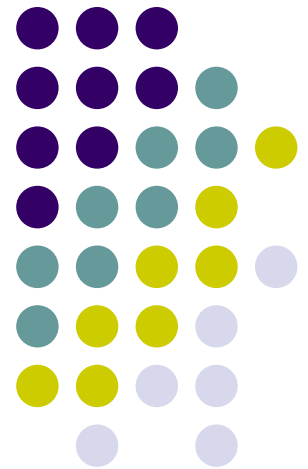
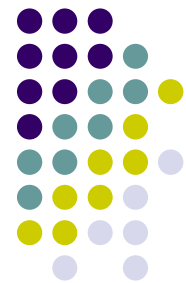


Introduction to Economics of Development

Lewis Two-sector
Migration Model





What's Happening 03/06/08

The world's 25 richest billionaires:

RANK	NAME	CITIZENSHIP	AGE	NET WORTH (\$BIL)	RESIDENCE
1	Warren Buffett	United States	77	62.0	United States
2	Carlos Slim Helu & family	Mexico	68	60.0	Mexico
3	William Gates III	United States	52	58.0	United States
4	Lakshmi Mittal	India	57	45.0	United Kingdom
5	Mukesh Ambani	India	50	43.0	India
6	Anil Ambani	India	48	42.0	India
7	Ingvar Kamrad & family	Sweden	81	31.0	Switzerland
8	KP Singh	India	76	30.0	India
9	Oleg Deripaska	Russia	40	28.0	Russia
10	Karl Albrecht	Germany	88	27.0	Germany
11	Li Ka-shing	Hong Kong	79	26.5	Hong Kong
12	Sheldon Adelson	United States	74	26.0	United States
13	Bernard Arnault	France	59	25.5	France
14	Lawrence Ellison	United States	63	25.0	United States
15	Roman Abramovich	Russia	41	23.5	Russia
16	Theo Albrecht	Germany	85	23.0	Germany
17	Liliane Bettencourt	France	85	22.9	France
18	Alexei Mordashov	Russia	42	21.2	Russia
19	Prince Alwaleed Bin Talal Al Saud	Saudi Arabia	51	21.0	Saudi Arabia
20	Mikhail Fridman	Russia	43	20.8	Russia
21	Vladimir Lisin	Russia	51	20.3	Russia
22	Amancio Ortega	Spain	72	20.2	Spain
23	Raymond, Thomas & Walter Kwok	Hong Kong	NA	19.9	Hong Kong
24	Mikhail Prokhorov	Russia	42	19.5	Russia
25	Vladimir Potanin	Russia	47	19.3	Russia

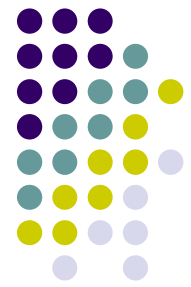


Model Motivation

- Why do we need a two-sector model?
 - Basic economics problem: how to allocate constrained resources more efficiently
 - Misallocation inefficiency in developing countries
 - Too much labor in traditional agricultural sector
 - Farmers not working at their full potential (efficiency)
 - Underemployment/Hidden unemployment/Disguised Unemployment
 - Industrial sector with a much higher productivity, needs to absorb more labor into workforce
 - Potential efficiency gains from labor migration to higher productivity sectors



Arthur Lewis (1915-1991)



Why is this significant?

