UNITED NATIONS UNIVERSITY
UNU-WIDER
World Institute for Development Economics Research

Research Paper No. 2008/13

Comparing Regional Development in China and India

Yanrui Wu*

February 2008

Abstract

Economic growth in China and India has attracted many headlines recently. As a result, the literature comparing the two Asian giants has expanded substantially. This paper adds to the literature by comparing regional growth, disparity and convergence in the two economies. This is the first of its kind. The paper presents a detailed examination of economic growth in the regions of China and India over the past twenty years. It also provides an assessment of regional disparity in the two countries and investigates whether there is any evidence of regional convergence during the period of rapid economic growth. It attempts to identify the sources of regional disparity and hence draw policy implications for economic development in the two countries in the near future.

Keywords: regional development, China, India, disparity, convergence

JEL classification: O57, O11

* UWA Business School, University of Western Australia, email: yanrui.wu@uwa.edu.au

This study has been prepared within the UNU-WIDER project on the Southern Engines of Global Growth.

UNU-WIDER acknowledges the financial contributions to the research programme by the governments of Denmark (Royal Ministry of Foreign Affairs), Finland (Ministry for Foreign Affairs), Norway (Royal Ministry of Foreign Affairs), Sweden (Swedish International Development Cooperation Agency—Sida) and the United Kingdom (Department for International Development).

ISSN 1810-2611 ISBN 978-92-9230-055-5

Acknowledgements

Work on this paper was supported by an UWA Research Grant and benefited from comments by participants at the international conference *Emerging China* (Melbourne, July 2006) and UNU-WIDER workshop on Southern Engines of Global Growth: China, India, Brazil, and South Africa (CIBS) (Beijing, January 2007).

Acronyms

GPP gross provincial product

GRP gross regional product

NBS National Bureau of Statistics (of China)

NSDP net state domestic product

UNU World Institute for Development Economics Research (UNU-WIDER)
Katajanokanlaituri 6 B, 00160 Helsinki, Finland

Typescript prepared by Liisa Roponen at UNU-WIDER

1 Introduction

Since the early 1990s, the world has witnessed rapid economic transformation and growth in China and India. This has subsequently triggered a boom in comparative studies of the two Asian giants.[1] This paper adds to the literature by focusing on regional growth in the two countries. In particular, it attempts to explore how regional economies in the two vast countries have performed during the period of high growth and assess whether or not regional disparity has deteriorated as economic liberalization deepens. It is found that substantial regional disparity exists in China and India. This disparity has shown an increasing trend in both countries during the period of rapid economic growth, in particular since the early 1990s. However, the increase in regional disparity in both countries largely reflects the enlarging gap between the super rich regions and the rest of the economy within each country. In other words, economic growth has not led to catch-up effects in the relatively poor regions as postulated by the new growth theories (Abramovitz 1986). This study also shows that variations in infrastructure development and the level of urbanization are the main sources of regional disparity in both countries. In China, the export sector also plays a role in affecting regional development. In India, human capital development in recent years may also affect regional disparity.

The rest of the paper is organized as follows. The next section presents some stylized facts about regional growth in the two economies. The paper then sheds some light on regional convergence and divergence in the past decades. This is followed by regression analyses to explain the sources of regional disparity. The concluding comments are presented in the final section.

2 Regional growth in China and India

During 1980-2005, China and India have achieved phenomenal economic growth at the average rate of 9.7 and 5.9 per cent, respectively.[2] These growth rates are unprecedented in the history of the two countries. However, there are substantial variations in growth across the regions of the two economies. Figure 1 presents the distribution of real gross regional products (GRP) per capita and GRP growth rates in China and India in 2001.[3] Several observations can be made.

First, in both countries, the regions (China's provinces and special municipalities and India's states and union territories) can be divided into two groups, i.e., the most urbanized areas including Shanghai, Beijing and Tianjin in China and Chandigarh, Goa and Delhi in India and the rest of the economies. As expected, the most urbanized

---

1 Recent comparative studies of China and India include Swamy (2003) and Srinivasan (2004) on reforms and economic performance, Srinivasan (1994) and Balasubramanyam and Wei (2005) on international trade, Kehal (2005) on foreign investment, Singh (2005) and Wu and Zhou (2006) on bilateral relationships, and Wu (2007) on the service sector, to cite a few.

