From the ‘Workshop of the World’ to an emerging global city-region: Restructuring of the Pearl River Delta in the advanced services economy
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Chapter 3

Connecting the ‘Workshop of the World’: Intra- and Extra-Service Networks of the Pearl River Delta City-Region†

Most research on globalization and city-regions in developing countries has focused on manufacturing activities, disregarding the considerable growth of producer services. Drawing on the Interlocking Network Model, this chapter presents a first analysis of the intra- and extra-service networks of the Pearl River Delta (PRD) city-region in China. The central question is how cities in the PRD are (re)positioned in the regional urban networks and which national and global cities are their major external connections in the service economy. The result reveals a new pattern of producer-services-led development that differs from the former industrialization experience in the region.

3.1 Introduction

Since the 1970s, globalization and worldwide capitalist restructuring have profoundly changed the spatial organization of world economy. Selective economic concentration, deconcentration and re-concentration have not only reconstructed the economic structures of cities and regions, but also reshaped their functional connections with the outside world. One significant outcome is the emergence of prominent city-regions with complex internal networks and external linkages all over the world (Hoyler and Kloosterman et al., 2008; Pain, 2012). These city-regions, often preceded by ‘global’ or ‘mega’, have become key arenas for high-end economic activities and the generation of innovations (Herrschel and Newman, 2002; Scott, 2001, 2012). At the same time, their prosperities are increasingly attached to their capability to combine a fruitful ‘local buzz’ with ‘global pipelines’ (Malmberg, 2003; Bathelt et al., 2004).

Many studies have been undertaken to capture the mechanisms of such

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global/mega city-regions in the current process of global economic restructuring (Hall and Pain, 2006; Hoyler and Kloosterman et al., 2008; Taylor et al., 2009; Lüthi et al., 2010; Derudder et al., 2012). One common feature of them is that most are limited to developed economies. However, with ongoing globalization, regions in developing areas are also increasingly connected to the global economic system, being reshaped by such processes and, in their turn, boosting globalization into a new level (Douglass, 2000; Florida et al., 2008; Jones and Douglass, 2008; Scott, 2012). Due to their success in manufacturing, research on these regions has basically focused on the process and influence of rapid industrialization. In comparison, although displaying considerable growth, services, especially advanced producer services (APS), have only attracted marginal attention (Daniels et al., 2005). How regions in developing countries are reshaped by advanced service activities and are connected to the global urban system through them have remained mostly a black box.

This research focuses on the Pearl River Delta (PRD), the famous ‘workshop of the world’, to explore its internal and external service networks drawing on the method of the Interlocking Network Model (Taylor, 2004). Several characteristics compared to its western counterparts make the PRD especially interesting: its extraordinary size, its rapid industrialization and urbanization, its importance in China’s economic landscape, and a distinct path of modernization with complicated, even opaque, state-market relations (Jacques, 2012). The purpose is to provide some new insights on the global/mega city-region, this globalization’s new urban form (Hall and Pain, 2006), from the perspective of the developing world. The central question is how cities in the PRD are (re)positioned in the regional urban networks and which national and global cities are their major external connections in the service economy.

The chapter is structured as follows. It begins with a brief review of the theoretical progress on globalization, economic restructuring and regional development in China, focusing on the PRD. Next, the development of producer services in the PRD is introduced in the third section. The fourth section deals with methodology and data. The fifth section describes and interprets the inter-city connections at regional, national and global scales of the PRD produced through the intra-firm networks of five APS sectors. The concluding section discusses the implications of
the empirical results for understanding the new phase of service-led economic transition and urbanization in some emerging economies (like China), as well as the applicability of the Interlocking Network Model in the Chinese context.

3.2 Globalization, economic restructuring and regional development in the Pearl River Delta

In the past two decades, the integration of China with the world economy and its regional restructuring and development have become an important field of research. The PRD, as the first region experiencing globalization and economic transition in China, is of particular interest. Due to the key role of foreign investments (primarily from Hong Kong) in the region during its initial developmental stage, most early studies focused on the characteristics of foreign investments and their spatial effects, especially their influence on the regional urbanization process. A common finding is that, during the 1980s and the 1990s, many Hong Kong industries outsourced their production activities to the PRD, which induced a process of rapid export-oriented industrialization in the region. Meanwhile, Hong Kong was upgraded into an international commercial and financial centre, focusing on marketing, logistics, trading, banking and other high-value-added services. A ‘front shop-back factory’ model was proposed to describe the unique regional division of labour between Hong Kong and the PRD (Sit and Yang, 1997). Spatially, since foreign direct investment (FDI) flowing into the PRD concentrated mainly in small and medium scale, labour-intensive and processing-types manufacturing activities, it promoted the predominant growth of smaller urban places and rural areas, at the expense of a declining primacy of Guangzhou and other traditional centres (Sit and Yang, 1997; see also Xu and Li, 1990; Eng, 1997; Lin, 2001). This pattern of ‘urbanization from below’ or ‘bottom-up urbanization’ distinguished China’s industrialization and urbanization process from the Western experience (Ma and Fan, 1994; Ma and Cui, 2002).

