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# CHINA'S REGIONAL INEQUALITY
# AND THE RELATED POLICIES:
# A MICRO-ECONOMIC APPROACH

by

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# ABSTRACT

The paper develops a micro-economic approach to study the reasons for China's regional inequality and the related policies. Through an econometric estimation, it is shown that the great regional inequality in current China is related to the high disparities in investment between the provincial capital, in population growth and in relative price indices. It is argued that the regional inequality can be reduced in the future by means of an adjustment of China's coastal-favorite regional development strategy, by relaxation of strict regulations of inter-regional migration, and by driving further forward the transformation towards a nurtured market economic system in China.

# CHINA'S REGIONAL INEQUALITY AND THE RELATED

# POLICIES: A MICRO-ECONOMIC APPROACH [1]

## 1. INTRODUCTION

In the past fifteen years, owing to the reforms and open-door policy adopted by the Chinese government, the Chinese economy has achieved a remarkable growth. Recently, as the reform pace towards a market economy is accelerated, much more foreign capital has been attracted to be invested in the country, and the growth rate of China's gross domestic product (GDP) has reached 12.8% and 13.4 % for 1992 and 1993 respectively. Alongside the rapid national economic growth, however, some socio-economic problems such as the regional inequality are also becoming more serious than before, which have drawn attention from people with interests in China's economy.

To see the changes in China's regional inequality under the reforms and open-door policy, we plotted in Fig.1 the standard deviation and the coefficient of variation of GDP per capita for all the thirty provinces in China from 1978 to 1992, [2] based on the data published by China's State Statistical Bureau. From this figure, it can be observed that the absolute dispersion, represented by the standard deviation, is expanding continually during the whole period, whereas the relative dispersion, revealed by the coefficient of variation, shows a substantial decline until 1990 but a turning to rising recently. By comparing the present situation to that in the pre-reform era, we may be able to say that the regional inequality has been reduced to some extent, but it can not denied that since 1990, there has turned out to be an obviously expanding tendency in the regional inequality to which we should pay much attention. As the regional inequality would also make the society to be instable, we need to find an insightful explanation and to propose some effective policies for solving the problem.

> Fig. 1 is about here

Concerning China's regional inequality, because of the lack of data, there seem to have been very few scientific research works until recently. Based on the data newly published by the Chinese government, Lyons (1991), Tsui (1991, 1993) and Yang (1990), among others, examined the inter-provincial disparities in China from the early 1950s to the late 1980s. In these works, a great deal of attention has been paid to how the disparities have been changing in the long run, and how the regional inequalities could be explained by means of their intra-regional and industrial components. Most of their

findings seem to be related with the macro-economic relationship between production, consumption, and industrial structures. With this view, it seems that we still can not be sure of what accounts for the current changes in China's regional inequality in terms of the micro-economic factors, and of what we should do to improve the present economic system for narrowing the regional inequality. The reason why we emphasize the current changes in China is that China is now in a drastic transition from a traditional planned economy to a market economy. Hence, many explanations for regional inequality in the pre-reform era before the early 1980s may probably become no longer useful for the post reform period. Moreover, since the Chinese economic system is changing not only at the macro-level but also at the basic micro-level, we argue that China's regional inequality should be explained in terms of micro-economic factors, such as capital investment, population growth, and the development of price system. As long as the reforms and open-door policy are in the direction towards a market economy, the relation between the market mechanism and regional inequality will become more and more important. If we can understand the relationship, we may be able to propose reasonable and practical measures to reduce the regional inequality in China.

By taking the aforementioned points into consideration, the purpose of this paper is to explain the current China's regional inequality through examining the behavior of some micro-economic factors in China, and to shed light on the designing of policies to reduce the regional inequality in the long run. In the paper, regional inequality will be represented by the dispersion in provincial GDP per capita, which is shown to be the function of capital investment, population and the relative price indices of each province. Based on an empirical investigation, it will be shown that an increase in capital investment and price indices or a decrease in population would cause GDP per capita to rise. Hence, higher disparities in regional capital investment, population growth and price indices would result in greater regional inequality. To narrow China's regional inequality in the future, it is suggested to adjust the allocation pattern of capital investment among provinces, and to relax the regulation of inter-provincial migration to some extent. At the same time, the establishment of a complete market economic system would help to equalize the inter-provincial relative price indices, and then reduce the regional inequality ultimately.

The paper is organized as follows. In Section 2, a simple micro-economic model will be presented to describe the provincial GDP per capita in China. The model will be empirically verified by using the provincial data in Section 3, and its interpretations and implications will be discussed in Section 4. Finally, Section 5 will conclude the paper and suggest some directions to extend the present work.

