

GROWTH AND INVESTMENT EFFICIENCY IN CHINA

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Executive Summary

1. Although less developed economies are often short of capital during the course of economic development, China seems to be an exception. In order to promote economic growth, China has invested substantially for several decades. The recently announced stimulus package will trigger a new round of investment boom.
2. Due to robust growth in investment, gross capital formation as a proportion of China's GDP has maintained at a steadily high level since 1978 when economic reform was initiated. The overall average during the period 1978-2007 was 37.5% which is much higher than that of other countries at the similar stage of development such as Japan (1961-1970), Korea (1969-1983) and Brazil (1962-1979).
3. There is no doubt that investment had made substantial contribution to China's GDP growth over the past three decades. Policy makers in China have relied on investment expansion to stimulate economic growth on several occasions including current response to the US financial crisis.
4. However, China's investment has suffered from low efficiency. It is estimated that the overall weighted mean level of investment efficiency among China's regional economies is about 66% implying considerable scope for improvement. In general, the coastal regions (with a mean efficiency score of 71%) are more efficient than the central and western regions (with mean efficiency scores of 59% and 43%, respectively).
5. With China's western development program, more resources have been diverted towards the less efficient regions. The latter could adopt policies focusing on improving investment efficiency. This issue should be addressed seriously in the process of implementing the current stimulus package of 4 trillion yuan.

6. Infrastructure development, economic reform and participation of foreign investment positively affect the performance of investment. Thus, improvement in these areas has the potential of narrowing the efficiency gap between the regions, especially between the coastal and western areas. In the meantime, it is found that economic openness and production technology are not explicitly related to investment performance among the regions.

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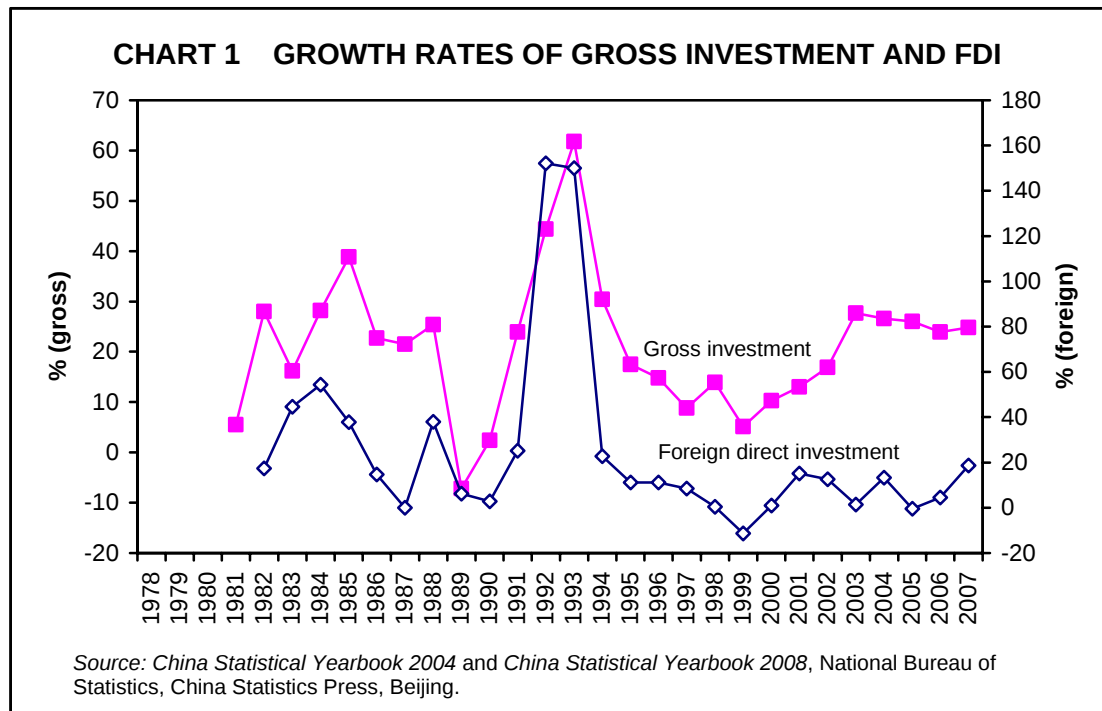
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Three Decades of High Investment