Since the 2000s, reflecting some new trends of economic development in the PRD, researchers have diversified their interests into more directions, including, mainly, the shifting spatial dynamics of FDI (Shen et al., 2000; Zhao and Zhang, 2007); the linkages and interactions between the PRD and the global production networks (Yang, 2007; Yang and Liao, 2010); and the localization of foreign capital and
industrial restructuring in the region (Lu and Wei, 2007; Meyer et al., 2012; Lin, 2009; Yang, 2012). These studies have captured an emerging new stage of development in the PRD, which is characterized by more complex industrial linkages with the global production system, increasing importance of internal forces in driving economic development and shaping regional space, and upgrading and diversification (although with pitfalls) of local industries. They have challenged the ‘export-oriented growth’ and ‘front shop-back factory’ model which typified the early development of the PRD. However, as the primary driving force of the ‘workshop of the world’, manufacturing has still taken up the central position of investigation. Service sectors, especially APS, so far have only attracted marginal attention (Yeh, 2005; Lin, 2005; Yi et al., 2011) in spite of, as shown below, their consider growth in the region.

According to Western experiences, producer services can have direct and indirect beneficial effects on regional economic development: creating added value and employment, generating multiplier effects to the regional economic base, boosting productivity and competitiveness of the entire production system, and facilitating economic change and adaption (Illeris, 1996; Coffey, 2000; Daniels et al., 2005; Bryson and Daniels, 2007). Moreover, compared with the Fordist-type manufacturing, whose major concern is to minimize production and delivery costs, producer services tend to have a stronger demand on high-level knowledge and professional labour, advanced infrastructure and communication systems, and the co-presence with clients and other service providers to reduce transaction costs. Therefore, producer services demonstrate a location pattern (typically, a disproportionate concentration in a large metropolitan regions, and particularly in their central business districts) different from that of most manufacturing activities, which makes them a major force to reconfigure urban and regional structures and to reposition cities and city-regions in the broader networks and systems in the ‘Post-Fordist’ economic transition (Daniels, 1991; Illeris, 1996; Scott, 2001; Hutton, 2003; Taylor, 2004; Hall and Pain, 2006; Hoyler and Kloosterman et al., 2008; Sassen, 2011).

It has been noted that the expansion of high-end services into traditional manufacturing areas in developing countries and the concomitant rise of service centres in the ‘East’ (Derudder et al., 2010) seem to take place along different
trajectories than those taken by the mature economies of the Atlantic core (Daniels et al., 2005; Yeh and Yang, 2013). Detailed empirical work is needed to understand how current manufacturing regions in developing countries are being reconstructed by modern service activities and how this process is influenced by local specific contexts. Specific to the PRD, the rise of advanced service economies raises some questions to the current understanding of the ‘workshop of the world’. Does the development of producer services in the region demonstrate a spatial pattern similar to that in the West, that is, a disproportionate concentration in large cities, or is it affected, at least partially, by the region’s former unique decentralized industrialization and urbanization trajectory? Does Hong Kong maintain its ‘front shop’ function and dominate most of the PRD’s external service connections or, considering the diversification of the region’s local economy and global linkages, is it challenged by other global cities? A more general theoretical question is how the new service-led transitions in the PRD can help understand the continuing globalization and regional development in emerging economies? This chapter explores these questions through the lens of the location strategies of APS firms. Before that, it is necessary to briefly review the producer services development in the PRD in the past decades.

3.3 The development of producer services in the Pearl River Delta

With China gradually reforming economies and opening up to the world from 1978 onwards, the PRD has become one of the fastest growing and globalizing city-regions in the world. Geographic proximity to Hong Kong and extensive social network connections with overseas Chinese entrepreneurs enabled this region to be chosen by the central government as the first place to practice flexible economic policies (Lin, 2001). Two of China’s earliest special economic zones (SEZs), Shenzhen and Zhuhai, were established here in 1980 and the entire region was designated as an open economic zone in the late 1980s. A large and cheap labour force, sufficient land supply and support from local authorities attracted huge overseas investments, primarily from Hong Kong, Macao and Taiwan, but also from Japan, the United States and other developed economies (Sit and Yang, 1997). Based on the export-oriented, assembly manufacturing types of industrialization (Sit and Yang, 1997), the PRD has quickly transformed into the famous ‘workshop of the world’- the home to many world leading manufacturing clusters and an
important gateway in integrating China with the world economy. Such internal economic transformation and global integration have brought this region dramatic growth and a rising status within China’s economic landscape in the past thirty years (see Table 3.A1 in the appendix of this chapter).

However, great success in manufacturing does not tell the whole story. Although triggered by manufacturing, economic growth in the PRD has also been accompanied by the development of services. The tertiary sector experienced the fastest growth in the region after 1979. In 2010, it already took over the secondary sector as the primary contributor to local gross domestic production (GDP) (see Figure 3.A1 in the appendix of this chapter). Unlike the linear consecutive and progressive sector transition in Western countries, economic growth and transition of the PRD is characterized by a simultaneous expansion of both manufacturing and service economies (cf. Lin, 2005).

