

## **Area classification and regional disparities in China: A perspective from 2007-2010**

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**Abstract:** This paper reviewed traditional methods for the spatial distribution of the Chinese regional economic policy's main instruments. It analyzed current situation and main characteristics of the Chinese regional economic development in the new social environments. The author also discussed in detail the new method to analyze the basic situation of the Chinese regional development disparity. Empirical Research with a series of tables of China is drawn to display the latest situation of the Chinese regional development based on the data of China from 2007 to 2010. Finally, conclusions are given for the future of the Chinese regional sustainable and coordinated development strategy and the Chinese geographic space.

### **Introduction**

With rapid development of the world economy and greater regional integration, strategies for regional sustainable and coordinated development has become more and more important. The Chinese government has accordingly developed a regional sustainable and coordinated development strategy to manage regional economies, regulate regional economic behavior and reduce step by step economic development disparities between developed regions and developing. In the European Union (EU), regional policy assumes considerable importance and accounts for more than one-third of the European Union budget. China and the EU however adopt very different approaches to the classification of regions and the definition of eligibility for regional development policy assistance. China defines a small number of macro-regions (Coast, Northeast, Centre and West) whereas the EU operates with much smaller building blocks. The aim of this paper is to consider the implications for the analysis of regional disparities and the implementation of regional policy of the adoption of smaller areas as building blocks.

With this aim in mind, Section 2 reviews the history of Chinese regional economic division and planning, while Section 3 analyzes the main characteristics of China's regional sustainable and coordinated development strategy. In Section 4 and Section 5, a new method of examining the geographical distribution of Chinese regional disparities is examined, and is applied using data from 2007 to 2010 to identify the problem regions of China and reasons for that. The final section concludes with some practical suggestions for the future development of the Chinese regional policy.

### **The History for Chinese Regional Economic Division and Planning**

The Chinese regional sustainable and coordinated development strategy originated from the Chinese regional economic planning and the identification of economic regions. In the 1950s, China was divided into two large areas, the coastal area and the inland area, the former being considered as the developed area and the latter as the developing area. At the beginning of the 1960s, the industrial distribution between the coastal area and the in-land area was so uneven and regional economic development was so unbalanced that the Chinese Central Government decided to further divide the

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whole country into 6 areas to solve the regional problem (the South-western Area, North-western Area, Central China Area, Northern China Area, North-eastern Area and Eastern China Area. In this way, policy resources could be distributed more evenly to these 6 areas. In the 1970s, these 6 areas were further divided into 10 Coordinated Economic Zones to promote the development of local economy. Later, many regional economics experts and specialists advocated different kinds of regional division. With the rapid development of the Chinese economy, different regions became to display different development style and path. In 1987, in the Chinese Seventh-five-year-plan, the Eastern China Area, Central China Area and Western China Area were identified and became the basis for Chinese regional planning and regional policy for over 20 years.

In general, the division of China into economic regions is the main foundation for the selection of policy objectives and the implementation of Chinese regional planning. Before 1985, the division into economic regions was a planned economy mechanism designed to ensure Central Government's concentrated control and the planned direction of the activities of local governments with the aim to meeting the demands of economic planning and national defense. Since 1985, Chinese economic regions are a market economy mechanism. In this period, China began to recognize that there is significant social and economic difference among regions and to realize that balanced development was at least at first unrealistic. As a result a new strategy allowing some regions to get developed and rich first and all regions to realize general and co-development in the end was adopted.

### **Main Characteristics of the Chinese Regional Development Strategy**

At the close of the 20<sup>th</sup> century, the Chinese Central Government tried to promote regional sustainable and coordinated development. Strategies for the Development of Western China, the Revitalization of North-Eastern China and the Rise of Central China were implemented. At the same time, based on an urban agglomeration development strategy, urban zone development planning was designed and put into practice. The current Chinese regional development strategy has paid a great deal of attention to macro multi-province administrative regions and micro-regions within the provinces. This kind of strategy is based on the regional co-operation and is centered on the division into economic regions, especially regions within a province and at a multi-province level. However, much less attention has been paid to the relationship between a coordinated regional development strategy and micro regions. The choice of scale does however directly influence the distribution of policy resources and the efficiency of the regional coordinated development strategy.

