013), and as Pickles *et al.* (2006) have suggested, it poses the question of how GVC upgrading can deal analytically with the complexity and contingent nature of upgrading and its geographical and firm-specific unevenness. In this scenario process and product upgrading/downgrading can co-exist with functional downgrading/upgrading as firms adjust their production processes and business strategies to complex changing market conditions. Ponte and Ewert (2009: 1648) have gone even further, attempting to jettison the normative view that “the ‘high road’ to upgrading is the movement from Original Equipment Manufacturing to Original Design manufacturing to Original Brand Manufacturing” as they also stress the complexity and contingent nature of upgrading. This second question is therefore not only about the ways in which GVC commitments to parsimony may underestimate the complexity of business strategies at work in supplier networks, but it is a question of how we then characterize the GVC structure at the national level. Here functional upgrading from OEM to OBM or ODM production is not the only ‘high-road’ upgrading trajectory firms/countries can pursue, and process and/or product upgrading are not necessarily low road.

The third constraining assumption relates to how suppliers are conceptualized in GVC analyses. While suppliers are encouraged to undertake process/product upgrading, they face much greater obstacles when it comes to functional upgrading (Humphrey and Schmitz, 2002a, 2002b; Schmitz and Knorringa, 2000). To achieve functional upgrading, especially in a quasi-hierarchical chain, local suppliers have to rely to a greater extent on local sources of innovations, which are not only the result of knowledge spill-overs and inter-firm synergies within local cluster but are also fostered by policy networks of public and private actors (Barnes and Gertler,

1999; Scott, 1996; Storper, 1997). Therefore, while process and product upgrading have been linked to ‘learning from *global* buyers’, the sources of capabilities that lead to functional upgrading are conventionally understood to derive from *local* knowledge transmission and *local* institutional context (Giuliani et al., 2005; Humphrey and Schmitz, 2002b). This tendency to attribute functional upgrading to ‘local’ factors and process/product upgrading to ‘global’ factors has become ever more problematic as the global sourcing system and GVCs have been radically transformed in the past decade and as the capabilities and competencies of producers have expanded in some key areas of the global value chain. This dichotomy becomes more problematic as global lead firms increasingly transfer functions like design to their OEM suppliers and encourage them to upgrade the range of functions and services they can provide (Ozatagan, 2011). Increasingly, as suppliers provide these additional functions and services, buyers are trimming their supply chains and focusing their contracting on a smaller number of strategic partners. The resulting change in the ways in which risk is managed globally and finances can be managed locally mean that certain types of upgrading are increasingly being driven by *regional* production networks (RPNs) and learning within industrial systems and industrial districts where the sources of capabilities come from neither the GVC nor the local context (Lyberaki, 2010; Pickles and Smith, 2011; Pickles et al., 2006). Thus, the third question on which I focus has to do with how power within the GVC is being restructured around new strategic partnerships, in part driven by lead-firm willingness to devolve functions and services to suppliers, and in part driven by changes in the ability of supplier firms to mobilize local and regional resources and knowledge networks.

In the next section I interrogate these three constraining assumptions through an analysis of apparel production systems in Ningbo, China, and suggest an elaborated analytical framework

for dealing with the changing and increasingly complex nature of GVC dynamics and actors. This is not intended as a challenge to GVC upgrading logics and analyses, but it is an attempt to align them with the emerging geographies of contemporary GVCs dynamics. That is, while I agree entirely with Brown, Bessant and Lamming (2000) and Kaplinsky and Morris (2001) that GVC analyses are well aware of the simplification involved in the deployment of chain models, I also want to suggest that while this form of parsimony is essential to reading the relations of power and value capture in the value chain, its implications for our understanding of upgrading are more sanguine. Nowhere is this clearer than in the transformations and new entrants in the Chinese clothing industry. Drawing on extensive field research in the apparel cluster of Ningbo, China, I analyze how three types of transformation have unfolded and then shaped global production networks in ways that differ from these three constraining assumptions.

Different firms, different upgrading trajectories

The results of these forms of regional embeddedness and inter-firm linkages are important for the question of upgrading. Many of Ningbo's enterprises are engaged in forms of product, process, functional, and/or chain upgrading, but these regionally specific conditions and the ways in which export production has entered into and articulated with domestic production has made the form of upgrading and the trajectories of firm strategies extremely complex. To show how Ningbo's apparel enterprises articulate with broader GVCs and help us understand the limits of the three constraining assumptions I have identified I develop four case studies of specific firm upgrading trajectories. The firms I discuss are actual firms active in upgrading, with starting points, trajectories and sources of upgrading that are all very distinct. They are also ideal typical firms that represent the wider dynamics in the regional cluster.

It is certainly not a surprise that different firms choose different upgrading strategies, and that context and contingency are critical in shaping these differences. My goal is not to argue that firm strategies differ, but that functional upgrading as a goal of firm adjustment has become much more of a strategic issue than it was in the past. The result is that we need to understand the ways in which emerging market manufacturers are making resource and investment decisions in ways that mobilize a wider range of upgrading (or downgrading) practices. As Bernhardt, Pollak and Janoo (2014: 23) have recently argued:

“[T]he approach and terminology used here might seem to suggest that upgrading is always desirable in any given GVC. However, it would be wrong to generalize this assertion. Certain sectors or chains – especially those that offer little prospects for learning, productivity increases or technological progress – may prove to be, in a sense, dead ends with regard to longer-term economic development. If developing countries focus their upgrading efforts on these chains and allocate an increasing amount of resources to these sectors, they risk being trapped in a “low road” trajectory to development (Milberg and Houston, 2005). Additionally, developing countries should not be seen as a homogenous group. Rather, each country may wish to specialize in different value chains for different reasons, or at different stages of their development. Lack of upgrading (or even downgrading) in a given GVC as measured by the indicators adopted here, therefore, might be a good thing if it is a side effect or manifestation of the structural change an economy is undergoing.”

Before turning to specific case studies, I formulate a horizontal and vertical upgrading framework (Figure 20) that is sensitive to the strengths of both GVC and GPN analyses, but which also elaborates functional and process/product upgrading in a different way.²¹ The Y axis represents vertical upgrading (functional upgrading) and refers to the acquisition of new functions. Along the X axis is horizontal upgrading (process/product upgrading), involving firms retaining their position in a chain and enhancing productivity gains through adopting new

²¹For Ponte and Ewert (2009: 1639) “The status of inter-sectoral upgrading is unclear, as it relates to a trajectory of upgrading, while the other three categories describe what aspect of a given business is being upgraded”. For similar reasons I do not consider chain upgrading in this chapter.

production processes or new configurations of product mix.²² Conventional process and product upgrading tend to focus on upgrading within production. By using horizontal upgrading I also incorporate any managerial and organizational upgrading that lead to productivity improvement (e.g., transformation from family workshop to real registered enterprise). Based on this framework I map out the upgrading trajectories of four Ningbo's apparel firms I have selected to represent 'ideal types' of firm structures and strategies currently emerging in the region. The selection is based on eight months of fieldwork in Ningbo, including extensive and repeated interviews with 30 firms, and trade associations, national and regional textile and apparel industry association, and local public officials. All interviews were selected from analysis of firm-level data on all apparel enterprises in Ningbo from China's Annual Survey of Industrial Firms (ASIF) (1998-2009). The ASIF is administered by the National Bureau of Statistics of China and covers all Chinese industrial state-owned enterprises and non-state-owned enterprises with annual sales of 5 million RMB or more. The database provides firm-level data on firm structure and operation, including firm identification, location, capital structure, total profits, total shipments, exported shipments, intermediary inputs, asset value, inventory, employment, sales value, type of investment, output, value added, R&D expenses, education and training of staff, and wages, social insurance, and benefits paid.

²²Not included here are cases where CMT contracting is sustained without product or process upgrading, and without productivity gains or increased value added, but is maintained as an enabling part of firm upgrading efforts. Here I am thinking of firms that maintain CMT contract in order to maintain wage payments and employ workers in periods when seasonal contracts decline (often at no profit). This represents an indirect form of economic upgrading as wage and employment maintenance functions as a necessary condition for other kinds of process and product enhancements.

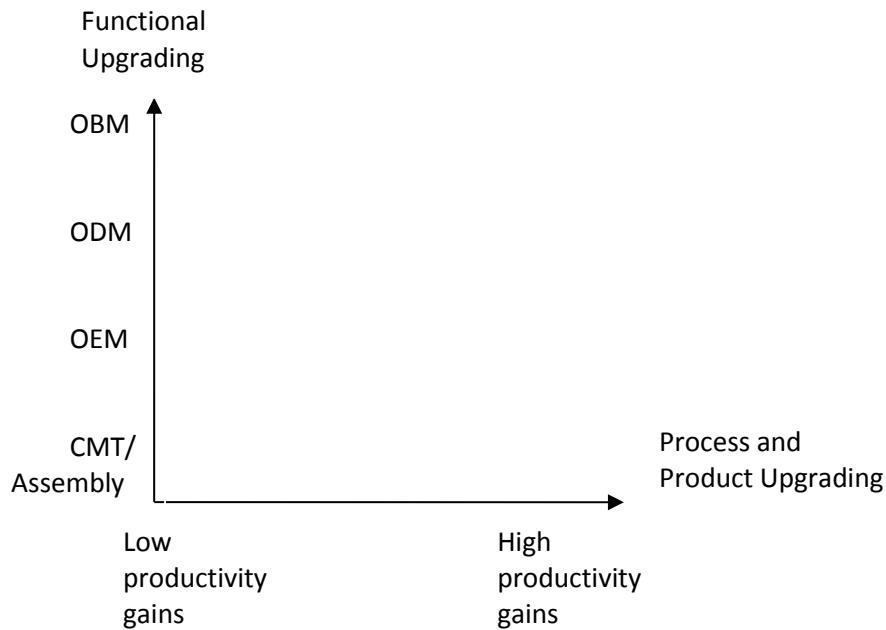


Figure 20 Horizontal and vertical upgrading framework
(Source: compiled by authors)

Case A: Peace Bird and GXG

Peace Bird started as a family workshop producing men's suits in the 1980s and expanded drastically in the 1990s as domestic demand for garments rocketed in China's transition to a market economy. After its transformation from a small family workshop to a registered enterprise in 1995, Peace Bird focused production on medium-value casual menswear, a decision that gave Peace Bird a competitive advantage over other state-owned and private apparel enterprises most of which relied on mass production and a low-cost strategy (Figure 16). In 1999, Peace Bird added ladies' wear production in a men's-wear dominated apparel cluster. Unlike many companies in Ningbo, Peace Bird did not seek contracts from global brands. Production was first carried out in-house targeting medium or high-quality, own brand products for domestic markets. Over the past three decades it invested intensively in innovation and upgrading, gradually became a lead firm focusing on OBM production. It now concentrates on its core competences (R&D, branding, marketing and sales), while the rest of production (cutting,

sewing, ironing, and trimming) are increasingly carried out in smaller factories in Ningbo and elsewhere (Figure 21). In 2006, it still directly produced 80% of its production, while today outsourced production makes up around 80% of its total output. The share of outsourcing is likely to increase in the near future as the company's focus has been increasingly switching towards R&D, branding and marketing.

In the second round of industrial restructuring, Peace Bird embarked on a new phase of upgrading. Although fluctuations in global demand had little effect on the domestic-market-oriented Peace Bird, rising labor costs did have an impact on its strategy. In 2003, it invested 0.1 billion Yuan to build up a new manufacturing base located inland in Yichang, Hubei. This westernization of part of its production allowed more direct access to the rapidly growing inland markets and to lower cost labor markets (see (Zhu and Pickles, 2014) on the broader role of Chinese relocation strategies). In addition, as Peace Bird shed its non-core operations, it adopted an open bidding process in outsourcing orders, announcing its needs and letting subcontractors bid. Whoever offered the best bids in terms of price, volume, quality, and delivery time became one of its subcontractors.