After entering the new millennium, export-oriented industrialization in the PRD has encountered enormous challenges due to the rise of labour and production costs, the appreciation of RMB and the increasing external competitions (Yang, 2012). Instead, producer services seem to have become a potentially new engine of economic growth in the region. Based on statistics on six producer service sectors in Guangdong, it is clear that these activities showed significant growth between 2003 and 2010. Employment in these sectors almost doubled from 2.41 million to 4.65 million. Their share in the employment of all services and all sectors increased from 19.8% and 5.5% to 23.8% and 8.1% respectively (see Table 3.A2 in the appendix of this chapter). Meanwhile, FDI actually realized in these six sectors also doubled from 2.83 USD billion in 2006 to 5.68 USD billion in 2010. In total, 75% of FDI in services and 27% in all sectors went into them (see Table 3.A3 in the appendix of this chapter). Realizing the important function of producer services in attracting investment and stimulating economic growth, both provincial and municipal governments take fostering their growth as a key development strategy. APS stand out in ‘The Outline of the Plan for the Reform and Development of the Pearl River Delta (2008-2020)’ and most cities’ ‘Twelfth Five-year Plans’. It is quite common to see local municipalities actively building modern infrastructures (central business district, technical park, logistics centre, etc.) as a way to attract higher-end business services.
With the increasing pressure to upgrade economic structure, the ongoing diversification and specialization of local industries and the interventions from the government, it seems likely that the PRD is now entering a new phase of economic transition toward the higher-end of the global value chain. Modern producer services will be both a key driving force and a major beneficiary. This transition will not only affect the PRD’s economic performance, but also restructure its connections with the broader economic network.

3.4 Method and data

The Interlocking Network Model (INM)

The INM was originally developed by Taylor and the Globalization and World Cities (GaWC) group to investigate inter-cities relations within the global service networks (Taylor, 2004). The POLYNET project expanded it into the study of functional connections between cities at a regional scale and generated new insights (Hall and Pain, 2006). As recent publications have demonstrated, this method can also be used in diverse geographic contexts (Bassens et al., 2011; Derudder et al., 2013). Its basic idea is that the spatial organizations of multi-location APS firms are the outcomes of their long-term operational strategies, reflecting their considerations of the investment conditions and potential values of different places. A city chosen by a firm to be part of its office network can be interlocked with other cities through flows of information and knowledge within such network. Two cities may have a stronger connection if they share more office networks from the same firms. The importance of a city in the overall economic system can also be deduced from the features of networks to which it is connected. So, in the absence of comprehensive relational data, a close examination of firms’ office networks can provide a surrogate measure of the functional connections between cities where these offices located in and the position of each city within the regional/national/global economies.\(^2\)

Five APS sectors were selected for this research: banking, insurance, accountancy, law and advertising. This is a smaller selection compared with the POLYNET project which used eight sectors. Design consultancy and management consultancy
were excluded because a pilot data collection showed that these two sectors were still very new in the PRD and only a few multi-location firms existed. Logistics was left out due to data collecting difficulties. Considering the unique regional context, several methodological modifications were introduced while applying the model in this study. They will be specified in the following introductions to the service value matrix constructing process.

Selecting cities

To make data collecting and analyzing feasible, a limited but sufficient number of cities were selected at the regional (PRD), national (mainland China) and global scales. Regionally, all nine cities within the PRD were selected. National cities were chosen according to cities’ economic performance (GDP) and, considering the significance of political factors in Chinese cities, administrative function (provincial capital) in the national urban system. The selection of global cities was primarily based on the GaWC’s world city index 2008 (all ALPHA and BETA cities), complemented by some extra cities which were found important during data collecting. Finally, nine regional cities, 43 national cities and 95 global cities constitute the city set.

Selecting firms

Typically, studies using the INM only focus on leading international firms. But in this research, since APS sectors were not highly developed in the PRD and only a limited amount of international firms were located there, it was necessary to include firms varying from large multinationals to small local operators. To conduct the analysis, a firm had to meet two basic criteria: it should have at least two offices (multi-location firms), and at least one of its offices should be located within the PRD. Besides, some firms only had offices within the region, while others also had offices outside it and even abroad, so the sets of firms were different according the scale of analysis. No single database containing a complete list of all APS firms within the region was available. Firms were identified from various sources, including statistical yearbooks, reports from specialized associations and business rankings etc. Different sources were mutually checked to ensure that all important firms were included.
In China, there were only a limited number of banks and insurance firms and only some of them had offices in the PRD, so all firms from these two sectors met the criteria were selected. The number of firms in the sectors of law, accountancy and advertising was quite large. However, most of them were small single-office firms which could not be used for network analysis, and the number of identifiable multi-location firms was, hence, relatively small. So, most multi-location firms that can be identified in these three sectors were also included. It is reasonable to believe that the database contains the majority of important multi-location firms in the five sectors in the PRD.

Information about office location and function was collected mainly from firms’ official websites, supplemented by some specialist statistical websites and other internet sources. Firms with no information available were excluded. The final database comprises 219 APS firms (Table 3.1).

**Determining service value matrix**

To make different firms comparable, each of their locating cities was allocated a service value, which indicated the importance of the city within a firm’s business network. Service values need to be allocated on a unified scale. GaWC used a 6 grades system from 0 (no office) to 5 (headquarter) to study the world city network, while the POLYNET project reduced it into four grades (from 0 to 3) to coordinate different research teams. A single valuing system is less problematic when firms are similar in size (e.g. when all of them are large international firms). However, since firms used in this research differed in size, ranging from small firms with only two offices to large international ones, it is necessary to consider such difference.

