


Knowledge Economies in China

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Conclusions

- China's place in a dynamic world economy
- Slight difficulty
- Snapshot of indicators underlying future growth prospects

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2003

- 6 economies (G6) > US\$ 1 trillion each
- China, India, Russia, Brazil **total** < average G6
- (Growth accounting)
 - $g_4 > G_6$ by 2040
 - China > all but US by 2016

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US\$ GDP catch up by

- China
 - De (2008), Jp (2016), US (2039)
- India
 - Fr (2020), De (2025), Jp (2032)

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But...

- People still poor; just economies large
- 10³ US\$/capita, 2050 (market exchange rates)

Br	Cn	In	Ru
27	31	17	50
US	UK	Jp	De
84	59	67	49

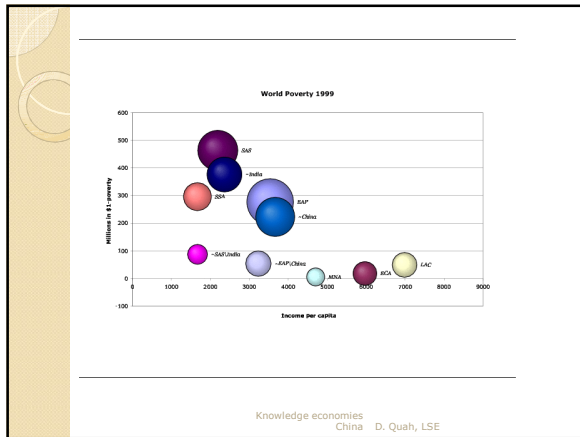
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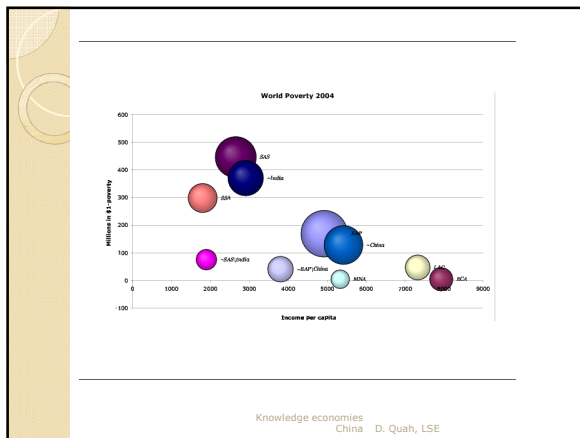
Relative contribution to world economy

From a small base, the contributions are already substantial, even at market exchange rates

	2005 Fraction of World GNI	2006 growth, 10 ⁹ US\$
US	28.6%	533.1
China	5.0%	371.8
India	1.8%	102.5
China + India	6.8%	474.3
High Income OECD	75.6%	1763.4
Low + Middle Income	21.1%	1462.8

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Slight difficulty: Technical progress vs. technology

- Growth is a production function $Y = F(K, N, A)$ and Total Factor Productivity (A)
- TFP and technical progress. Not growth through “mere factor inputs”
- What drives A ?
 - IPRs: Creativity versus dissemination
- How high-tech must a society be to count for high TFP?

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Slight difficulty: Korea

- Mid-1960s poorer than Cameroon, the Philippines, Senegal, Zimbabwe;
- more than 50% labour force agricultural ...
- ...by mid-1980s, Samsung's EPROM chips and semiconductor wafers more efficient than Intel
- ...relative to population, by 1998 more mobile phones and by 2000 three times the broadband Internet subscribers than the US

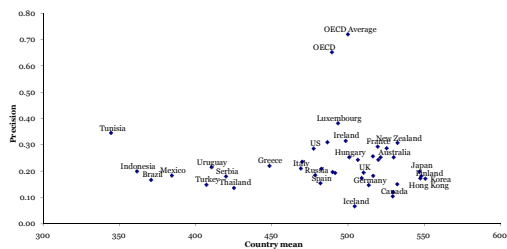
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Korea: Sustained growth?

- 1997 East Asian crisis the Korean won fell 35% in 6 months
- \$57bn IMF rescue package set a new record
- Daewoo Group disappeared altogether
- Annual per capita GDP growth after, 4.5%, only two-thirds of the 6.9% before
- Even in 2000 Korea's TFP only 57% that of US

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Problem-solving skills in 15 year-olds, 2003



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Slight difficulty: Technical progress vs. technology

- ...
- Even in 2000 Korea's TFP only **57%** that of US
- How high-tech must a society be to count for high TFP?
- In 2000 China's TFP only **35%** that of the US

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Human capital development

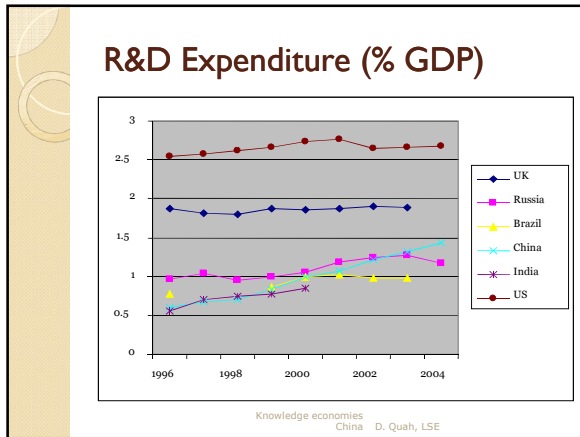
% gross enrollment	Primary	Secondary	Tertiary
UK	102.2	154.1	60.4
Russia	112.0	93.0	66.7
Brazil	147.8	104.3	18.1
China	116.6	66.6	11.8
India	102.4	48.6	11.0
US	100.7	94.0	76.0
World	102.3	64.2	21.8
High-income	100.3	103.7	63.4
Middle-income	112.8	72.6	20.2
Low-income	95.0	42.7	8.7