- 1.1 Less developed economies are often hampered by shortage of funds during the course of economic development. However, China seems to be an exception. Over the past three decades, China has accumulated the largest foreign reserves in the world, and undertaken many ambitious capital-intensive projects such as the Three Gorges Dam (costing about \$200 billion), the Hangzhou Bay Bridge (spanning about 36 km across the sea) and the extravagant Beijing Olympic Games. The appearance of many new highways and buildings across the nation gives the impression that the country is flooded with money.
- 1.2 In order to promote economic growth, China has indeed invested substantially for several decades. Chart 1 demonstrates that, with an average annual rate of growth of 21.2% during the period of 1981-2007, investment has undergone several waves of rapid growth.
- 1.3 The first wave of growth took place immediately after the adoption of the economic reform program in the early 1980s. Liberalization policies boosted rural growth and income and hence led to a boom in township and village enterprises (TVEs) due to the investment of surplus rural funds. In the meantime, foreign direct investment (FDI) increased rapidly, though from a low basis (Chart 1). According to official records, China's FDI totaled about

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US\$1.8 billion from 1979 to 1982 while it reached US\$1.4 billion in 1984 and US\$2 billion in 1985.¹



- 1.4 The second wave of investment was triggered by the “southern tour” of former leader Deng Xiaoping in 1992. During his tour of southern China, Deng encouraged more economic openness hence leading to subsequent implementation of more radical reform policies. The consequence was that both domestic and foreign investment surged during 1992-93, as shown in Chart 1.
- 1.5 The most recent wave of investment came with China’s ascension to the World Trade Organization (WTO) in November 2001. Since then, both domestic and foreign direct investment has maintained strong growth. In addition, this round of the investment boom was stimulated by the launch of the western development program in 1999 and the preparation for the 2008 Olympic Games in Beijing. There is no doubt that the recent announcement

¹ China Statistical Yearbook 2008, National Bureau of Statistics, China Statistics Press, Beijing.

of the stimulus package of 4 trillion yuan will lead to a new round of investment boom in China.

Investment-Driven Growth

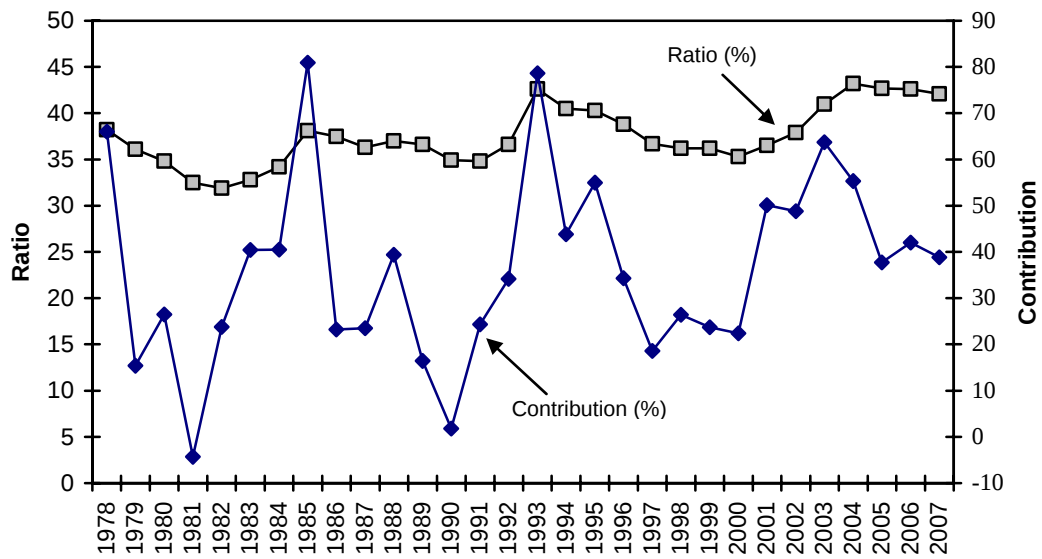
- 2.1 Due to continued growth in investment, gross capital formation (GKF) as a proportion of China's GDP has maintained at a robustly high level since 1978 when economic reform was initiated. The overall average during the period 1978-2007 was 37.5 per cent according to Chart 2. At a similar income level, gross capital formation as a share of GDP amounted to 35.8 per cent in Japan (1961-1970), 29 per cent in South Korea (1969-1983), 21.4 per cent in Brazil (1962-1979) and 29.5 per cent in Thailand (1970-1992).²
- 2.2 Thus, China has invested much more than other economies at a similar stage of development. In the meantime, though extremely volatile, incremental investment as a share of incremental GDP during 1978-2007 averaged about 36 per cent according to Chart 2. The contribution of investment to economic growth is hence substantial.
- 2.3 Official statistics show that the Chinese economy has achieved an average annual growth rate of about 9.9% during 1978-2007. During the same period, China's GDP per capita rose from under US\$200 to about US\$2,548.³ However about a half of this growth originated from investment growth according to various estimates.⁴ In comparison with other major economies in the world, China's domestic consumption accounts for a relatively small share over GDP (Chart 3).