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## 2. MODELING REGIONAL INEQUALITY

In this paper, we shall use the provincial GDP per capita to express the regional inequality in China. Using the standard micro-economic theory, we can suppose that GDP in each province is produced through a production technology that uses capital, labor and some intermediate good as inputs. So the production function of the provincial GDP can be defined as follows,

$$Y = AK^{\alpha}L^{\beta}S^{\gamma}, \tag{1}$$

where $Y$ is GDP, $K$ is capital, $L$ is labor, $S$ is intermediate good, $A$ is positive constant, and, $\alpha$, $\beta$ and $\gamma$ are also positive parameters but less than one.

Next, let us consider the behavior of economic agents in contemporary China. As the reforms and open-door policy are progressing furthermore, the Chinese economic system has become more and more market-oriented, and the economic agents have begun to behave so as to maximize their profits or benefits in determining what and how many to consume. So, it seems reasonable to suppose that from the early 1980s the provinces in China are behaving so as to maximize the profit under the constraint of their production functions.

On the other hand, however, as the history of China's reforms and open-door policy are only fifteen years that is short compared to the period of traditional planned economy from 1949 to 1977, the current Chinese economic system still remains as before in many fundamental aspects. For instance, the systems of financial and labor markets have not been developed to a satisfactory extent, and most local economic agents do not have sufficient authority and opportunities to determine how much to invest and how many people to employ. What they can decide most freely, at present, is probably how many intermediate goods or services to consume, and how much output to produce. By taking these present institutional constraints into account, the maximization of profit, denoted as $\pi$, for each province can be written as follows,

$$\max \ \pi = pAK^{\alpha}L^{\beta}S^{\gamma} - rK - wL - qS, \tag{2}$$
$$\text{w.r.t.} \ S$$

where $p$ is price of product, $r$ is rent of capital, $w$ is wage of labor, $q$ is price of the intermediate good. Here, $K$ and $L$ are considered as given in the maximization.

Solving the above maximization problem, we can get the demand function for the intermediate good as,

$$S = (A\gamma)^{\frac{1}{1-\gamma}} K^{\frac{\alpha}{1-\gamma}} L^{\frac{\beta}{1-\gamma}} (p/q)^{\frac{1}{1-\gamma}}. \tag{3}$$

Substitution of (3) into (1) gives the following expression of GDP,

$$Y = (A\gamma^\gamma)^{\frac{1}{1-\gamma}} K^{\frac{\alpha}{1-\gamma}} L^{\frac{\beta}{1-\gamma}} (p/q)^{\frac{\gamma}{1-\gamma}}, \tag{4}$$

and the per capita GDP, denoted as y, can be obtained by,

$$y = \frac{Y}{L} = (A\gamma^\gamma)^{\frac{1}{1-\gamma}} K^{\frac{\alpha}{1-\gamma}} L^{\frac{\beta+\gamma-1}{1-\gamma}} (p/q)^{\frac{\gamma}{1-\gamma}}. \tag{5}$$

As a result, we have got an expression of the provincial GDP per capita, which seems meaningful especially for contemporary China that is in the transition from a traditional planned economy to a market economy. As this expression describes, the per capita GDP depends upon the inputs of capital and labor, and the relative price of products. It can be easily confirmed that an increase in capital investment would make per capita GDP to rise, but the effect of the increase in labor on per capita GDP is ambiguous. More importantly and interestingly, the price system would also play a role in the determination of GDP per capita. That is, if a region can realize a higher price for its products, it will have a greater GDP per capita for its residents. If these statements could be empirically proven, we would be able to explain the regional inequality through examining the disparities in capital investment, population growth, and the present state of the price system in China.

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## 3. EMPIRICAL VERIFICATION

In this section, we shall provide an econometric estimation for the relation between the provincial GDP per capita on one hand, and capital, labor and price indices on the other hand, by using the provincial data in China published by the Chinese government.

To begin with, let us take a log-linear form for equation (5) and express the equation to be estimated as follows,

$$\ln y = \frac{1}{1-\gamma}\ln A + \frac{\gamma}{1-\gamma}\ln \gamma + \frac{\alpha}{1-\gamma}\ln K + \frac{\beta+\gamma-1}{1-\gamma}\ln L + \frac{\gamma}{1-\gamma}\ln(p/q) + u, \quad (6)$$

where $u$ is a normally distributed error term with zero mean and constant variance. If we define the following parameters,

$$a \equiv \frac{1}{1-\gamma}\ln A + \frac{\gamma}{1-\gamma}\ln \gamma, \qquad (7)$$

$$b \equiv \frac{\alpha}{1-\gamma}, \qquad (8)$$

$$c \equiv \frac{\beta+\gamma-1}{1-\gamma}, \qquad (9)$$

$$d \equiv \frac{\gamma}{1-\gamma}, \qquad (10)$$

equation (6) can be rewritten as,

$$\ln y = a + b\ln K + c\ln L + d\ln(p/q) + u, \qquad (11)$$

whose parameters can be estimated through any standard regression procedure, say ordinary least squares (OLS).