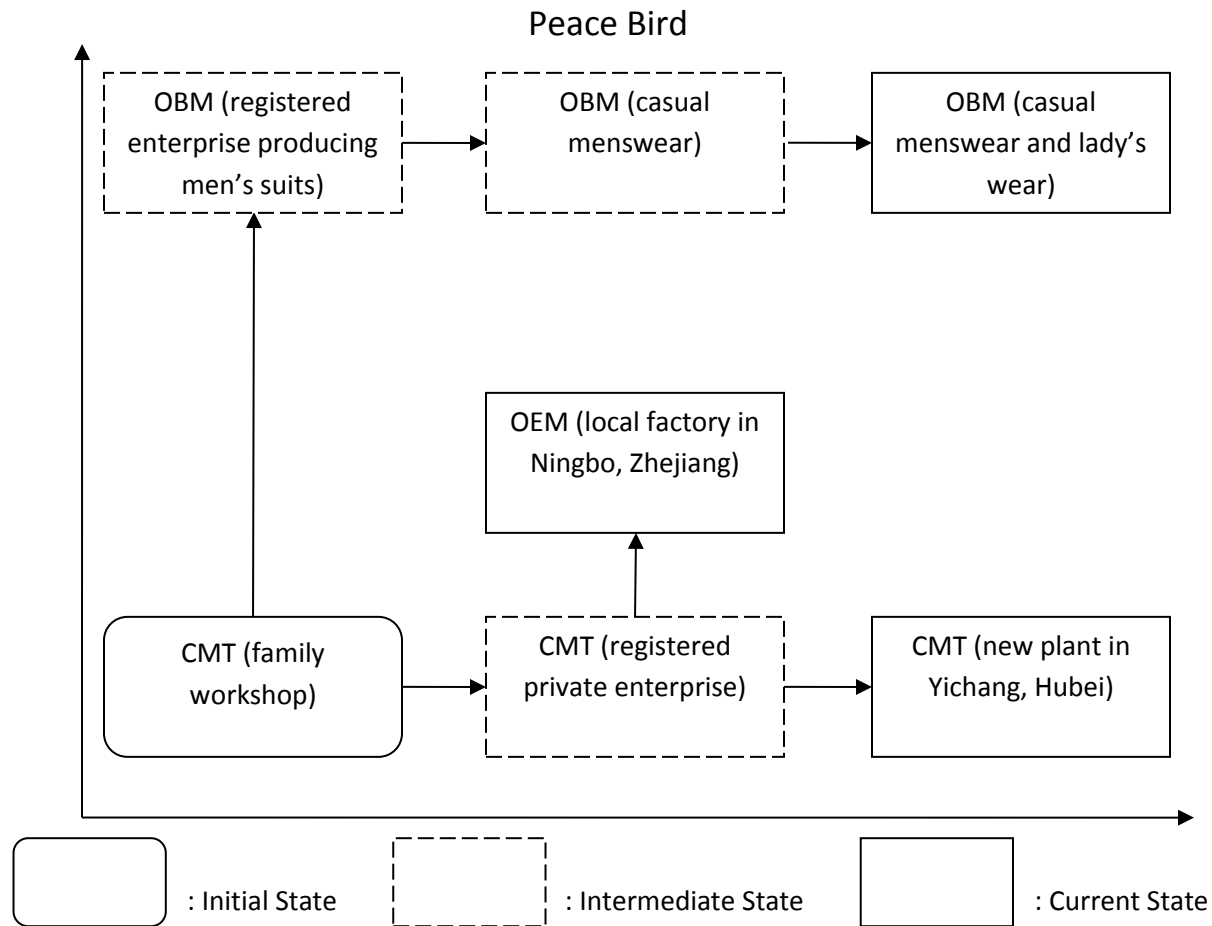


Figure 21 Upgrading trajectories of Peace Bird
(Source: compiled by authors)

Compared with Peace Bird, GXG has gone even further along the OBM road (Figure 22). GXG was established as an OBM company marketing casual menswear in its own retail stores. It targeted the youth market and has aimed to upgrade consistently since it was established. Its sales reached 8 million Yuan in its first year (2007), and increased to 3.5 billion Yuan in 2011, generating a four-hundred-fold growth within five years. It continued to expand as business increased, with the number of its stores growing rapidly from less than 100 in 2008 to above 600 in 2011. In August 2010, GXG started its “walking on two legs” initiative (on-line and off-line businesses), and by November 11, 2011, its online daily sales had risen to 40 million Yuan.²³

²³November 11 is also known as ‘Double Elevens’, which is China’s equivalent of the Cyber Monday.

GXG exemplifies the second generation of firms by exclusively specializing in domestic-oriented, OBM production. It has become a manufacturer without a factory with a ‘dumbbell-style’ production, focusing on both ends of the value chain (R&D, branding, marketing and sales) and outsourcing the middle part.

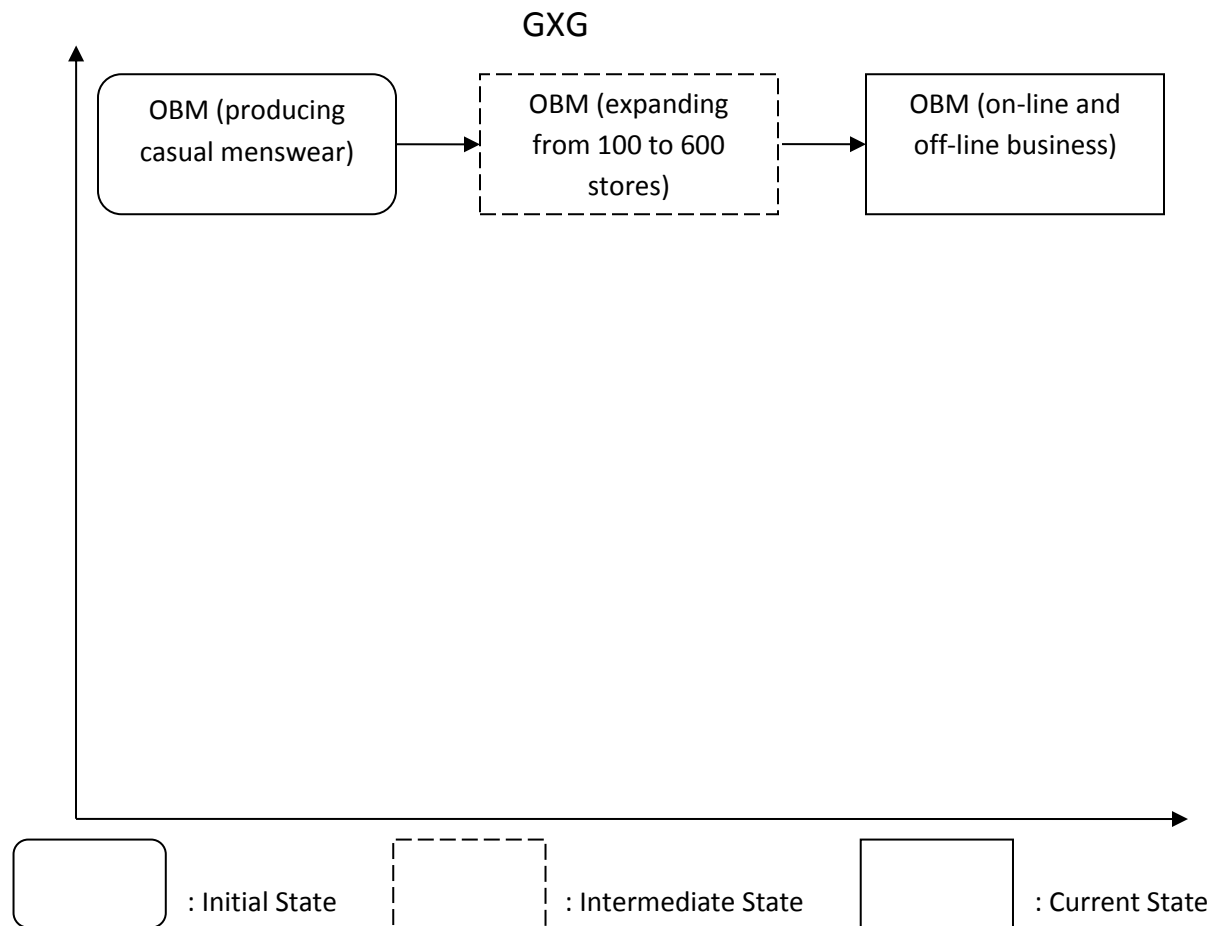


Figure 22 Upgrading trajectories of GXG
(Source: compiled by authors)

Case B: Seduno

Peace Bird and GXG represent one extreme of firms that have concentrated on or started from OBM production and that have become lead firms in their own value chains. As a result, beyond changes in input costs and broader regulatory and labor market dynamics, these domestic-oriented Peace Bird and GXG are barely affected by shifts in the global economy or by

the changing dynamics of apparel global value chains. By contrast, Seduno represents the other extreme in which asymmetric relationships between global buyers and local suppliers predominate, creating captive suppliers in a low-wage economy (Gereffi, 1994; Humphrey and Schmitz, 2002b). Emerging out of a state-owned enterprise (Zhejiang Dongfang), Seduno underwent a process of partial privatization and became a joint-venture in the 1990s. Starting with assembly and CMT (cut-make-trim) production, Seduno now focuses on assembly and OEM production, although in 2012 it did begin to develop its own brand—C.O (Figure 23). Around 90% of its production is carried out in-house, which makes Seduno the second largest apparel producer in Ningbo. Seduno is weak in OBM production, concentrating instead on basic assembly. Seduno's more than 150 clients are made up by two categories: one group comprise fast fashion retailers like H&M and Zara accounting for 70% of its output; the remaining 30% of its customers are sportswear lead firms such as Adidas and Reebok. By focusing on cost-sensitive production (low-cost assembly and OEM production) Seduno is particularly vulnerable to further rounds of restructuring and rising labor costs. As its general manager argued:

“Increasing costs are eroding the profit margin drastically. First, the price of cotton increased 100% in 2009; second, Chinese currency appreciated 20%; third, labor cost increased from 1000 Yuan a month [in 2000] to 3000 [in the coastal regions in 2012]. Since cotton prices and exchange rates are relatively stable this year, the biggest concern is the rising cost of labor. Ningbo's labor cost has already increased 15% in 2012.”

(General Manager of Seduno, translated from Chinese)

He also emphasized that owning an overseas manufacturing base was already a prerequisite for receiving orders from global buyers. In these cases, global buyers are increasingly pressuring their suppliers to relocate to lower cost locations. As a captive producer, Seduno felt it had to comply with these imperatives from global buyers and—in 2012- it opened a new manufacturing base in Cambodia, where it employs 500 local workers and plans to recruit another 1500 in the next five years. Although wages in Cambodia are only one fourth of that in

China, Seduno views the lack of local supporting facilities in Cambodia as a limit to this off-shoring, forcing Seduno to relocate only CMT production oversea, while keeping OEM production in Ningbo.

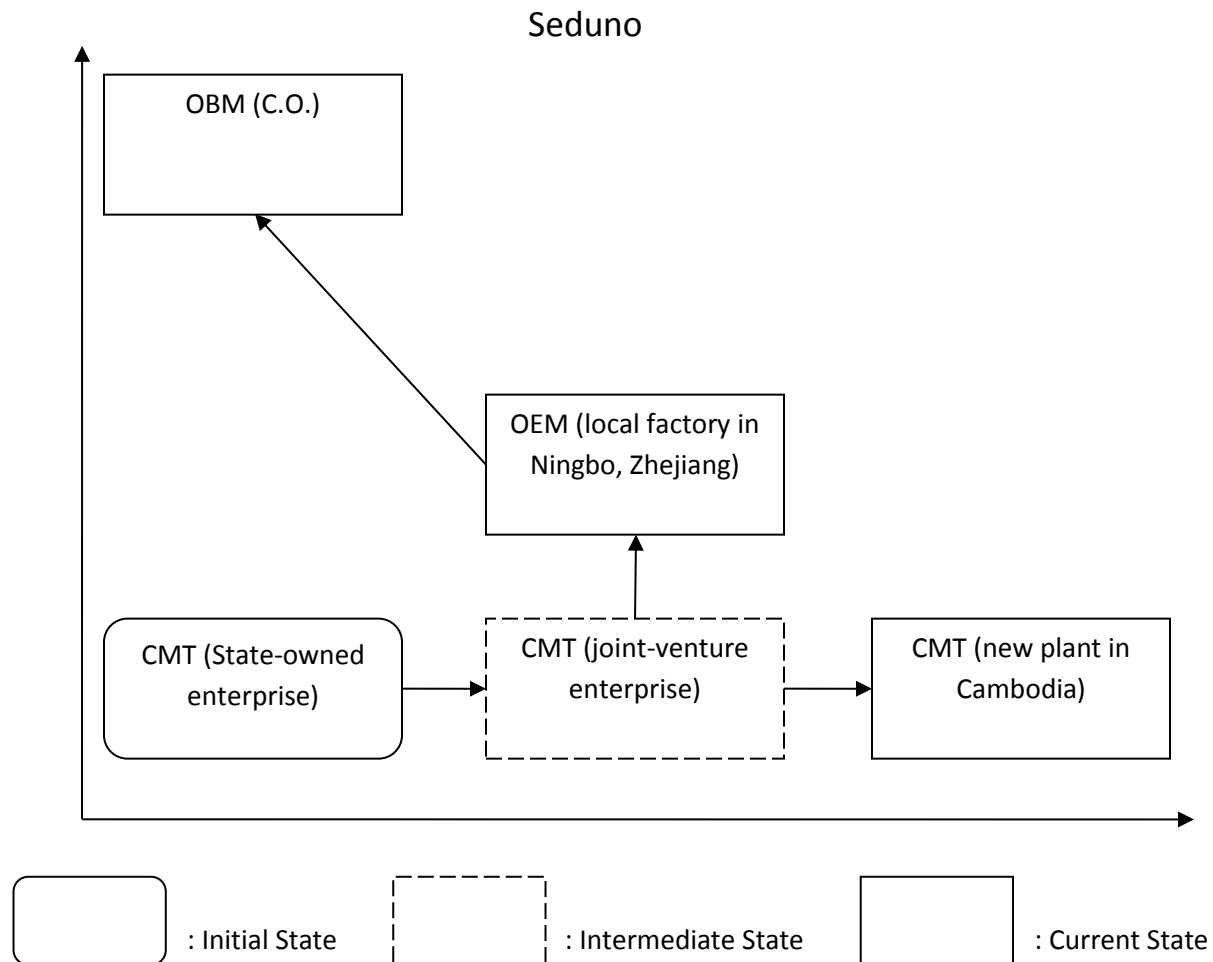


Figure 23 Upgrading trajectories of Seduno
(Source: compiled by authors)

Case C: Baimu

Established in 1998 as a small family business performing assembly production on behalf of global brands, Baimu gradually strengthened its position in the GVC and established a strong position in OEM and ODM production. Like Seduno, it started with assembly and CMT production (Figure 24). Unlike Seduno, it stopped taking low-end and low-value-added orders from global buyers like Wal-Mart as it planned to upgrade. Now it only supplies medium- and

high-end brand firms, such as Abercrombie, VANS, Tommy Hilfiger and Diesel. As its founder indicated, “Otherwise, we are not competitive compared with low-cost suppliers in Bangladesh and Vietnam.”

