The Impact of Core-cities Growth on the Regional Economic Development in China

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China has achieved a remarkable economic growth in the past two decades. However, the rapid economic development has led to regional disparities between the advanced coastal regions and the other regions. Regional development planning in China has sought to achieve the redress of regional disparities as well as a high economic growth. This paper aims to examine the role of core cities in the development of Chinese regional economy and their impact on regional differentials. Following a brief review of regional development planning in China, the paper examines the role of core cities on the regional development and the trends in regional disparities using data for seven coastal provinces (Guangdong, Fujian, Zhejiang, Jiangsu, Shandong, Hebei and Liaoning) and three municipalities (Beijing, Tianjin and Shanghai) in the period 1989-1997. It shows that while the coastal regions achieved a high economic growth, the extent of regional disparities and the contributions of core cities to the reduction of economic differentials varied among provinces. The paper concludes by proposing future issues on regional development planning in China.

**Key words:** regional disparities, core cities, per capita GDP, labor productivity, per capita employment

1. INTRODUCTION

China has a large disparity in terms of economic vitality between the coastal (eastern) and the inland (middle and western) regions. Now the coastal region, which consists of 7 provinces and 3 municipalities, plays an important role in economic development of China (shown as Table I). A rapid growth of core cities and its impact on the development of surrounding regions deserve a great attention. However, the rapid growth has caused an excessive concentration of economic activities and employment in a few core cities in each region. The rest areas have not achieved enough economic growth and have been losing their economic vitality.

On the other hand, the core cities have to cope with the excessive concentration of population and economic activities in order to achieve a sustainable development. The regional development planning in China is now facing a challenge to correct the growing regional disparities.

This paper examines the economic disparities between the core cities and the rest areas in 7 coastal provinces (including 3 municipalities) in terms of per capita GDP, labor productivity and employment for the period 1989-1997. Regional disparities between the core cities and the rest areas in each province are assessed with two elements deduced from per capita GDP, labor productivity and per capita employment. The paper concludes by identifying future issues on the regional development strategies in China emerged from the empirical analysis.
Table 1 Share of area and GDP of coastal provinces and Municipalities (1989, 1997)

<table>
<thead>
<tr>
<th></th>
<th>1989</th>
<th>1997</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Area (sq.km)</td>
<td>%</td>
</tr>
<tr>
<td>China</td>
<td>960,180</td>
<td>100.00</td>
</tr>
<tr>
<td>7 Provinces</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guangdong</td>
<td>177,900</td>
<td>1.85</td>
</tr>
<tr>
<td>Fujian</td>
<td>121,400</td>
<td>1.26</td>
</tr>
<tr>
<td>Zhejiang</td>
<td>101,800</td>
<td>1.06</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>102,600</td>
<td>1.07</td>
</tr>
<tr>
<td>Shandong</td>
<td>156,700</td>
<td>1.63</td>
</tr>
<tr>
<td>Hebei</td>
<td>187,700</td>
<td>1.95</td>
</tr>
<tr>
<td>Liaoning</td>
<td>145,900</td>
<td>1.52</td>
</tr>
<tr>
<td>3 Municipalities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beijing</td>
<td>16,800</td>
<td>0.17</td>
</tr>
<tr>
<td>Tianjin</td>
<td>11,300</td>
<td>0.12</td>
</tr>
<tr>
<td>Shanghai</td>
<td>6,300</td>
<td>0.07</td>
</tr>
<tr>
<td>Total</td>
<td>10,284,00</td>
<td>10.71</td>
</tr>
</tbody>
</table>

2. REGIONAL DEVELOPMENT STRATEGY AFTER THE CHINESE REVOLUTION

In past 50 years, the basic concept of regional development strategies in China switched from the equilibration to the imbalance.

During the first 30 years after the Chinese revolution, the development strategies in China had centered on heavy industries. China was isolated from the rest of the world, especially from the Western countries, and had to emphasize the development of heavy industries to achieve a rapid growth in manufacturing industries. However, the excessive concentration of industries in the coastal region resulted in a serious imbalance of regional economy between the midland and the coastal region. In order to redress the differences and to achieve a balanced regional development, several development strategies were conducted.

The first Five-year Plan (1953–1957) laid emphases on the basic industrial construction in the midland and the relocation of existing industries from the coastal region to the midland.

The second Five-year Plan (1958–1962) divided the whole national area into seven economic cooperation regions. The proportions of investment in the Maritime and the Midwest were 44.1% and 55.9% respectively. The investment in the Midwest was larger than that in the East.

The third Five-year Plan (1966–1970) classified the nation into three regions, considering the national border conditions at that time. It was influenced by the national defense policies. The “Third Front Construction” policy aimed at building military bases strategically. The emphasis of economic development in the Midland, especially in the Southwest, continued in the forth Five-year Plan (1971–1975).