The strategy used was setting a maximum service value for each firm according to the amount of its locating cities, ranging from 3 (headquarters city of a firm locating in fewer than 20 cities) to 5 (headquarters city of a firm locating in more than 40 cities). All cities with a firm’s presence were initially allocated a standard service value 2 (a standard office), while cities with no office scored 0. Then, a city’s service value might be lowered to 1 or be raised to 3, 4 or 5 according to the
sizes and/or functions of its offices. It was relatively easy to identify headquarters and the absence of an office. But the identification of higher- or lower-level offices proved more difficult due to the limitation of information. This might result in some subjective valuation for some cities. Since the number of firms was large enough, the aggregated service values should be valid to reflect cities’ real conditions.

**Table 3.1 Distribution of advanced producer service firms across selected cities**

<table>
<thead>
<tr>
<th>City</th>
<th>Banking</th>
<th>Insurance</th>
<th>Law</th>
<th>Accountancy</th>
<th>Advertising</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guangzhou</td>
<td>42</td>
<td>29</td>
<td>39</td>
<td>28</td>
<td>36</td>
<td>174</td>
</tr>
<tr>
<td>Shenzhen</td>
<td>45</td>
<td>30</td>
<td>30</td>
<td>27</td>
<td>7</td>
<td>139</td>
</tr>
<tr>
<td>Dongguan</td>
<td>17</td>
<td>20</td>
<td>6</td>
<td>3</td>
<td>1</td>
<td>47</td>
</tr>
<tr>
<td>Foshan</td>
<td>20</td>
<td>20</td>
<td>3</td>
<td>3</td>
<td>0</td>
<td>46</td>
</tr>
<tr>
<td>Zhuhai</td>
<td>16</td>
<td>18</td>
<td>3</td>
<td>3</td>
<td>1</td>
<td>41</td>
</tr>
<tr>
<td>Zhongshan</td>
<td>16</td>
<td>21</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>39</td>
</tr>
<tr>
<td>Huizhou</td>
<td>13</td>
<td>19</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>33</td>
</tr>
<tr>
<td>Jiangmen</td>
<td>10</td>
<td>19</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>30</td>
</tr>
<tr>
<td>Zhaoqing</td>
<td>6</td>
<td>14</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Gross number of firms</td>
<td>55</td>
<td>33</td>
<td>58</td>
<td>37</td>
<td>36</td>
<td>219</td>
</tr>
<tr>
<td>Gross number of offices in the Pearl River Delta (PRD)</td>
<td>185</td>
<td>190</td>
<td>83</td>
<td>65</td>
<td>46</td>
<td>569</td>
</tr>
<tr>
<td>Number of offices per firm in the PRD</td>
<td>3.4</td>
<td>5.8</td>
<td>1.4</td>
<td>1.8</td>
<td>1.3</td>
<td>2.6</td>
</tr>
<tr>
<td>Gross number of offices in all cities</td>
<td>1,937</td>
<td>1,326</td>
<td>461</td>
<td>1,885</td>
<td>1,244</td>
<td>6,853</td>
</tr>
<tr>
<td>Number of offices per firm in all cities</td>
<td>35.2</td>
<td>40.2</td>
<td>7.9</td>
<td>50.9</td>
<td>34.6</td>
<td>31.3</td>
</tr>
</tbody>
</table>

*Note: ‘Gross number of offices’ only counts the existence/inexistence of a firm’s office(s) in a city, regardless of the number of its office(s).*
3.5 Mapping the intra- and extra-service networks of the Pearl River Delta

3.5.1 Firms and offices

The 219 firms operate through 569 offices (without repetitively counting offices belonging to a firm within the same city) in the region (Table 3.1). Most firms (79%) choose to maintain a presence in Guangzhou. Especially in advertising, all 36 firms have set up an office(s) in this provincial capital. Shenzhen follows not far behind Guangzhou, attracting about two-thirds of all firms and even leading in banking and insurance. The gap between these two cities and others is quite large. Among the rest, Dongguan, Foshan, Zhuhai and Zhongshan can be classified as the second tier. However, none of them has offices of over 50 firms. Three geographically peripheral cities (Jiangmen, Zhaoqing and Huizhou) are chosen by only a few firms.

Table 3.1 also shows that different APS activities have quite diverse location strategies. Insurance and banking are two most widespread sectors within the PRD, which also maintain extensive international service networks. This indicates that banks and insurance firms have a strong demand to keep close relations with local clients and, therefore, need to maintain a broader service network. They make significant contribution to the region’s overall connectivities. Accountancy is the most ubiquitous sector at the global scale, but is relatively concentrated in the PRD. Most accountancy firms choose to provide services to the region through only Guangzhou and/or Shenzhen. Advertising is also a highly internationalized sector. About half of the advertising firms in the database are international companies with headquarters outside China (Table 3.2). However, advertising firms prefer a single-office operating strategy in the PRD. Apparently, Guangzhou is the most attractive city. This sector significantly improves the PRD’s global connectivity but contributes almost nothing to its connectivity at the regional scale. Law is highly concentrated at both scales. Although this sector contains the largest number of firms, their average size is the smallest at the global level and the second smallest in the PRD. It is the most localized sector with quite limited contribution to the region’s overall connectivities.
Table 3.2 Distribution of firms’ headquarters

