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# Evolution and Mechanism of the “Core–Periphery” Relationship: Micro-Evidence from Cross-Regional Industrial Production Organization in a Fast-Developing Region in China

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**Abstract:** The location selection mechanism and effect of industrial transfer have been widely considered in academia, but the influence of institutional factors on cross-regional industrial transfer and regional differences still need further investigation. Based on theories of economic geography as well as new economic geography (NEG) and its’ institutional transformation, this paper studies the form, mechanism, and effect of the “core–periphery” regional relationship between the Pearl River Delta (PRD) and non-Pearl River Delta (NPRD) areas in Guangdong Province from the micro perspective of industrial spatial organization. Based on a case study on the change of the cross-regional production spatial organization of ceramics enterprises between Foshan and Qingyuan, it is found that after three rounds of spatial reorganization, the production spatial organization of Foshan’s and Qingyuan’s ceramics industries has changed significantly, forming a multifactory, multilocation production spatial structure and regional production network, which further drives to form the regional functional division of “core–periphery”. Institution factors, especially environmental regulation and industrial transfer institutional arrangements, have become an important driving force for the current industrial transfer, but its impact on regional relations is still not a decisive factor. The path locking of the “core–periphery” mode has not been fundamentally broken through. Although the form of spatial inequality has greatly changed, in fact, it produces a new form of inequality. The economic, geographical, and political theoretical framework from the micro-perspective of enterprises will provide a possible theoretical explanation for the phenomenon of “pollution moving to the West, high-tech industry moving to the East, industrial output gathering to the East” in China.

**Keywords:** cross-regional industrial production reorganization; regional unbalanced development; the “core–edge” model; ceramic industry; Pearl River Delta (PRD) and non-Pearl River Delta (NPRD); Guangdong Province; China

## 1. Introduction

Regional economy is regarded as a dynamic process of cross-regional growth and change [1]. As Krugman, the economic master, said, “the best way to understand the world economy works is to start from studying what happens inside the country. If we want to understand the differences in growth rates among countries in the world, we’d better start from the study of regional differences.

If we want to study the international division of labor, we'd better start from the study of regional division of labor." Therefore, in recent years, the development of regional economics has become a hot research topic, especially uneven regional development and integrated regional development in the process of globalization. China has achieved unprecedented economic growth in the past three decades, but it has also faced the problem of unbalanced development between its coastal and interior regions [2–4]. It has caused problems including an unreasonable allocation of resources and environmental pollution [5–7]. In the background of globalization, regional integration has been seen as a new developing form of world economy, such as the growth triangle of developing countries in the 1980s [8]. Industry transfer has led to cross-regional industrial production reorganization within inter-city geographical areas of an integrated area, and it has formed a unique regional division of labor. Industry transfer, from the perspectives of regional integration and cooperation, becomes an important approach to accelerate the transformation of regional economic sustainable development and to optimize and upgrade the regional industrial structure [9].

Since the 21st century, especially after the global financial crisis in 2008, the economic slowdown of the People's Republic of China (PRC) has caused panic among global investors. The domestic and international situation that is beneficial to the development of export-oriented and labor-intensive industries in China has changed greatly [10]. Observers are worried that manufacturing, as the engine of the PRC's hypergrowth over the past decades, has fallen into a downturn. Low-end, labor-intensive export manufacturers in the eastern coastal areas like Shenzhen and Shanghai have indeed been hit by diminishing marginal efficiency of investment, rising factor and labor costs, rigid constraints on resources and energy, and stricter environmental regulation by local governments. Moreover, local governments in coastal cities are increasingly unfriendly toward low-end manufacturers, preferring instead to attract investment in high-tech production and services [11]. To take advantage of lower costs and policy concessions, some coastal manufacturers have begun relocating to, and investing in, the inland provinces of the PRC, such as Anhui, Jiangxi, Hubei, Hunan, Henan, as well as the underdeveloped regions in Guangdong province. By 2015, the domestic investment value of the five central provinces mentioned above was 2.5 times that of foreign investment in China. This phenomenon of industrial transfer, which began in the 2000s, has played a vital role in promoting economic growth in inland areas, adjusting economic structure in coastal areas, and reshaping the national competitive advantage of the People's Republic of China [11,12]. China's domestic industrial transfer is more prevalent in regions with high degrees of integration and cooperation. Good examples include southern Jiangsu, Wenzhou, and PRD regions [13–16]. The statistical data published by Guangdong Province Economic and Trade Commission showed 7148 enterprises in Guangdong Province, mainly the PRD Area, were closed, ceased, suspended, or relocated between January and September of 2008. Therefore, a study of the impact of industry agglomeration and transfer on regional economic development in the PRD will be helpful to deepen regional economic research and the formulation of regional strategy in China.

In the process of industrial transfer, enterprise relocation choices and mechanisms, the effects of centralized (top-down) governmental policies versus local governmental policies, regional undertaking, and the impact and effect of regional sustainable development have received widespread attention [14, 17–23]. However, unlike transnational industrial transfer, which only involves the transfer of capital and technology, China's current domestic transfer involves not only industrial transfer but also policy transfer and knowledge spillover. China's regional economic research has already gone beyond the scope of "China's problems". China's regional economic development is a research topic related to economic growth theory, economic geography and new economic geography (NEG), trade and division of labor theory, income distribution, and so forth. In this paper, we used the qualitative research method of semi-structured enterprise interviews to analyze ceramic manufacturing transfer between the PRD and its peripheral NPRD areas of Guangdong Province, and we try to answer several questions related to China's industrial structure adjustment and regional development: To what extent does industrial agglomeration and diffusion factors in the NEG promote industrial transfer between

the PRD and NPRD, and how do they affect the regional differences? Is there low value-added industry transfer in upgrading regional industrial structure? How does China's industrial policies adapt to the level of industrial agglomeration?

## 2. Theoretical Framework

In the traditional theory of economic geography, the classical theories of industrial transfer [24,25], such as the "flying geese model" theory, the marginal industrial theory, the product life cycle theory, the International Production Compromise theory, and the labor-intensive industry transfer theory, examine the causes of industrial agglomeration and diffusion from the perspective of products, enterprises, and industries. However, the above theories still have not gotten rid of the shackles of "comparative advantage" theory and neoclassical analysis framework. Under the assumption of constant returns to scale and perfect competition, they attribute the fundamental motivation of industrial transfer to the differences of comparative advantage in different regions, or the different requirements on the factors in their regions for different industries at specific development stages. Some scholars think that economic geography has been or will be in crisis and predicament [26].

In fact, the basis of industrial transfer is not necessarily the difference of "the first nature" and economic geography. In the same homogeneous space, a decrease in transportation cost can also promote the agglomeration and diffusion of industries [27,28]. Looking for the reasons beyond economic geography has become the driving force for the rise of NEG, represented by Krugman [29–33]. Different from the traditional industrial transfer theory, NEG has realized a general equilibrium analysis based on the location choices of consumers (also producers) and enterprises under the Dixit-Stiglitz model of scale economy and incomplete competition, which provides another explanation for the industrial transfer phenomenon in the real world where incomplete competition and scale economy coexist [34]. Its core idea is that, even if the two regions are very similar in terms of natural conditions, some accidental factors (such as historical events or accidental policy adjustments) may cause industries to start to gather in one of them. Because of the increasing returns of economic power, under the condition that the transaction cost between regions is not large enough to divide the market, it may lead to industrial agglomeration and regional economic differences. Fujita, Krugman, and Venables discussed the micro-mechanism of location or spatial analysis in economic activities based on the interaction of agglomeration and diffusion, and they divided the factors into centripetal force and centrifugal force [35], as shown in Table 1.

**Table 1.** Theoretical menu.

Centripetal Forces	Centrifugal Forces
Linkage	Immobile factors
Thick markets	Land rents/commuting
Knowledge spillover and other pure external economies	Congestion and other pure diseconomies

Quoted from "The spatial economy: cities, regions and international trade" (Fujita, Krugman and Venables, 1999).