In estimation, we are restricted to provincial data from 1985 to 1992 because of data limitations. For capita, the data on the total investment amounts in fixed assets by province are used, which include the investment by the state-owned and collective-owned organizations, and by private individuals. For labor, we use data on the total population by province. And for the relative price indices, we use data on the free market price indices by province as a proxy. These data signal the relative prices in the agricultural and consumer goods markets in different provinces.

The results of estimation by OLS for each year and the period of 1985 to 1992 are given in Table 1. From the table, we can see without surprise that the effect of the increase in capital investment on GDP per capita is estimated to be plus with high significance (parameter $b$). But it is also significantly estimated that when the provincial population increases, GDP per capita will be forced to fall (parameter $c$). This may be because the regional economies in China have only reached the stage of relatively small increasing returns to scale, where in case of an increase in population, the output would

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increase by a greater proportion but the per capita output would increase by a less proportion.[3] Hence the increasing of population would cut down the provincial GDP per capita. Finally, concerning the effect of relative price indices on GDP per capita, we found that the estimation results of all the samples except 1989 show a positive sign (parameter $d$). The statistical significance for the estimation varies between years. But the t-value for the pooled case of 1985 to 1992 is sufficiently high, so we could conclude that the relative price indices realized in each province seem to have positively affected the provincial GDP per capita during the period. That is, the higher prices the regional market could realize, the higher the regional GDP per capita would be. This statement seems particularly appropriate for contemporary China, since, in the country, a functional market economic system has not been completely established, and there still exist such phenomena that prices of even the same commodities differ considerably by province.

Table 1 is about here

# 4. INTERPRETATIONS AND IMPLICATIONS

In the last section, it has been shown that the provincial GDP per capita in China is affected by capital investment, population growth, and the relative price indices in each province. Based on this empirical result, we can infer that the dispersion in these factors would result in the disparity in the provincial GDP per capita, and then bring about the regional inequality. In this section, we shall provide some evidence to discuss the causes of China's regional inequality and to suggest some related policies for the problem.

*Allocation of Capital Investment and Regional Development Strategy*

First of all, let us look at the current allocation pattern of capital investment in China. Table 2 depicts China's population, area, total investment in fixed assets, and foreign direct investment by province in 1992. The provinces are divided into three regions: coastal, central and western, which are frequently used in studying China's regional economies. It can be seen that although the coastal region only accounts for 41% of national total population and 14% of total area, it has received 62% of total investment in fixed assets and has attracted 91% of foreign direct investment to its territory. In contrast, the central and western regions have been allocated only a very small share of investment despite their vast area and numerous population. This unequal allocation of capital investment undoubtedly leads to the high disparity in the provincial GDP per capita and, hence to the significant regional inequality in the current China.

> Table 2 is about here

Such an unequal allocation of capital investment is mainly the consequence of the uneven regional development strategy adopted by the Chinese government since the reforms and open-door policy started in the late 1970s. Before then, for the consideration of national defense under the Cold War, most social capital had been invested in the western and central regions which are in the interior of China far from the coast. But, as the reforms and open-door policy basically aim at raising the economic efficiency of the whole country, the regional emphasis has been gradually shifted to the coastal region because of its comparative advantages, and a number of important development policies that favor the coastal region have been proposed and put into practice. Among them, the ones most worth being mentioned are the foundation of four Special Economic Zones in south-eastern China in 1980, the adoption of the Coastal Regional Development Strategy in 1988, and the decision to develop the Pudong New Area of Shanghai as China's national project in 1990.

It should be noted that these coastal region favoring development policies do have brought about a high economic growth for the coastal region and then for the whole country. But at the same time, it can not be denied that they also have widened the regional inequality of productivity and welfare between the coastal and the other regions. So, to narrow this regional inequality, one conceivable solution is to adjust the aforementioned uneven regional development policies and to allocate the capital investment among provinces much more equally.

*Effect of Population Growth and Population Policies*

Since, as the estimation result has suggested in the last section, the regional population in China is inversely related to the provincial GDP per capita, the disparity of GDP per capita could be partially explained by the difference in the population growth between provinces.

Table 3 presents the natural and social increase rates of China's population by province between 1980 and 1990. From the table, it can be found that the increase of population varies greatly between provinces. For example, the crude natural increase rates range from 5 to about 20 ‰, in which provinces in the coastal region show a relatively low rate, whereas the rates of the western and central regions are rather high. The same tendency can be found in the net-migration rate, i.e., while most coastal provinces have positive net-migration rates, nearly all of the western and central regions suffer an outflow of people. Furthermore, to see the reasons for the dispersion in the natural increase rates, we can realize that since the crude death rates do not vary considerably, the dispersion is mainly caused by the difference in the crude birth rates. The crude birth rates of many provinces in the coastal region are below the national average, but those of most provinces in other regions are higher. So, to make the GDP per capita in the western and central regions to increase, we may need to pay much attention to controlling of the natural increase in population of these regions.