The main characteristics of the current Chinese regional coordinated development strategy include the following. First, the Chinese regional coordinated development strategy is based on the current administrative regions' division and is combined with the internal coordinated development of economic regions. The Zhujiang River delta area, the Yangze River delta area, the Huanghe River delta ecological economic zone, the Hengqin Island, the North-eastern area, the Central China area and so on are typical and successful cross-province co-operative regions in China. The Wuhan Metropolitan Zone, the Changsha-Zhuzhou-Xiangtan Metropolitan Zone and the Wanjiang Rivier Metropolitan Zone are typical metropolitan zone of urban coordinated development aiming to formulate the Chinese-style system of scientific urban development system. Some cross-border regions, including the Shan-Gan-Ning revolution area, the Wuling Mountain area and the Qingba Mountain area are typical cross-border mountain areas to promote the low-income cross-border mountain areas' rapid development.

Second, the Chinese regional coordinated development strategy has paid more attention to planning and design at the macro-economic level and paid less attention to the implementation of detailed instruments and policies. The implementation of detailed instruments and policies is the key to ensuring policy efficiency of the regional coordinated strategy and the key to solving the problem of regional economic development in developing areas. It is also the main problem in the implementation of the current Chinese regional coordinated strategy.

Third, the current regional coordinated development strategy has paid close attention to the ways of promoting the healthy and rapid development of the developed areas of China. However, less attention has been paid to the planning regions and developing regions in China. In particular, areas, which are lagging behind and need support from the regional economic policy, cannot be distinguished effectively and the means and ways to solve the development problems of developing regions in the implementation of the regional coordinated strategy are very limited.

### **A new method for the measurement of the Geographical Distribution Chinese Regional Disparities**

The implementation of the Chinese regional coordinated development strategy needs the support of administrative bodies at the local level, so the implementation of the Chinese regional policy should also be based on the current administrative regional division, and on the selection of a certain critical level of the administrative hierarchy.

According to the 1982 Constitution of China, the Chinese administrative system involves in four levels, including central government, provinces (autonomous region and municipality), counties (autonomous counties and cities) and townships (autonomous townships and towns). The provinces are very large area and it is difficult to distinguish problem regions. The townships are too small in area, so it is difficult to realize diffusion effects. The county level is perhaps the best and most reasonable choice for the implementation of a regional development strategy and the basis for the geographical distribution of regional policy resources.

GDP per capita is one index that can represent the basic regional development situation and people's living standards, and can therefore be used as the basic economic index to distinguish problem regions, especially developing regions, which need the financial support from the Chinese regional coordinated development strategy. Meanwhile, considering the convenience of data processing and statistical analysis, EU practice, and the basic situation of China, 75% of the national average GDP per capita can be chosen as the main index to distinguish problem regions.

Government revenue displays the basic financial situation of the government which has a significant impact on the living standards of local people and the construction of basic infrastructure. It is therefore a second indicator that can be used to distinguish problem regions.

Due to the importance of rural-urban differences, the share of agriculture in total output is chosen as a third indicator. A high share implies a limited presence of industry and services and relatively low income per head.

### **Empirical Research : China in 2007-2010**

The most complete recent data is for 2007. Three indicators were used: GDP per capita, government revenue and share of agriculture in output for 2262 counties and cities on the Chinese mainland from the SRIT DRCNET database sponsored by the Development Research Center of the State Council of China. The data for cities surrounded by counties are also included, but for statistical reasons the indicators only computed the city without the surrounding county area.

In 2007 Chinese average GDP per capita was 19524.1 Yuan. 75% of the average GDP per capita was 14643.1 Yuan. Counties and cities with the GDP per capita below 75% of the national average level are defined as problem regions.