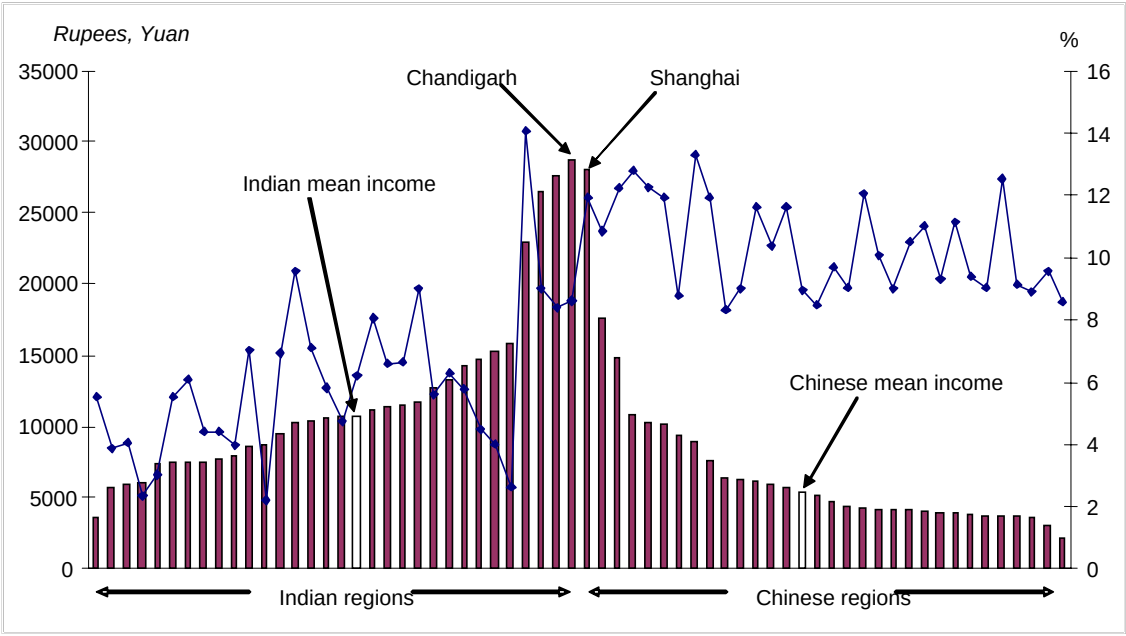
2 These rates are author's own estimates using official statistics of China and India published by the National Bureau of Statistics (various issues) and Reserve Bank of India (2005), respectively.

3 The 2001 data are employed here, as there are too many missing data in more recent statistics for Indian states.

regions have the highest per capita income in both economies. Thus, one could conclude that the level of urbanization is positively associated with the level of economic development among the regions. Second, the gap between the rich and the poor is much bigger in China than in India. For instance, the ratio of per capita GRP in China's richest region (Shanghai) over that in the country's poorest region (Tibet) in 2001 was 13.1 which is much greater than the similar ratio (8.1) in India, i.e., the ratio of per capita GRP in Chandigarh (the richest) over that in Bihar (the poorest). Third, if the super rich regions (three municipalities in China and four states in India) are excluded, regional disparity appears less severe in the two countries. Without the super-rich, the income ratio of the richest region over the poorest region was 5.0 in China and 4.4 in India in 2001. These are still high but seem to be close to those in economies at the similar stage of development. For example, the ratio of per capita income of the richest state over the poorest state was 5.8 in the US in 1900, 3.0 in Italy in 1950, 2.4 in France in 1950, 2.8 in Japan in 1955 and 2.2 in the US in 1990.[4]

As for the rates of regional growth, they are very diverse in both countries. According to Figure 1, as expected, the average rate of growth is higher in China than in India. China's most developed regions tend to grow faster than the country's least developed regions. In India, the fastest growing regions appear to be the 'middle classes', i.e., those states with per capita income ranked between the super-rich and the poorest states.

Figure 1
Regional ranking and growth rates



Notes: Ranking is based on the value of 2001 gross provincial product (GPP) per capita in China and 2001/2 net state domestic product (NSDP) per capita in India. Growth rates are the average rates during 1994-2001. In 2001, US$1=47.186 rupees and 8.277 yuan.

Source: Data are drawn from the National Bureau of Statistics (various issues) and Reserve Bank of India (2005).

4 These statistics are based on data reported in Barro and Sala-i-Martin (1995). Tokyo is excluded from the comparison.

Perhaps, due to these variations in the rates of growth, the ranking of the regions between 1980 and 2001 changed considerably in China and modestly in India (Table 1). In China, only five of the top ten regions in 1980 remain in the top-ten group in 2001. The major winners in China are such coastal regions as Zhejiang, Jiangsu, Guangdong, Fujian and Shandong. These regions are also the beneficiaries of China's economic reforms as they were offered special policy initiatives under the concept of 'letting some get rich first'. Thus, economic policies have played an important role in affecting regional disparity in China in the past two decades. In India, between 1980 and 2001, eight of the top ten regions maintained their top positions. Only two states, Tamil Nadu and Nagaland, moved into the top-ten category.[5] In addition, the ranking of the top eight regions in India has remained the same with the exception of Goa and Delhi swapping positions.