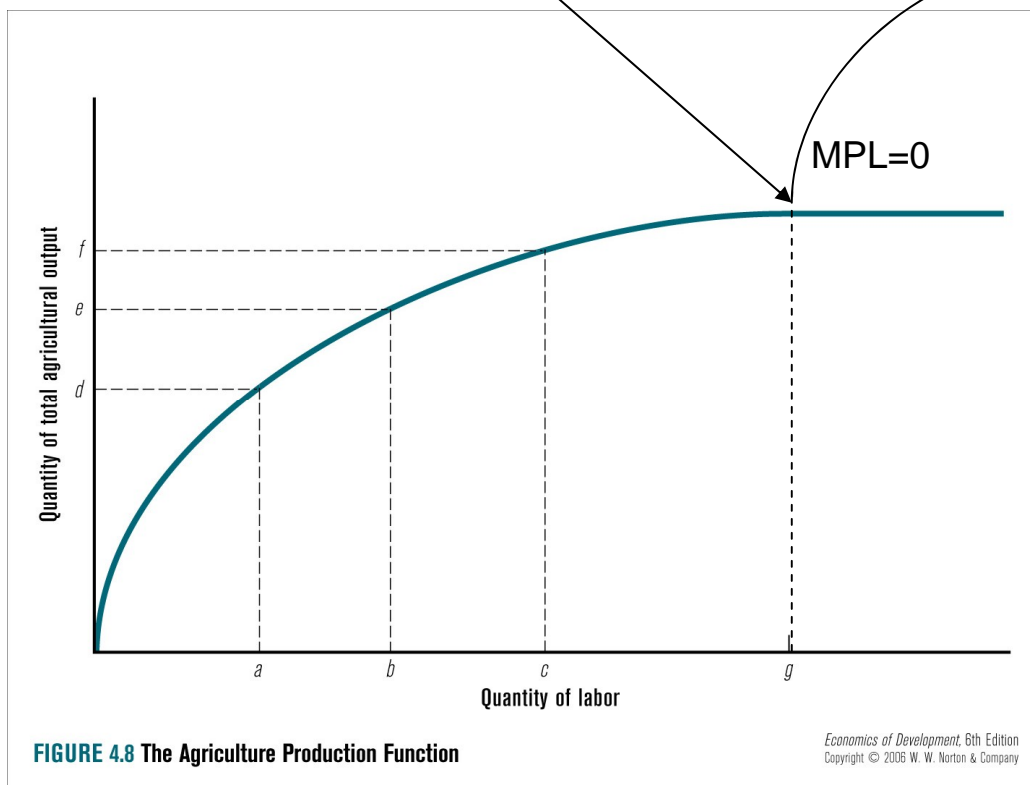
country	labor force (in millions)	agricultural % GDP	GDP, nominal (in billions)	agricultural employment share
Somalia	3.7	65%	2.5	71%
India	516	18%	1090	60%
China	803	12%	3249	43%
Mexico	45	4%	886	18%
US	153	1%	13790	0.6%



The problem of surplus labor

At point g and thereafter, $MPL=0$, with more labor working on the fixed amount of land, the more severe the surplus labor problem becomes. This results in lower labor productivity on average.

In other words, everyone is not working at their full potential, or at least some of them are shading.