<table>
<thead>
<tr>
<th>City/Region</th>
<th>Banking</th>
<th>Insurance</th>
<th>Law</th>
<th>Accountancy</th>
<th>Advertising</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pearl River Delta</td>
<td>6</td>
<td>4</td>
<td>10</td>
<td>3</td>
<td>7</td>
<td>30</td>
</tr>
<tr>
<td>Guangzhou</td>
<td>2</td>
<td>6</td>
<td>2</td>
<td>5</td>
<td></td>
<td>15</td>
</tr>
<tr>
<td>Shenzhen</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Dongguan</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Foshan</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
<tr>
<td>National Cities</td>
<td>25</td>
<td>21</td>
<td>30</td>
<td>17</td>
<td>11</td>
<td>104</td>
</tr>
<tr>
<td>Beijing</td>
<td>9</td>
<td>11</td>
<td>24</td>
<td>14</td>
<td>8</td>
<td>66</td>
</tr>
<tr>
<td>Shanghai</td>
<td>4</td>
<td>5</td>
<td>3</td>
<td></td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>Others</td>
<td>12</td>
<td>5</td>
<td>3</td>
<td>3</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Global cities</td>
<td>24</td>
<td>8</td>
<td>18</td>
<td>17</td>
<td>18</td>
<td>85</td>
</tr>
</tbody>
</table>

3.5.2 Networks and connections

This part examines the patterns of the PRD’s service connections by adding up office linkages between pairs of cities and mapping outcomes within different geographic territories.

Regional connections

Figure 3.1 shows that the strongest service connection within the PRD is the one that linking Guangzhou and Shenzhen, confirming the dominance of these two core cities in the regional service market and the intensive interactions between them. Next are four connections between this pair of cities and two important regional manufacturing centres: Guangzhou-Foshan, Shenzhen-Foshan, Guangzhou-Dongguan and Shenzhen-Dongguan. However, they are much weaker compared to the primate one. Even the second strongest connection (Guangzhou-Foshan) is only about 37% of that between Guangzhou and Shenzhen. Other relatively robust connections are those between Guangzhou/Shenzhen and two smaller cities (Zhongshan and Zhuhai). Obviously, most minor urban centres in the PRD are primarily connected with Guangzhou and Shenzhen, but not well connected with each other. In general, four geographically nearby cities
(Guangzhou, Shenzhen, Foshan, Dongguan) compose a well-connected regional core. The connections of other cities decay with the increase of their distances from this core area.

**Figure 3.1 Regional connections of the Pearl River Delta (PRD)**

![Diagram of regional connections of the Pearl River Delta (PRD)](image)

*Note:* The width of each line is in proportion to the value of the connection it represents.

This pattern indicates that an emerging regional service network, although still at an early stage, is in formation in the PRD, promoted mainly by the financial sectors. This service network has a very strong bias toward regional core cities, especially the provincial capital Guangzhou and the financial centre Shenzhen. Most firms’ regional headquarters concentrate in these two cities with only two exceptions (Table 3.2). It can be inferred that market demand is the primary driving force for firms to extend their networks into other cities.
**National connections**

Beijing and Shanghai are the two best-connected national cities with the PRD (Figure 3.2). As Lai (2012) indicates, these two cities perform ‘qualitatively different roles’ with Beijing as the historical political centre and home to key political and economic institutions, and Shanghai as the largest business and commercial hub in mainland China. They occupy key positions in China’s national urban system and share most national headquarters of APS firms (Table 3.2). Following them are a series of important regional centres in both economic and administrative senses, such as Chengdu, Hangzhou, Tianjing, Nanjing and Wuhan. In comparison, provincial capitals with less economic importance in the middle and western part of China (e.g. Guiyang, Langzhou, Lasha, Yinchuan, Xining) have the weakest connections. Some cities (Suzhou, Wuxi, Tangshan etc.), showing very impressive economic performance but undertaking less administrative functions compared with provincial capitals, only have middle-level connections with the PRD. So it is appropriate to infer that most regions in China are connected with the national service network mainly through one or two regional centres. These centres are not solely determined by pure economic achievements, but also influenced by their administrative functions.

Specific to individual cities, their national connections are quite similar to each other and to the region’s general pattern. For all cities, Beijing and Shanghai are two best connected service centres with an obvious advantage. After them are several major regional centres in China, such as Hangzhou, Chengdu, Wuhan and Tianjing. The gaps between these cities are quite small (see Figure 3.A2 in the appendix of this chapter). This pattern suggests that cities in the PRD have very similar ways to connect with the national service network. No city has a unique orientation toward any preferential area.
Figure 3.2 National connections of the Pearl River Delta (PRD)

Note: The size of each rectangle is in proportion to the value of that city’s connection with the PRD.

Global connections

Figure 3.3 shows the top 30 global cities in terms of connections with nine cities in the PRD. Hong Kong is the city with which most connections exist. Due to its global city status, competitive institutional and regulatory environment, geographic and socio-cultural advantages and, moreover, the role of an ‘offshore financial centre’ which offers an enclave within China with much less currency restrictions (Lai, 2012), Hong Kong is chosen not only by most international service firms as
the hub of management and control in the market of China (and even Pacific Asia), but also by many Chinese firms as the first springboard for abroad. This dual role makes it an important gateway to connect the PRD with the global services market.