At the same time, since the 1980s, under the profound influence of the theories of economic sociology, institutional economics, and evolutionary economics, the trend of "institutional turn" has appeared in economic geography [36], which introduces "institutional environment" (including various formal and informal social, economic, cultural, and political system characteristics) and "institutional arrangement" (referring to organizational form, market, firms, trade unions, parliaments, government units and national welfare systems, etc.). "Institutional turn" has formed influential schools, including flexible specialization and industrial district [37], new industrial space [38,39], learning regional [40], innovation environment [41], regional innovation system [42], and regulation and governance theory schools [43]. One of the common points of these schools is that economic activities are not only an institutionalized process but also an activity rooted in society; this is called "institutional thickness". Its evolution is both environment-specific and path-dependent. Before the "institutional turn" of economic

geography, the location theory of neoclassical economics regards economic behavior as atomic, rational, and maximizes individual motivation. Social and political situations are either completely ignored or regarded as fixed. Institutionalist scholars believe that economic activities are the product of specific social and institutional situations, which must be understood in broader social, economic, and political rules, procedures, and traditions. Therefore, the “institutional turn” of economic geography pays close attention to the role of various formal and informal institutions in shaping economic space [44–46], as well as the social regulation and governance mechanisms for regional and local development. From the macro level of regional economy, Feils and Rahman verified the important role of regional institutional change in promoting regional economic integration under the guidance of FDI through regression analysis [47]. At the micro level, according to Massey’s labor spatial division theory of new Marxist political economic geography, there are three spatial structures of enterprise production organization: First is the location-concentrated spatial structure (single location). Second is the cloning branch–plant spatial structure. Third is the part–process spatial structure [48–50]. Massey pointed out that because of the change of production organization (including location and production relations), the spatial separation of labor processes will eventually form the division of regional functions, which can explain the unbalanced development of the region. In this process, Massey emphasized the role of local social and cultural institutional factors in determining industrial location, such as gender, religious organizations, and class factions [50]. Over recent years, economic geographers have had a renewed interest in the informal institutional relationships between enterprises and the ways in which these might contribute to processes of local and regional economic development. The first concerns the implications of unequal power relationships between enterprises on the performance of enterprises and localities. The second relates to the implied significance of geographical proximity, whereby close spatial ties between enterprises are considered to be an important determinant of local competitiveness and economic performance [51].

The importance of institutional factors has been proven in the empirical test of growth theory and regional economic theory [44,52–54]. As MacKinnon et al. highlighted, institutions may constrain or incentivize particular intentions, but also mold and enable habits, preferences, values, and actions [55]. However, early NEG literature focused on explaining the mechanism of industrial transfer under the condition of a complete market, ignored the role of economic policies, and rarely involved government intervention measures and corresponding welfare changes. They emphasized that the transportation cost between regions is the key variable to determine regional industrial transfer. They believed that, under the situation of the continuous decline of transportation cost and the long-term growth of industrial demand, the wage gap between the core and the peripheral areas continued to expand, the “center–periphery” structure could not be maintained, and then industrial diffusion occurred [35]. However, the “peripheral” areas and the areas that are going to be “peripheral” are not willing to accept the “center–periphery” spatial order. They take various measures to compete with the “center” areas for industrial location. At the same time, in order to coordinate the development and social stability between regions, government authorities also take a series of policy measures to promote industrial transfer between regions. Therefore, in recent years, NEG literature has also analyzed the policy measures affecting industrial transfer and their effects, such as preferential tax competition [56,57], the improvement of public infrastructures [58–60], regional subsidies [61,62], and industrial and spatial planning.

Rodríguez Pose A pointed out that generating an institution-based regional development strategy is necessary to correctly understand these problems related to the measurement of institutions, to their space and time variability, to the difficulties in establishing the right mix of formal and informal institutions, and to the endogeneity between institutions and economic development [63]. Otherwise, it can make one-size-fits-all approaches to operationalizing institutions difficult. Therefore, it is crucial to distinguish between the “institutional environment” and “institutional arrangements”, that is, to target not the institutions which shape the unique character of any territory, but the institutional factors that represent barriers for the efficacy of other factors influencing economic development

(e.g., education, training and skills, innovation, infrastructure, and the like). Therefore, this paper proposes an analysis framework of labor spatial division by coupling economic geography, NEG, and political economic geography to jointly influence industrial agglomeration and diffusion. As shown in Figure 1, institutional factors can work in the following ways. First, there is the direct impact of path-dependent economic policies (institutional environment) on industrial agglomeration and the economic development gap between regions (arrow path 1 as shown in Figure 1). Second, because NEG emphasizes the influence of accidental factors such as historical events under the mechanism of increasing returns, institutional arrangement (or economic policy adjustment) is regarded as an accidental event that leads to industrial agglomeration and diffusion for a certain region, and it has indirect influence through economic geography or NEG factors (arrow path 2–6 and path 3–8 as shown in Figure 1). Finally, due to economic geography and NEG factors, institutional arrangement (or economic policy adjustment) also has an impact (arrow path 4–1 and path 5–1 as shown in Figure 1).

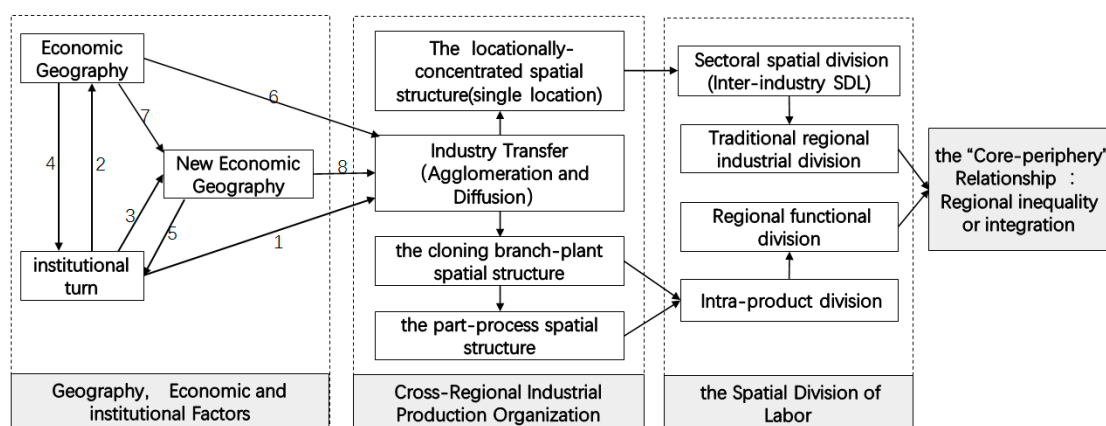


Figure 1. Theoretical framework.

In fact, for the study of China's regional problems, in addition to the natural factors of economic geography and the NEG factors listed in Table 1, institutional factors undoubtedly play a very important role in the process of economic growth and regional development. Therefore, this paper is different from the conventional research on location selection of industrial transfer. Based on this theoretical framework and Massey's micro-perspective of enterprise production space organization, this paper discusses the impact of geography, economy, and political factors on the formation of cross-regional production network of ceramics enterprises and the change of regional relations between the core PRD and the peripheral NPRD in Guangdong Province, China.

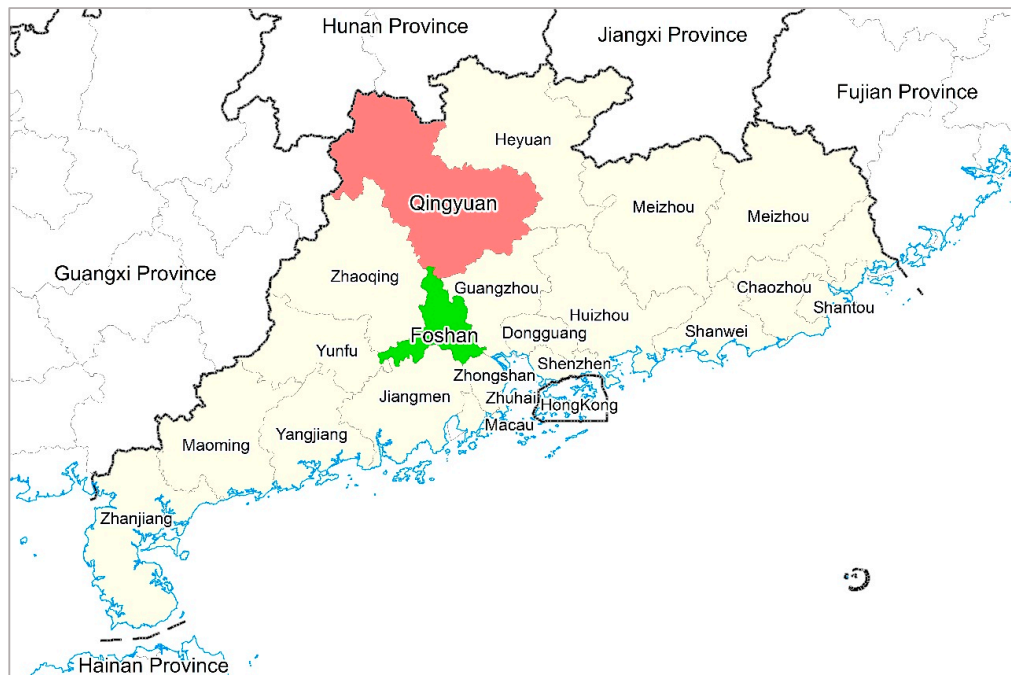
### 3. Research Areas and Methods

#### 3.1. Research Areas

Located in south China, Guangdong is one of the most developed provinces in China. It has been continually ranked No. 1 in GDP among China's provinces since 1989. Since 1978, a lot of foreign businessmen—those mainly engaged in Hong Kong's labor-intensive manufacturing industry—marched into the PRD of Guangdong Province. It also heavily promoted the economic development of PRD city groups, giving the well-known area the nickname of "the factory of the world". The "Front Shop, Back Factory" industrial division pattern among PRD, Hong Kong, and Taiwan was formed at the end of the 20th century. Meanwhile, the economic gap between PRD and the peripheral NPRD was expanding quickly. The PRD, comprising 20% of the population and 14% of the area of the entire province, constituted 80% of the overall economy of the province. This is the core-periphery gradient, with the core PRD being the developed region and the peripheral NPRD as the developing region [3]. This paper chose Foshan City (the industry transfer-out place in the PRD) and Qingyuan City (the industry transfer-in place in the NPRD) as the case study area (Figure 2).