In 2006, Baimu initiated the ‘irreplaceable’ strategy. This refers to not only rejecting low-end and low-value-added orders from global buyers like Wal-Mart, but also upgrading from assembly to OEM and ODM production while supplying medium- and high-end brand firms. First, fewer subcontractors can meet the requirement of Abercrombie and Tommy Hilfiger since they demand higher-quality of service, quicker response and shorter lead time. This has ruled out numerous suppliers with low capacity. In other words, the asymmetries faced by firms like Seduno are weaker in Baimu’s case and buyers like Abercrombie and Tommy Hilfiger cannot easily play off Baimu and other low-cost suppliers against each other. Second, Baimu actively invested in new equipment, particularly in a new automatic assembly line which raised productivity levels 30% with the same labor inputs. In addition, its cooperation with Abercrombie and Tommy Hilfiger has evolved towards a model where global buyers contribute only their brand names. For example, Abercrombie and Tommy Hilfiger send orders to Baimu with general requirements, but Baimu is in charge of nearly all operations in the value chain including design, procurement of fabric, manufacturing, and logistics management. Baimu shows its designs to the buyers or their representatives and revises them accordingly. Baimu expanded its OEM and ODM production, receiving orders from global brands, while offering to them integrated product development and design services. Other parts of the production process were then outsourced to subcontractors. In this process, shipping and logistics were strictly monitored by Baimu. In the second round of restructuring, Baimu further expanded its sourcing network from one largely made up by local subcontractors to one increasingly spread across

neighboring provinces, resulting in a regional sourcing system regulated and monitored by its head office in Ningbo. With its new role as an intermediary between buyers and manufacturers Baimu typifies the third generation of enterprises.

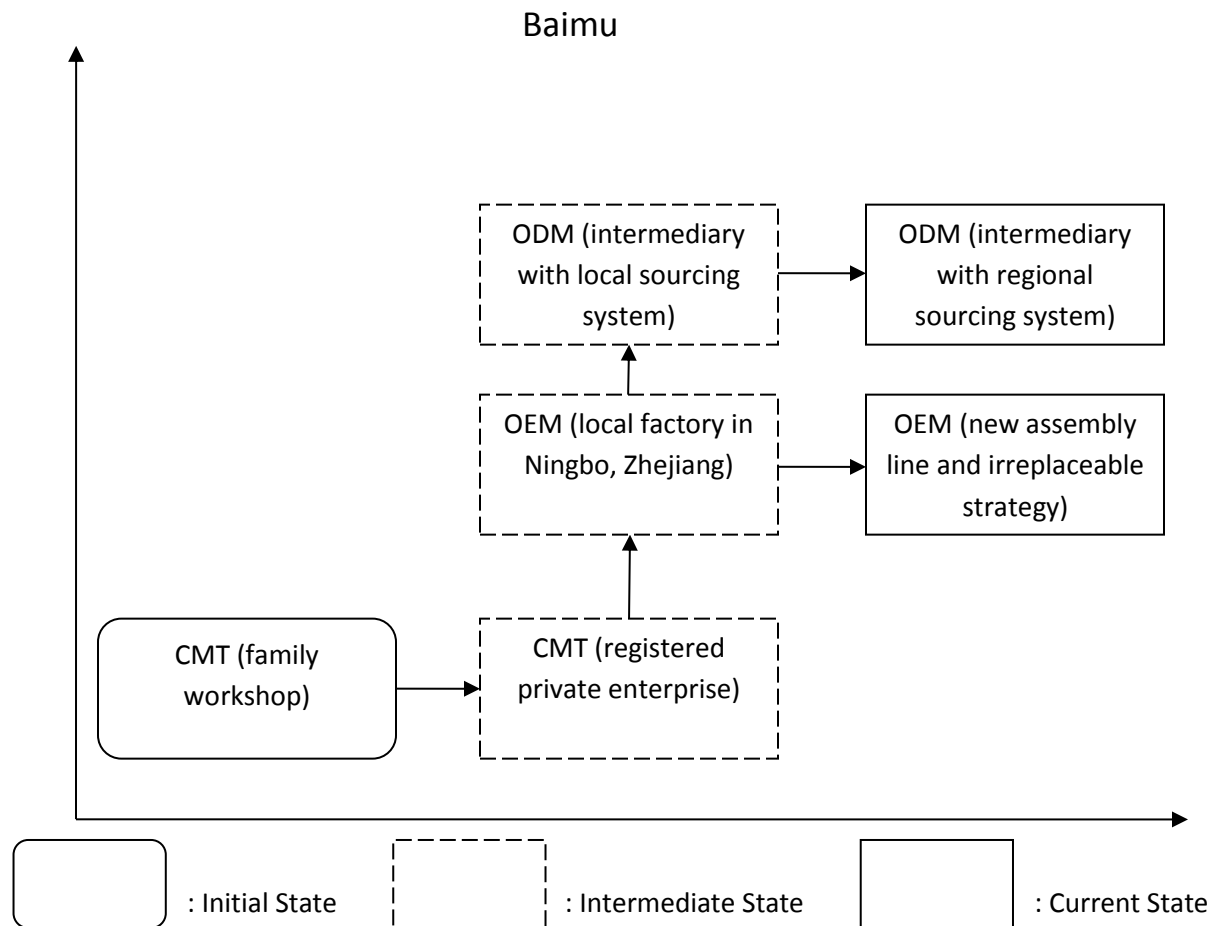


Figure 24 Upgrading trajectories of Baimu
(Source: compiled by authors)

A tentative analytical framework of upgrading

The central argument in this chapter is that three key assumptions about upgrading remain problematic and need to be unpacked more carefully than they have been to date. The upgrading trajectories of these four ‘ideal typical’ apparel firms demonstrate that upgrading trajectories are often not linear and unidirectional, and acquiring new functions does not necessarily lead to the abandoning old functions (Pickles et al., 2006). Instead, firms branch out

in multiple directions without withdrawing from profitable, old activities, such as assembly and CMT production. ‘Wearing multiple hats’ may be more prevalent business strategy than the linear, unidirectional upgrading, because, as Tokatli (2013: 1000) argued “firms enhance their activities in one area by utilizing knowledge and experience gained in another area.” What lessons can we draw from these examples?

Functional upgrading equals success

I have suggested that GVC analyses have tended to privilege the role of functional upgrading in capturing value for enterprises and regions. Such forms of value capture are seen to represent successful upgrading paths, paths that have been conventionally associated in GVC analysis with the rise of East Asian suppliers (CMT→OEM→ODM→OBM) (Gereffi, 1999, 2005, 2009; Kaplinsky and Farooki, 2010a; Kaplinsky and Morris, 2001). In their work, Pickles et al (2006) attempted to show how this focus on functional upgrading had several negative effects on public policy in Central and Eastern Europe by under-estimating the relative importance of functional downgrading in successfully sustaining employment and profitability, or of shifting from export to domestic markets as a viable strategy to strengthen a firm’s competitiveness. This was particularly important when state or regional industrial policies encouraged firm upgrading to OBM and ODM production as a path for successful competitive development. In this sense, and in the cases in Ningbo, ‘wearing multiple hats’ is a much more prevalent business strategy than linear, unidirectional upgrading.

More importantly, GVC analyses of upgrading have yet to clarify what could be an end point of upgrading. Tokatli (2013) has pointed out that one problem of the current upgrading literature is its focus on ‘entry.’ If one firm or region functionally upgrades into OBM and ODM, the firm or regional economy is then seen to be successful. However, since the entry of suppliers into design is sometimes more a result of the willingness of global brands to shed these functions

than it is of achievements of suppliers to add core competences, it remains an open question whether additional value is captured in the process (Ozatagan, 2011). By outsourcing these kinds of services to their suppliers, global brands relieve themselves of risks and responsibilities that entail potential costs as well as benefits. Not all export producers can take on these functions or assume the risks they may bring with them, and several have to retreat from ODM production to survive (Pickles et al., 2006). Can we say that this retreat is a form of downgrading or upgrading? By the same token, functional upgrading to OBM production can also yield no added value unless it is accompanied by other changes that ensure that the specific brand stands out in the crowd (Tokatli, 2013). As Seduno's general manager argued with respect to its own brand (C.O. developed in 2012):

“We have not seen one penny back from C.O. On the contrary, we are losing money. If you want to start a new brand in apparel, the ideal path is “losing money in the first two years, making ends meet in the next two years, and starting to make profit in the fifth year”. This is the best outcome one firm can expect, and most give up in the first two years and go back to OEM and assembly production. Now, we are actually using profit made from OEM and assembly production to maintain the operation of OBM production.”
(General Manager of Seduno, translated from Chinese)

In Seduno's case, functional upgrading did not mean that more value is automatically captured, but instead it has resulted in process and product downgrading.

Tokatli (2013) has drawn attention to the potential drawbacks of the ‘entry’ problem, but she did not provide any recommendations about how to deal with them. By deploying the simple device of horizontal and vertical axes I provide a parsimonious framework that addresses some of these drawbacks. First, this framework alters the end point of upgrading. The inclusion of the horizontal dimension is important because an increasing number of developing country firms have either already entered into OBM/ODM production or they have begun operations with OBM production. Does this mean that these firms have already started or arrived at the

conventionally defined endpoint of upgrading and have no further opportunities for functional upgrading? Obviously it does not and my simple model allows for that possibility.

GVC analyses typically assume that suppliers that adopt OBM production capture more value. While such analyses certainly recognize the importance of different types of upgrading they also under-estimate process and product upgrading. In this reading, process and product upgrading do not fundamentally change the power asymmetry of buyers and suppliers (suppliers remain in a relatively weak position in regard to their more 'powerful' buyers). One result has been that there are relatively few analyses that have focused on how an OBM firm or 'weak' buyer in a developing country actually carries out process and/or product upgrading to make its own brand or its position in the value chain more competitive.

The broader framework I suggest focuses much more on the ways in which a wide range of opportunity structures shape the diversity of firm upgrading pathways. For firms which upgrade vertically to ODM production, this long road means they have to keep upgrading horizontally in order to withstand risks and uncertainties related to their design functions. For firms which achieve OBM production, they must still manage process and product upgrading through which their brands can stand out from the crowd and start to make profits. In other words, the entry problem and the tying of value capture to functional upgrading is here adjusted to take account of the endless forms of upgrading and downgrading that firms make to sustain competitiveness. It is inter-firm and inter-regional competition that necessitates a much more differentiated model of value capture, and precisely how value capture and upgrading are articulated remains a thoroughly contingent and context specific relation.

High Road VS Low Road

Even though process and product upgrading are well-defined and recognized in GVC analyses, the normative expectation in these works tends to overemphasize functional upgrading

as ‘high road’ and implicitly relegates process and product upgrading to secondary or ‘low road’ upgrading. As I have just argued, with the growing complexity of emerging market manufacturing enterprises, we need to pay much more attention to the broader context of both the business environment within which upgrading is situated (e.g., conditions in the domestic market, economic regulations and regional policies) and the local clusters in which vertical and horizontal relationships generate collective efficiencies (Pietrobelli and Rabellotti, 2004; Schmitz, 1995).

Firms in developing countries are too often conceptualized as ‘generally-acknowledged weak’ suppliers which start from assembly and CMT production and rely on lead firms from the North (Tokatli, 2008; Wei, 2011). Where developing country suppliers are characterized as weak suppliers focusing on assembly and CMT production, the starting point for upgrading is assumed to be around the origin (0, 0) in Figure 20. Two upgrading trajectories are therefore projected from the beginning: either upgrading from CMT to OBM (along the Y axis), or improving productivity gains (along the X axis). However, if we focus on the diverse upgrading trajectories between X and Y axis we have a different language for understanding non-linear upgrading strategies, one that re-balances the relationship between different forms of upgrading pursued by individual firms.

For developing country suppliers (starting from around (0,0)), no matter how far they are able to move along the X axis (process and product upgrading), they remain assembly and OEM suppliers stuck in the type of production where competition is fierce and barriers to entry are low. The only promising pathway seems to be one that involves moving to OBM and ODM production through functional upgrading. But, while this ‘high road’ and ‘low road’ dichotomy may have been more accurate several years ago, as more developing countries firms have either

already adopted OBM and ODM production or have started business as OBM producers it becomes a less useful model. It would certainly be unwise if we simply characterized Peace Bird's product upgrading within OBM production and Baimu's process upgrading from local sourcing to regional sourcing within ODM production as 'low road'.

This issue has become particularly important as firms in developing countries are increasingly able to begin their operations from OBM or ODM production by targeting the rising domestic market and imitating successful predecessors within the same cluster (Wei, 2011). The result is increasing complexity within developing country firms. Depicting all developing country firms as weak assembly suppliers tends to rule out the possibility that process/product upgrading can happen to OBM and ODM firms in developing countries and can function, itself, as a 'high road' development strategy.

While horizontal upgrading for OBM and ODM firms can be 'high road', assembly and OEM suppliers' process/product upgrading is not necessarily 'low road'. Appelbaum (2006) has pointed out that the rise of giant contractors and suppliers in developing countries portends a potential shift of organizational power within GVC, as suppliers with larger factories provide a possible counterweight to the growing power of global buyers. The objective here is to observe the main dynamics at work during this process in a manner similar to Appelbaum (2006), less from the perspective of buyers in the North and more from the perspective of manufacturing suppliers in developing countries. If we focus overly on how many suppliers are taken captive by global buyers, we are unable to see the agency in suppliers who constantly strive to change the power asymmetry in GVCs. For instance, Mobi-garden, another firm in Ningbo, ensures that each customer makes up less than 30% of its total outputs in order to avoid becoming a captive supplier.

