

Regional Growth, Disparity and Convergence in China and India: A Comparative Study

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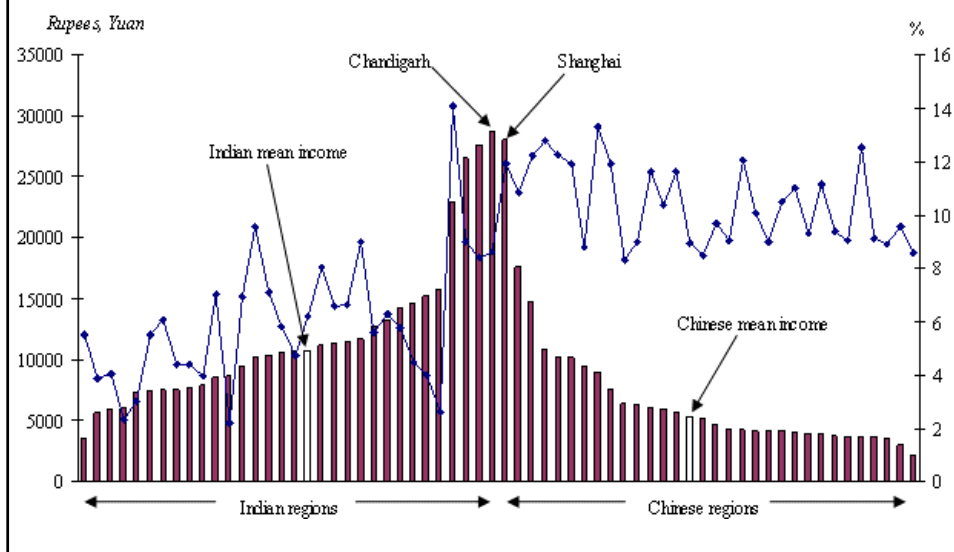
Objectives

- Investigation of regional growth, disparity and convergence in China and India
- Comparison and implications

Outline of Presentation

- Regional economic growth in China and India
- Regional convergence/divergence
- Sources of regional disparity
- Remarks

Regional Ranking and Growth Rates





Regional Growth

- Regions can be divided into four groups
- Most urbanized areas have the highest per capita income, Shanghai, Beijing and Tianjin in China and Chandigarh, Goa and Delhi in India
 - The level of urbanization is positively associated with the level of economic development



Regional Growth

- The gap between the rich and the poor is much bigger in China than in India
- The super rich regions (three cities in China and four states in India) are excluded, regional disparity appears less severe in both countries

Regional Growth

- 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"

Ranking of Chinese and Indian Regional Economies

Chinese regions			Indian regions		
	1980	2001		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			



Regional Growth

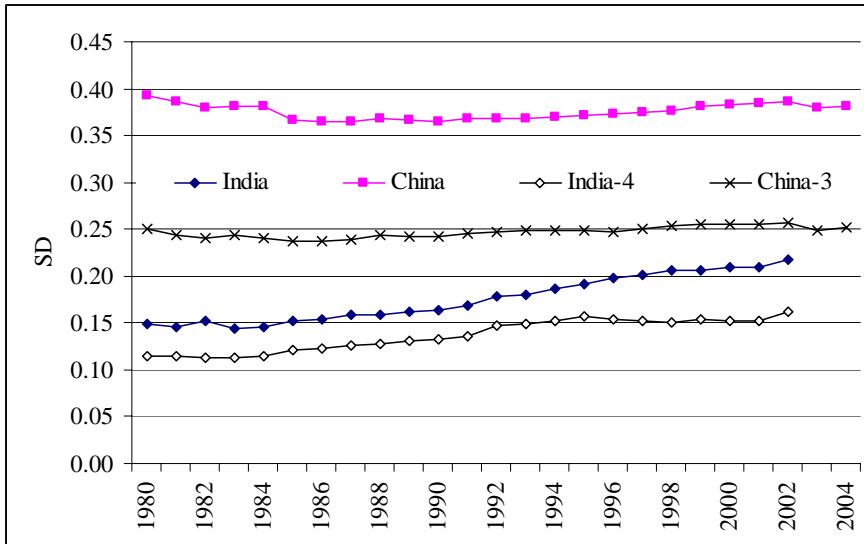
- Major winners in China are the coastal regions such as Zhejiang, Jiangsu, Guangdong, Fujian and Shandong – moved into the top ten league
- In India, between 1980 and 2001, eight of the top ten regions remain in the top group
- Two states, Tamil Nadu and Nagaland, moved into the top-ten category



Regional Convergence or Divergence

- Two types of convergence: sigma-convergence and beta-convergence
- 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
- One set contains all regions
- The other excludes the super rich regions according to the 2001 ranking of per capita income