Table 1
Ranking of Chinese and Indian regional economies

Chinese regions	1980	2001	Indian regions	1980	2001
Shanghai	1	1	Goa	2	1
Beijing	2	2	Delhi	1	2
Tianjin	3	3	Pondicherry	3	3
Zhejiang	12	4	Andaman & Nicobar Islands	5	4
Jiangsu	11	5	Punjab	4	5
Guangdong	15	6	Maharashtra	6	6
Liaoning	4	7	Haryana	7	7
Fujian	19	8	Gujarat	8	8
Shandong	17	9	Tamil Nadu	16	9
Heilongjiang	5	10	Nagaland	20	10
Hebei	8	11	Karnataka	14	11
Jilin	9	12	Himachal	11	12
Hubei	20	13	Sikkim	13	13
Xinjiang	14	14	Kerala	15	14
Inner Mongolia	13	15	Andhra Pradesh	18	15
Shanxi	10	16	West Bengal	10	16
Anhui	27	17	Tripura	23	17
Hunan	21	18	Meghalaya	19	18
Qinghai	7	19	Arunachal Pradesh	12	19
Guangxi	22	20	Rajasthan	26	20
Henan	25	21	Madhya Pradesh	21	21
Jiangxi	23	22	Jammu & Kashmir	9	22
Sichuan	24	23	Manipur	17	23
Ningxia	6	24	Assam	24	24
Shaanxi	16	25	Orissa	22	25
Yunnan	26	26	Uttar Pradesh	25	26
Gansu	18	27	Bihar	27	27
Guizhou	28	28			

Note: China's Hainan, Chongqing and Tibet are excluded from the ranking exercises due to missing data. So are India's Chandigarh, Jharkhand, Chhattisgarh and Uttaranchal. Ranking is based on the value of gross regional product (GRP) per capita. Indian ranking is based on the 1980/1 and 2001/2 financial year statistics.

Source: Data are drawn from the NBS (various issues) and Reserve Bank of India (2005).

5 In fact, Chandigarh is excluded from the ranking due to missing data. Given that Chandigarh has been the richest region in India, Tamil Nadu is probably the only region which moved into the top ten.

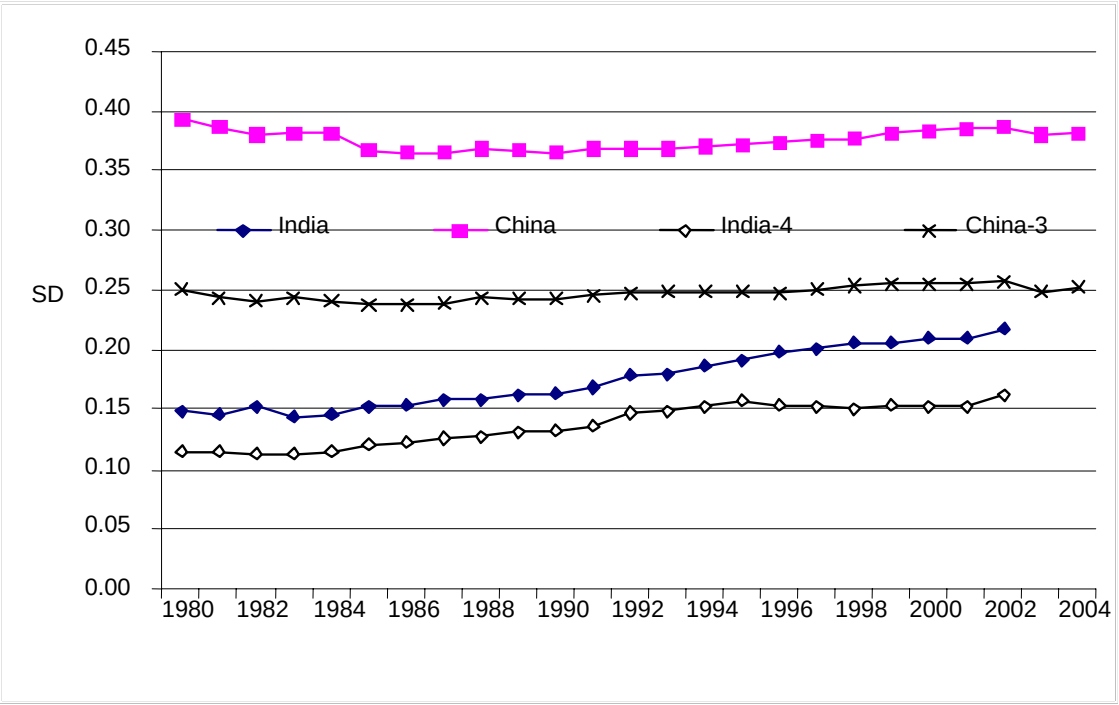
Thus, with regard to changes in regional disparity over the past two decades, China and India are very different. One may argue that India's democratic system makes it difficult for the country to pursue an unbalanced development strategy as China has adopted over the period. The deteriorating regional disparity in China is hence partly attributed to the country's economic policies while in India it may be more related to non-institutional factors such as historical and geographic reasons. For example, Rao, Shand and Kalirajan (1999) argue that India's more developed regions with relatively better infrastructure, human resources and accessibilities to markets have been able to exploit the opportunities offered by economic liberalization better than the relatively poor states. Sachs, Bajpai and Ramiah (2002) claim that Orissa's vulnerability to floods and devastation from tropical cyclones are partly attributed to its poor performance in agriculture and hence the overall economic conditions in the state.