“The ‘less than 30%’ rule is set to give us more bargaining power against each of our customers. Wal-Mart has contacted us many times to discuss about subcontracting. We said no. Wal-Mart is so big that its demand easily outstrips half of our production. We do not want to be like those firms who ‘live on Wal-Mart’.”

(Founder of Mobi-garden, translated from Chinese)

Today’s global production networks are increasingly more nuanced and GVC models need to reflect this dynamic with more complex analyses of upgrading trajectories. As Mobi-garden’s founder argued, “it is hard to decide whether Foxconn relies on Apple or the other way around.” In other words, process/product upgrading for assembly and OEM suppliers (e.g., increasing factory size and adjusting each customer’s share) can subtly alter their captive role in GVCs and lead to a ‘high road’ development.

Finally, functional upgrading can also be ‘low road’. For instance, “more often than not, the entry of a manufacturing supplier into design is just another means by which the buyer extends its power, in this case by passing the costs and risks of design onto the supplier” (Tokatli, 2013: 1000). The power asymmetries in GVCs continue to exist, and simply acquiring a higher-value-added function does not guarantee the capture of additional value (Ozatagan, 2011). Functional upgrading to OBM production also can be meaningless if the specific brand does not stand out in the crowd or if functional upgrading is simply conducted to take advantage of certain government policies.

Functional upgrading=‘local’ VS process/product upgrading=‘global’

The third constraining assumption I identified above tends to attribute functional upgrading to ‘local’ factors and process/product upgrading to ‘global’ factors. I make three points in this regard. First, ‘global’ factors can stimulate functional upgrading. As Tokatli (2013: 1000) has argued, “the fast and continuous production schedules of fast fashion make it impossible for design to be exclusively the domain of the buyer, basically because the pace rarely allows time for designs to go back and forth between countries as suppliers turn designs

into finish goods.” As fabrics and product needs are developed, apparel suppliers interpret ideas and designs in developing countries, show them to representatives traveling from the North on behalf of global buyers, receive advice from them, and then reinterpret those designs. OEM and ODM production increasingly includes not only procurement of the raw materials but also preparation of collections of various designs and ideas. In this scenario, upgrading from CMT into OEM and ODM production remains in the interests of buyers, and therefore buyers welcome and encourage this type of functional upgrading. However, such functional upgrading is driven more by the needs of global buyers to relinquish these functions than it is by the success of suppliers in encroaching upon these once core competences of their customers. The power asymmetries in GVCs continue to exist, and upgrading barriers may be re-set around new functions (e.g., branding).

Second, local sources of innovation promote both functional and process/product upgrading. These are created by knowledge spill-overs and inter-firm synergies within local clusters, and policy networks of public and private actors (Barnes and Gertler, 1999; Scott, 1996; Storper, 1997). Some types of product/process upgrading are more reliant on ‘local’ factors than ‘global’ factors, particularly where market risk is managed through long-term stable relationships (Pickles et al., 2006). Here, local social networks with common cultural backgrounds and friendship ties can enhance information exchange, communication and cooperation between enterprises, help manage uncertainty and short-term instabilities through trust, and boost process/product upgrading. As one entrepreneur from Ningbo argued:

“We were only able to manufacture suits. But as we are embedded in Ningbo’s apparel cluster, we imitated local lead firms’ success to diversify production. We cooperate with local coat firms to learn how to make coats; we work with local shirt firms to learn how to make shirts; we have also learnt how to make woollen overcoats through collaboration with local firms. The inter-firm linkages remain, even after we have mastered the new know-how. We outsource part of production to them in rush season.”

(Chairman of Kangnan, translated from Chinese)

In this way, GXG and Peace Bird's process/product upgrading within OBM production is also due more to 'local' factors than to inter-firming learning within GVCs.

Third, while the upgrading literature tends to assume that both 'global' and 'local' factors have a major influence on the type of upgrading trajectories that are open to suppliers (Giuliani et al., 2005; Humphrey and Schmitz, 2002b), this overlooks certain types of upgrading driven by *regional* production networks (RPNs) (Lyberaki, 2010; Pickles et al., 2006). In this scenario, the sources of capabilities that lead to moving up the value chain and to increasing competencies come from neither 'global' factors nor 'local' factors. For some firms with previous experience of supplying global buyers, relocation of their own low-value-added processes to lower-wage locations may become an option. In so doing, these firms either develop their own brand or engage in triangular trade where the former suppliers become intermediaries or full-package producers as they further outsource orders to second-tier subcontractors (or their new plants) in lower-cost locations (Smith et al., 2008). When such outsourcing occurs while logistical costs need to be managed carefully, firms tend to relocate to geographically proximate regions with the result that they deepen their embeddedness in regional production networks (RPNs) (Abernathy et al., 2006; Tewari, 2006). Baimu's regional sourcing strategy and Peace Bird's relocation to inland China exemplify the importance of such geographically proximate RPNs in the process of a firm's upgrading (also see (Zhu and Pickles, 2014)). Relocation and the regional sourcing it generates therefore offers another source of upgrading other than GVC and local context (Lyberaki, 2010). While much GVC literature has relegated geography to the empirical background of value chain network, the more recent engagement of GVC researchers with industrial district analyses illustrates the increasing recognition that geographical

complexity within developing countries is becoming a more central feature of successful RPN development (see Bair and Gereffi 2014 on such regional linkages in the Nicaraguan and Honduras apparel and textile industries).

The beauty of ‘wearing multiple hats’ is that firms can take advantage of all sources of upgrading: knowledge transmission from global buyers, inter-firm synergies in local clusters, and regional sourcing systems. Traditional GVC claims that power asymmetries in GVCs limit functional upgrading opportunities for suppliers tend to overestimate the buyer’s capability to set up obstacles to supplier functional upgrading (Tokatli and Kizilgun, 2004). They also tend to under-estimate the agency and autonomy of suppliers. Indeed, it may simply be impossible for a global buyer to prevent one supplier from investing in functional upgrading if the latter knows how to master other capacities and sources of investment that enable it, whether these capabilities revolve around managing multiple buyers to reduce dependency and increase supplier autonomy, or whether they relate to the additional capacities that regional and local factors and networks may provide. For instance, Seduno’s functional upgrading to OBM production, on the one hand, could be attributed to its strategic intent and a group of young, aggressive high-level managers who considered such a strategy to be necessary for long-term development. On the other hand, it is also due largely to Seduno’s capability to master and exercise other sources of capabilities and, in particular, to learn from neighboring predecessors in the same cluster who had already succeeded in OBM production (i.e., local sources). In this case, even though its customers (global buyers such as Zara, H&M and Adidas) tended to place obstacles in its way to functional upgrading, it was not possible for them to make Seduno act in certain ways or prevent it from encroaching on their core competencies.

Conclusion and discussion

In this chapter I have formulated a two-dimensional framework that combines horizontal (process/product) and vertical (functional) upgrading. By drawing on ideal typical cases, I realize the potential limitations of my analysis. However, the case of Ningbo provides a number of insights to the interpretation of firm upgrading, and our findings echo with other recent studies (Pickles et al., 2006; Tokatli, 2013).

I have argued that contemporary changes in emerging economies necessitate a strong focus on the endless processes of competition that mark the upgrading process. One form of this constraining assumption is the entry problem identified by Tokatli. Furthermore, even though process/product upgrading are well-defined and recognized in GVC analyses, I have argued that their normative assumptions tend to overemphasize functional upgrading as ‘high road’ and implicitly relegate process/product upgrading to secondary or ‘low road’ upgrading. However, the correspondence between functional upgrading and ‘high road’, process/product upgrading and ‘low road’ is not one that is set in stone. In reality functional upgrading can be a ‘low road’ strategy and process/product upgrading is not necessarily ‘low road’. Finally, I have argued that global, regional and local factors operate in more complex ways in shaping firm-level upgrading strategies than current upgrading theory addresses.

In this sense I argue that GVC analyses need to be more sensitive to the strategic nature of firm strategies and the open nature of the consequences on firm performance of any specific upgrading (or downgrading) strategy. As the World Bank, UNCTAD, OECD, and WTO each embark on ambitious plans to incorporate GVC analyses into their policy frameworks, this becomes ever more important. Especially in developing countries, industrial policies have already been unrealistically encouraging firms to adopt the view that upgrading to OBM and

ODM production is a high-road path to value capture and economic growth and sustainability. This may well be true for some firms. But, as one firm manager in Ningbo complained, “most government policies are issued to encourage and support functional upgrading to OBM and ODM production, but can all firms do this? Even if we can, who will do the assembly and OEM production afterwards?” These industrial policies clearly envision that all firms can achieve functional upgrading to OBM and OEM production, but they also assume or imply that functional upgrading is the only, ‘high road’ strategy that leads to long-term industrial and regional development. Tokatli (2013) and Selwyn (2012) have cast doubts on this type of industrial policy by pointing out that it is difficult to generalize functional upgrading across space and firms flooding into OBM and ODM production, a process that itself devalues the functional upgrading they achieve. This is a fundamental issue in a competitive environment, but without some clearer answers to these questions industrial policy encourages a kind of dog-chasing-its-tail process in which the costs of entry and participation rise, squeezing out more producers and regions, risks increase, and actors experience enhanced not reduced uncertainty. Of course, this may, indeed be the outcome of competitive capitalism—the trampling of others in the race to upgrade, where increasing competencies come with increasing scale of production and control over distributed production systems. But the regional consequences of such competitive upgrading logics are different from those currently being sold to manufacturers and workers (Brewer, 2011; Tokatli, 2013).

I have argued that functional upgrading is not the only route to business success or viability, that viability that sustains contracts and employment may—under certain conditions—have more important regional consequences than upgrading strategies that squeeze out competitors, and that even where regional production systems experience generalized economic

upgrading, expanded competencies and capacities, and improved market position, such models of upgrading—in presupposing a linear trajectory—may be temporary. In this chapter, I have argued for a more diverse understanding of firm and inter-firm strategies in articulating (or not) with upgrading practices in GVCs. In this approach, functional upgrading does not guarantee that more value will be captured and process/product upgrading is not necessarily a less valuable ‘low road’.

Although in recent years global buyers seem to be shifting design functions and other services to their suppliers, Ozatagan (2011) remains skeptical that these shifts will change the power asymmetries in GVCs. Instead, he argues that upgrading barriers have been re-set around new functions (such as branding) by the very shift of design from global buyers to their suppliers. Of course, the issue is not whether to participate in the global economy that operates in this manner, but how to do so. Firms need to keep in mind that ‘global’ factors can be one source of upgrading and sustainable growth but that they are not the only one. The success of developing country firms is increasingly dependent not only on knowledge and information flow within GVCs from lead firms to their suppliers, but also on knowledge spill-overs and inter-firm synergies within local cluster, supportive business environment, rising domestic market, firm’s strategic intent and investment activities, and the formulation a geographical proximate RPNs. Furthermore, most of these cannot be achieved without governments and industry associations playing an active role in fostering conditions that reinforce competitive advantages and expand opportunities, rather than fixating on functional upgrading and closing down the paths and geographies of opportunity.

CHAPTER 7 PATH DEPENDENT AND PATH BREAKING: AN AGENT-BASED MODEL OF EVOLUTION, CO-EVOLUTION, AND LOCK-IN IN A CHINESE APPAREL CLUSTER

Introduction

In economic geography much has been written about the robust growth of certain industrial districts, clusters or regional innovation systems (Piore and Sabel, 1984; Saxenian, 1994; Storper, 1997). Industrial clustering has been seen to be important because it deepens social networks and inter-firm linkages among proximate firms, especially if those linkages involve complicated forms of interaction and trust (Barnes and Gertler, 1999; Storper, 1997). Interpretations on geographical clustering of industries thus have tended to focus on the sources of competitiveness driven by local economic agents and their vertical and horizontal relationships which generate collective efficiency and knowledge spillovers (Marshall, 1920 [1890]), institutional thickness (Amin and Thrift, 1994), embeddedness (Granovetter, 1985) and traded and untraded interdependencies (Scott, 1988; Storper, 1997).

Much of this literature assumes that geographical clustering of industrial activities positively affects competitiveness. However, recent studies focusing on the role of path dependence and lock-in have pointed more explicitly to the negative effects of clustering, particularly in explaining the decline of old industrial districts or clusters and the inability of firms to respond adequately (Cho and Hassink, 2009; Grabher, 1993; Schamp, 2005; Stam and Martin, 2012; Yang, 2012). As Grabher (1993: 256) argued, ‘the initial strengths of the industrial districts of the past—their industrial atmosphere, highly developed and specialized infrastructure, the close inter-firm linkages, and strong political support by regional institutions—turned into

stubborn obstacles to innovation.’ Such obstacles have given rise to what Hassink and Shin (2005) have termed the ‘rigid specialization’ trap, where geographically concentrated clusters become insular and inward-looking systems. Here, the notion of ‘lock-in’ has been coined to describe those situations where the processes that cause path dependence gradually lead to increasing fixity or rigidities in the patterns of industrial activity (Arthur, 1989; Martin and Sunley, 2006).