| Table 3 is about here |
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On the other hand, by comparing the average internal migration rates in China and countries with market economies, we find that China has a very low rate (about 6 ‰ during 1982 to 1987) compared with the other countries. For instance, the rate of inter-regional migration in Japan during the same period was about 50 ‰, nearly ten times of China's! The reason for the low inter-provincial mobility in China is that for more than 40

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years, migration within the country has been strictly controlled by the government through a family registration system. Under such a system, people who have registered at one place are not permitted in principle to move to live in other areas. Anyone who moves to other places without permission would not be given an equal opportunity of education, employment and other social welfare compared with the local registered residents. It is clear that such a strict regulation of migration would lead to a situation where migration can not effectively play the role of equalizing the welfare per capita among regions as in the market economic countries. So, from the view of narrowing regional inequality, we suggest to reconsider the existing migration-controlling system in China. In particular, we propose to partially relax the regulation on the migration in some coastal provinces, except for some large cities like Shanghai and Beijing because the net in-migration rates there have already been rather high.

*Operation of Market Mechanism and Transformation towards Market Economy*

Now let us see the effect of China's economic system on the regional inequality. As the simple econometric model has shown, the relative price indices by province positively affect the provincial GDP per capita in contemporary China. It seems plausible that a high dispersion in the relative price indices would result in the great variation in the per capita GDP.

Table 4 shows the relative price indices in the local markets of different provinces in 1985 and 1992. The maximum difference among the price indices has declined from 46 to 24 percentage points during the period, but the price indices still vary considerably between provinces. Though it may not be appropriate to compare the situations in China and in Japan, it should be noted that the maximum difference between regions of average consumer good prices in Japan in 1992 was about 17 percentage points.

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Table 4 is about here
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The great regional difference in the relative price indices in China may be due to many reasons such as the vast territory of the country, and the poor conditions of the transportation and communication systems. But the present incompletion of the transformation from the centralized economy to the decentralized economy is probably one of the most important reasons. For this point, Table 5 provides some detailed evidence concerning the change of China's price-determining system in the last decade. In 1978 when the reforms and open-door policy started, the prices of nearly all the agricultural, industrial and consumer goods were determined by the government. As the

reforms are progressing, the percentage of goods whose prices are determined by the government has been lowered, and the percentage of those goods whose prices are adjusted by the government or wholly based on the market has increased gradually. However, in 1991 there still remained 22% of agricultural goods, 36% of industrial goods and 21% of consumer goods whose prices were under the control of the government. It is reasonable to point out that too much government intervention would cause the goods to move not so freely across the country, and then make the relative price indices differ greatly between regions. In this sense, to narrow the regional inequality in contemporary China, we need to expect much more advances in the transformation towards a mature market economy. The experience in Japan and other developed countries have suggested that the regional inequality would ultimately be reduced to some acceptable extent when the market economic system has been established completely.

| Table 5 is about here |
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# 5. CONCLUDING REMARKS

In this paper, we developed a simple micro-economic approach to show the reasons of regional inequality in contemporary China, and proposed some conceivable policies to solve the problem based on the empirical investigation. It has been estimated that an increase in capital investment and in the relative price indices, or a decrease in population would raise the level of provincial GDP per capita. The most important implication of this estimation result is that the higher disparities in the provincial capital investment, population growth and the relative price indices would result in the greater regional inequality. In the paper, we also provided some evidence of these disparities in contemporary China, and concluded that to narrow China's regional inequality, we need to adjust the existing coastal-favoring regional development policies, to reasonably and effectively control the natural increase of population in the western and central regions, and to partially relax the regulation of the inter-regional migration. And last but not least, in the sense of reducing the regional inequality ultimately, we should drive further forward the transformation towards a mature market economy in China.

This study can be considered as the first step towards studying China's regional inequality by using the micro-economic theory. There seems to be many related subjects awaiting further research. For example, in this paper the regional inequality was measured by the provincial GDP per capita, which is a little different from per capita income. Through investigation of the regional distribution of income per capita, we may be able to find some relation between China's welfare allocation system and the regional inequality. Another interesting subject we need to work on in the future is to what extent the regional inequality could be accepted. This is because that the regional inequality seems to have a trade-off relationship with the economic efficiency of the whole country. [See Mera (1967) and Sakashita and Kamoike (1973)] So, it is important for the Chinese economy to realize a balanced development stage in which we could make the whole economy to grow continually while keeping the regional inequality within the publicly acceptable extent at the same time.

# REFERENCES

Institute of Developing Economies, *Population Policy and Vital Statistics in China*. Tokyo: Institute of Developing Economies, I.D.E. Statistical Data Series No.56. 1991.

Lyons, Thomas, "Interprovincial Disparity in China: Output and Consumption, 1952-1987." *Economic Development and Cultural Change* 39: 471-506, 1991.

Mera, Koichi, "Trade-off between Aggregate Efficiency and Inter-regional Equity: A Static Analysis." *Quarterly Journal of Economics* 81: 658-674, 1967.