3 Regional convergence or divergence

In the growth literature, two types of convergence have been defined and applied, i.e., the sigma-convergence and beta-convergence (Barro and Sala-i-Martin 1995). In this paper, sigma-convergence is measured by the standard deviation of the logarithm of the gross regional product (GRP) per capita. Two sets of samples are employed for each country. That is, one set contains all regions in each country and the other excludes the super rich regions according to the 2001 ranking of per capita GRP. The estimation results are presented in Figure 2. In comparison, Chinese regions have shown greater dispersion than Indian regions according to Figure 2 which depicts the two curves for China above the Indian ones. The chart also presents evidence of modest regional convergence in China in the 1980s particularly during the first half of the 1980s. This observation is consistent with findings reported in other studies (e.g., Raiser 1998; Démurger et al. 2002; Wu 2004). However, since the early 1990s, Chinese regions have shown the tendency of divergence which is mainly reflected in the widening gap between the three large municipalities and other provinces. Figure 2 shows clearly that the standard deviation across regions excluding the three municipalities hardly changed in the 1990s, implying income differences being relatively stable.

In the case of India, there was little change in regional disparity in the first half of the 1980s but regional divergence has taken place since 1984 when Rajiv Gandhi took office and initiated the first wave of economic reforms. However, the trend of regional divergence seems to be originated from different sources in the late 1980s and since the early 1990s. In the late 1980s, divergence occurred mainly between regions excluding the four super rich states (Chandigarh, Goa, Delhi and Pondicherry). This is clearly demonstrated in Figure 2 where the two curves for Indian are almost parallel to each other during the 1980s. But, since the early 1990s when more comprehensive reforms were introduced in the aftermath of the 1991 balance of payment crisis, regional divergence seems to be driven by the widening gap between the super rich states and rest of the economy. In the absence of the super-rich, regional disparity remains unchanged in the 1990s (i.e., almost a horizontal line with a value of 0.15 as shown in Figure 2). This is similar to the observation in China in the 1990s. That is, with the exclusion of the super rich states, regional disparity has remained almost at the same level in both economies since the early 1990s while the gap between the super-rich and the rest of the economy has become larger. These findings are in sharp contrast to

Figure 2
Sigma-convergence of regional income



Note: SD stands for the standard deviation of the logarithm of gross provincial product per capita in China and net state domestic product per capita in India. India-4 is calculated excluding the four super rich regions (Chandigarh, Goa, Delhi and Pondicherry) and China-3 is based on all regions but three super-rich (Shanghai, Beijing and Tianjin).

Source: Computed by the author.

popular perception about regional inequality in China and India during the reform periods (Jian, Sachs and Warner 1996, Rao, Shand and Kalirajan 1999).[6] Thus, in many existing studies, regional disparity may be inflated due to the impact of several highly urbanized economies among the regions (the three municipalities in China and Chandigarh, Goa and Delhi in India). To gain a better understanding of regional disparity, one should treat the super rich regions separately.

The observed sigma-convergence or divergence is mirrored in the estimation results of beta-convergence which are summarized in Table 2. The estimated values of beta and t-ratios in parentheses are derived from the following non-linear regression

$$\log y_{iT} - \log y_{i0} = A - (1 - e^{-\beta T}) \log y_{i0} + \varepsilon_i \qquad (1)$$

where y_{iT} and y_{i0} are income per capita at periods T and 0, respectively, and ε_i is the standard white noise. In the case of India, all scenarios considered here show evidence of regional divergence during 1980-2001. In China, the estimation results in Table 2 demonstrate the trend of regional convergence in the first half of the 1980s. This reflects

6 In this study, 'regional inequality' refers to inequality between provinces (and states) in China (and in India). Inequality within the provinces/states is not addressed here but becomes increasingly important in both countries. For empirical studies, see Knight, Li and Zhao (2004) and Kanbur and Zhang (2005) on China, and Bhanumurthy and Mitra (2004) on India.

however a fall in the gap between the three largest cities (Shanghai, Beijing and Tianjin) and the rest of the country. Without the three municipalities, the findings in Table 2 do not show significant evidence of convergence among the regions in China.