Regional Convergence or Divergence



Regional Convergence or Divergence

- Evidence of regional convergence in China in the 1980s during the first half of the 1980s
- Since the early 1992, Chinese regions have shown the tendency of divergence
 - Widening gap between the three large cities and other provinces

Regional Convergence or Divergence

- In India, there was little change in regional disparity in the first half of the 1980s
- Regional divergence has taken place since 1984
 - In the late 1980s, divergence occurred mainly between regions excluding the four super rich regions (Chandigarh, Goa, Delhi and Pondicherry).
 - Since the early 1990s, divergence has been driven by the gap between the super riches and rest of the economies

Regional Convergence or Divergence

- This is similar to the observation in China in the 1990s
- Regional disparity may be inflated due to the impact of several highly urbanized economies among the regions
- In comparison, Chinese regions have shown greater dispersion than Indian regions

Regional Convergence or Divergence

- Observed sigma-convergence or divergence is mirrored by the estimation results of beta-convergence
- In India, all scenarios considered here show evidence of divergence during 1980-2001.
- In China, the estimation results demonstrate convergence in the first half of the 1980s

Estimation Results of *beta*-convergence

	Group I		Group II	
	<u>beta (t-ratios)</u>	<u>n</u>	<u>beta (t-ratios)</u>	<u>n</u>
China				
1980-1987	0.0067 (<u>1.982</u>)*	28	0.0044 (0.760)	25
1987-2002	-0.0020 (-0.676)	30	0.0003 (0.037)	27
1980-2002	0.0013 (<u>0.486</u>)	28	0.0034 (0.680)	25
India				
1980/81-1995/96	-0.0428 (-1.071)	27	-0.0435 (-0.742)	24
1995/96-2001/02	-0.0035 (-0.310)	31	0.0158 (<u>1.303</u>)	27
1980/82-2001/02	-0.0083 (-1.719)	27	-0.0045 (-0.606)	24

Sources of Regional Disparity

- Income equation:

$$y = \beta_0 + \sum \beta_i x_i + \varepsilon$$

y : a measure of income

x_i : a list of variables

ε : the standard white noise

Sources of Regional Disparity

- Proportional contribution of the i th component to inequality

$$S_{CV}^i = S_{Var}^i = \frac{\text{cov}(y^i, y)}{\text{var}(y)}$$

Empirical Model

$$\log(y) = f(\text{inf}, \text{hum}, \text{urb}, \text{ind}, z) + \varepsilon$$

y , inf , hum , urb , ind and z represent real gross regional product (GRP) per capita, infrastructure, human capital, urbanization, industrialization and a control variable

- Estimated for each country using two 1-year cross-sectional data sets representing the 1990s and the current period

Estimation Results

Indian model	1991		2001	
	$\hat{\beta}_i$	shares (%)	$\hat{\beta}_i$	shares (%)
<i>intercept</i>	6.4987 (0.2258)*		6.8447 (0.3470)*	
<i>inf</i>	0.0067 (0.0027)**	24.5	0.0042 (0.0021)***	6.6
<i>hum</i>	0.0055 (0.0033)	8.1	0.0226 (0.0046)*	36.1
<i>urb</i>	0.0086 (0.0034)**	25.5	0.0099 (0.0026)*	34.2
<i>ind</i>	0.0058 (0.0070)	5.3	0.0099 (0.0040)**	8.5
<i>z</i>	9.8615 (2.722)*	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	

Estimation Results (Continue)

Chinese model	1990		2000	
	$\hat{\beta}_i$	shares (%)	$\hat{\beta}_i$	shares (%)
<i>intercept</i>	6.7894 (0.2356)*		7.4887 (0.3377)*	
<i>inf</i>	0.0859 (0.0340)**	30.4	0.0480 (0.0117)*	65.7
<i>hum</i>	0.0013 (0.0036)	1.4	0.0370 (0.4396)	0.2
<i>urb</i>	0.0139 (0.0045)*	37.2	0.0059 (0.0054)	15.7
<i>ind</i>	0.0046 (0.0047)	6.7	0.0010 (0.0049)	0.5
<i>z</i>	0.6489 (0.2497)**	11.9	0.4319 (0.3078)	9.2
R^2	0.8757		.9129	
adjust- R^2	0.8498		.8954	
Sample size	30		31	

Estimation Results

- The selected variables can explain a large proportion of the variation in regional income per capita
- Variations in infrastructure development and urbanization are the main sources of regional disparity
- Human capital 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

Concluding Remarks

- Unbalanced regional economic development in China and India
- Relatively more developed regions in both countries have forged ahead with no evidence of catch-up by the backward regions
- Gap between the super rich regions and the rest of the economy in both countries has widened since the early 1990s
- Regional disparity is in general more severe in China than in India while it is rising fast in India than in China in recent years
- variations in urbanization and infrastructure development are found to be major contributors to regional disparity



Thank You!