² These numbers are calculated using data from the World Development Indicators online database (www.worldbank.org).

³ *China Statistical Yearbook 2008*, National Bureau of Statistics, China Statistics Press, Beijing.

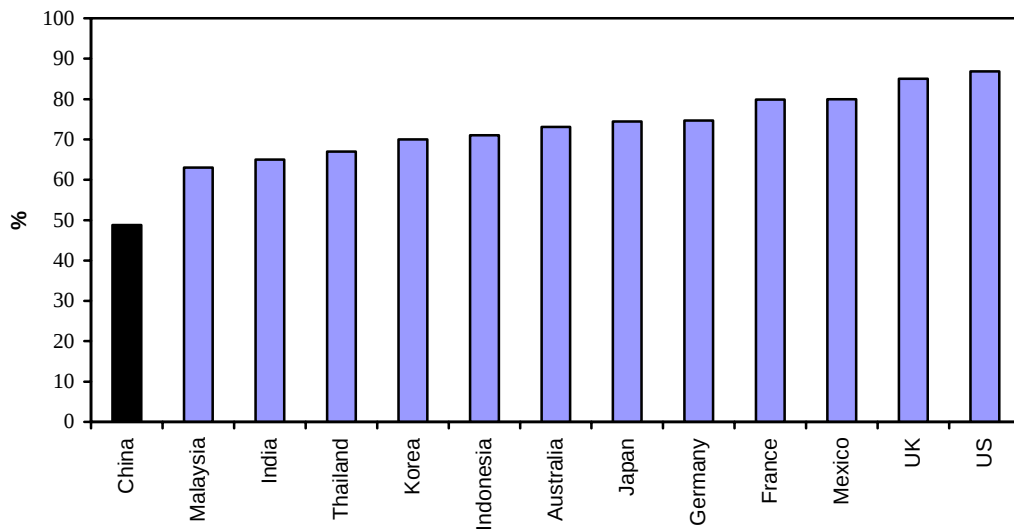
⁴ Yanrui Wu, "Can China's high economic performance be sustained by productivity growth?" *EAI Background Brief No.265*, East Asian Institute, National University of Singapore, 2005.

CHART 2 GROSS CAPITAL FORMATION OVER GDP (%), 1978-2007



Source: China Statistical Yearbook 2008, National Bureau of Statistics, China Statistics Press, Beijing.