Fewer than 60% of counties and cities were classified as problem areas in 10 provinces (Fujian, Hebei, Henan, Jilin, Jiangsu, Liaoning, Inner Mongolia, Shandong, Shanxi (Jin) and Zhejiang). In Zhejiang Province and Shandong province the shares were 11.8% and 26.9% respectively, both of which are below 30% of the total number. The index of Jiangsu Province was 32.3% of the total, which is around 30%. However, in Guizhou Province and Yunnan Province more than 90% of counties and cities were beneath the 75% threshold (97.5% and 91.2% respectively). 150% (29286.15 Yuan), 120% (23428.92 Yuan), 100% (19524.1 Yuan), 75% (14643.075 Yuan) and 60% (11714.46 Yuan) of the

Chinese national average GDP per capita were then chosen as different standards, dividing these 2264 Chinese counties into 6 types of region, shown in Table 1.

Areas below 30% of the national average GDP per capita are widely spread, lying in western China and the cross-border area of south-western part of China (Sichuan, Yunnan, Guizhou, Qinghai, Shanxi, Gansu, Xinjiang Provinces and Tibet), the mountain areas and cross-border areas in the central China and certain areas in the north-eastern part of China

**Table 1 the Division Standards of Different Types of Chinese Regions (2007)**

| The Type of Regions              | The Standards of GDP per capita (Yuan) |
|----------------------------------|--|
| Type 1 Highly developed regions  | >29286.15 (150%)                       |
| Type 2 Normal developed regions  | 23428.92 (120%) – 29286.15 (150%)      |
| Type 3 Ordinary regions          | 19524.1 (100%) – 23428.92 (120%)       |
| Type 4 Normal developing regions | 14643.075 (75%) – 19524.1 (100%)       |
| Type 5 Poor regions              | 11714.46 (60%) – 14643.075 (75%)       |
| Type 6 Seriously poor regions    | <11714.46 (60%)                        |

Resource: SRIT DRCNET sponsored by the Development Research Center of the State Council of China

Government revenue is a very important index to display basic economic situation of the governments at all levels. If the index is not very high or even very low, it shows that local government lacks resources. As a threshold 50% of the national average government revenue (county level) was chosen to distinguish the poor problem regions. The portion of agriculture in total output records the importance of local agriculture. 40% was chosen as a criterion to identify areas dependent on agriculture.

With the help of a Geographic Information System (or GIS), less than 75% of the national average GDP per capita, less than 50% of the national average government revenue and above 40% of output from agriculture were chosen as indicators to identify problem regions.

From the tables and maps, we can clearly distinguish the detailed geographic location of the problem regions within the Chinese mainland. Distinguishing these regions will be very helpful for the government to give guidance for the geographical distribution of future regional policy resources.

With the database we have collected and created, empirical research has been completed as following. We appoint  $\lnnongye\_zhanbi$  as the logarithm of agricultural proportion in 2007,  $\lnrenjun\_yunsuan$  as the logarithm of budget income per capita in 2007,  $\ln gdp2007$ ,  $\ln gdp2008$ ,  $\ln gdp2009$ ,  $\ln gdp2010$  as the logarithm of GDP per capita in 2007, 2008, 2009 and 2010 respectively,  $\_cons$  as the constant term.

**Table 2 OLS Regression Results of China and four Regions in 2007**

|                      | (1)                   | (2)                 | (3)                  | (4)                   | (5)                  |
|----------------------|-----------------------|---------------------|----------------------|-----------------------|----------------------|
|                      | $\ln gdp2007$         | $\ln gdp2007$       | $\ln gdp2007$        | $\ln gdp2007$         | $\ln gdp2007$        |
| $\lnnongye\_zhanbi$  | -0.541***<br>(-33.38) | -0.0778<br>(-1.13)  | -0.280***<br>(-9.87) | -0.649***<br>(-24.92) | -0.160***<br>(-4.58) |
| $\lnrenjun\_yunsuan$ | 0.158***<br>(19.90)   | 0.430***<br>(8.59)  | 0.403***<br>(19.49)  | 0.114***<br>(12.94)   | 0.400***<br>(12.80)  |
| $\_cons$             | 10.01***<br>(119.11)  | 7.129***<br>(14.69) | 7.956***<br>(40.24)  | 10.51***<br>(92.55)   | 7.321***<br>(26.65)  |
| $N$                  | 1935                  | 147                 | 464                  | 833                   | 491                  |
| $R^2$                | 0.591                 | 0.557               | 0.795                | 0.578                 | 0.598                |

$t$  statistics in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Model ( 1 ) is the results for China, model ( 2 )-( 5 ) are the results of the Chinese North-Eastern, the Chinese Eastern, the Chinese Western and the Central China areas respectively. N is the quantity of the observed value. R2 is r-square as the reference.