With an excellent geographic location, Foshan locates in southeast Guangdong, northwest PRD, and is adjacent to Hong Kong and Macao. Guangzhou City is to its east, Zhaoqing City is to its west, Zhuhai City is to its south, and Qingyuan City is to its north. Currently, Foshan City is one of the five major ceramics production areas (the other four major areas are Zibo City, Shandong Province; Jingdezhen City, Sichuan Province; Liling City, Hunan Province; and Tangshan City, Hebei Province) and the main ceramics production center, sales center, and export base in China, holding a strong economic and industrial base and technical force.



**Figure 2.** Location of the studied area.

Qingyuan City is in the northern part of Guangdong Province and is bound on the south by Guangzhou and Foshan (Figure 2). With the establishment of the Wuhan–Guangzhou high-speed railway and the city-to-city rail transportation network in PRD, as well as expressway network, Qingyuan gradually integrated into the PRD half-hour economic cycle. The city also became an important node, connecting PRD with northern Guangdong and other areas. As an underdeveloped, mountainous area of northern Guangdong, Qingyuan has relatively abundant land, labor, pottery clay, and other resources, which makes it an important location for the ceramics industry transferring from PRD, particularly for Foshan City.

The center of Foshan City is about 95 km from the center of Qingyuan City. The two cities have long associated with each other, have close government communication, and close economic activity contact. Hence, the industrial transfer between them is very frequent.

### 3.2. Research Methods

Unlike previous regional studies in China based on official statistical data, this paper adopted the enterprise-led analysis method, that is, to understand the region through the analysis of enterprises [64]. The research methods were mainly on-site interviews with ceramic enterprises in Foshan and Qingyuan, especially those who migrated from Foshan to Qingyuan and played an important role in the process of remodeling regional economy. This method is suitable for investigating the role of microsubjects and other factors to quantify difficultly, such as the institution and the spatial organization of enterprise production.

Focusing on the recent situation after the implementation of the “double transfer” policy in Guangdong Province, the interviews of enterprises lasted more than one year from September 2010

to November 2011. The follow-up interviews of relevant government personnel and enterprise managers were held in 2015, focusing on the changes of regional relations after the industrial transfer. Participants in the interview included both ceramics enterprises, which transferred into Qingyuan, and the headquarters of enterprises in Foshan, which transferred their production functional department to Qingyuan. The interview subjects were divided into three types: government officials (15 persons), administrators from industrial parks management committees (9 persons), and enterprise managers (about 30 persons). Interview questions mainly involved (1) understanding the spatial–temporal process, development trend, and existing problems of Foshan and Qingyuan ceramics industry transfer and development at regional level. This section also includes focusing on the investigation of the temporal and spatial features of the spatial reorganization of Foshan ceramics industry and the relationship between the transfer-out and transfer-in areas. (2) Understanding the characteristics of production and operation and spatial organization of Foshan transfer-out enterprises at the enterprise level, and to master the change of spatial organization of enterprise cross-regional production and the new regional spatial division of labor caused by it. (3) Understanding the change of industrial policy and the interaction among governments at all levels, as well as between government and enterprise. Furthermore, in addition to official statistics (2000–2017) and secondary investigation data of business associations, relevant government documents, company directory and profile, and industrial research reports were also collected during field investigation, and relevant websites also provided valuable information.

Samples of the enterprise and park interviews are shown in Table 2. Among the 14 ceramics enterprises participating in the interview, 12 enterprises had transferred from Foshan to Qingyuan. The interview focused on their headquarters in Foshan and their production bases in Qingyuan, such as NEW ZHONG YUAN. Of the two remaining enterprises, one transferred from Dongguan and the other from Fujian. Both transferred to Qingyuan, and the interview focused on their production bases in Qingyuan. Eight of these enterprises transferred to Qingyuan before 2006, including six at Qingcheng Yuantan Ceramic Industrial Park and one in located in Fugang County. The remaining six enterprises were located in Foshan Chancheng (Qingxin) Industrial Transfer Park and transferred to Qingyuan after 2006. At the date of investigation, some of the enterprises had been operational for many years, some only recently beginning, and the rest were still under construction and pending operation.

**Table 2.** Statistics of the Interview Sample of Enterprises Transferred to Qingyuan.

Interviewees	Number of Interviewees	Interview Time	Enterprises and Institutions	Year and Mode of Transfer-in, Headquarters and Transfer-in Industrial Parks
Enterprise managers	4	2010–2011	Guangdong New Zhong Yuan Ceramics Co., Ltd.	2002–2005, Expansion, Foshan-Yuantan Ceramic Industrial Park
	2	2010–2011	Qingyuan Southern Building Materials and Sanitary Ware Co., Ltd.	
	3	2010–2011	Foshan Dongpeng Ceramic Co., Ltd.	
	3	2010–2011	Guangdong Qingyuan Monalisa Ceramics Co., Ltd.	
	2	2010–2011	Guangdong Hongyu Ceramics Co., Ltd.	
	2	2010–2011	Guangdong Guanxing Ceramic Group	
	2	2010–2011	Guangdong Jiamei Ceramics Co., Ltd.	

Table 2. Cont.

Interviewees	Number of Interviewees	Interview Time	Enterprises and Institutions	Year and Mode of Transfer-in, Headquarters and Transfer-in Industrial Parks
	1	2010–2011	Guangdong Bohua Ceramic Co., Ltd.	2004, Partial relocation, Foshan-production base in Fogang County
	2	2010–2011	Guangdong Homeway Ceramics Industry Co., Ltd.	2008, Partial relocation, Foshan-Yuantan Ceramic Industrial Park
	2	2010–2011	Qingyuan Juncheng Ceramics Co., Ltd.	
	2	2010–2011	Qingyuan Tianyu Ceramics Co., Ltd.	2008–2010, Partial relocation, Foshan-Foshan Chancheng (Qingxin) Industrial Transfer Park
	1	2011	Qingyuan Megacers Ceramics Co., Ltd.	
	3	2011	Guangdong Simpire Building Materials Co., Ltd.	2010, Expansion, Foshan-Foshan Chancheng (Qingxin) Industrial Transfer Park
	1	2011	Qingyuan Ganglong Ceramics Co., Ltd.	2011, Expansion, Dongguan-Foshan Chancheng (Qingxin) Industrial Transfer Park
Administrators of industrial parks management committee	3	2010–2011	Yuantan Ceramic Industrial Park	-
	2	2010–2011	production base in Fogang County	-
	4	2010–2011 2015	Foshan Chancheng (Qingxin) Industrial Transfer Park	-
Government officials	15	2010–2011 2015	Government Departments Related to Industrial Economic Development and Environmental Protection	-

#### 4. The Process and Mechanism of Cross-Regional Spatial Organization of Foshan–Qingyuan Ceramic Enterprises

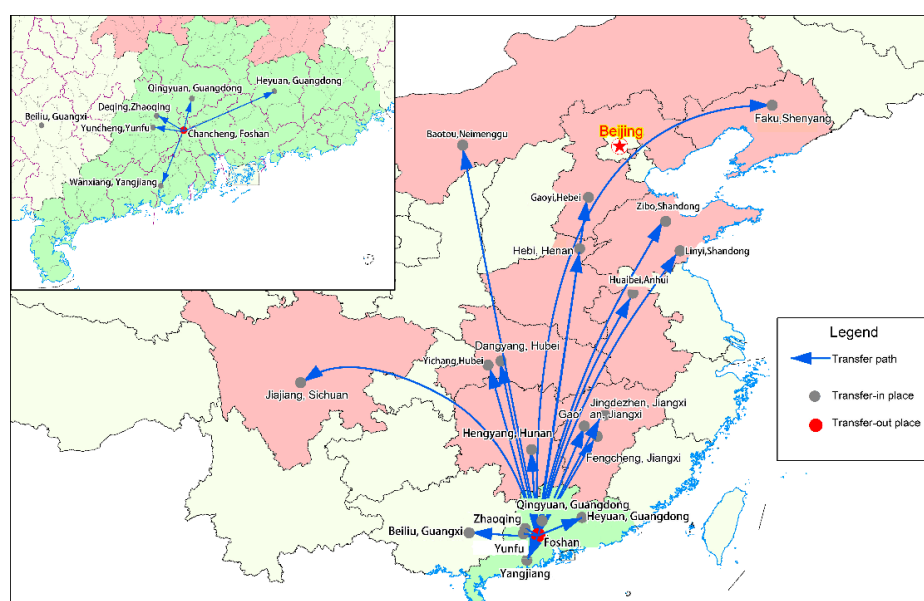
##### 4.1. Spatio-Temporal Process of Foshan–Qingyuan Ceramic Industry Migration