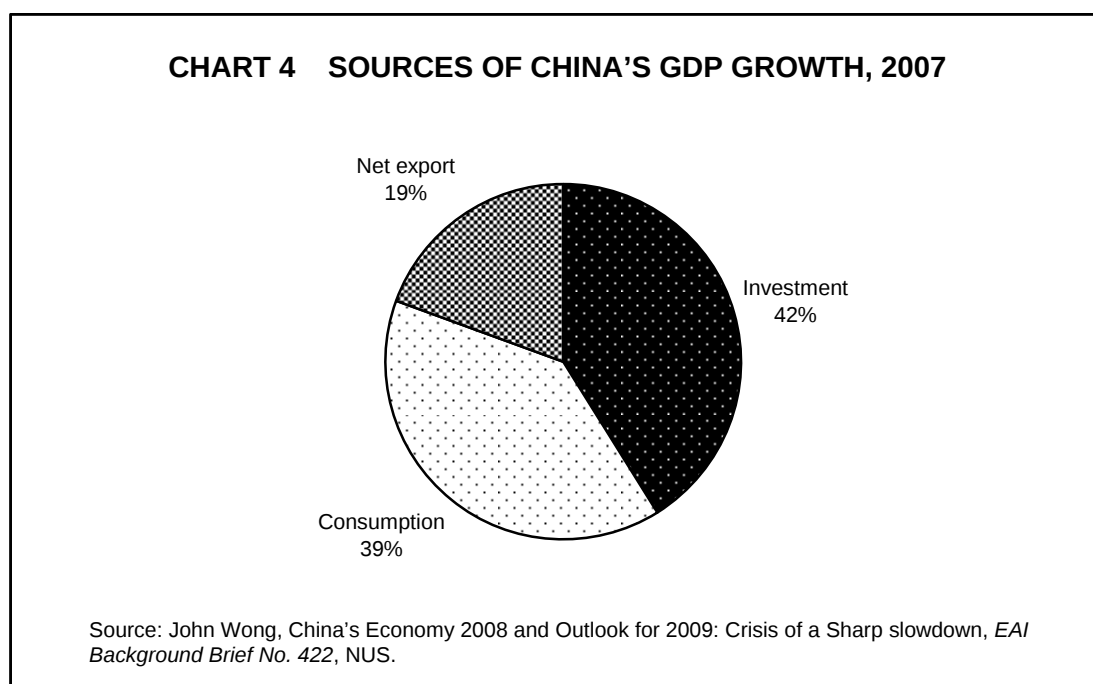
CHART 3 FINAL CONSUMPTION OVER GDP IN SELECTED ECONOMIES



Sources: World Development Indicator 2008 (www.worldbank.org), National Bureau of Statistics of China (www.stats.gov.cn) and OECD (www.oecd.org).

2.4 National Bureau of Statistics of China recently released the newly revised growth figure for 2007. At the growth rate of 13%, China already overtook Germany to become the third largest economy in the world in 2007. However,

GDP growth pattern remains the same. Of the 13% growth, investment amounted to a share of 42% with the rest being consumption (39%) and net external demand (19%) (see Chart 4).



Regional Investment and Efficiency

- 3.1 There is however considerable variation in regional investment. In general, gross investment as a ratio of gross regional product (GRP) is very high among China's regional economies (Table 1). In particular, the investment ratio is high in regions which are less export-oriented and hence confronted with net imports. They are mainly located in western China, which has also enjoyed an investment boom due to the implementation of the western development program since 1999.⁵

⁵ China's western development or "go-west" program was initiated in 1999 and covers five autonomous regions (Guangxi, Inner Mongolia, Ningxia, Tibet, and Xinjiang), six provinces (Gansu, Guizhou, Yunnan, Qinghai, Shaanxi, and Sichuan) and one autonomous municipality (Chongqing). This classification is slightly different from the traditional official grouping according to which Guangxi belongs to the coastal region while Inner Mongolia is a middle or central region.

**TABLE 1 REGIONAL INVESTMENT AND EXPORTS OVER INCOME,
2007**

Regions	Investment/GRP (%)	Export/GRP (%)
Coastal	48.5	44.2
Central	51.4	7.8
Western	60.9	7.7

Sources: Table A1 in the Appendix of this paper.