There are three cities whose connections with the PRD reach or exceed 60% of that of Hong Kong: London, New York and Singapore. London and New York are the two leading global cities which can be found on tops of most rankings of global economic or financial centres. Their multiple connections with the PRD benefit from hosting headquarters of most large international APS firms. Singapore’s situation is similar to Hong Kong’s but to a lesser degree. It is preferred by both international and Chinese APS firms as the hub of South East Asia. So its high degree of connection reflects the tight relations between the PRD and this area. After these four cities are a series of familiar global cities such as Tokyo, Sydney, Paris, Dubai, Seoul, Moscow and Frankfurt. Most of them are leading management and service centres in their respective regional markets and the first choices of international firms to setup regional headquarters.

**Figure 3.3 Global connections of the Pearl River Delta**
In general, Pacific Asia is the best connected region with the PRD. More than one-third of the top 30 connected cities are from this area. Geographic proximity, socio-cultural similarity and close economic connections are important explaining factors. After Pacific Asia, Western Europe and North America are highlighted, reflecting the dominance of these two areas in the global service market. In comparison, although China’s economic connections with Africa and Eastern Europe have grown in recent years, only a few cities sharing important service connections with the PRD can be found in these two areas. It is worth noting that most well-connected cities are also the core cities in countries which are the PRD’s major trade partners (GSB, 2011). This implies a close interrelation between international trade and business services, and the key role of core cities in both trade and service networks.

Like the national connections, the global connections of individual cities also show a high similarity. Every city has the strongest connection with Hong Kong, followed by several major global cities like London, New York, Singapore and Tokyo at some distance (see Figure 3.A3 in the appendix of this chapter). This is because minor centres in the PRD are connected with the global service network mainly through several big international firms, whose location choices are quite similar to each other.

### 3.5.3 Cities within networks

The final part compares the relational significance of cities within the service networks through accumulating their connections with other cities at different scales. Figure 3.4 shows that Guangzhou and Shenzhen have maintained their predominance in all regional, national and global networks. Their importance also increases sharply with the upgrading of geographic scales. Clearly, these two cities function as hubs in the regional service networks and in linking the PRD with the wider service markets. It is interesting to observe that, although lagging behind in the absolute number of offices, Shenzhen equals Guangzhou in network connectivity at the regional scale and even slightly surpasses the latter at the national scale. The explanation can be found in Shenzhen’s good performance in banking and insurance, not only in terms of the quantity of offices, but also with respect to their functions within the whole networks. Shenzhen hosts 12 national
headquarters (including foreign firms’ headquarters in China) of banks and insurance firms, much more than Guangzhou which has only two. Since these two sectors are well-distributed regionally and nationally, they help Shenzhen compete with, even surpass, Guangzhou at these two scales. This outcome reflects Shenzhen’s important role as a financial centre in mainland China. The development of financial services is a relatively new phenomenon in China. Instead of being encumbered by a short history, Shenzhen benefits from its newly emerging urban identity and SEZ status. One of the two stock exchanges in mainland China was located here in 1990. This gives Shenzhen significant advantages in attracting financial investments in the PRD. Building on this, Shenzhen has rapidly grown into a major national financial centre, attracting headquarters of several important Chinese financial institutions such as Ping An Insurance (Group) Company and China Merchants Bank. According to ‘Global Financial Centres Index 10’, Shenzhen ranks 25th of all 75 global financial centres and third in mainland China following Shanghai and Beijing. Financial services become a pillar sector in Shenzhen which also play a key role in connecting it with the broader economic system.

Interestingly, Guangzhou regains the ‘First City’ status at the global scale with a clear lead. Advertising and law are the main contributors. Most foreign firms (for law, also firms from Hong Kong) in these two sectors choose to set up their regional offices in Guangzhou, contributing to creating a near monopoly in connecting the region with the global legal and advertising markets. These two sectors should be attracted by Guangzhou’s longstanding significant regional influence and institutional legacies. Guangzhou has been the regional economic, political and cultural centre for more than 2000 years. For a long time, it was the largest port in China and, linked to that, a major gateway to connect the country with the world economy (Xu and Yeh, 2003; Zhang, 2015). Although under challenges (particularly in manufacturing) from other regional cities since the 1980s, it is still the most important regional hub in southern China, performing a coordinating role in commerce and trade. Besides, related to this historical heritage, Guangzhou is also the location of most important regional institutions (e.g. provincial government, justice, court, etc.) and big media groups (e.g. most official media of Guangdong province), which are also very important factors in legal and advertising firms’ locational choices. It can be expected that, Guangzhou’s strategic
role in the regional commercial network and institutional-cultural legacies could be very attractive for foreign advertising and law firms who want to enter the market in southern China.

**Figure 3.4** Network connectivities of the Pearl River Delta at regional, national and global scales

![Network Connectivities Chart](image)

*Note:* Values are calculated as proportions of the value of each primate city.