The line between successful and vigorous cluster and insular, inward-looking and inflexible cluster can be very thin (Hassink and Shin, 2005; Saxenian, 1994). Indeed, although the idea of lock-in has usually been assigned a negative interpretation, path dependence and lock-in, broadly defined, may have both negative and positive effects on regional economic performance (Henning et al., 2013; Martin and Sunley, 2006). On the one hand, lock-in may contribute to economic performance as increasing returns and positive externalities reinforce local industrial dynamism. On the other hand, the same forms of lock-in may subsequently contribute to economic decline as established structures and configurations that once offered positive effects to firms lead to growing fixity or rigidity.

The thinness of the line between negative and positive lock-in has resulted in the rise and fall of regional economies and restructuring of industrial areas (Hassink and Shin, 2005; Stam and Martin, 2012), and we now have several examples of where such negative effects have forced the restructuring of regional economies in Europe, North America and Japan (Grabher, 1993; Hassink, 2007; Schamp, 2005), the Asian newly industrialized economies since the mid-1990s (Cho and Hassink, 2009; van Grunsven and Smakman, 2005), and emerging regional economies such in mainland China since the 2000s (Li et al., 2011; Wei et al., 2007; Wei et al., 2009). Even many of the classical industrial clusters in Italy have experienced serious declines

recently (Dunford, 2006; Dunford and Greco, 2006; Dunford and Greco, 2007). This chapter seeks to contribute to this emerging body of work on industrial restructuring by focusing specifically on the restructuring of the apparel industry cluster in Ningbo, China.

The rise of China's export-oriented apparel industry since the 1990s has been driven largely by global sourcing practices intent on capturing the cost advantages of a development model predicated, in part, on unskilled or semi-skilled migratory labor flows linking inland labor pools to coastal production sites (Gereffi, 2009; Wang and Mei, 2009). Production and employment of the apparel industry have been heavily concentrated in a number of clusters in the coastal regions of East and Southeast China (He et al., 2008; Wang, 2010; Wei et al., 2007; Wen, 2004). Since the early 2000s, coastal clusters have progressively had to confront difficulties generated by the increasing social and economic costs of this regionally concentrated low-wage growth model, which has resulted in not only poor working condition but also increasing pressure for higher quality and higher wage opportunities (Henderson and Nadvi, 2011). Alongside these significant and rapidly changing labor market dynamics, other factors have also been important, including the appreciation of China's currency and slackening global demand especially after the outbreak of the financial crisis (Li & Fung Research Centre, 2008; Zhu and Pickles, 2014). These exogenous shocks have, in turn, triggered industrial restructuring in China's coastal clusters.

The chapter documents how a cluster becomes progressively locked-in and how the knowledge-base of an industry becomes homogenized resulting in a loss of innovative dynamism and a slowdown in the growth, and even stasis, of the cluster. These rigidities and inflexibilities amongst a cluster's firms become especially apparent once the cluster is subjected to an external shock, leading to new rounds of far-reaching restructuring. The chapter also investigates some of

the ways in which different kinds of agents are co-evolving in response to the external shock and the dilemmas it pose. It does so by portraying the co-evolution of governments and firms as a process fraught with tensions and divergences. Section two presents a conceptual account on evolutionary economic geography (EEG) and lock-in. Section three investigates how the apparel industry cluster in Ningbo has become progressively locked-in and now experiences a kind of homogenization of the knowledge base. The fourth section seeks to examine the co-evolution of governments and firms in the process of industrial restructuring.

Lock-in and lock-out

Before examining industrial restructuring of Ningbo's apparel cluster through the lens of evolutionary economic geography (EEG), it may be useful to make some clarifications of the notion of lock-in, which is arguably the core concept of the path dependence model and EEG (Boschma and Martin, 2007; Martin, 2010; Martin and Sunley, 2006, 2007). It is the notion of lock-in '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' (Martin, 2010: 3). In other words, it is the notion of lock-in that does the 'evolutionary' work in the path dependence model. Furthermore, it is the duality of lock-in (negative and positive lock-in) that gives rise to the rise and fall of industrial clusters.

Two trajectories of path dependence, openness of cluster and lock-in

The standard canonical path dependence model portrays the spatial industrial evolution as a four-phase development: (1) *path creation*, where historical accidents initiate a new path and have significant long-run effects on the technological, industrial and institutional structure of an economy; (2) *path development*, where emergence and development of local increasing returns and externalities assists the development of the path (positive lock-in); (3) *path rigidification*, characterized by increasing rigidification of knowledge, networks and structures of firms

(negative lock-in); (4) *path de-locking*, where an exogenous shock disrupts or dislodges the regional economy resulting in a cluster atrophy or restructuring (Arthur, 1989, 1994; David, 1985; Martin, 2010; Martin and Sunley, 2006).

After criticizing the standard canonical path dependence model's overemphasis on continuity and stability, Martin (2010) has suggested a second type of trajectory which is more open and allows for constant endogenous change and evolution. His model diverges from the canonical one in the third step, and proposes a new phase three where industry changes slowly over time leading to an incremental, path dependent evolution. Local industry is able to adapt and mutate constantly and gradually, which prevents it from being trapped in a stable, inflexible and rigid state that only can be destabilized by an external shock. This idea has been further developed by Martin and Sunley (2011) when they employ a modified cluster adaptive cycle model and introduce much more diverse trajectories of cluster evolution. The gist of their argument for my present purposes is that apart from being stuck in a state of fixity and rigidification and waiting for an unpredictable external shock to set it free, a cluster can evolve along another trajectory where firms in the cluster are able to innovate more or less continuously and the cluster constantly mutates and adapts.

This second trajectory can be realized by keeping the cluster relatively open (Hassink, 2005). The openness of a cluster is partly supported by the diverse overlaps between organizations and institutions inside and outside cluster, and the subsequent information, technology and knowledge exchange across cluster borders (Sydow et al., 2010). In this way, EEG distinguishes between two kinds of information exchange and learning process. That which occurs in the cluster as a consequence of being in the cluster, by being embedded in the community is referred to as 'buzz'. The kind of understanding and learning that derives from

participation in various kinds of links with others beyond the cluster (buyer-supplier relations, input suppliers, participation in global value chains, industrial association linkage programs, etc.) is referred to as ‘pipelines’ (Bathelt et al., 2004). Bathelt et al. (2004) are more focused on global pipelines that encompass firms from different parts of the world and are embedded in different socio-institutional and cultural environments. I do not necessarily see pipelines as ‘global’ and flowing across national border. Instead pipelines may be intra-national and regional, and this is particularly true in the case of such large-scale regional networks and clusters as those in China. Consequently, I use the term trans-local pipelines, rather than global pipeline, and local buzz.²⁴

‘Pipelines’ which connect agents inside and outside cluster may be important in enabling firms in the cluster to avert tendencies towards rigidification and negative lock-in in cluster evolution, thus enabling cluster to remain innovative and competitive (Bathelt and Li, 2013; Bathelt et al., 2004; Sturgeon et al., 2008; Sydow et al., 2010). The idea that nurturing connections with distant actors may help prevent systematic negative lock-in is also supported by Maskell and Malmberg (2007) who have argued that, from a micro-level perspective, localized learning and knowledge development often lead to overreliance on localized routines and over-embeddedness in existing structure, what Maskell and Malmberg called ‘spatial myopia’. The potentially devastating long-run effects of spatial myopia may be avoided as long as some firms actively invest in establishing pipelines to external knowledge pools with dissimilar routines or institutional patterns. Negative lock-in is therefore alleviated by rejuvenation processes where externally connected local firms are able to keep importing fresh knowledge and state-of-the-art technology. As Pickles and Smith (2011) have also shown, such externally connected firms are

²⁴I am aware of the parallelism between some of these claims about inter-firm learning in pipelines and global value chain research on buyer-supplier upgrading, as well as claims about local buzz and the longer-standing claims about inter-firm learning in industrial clusters. I have engaged with these traditions elsewhere. My purpose here is to explore the advantages of thinking through the approach of evolutionary economic geography to consider what it offers to and beyond these frameworks.

also, as a result, better able to sustain their markets, add additional functions and capacities devolved from their external partners, and benefit from state-of-the-art learning, especially where technology and fashion products require rapid adaptations strategies.

By deliberately investing in building pipelines to distant communities some firms may be able to increase the variety of knowledge, resources, and capabilities available to them and escape the potential rigidification stemming from myopia and negative lock-in. However, the association between the openness of a cluster and Martin's second trajectory characterized by constant adaptation and mutation is not always straightforward. There are different types of pipelines to external knowledge pools, and each potentially plays different roles in cluster evolution. It is to this heterogeneity of forms of pipeline, the different ways in which they link firms and clusters to external knowledge pools, and the ways in which they are associated with lock-in and cluster evolution that I now turn.

Agents, multi-scalar co-evolution and lock-out

Not only has the canonical path dependence model overlooked Martin's second trajectory of cluster evolution, but it also rarely pays attention to the role of individual agency in affecting path-dependent processes (Arthur, 1989, 1994; David, 1985; Henning et al., 2013; Martin, 2010). Once a cluster or regional economy enters into the third phase in the traditional path dependence model, it is assumed that it will remain or be trapped in that stable state until it is disturbed or liberated by some unpredictable and unexpected exogenous shock (Martin, 2010; Martin and Sunley, 2011). The role of individual agency is implicitly ruled out from the process of path dependence, and seemingly has nothing to do with path disruption and new path creation. The idea that a stable, inflexible and rigid state of a cluster cannot be dislodged except by an external shock is certainly a questionable one. Instead, while the rigidification of firms, networks, and structures in a cluster may weaken the vitality and adaptability of the cluster resulting in cluster

atrophy it may also encourage or enable a reorganization of resources and greater opportunities for surviving firms (Martin and Sunley, 2011) or it may force purposeful action by individuals (firms, industry associations and governments) who are deliberately trying to de-lock themselves. The result can be that the entire system can dislodge itself from an old path and create a new one (Sydow et al., 2010). As a result, there are reasons to consider path-dependent process of cluster evolution as being created both unintentionally (e.g., by external shocks) and by purposeful action of agents.

Here by agents, I refer to not only firms, but also different levels of governments. The former inflect cluster evolution through corporate strategy, while the latter play an important role in affecting path dependent processes through government policies and political institutions. My inclusion of political institutions heeds the call for incorporating the political dimension in an evolutionary approach to economic geography (Boschma and Frenken, 2009), and responds to the challenge that the prevalent evolutionary approach to economic geography has been relatively isolated from approaches and perspectives from institutional economic geography (Boschma and Frenken, 2006; Martin, 2010). One way to demarcate the role of institutions in an EEG framework is to explain the interplay between industrial dynamics and institutional change, since institutions are normally co-evolving with firms, technology, networks and structures (Nelson, 1994, 1995). There is increasing awareness that institutional change is able to disrupt the situation of negative lock-in and rigidification (Hassink, 2005; Pike et al., 2009), and is required to enable the emergence of new industries and cluster repositioning, since individual initiative alone is sometimes unable to do so (Lowe, 2009). This awareness of state institutional action is of central importance particularly in the context of China where the state remains a heavy-handed actor in regulating industrial activities (Wei, 2000, 2001b). Furthermore, not only

has China's central government been heavily involved in local economic development, China's decentralization has also empowered local governments to participate directly in the development process as planners, developers and policy-makers, far beyond providing just public goods (He et al., 2008; Wei, 2001b; Wei et al., 2007). In the Chinese case in particular it is vital that the co-evolution of institution and industry should be examined in a way which recognizes the complicated interactions not only between firms and states but also different levels of governments.

Using an agent-centered approach, Sydow et al. (2010) have examined the ways in which agents intentionally choose to inflect cluster evolution, pointing out the potential benefits of the *concerted* actions of a variety of agents within the path-dependent processes. On the other hand, Yang (2012) has argued that industry restructuring in the Pearl River Delta of south-eastern China has been greatly hindered by the *conflicts* between various agents (such as governments and firms), and difficulties of restructuring have been heightened by emerging tensions between the state and firms. The dominant interpretation of such conflicts between governments and firms is based on negative political lock-in (Grabher, 1993) or hysteresis, where institutional inertia and dependence on past linkages and practices (including routines, conventions and traditions) change slowly over time, deepening forms of path dependence (Martin and Sunley, 2006; Setterfield, 1997). Once institutions become firmly established, the further growth of a cluster may be obstructed by the very institutions which supported it, creating a form of institutional hysteresis. My case study of Ningbo is even more nuanced, where the processes of co-evolution are fraught with both harmonies and disharmonies between a variety of agents (different kinds of firms and different levels of governments). In addition, the underlying mechanisms that have

given rise to conflicts between governments and firms have been more complicated than is suggested by notions of institutional inertia and hysteresis.

Pipelines to external knowledge and negative lock-in

The Reform and Opening-up policies dislodged Ningbo's old path, which was centered on family business units and town and village enterprises supplying domestic markets in a shortage economy, and triggered the first round of industrial restructuring. This path was characterized by a private-sector-led export-oriented industrialization. Rapid expansion was also supported by the Reform and Opening-up policies from the central government and specific policies from Ningbo's local government. Political institutions were deliberately created to bolster and sustain the further growth along this path. In the 1990s, export-oriented production surpassed domestic-oriented production and accounted for the majority of Ningbo's apparel industry.