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Using that human capital

R&D environment	R&D expenditure (% GDP)	Researchers in R&D (per 10 ⁶ population)
UK	1.86	2572
Russia	1.10	3458
Brazil	0.94	344
China	0.98	539
India	0.72	138
US	2.66	4487
World	2.15	na
High-income	2.40	3622
Middle-income	0.69	707
Low-income	0.68	na

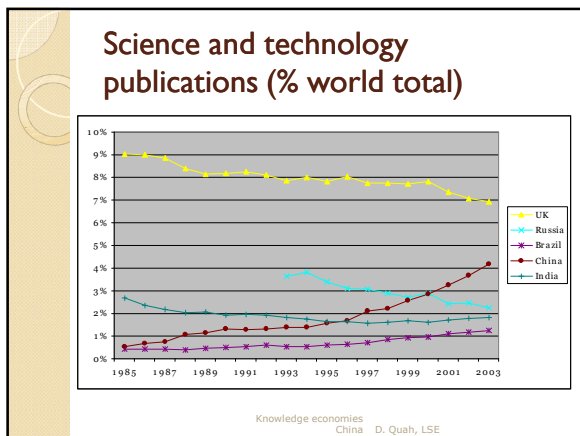
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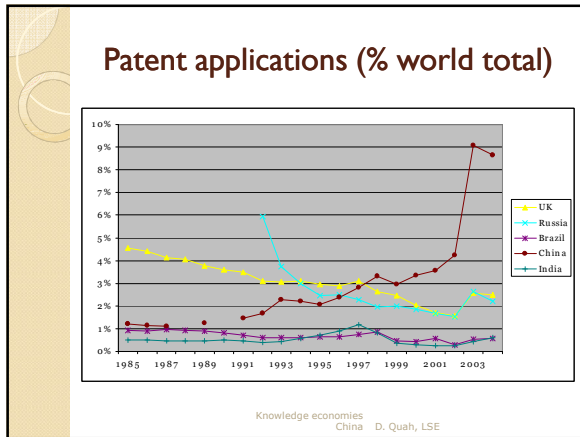


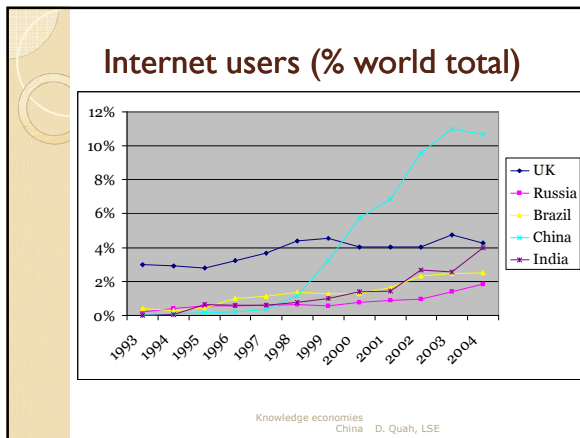
What to show for it?

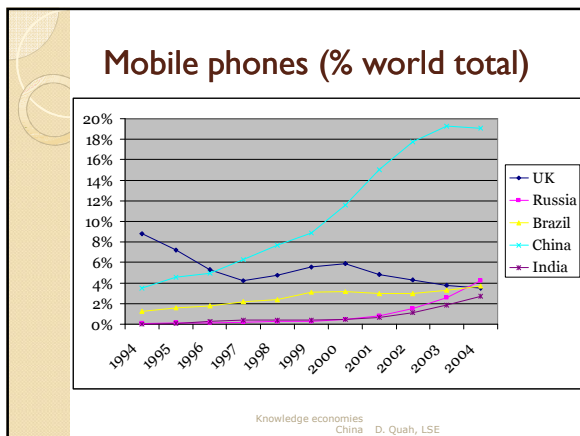
Percentage of world totals	Scientific and technical journal articles	Patent applications
UK	8.1	3.1
Russia	3.0	2.6
Brazil	0.7	0.7
China	1.8	3.0
India	2.0	0.5
US	36.0	20.3
High-income	88.4	83.8
Middle-income	9.3	12.5
Low-income	2.4	3.7

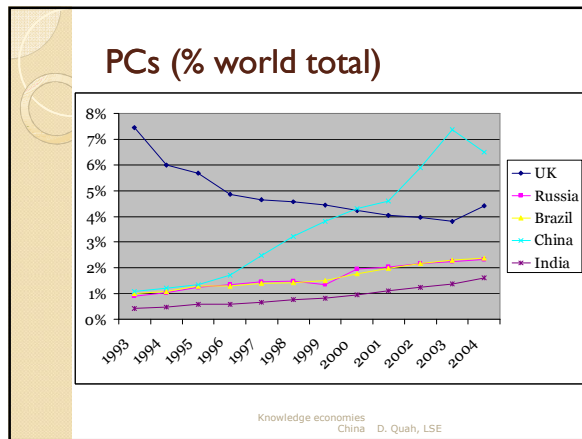
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Intellectual property rights


- Music, digital entertainment
 - MP3s, DVDs
- Computer software, operating systems
 - MS Windows, Linux
- Pharmaceuticals
 - AIDS antiretrovirals

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