To sum up, the results from the analyses of both sigma-convergence and beta-convergence illustrate that during the period of high economic growth, the regions in China and India have shown the tendency of divergence. The latter has mainly been driven by the enlarging gap between several highly urbanized regions and the rest of the economy in the two countries. This trend of divergence seems to be relatively more severe in India than in China in recent years, though China's regional disparity in absolute terms is much worse than India's. In both countries, it seems that regional disparity has been relatively stable if several super rich regions (provinces or states) are excluded from the analysis. This is contradictory to popular perception that regional disparity has deteriorated seriously in both China and India since the early 1990s.

Table 2
Estimation results of beta-convergence

	Group I			Group II		
	beta (t-ratios)		n	beta (t-ratios)		n
China						
1980-87	0.0067	(1.982)*	28	0.0044	(0.760)	25
1987-2002	-0.0020	(-0.676)	30	0.0003	(0.037)	27
1980-2002	0.0013	(0.486)	28	0.0034	(0.680)	25
India						
1980/1-1995/6	-0.0428	(-1.071)	27	-0.0435	(-0.742)	24
1995/6-2001/2	-0.0035	(-0.310)	31	0.0158	(1.303)	27
1980/2-2001/2	-0.0083	(-1.719)	27	-0.0045	(-0.606)	24

Notes: Group I includes all regions for which data are available in the two countries. Group II excludes China's Shanghai, Beijing and Tianjin, and India's Chandigarh, Goa, Delhi and Pondicherry, respectively. These regions are the city states or provinces in the two countries. * indicates significance at the level of 5 per cent. The numbers under 'n' represent the size of the samples used.

4 Sources of regional disparity: a regression analysis

The results discussed in the preceding sections indicate the existence of regional disparity in both China and India. There is, however, no evidence of regional convergence although both economies have experienced phenomenal growth over the past decades. This section attempts to provide an explanation of the sources of regional disparity. A regression approach is employed. To introduce this approach, consider the following income equation:

$$y = \beta_0 + \Sigma\beta_i x_i + \varepsilon \tag{2}$$

where y represents a measure of income, e.g., income per capita, and x_i (i =1, …, n) are a list of variables that affect income. Equation (2) can be estimated using the ordinary least square (OLS) technique. Given the estimates, $\hat{\beta}_i$, the prediction of income is $\hat{y} = \hat{\beta}_0 + \Sigma y^i = \hat{\beta}_0 + \Sigma\hat{\beta}_i x_i$. Morduch and Sicular (2002) show that the proportional

contribution of the *i*th component to inequality measured using the variance or squared coefficient of variation is given as follows:[7]

$$S^i_{CV} = S^i_{Var} = \frac{\text{cov}(y^i, y)}{\text{var}(y)} \tag{3}$$

To estimate the system of Equations (2) and (3), the following empirical model is considered:

$$\log(y) = f(inf, hum, rub, ind, z) + \varepsilon \tag{4}$$

where y, *inf*, *hum*, *urb*, *ind* and z represent real gross regional product (GRP) per capita, infrastructure, human capital, urbanization, industrialization and a control variable. The selection of these variables and their definitions are very much dictated by the availability of regional data in the two countries. For the same reason, Equation (4) is estimated for each country using two 1-year cross-sectional datasets representing the 1990s and the current period, respectively.[8] The variables identified in Equation (4) are also popular candidates in growth analyses.[9] A more detailed description of the variables is provided as follows.

Infrastructure

The condition of infrastructure development plays an important role in economic development. Well developed infrastructure such as roads and telecommunications can help reduce business costs and improve efficiency, and hence is a key prerequisite for attracting domestic as well as foreign investment. The level of infrastructure development is expected to be related to income positively. For the India model, access to drinking water is employed as the proxy of infrastructure development and the information is available for each state for the years 1991 and 2001.[10] Another indicator which may also capture the activities of infrastructure development is investment in transport in each state.[11] This variable is included in the Indian model as a control variable. For the Chinese model, as access to drinking water is very much universal in China, telecommunication density across the regions is employed as a proxy of the level of infrastructure development.[12]

Human capital

The role of human capital in economic growth is highlighted in the new growth theory (Benhabib and Spiegel 1994). The measurement of human capital stock is, however,

---

7 Recent applications of similar technique include Zhang and Zhang (2003) and Wan (2004).

8 The choice of one single year data is due to the unavailability of data in particular Indian regional statistics.

9 These variables are also included in the sixty variables identified by Sala-i-Martin (1997).

10 The sources of data are listed in the appendices.

11 Canning (1998) presents a detailed study of measuring the stock of infrastructure in the world.

12 The same data for India are not available unfortunately.

difficult and controversial.[13] This paper simply employs regional literacy ratios as an indicator of the level of human capital development among the regions in China and India.