There is a clear gap between two leading cities and the other ones. The nine cities can be divided into three categories, with Guangzhou and Shenzhen as leaders in
the first tier, Foshan, Dongguan and (to a lesser degree) Zhuhai following in the second, and the other five in the last. Foshan is an important manufacturing centre with a strong local industry based on domestic enterprises. Dongguan, in contrast, is a typical foreign-investment-boosted and export-oriented city. High service connectivities of both cities reflect their robust economic foundations and relatively large markets created by manufacturing activities. Another interesting case is Zhuhai. Although with the smallest population and the second lowest GDP in the PRD, Zhuhai ranks fifth among nine cities at all scales. This is, arguably, related to its SEZ status and geographic proximity to Macao. It also attracts some back-end processing functions in the banking sector. In general, the spatial distribution is more or less in correspondence with cities’ geographic locations spreading from the Guangzhou-Shenzhen axis to the periphery of the PRD.

3.6 Conclusions

This research has examined the intra- and extra-regional service networks of the PRD city-region. It has shown how advanced service activities are being inserted into the regional urban system, and also how a predominantly manufacturing city-region is being reshaped by APS activities and re-connected to the national and global economic systems.

With the rapid growth of APS activities, an emerging service network is taking shape in the PRD. However, unlike manufacturing, which has a more balanced developmental pattern, producer services, prone to strong economies of agglomeration, display a strong bias toward major regional centres. The two core cities, Guangzhou and Shenzhen, act as hubs in the regional service market and in linking the region with the broader service networks. In comparison, other cities function mainly as customers of such services in these networks. On the one hand, this reflects the uneven development created by producer services, ‘leaving nonmetropolitan, and even smaller metropolitan areas, relatively disadvantaged’ (Coffey, 2000, p. 172). On the other, it indicates a top-down developmental trajectory of producer services in the PRD. This is a pattern quite different from the PRD’s early ‘bottom-up’ mode of industrialization and urbanization, which were led by low-end manufacturing industries, but similar to the experience in many Western countries.
Due to the important role of foreign investments in the region, one may expect that the PRD’s global service connections will resemble its FDI pattern. However, this research shows that although some similarities do exist, there are also clear divergences. Hong Kong is the best connected global city with the PRD, but compared with its dominance in channeling FDI into this area, this city’s influence in the service sector is less preponderant. London and New York also show a high level of linkages with the region, monopolizing most global headquarters of large international firms. With only a modest global headquarter function (except in banking), Hong Kong is more like a service intermediary between the PRD (and mainland China) and the global service market. The same pattern can be found in two other important regional FDI sources, Taiwan and Macao. Singapore and Tokyo, instead, appear as major overseas service centres for the PRD in Asia. This pattern reflects the dominance of Western international firms in global services and the concentration of ‘command and control’ functions in a few cities (Sassen, 2011). It also implies that, with remarkable improvements in economic performance, urban infrastructure and labour skills in the past three decades, the PRD cities, mainly Guangzhou and Shenzhen, have also developed their own producer service sectors, which, to some extent, make them possible to link directly with global players and bypass the equivalent facilities available in Hong Kong and Macao (cf. Yeh, 2005). It is, then, rather inappropriate to treat the PRD still as a ‘back-factory’ of Hong Kong.

However, this does not mean that geographic and socio-cultural factors no longer matter. East Asian cities are prominent in the PRD’s external service network, especially compared to their rankings in the GaWC’s world cities assessment (GaWC, 2012). The reason is that, besides large, Western-dominated international firms, there are also many Asian and Chinese firms (now concentrating in financial sectors) operating in the East Asian local market. These emerging service providers tend to choose geographically proximate and culturally similar regions, which already have a long history of intensive economic interactions, as first places to extend overseas business. They thus improve the connections between cities and regions in the East Asian area. Although still smaller, these rapidly growing firms may create a unique East Asian service network and economic space in the future.
The findings also shed light on the processes of globalization and regional development in emerging economies. Firstly, the impacts of globalization can change very quickly. In just three decades, foreign-investment-driven, export-oriented manufacturing has transformed the PRD into the famous ‘workshop of the world’ with a more decentralized regional structure. However, with the region starting to move up the value chain, such balanced developmental pattern already seems to change. High value-added, advanced services activities are much more prone to agglomeration economies. This raises some important questions with both academic and policy relevance. For instance, how can smaller cities which used to benefit from low-end manufacturing break away from their former developmental path, capture the new opportunities in the service-led development and, thereby, avoid the ‘rust belt’ trap appeared in the Western developed countries? How will the long tradition of state intervention in China and many other Asian countries function in this process?

Secondly, cities can follow different routes of development and globalization. Guangzhou, although lagging behind in the last round of low-end manufacturing-led development, starts to regain the leading position in advanced service economies, drawing on its regional centre status and institutional-cultural legacies formed in a long history. Shenzhen, benefiting from its SEZ status, also attracts some high-end service functions and maintains its advantage in the region. These two contrasting cases show how local specific factors can interact with globalization and influence cities’ development in different ways. More in-depth, comparative studies with a special consciousness of historical dependency and contingency are needed to capture cities’ diverse pathways of restructuring in the modern capitalist economy.