Supply & Demand of Labor in Industrial Sector

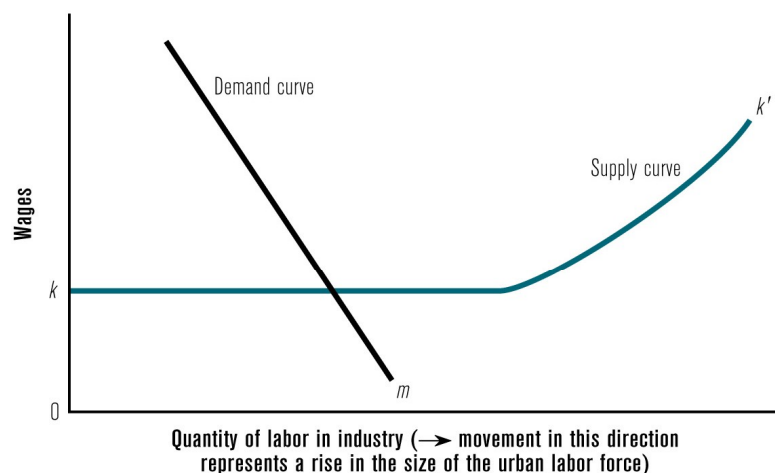


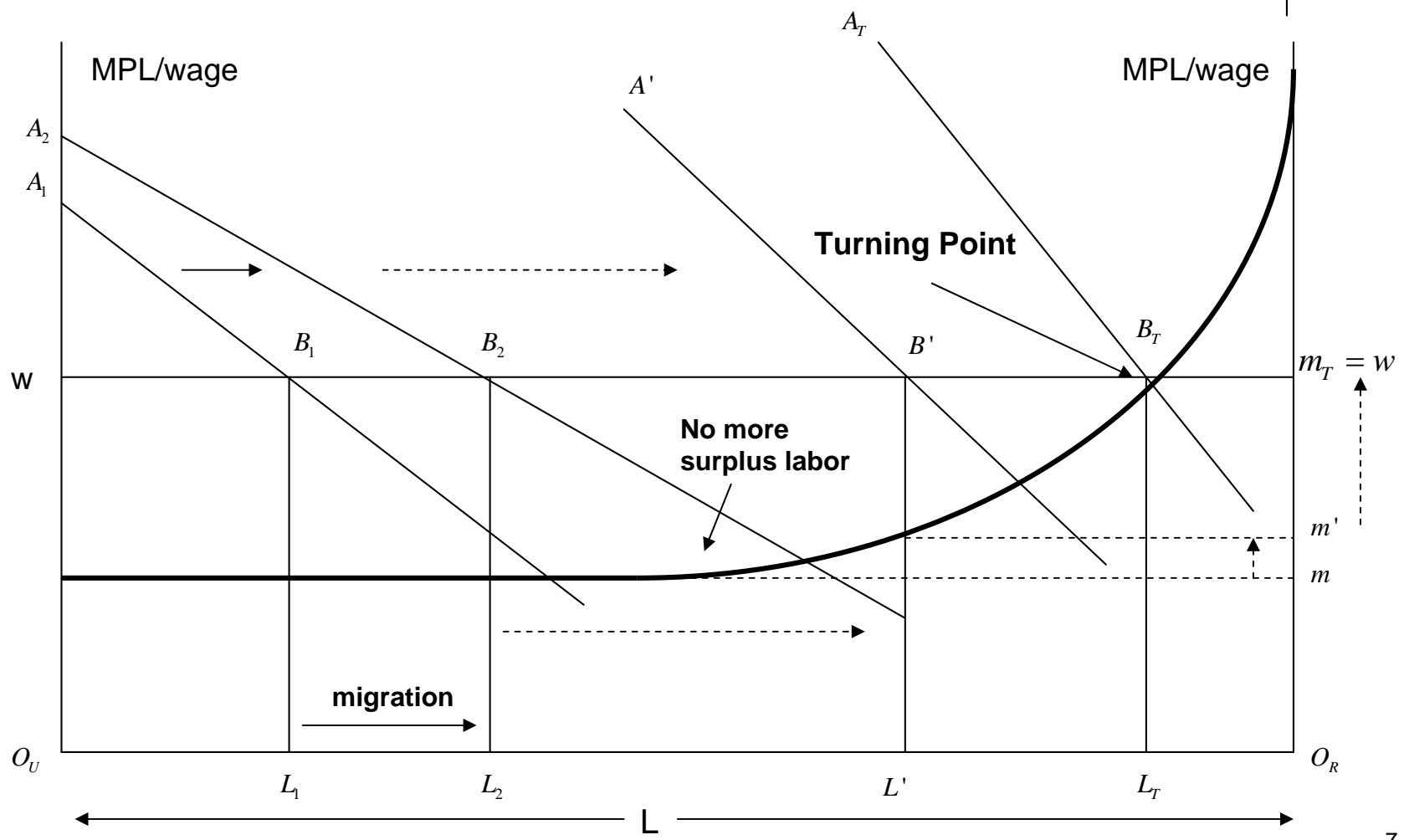
FIGURE 4.10 The Supply and Demand for Industrial Labor

Economics of Development, 6th Edition
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- When industrial sector offers a wage that is slightly higher than rural wage, it provides incentives for farmers to move out of agricultural sector.
- As the demand of labor in industrial sector increases, more and more rural labor migrate to urban area. At on point (the kink point on supply curve), surplus labor will disappear and MPL goes back to positive.
- With fewer farmers left, the agricultural output will not necessarily fall as everyone previously was not working at their full potential. In fact, after pullout of surplus labor, productivity may increase, so does wage.