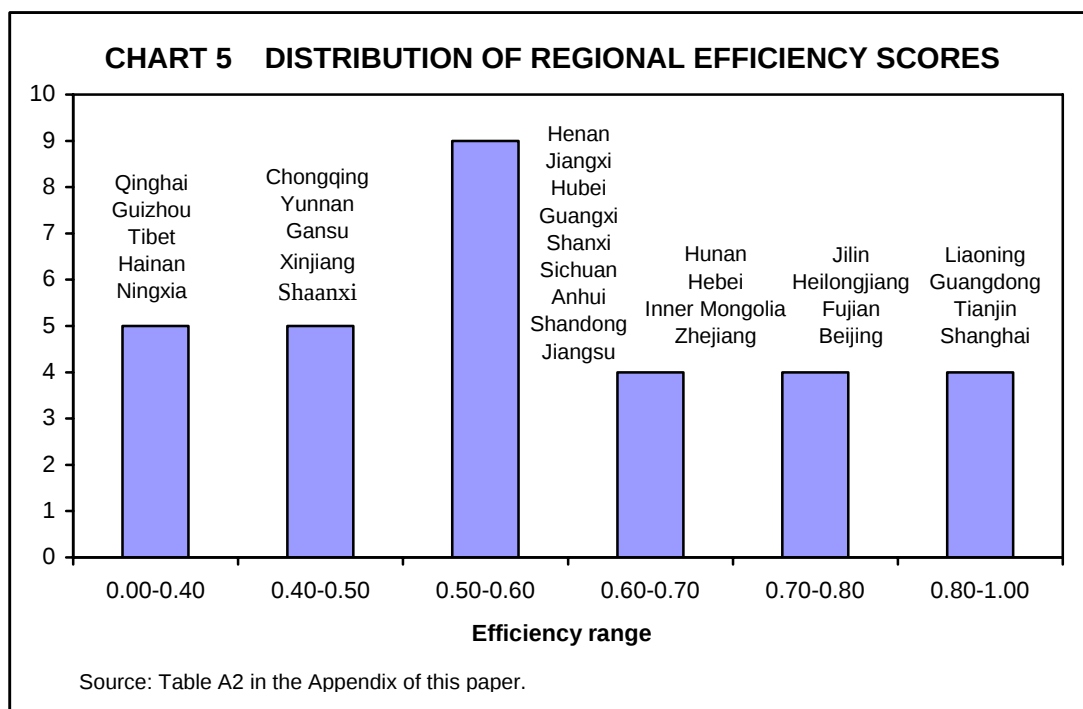
3.2 The performance of the Chinese regions' investment can be assessed using production function approaches.⁶ The estimated regional scores of investment efficiency are presented in Chart 5. Consistent with prior assumptions, efficiency performance varies substantially across the regions. Shanghai has achieved the highest score followed by Tianjin and Guangdong. In general, the coastal regions with a mean score of 71% are much more efficient than the central and western regions (with mean scores of 59% and 43%, respectively). In fact, regions with an efficiency score of under 50% are all located in western China. The overall weighted mean level of investment efficiency for China is about 66%, implying considerable scope for improvement.⁷

3.3 The findings in Chart 5 are consistent with the conclusions of other authors. For example, Qin and Song found that the coastal regions are generally more efficient than the western regions in terms of "capital productivity" and Boyreau-Debray and Wei argued that capital has been diverted to the less productive western regions.⁸ In recent years, more funds have probably been allocated to the western regions due to the implementation of the western development program. Therefore, drastic policy changes may be needed to improve investment efficiency in the western regions.

⁶ Yanrui Wu, "Has China Invested too Much? A Study of Capital Efficiency and Its Determinants", *Discussion Paper 36*, China Policy Institute, University of Nottingham.

⁷ The weights were regional shares of capital stock in 2006.

⁸ D. Qin and H. Y. Song, "Sources of investment inefficiency: The case of fixed-asset investment in China", *Working Paper No.584*, Department of Economics, Queen Mary University of London, 2007. G. Boyreau-Debray and S. J. Wei, "Can China grow faster? A diagnosis of the fragmentation of its domestic capital market", *IMF Working Paper WP/04/76*, International Monetary Fund, 2004.



Determinants of Efficiency Variation

- 4.1 To investigate the determinants of efficiency, the author considered several factors including infrastructure development, economic reforms, technology, economic openness and foreign direct investment.⁹ It is shown that regional investment efficiency is affected positively by the level of infrastructure development, degree of economic reforms and participation of foreign direct investment.
- 4.2 Better infrastructure can reduce the cost and time of transactions in businesses and hence contributes to higher returns to capital. The economic reform variable essentially captures the role of the private sector and it is always believed that the private firms are more efficient than the public sector or state-owned enterprises (SOEs). Some authors even argued that it was the private firms' ability to generate internal finance and raise funds from informal channels and to maintain high efficiency that underlies China's

⁹ Yanrui Wu, "Has China Invested too Much? A Study of Capital Efficiency and Its Determinants", *Discussion Paper 36*, China Policy Institute, University of Nottingham.

sustained growth in recent decades.¹⁰ Finally the positive spillover effects of FDI on productivity, particularly in the long term have also been confirmed and this is in line with the other authors' findings.¹¹

- 4.3 Economic openness and technology are however found to influence investment efficiency negatively. Surprisingly, a higher openness level is not necessarily associated with greater efficiency. This may suggest that there may be a learning process in improving investment efficiency as far as openness is concerned. This unexpected relationship may also be driven by a few outliers. A few regions, such as Liaoning, Beijing, Hebei, Heilongjiang, Jilin and Inner Mongolia, have achieved above-average efficiency while their openness indicators have relatively low values.
- 4.4 Finally, the negative relationship between technology (capital-labor ratio) and efficiency indicates that investment in more capital intensive economies may not necessarily be more efficient in China and *vice versa*. For example, Guangdong is one of the most export-oriented regional economies in China and has achieved relatively high efficiency in investment. However, in 2006, Guangdong's capital-labor ratio was just 1.943, well below the national mean of 3.357.
- 4.5 Therefore, to boost investment efficiency in China, further economic reform and improvement in infrastructure are critical. This is particularly so in western China where investment is less efficient inspite of continuous and adequate funding. With better investment efficiency, China can then divert more resources to boost domestic consumption, construction of a social security system and so on.