Transformation from small family business units to shareholding enterprises or limited liability corporations facilitated apparel firms' productivity increases and economies of scale. Access to GVCs increased rapidly with the Opening-up policies as apparel producers were able to draw on low-wage and unskilled or semi-skilled labor and the leveraging of domestic advantages, including the comparatively low cost of other factor inputs, land, electricity and other raw materials (Gereffi, 2009; He et al., 2008). This combination of national reforms and international demand led to rapid expansion in the industry. As firms in the cluster began to benefit from following such a path, other entrepreneurs tended to imitate and learn from their successful neighbors. Given the thick, historically rooted inter-firm synergies in the region, it seems to have been relatively easy for knowledge on export-oriented production to spread within the cluster through business and personal relationships (Li et al., 2011; Wei et al., 2007). As

export production boomed and the enormous demand from international buyers at times outweighed the capacity of Ningbo's apparel firms to meet their orders, many were forced to outsource or subcontract part of production to inland China especially in the rush season. In addition, apparel firms in Ningbo also outsourced part of their production to better endowed regions. For instance, manufacturing of jeans was outsourced because high-quality water for the washing processes was not available in Ningbo. However, to minimize additional logistical costs and lead time, firms tended to outsource to geographically proximate regions (e.g., manufacturing bases in the same province or neighboring provinces), further deepening their integration into regional production networks (RPNs) (Abernathy et al., 2006; Tewari, 2006).

By actively participating in the GVCs, apparel enterprises in Ningbo gradually acquired new capabilities and increased competencies in the process of supplying global buyers. This global pipeline to external knowledge allowed advanced knowledge and information to flow from global lead firms to apparel suppliers located in Ningbo cluster. The upgrading process unfolded in Ningbo's apparel cluster in classic GVC terms as firms gradually moved from low-value cut-make-trim production to relatively high-value activities such as full package and original equipment manufacturing (OEM) production (Gereffi, 1994, 1999, 2005). The local social network with its common social networks and friendship ties made information exchange, communication and cooperation between enterprises within the cluster much easier. It also enabled firms to imitate strategies and learn from local pioneers. These networks were particularly important in the context of Reform Ningbo. Prior to 1978 enterprises lacked knowledge about export-oriented production and, as a result, imitation practices were crucial for the survival and revival of a cluster as a largely family business dominated domestic-oriented industry shifted towards enterprise-led export-oriented production. In the process, RPNs

formed by Ningbo's apparel firms allowed Ningbo's firms to shed low-value production by outsourcing to subcontractors elsewhere, diversify their regional footprint, deepen their manufacturing skills, and focus on relatively high-value production. This regional pipeline eased Ningbo's under-capacity in rush seasons and facilitated upgrading. In summary, the prosperity of Ningbo's apparel cluster between the first and second round industrial restructuring was partly supported by a combination of 'local buzz' and 'trans-local pipeline' (Figure 25).

However, as time went by, it was this very combination that led to a progressive lock-in or homogenization of the knowledge base which resulted in a loss of innovative dynamism and a slowdown in the growth, or even stasis, of the cluster. When local buzz and trans-local pipelines were formed alongside new industries, they fulfilled a specific need, but once they were firmly established, they ran a risk of turning the positive lock-in into a negative one, resulting in homogenization of the knowledge base. First, in a buyer-driven GVC like apparel which is often characterized by the asymmetric relationships and the captive role of producers in low-wage economies, particular attention has been drawn towards how the action and motivation of global buyers are the key causal forces in the organization of global contracting systems (Gereffi, 1999; Schmitz and Knorringa, 2000). Although global buyers are willing to help suppliers improve productivity and efficiency and the former may even gradually transfer certain relatively high-value functions to the latter, upgrading barriers are still set and re-set around core competencies by global buyers (Ozatagan, 2011; Tokatli, 2013). Therefore, the very global pipeline which initially facilitated inter-firm knowledge transmission from global buyers to Ningbo's apparel firms can be quickly converted into shackles, inhibiting apparel firms from making further upgrading once they started to encroach upon the core competencies of global buyers. Second, as the global pipeline switched from enabler to constrainer of further development, the now well-

established regional pipeline compounded the problem. If the global pipeline was the one that trapped Ningbo's apparel firms into low-cost and peripheral production, the regional pipeline was the one that created flexibility for the industry allowing Ningbo's apparel firms to maintain low-cost production in the face of increasing cost squeezing and manage peak season orders as export contracts became an ever more important part of their production. RPNs that were originally established to solve the under-capacity issue in rush seasons started to create a form of negative lock-in as wages increased and labor market competition enhanced the positional power of workers. In these circumstances, Ningbo's apparel firms were able to survive and remain low-cost producers only if they could outsource parts of their production to lower-cost inland China through the regional pipeline. But the expansion of RPNs into Western areas of the province or to other provinces also creates a series of its own rigidities and risks, including more costly extended supply chains, increased uncertainty around delivery time, and greater quality control and compliance problems. Finally, the local buzz homogenized the local knowledge base and limited the exploration of alternative possibilities. These imitation practices resulted not only in a cognitive lock-in with little innovation and creativity (Grabher, 1993), but also—in some instances—in low quality products, particularly where the opportunities generated by export growth encouraged firms to mimic other successful firms' products rather than develop their own products or brands.

The only promising trans-local pipeline to external knowledge that kept importing fresh knowledge and diversifying regional economy was inter-cluster linkages where know-how exchange occurred between Ningbo's apparel firms and counterparts in other clusters specializing in the same or related industries, such as textile and apparel clusters in Guangdong, Jiangsu and Shandong as well as other apparel clusters in the same province, Zhejiang. Thus, to

the extent that firms that were locked into global and regional pipelines built on vertical input-output linkages were able to access inter-cluster pipelines they benefitted. Unfortunately, most of my interviewees pointed out that their only chance to communicate with firms in other clusters specializing in the same or related industries was through the two factory tours every year organized by the NGA. In other words, inter-cluster pipelines were weak and thin (Figure 25).

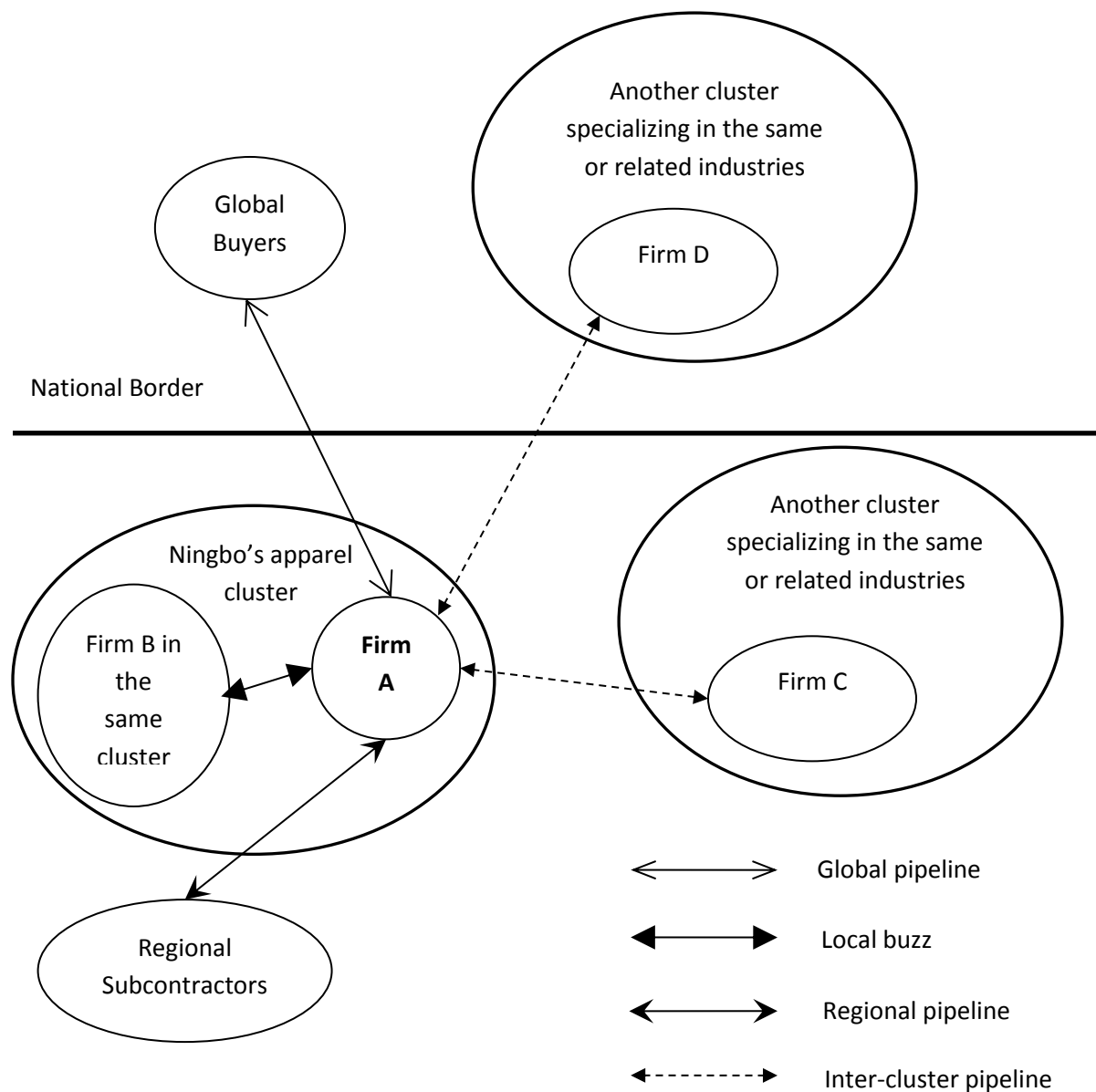


Figure 25 Trans-local Pipeline and Local Buzz of Firms in Ningbo's Apparel Cluster

The historically evolved combination of local buzz and trans-local pipeline can thus sometimes lock the entire cluster into specific, initially successful, ways of doing things that later convert into shackles, which inhibit or block further progress. By deliberately investing in building pipelines to distant communities some firms may be able to increase the variety of knowledge available to them and escape the potential rigidification stemming from myopia and negative lock-in. However, the association between trans-local pipelines and the second trajectory is not pre-determined, because different types of trans-local pipelines may have different effects in cluster evolution, and pipeline may become clogged over time.

Harmonies and disharmonies in the processes of co-evolution

When the local buzz and trans-local pipeline malfunctioned or even started to restrain further progress, positive lock-in was gradually overtaken by negative lock-in and spatial myopia, leading to loss of innovative dynamism and a slowdown in the growth, or even atrophy, of the cluster. Martin and Sunley (2006) have summarized five possible strategies to escapes negative lock-in. However, all of their strategies tend to stress technological development, innovation and upgrading, with little attention to industrial relocation (Schamp, 2005; Wei et al., 2007). Both upgrading and relocation will be taken into account in my analysis of industrial restructuring, as well as the co-evolution of different levels of government and different kinds of firms.

Before I turn to specific de-locking strategies implemented by governments and firms, it is necessary to clarify the different role of exogenous shocks and endogenous change in the process of cluster lock-out and industrial restructuring. The canonical path dependence model not only overlooks the second trajectory of cluster evolution, but it also pays little attention to the role of individual agency in affecting the path-dependent process. Even though Ningbo's apparel cluster seemingly evolves according to the canonical path dependence model, the whole process

of industry restructuring and lock-out is also shaped by exogenous shocks and endogenous change, rather than realized by the former alone. Exogenous shocks, such as dwindling international demand and rising production costs, contributes to the process of path disruption, but this only creates an unknown and uncertain future in which cluster decline, stasis, atrophy, disappearance and revival can each occur. Here I argue that exogenous shocks, while important, should not be overrated since they only give rise to path disruption. Instead, endogenous change is the real driver of path creation. Thus, even though the evolution of Ningbo's apparel cluster may follow the canonical path dependence model, exogenous shocks merely trigger the process of lock-out while endogenous change determines if Ningbo's apparel cluster will decline, disappear or revive after their further restructuring and upgrading.

Harmonies and disharmonies in the process of upgrading and relocation

Central government strategies play significant roles in shaping industrial policy in the Ningbo apparel industry, pushing and encouraging labor-intensive and low-value enterprises to relocate from the higher-cost coastal regions to release space and resources for higher-value apparel and other industries while simultaneously promoting economic development in less developed inland China (Table 3). For instance, in order to variously support and compel apparel firms to upgrade, the *Adjustment and Revitalization Plan of Textile and Apparel Industry* released by the State Council in 2009, included new investments in autonomous innovation and independent brand development, support for key enterprises and consolidation in the small and medium-sized enterprises (SME) sector, and enhanced credit and other financial support for SMEs. In addition, in 2010 the Ministry of Industry and Information Technology released the *Guideline on Pushing Forward Relocation of Textile and Apparel Industry*, to propel and facilitate the shift of apparel from coastal regions to inland China. In 2007, less direct impacts were seen when China's Ministry of Commerce and China Customs promulgated the *List of*

Restricted Commodities in Processing Trade, differentiating between allowed low-cost, labor-intensive processes inland and those that are now restricted in coastal regions. Importantly for my purposes, apparel products made up most of the restricted low-cost process and products. The Ministry of Commerce also designated fifty priority relocation destinations in inland China to attract apparel firms that would relocate from coastal regions. The State Development Bank provided loans and tax incentives.