According to the time evolution of ceramic industry transfer and the change of the number and output value of nonmetallic mineral product enterprises in Foshan and Qingyuan (Tables 2 and 3; data sources in Table 3: Statistical Bureau of Guangdong Province, Guangdong Investigation Team of National Bureau of Statistics of China (2001–2018), Guangdong Statistical Yearbook, And Chinese Statistics Press, Beijing.), three different stages of Foshan–Qingyuan ceramic industry transfer can be found (Figure 3).



**Table 3.** Comparison of the Quantity and Gross Output Value of Industry above Designated Size of Foshan-Qingyuan Nonmetallic Mineral Products Industry since 2000.

Annual	The Quantity of Industry above Designated Size (Unit)		The Gross Output Value of Industry above Designated Size (100 Million Dollars)		The Average Output Value of Industry above Designated Size (100 Million Dollars per Unit)		The Ratio of Gross Output Value between Foshan and Qingyuan
	Foshan	Qingyuan	Foshan	Qingyuan	Foshan	Qingyuan	
2000	342	53	23.33	1.64	0.07	0.03	14.21
2005	513	72	60.38	5.53	0.12	0.08	10.92
2010	503	123	140.59	65.61	0.28	0.53	2.14
2015	438	113	191.08	45.83	0.44	0.41	4.17
2017	453	119	193.08	42.93	0.43	0.36	4.50

**Figure 3.** The national transfer path of the ceramics industry in Foshan City.

#### 4.1.1. The Scale Expansion Stage of Foshan–Qingyuan Ceramic Industry before 2006

Since the introduction of foreign building ceramics production lines in the 1980s, the Foshan ceramics industry rapidly achieved the stage of large-scale quantitative expansion. After nearly 30 years of development, it has become a local pillar industry with a strong industrial foundation, huge market system, perfect production network, and supporting environment. In 2005, there were 513 nonmetallic mineral products industries in Foshan City (Table 3), in which ceramics enterprises accounted for more than 90%. There are more than 1200 production lines with a total output value of over \$2.83 billion, accounting for nearly 50% of the whole city's nonmetallic mineral products industry and one-third of the total output value of China's ceramics industry. Gross export value of the ceramics industry in Foshan peaked at over 60% of the national gross export value of the ceramics industry. Foshan City builds many Chinese brands, such as NEW ZHONG YUAN, Eagle, DONGPENG, and ARROW. The total area of the ceramic specialized market is about one million square meters. The ceramic market directly sells the products all over the country, and some products are exported to more than 20 countries and regions in Southeast Asia, Europe, and the Americas.

After the rapid development of Foshan's ceramics industry in the 1990s, production factors such as land, labor, and raw material became quite limited. This led to the start of early spatial reorganization of the Foshan ceramics industry. The most prominent constraint was the dwindling supply of inexpensive, high-quality black mud and low-temperature porcelain sand in Foshan. The raw material advantage had disappeared. Furthermore, the implementation of the new Labor Contract Law increased the cost of labor, essentially shrinking the potential size of the enterprises, particularly the smaller ones. During this period, the demand for ceramics products was expanding all over

the country. Under the internal impetus of resource constraints and rising costs, and the external pulling force of market demand, the Foshan ceramics industry began to expand, and larger ceramics enterprises accelerated the extension of the production base to areas with rich resources or markets inside or outside Guangdong Province (Table 2). Since 2000, large enterprises represented by NEW ZHONG YUAN began to transfer to areas such as Jiajiang County, Sichuan Province and Qingyuan City, Guangdong Province. By 2006, over 50 Foshan ceramics enterprises had made arrangements to build factories across the country. The total area of lands invested in and purchased in other places reached 30,000 mus. Relying on its own resource advantages, basic conditions of nonmetallic mineral products industry and location advantages adjacent to Foshan and Qingyuan began to undertake the transfer of ceramic industry from Foshan City. Yuantan Ceramic Industrial Park in Qingyuan City has developed rapidly with an area of more than 1333 hectares and 160 ceramic production lines. In 2005, there were 19 more nonmetallic mineral products industries above designated sizes than in 2000 (Table 3). Among them, there were 16 new large-scale brand ceramic enterprises transferred from Foshan, such as Xinzhongyuan, DONGPENG, MONALISA, Hongyu, and so on. The ceramics industry in Qingyuan City has initially shown the trend of cluster development. Qingyuan is known as the “second hometown” and “back garden” of Foshan ceramics.

Yuantan Town, Qingyuan City took this first round of the transfer of the ceramics industry. Because of the beginning of industrialization, the government provided the ceramics enterprises a variety of preferential policies, including land supply, and very few strict environmental regulation measures were taken. Relevant personnel from the town government said, “The ceramic industry causes severe pollution, as acid rain results from dust and roads are significantly damaged due to vehicle overload and an increase in the traffic construction;” “the ceramics industry has been one of main pollution sources of our city, and it is urgent to solve the pollution caused by ceramics industry;” “our environment has been damaged and civilians are very upset about this. It is difficult to introduce high-end industry now” (2011).

#### 4.1.2. The Shrinkage Stage of Foshan–Qingyuan Ceramic Industry under the Regulations from 2007 to 2010

Many small ceramics enterprises in Foshan maintain low output and offer limited technical advantages but take up a relatively large physical area. The competitiveness of the industry as a whole is weak. According to the statistics, the Gross Output Value of Industry above Designated Size of the Foshan ceramics industry accounts for only 7.3% of Gross Output Value of Industry above Designated Size of all the city in 2007. Extensive modes of production have led to increasingly serious environmental problems. Environmental statistics (data sources: Foshan Ceramic Industry Development Plan (2008–2015), Foshan Municipal Government Office [2008] 101) of Foshan in 2007 showed that industrial dust, sulfur dioxide, nitrogen oxide, and industrial waste gas emissions of the ceramics industry accounted for 59.86%, 42.15%, 32.27%, and 29.85% of all industrial enterprises in the city, respectively. With the implementation of the mandatory national standard—the Norm of Energy Consumption per Unit Product of Architecture and Sanitary Ceramics—on 1 June 2008, the ceramics industry started to face an increased pressure on energy conservation, emission reduction, and environmental protection. Especially since the 2008 financial crisis, the Foshan ceramic industry has encountered unprecedented pressure. Foshan Municipal Government quickened the pace of industrial upgrading and transformation and issued a series of files, such as the Notice on Accelerating the Adjustment and Upgrading of Ceramics industry in Foshan City, the Evaluation and Guidance Scheme for the Structural Adjustment of Ceramics industry in Foshan City, and the Several Support-the-Strong Policies and Measures of Foshan City for Ceramics industry, successively after 2007. According to the different statuses of about 300 ceramics enterprises in Foshan City, Foshan City executes classified guidance and proposes the concept of “supporting and expanding a part, reforming and upgrading a part, and transforming and sifting out a part.” According to the requirements, 80% to 90% of the Foshan ceramic enterprises that cannot meet the environmental index must be transferred out within specified