Lewis Two-Sector Migration Model Dynamics





Application: Why China Grows So Fast

According to Spence(2007):

- High savings and investment
 - Including public investment in education and infrastructure
- People are employed more productively
 - Labor migration from agricultural to industrial
 - More people work for private sectors, away from State-Owned-Enterprises (SOEs), the source of huge resources misallocation.
- International trade
- Technology / applied practical knowledge

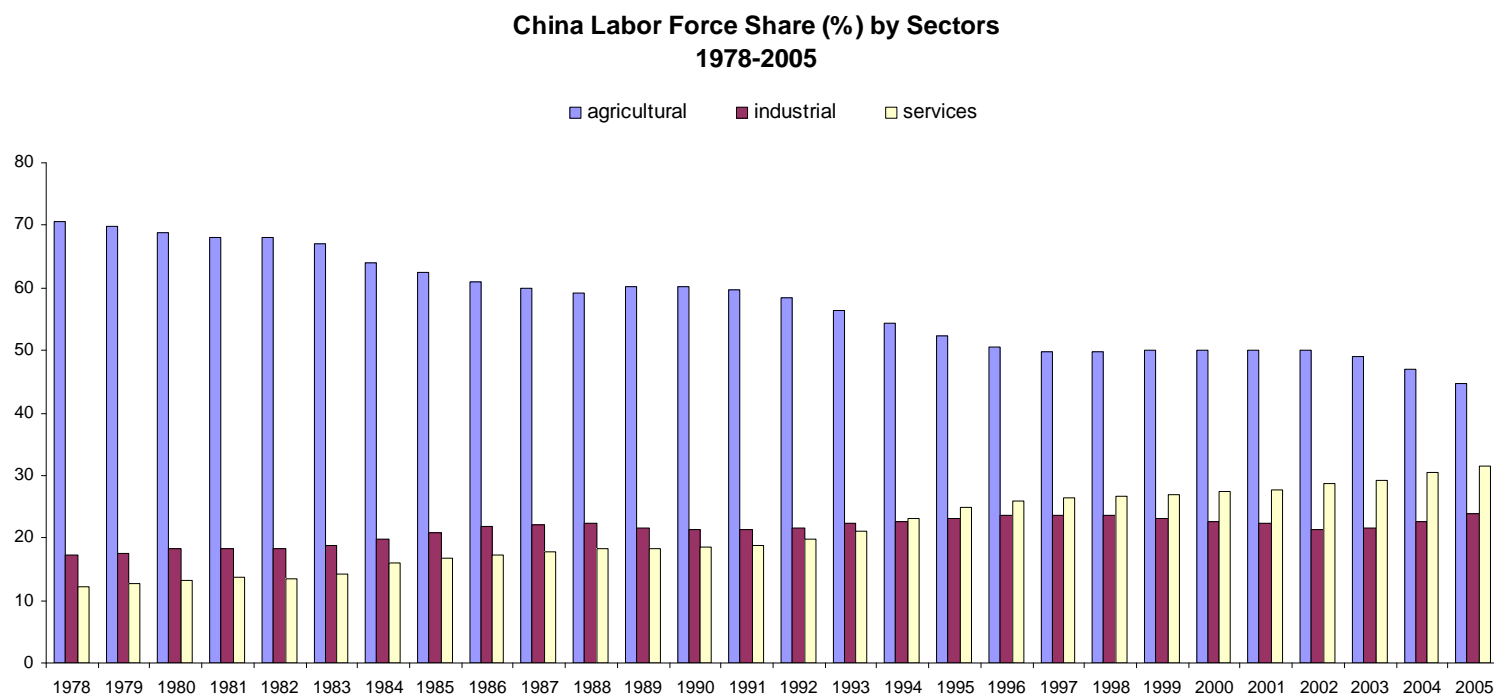


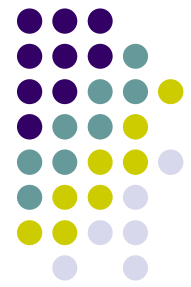
2001 Nobel winner



Application: Why China Grows So Fast

- People are employed more productively
 - From agricultural (lower productivity) → industrial and services sector (higher productivity)