Local governments and apparel firms have also responded to the call of the central government and participate in industrial restructuring such as relocation and upgrading directly or indirectly. Ningbo's local government has been especially active in assisting its apparel industry by offering generous financial and technological support to key enterprises, bolstering the Annual Ningbo International Fashion Fair (ANIFF), coordinating inter-firm relations, and building up a vocational school specifically for apparel (Zhejiang Textile & Fashion College). Ningbo's apparel firms have responded by taking advantage of the new institutional arrangements. Some managers, especially those from large firms, indicated that over the past few years they had invested intensively in innovation and upgrading, gradually upgraded from low-value assembly and cut-make-trim production to relatively high-value activities such as full package, OEM production, and even original design manufacturing (ODM) and original branding manufacturing (OBM) production. For instance, Peace Bird directly owned 80% of production in 2006, while today it outsources around 80% of its total production. The share of outsourcing is likely to increase in the near future as the company's focus continues to switch towards R&D, branding and marketing. Baimu, as an OEM and ODM supplier, moved from supplying low-end buyers such as Wal-Mart towards supplying only medium- and high-end brand firms, such as Abercrombie, VANS, and Tommy Hilfiger. Ningbo's second largest

producer, Seduno, branched out into branding, designing and retailing while it still focused on low-value assembly and OEM production. All of these upgrading efforts could not occur without taking advantage of the new institutional supports such as tax incentives and financial aid. Additionally, for apparel firms planning to partly relocate to inland cities, the Ningbo government and NGA normally convened them, researched the investment environment beforehand, and bargained with local governments on their behalf. These tight firm-government relationships were crucial for some enterprises. For example, Rouse's relocation to Zigui, Hubei resulted directly from the negotiation between Ningbo and Zigui governments.

The picture of coordinated governmental and firm action must also be located in a more complex set of industrial restructuring dynamics, some of which are highly conflictual. According to the *Guideline*, national political institutions were supposed to help accelerate industrial upgrading and the shift to high-end apparel, develop OBM and ODM production in coastal regions, and relocate low-cost, labor-intensive OEM and assembly production to inland regions. The blueprint may have had good intentions but its implementation has had indirect consequences. For example, some policies were applied in such a way as to encourage every firm in the coastal regions to upgrade from low-end assembly production to OBM and ODM production. This obsession of pushing all firms to upgrade into high-value production was carried even further by Ningbo government. First, financial aid and tax incentives were disproportionately assigned to key apparel enterprises, since the implicit and overarching spirit of Ningbo's local policies was to invigorate large apparel enterprises and to leave the SMEs to fend for themselves. Some apparel managers from SMEs complained that purportedly industry-wide policies were being applied preferentially to favor large enterprises. Second, an increasing share of government aid was channeled towards the so-called high-tech and high-value-added

industries, such as the electronic industry, even though Ningbo was still known as an Apparel City. Most interviewees took issue with this central government fixation on upgrading and its subsequent policies. In their view, the local government was unrealistic in hoping that every firm could upgrade to OBM and ODM production immediately. As one firm manager in Ningbo complained,

Most government policies are issued to encourage and support upgrading to OBM and ODM production, but can all firms do this? Even if we can, who will do the assembly and OEM production afterwards?

(Chairman of Kailian, translated from Chinese)

They also disliked the local government's abandonment of apparel SMEs as well as its obsession with so-called high-tech industries, and considered its policies to be irresponsible, running counter to Ningbo's industrial strengths and capacities. These disharmonies between different levels of government and different kinds of firm were clearly reflected in the region's industrial dynamics. SMEs that did not have the financial and technological capabilities to upgrade to OBM and ODM production or move to the so-called high-tech industries remained trapped in the low-margin labor-intensive OEM and assembly production. It was extremely difficult for them to obtain bank loans, tax credit and low-price land from either central or local governments. As one interviewees remarked,

It may take Youngor (China's leading menswear manufacturer based in Ningbo) one phone call to get several billion [Yuan] bank loan, while it takes us forever to even get in touch with the bank.

(Assistant President of Progen, translated from Chinese)

As the exogenous shocks that followed the 2008 financial crisis took effect, profit margins in these firms were squeezed to such a degree that some were forced to downsize or close altogether. In 2011, 16.18% of Ningbo's apparel firms were making negative profits, 50% more than 2010 (Xia et al., 2012).

Not all large firms benefitted from these policies in productive ways. While a number of large firms actively invested intensively on innovation and upgrading, some large apparel firms gradually adopted accumulation strategies that depended heavily or entirely on their beneficial access to central and local governments' supports for cheap land, tax credits and bank loans. Rather than stimulating restructuring, this excessive dependence encouraged passive behavior by local entrepreneurs even in the face of deepening exogenous shocks. Enjoying such preferential access to government supports, particularly government programs that granted access to land at abnormally low prices, other large apparel firms avoided risk-taking ventures and, instead, sought to capture rents from land speculation.

Tension also emerged in the relocation process. As indicated above, China's central government not only urged the shift of low-cost OEM and assembly production from coastal regions to inland China, but also designated priority relocation destinations in inland China. First, this government-led relocation sometimes exacerbated the traditional 'race to the bottom'. By relocating to lower-cost regions in inland China and by extending RPNs Ningbo's apparel firms were able to survive and remain as low-cost producers even though labor costs surged in coastal regions. Relocation policies also triggered a new type of strategic 'race to the bottom' where apparel firms took advantage of government relocation policies by searching for the most favorable policies, cheapest land, and best tax credits and playing off local governments in inland China against each other. As a result, while above I have shown how large, key enterprises become captured in speculative arrangements because of the favorable policies granted by the Ningbo government, rejecting relocation as a result, here in the process of relocation to inland China, firms play off local governments against each other to leverage favorable policies and cheap land. As a result, they became less interested in investing in production and more focused

on capturing rents from subcontracting and land speculation. Second, in some cases, even though Ningbo's local government relaxed controls over relocation, apparel firms sometimes were forced to relocate to specific inland cities because of the personal relationships that existed between the political leaders of two cities. For instance, Peace Bird's relocation to Hubei partly resulted from local government intervention. Third, firms in Ningbo considered the government-designated priority relocation destinations to be inappropriate because, as a top-down policy, it barely paid attention to any of the main factors affecting location and relocation decisions, such as supplying facilities, infrastructures, cultural circumstances, labor quality and logistical costs. As one interviewee explained,

The supplying facilities in some government-designated relocation destinations are so poor that we have to purchase raw materials [e.g., fabrics] and accessories [e.g., buttons and zippers] elsewhere and transport the finished products back to Ningbo for distributing and retailing.

(General Manager of Alphabet, translated from Chinese)

Path-dependent and path-breaking

The dominant interpretation of such disjuncture in the co-evolution of state policies and firm strategies is based on institutional inertia and hysteresis (Martin and Sunley, 2006; Setterfield, 1997). This interpretation argues that institutions that are initially conducive for the growth of clusters may evolve into shackles that restrict on-going regional development, particularly during the process of industrial restructuring. In my case, the rise of Ningbo's apparel cluster between the first and second round of industrial restructuring was driven by apparel producers dependent on low-wage and unskilled or semi-skilled labor and the leveraging of domestic advantages, including the comparatively low cost of other factor inputs, land, electricity and other raw materials which allowed them to expand their role in export markets. As production costs in coastal regions surged and international demand declined, local governments and some apparel enterprises avoided risk-taking investments. Local governments, seeing

aggressive relocation to other provinces weakening their own plans for local economic development, hoped to keep key enterprises *in situ* by offering land, electricity and labor at abnormally low price. For some more mercantilistic entrepreneurs rent-seeking through land speculation followed. These forms of institutional inertia gave rise to conflicts between China's central government and local administrations, but also between firms that were genuinely interested in improving their learning capability through relocation and upgrading and firms that either clung to old path or sought rents through speculation.

Institutional hysteresis is only part of this story. Once a new path is established, it may gain momentum and sustain a particular trajectory, especially where initial fixed set-up costs are large and where there are dynamic learning effects, network externalities and self-reinforcing mechanisms (Martin and Sunley, 2006). New institutions that formed alongside such paths tend to fulfill specific needs, supporting and sustaining its further growth (Boschma and Frenken, 2009). However, while the coordination between various agents along an established path has been the focus of many studies, little attention has been directed towards the relationship between different agents at the turning point from the disruption of the old path and the turn to a new path. Where no entrenched path has emerged, the conjuncture is full of possibilities. A variety of agents may actively strive to capture rents from or escape the rigidification into which they have been locked. As old, established paths fall apart, so does the underlying self-reinforcing mechanism that forces agents to follow one specific path. It is therefore highly possible that, at this conjuncture, different agents with different financial, political and technological capabilities and strategic intentions make different decisions based on different interests. Network coordination between diverse agents along one certain path may be therefore replaced by a new type of situation where there are conflicts and tensions, but no one

obvious or dominant path. In this scenario, the institutional inertia and hysteresis plays little role since all agents are proactively seeking to de-lock and find new pathway, perhaps in different directions.

In the case of the firms in Ningbo, although institutional inertia may have emerged as a result of both government policies and corporate strategies, it is also important to point out the heterogeneity of different agents' intentions and capabilities and their uncoordinated and conflictual actions in the process of path disruption and creation. The central government saw this conjuncture as not only an urgent signal that coastal regions should shed low-cost, low-value and low-tech, export-oriented production, but also an opportunity to relocate such production from the higher-cost coastal regions to release space and resources for higher-value apparel and other industries while simultaneously encouraging economic development in less developed inland China. Such a relocation and upgrading plan also met the national government's goal of alleviating regional disparity. Ningbo's local government, seeing aggressive relocation to other provinces as weakening their own plans for local economic development, tended to encourage large enterprises to upgrade *in situ* while relaxing controls on the relocation of SMEs, thus releasing space and resources for high-tech industries.

The intentions and actions of firms were even more diverse. Although some large apparel enterprises became increasingly addicted to land speculation, other large firms invested intensively in innovation and upgrading. Some SMEs remained export-oriented by subcontracting even as their profit margins were squeezed drastically. Others were more ambitious. For instance, apart from some large firms that were able to innovate and upgrade based on internal strategic decisions and external government support, some medium-sized firms also succeeded in improving their learning capability and locking-out. They escaped

political lock-in because medium-sized firms normally had no substantial government assistance to rely on. They escaped cognitive lock-in because they were often managed by young entrepreneurs either trained outside or who had moved from outside Ningbo's apparel cluster. They tended to break the functional lock-in by moving from export-oriented OEM production to domestic-oriented OBM production. In addition, they proactively embraced risk-taking ventures and initiated new businesses, such as ladies' wear and men's casual wear, in a men's suit dominated apparel cluster. GXG, starting from domestic-oriented, OBM production and becoming a manufacturer with no factory with 'dumbbell-style' production that focuses on both end of the value chain (R&D, branding, marketing and sales) and outsourcing production, is a case in point and possessed all these characteristics.

Henning et al. (2013) have argued that at this stage, as an external shock sets in, or if stasis and rigidity itself sets off internal processes of decay or atrophy, the cluster enters a 'release' phase. Resources built up around an old path start to be lost, and disinvestment and destruction may take place (such as relocation). This is then followed by a 'reorganization' phase of reconfiguration and restructuring characterized by various experiments initiated by a wide range of agents. This new path has not been fully consolidated yet the relationship established in the old path is weakened. As a result, conflicts become more common as attempts increase to find new viable path. The variety of firm strategies and organizational forms is increased as options open.

In summary, by applying an agent-based approach to the analysis of path dependence I am able to disclose a dimension of disharmonious industrial restructuring which has been overlooked, if not completely ignored, by traditional institutional inertia and hysteresis theory. Instead of negating the effects of institutional inertia, I am suggesting that two types of

mechanism co-exist and that all agents can be both path-dependent and path-breaking, especially between the release (path disruption) and reorganization (path creation) phase.

Conclusion

Recent studies in EEG have critiqued the four-phase development of clusters in the standard traditional or canonical path dependence model formulated by David (1985) and Arthur (1989, 1994), and have suggested a second type of trajectory which is more open and allows for constant endogenous change and evolution (Martin, 2010; Martin and Sunley, 2011). The second trajectory can be realized by keeping the cluster relatively open (Hassink, 2005). It has been argued that some ‘extrovert’ entrepreneurs who have deliberately developed pipelines to trans-local networks may be able to increase the variety of knowledge available to them, escape the potential problem of rigidification stemming from myopia and negative lock-in, and rejuvenate the cluster (Martin and Sunley, 2011). However, the idea that nurturing connections with distant actors may help prevent systemic negative lock-in is not always the case. In the case of Ningbo’s apparel cluster, the historically evolved global pipeline, regional pipeline and regional buzz rendered the entire cluster locked into specific initially successful ways of doing things that later emerged as shackles that inhibited further progress. Different types of trans-local pipelines may have different effects in cluster evolution, and pipelines may become clogged over time.

In addition, this canonical path dependence model has perhaps focused too much on exogenous shocks in the process of path disruption and on ‘historical accidents’ in the early stages of path creation, implying that managers and policy-makers have few choices left thereafter. I have suggested that path dependence is a socially dynamic process, forcing us to look at structure as well as the action of agents. The agent-based approach helps researchers to understand exactly the ways in which a diverse range of agents are implicated in the construction

and constitution of interdependent sequences of events and decisions. In this process of co-evolution, collaboration among agents (such as firms and governments) leads to certain process of path creation and maintenance, by facilitating intentional network coordination and generating collaborative and deliberate planning. However, such a process of co-evolution and network coordination does not always emerge, and industrial restructuring may be fraught with conflicts and tensions between various actors. By applying an agent-based approach in path dependence analysis, I have suggested that all actors can be both path-dependent and path-breaking, especially between the release (path disruption) and reorganization (path creation) phases. Conflicts in the process of co-evolution can be driven not only by institutional inertia and hysteresis, but also by the heterogeneity and divergence of various agents' actions. This type of divergence exists all the time, because the interactions between structure and purposeful actions constantly give rise to both on-path and off-path changes and innovations. But during the release and reorganization phase, intensive conflicts and tensions between different actors may emerge in a more phenomenal way (in my case, different levels of governments and different kinds of firms).