From the results, we could find from the Table 1 that all the results are significant except 1 result of model (2). It displays that the higher the agricultural proportion, the lower the GDP per capita; the higher the budget income per capita, the higher the GDP per capita. The results of 4 areas of China are similar with the results of the country. The 1 exception result is that the agricultural proportion of the North-eastern Area is not so significant to the GDP per capita. We could not conclude that the lower the agricultural proportion, the higher the GDP per capita. The reason may rely on industrial structure of the area. This area is a typical agricultural area and agriculture is one of the main GDP sectors and one important government financial resources.

We use the data of GDP per capita of China in 2008, 2009, 2010 for further research with the data of 2007 as explanatory variable and hysteresis value as well.

**Table 3 OLS Regression Results of China in 2007-2010**

|                  | (1)<br>lngdp2008      | (2)<br>lngdp2009      | (3)<br>lngdp2010      |
|------------------|-----------------------|-----------------------|-----------------------|
| lnnongye_zhanbi  | -0.547***<br>(-31.62) | -0.508***<br>(-28.57) | -0.460***<br>(-26.09) |
| lnrenjun_yunsuan | 0.152***<br>(18.05)   | 0.161***<br>(18.56)   | 0.161***<br>(18.96)   |
| _cons            | 10.24***<br>(114.64)  | 10.20***<br>(110.88)  | 10.22***<br>(113.04)  |
| N                | 1815                  | 1815                  | 1798                  |
| R <sup>2</sup>   | 0.573                 | 0.545                 | 0.516                 |

t statistics in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

All the results are significant. It shows that we could basically avoid the influence of the data's endophytism.

We use the data of the 4 Chinese regions in 2009 to complete OLS recession research and get table 4.

**Table 4 OLS Regression Results of four Regions in 2009**

|                  | (1)<br>lngdp2009    | (2)<br>lngdp2009     | (3)<br>lngdp2009      | (4)<br>lngdp2009    |
|------------------|---------------------|----------------------|-----------------------|---------------------|
| lnnongye_zhanbi  | 0.0506<br>(0.68)    | -0.148***<br>(-4.68) | -0.704***<br>(-24.16) | -0.0362<br>(-0.95)  |
| lnrenjun_yunsuan | 0.516***<br>(8.84)  | 0.474***<br>(20.48)  | 0.110***<br>(11.50)   | 0.471***<br>(13.82) |
| _cons            | 6.565***<br>(11.94) | 7.404***<br>(33.48)  | 11.04***<br>(87.47)   | 6.829***<br>(22.82) |
| N                | 105                 | 464                  | 758                   | 488                 |
| R <sup>2</sup>   | 0.599               | 0.747                | 0.575                 | 0.535               |

t statistics in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Model (1), (2), (3) and (4) are the regression results of the Chinese North-eastern area, the Chinese Eastern Area, the Chinese Western Area and the Central China Area. From the results, we find that the agricultural proportions of the Chinese North-eastern Area and the Central China Area are not significant to GDP per capita. We could not conclude that the higher the agricultural proportion of the 2 regions, the lower the GDP per capita. The reason is that both regions are important planting areas of China and the agriculture is one of the most important sectors in the history and in the new blueprint.