time. Environmental regulation and industrial upgrading policies brought severe challenges to Foshan ceramics enterprises. Large-scale, industrial spatial reorganization has become inevitable. Quite a few ceramics enterprises were forced to stop production and ended up transferring to other areas. By the end of December 2008, 144 building ceramics enterprises, accounting for 50% of the total, had been transferred or closed, while the proportion of Chancheng District in the central urban area of Foshan was about 70%. By now, 62 enterprises are retained in the city. The tide of Foshan ceramics industry transfer centered around the movement of small and medium-sized enterprises. Foshan ceramic enterprises began to transfer to Jiangxi Province, Guangxi Province, Hunan Province, Hubei Province, Henan Province, Shandong Province, Anhui provinces, the Inner Mongolia Autonomous Region and the NPRD area in Guangdong Province. More than 100 enterprises including famous Chinese enterprises such as NEWPEARL, NEW ZHONG YUAN, DONGPENG, WONDERFUL, MONALISA, Eagle, Simpire, RYOWA, KITO, TIDIY, and Z&D have transferred their production base out of Foshan in the past three years. Guangdong Province announced the “double transfer” policies of industry and labor migration in 2008. This determined that Foshan City shall conduct counterpart transfers with Qingyuan, Heyuan, Zhaoqing, Jiayang, and Yangjiang cities. A number of ceramics industrial transfer parks were established, such as Foshan Chancheng (Qingxin) Industrial Transfer Park and Foshan Chancheng (Yuncheng Duyang) Industrial Transfer Park. More than half of these Foshan enterprises transferred to other areas in Guangdong Province. The ceramics production bases in Qingyuan, Zhaoqing, Heyuan, and Yunfu cities have taken shape after just a few years of operation. During this period, led by ceramics enterprises, the number of enterprises above the designated size of nonmetallic mineral products industry in Qingyuan increased by 51, and the added output value more than doubled. The gap of the Gross Output Value of Industry above Designated Size of nonmetallic mineral products industry between Foshan and Qingyuan narrowed sharply. The gross output value of unit enterprises in Qingyuan (\$53.35 million) far exceeded that of Foshan (\$28.02 million) (Table 3).

#### 4.1.3. The Internal Adjustment Stage of the Foshan–Qingyuan Ceramic Industry from 2011 to 2017

After large-scale renovation and adjustment, the Foshan ceramics industry has focused on R&D and design, marketing, talent training, provision of production equipment, and production of high-end products, which has promoted the economic development of ceramic headquarters. For this reason, this industry maintains high economic output, provided that the productivity drastically reduces. In 2017, the Gross Output Value of Industry above Designated Size of ceramics industry exceeded \$14.15 billion in Foshan (Table 3). The output accounted for more than 30% of the country’s total output, and the export volume accounted for more than 70% of the country’s total export. The remaining 62 enterprises are mainly focused on design, post-process processing (polishing), and marketing links. Most of the main manufacturing links (before cold processing) have been relocated. In addition, Foshan has also introduced more than 50 international advanced ceramic equipment manufacturers from Italy and Spain, to realize the goal of “emptying the cage to change the bird” (tenglong huanniao). Presently, Foshan has hundreds of ceramic equipment manufacturers and has become the largest production base of ceramic machinery in China with an output value of about \$0.57 billion. Qingyuan has become the production base of Foshan ceramics enterprises, such as Qingyuan Heyun Industrial Park, which is mainly responsible for the production of lower-end products and semi-finished products, and the semi-finished products are transported back to Foshan for further processing.

As shown in Table 3, the gap of the Gross Output Value of Industry above Designated Size of Nonmetallic Mineral Products Industry between the two cities has begun to widen again. The output value of Foshan is 5.5 times that of Qingyuan, and the average output value of enterprises in Foshan has again surpassed Qingyuan.

#### 4.2. Evolution of Production Space Organization of Ceramic Enterprises: A Case Study

By two transfer processes, the Foshan ceramics industrial district has undergone drastic location changes, which has included transfer from developed areas to underdeveloped areas, from coastal

areas to mainland areas, and from metropolitan areas to small towns and rural areas. Production spatial organization also experienced significant reorganization. However, the performance of small-sized manufacturers is entirely different from that of large-sized manufacturers.

Under the pushing force of environmental regulation and the pulling force of the “double transfer” policy, most small and medium-sized manufacturers have experienced serious sifting out and decline. A large number of them were forced to close down, or the production department was forced to relocate collectively. In order to utilize the good brand effect and matching environment to the place of origin, most enterprises relocated all departments (or retained the sales and R&D department at the origin), relocated all the production lines, set an affiliated production base or subsidiary, and chose to do the required upgrading and transformation of production equipment and technology. Because of limited capital, such enterprises generally do not set extra production bases. Examples include Homeway, Megacers, Tianyu, and Juncheng.

Because there are still open spaces in domestic and international markets for the development of the ceramics industry—especially for middle-grade and high-grade ceramic industries at present—large-sized manufactures with certain competitiveness have a chance to thrive. After accumulating basic amounts of capital, they can first execute “voluntary and dispersive” expansion investment. Next, they can establish development bases on a national scale, including branches, production bases or centers of exhibition, and sales bases, for the purpose of further expanding enterprise scale, reducing production cost, improving market competitiveness, and executing cross-regional development strategy. They retained the headquarters, research and development base, and partial high-end production links in the origin, and they finally attained the multiplant, multilocal production spatial organization form. Through the interview to headquarters in Foshan and branch factories in Qingyuan of some enterprises, it is evident that trans-regional expansion and the change of production organization of NEW ZHONG YUAN CERAMICS GROUP is a typical case of a multiplant, multilocal production spatial organization (e.g., Table 4). NEW ZHONG YUAN has built a complex network spatial pattern of multilocal management, production and marketing composed of 10 production bases in South China, Central China, East China, Southwest China, Northeast China and North China, and more than 1000 sales networks and foreign marketing networks in more than 120 countries and regions. It has claimed the largest global production scale and export volume of modern production and sales enterprises of the Chinese ceramics industry in history. The hierarchy, functional division, and grouping network structure has gradually appeared all over the country; headquarters, subsidiaries, production base networks, and marketing networks are shown in Figure 4.

**Table 4.** Cross-Regional Expansion and Production Organization Change of NEW ZHONG YUAN GROUP.

Year	Stage	Change in Production Location	Production Spatial Organization	Functional Division
1984–1999	Establishment period	Macao-Shunde District and Sanshui District, Foshan City	The location-concentrated spatial structure	Centralized management, production and sale
2000–2006	Early stage of expansion	Jiajiang County, Leshan City, Sichuan Province and Heyuan City and Qingyuan City, Guangdong Province	The cloning branch-plant spatial structure and the part-process spatial structure: Head office + branches (production bases)	Coexisting administration hierarchy of headquarters—branch and internal hierarchy of production process
2007–Now	Expansion and adjustment period	Hengyang City, Hunan Province, Gaoan City, Jiangxi Province, Dangyang City, Hubei Province, Faku County, Shenyang City and Hebi City, Henan Province	Networking group spatial structure: Headquarters + branches + national production network + global sales network	Coexisting administration hierarchy of headquarters—subsidiary branch and internal hierarchy of production process



In conclusion, the production spatial organization of Foshan ceramics enterprises has already changed fundamentally since the early 21st century. Although small-sized manufacturers still maintain the spatial structure based on the location, the necessary R&D and sales departments still remain in the origin of Foshan. Even without technical division, functional division has been very clear for most small-sized manufacturers. However, large-sized ceramics manufacturers have gone through the evolution from the spatial structure based on location to the part–process spatial structure and then to the network grouping spatial pattern.

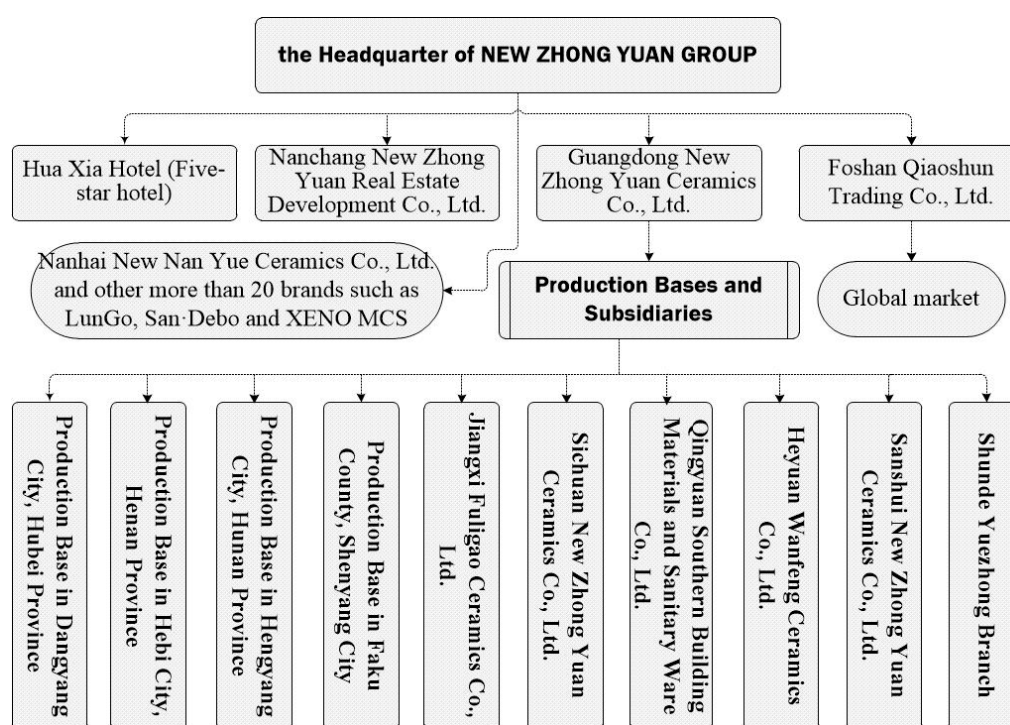


Figure 4. Spatial structure of regional production network of NEW ZHONG YUAN GROUP.