As for the future development of Ningbo's apparel cluster, I argue that the emergence of a new path may not be stimulated or enabled by happenstance or by historical accident, but may be based, at least in part, on the preexisting resources, technological capabilities and skills, competencies, and experiences that have been inherited from old paths (Martin, 2010). These inherited conditions form the context in which purposive actions and intentional experiments take place. In this respect, the obsession of national and local governments with high-value and high-tech industries and their rush into encouraging every firm in the coastal regions to upgrade to OBM and ODM production may be unrealistic and possibly even self-defeating. Moreover,

where policies imply a total abandonment of the apparel industry or apparel SMEs in favor of high-tech or higher value-added industries, they do so regardless of the existing infrastructural capacities in apparel and the absence of parallel capabilities in the new industries. On the other hand, the most promising enterprises are those that either upgrade gradually based on existing resources and competences, or branch out into new areas that build on existing capacities and know-how. For instance, some firms proactively embraced risk-taking ventures and initiated new business, such as ladies' wear and men's casual wear, in a men's suit dominated apparel cluster. This idea of 'dependence between successive paths' (Martin and Sunley, 2006) thus suggests that incremental industry policies based on existing resources may be most helpful in effecting the efficient coordination between various agents and capitalizing on existing capacities.

Finally, I argue that EEG is an emerging paradigm in economic geography, yet it currently remains to some extent isolated from developments in other theoretical approaches. An agent-based EEG approach not only provides genuine new interpretations for the main debates in economic geography, such as the co-evolution of a wide range of actors, the spatial evolution of industries and clusters, and harmonies and disharmonies in spatial systems, but also offers interfaces with other theoretical approaches in economic geography as well as economic sociology and development studies. Recent studies have led to innovative theorizing at the interface between EEG and institutional economic geography and at the interface between EEG and analysis on industrial districts and clusters (Boschma and Frenken, 2009; Boschma and Frenken, 2006; MacKinnon et al., 2009; Martin, 2010). The interface between agent-based EEG approaches and global value chain (GVC) approaches could be a fertile area for further consideration. GVC analyses have—at least until recently—tended to freeze complex and diversified circuits of economic activity into fixed territorial frameworks where consumption is

presumed to be located in the North and production has been increasingly outsourced to cheap labor markets in the South (Leslie and Reimer, 1999). In other words, the GVC literature, which links local suppliers in the ‘periphery’ on the one end and global buyers in the ‘core’ on the other, has implicitly portrayed global sourcing systems in terms of the interactions of lead firms in advanced economies and ‘generally-acknowledged weak’ manufacturing suppliers from developing countries (Gereffi, 1994, 1999; Humphrey and Schmitz, 2002b; Tokatli, 2007a). This focus reflected the structure of global sourcing relations and the relative power of actors in the value chain throughout the 1980s and 1990s. More recent GVC analysis has started to take a more dynamic and evolutionary perspective, in which the effects of the emerging economies, new patterns of consumer demand in the South, the emergence of regional production chains, and the growing importance of domestic sourcing are central to the analysis of GVC dynamics (Cattaneo et al., 2010; Tokatli, 2013). It is the interplay between GVC and EEG that illustrates so well how this North-South dualism is now re-shaping models of local industrial development and their changing relationships with global value chains.

CHAPTER 8 SUMMARY AND CONCLUSION

Based on recent insights in economic geography and economic sociology on industrial relocation/delocalization, upgrading, governance, global value chains and global production networks, this dissertation strives to understand the articulation between changing industrial policies and corporate strategies in China's apparel industry. Specifically, the central thesis of the research demonstrates the ways in which, as competitive pressures increase, new government policies and emerging firm strategies are restructuring the geography and organization of the Chinese apparel industry. It is divided into three sections: (1) changing industrial policies from various levels of governments, (2) firm strategies to increasing competitive pressures, and (3) articulation between changing industrial policies and firm strategies.

China's emergence as a key exporter to the world has relied on low-wage and unskilled or semi-skilled labor. The apparel industry exemplifies this export-oriented development model. Production and employment have become heavily concentrated in the coastal regions of East and Southeast China. With growth in other sectors, prices, land costs, wages, and competitive pressures have all risen. As production costs and competitive pressures both rise, the flexible business environment that export-led production used to embed in has undergone dramatic restructuring and this has further pushed forward new rounds of spatial restructuring, upgrading and relocation, especially in China's highly export-oriented apparel industry. The 'race to the bottom' that typified the 'China price' and the rapid rise of China as a global supplier of clothing over the past decade is now changing in ways that are having profound effects on the industrial organization and spatial structure of production and employment, and will change the ways in

which we understand China's role in global and regional export markets in the coming years. This dissertation focuses on the interaction between the different and related roles of governments and firms and their complementary and/or conflicting effects in restructuring the geography and organization of the Chinese apparel industry. In doing so, it seeks to demonstrate that the model of inward investment, global sourcing, and export orientation is already undergoing fundamental restructuring, producing new geographies of production and employment, with the consequent need to re-assess the policy implications of China in the global production networks.

Changing industrial policies from various levels of governments

China's central government has been extremely pro-active in responding to these pressures and has approved a series of policy initiatives to encourage and support enterprises to implement industrial upgrading and relocation in three ways: GO UP (industrial upgrading), GO WEST (relocation to inland China) and GO OUT (relocation overseas).). The central government has designated funds to support relocation, improve infrastructure, simplify relocation approval procedures, provide information about foreign apparel markets, increase investments and support for technological transformation, increase financial support and provide subsidies and support research on apparel-related technological innovations.

Local governments do not always share the concerns that motivate central government policies and as a result, they have, at times, responded differently. In recognizing that aggressive relocation to other provinces could harm the local economy and affect employment, local governments in coastal provinces creatively adapt relocation incentives to impede inter-provincial relocation in favor of relocation within a province or upgrading locally. By contrast, Western regions increasingly offer competitive advantages on wages, infrastructural costs and

logistical support and their governments actively recruit enterprises away from established production centers to often well-provisioned green-field industrial parks by offering incentives and supports, such as tax breaks and subsidies.

The result is the emergence of a much more spatially extended and functionally articulated series of regional production networks. Whether these regional production networks – with their higher-value cores, regionally extended assembly plants, and overseas outsourcing of low-value added contracts – will resolve the challenges of China's dominant role in GVCs remains an open question. For the moment, the rapid expansion of domestic consumption acts as a stimulus and subsidy while global markets remain turbulent and price sensitive.

Firm strategies to increasing competitive pressures

Delocalization/Relocation

At the present time, while efforts to explain new firm formation and industrial relocation have attracted increasing scholarly attention, a great deal of attention is directed towards analyzing industrial relocation and new firm formation in either global, regional or local context and most extant studies have fallen short in disclosing the full picture where all three aspects (global, regional and local) have profound impacts over the processes of industrial relocation and new firm formation in interactional and collective ways. This dissertation hence formulates a tri-polar analytical framework that combines all three aspects, and further demonstrates its usefulness by using it to interpret the geographical dynamics and industrial relocation in China's apparel industry. First, firms are deeply embedded in their original locations and keep benefiting from local vertical and horizontal linkages they have cultivated over time in cluster. Second, the global factors emphasize cross-border linkages between global buyers from the North and local suppliers from Ningbo, and have been acting as a centrifugal force while driving firms to delocalize and relocate to lower-cost locations. Third, regionalization draws attention to the

assemblage of a range of forces including geographical proximity, delivery time, supply chain management as well as labor costs, all impacting on the geographies of sourcing decisions and production networks. Combining these important pillars, my tri-polar framework interprets industrial relocation through systematic interrelationships and ongoing interaction between globalization, regionalization and localization.

In addition, the extent to which firm relocation processes are affected by globalization, regionalization and localization is determined by firm's characteristic. For instance, firm's embeddedness into local cluster, its horizontal and vertical linkages with other firms co-locating in the same cluster, and reliance on local supporting facilities largely explains its degree of localization and capability to resist relocation. Furthermore, firm's core competencies, main products, and business mode disclose its position in GVC and extent to which global buyers are able to affect its sourcing strategy and relocation processes. These characteristics also decide firm's need to handle quick response, short lead time, quick replenishment and therefore its tendency to embrace geographical proximity and regional production network. My argument is, therefore, not only simply about industrial relocation in the global, regional and local context where advantages of some untraditional factors can outweigh profit generated by lower labor cost, but about also the diversity of trajectories of relocation, some of which may not be reducible to a singular logic.

The statistical results also confirm that, as labor cost surges and competitive pressures intensifies in coastal region, employment and production of the apparel industry start to diffuse from over-concentrated coastal region towards central region which is moderately distant from China's coastline. While the vast majority of low-capability apparel firms follow this trend, their high-capability counterparts which manufacture high-end and time-sensitive items are resistant

to the intensified competitive pressures in general and rising labor cost in particular. The latter's persistent preference of coastal region over central region is due in large part to its strong dependence on high-quality labor, the Jacobsian externalities, as well as geographical proximity to overseas end markets, all of which can only be realized by locating in coastal region.

Upgrading

First, I focus on the development and dynamism of functional, process and product upgrading in China's apparel industry, and investigate the ways in which and the extent to which different types of upgrading have been co-shaped by both global and local forces. While process, product and functional upgrading may be apparent in China's apparel industry, these have been articulated with a range of other causal mechanisms that relate to wider and changing economic, institutional and historical conditions which are central in assessing the extent to which a process of upgrading is even possible. This means the articulation between various types of firm upgrading and global/local factors needs to be not only understood as dynamic, contingent, and fluid, but also interpreted in ways which take into account the specific historical development of China's apparel industry, the evolution of institutional arrangements for apparel, and the ups and downs of globalization and global economy. Furthermore, statistical results also confirm that, in these debates on upgrading, it is also important that we take seriously the heterogeneity, complexity and variety of the relationship between upgrading and global/local factors.

Second, contemporary changes in emerging economies necessitate a strong focus on the endless processes of competition that mark the upgrading process. One form of this constraining assumption is the entry problem identified by Tokatli. Furthermore, even though process/product upgrading are well-defined and recognized in GVC analyses, I have argued that their normative assumptions tend to overemphasize functional upgrading as 'high road' and implicitly relegate process/product upgrading to secondary or 'low road' upgrading. However, the

correspondence between functional upgrading and ‘high road’, process/product upgrading and ‘low road’ is not one that is set in stone. In reality functional upgrading can be a ‘low road’ strategy and process/product upgrading is not necessarily ‘low road’. Finally, functional upgrading is not the only route to business success or viability, that viability that sustains contracts and employment may—under certain conditions—have more important regional consequences than upgrading strategies that squeeze out competitors, and that even where regional production systems experience generalized economic upgrading, expanded competencies and capacities, and improved market position, such models of upgrading—in presupposing a linear trajectory—may be temporary. In this dissertation, I have argued for a more diverse understanding of firm and inter-firm strategies in articulating (or not) with upgrading practices in GVCs. In this approach, functional upgrading does not guarantee that more value will be captured and process/product upgrading is not necessarily a less valuable ‘low road’.

Articulation between changing industrial policies and firm strategies

Recent studies in Evolutionary Economic Geography have critiqued the four-phase development of clusters in the standard traditional or canonical path dependence model, and have suggested a second type of trajectory which is more open and allows for constant endogenous change and evolution. The second trajectory can be realized by keeping the cluster relatively open. It has been argued that some ‘extrovert’ entrepreneurs who have deliberately developed pipelines to trans-local networks may be able to increase the variety of knowledge available to them, escape the potential problem of rigidification stemming from myopia and negative lock-in, and rejuvenate the cluster. However, the idea that nurturing connections with distant actors may help prevent systemic negative lock-in is not always the case. In the case of Ningbo’s apparel

cluster, the historically evolved global pipeline, regional pipeline and regional buzz rendered the entire cluster locked into specific initially successful ways of doing things that later emerged as shackles that inhibited further progress. Different types of trans-local pipelines may have different effects in cluster evolution, and pipelines may become clogged over time.

In addition, this canonical path dependence model has perhaps focused too much on exogenous shocks in the process of path disruption and on ‘historical accidents’ in the early stages of path creation, implying that managers and policy-makers have few choices left thereafter. I have suggested that path dependence is a socially dynamic process, forcing us to look at structure as well as the action of agents. The agent-based approach helps researchers to understand exactly the ways in which a diverse range of agents are implicated in the construction and constitution of interdependent sequences of events and decisions. In this process of co-evolution, collaboration among agents (such as firms and governments) leads to certain process of path creation and maintenance, by facilitating intentional network coordination and generating collaborative and deliberate planning. However, such a process of co-evolution and network coordination does not always emerge, and industrial restructuring may be fraught with conflicts and tensions between various actors. By applying an agent-based approach in path dependence analysis, I have suggested that all actors can be both path-dependent and path-breaking, especially between the release (path disruption) and reorganization (path creation) phases. Conflicts in the process of co-evolution can be driven not only by institutional inertia and hysteresis, but also by the heterogeneity and divergence of various agents’ actions. This type of divergence exists all the time, because the interactions between structure and purposeful actions constantly give rise to both on-path and off-path changes and innovations. But during the release and reorganization phase, intensive conflicts and tensions between different actors may emerge

in a more phenomenal way (in my case, different levels of governments and different kinds of firms).

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