The economic development in the Midland at that time had established a basis for the inland industrialization and calmed the regional conflict by promoting a balanced regional development. However, such policies ignored economic efficiency and eventually proved to be costly. The inland-centered policies could not achieve high economic performance compared with the amount of investment. They hindered the relative speed of economic development in the coastal regions, where the growth potential was greater.

The promotion of heavy industries in the Midland was abolished in the fifth Five-year Plan (1976–1980). The plan was published under the national policy of reform and openness. While the development of national economy was emphasized, the aim of regional policies turned into the economic efficiencies from the former superficial balanced growth. The investments were refocused on the coastal regions instead of the midland. It was a turning point of regional development strategies in China.
For the past two decades, Chinese regional development put emphasis on the effective and rapid economic growth. It was well exemplified by the slogan "giving priority to the efficiency, and considering the fairness at the same time." The policy was adopted in early 1980's, when the sixth Five-year Plan (1981–1985) was presented. The Chinese government promoted the investment in the coastal region to achieve an efficient economic growth. Meanwhile, the Midland was given assistance to reduce regional disparities. From the 1980' "the open coastal cities" and "the separate planning cities" were continuously designated in the coastal region, and became the growth centers in China.

The seventh Five-year Plan (1986–1990) proposed the redress of regional disparities both in the coastal region and in the midland. However, the plan could not achieve its goal in terms of the reduction of regional disparities. Thereupon, a new policy was presented in the eighth Five-year Plan (1991–1995), which stressed the mutual benefit and the collaboration between the coastal region and the midland, such as the open-door policy, the intimate cooperation among regions, the economic assistance to the midland and so on.

In the beginning of 1990s, the coastal region achieved
Fig. 3 Provinces and core cities in coastal region of China
a remarkable economic growth under Deng Xiaoping's "Comments on the Southern Tour" in 1992 (see Fig.1 above). However, it resulted in an expansion of regional disparities in China, as can be seen in Fig.2. The regional development planning in China is now facing a challenge to correct the growing regional disparities.

Under the rapid economic growth in the coastal region since 1978, many cities, especially the open coastal cities and the separate planning cities in the ninth Five-year Plan (1996–2000), achieved rapid economic growth. They have become the growth centers in Chinese regions. The current regional development strategies in China have been accelerating the growth of these cities to promote the development of their surrounding regions.

Following a summary of regional development strategies in China, this paper examines the trends in economic disparities among 7 coastal provinces (including 3 municipalities) for the period 1989-1997. The paper is divided into two parts; the assessment of economic disparities among core cities in coastal provinces, and the examination of disparities between the core cities and the rest areas in each province.

3. ADMINISTRATIVE AREAS IN THE COASTAL REGION OF CHINA

As illustrated in Fig.3, the Coastal (eastern) region defined in this paper includes 7 provinces (Guangdong, Fujian, Zhejiang, Jiangsu, Shandong, Hebei and Liaoning) and 3 municipalities (Beijing, Tianjin and Shanghai). In this paper, Beijing and Tianjin are included in Hebei province, and Shanghai is included in Jiangsu province. The land area is 102,8400 square kilometers and is about 11% of Chinese national land area. The coastal region had a population of some 453 million in 1998, which occupied 36% of total population of China.

Under the Chinese local government system, the province is further divided into three types of areas: the city at prefectural level, the city at county level and the district. Fig.3 illustrates the location of cities at prefectural level. We define the built-up area of each city at prefectural level as "a core city", and the other areas of province as "rest areas".

4. DATA AND METHODOLOGY

4.1 DATA BASE

Data are collected for 88 urban units of the 7 provincial (see Fig.1) from the Urban Statistical Yearbook of China, 1990-1998 (State Statistical Bureau of China 1990-1998), and the Statistical Yearbook of China, the Provincial Statistics Yearbook of China, 1990-1998 (State Statistical Bureau of China 1990-1998).

4.2 METHODOLOGY

The purpose of this study is to explore the economic disparities between the core cities and the rest areas in 7 coastal provinces (including 3 municipalities). The factors of regional differences are examined by calculating two elements deduced from the per capita GDP: the labor productivity and the per capita employment.