¹⁰ R. Cull, L.C. Xu and T. Zhu, "Formal finance and trade credit during China's transition", *Policy Research Working Paper No.4204*, the World Bank, 2007. M. Ayyagari, A. Demirgüç-Kunt, and V. Maksimovic, "Formal versus informal finance: evidence from China", *Policy Research Working Paper No.4465*, the World Bank, 2008. A. Guariglia, X. X. Liu and L. N. Song, "How does internal finance affect the growth of Chinese firms", paper presented at the conference "Microeconomic Drivers of Growth in China", Oxford University, 29-30 September, 2008.

¹¹ A.G.Z. Hu and H. Jefferson, "FDI impact and spillover: evidence from China's electronic and textile industries", *World Economy* 25 (8), 1063-76, 2002. Z. Liu, "Foreign direct investment and technology spillover: evidence from China", *Journal of Comparative Economics*, 30, 3, 579-602, 2002. Yanrui Wu, *Productivity, Efficiency and Economic Growth in China*, London and New York: Palgrave Macmillan, 2008.

Appendix

**TABLE A1 REGIONAL INVESTMENT AND EXPORTS OVER INCOME,
2007**

Regions	Investment/GRP (%)	Export/GRP (%)
<i><u>Coastal</u></i>	48.5	44.2
Guangdong	35.9	91.3
Zhejiang	45.3	55.4
Hainan	45.6	10.3
Shanghai	45.7	85.6
Jiangsu	48.1	61.3
Shandong	48.6	22.9
Beijing	48.7	24.6
Hebei	49.3	12.1
Fujian	50.4	40.4
Liaoning	57.5	24.6
Tianjin	57.9	57.4
<i><u>Central</u></i>	51.4	7.8
Heilongjiang	43.0	10.8
Hunan	43.9	5.4
Anhui	46.4	8.7
Hubei	46.6	6.6
Jiangxi	50.3	7.5
Henan	55.7	4.6
Shanxi	55.9	12.7
Jilin	69.3	5.8
<i><u>Western</u></i>	60.9	7.7
Gansu	48.9	4.7
Sichuan	49.4	5.3
Guangxi	51.0	6.3
Guizhou	51.8	5.7
Yunnan	56.2	6.9
Xinjiang	59.3	23.2
Shaanxi	60.9	7.4
Chongqing	62.3	7.8
Qinghai	63.4	2.8
Ningxia	73.6	11.5
Inner Mongolia	73.8	4.7
Tibet	79.6	6.4

Source: Author's own calculation using data from *China Statistical Yearbook 2008*, National Bureau of Statistics, China Statistics Press, Beijing.

TABLE A2 MEAN SCORES OF INVESTMENT EFFICIENCY

Regions	Efficiency scores
<i><u>Coastal</u></i>	<i>0.714</i>
Shanghai	0.937
Tianjin	0.927
Guangdong	0.899
Liaoning	0.799
Beijing	0.746
Fujian	0.738
Zhejiang	0.674
Hebei	0.603
Jiangsu	0.593
Shandong	0.572
Hainan	0.363
<i><u>Central</u></i>	<i>0.593</i>
Heilongjiang	0.720
Jilin	0.699
Hunan	0.599
Anhui	0.561
Shanxi	0.560
Hubei	0.554
Jiangxi	0.532
Henan	0.517
<i><u>Western</u></i>	<i>0.426</i>
Inner Mongolia	0.667
Sichuan	0.560
Guangxi	0.557
Shaanxi	0.470
Xinjiang	0.423
Gansu	0.419
Yunnan	0.418
Chongqing	0.405
Ningxia	0.381
Tibet	0.300
Guizhou	0.292
Qinghai	0.219

Source: Author's own estimates.