Sakashita, Noboru, and Kamoike, Osamu, "National Growth and Regional Income Inequality: A Consistent Model." *International Economic Review* 14: 372-382, 1973.

State Statistical Bureau, *Zhongguo Tongji Nianjian [Chinese Statistical Yearbook]*. Beijing: Zhongguo Tongji Chubanshe [Chinese Statistics Press], 1985-1993.

State Statistical Bureau, *Quanguo Gesheng Zizhiqu Zhixiashi Lishi Tongji Ziliao Huibian: 1949-1989 [A Collection of China's Provincial Statistics: 1949-1989]*. Beijing: Zhongguo Tongji Chubanshe [Chinese Statistics Press], 1990.

The Editorial Board of the Almanac of China's Foreign Economic Relations and Trade, *The Almanac of China's Foreign Economic Relations and Trade*. Beijing: China Prospect Publishing House, 1985-1993.

Tsui, Kai-yuen, "China's Regional Inequality, 1952-1985." *Journal of Comparative Economics* 15: 1-21, 1991.

Tsui, Kai-yuen, "Decomposition of China's Regional Inequalities." *Journal of Comparative Economics* 17: 600-627, 1993.

Yang, Dali, "Patterns of China's Regional Development Strategy." *China Quarterly* 122: 231-257, 1990.

## FOOTNOTES

1. The author wishes to thank Professor Jacques Poot for his useful comments. The financial support from the University of Tsukuba Research Projects Fund is gratefully acknowledged.

2. Let $y_i$ represent GDP per capita in province $i$ ( $i = 1, 2, ..., n$ ), and $y$ the mean of the provincial GDP per capita. The standard deviation *(sd)* and the coefficient of variation *(cv)* of GDP per capita can be defined as follows,

$$sd = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(y_i - \bar{y})^2}, \qquad cv = \frac{sd}{\bar{y}}.$$

3. In fact, for the case of 1985-1992 period the parameters in (1) are calculated as follows, $A = 391.940$, $\alpha = 0.632$, $\beta = 0.201$, $\gamma = 0.251$. So $\alpha + \beta + \gamma = 1.084$, which implies the production function has relatively small increasing returns to scale.
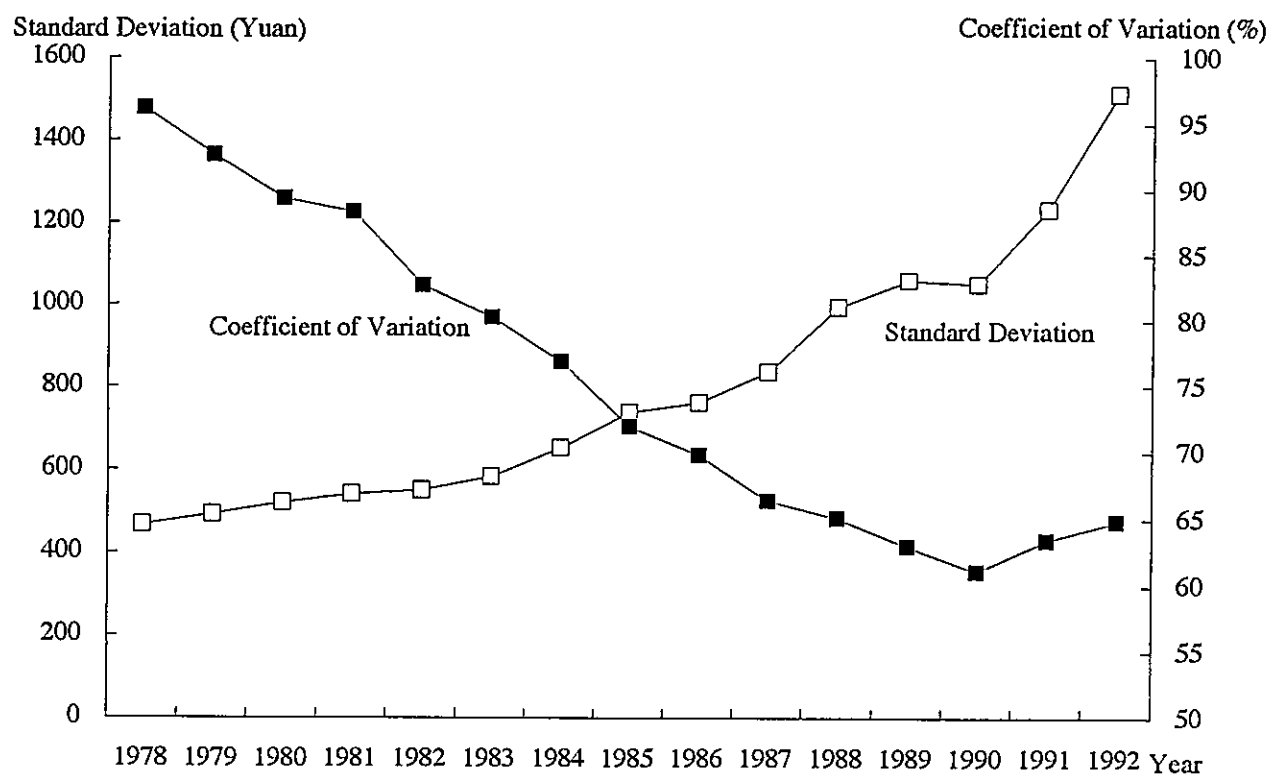
Fig. 1. Standard deviation and coefficient of variation of provincial GDP per capita