Urbanization

Preliminary analysis in the preceding section provides clear evidence about the relationship between the level of income and the degree of urbanization in both China and India. Thus, a variable reflecting the progress of urbanization is included in Equation (4) so that the contribution of urbanization to regional disparity is analysed.

Industrialization

Regional disparity could be driven by structural differences between the regional economies in each country. More industrialized regions are expected to be more developed and hence have higher per capita income. For example, Bhattacharya and Sakthivel (2004) find that India's more industrialized states grew much faster than the less industrialized states during the reform period. To examine the effect of economic structure on regional disparity, the share of the manufacturing sector in GRP is employed as a proxy of the level of industrialization in the empirical models.

International trade

Openness to trade and investment is expected to play an important role in economic development.[14] This is confirmed by recent development experience in both China and India. The two economies, in particular China, have benefited substantially from foreign investment and access to foreign markets through exports and imports. While regional trade figures are not available in India, the shares of the value of exports over GRP for the Chinese regions are included as a control variable.

The estimation results are presented in Table 3. The table shows that the chosen variables can explain a large proportion of the variation (between 70 to 90 per cent) in regional income per capita. Another important conclusion can also be drawn from the table. That is, variations in infrastructure development and urbanization are the main sources of regional disparity in both countries. This is consistent with the findings about the role of infrastructure by Nagaraj, Varoudakis and Veganzones (2000) and urbanization by Sachs, Bajpai and Ramiah (2002). In addition, human resource development tends to play a key role in affecting regional disparity in recent years in India. In the case of China, international trade also plays a role in influencing regional development. As for the level of industrialization, it is not the dominant contributor to regional disparity.[15] In fact, surprisingly, none of the variables representing the level of industrial development is statistically significant. Thus, there may be some room for improvement, e.g., the use of alternative variables. These findings imply that to reduce

---

13 See, for example, Benhabib and Spiegel (1994), Pritchett (1997) and Temple (1998).

14 There is a large body of literature on the relationship between economic development and trade. Readers may refer to Edwards (1992) and Harrison (1996).

15 Mitra (1992) and Ravallion and Datt (1996) show that industrial growth had nominal impacts on rural and urban poverty in India.

regional disparity, governments in China and India should seriously deal with regional differences in the level of infrastructure development and urbanization.

While the findings in Table 3 provide important implications, they are subjected to several qualifications such as the problems of endogeneity and outliers. The regression results from OLS may be biased due to endogeneity but lack of data makes it impossible to apply alternative approaches such as the two-stage least square method. The impact of outliers can, however, be assessed and the results are presented in Table 4.[16] The outliers for each dataset are identified by examining the residuals from the regressions in Table 3.[17] The regressions excluding the outliers are re-run. Table 4 shows that the explaining power improves after the exclusion of the outliers in each case. The decomposition of the sources of regional disparity is in general consistent with the results in Table 3. That is, infrastructure and urbanization variables still account for the major shares of regional disparity.

Table 3
Estimation results

Indian model	1991			2001		
	$\hat{\beta}_i$		Shares, %	$\hat{\beta}_i$		Shares, %
Intercept	6.4987	(0.2258)*		6.8447	(0.3470)*	
Infrastructure	0.0067	(0.0027)**	24.5	0.0042	(0.0021)***	6.6
Human capital	0.0055	(0.0033)	8.1	0.0226	(0.0046)*	36.1
Urbanization	0.0086	(0.0034)**	25.5	0.0099	(0.0026)*	34.2
Industrialization	0.0058	(0.0070)	5.3	0.0099	(0.0040)**	8.5
Transport	9.8615	(2.7220)*	16.0	1.4260	(1.3281)	0.9
R^2		0.8064			0.8619	
adjust-R^2		0.7554			0.8305	
Sample size		25			28	
Chinese model	1990			2000		
	$\hat{\beta}_i$		Shares, %	$\hat{\beta}_i$		Shares, %
Intercept	6.7894	(0.2356)*		7.4887	(0.3377)*	
Infrastructure	0.0859	(0.0340)**	30.4	0.0480	(0.0117)*	65.7
Human capital	0.0013	(0.0036)	1.4	0.0370	(0.4396)	0.2
Urbanization	0.0139	(0.0045)*	37.2	0.0059	(0.0054)	15.7
Industrialization	0.0046	(0.0047)	6.7	0.0010	(0.0049)	0.5
Export	0.6489	(0.2497)**	11.9	0.4319	(0.3078)	9.2
R^2		0.8757			0.9129	
adjust-R^2		0.8498			0.8954	
Sample size		30			31	

