

# Bosworth & Collins' (2008) - Accounting for Growth: Comparing China and India

- This paper examines sources of economic growth in India and China during 1978-2004.
- The authors compare the sources of growth analysis between the two countries and across three sectors (agriculture, industry, services).
- The equation used to analyze sources of growth is:

$$\Delta \ln(Y/L) = \alpha[\Delta \ln(K/L)] + (1-\alpha)\Delta \ln H + \Delta \ln A$$

- Employment growth: growth in pop of labor force age
- Data on capital: national account
- Data on education: constructed indices of educational attainment

*Table 1***Sources of Growth: China, India, and East Asia, 1978–2004***(annual percentage rate of change)*

<i>Period/country</i>		<i>Output</i>	<i>Employment</i>	<i>Output per worker</i>	<i>Contribution to output per worker of</i>		
					<i>Physical capital</i>	<i>Education</i>	<i>Total factor productivity</i>
1978–2004	China	9.3	2.0	7.3	3.2	0.3	3.6
	<b>India</b>	<b>5.4</b>	<b>2.0</b>	<b>3.3</b>	<b>1.3</b>	<b>0.4</b>	<b>1.6</b>
1978–1993	China	8.9	2.5	6.4	2.4	0.4	3.5
	<b>India</b>	<b>4.5</b>	<b>2.1</b>	<b>2.4</b>	<b>0.9</b>	<b>0.3</b>	<b>1.1</b>
1993–2004	China	9.7	1.2	8.5	4.2	0.3	3.9
	<b>India</b>	<b>6.5</b>	<b>1.9</b>	<b>4.6</b>	<b>1.8</b>	<b>0.4</b>	<b>2.3</b>
East Asia excluding China							
1960–1980		7.0	3.0	4.0	2.2	0.5	1.2
1980–2003		6.1	2.4	3.7	2.2	0.5	0.9
1980–1993		7.3	2.7	4.6	2.6	0.6	1.4
1993–2003		4.5	2.0	2.5	1.8	0.5	0.3

Table 3

**Sources of Growth by Major Sector, 1978–2004***(annual percentage rate of change)*

<i>Period/country/sector</i>	<i>Output</i>	<i>Employment</i>	<i>Output per worker</i>	<i>Contribution to output/worker of</i>			
				<i>Physical capital</i>	<i>Education</i>	<i>Factor productivity</i>	
<b>Agriculture</b>							
1978–2004	China	4.6	0.3	4.3	2.3	0.3	1.7
	<b>India</b>	<b>2.5</b>	<b>1.1</b>	<b>1.4</b>	<b>0.3</b>	<b>0.3</b>	<b>0.8</b>
1978–1993	China	5.2	0.9	4.3	2.2	0.3	1.7
	<b>India</b>	<b>2.7</b>	<b>1.4</b>	<b>1.3</b>	<b>0.1</b>	<b>0.2</b>	<b>1.0</b>
1993–2004	China	3.7	−0.6	4.3	2.3	0.2	1.7
	<b>India</b>	<b>2.2</b>	<b>0.7</b>	<b>1.5</b>	<b>0.6</b>	<b>0.3</b>	<b>0.5</b>
<b>Industry</b>							
1978–2004	China	10.0	3.1	7.0	2.2	0.3	4.3
	<b>India</b>	<b>5.9</b>	<b>3.4</b>	<b>2.5</b>	<b>1.5</b>	<b>0.3</b>	<b>0.6</b>
1978–1993	China	9.3	4.4	4.9	1.5	0.4	3.0
	<b>India</b>	<b>5.4</b>	<b>3.3</b>	<b>2.1</b>	<b>1.4</b>	<b>0.4</b>	<b>0.3</b>
1993–2004	China	11.0	1.2	9.8	3.2	0.3	6.1
	<b>India</b>	<b>6.7</b>	<b>3.6</b>	<b>3.1</b>	<b>1.7</b>	<b>0.3</b>	<b>1.1</b>
<b>Services</b>							
1978–2004	China	10.7	5.8	4.9	2.7	0.3	1.8
	<b>India</b>	<b>7.2</b>	<b>3.8</b>	<b>3.5</b>	<b>0.6</b>	<b>0.4</b>	<b>2.4</b>
1978–1993	China	11.3	6.5	4.7	1.8	0.4	2.5
	<b>India</b>	<b>5.9</b>	<b>3.8</b>	<b>2.1</b>	<b>0.3</b>	<b>0.4</b>	<b>1.4</b>
1993–2004	China	9.8	4.7	5.1	3.9	0.3	0.9
	<b>India</b>	<b>9.1</b>	<b>3.7</b>	<b>5.4</b>	<b>1.1</b>	<b>0.4</b>	<b>3.9</b>

# Key Findings (1)

- For the entire period, China's output growth rate (9.3%) was much higher than that of India (5.4%).
- Physical capital and TFP play contributed more to China's growth in output per worker.
- India's growth in output per worker improved after 1993, and it's comparable to that in East Asia (before financial crisis)
- In both countries, growth in output per worker is equally split between increases in K & H and gains in TFP.

# Key Findings (2)

- **Agriculture**

- Growth in agricultural Y/L in China after 1993 was impressive because the sector grows despite a drop in employment.
- The gains in China were achieved through increases in K/L and TFP gain (more than double those for India).

- **Industry**

- After 1993, China has achieved spectacular growth rate in industrial Y/L (9.8%) – This is attributed largely to TFP gain and increases in K/L (double of growth in previous period) .
- Growth in Y/L in India is only 1/3 of that in China, and gains in TFP have been very modest (1%).

# Key Findings (3)

- **Services**

- Growth in  $Y/L$  in service sector in China has been  $\sim 5\%$  steadily (mostly attributed to increases in  $K/L$ ).
- After 1993, growth in  $Y/L$  service sector in India exceeds  $5\%$  (closest match to China). This gain is reflected in a rapid improvement in TFP.