First, the weighted coefficient of variation is calculated for core cities in each province to measure the disparities for 1989-1997. The weighted coefficients of variation for the above elements are defined by the following equations:

\[
CV_A = \sqrt{\frac{\sum (Y_p - \bar{Y})^2}{\bar{Y}}}
\]

\[
CV_B = \sqrt{\frac{\sum (E_p - \bar{E})^2}{\bar{E}}}
\]

\[
CV_C = \sqrt{\frac{\sum (E_p - \bar{E})^2}{\bar{E}}}
\]

where,

\(CV_A\) : weighted coefficient of variation on per capita GDP for core cities

\(CV_B\) : weighted coefficient of variation on labor productivity for core cities

\(CV_C\) : weighted coefficient of variation on per capita employment for core cities
Second, three kinds of ratios are defined to measure the disparities between the core cities and the rest areas in each province:

\[ R_A = \frac{Y_c / P_c}{Y_r / P_r} \]  \hspace{1cm} (4)
\[ R_B = \frac{Y_c / E_{nc}}{Y_r / E_{nr}} \]  \hspace{1cm} (5)
\[ R_C = \frac{E_{nc} / P_c}{E_{nr} / P_r} \]  \hspace{1cm} (6)

where

- \( R_A \) : ratio of the core cities to the rest areas on per capita GDP
- \( R_B \) : ratio of the core cities to the rest areas on labor productivity
- \( R_C \) : ratio of the core cities to the rest areas on per capita employment

\[ Y_c \] : total gross domestic product for core cities
\[ P_c \] : total population for core cities
\[ E_{nc} \] : total employed persons for core cities
\[ Y_r \] : gross domestic product in the rest areas
\[ P_r \] : population in the rest areas
\[ E_{nr} \] : employed persons in the rest areas

The influence of two elements (i.e. labor productivity and per capita employment) as determinant factors for per capita GDP is examined by calculating the correlation coefficients among three variables.

Finally, the differentials in industrial structure between the core cities areas and the rest areas of each province are compared to identify the relationship between the economic disparities and the industrial structure.

5. RESULTS AND DISCUSSIONS

5.1 DISPARITIES AMONG CITIES IN COASTAL PROVINCES

Fig 4 illustrates the trends in disparities among core cities in each coastal province. The disparities in Hebei and Jiangsu were low, while it was high in Gangdong. The existence of three large municipalities (Beijing, Tianjin and Shanghai) significantly contributed to accelerate the development of other cities in Hebei and Jiangsu during a long period before 1990s. The disparities among core cities were high in Guangdong, due to the rapid economic growth and the concentration of economic activities into areas around Guangzhou and Shenzhen.

Fig 4 shows that the disparities in per capita GDP had been reduced in Jiangsu, Shandong and Hebei. They are in marked contrast with the trends of Guangdong, Fujian, Zhejiang and Liaoning. The disparities in employment among core cities had shown sharp increases except Jiangsu.

Table 1 represents the coefficients of correlation between three elements of each coastal region. The labor productivity showed a close relationship with the per capita GDP in all coastal provinces.

The disparities in per capita GDP had reduced in Jiangsu and Hebei during the period 1989-1997. They led to the decline of coefficients of correlation between per capita employment and per capita GDP, and between per capita employment and labor productivity.
In Guangdong and Fujian, per capita GDP had shown stable relationships with labor productivity and per capita employment. A sharp increase in disparities of per capita employment was offset by a decline of disparities in labor productivity in core cities.

5.2 CITY-REST DISPARITIES IN COASTAL PROVINCES

As illustrated in Fig.5, the disparities in per capita employment between the core cities and the rest areas
Fig.5 Trends in economic disparities between the core cities and the rest areas in coastal provinces of China

Table 3 Labor productivity of the core cities areas and the rest areas in coastal provinces of China

<table>
<thead>
<tr>
<th></th>
<th>Guangdong</th>
<th>Fujian</th>
<th>Zhejiang</th>
<th>Jiangsu</th>
<th>Shandong</th>
<th>Hebei</th>
<th>Liaoning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core cities</td>
<td>1989</td>
<td>7543</td>
<td>5992</td>
<td>5885</td>
<td>8080</td>
<td>4917</td>
<td>6431</td>
</tr>
<tr>
<td></td>
<td>1997</td>
<td>36119</td>
<td>33839</td>
<td>27232</td>
<td>36836</td>
<td>23083</td>
<td>24625</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>379%</td>
<td>465%</td>
<td>363%</td>
<td>378%</td>
<td>369%</td>
<td>283%</td>
<td>265%</td>
</tr>
<tr>
<td>Rest areas</td>
<td>1989</td>
<td>2945</td>
<td>2590</td>
<td>2640</td>
<td>2762</td>
<td>2271</td>
<td>2101</td>
</tr>
<tr>
<td></td>
<td>1997</td>
<td>12095</td>
<td>14988</td>
<td>14580</td>
<td>15024</td>
<td>11070</td>
<td>9685</td>
</tr>
<tr>
<td>Growth Rate</td>
<td>311%</td>
<td>479%</td>
<td>452%</td>
<td>444%</td>
<td>387%</td>
<td>361%</td>
<td>213%</td>
</tr>
</tbody>
</table>

were stable during the period 1989-1997. The disparities in per capita GDP showed similar trends to those in labor productivity.