Finally, we divided the data of all the counties in 2009 into 2 groups and get table 6. Model (1) is the counties with lower GDP and Model (2) is the counties with higher GDP

**Table 5 OLS Regression Results of 2 groups in 2009**

|                       | (1)                  | (2)                   |
|-----------------------|----------------------|-----------------------|
|                       | lngdp2009            | lngdp2009             |
| lnnongye_zhanbi       | -0.185***<br>(-7.05) | -0.304***<br>(-15.01) |
| lnrenjun_yunsuan      | 0.0706***<br>(9.65)  | 0.149***<br>(11.34)   |
| _cons                 | 9.310***<br>(88.87)  | 9.965***<br>(80.93)   |
| <i>N</i>              | 904                  | 904                   |
| <i>R</i> <sup>2</sup> | 0.161                | 0.426                 |

*t* statistics in parentheses

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

From the results, we get the same conclusions. The higher the GDP per capita of the county is, the higher the negative influence of the agricultural proportion's increase to the GDP per capita will be. The higher the GDP per capita of the county is, the higher the positive influence of the budget income per capita to the GDP per capita will be.

From our empirical research based on the data of china, 4 regions and 2 groups in 2007- 2010, we get the conclusion that from the national scope, the higher the agricultural proportion is, the lower the GDP per capita will be; the higher the budget income is, the higher GDP per capita will be.

## Conclusions

From the data collected and analyzed, we find that geographical disparities in Chinese regional economic development are still significant both between and within provinces. The main reasons for these regions' economic problem are related to industrial structure and government budget income. To solve the Chinese regional problems, the government could start from 3 aspects.

First, the central government could relocate the regional policy resources based on the different situation of different governments and pay more attention to the problem regions distinguished in this paper that suffer from low GDP per capita, low government revenue and strong dependence on agriculture. The government could help readjust the industrial structure and promote the rapid development of manufacturing industry and service industry to realize the modernization of industrial structure.

Second, the government could distribute policy resources using the principles of scientific project selection and realize the scientific project management. Projects are an important way to help solve the problem of the poor developing regions. Government supported projects could be carefully designed to solve different regional problems, such as poor basic infrastructure (including transport and communications), a lagging industrial and service sector and a low-level of public services. All projects of these kinds should be opened to application from all local government. Based on the scientific

selection standards and reasonable procedures, some local governments should be approved and secure government financial support.

Finally, the relevant departments of the government could set up a comprehensive system to collect basic regional data, construct the basic regional database, analyze the resulting data and produce professional maps and tables with the help of computer database technique, statistical analysis software and GIS. With this kind of system the government could realize scientific decision-making using the latest data and analysis.

### **Reference :**

- [1] Norbert Vanhove: *Regional Policy: A European Approach (Third Edition)* (Ashgate Publishing Ltd., 1999).
- [2] John Bachtler and Ivan Turok: *the Coherence of EU Regional Policy, Contrasting Perspective on the Structural Funds* (Jessica Kingsley, 1997).
- [3] R. H. Williams: *European Union Spatial Policy and Planning* (Paul Chapman Publishing Ltd., London 1996).
- [4] Z. Hajdu and G. Horvath: *European Challenges and Hungarian Responses in Regional Policy* (Pecs., 1994)
- [5] Zhang Keyun.: *Regional Economic Policy* (The Commercial Press, Beijing 2005).
- [6] Hou Jinxin, Pu Shanxin and Xiang Jincheng: *Administrative Division and Regional Planning* (China Renmin University Press, 2006).
- [7] Sun Jiuwen: *Regional Economic Planning* (The Commercial Press, Beijing 2004).
- [8] Chen Xuanqing and Zhang Keyun: *The Study on the Strategic Problems and Policy of the Regional Coordinated Development* (China Market Press, Beijing 2007).
- [9] Li Ming: *The Regional Policy of the EU and its Inspiration for the Development of Central China Area* (Wuhan University Press, Wuhan. 2010).
- [10] Liu Zaixing: *Problems of the Comprehensive Economic Regional Division. Economic Theory and Economic Management*, 1985( 6)
- [11] Chen Dongsheng: *Problems of the Productive Power Location of China. Productive Power Location and Land Planning*, 1986 (4).
- [12] Li Ming: *Problems in the Regional Economic Policy System of China. Macroeconomic Management*, 2010(10).