#### 4.3. Analysis of Regional Effect and Mechanism

##### 4.3.1. Micro Mechanism Analysis of Enterprises Production Space Organization

It is not difficult to find that market and policy factors are important dynamics of Foshan–Qingyuan ceramic industry transfer (Figure 5).

For large-scale manufacturers, they were initially driven by the market factors and later turned into a mixed dynamics of policy and market factors. Under the endogenous power of market factors such as cost and profit, they carried out an expanding transfer with the help of the exogenous power of policy. For example, leading enterprises such as NEW ZHONG YUAN and DONGPENG have built production bases all over the country for strategic layout. Before 2007, ceramic manufacturers transferred from Foshan to Qingyuan were mainly distributed in Yuantan Town, Qingcheng district. After industrial agglomeration, Yuantan Ceramic Industrial Park was created. There were 13 ceramics enterprises factories and 91 production lines, including DONGPENG, NEWPEARL, Hongyu, Guanxing, NEW ZHONG YUAN, MONALISA, and MARCO POLO (JIAMEI).

Respondents explained the motives for selection of enterprise location from different angles: “Foshan land resources are limited, and it is impossible to expand the production scale. But Qingyuan has the advantage of land resources” (DONGPENG, 2011); “Qingyuan Municipal Government positively attracts investment and contacts with investors, implements various flexible and preferential policies including land and taxes, and helps to contact raw material suppliers; “Qingyuan is adjacent to the PRD and it is closer to inland market than the PRD” (NEW ZHONG YUAN, 2011).



Mr. Cao, the Manager of Guangdong Fogang Bohua Ceramics Co., Ltd., with more than 10 years of working experience in this industry and two years in a well-known enterprise of Jingdezhen City, Jiangxi Province, introduced the ups and downs of Foshan ceramics industry for us and summarized the reasons that ceramics enterprises transferred to Qingyuan: “1. Lower investment costs. For example, logistics cost of Jingdezhen City, Jiangxi Province is eight percent higher than that of Foshan and six percent higher than that of Fogang; 2. Good investment environment, such as climate and policy. In service efficiency and quality, social security, water, electricity, and traffic, Jiangxi Government lags far behind Qingyuan. Government service efficiency and technical level are also far behind Guangdong; 3. Superior geographical location. Qingyuan City is one hour away from Foshan, and it is close to the airport; 4. Richer land supply. There used to be a sufficient supply of land in Qingyuan that basically met the scale of the plan; 5. Enough energy supply. Electricity supply is sufficient and power rationing is less frequent than in Foshan; 7. Relaxed government policies. The government used to welcome ceramic enterprises before and a series of favorable policies about industry transfer are issued at that time; when many ceramics enterprises in Foshan transfer to other provinces, all of them suffer ‘non-acclimatized’ problem. It is difficult for enterprises that transfer to other provinces to copy the production and operation mode in Foshan” (2011).

For most small and medium-sized manufacturers, the transfer dynamics mainly involve policy factors. One is the implementation of industrial structure adjustment and environmental regulation policies, and the other is the “double transfer” industrial policy implemented to overcome the unbalanced development of the region in Guangdong Province. Since 2007, Qingyuan continued to be a main area that accepted transferred-in ceramics enterprises under the environmental regulation policy and the “double transfer” policy. In this period, Foshan Chancheng (Qingxin) Industrial Transfer Park was built. In 2011, 18 enterprises moved into this park, mainly transferred from Foshan. It planned to build 155 production lines, with a total investment of \$1.26 billion. At this time, enterprise transfer is no longer the location choice behavior of individual enterprises, but collective activity of many enterprises guided by government to move in an industry transfer park created by government. It is more easily led by larger enterprises.

Managers from small- and medium-sized enterprises, such as Juncheng, Tianyu, and Megacers, all claimed the driving of government policies is the leading cause of enterprise transfer, i.e., strict environmental regulation (2011).

Large-sized enterprises, Simpire, expressed, “They can expand their production scale under the driving force of ‘double transfer’ policy” (2011).

However, both of them claimed that other reasons to select Qingyuan were the location advantage of Qingyuan City, which is close to economic circles of the PRD, and its local resources (land, water, and raw materials).

In conclusion, cost, raw material, market, agglomeration, and other factors of traditional location theory still play an important role in relocation of the Foshan ceramics industry. However, institutional factors such as environmental regulation policy and industry transfer policy have gradually become the important bases of relocation for ceramics industry, as a pollution-intensive industry.

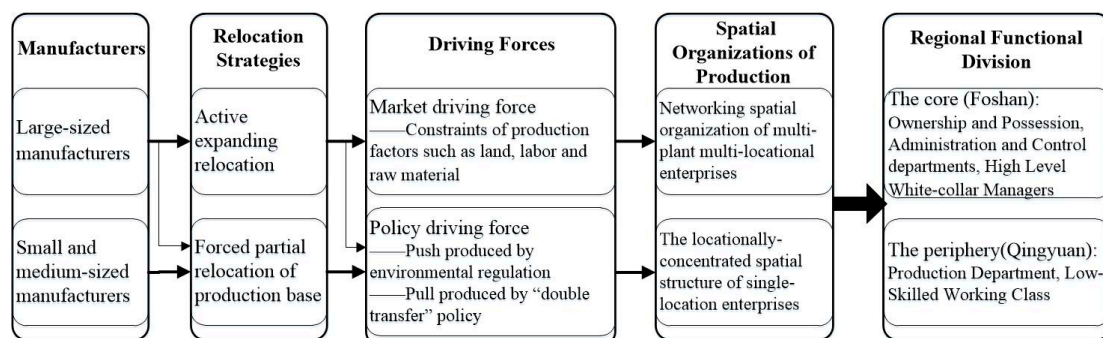


Figure 5. Formation mechanism of spatial organization of production and regional functional division.

#### 4.3.2. Macro Mechanism Analysis of Regional Effect

According to the above analysis, in the early days there were weak environmental policy differences between the underdeveloped peripheral areas and the developed core areas, and high-pollution industries were distributed in both areas. However, because of the existence of comparative advantages and agglomeration economies, the core areas of the PRD have gathered a large number of low-pollution and high value-added industries, which enjoy a higher level of welfare. It is difficult for the NPRD peripheral areas to increase their share of total industrial output because of the loosely environmental policy constraints. In recent years, environmental policy differences and industrial institutional arrangements have led to industrial transfer and regional industrial structure changes. With the spatial separation of labor process, Foshan in PRD had gradually obtained the dominant ownership and control right of the ceramics production process, attracting high-level management and R&D personnel. The increase in scale was further strengthened. In turn, Qingyuan in NPRD once again accepted most of the industries with high pollution and low added value, thus bearing most of the negative externalities of the environment and the welfare losses related to environmental pollution. It concentrated the low-skilled working class and lacked high-ranking, white-collar management positions. It can be seen that the distribution of the labor process and the hierarchical relationship in space formed the regional functional division of “core–periphery” (Figure 5).

By contrast, Qingyuan Municipal People’s Government calculated the gains and losses by taking BOHUA Ceramics and York Air Conditioner and Refrigeration Equipment as examples: “BOHUA covers an area of 1,800 mu but the annual revenues paid by it to the Qingyuan Municipal People’s Government are only more than RMB 20 million. High-end links, such as sales, are located in Foshan and most of taxes are paid to Foshan Municipal People’s Government. What’s worse, BOHUA is also a heavy-pollution enterprise that does not bring benefit to local farmers. However, York only covers an area of more than 40 mu but its annual revenues reach RMB 200 million. It also has no influence on the environment” (2015).

The head of HOMEWEY said, “Talents do not stay in Qingyuan. Technology-savvy locals are unwilling to stay in Qingyuan. The technicians transferred with the enterprises have also returned to Foshan one after another” (2010).

The head of Qingyuan New Zhong Yuan Ceramics Co., Ltd. also expressed, “There was a high mobility of employees here because many of them switched to other companies in Foshan after they master techniques” (2011).