## TABLE 1
RESULTS OF ESTIMATION:  $( ln\ y = a + b\ ln\ K + c\ ln\ L + d\ ln\ (p/q) + u )$

| Sample | Sample Number | a | b | c | d | Adjusted R-Square |
|--------|---------------|-----|-----|-----|-----|-------------------|
| 1985 | 27 | 7.585 | 0.955 (14.117) | -0.800 (-14.617) | 0.309 (1.102) | 0.903 |
| 1986 | 28 | 8.452 | 0.870 (15.698) | -0.765 (-15.836) | 0.140 (0.358) | 0.916 |
| 1987 | 28 | 6.518 | 0.843 (18.036) | -0.731 (-17.882) | 0.523 (1.816) | 0.935 |
| 1988 | 28 | 8.710 | 0.800 (19.119) | -0.738 (-18.491) | 0.116 (0.354) | 0.941 |
| 1989 | 29 | 9.755 | 0.751 (17.804) | -0.692 (-16.473) | -0.099 (-0.229) | 0.928 |
| 1990 | 29 | 8.778 | 0.748 (15.765) | -0.650 (-14.395) | 0.047 (0.096) | 0.919 |
| 1991 | 28 | 6.382 | 0.765 (15.670) | -0.672 (-15.256) | 0.577 (1.381) | 0.926 |
| 1992 | 29 | 7.217 | 0.764 (16.083) | -0.670 (-14.714) | 0.380 (0.850) | 0.915 |
| 1985-92 | 226 | 7.508 | 0.843 (45.364) | -0.732 (-40.217) | 0.335 (2.246) | 0.910 |

Note. Figures in parentheses are associated t values.

TABLE 2

POPULATION, AREA AND INVESTMENT BY REGION (1992)

| | Population | | Area | | Total Investment in Fixed Assets | | Foreign Direct Investment | |
|---|---|---|---|---|---|---|---|---|
| | (million) | (% of total) | (10 thousand km2) | (% of total) | (100 million yuan) | (% of total) | (100 million dollar) | (% of total) |
| National Total | 1165.7 | 100.00 | 963.4 | 100.00 | 7575.6 | 100.00 | 107.2 | 100.00 |
| Coastal Region | | | | | | | | |
| Beijing | 11.0 | 0.95 | 1.7 | 0.17 | 263.4 | 3.48 | 3.5 | 3.26 |
| Tianjin | 9.2 | 0.79 | 1.1 | 0.12 | 174.4 | 2.30 | 1.1 | 1.00 |
| Hebei | 62.8 | 5.38 | 18.8 | 1.95 | 322.2 | 4.25 | 1.1 | 1.03 |
| Lianing | 40.2 | 3.45 | 14.6 | 1.51 | 431.0 | 5.69 | 4.9 | 4.57 |
| Shanghai | 13.5 | 1.15 | 0.6 | 0.07 | 356.4 | 4.70 | 4.8 | 4.49 |
| Jiangsu | 69.1 | 5.93 | 10.3 | 1.07 | 740.3 | 9.77 | 14.6 | 13.62 |
| Zhejiang | 42.4 | 3.63 | 10.2 | 1.06 | 443.8 | 5.86 | 2.3 | 2.17 |
| Fujian | 31.2 | 2.67 | 12.4 | 1.29 | 194.7 | 2.57 | 14.2 | 13.21 |
| Shandong | 86.1 | 7.39 | 15.7 | 1.63 | 597.6 | 7.89 | 9.7 | 9.08 |
| Guangdong | 65.3 | 5.60 | 21.2 | 2.20 | 938.5 | 12.39 | 35.5 | 33.12 |
| Guangxi | 43.8 | 3.76 | 23.7 | 2.46 | 140.2 | 1.85 | 1.8 | 1.66 |
| Hainan | 6.9 | 0.59 | 3.4 | 0.35 | 87.0 | 1.15 | 4.5 | 4.22 |
| Sub-total | 481.2 | 41.28 | 133.6 | 13.86 | 4689.6 | 61.90 | 98.0 | 91.41 |
| Central Region | | | | | | | | |
| Shanxi | 29.8 | 2.56 | 15.6 | 1.62 | 162.8 | 2.15 | 0.5 | 0.50 |
| Inner Mongolia | 22.1 | 1.89 | 118.3 | 12.28 | 138.6 | 1.83 | 0.1 | 0.05 |
| Jilin | 25.3 | 2.17 | 18.7 | 1.95 | 151.3 | 2.00 | 0.7 | 0.62 |
| Heilongjiang | 36.1 | 3.10 | 45.4 | 4.71 | 244.3 | 3.22 | 0.7 | 0.66 |
| Anhui | 58.3 | 5.00 | 13.9 | 1.44 | 189.0 | 2.49 | 0.5 | 0.47 |
| Jiangxi | 39.1 | 3.36 | 16.7 | 1.73 | 123.9 | 1.64 | 1.0 | 0.90 |
| Henan | 88.6 | 7.60 | 16.7 | 1.73 | 310.3 | 4.10 | 0.5 | 0.49 |
| Hubei | 55.8 | 4.79 | 18.6 | 1.93 | 245.2 | 3.24 | 2.0 | 1.89 |
| Hunan | 62.7 | 5.38 | 21.2 | 2.20 | 234.4 | 3.09 | 1.3 | 1.20 |
| Sub-total | 417.8 | 35.84 | 285.1 | 29.60 | 1799.8 | 23.76 | 7.3 | 6.77 |
| Western Region | | | | | | | | |
| Sichuan | 110.0 | 9.43 | 57.0 | 5.92 | 401.9 | 5.31 | 1.0 | 0.95 |
| Guizhou | 33.6 | 2.88 | 17.6 | 1.83 | 68.5 | 0.90 | 0.2 | 0.18 |
| Yunnan | 38.3 | 3.29 | 39.4 | 4.09 | 148.3 | 1.96 | 0.2 | 0.22 |
| Tibet | 2.3 | 0.20 | 120.0 | 12.46 | 14.6 | 0.19 | - | - |
| Shaanxi | 34.1 | 2.92 | 20.6 | 2.13 | 133.2 | 1.76 | 0.5 | 0.42 |
| Gansu | 23.1 | 1.99 | 45.4 | 4.71 | 83.9 | 1.11 | 0.0 | 0.00 |
| Qinghai | 4.6 | 0.40 | 72.1 | 7.49 | 30.6 | 0.40 | 0.0 | 0.01 |
| Ningxia | 4.9 | 0.42 | 6.6 | 0.69 | 33.6 | 0.44 | 0.0 | 0.03 |
| Xinjiang | 15.8 | 1.36 | 166.0 | 17.23 | 171.8 | 2.27 | - | - |
| Sub-total | 266.7 | 22.88 | 544.7 | 56.54 | 1086.3 | 14.34 | 1.9 | 1.82 |