Notes: All four regressions are tested for heteroscadesticity. The null hypothesis of homoscadesticity for India in 1991 is rejected and hence the weighted least square approach is employed to re-estimate the model. Standard errors are reported in the parentheses. *, ** and *** represent significance at the level of 1%, 5% and 10% respectively.

16 Only the decomposition results are presented.

17 It should be pointed out that the choice of outliers is based on an ad hoc method which determines the number of outliers to be excluded and in the meantime maintains a reasonable size for the new data sample after the exclusion of the outliers in each case.

Table 4
Sensitive analysis

Contributing factors	1991	2001	1990	2000
Infrastructure	10.3	17.4	30.3	59.2
Human capital	6.5	30.1	1.4	
Urbanization	41.6	37.1	35.5	24.3
Industrialization	9.0	3.1	8.9	
Transport/export	25.4	1.0	11.5	9.7
Total	92.7	88.6	87.6	93.2

Notes: The numbers represent percentage contributions. Three outliers are identified and excluded for the 1991 model (India), one for the 1990 model (China), two for the 2000 model (China) and three for the 2001 model (India). For the 2000 Chinese model, *human capital* and *industrialization* variables have insignificant coefficients and are excluded from the final regression.

Concluding remarks

This paper presents some preliminary findings comparing regional economic growth, disparity and convergence in China and India. It is found that regional economic development in China and India is unbalanced. Relatively more developed regions in both countries have forged ahead with no evidence of catch-up by the backward regions. As a result, regional disparity has deteriorated though the two countries enjoyed unprecedented growth over the past two decades. In particular, the gap between the super rich regions and the rest of the economy in both countries has widened since the early 1990s. While regional disparity is in general more severe in China and in India, it is rising fast in India than in China in recent years. The Chinese government is now fighting hard to reduce regional disparity and build a harmonious society. India would face the same problem if the current trend of rising disparity continues. India could learn from the Chinese experience and try to avoid repeating China's mistakes.

This study also shows that variations in urbanization and infrastructure development are found to be major contributors to regional disparity. While both countries have to build more infrastructure and speed up urbanization, they should also aim for a more balanced strategy among the regions. In addition, it seems that human resource development also plays a role in affecting regional disparity in India in recent years while, in China, the export sector is found to be a positive contributor to regional disparity. These findings, though subjected to qualifications, may point out the direction for policy responses by governments in China and India in the near future.

Appendix: Sources of data

Chinese statistics are drawn mainly from the *Statistical Yearbook of China* compiled by the National Bureau of Statistics–NBS (various issues). Indian data come from several sources including the *Handbook of Statistics on the Indian Economy* published by the Reserve Bank of India (2005), the *Handbook of Urban Statistics* compiled by the National Institute of Urban Affairs, Department of Urban Development and *Five Year Plans,* Planning Commission, government of India.

References

Abramovitz, M. (1986). 'Catching Up, Forging Ahead, and Falling Behind'. *Journal of Economic History*, 46 (2): 385-406.

Balasubramanyam, V. N., and Y. Wei (2005). 'Textile and Clothing Exports from India and China: A Comparative Analysis'. *Journal of Chinese Economic and Business Studies*, 3 (1): 23-37.

Barro, R. J., and X. Sala-i-Martin (1995). *Economic Growth*. New York: McGraw-Hill Inc.

Benhabib, J., and M. Spiegel (1994). 'The Role of Human Capital in Economic Development: Evidence from Aggregate Cross-Country Data'. *Journal of Monetary Economics*, 34 (2): 143-74.

Bhanumurthy, N. R., and A. Mitra (2004). 'Economic Growth, Poverty, and Inequality in Indian States in the Pre-reform and Reform Periods'. *Asian Development Review*, 21 (2): 79-99.

Bhattacharya, B. B., and S. Sakthivel (2004). 'Regional Growth and Disparity in India: Comparison of Pre-and Post-reform Decades'. *Economic and Political Weekly*, 6 March: 1071-7.

Canning, D. (1998). 'A Database for the World Stocks of Infrastructure, 1950-95'. *World Bank Economic Review*, 12: 529-47.