Because of the emergence of new inequality, the attitude of industrial transfer-in areas toward the ceramics industry has changed from welcoming and supportive at the beginning to restriction and rejection. This attitude is reflected in a series of related plans and policies made by the government. In 2011, the government of Qingyuan City issued the Standard Management Program for Ceramics Industry of Qingcheng District and formulated the Green Ceramics Industrial Standards of Qingcheng District. In 2013, the Comprehensive Control Program for Ceramics Industry of Qingyuan City (QFB [2013] No. 34) was issued. The standards of cleaner production of ceramic enterprises were increased. Ceramics enterprises shall pass the cleaner production examination according to national standards of pollution emissions and energy consumption. Otherwise, they shall be forced to rectify or close down in accordance with the law.

Most of respondents expressed, “The power rationing is first imposed on the ceramics enterprises when power is running out” (2015).

Government officials said, “Qingcheng District government clearly suggested not introducing ceramics enterprises in early 2008. It would focus on helping 13 enterprises that have settled in Qingcheng District to expand production and upgrade technology, and it planned to control the ceramic production lines within 100.” “At present, Qingyuan is making an effort to build the Guangzhou-Qingyuan Airport Economic Zone. A large modern airport logistic park is planned for Yuantan Town, Qingcheng District, which needs to reserve a lot of land” (2015).

## 5. Conclusions and Discussion

The study shows that the development of multilocal enterprises and the agglomeration of their functional departments related to administration and control, research and development, and sales and production serve as an important microfoundation of evolution of regional spatial division of labor. In the process of spatial reorganization of the Foshan–Qingyuan ceramic industry, the production spatial organization of both small- and large-sized manufacturers has changed. Small-sized manufacturers maintain the spatial structure based on location, while large-sized ceramics manufacturers have evolved from the location-based spatial structure to the part–process spatial structure and then to network grouping spatial structure. These changes not only lead the spatial separation of production department from management departments for small-sized manufacturers, but they also form the networked production spatial organization structure of multiplant, multilocal enterprises and promote the evolution of regional labor spatial division to regional functional division between Foshan and Qingyuan. This is characterized by the division of the industrial value chain caused by the spatial separation of functional departments and division of production technology caused by labor force level. This verifies the pattern of spatial division of labor in the PRD and NPRD since the early 21st century, making regional functional division with “core–periphery” regional relation becoming increasingly apparent. In turn, the old regional division of labor based on distinct industry categories has faded sharply. Although the division is determined by regional production relations, it also can result in new and unequal production relations. The cross-regional organization, characterized by production hierarchy of multilocal enterprises, not only depends on spatial inequality but also inevitably generates new forms of inequality. The space distribution for labor processes and allocation of regional hierarchical relations proceed simultaneously. As administration and control have been increasingly concentrated in the PRD, such as Foshan, people of high social status, such as the white-collar class, are more likely to stay here while workers spread to NPRD of Guangdong, such as Qingyuan. New regional spatial division of labor promotes regional cooperation and competition but also creates new inequalities of power, function, income, and status.

Based on the “institutional turn” of economic geography, this paper seeks to identify the impact of different institutional environment changes (such as environmental regulation) and institutional arrangements (such as industrial transfer policies) on specific spatial economy in a specific period, including how institutional environment affects the existence and evolution of economic organizations, as well as the shaping of different economic landscapes. The driving forces for spatial reorganization of the Foshan–Qingyuan ceramics industry have changed from market driven to policy driven, supplemented by market driven. For the developed PRD, the institutional arrangement of the “double transfer” industry policy is the “centrifugal force” to promote industrial diffusion. But for the underdeveloped NPRD, it is the “centripetal force” to promote industrial agglomeration. However, with the change of the institutional environment, environmental regulation is getting stronger, which has different effects on the two regions. It is not only the “centripetal force” of advanced productivity concentration, but also the “centrifugal force” of backward productivity diffusion, especially for the PRD, and has led to new regional inequality. It can be seen that the institution is the carrier of history, and the path dependence is transferred to the economic process. Different regions have different institution paths, and the economic landscape is also different.

The practice of China’s reform and opening is very administrative, but it is gradually “thin” institutionalized. Now that Guangdong Province is in the crucial time of economic transformation, the importance of influencing factors begins to change, and institutional factors are becoming the key factors that profoundly affect the level, depth, and pattern of regional economic development in the future. In the future, regional industrial policy making still needs constant institutional “release” and requires that the “institutional thickness” should be connected with the corresponding geospatial scale. This is good for regional policy makers.

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## References

1. Coe, N.; Hess, M.; Yeung, H.W.C.; Dicken, P.; Henderson, J. 'Globalizing' regional development: A global production networks perspective. *Trans. Inst. Br. Geogr.* **2004**, *29*, 468–484. [\[CrossRef\]](#)
2. Wei, Y.H.D. Multiscale and multi-mechanisms of regional inequality in China: Implications for regional policy. *J. Contemp. China* **2002**, *11*, 109–124. [\[CrossRef\]](#)
3. Liao, F.H.F.; Wei, Y.H.D. Dynamics, space, and regional inequality in provincial China: A case study of Guangdong Province. *Appl. Geogr.* **2012**, *35*, 71–83. [\[CrossRef\]](#)
4. Diao, X.D.; Zeng, S.X.; Tam, C.M.; Tam, V.W.Y. EKC analysis for studying economic growth and environmental quality: A case study in China. *J. Clean. Prod.* **2009**, *17*, 541–548. [\[CrossRef\]](#)
5. Grossman, G.M.; Krueger, A.B. Environmental impacts of a North American free trade agreement. In *The Mexico-U.S. Free Trade Agreement*; MIT Press: Cambridge, MA, USA, 1993; pp. 13–56.
6. Copeland, B.R.; Taylor, M.S. Trade, growth, and the environment. *J. Econ. Lit.* **2004**, *42*, 7–71. [\[CrossRef\]](#)
7. Liu, L. Geographic approaches to resolving environmental problems in search of the path to sustainability: The case of polluting plant relocation in China. *Appl. Geogr.* **2013**, *45*, 138–146. [\[CrossRef\]](#)
8. Söderbaum, F. Introduction: Theories of New Regionalism. In *Theories of New Regionalism. International Political Economy Series*; Söderbaum, F., Shaw, T.M., Eds.; Palgrave Macmillan: London, UK, 2003.
9. Mckee, H.; Johnston, K.; Henry, C. Multinational Companies as a Source of Entrepreneurial Learning: Examples from the IT Sector in Ireland. *Educ. Train.* **2013**, *46*, 433–443. [\[CrossRef\]](#)
10. Wei, Y.H.D.; Jun, L.; Qiang, Z. Location decisions and network configurations of foreign investment in urban China. *Prof. Geogr.* **2010**, *62*, 264–283. [\[CrossRef\]](#)
11. Ang, Y.Y. *Industrial Transfer and the Remaking of the People's Republic of China's Competitive Advantage*; ADBI Working Paper 762; Asian Development Bank Institute: Tokyo, Japan, 2017; pp. 1–17.
12. Ang, Y.Y. *How China Escaped the Poverty Trap*; Ithaca, N.Y., Ed.; Cornell University Press: Ithaca, NY, USA, 2016.
13. Wei, Y.H.D. Regional inequality in China. *Prog. Hum. Geogr.* **1999**, *23*, 49–59. [\[CrossRef\]](#)
14. Wei, Y.H.D. Regional development in China: Transitional institutions, embedded globalization, and hybrid economies. *Eurasian Geogr. Econ.* **2007**, *48*, 16–36. [\[CrossRef\]](#)
15. Wei, Y.H.D.; Yuqi, L.; Wen, C. Globalizing Regional Development in Sunan, China: Does Suzhou Industrial Park Fit a Neo-Marshallian District Model? *Reg. Stud.* **2009**, *43*, 409–427.
16. Lu, L.; Wei, Y.D. Domesticating Globalization, New Economic Spaces, and Regional Polarization in Guangdong Province, China. *Soc. Sci. Electron. Publ.* **2007**, *98*, 225–244.
17. Yang, C. Restructuring the export-oriented industrialization in the Pearl River Delta, China: Institutional evolution and emerging tension. *Appl. Geogr.* **2012**, *32*, 143–157. [\[CrossRef\]](#)
18. He, C.; Wang, J. Regional and sectoral differences in the spatial restructuring of Chinese manufacturing industries during the post-WTO period. *Geojournal* **2012**, *77*, 361–381. [\[CrossRef\]](#)
19. Zhu, S.; He, C. Geographical dynamics and industrial relocation: Spatial strategies of apparel firms in Ningbo, China. *Eurasian Geogr. Econ.* **2013**, *54*, 342–362. [\[CrossRef\]](#)
20. Duan, X.W.; Li, L.L.; Miao, C.H.; Hu, Z.Q. Evaluation of Industry Transfer Comprehensive Undertaking Ability of Six Major Urban Agglomerations in the Central Region. *Sci. Geogr. Sin.* **2016**, *36*, 681–690.
21. Feng, M.; Yu, K.H.; Hao, R. Evaluation of Regional Industry Transfer Undertaking Ability Based on Sustainable Development. *J. Sci. Ind. Res.* **2017**, *76*, 269–272.