Sources. State Statistical Bureau, Statistical Yearbook of China. The Editorial Board of the Almanac of China's Foreign Economic
Relations and Trade, Almanac of China's Foreign Economic Relations and Trade.

## TABLE 3
### POPULATION GROWTH BY REGION (1980S)

| | Crude Birth Rate (1990, 0/00) | Crude Death Rate (1990, 0/00) | Natural Increase Rate (1990, 0/00) | In-migration Rate (1982-87, 0/00) | Out-migration Rate (1982-87, 0/00) | Net-migration Rate (1982-87, 0/00) |
|---|---|---|---|---|---|---|
| National Average | 20.98 | 6.28 | 14.70 | 5.91 | 5.91 | - |
| Coastal Region | | | | | | |
| Beijing | 13.35 | 5.43 | 7.92 | 33.52 | 10.09 | 23.43 |
| Tianjin | 15.50 | 5.98 | 9.52 | 16.24 | 5.70 | 10.54 |
| Hebei | 19.66 | 5.76 | 13.90 | 10.39 | 6.52 | 3.87 |
| Lianing | 15.60 | 6.01 | 9.59 | 8.32 | 6.11 | 2.21 |
| Shanghai | 11.32 | 6.36 | 4.96 | 30.40 | 6.63 | 23.77 |
| Jiangsu | 20.54 | 6.07 | 14.47 | 7.50 | 5.07 | 2.43 |
| Zhejiang | 14.84 | 6.10 | 8.74 | 3.03 | 5.79 | -2.76 |
| Fujian | 23.45 | 5.70 | 17.75 | 3.23 | 3.87 | -0.64 |
| Shandong | 18.86 | 6.25 | 12.61 | 6.93 | 4.28 | 2.65 |
| Guangdong | 21.96 | 5.34 | 16.62 | 4.74 | 2.39 | 2.35 |
| Guangxi | 20.71 | 5.96 | 14.75 | 1.47 | 5.33 | -3.86 |
| Hainan | 22.95 | 5.22 | 17.73 | - | - | - |
| Central Region | | | | | | |
| Shanxi | 22.31 | 6.25 | 16.06 | 6.12 | 6.73 | -0.61 |
| Inner Mongolia | 20.12 | 5.79 | 14.33 | 8.17 | 9.96 | -1.79 |
| Jilin | 18.40 | 6.12 | 12.28 | 7.20 | 10.18 | -2.98 |
| Heilongjiang | 17.51 | 5.33 | 12.18 | 5.64 | 13.28 | -7.64 |
| Anhui | 25.04 | 5.79 | 19.25 | 3.14 | 4.76 | -1.62 |
| Jiangxi | 24.47 | 6.59 | 17.88 | 2.83 | 4.07 | -1.24 |
| Henan | 24.03 | 6.18 | 17.85 | 3.33 | 3.98 | -0.65 |
| Hubei | 24.32 | 6.84 | 17.48 | 5.41 | 4.42 | 0.99 |
| Hunan | 24.03 | 7.07 | 16.96 | 3.76 | 6.54 | -2.78 |
| Western Region | | | | | | |
| Sichuan | 17.78 | 7.06 | 10.72 | 3.72 | 4.52 | -0.80 |
| Guizhou | 23.77 | 7.13 | 16.64 | 3.74 | 4.00 | -0.26 |
| Yunnan | 23.59 | 7.71 | 15.88 | 3.02 | 5.21 | -2.19 |
| Tibet | 27.60 | 9.20 | 18.40 | 0.00 | 16.79 | -16.79 |
| Shaanxi | 23.49 | 6.49 | 17.00 | 7.27 | 9.19 | -1.92 |
| Gansu | 22.85 | 5.92 | 16.93 | 4.45 | 9.05 | -4.60 |
| Qinghai | 22.65 | 6.84 | 15.81 | 6.86 | 23.98 | -17.12 |
| Ningxia | 24.56 | 5.07 | 19.49 | 21.36 | 11.76 | 9.60 |
| Xinjiang | 24.67 | 6.39 | 18.28 | 14.33 | 16.95 | -2.62 |