Démurger, S., J. Sachs, W T. Woo, S. Bao, G. Change, and A. Mellinger (2002). 'Geography, Economic Policy and Regional Development in China'. *Asian Economic Papers*, 1 (1): 146-97.

Edwards, S. (1992). 'Trade Orientation, Distortions and Growth in Developing Countries'. *Journal of Development Economics*, 39 (1): 31-57.

Harrison, A. (1996). 'Openness and Growth: a Timeseries, Cross-country Analysis for Developing Countries'. *Journal of Development Economics*, 48 (2): 419-47.

Jian, T., J. D. Sachs, and A. M. Warner (1996). 'Trends in Regional Inequality in China'. *China Economic Review*, 7 (1): 1-21.

Kanbur, R., and X. Zhang (2005). 'Fifty Years of Regional Inequality in China: a Journey through Central Planning, Reform, and Openness'. *Review of Development Economics*, 9 (1): 87-106.

Kehal, H. S. (ed.) (2005). *Foreign Investment in Rapidly Growing Countries: the Chinese and Indian Experiences*. Basingstoke and New York: Palgrave Macmillan.

Knight, J., S. Li, and R. Zhao (2004). 'Divergent Means and Convergent Inequality of Incomes among the Provinces and Cities of Urban China'. WIDER Research Paper 2004/52. Helsinki: UNU-WIDER.

Mitra, A. (1992). 'Growth and Poverty: the Urban Legend'. *Economic and Political Weekly*, 28 March: 659-65.

Morduch, J., and T. Sicular (2002). 'Rethinking Inequality Decomposition with Evidence from Rural China'. *The Economic Journal*, 112 (476): 93-106.

Nagaraj, R., A. Varoudakis, and M. A. Veganzones (2000). 'Long-run Growth Trends and Convergence across Indian States'. *Journal of International Development*, 12 (1): 45-70.

National Bureau of Statistics (various issues). *China Statistical Yearbook*. Beijing: China Statistics Press.

Pritchett, L. (1997). 'Where Has all the Education Gone?'. WB Policy Research Working Paper 1551. Washington, DC: World Bank.

Raiser, M. (1998). 'Subsidizing Inequality: Economic Reforms, Fiscal Transfers and Convergence across Chinese Provinces'. *Journal of Development Studies*, 34 (3): 1-26.

Rao, M. G., R. T. Shand, and K. P. Kalirajan (1999). 'Convergence of Income across Indian States: A Divergent View'. *Economic and Political Weekly*, 27 March-2 April. Available at: www.epw.org.in.

Ravallion, M., and G. Datt (1996). 'How Important to India's Poor Is the Sectoral Composition of Economic Growth'. *The World Bank Economic Review*, 10 (1): 1-25.

Reserve Bank of India (2005). *Handbook of Statistics on the Indian Economy*. Available at: www.rbi.org.in/scripts/publications.aspx.

Sachs, J. D., N. Bajpai, and A. Ramiah (2002). 'Understanding Regional Economic Growth in India'. *Asian Economic Papers*, 1 (3): 32-62.

Sala-i-Martin, X. (1997). 'I Just Ran Two Million Regressions'. *American Economic Review (Papers and Proceedings)*, 87: 178-83.

Singh, S. (2005). 'China-India Economic Engagement: Building Mutual Confidence'. CSH Occasional Paper 10. New Delhi: French Research Institutes in India.

Srinivasan, T. N. (1994). *Agriculture and Trade in China and India: Policies and Performance since 1950*. San Francisco: ICS Press

Srinivasan, T. N. (2004). 'China and India: Economic Performance, Competition and Cooperation: An Update'. *Journal of Asian Economics*, 15 (4): 613-36.

Swamy, S. (2003). *Economic Reforms and Performance: China and India in Comparative Perspective*. New Delhi: Konark Publishers Pvt Ltd.

Temple, J. (1998). 'Robustness Tests of the Augmented Solow Model'. *Journal of Applied Econometrics*, 13 (4): 361-75.

Wan, G. (2004). 'Accounting for Income Inequality in Rural China: A Regression-based Approach'. *Journal of Comparative Economics*, 32 (2): 348-63.

Wu, Y. (2004). *China's Economic Growth: A Miracle with Chinese Characteristics.* London and New York: Routledge Curzon Press.

Wu, Y. (2007). 'Service Sector Growth in China and India: A Comparison'. *China: An International Journal*, 5 (1): 137-54.

Wu, Y., and Z. Zhou (2006). 'Bilateral Trade between China and India'. *Journal of Asian Economics*, 17 (3): 509-18.

Zhang, X., and K. Zhang (2003). 'How Does Globalization Affect Regional Inequality within a Developing Country? Evidence from China'. *Journal of Development Studies*, 39 (4): 47-67.