22. Shen, J.; Wei, Y.D.; Yang, Z. The impact of environmental regulations on the location of pollution-intensive industries in China. *J. Clean. Prod.* **2017**, *148*, 785–794. [[CrossRef](#)]
23. Lin, S.L.; Lu, J.; Su, J.B.; Chen, W.P. Sustainable Returns: The Effect of Regional Industrial Development Policy on Institutional Investors' Behavior in China. *Sustainability* **2018**, *10*, 2769. [[CrossRef](#)]
24. Lewis, W.A. The state of development theory. *Am. Econ. Rev.* **1984**, *74*, 1–10.
25. Dunning, J.H. Trade, location of economic activity and the MNE: A search for an eclectic approach. In *The International Allocation of Economic Activity*; Ohlin, B., Hesselborn, P.O., Wijkman, P.M., Eds.; Macmillan: London, UK, 1977.
26. Amin, A.; Thrift, N. What Kind of Economic Theory for what Kind of Economic Geography? *Antipode* **2000**, *32*, 4–9. [[CrossRef](#)]
27. Krugman, P. *Geography and Trade*; Leuven University Press: Leuven, Belgium, 1991.
28. Krugman, P. First nature, second nature and metropolitan location. *J. Reg. Sci.* **1993**, *3*, 129–144. [[CrossRef](#)]
29. Krugman, P. Complex landscape in economic geography. *Am. Econ. Rev.* **1994**, *84*, 412–415.
30. Venables, A.J. Localization of industry and trade performance. *Oxf. Rev. Econ. Policy* **1996**, *12*, 52–60. [[CrossRef](#)]
31. Brulhart, M. Economic Geography, Industry Location and Trade: The Evidence. *World Econ.* **1998**, *21*, 775–801. [[CrossRef](#)]
32. Martin, R. The New 'Geographical Turn' in Economics: Some Critical Reflections. *Camb. J. Econ.* **1999**, *23*, 65–91. [[CrossRef](#)]
33. Fujita, M.; Thisse, J. New Economic Geography: An appraisal on the occasion of Paul Krugman's 2008 Nobel Prize in Economic Sciences. *Reg. Sci. Urban Econ.* **2008**, *39*, 109–119. [[CrossRef](#)]
34. Ottaviano, G.I.P.; Puga, D. Agglomeration in the Global Economy: A Survey of the 'New Economic Geography'. *World Econ.* **1998**, *21*, 707–731. [[CrossRef](#)]
35. Fujita, M.; Krugman, P.; Venables, A.J. *The Spatial Economy: Cities, Regions and International Trade*; MIT Press: Cambridge, MA, USA, 1999.
36. Amin, A. An institutionalist perspective on regional economic development. *Int. J. Urban Reg. Stud.* **1999**, *2*, 365–378. [[CrossRef](#)]
37. Amin, A. Flexible Specialization and Small Firms in Italy: Maths and Realities. In *Industrial Districts and Inter-Firm Cooperation in Italy*; Pyke, F., Becattini, G., Sengenberger, W., Eds.; ILO: Geneva, Switzerland, 1989; pp. 185–219.
38. Scott, A.J. *New Industrial Spaces: Flexible Production Organization and Regional Development in North American and Western Europe*; Pion: London, UK, 1988.
39. Markusen, A. Sticky places in slippery space: A typology of industrial districts. *Ecol. Geogr.* **1996**, *72*, 293–313. [[CrossRef](#)]
40. Morgan, K. The learning region: Institutions, innovation and regional renewal. *Reg. Stud.* **1997**, *31*, 491–503. [[CrossRef](#)]
41. Aydalot, P. *Milieux Innovateurs en Europe*; Gremi: Paris, France, 1986.
42. Cooke, P. Regional innovation Systems: An Evaluation of Six European Cases. In *Urban and Regional Development in the New Europe*; Getimis, P., Kafkalas, G., Eds.; Topos: Athens, Greece, 1993; pp. 133–154.
43. Peck, J.A.; Tickell, A. Local modes of social regulation? Regulation theory, Thatcherism and uneven development. *Geoforum* **1994**, *23*, 347–383. [[CrossRef](#)]
44. Martin, R. Institutional approaches in economic geography. In *A Companion to Economic Geography*; Tjames, E.S., Ed.; Blackwell: Oxford, UK, 2000; pp. 77–94.
45. Caballero, G.; Arias, X.C. Transaction Cost Politics in the Map of the New Institutionalism. In *Advances in Political Economy: Institutions, Modelling and Empirical Analysis*; Schofield, N., Caballero, G., Kselman, D., Eds.; Springer: Berlin, Germany, 2012; pp. 3–29.
46. Farole, T.; Rodriguez-Pose, A.; Storper, M. Human geography and the institutions that underlie economic growth. *Prog. Hum. Geogr.* **2011**, *35*, 58–80. [[CrossRef](#)]
47. Feils, D.J.; Rahman, M. The Impact of Regional Integration on Insider and Outsider FDI. *Manag. Int. Rev.* **2011**, *51*, 41–63. [[CrossRef](#)]
48. Massey, D. In what sense a regional problem? *Reg. Stud.* **1979**, *13*, 233–243. [[CrossRef](#)]
49. Massey, D. *Spatial Divisions of Labor: Social Structures and the Geography of Production*; Macmillan: London, UK, 1984.



50. Massey, D. Uneven Development: Social Change and Spatial Divisions of Labor. In *Uneven Re-Development: Cities and Regions in Transition*; Massey, D., Allen, J., Eds.; Hodder and Stoughton: London, UK, 1988.
51. Tonts, M.; Plummer, P.; Taylor, M. Power, enterprise and employment growth in Australian small-and medium-sized manufacturing firms. *J. Econ. Geogr.* **2012**, *12*, 1239–1266. [[CrossRef](#)]
52. Amin, A.; Thrift, N. Living in the Global, in Globalization. In *Institutions, and Regional Development in Europe*; Amin, A., Thrift, N., Eds.; Oxford University Press: Oxford, UK, 1994; pp. 1–22.
53. Macleod, D. Beyond soft institutionalism: Accumulation, regulation, and their geographical fixes. *Environ. Plan. A* **2001**, *33*, 1145–1167. [[CrossRef](#)]
54. Martin, R. Institutional Approaches in Economic Geography. In *A Companion to Economic Geography*; John Wiley & Sons, Ltd.: Hoboken, NJ, USA, 2008.
55. MacKinnon, D.; Cumbers, A.; Pike, A.; Birch, K.; McMaster, R. Evolution in Economic Geography: Institutions, Political Economy, and Adaptation. *Econ. Geogr.* **2009**, *85*, 129–150. [[CrossRef](#)]
56. Ottaviano, G. Regional policy in the global economy: Insights from new economic geography. *Reg. Stud.* **2003**, *37*, 665–673. [[CrossRef](#)]
57. Ihuri, T.; Yang, C.C. Interregional tax competition and intraregional political competition: The optimal provision of public goods under representative democracy. *J. Urban Econ.* **2009**, *66*, 210–217. [[CrossRef](#)]
58. Zheng, X.P. Economies of Network, Urban Agglomeration, and Regional Development: A Theoretical Model and Empirical Evidence. *Reg. Stud.* **2007**, *41*, 559–569. [[CrossRef](#)]
59. Puga, D. *Agglomeration and Cross-Border Infrastructure*; IMDEA, Universidad Carlos III and CEPR: Madrid, Spain, 2009; p. 06.
60. Becker, J.; Fuest, C. Eu regional policy and tax competition. *Eur. Econ. Rev.* **2010**, *54*, 150–161. [[CrossRef](#)]
61. Dupont, V.; Martin, P. Subsidies to poor regions and inequalities: Some unpleasant arithmetic. *J. Econ. Geogr.* **2006**, *6*, 223–240. [[CrossRef](#)]
62. Toulemonde, E. Acquisition of skills, labor subsidies, and agglomeration of firms. *J. Urban Econ.* **2006**, *59*, 420–439. [[CrossRef](#)]
63. Rodríguez-Pose, A. Do institutions matter for regional development? *Reg. Stud.* **2013**, *47*, 1034–1047. [[CrossRef](#)]
64. Markusen, A. Studying regions by studying firms. *Prof. Geogr.* **1994**, *46*, 477–490. [[CrossRef](#)]



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