Sources. Institute of Developing Economies, Population Policy and Vital Statistics in China (I.D.E. Statistical Data Series No.56, Institute of Developing Economies, Tokyo, 1991)

## TABLE 4
## RELATIVE PRICE INDICES BY REGION

|  | 1985 | 1992 |
|---|---|---|
| National Average | 100.00 | 100.00 |
| Coastal Region |  |  |
| Beijing | 80.54 | 101.54 |
| Tianjin | 103.17 | 102.61 |
| Hebei | 96.60 | 101.93 |
| Lianing | 90.58 | 95.56 |
| Shanghai | 103.09 | 113.42 |
| Jiangsu | 113.98 | 105.21 |
| Zhejiang | 107.49 | 104.25 |
| Fujian | 107.03 | 102.70 |
| Shandong | 92.59 | 97.39 |
| Guangdong | 84.02 | 92.08 |
| Guangxi | 90.81 | 100.39 |
| Hainan | - | 102.32 |
| Central Region |  |  |
| Shanxi | 99.77 | 99.42 |
| Inner Mongolia | 85.71 | 89.67 |
| Jilin | 109.03 | 89.38 |
| Heilongjiang | 123.55 | 97.68 |
| Anhui | 94.05 | 98.84 |
| Jiangxi | 114.29 | 92.86 |
| Henan | 89.96 | 96.14 |
| Hubei | 94.98 | 104.34 |
| Hunan | 97.22 | 97.97 |
| Western Region |  |  |
| Sichuan | 99.61 | 100.87 |
| Guizhou | 111.12 | 107.92 |
| Yunnan | 126.33 | 106.95 |
| Tibet |  |  |
| Shaanxi | 90.04 | 99.13 |
| Gansu | 92.36 | 89.86 |
| Qinghai | 101.78 | 108.01 |
| Ningxia | 90.66 | 93.73 |
| Xinjiang | 110.12 | 111.20 |

Sources. Calculated from the free market price indices
by province (State Statistical Bureau, Statistical
Yearbook of China) by letting the national
average to be 100.

TABLE 5
DETERMINATION OF PRICES BY GOOD

|  | 1978 | 1985 | 1991 |
|---|---|---|---|
| Agricultural Goods | | | |
| Determined By Government | 92.6 | 37.0 | 22.2 |
| Adjusted By Government | 1.8 | 23.0 | 20.0 |
| Based On Market | 5.6 | 40.0 | 57.8 |
| Industrial Goods | | | |
| Determined By Government | 100.0 | 64.0 | 36.0 |
| Adjusted By Government | 0.0 | 23.0 | 18.3 |
| Based On Market | 0.0 | 13.0 | 45.7 |
| Consumer Goods | | | |
| Determined By Government | 97.0 | 47.0 | 20.9 |
| Adjusted By Government | 0.0 | 19.0 | 10.3 |
| Based On Market | 3.0 | 34.0 | 68.8 |

Sources. Data of 1978 and 1985 are from Chinese Academy of Social Sciences, China's price
system: present state, problems and prospects (Financial Economics, No.5, 1992,
in Chinese). Data of 1991 are from Economic Daily (July 11, 1992. in Chinese).