Although there are obvious similarities between Western and, in this case, Chinese urban development trajectories, there are also clear differences. The timing, pace, scale and, importantly, complex relationship between the national state, local public authorities, firms and other actors (cf. Jacques, 2012) necessitate at least a recalibration of theories of urban development, if not a more fundamental overhaul. More work has to be done to even be able to sketch the contours of such a new framework.
What is clear on a lower level of abstraction, though, is that the INM, based on the experience of Western countries, in general provides an effective instrument to investigate systematically the inter-cities’ relations in the service economy in the Chinese context. The modeling technique, as testified in this chapter, can be applied at different scales and in different contexts, although some modifications are needed when it focuses on a specific country or region. However, the real challenge lies in the understanding of the underlying mechanism of what comes out of the analysis. Specific to China, one major feature that distinguishes it from western countries is the different institutional environment, especially the state-market relations. As was shown, the spatial pattern of the PRD’s APS networks is not purely driven by market logic. The idiosyncratic performance of Shenzhen in financial sectors has, to a large extent, benefited from its SEZ status designated by the central government in 1979. More generally, a city’s importance in the national service network is not determined completely by sheer economic factors, but also influenced by its position in the national administrative system. Administrative capitals, national or provincial, enjoy more advantages in attracting higher-end APS functions than other cities. Understanding regional development in China also means taking institutions, the state-market relations and even different developmental paths of cities and regions seriously. How these factors work have gone beyond the capability (and focus) of any specific model or technology. To answer these questions, further in-depth, qualitative studies are still needed.
Appendix

Table 3.A1 Growth of the PRD (1979-2010)

<table>
<thead>
<tr>
<th>Year</th>
<th>Permanent population (million)</th>
<th>Employed persons (million)</th>
<th>Industrial output value (RMB billion)</th>
<th>GDP (RMB billion)</th>
<th>GDP per capita (RMB yuan)</th>
<th>FDI actually utilized (USD billion)</th>
<th>Export (USD billion)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>18</td>
<td>9</td>
<td>14</td>
<td>11</td>
<td>621</td>
<td>0.04*</td>
<td>0.49</td>
</tr>
<tr>
<td>2010</td>
<td>56</td>
<td>34</td>
<td>7,210</td>
<td>3,767</td>
<td>67,132</td>
<td>18</td>
<td>432</td>
</tr>
<tr>
<td>% to the national total (2010)</td>
<td>4.1</td>
<td>4.5</td>
<td>10.3</td>
<td>9.3</td>
<td>223.8</td>
<td>17</td>
<td>27.4</td>
</tr>
</tbody>
</table>

Notes:

1. ‘GDP per capita’ is calculated by the authors based on ‘GDP’ and ‘Permanent population’.
2. ‘% to the national total (2010)’ is calculated based on the regional and the national values.
3. Indices in 1979 are calculated by adding up values of individual cities.
4. No data for Zhongshan and Jiangmen.


Table 3.A2 Growth of employment in six producer service sectors in Guangdong (2003-2010)

<table>
<thead>
<tr>
<th>Items</th>
<th>2003</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Employment in six sectors (10000 persons)</td>
<td>241</td>
<td>277</td>
<td>306</td>
<td>336</td>
<td>373</td>
<td>399</td>
<td>424</td>
<td>465</td>
</tr>
<tr>
<td>Share of six sectors in total service employment (%)</td>
<td>19.8</td>
<td>20.8</td>
<td>20.4</td>
<td>20.7</td>
<td>21.8</td>
<td>22.3</td>
<td>22.9</td>
<td>23.8</td>
</tr>
<tr>
<td>Share of six sectors in total employment (%)</td>
<td>5.5</td>
<td>5.9</td>
<td>6.1</td>
<td>6.4</td>
<td>6.9</td>
<td>7.2</td>
<td>7.5</td>
<td>8.1</td>
</tr>
</tbody>
</table>

Table 3.A3 FDI actually realized in six producer service sectors in Guangdong (2006-2010)

<table>
<thead>
<tr>
<th>Items</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2006-2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDI actually realized in six sectors (USD billion)</td>
<td>2.83</td>
<td>5.11</td>
<td>5.44</td>
<td>5.27</td>
<td>5.68</td>
<td>24.33</td>
</tr>
<tr>
<td>Share of six sectors in total FDI in services (%)</td>
<td>80</td>
<td>82</td>
<td>76</td>
<td>70</td>
<td>71</td>
<td>75</td>
</tr>
<tr>
<td>Share of six sectors in total FDI (%)</td>
<td>19</td>
<td>30</td>
<td>28</td>
<td>27</td>
<td>28</td>
<td>27</td>
</tr>
</tbody>
</table>


Figure 3.A1 Changes of the composition of GDP in the PRD (1979-2010)

Sources: Cheng et al., 2004; GSB, 2011.
Figure 3.A2 Top five connected national cities of different cities in the PRD

Figure 3.A3 Top five connected global cities of different cities in the PRD
Notes

1 These six sectors include ‘Transport, Storage and Postal Services’, ‘Information Transmission, Computer Services and Software’, ‘Finance’, ‘Real Estate’, ‘Leasing and Business Services’, ‘Scientific Research, Technical Services and Geological Prospecting’. Undoubtedly, this selection can only partly reflect producer services and may also contain some consumer service activities. However, they are the only available data which at least provide a baseline for evaluating some structural changes in the study area.

2 For a detailed introduction to this model, see Taylor et al. (2004).

3 The INM may not be an appropriate method to study logistics since it is nigh impossible to identify the locations of back-end activities (like storage), which should be at least as important as the front-office functions, of logistics firms from their public information. This may partly explain why logistics is also not included in the GaWC’s work.


5 Hong and Chin (2007) show that in logistics there is a similar concentration of foreign firms in Guangzhou and Shenzhen in the PRD.