Fig.5 shows that the disparities in per capita GDP between core cities areas and rest areas had been reduced in Jiangsu and Hebei. They are in marked contrast with the trends of Guangdong and Liaoning. We think it is because of the different growth rate on labor productivity for core cities areas and rest areas in these provinces, as can be seen in Table 3.

Fig.6 shows the relationship between the labor productivity and the per capita employment in each coastal province. In Jiangsu and Hebei, the levels of labor productivity and per capita employment had been approaching the province average. The trend explains the reason why the city-rest disparities in per capita GDP were reduced during the period. In Fig.6, we also find the rapid increases in per capita employment in Guangdong during 1989-1993 and in Zhejiang during 1993-1997. As shown in Fog.5, during the same period, the city-rest disparities in per capita GDP began to grow. The disparities in per capita employment among core cities greatly increased in two provinces.
5.3 DISPARITIES IN INDUSTRIAL STRUCTURE

There are diversified causes for different trends in economic disparities of coastal provinces, such as market economization, reform of the financial system and the preexisting industrial structure. In this paper, the differentials in industrial structure between the core cities and the rest areas in coastal provinces are compared to identify the relationship between the economic disparities and the industrial structure.

The differentials in industrial structure of coastal provinces have arisen from the natural and geographical conditions, while others come from a certain historical background. However, after 1992, the biases from the reforms and liberalization policies had a significant effect on regional problems in coastal provinces. The development of Guangdong and Fujian benefits from privileges bestowed by the central government, and depends on special outside economies, most notably Hong Kong and Taiwan, where have the close connection with two provinces for geographical and historical reasons.
Fig. 7 Industrial structure of the core cities areas and the rest areas in coastal provinces of China
As can be seen in Fig. 7, the rate of primary industry in core cities of Gangdong had decreased rapidly. It was largely due to the grand scale development of consumer goods processing industries in core cities by foreign capital mainly from Hong Kong and Taiwan. The investors certainly sink capital in areas where have the better economic base and free policy, such as Guangzhou, Shenzhen and surrounding cities. At the same time, however, there were no significant changes in the industrial structure in the rest areas of Gangdong. It led to an excessive concentration of economic activities and employment in core cities and the huge economic disparities between the core cities and the rest areas in Gangdong (see Fig. 5 above). However, in Fujian, which has almost the same policy background and developing mode as Guangdong, the development of secondary industries in the rest areas brought about the reduction of disparities between the core cities and the rest areas (see Fig. 5 above).

A remarkable feature of the industrial structure in Jiangsu and Zhejiang is a high accumulation of secondary industries in the rest areas, a typical model of industrialization in agricultural villages. This model centers on township-owned industries, and mainly depends on domestic markets and capital. It leads to the high labor productivity by rest areas of Jiangsu and Zhejiang among coastal provinces, shown as Table 3. Apparently, it can offer the most far-reaching insights into how the Chinese regional economy will develop in the future to cope with the problem of residue labor out of core cities and to achieve a balanced regional development.

Because of the existence of Beijing, the political center of China, economic development in Hebei is equable both in core cities areas and rest areas. It also can be reflected by the gentle reduction of disparities in regional economy (see Fig. 4 and Fig. 5 above). Although the rate of primary industry in core cities is commensurable high, Shandong shows the same equable economic development in the core cities and the rest areas.

Due to the former important base for heavy industries in China, Liaoning had a high rate of secondary industries in 1989. However, the slow renewal and reclaim of industries forced the labor productivity to remain low in core cities of coastal provinces, as shown in Table 3.

6. CONCLUSIONS

Regional development strategy in China since the reform and openness was the acceptance of temporal regional disparity. Because of the different natural and geographical conditions, certain historical background and biases in the reforms and liberalization policies, coastal provinces show different trends in economic disparities. This paper has examined economic disparities between the core cities and the rest areas in 7 coastal provinces (including 3 municipalities) in terms of per capita GDP, labor productivity and per capita employment for the period 1989-1997. Major findings of the study are summarized as follows:

1) Labor productivity was the main cause for the different trends in per capita GDP disparities between the core cities and the rest areas in coastal provinces. However, with the increase in per capita employment and the degradation of labor productivity, the disparities in per capita GDP were relieved in core cities.

2) Excessive concentration of economic activities and employment in core cities led to the expansion of disparities between the core cities and the rest areas. The development of secondary and tertiary industries in the rest areas is an effective strategy to calm the disparities between the core cities and the rest areas, especially when the regional economy grows rapidly.

China's regional development policies aim at promoting a gradual progress toward the equal prosperity among all Chinese regions. Because of the huge scale of Chinese domestic economy, China should take strategies for promoting the growth of inward-oriented sectors in its economy. Such a strategy will ensure a sustainable growth for China.

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REFERENCES