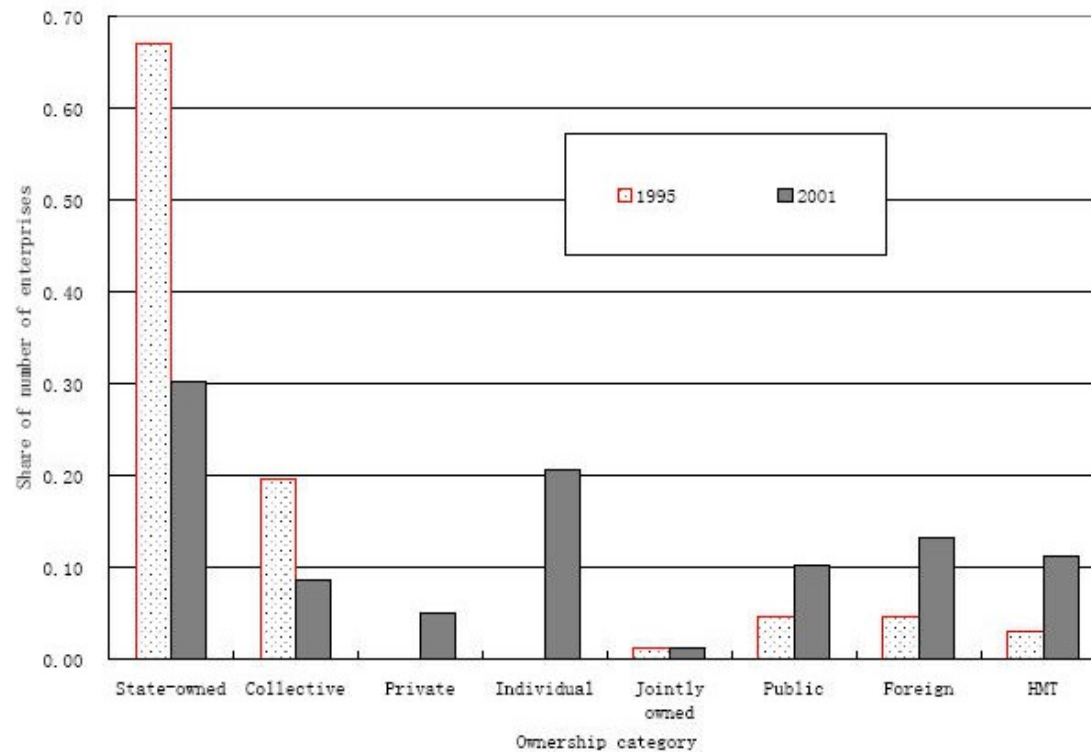




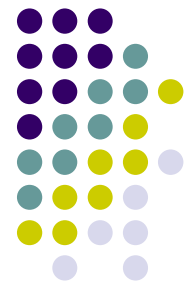
Application: Why China Grows So Fast

- People are employed more productively
 - Declining role of State-Owned Enterprises

Figure 9: Changing ownership structure of Chinese industry



HMT: Hong Kong, Macao, Taiwan Invested.



Application: Why China Grows So Fast

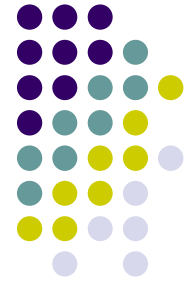
- People are employed more productively
 - SOEs are one big source of misallocation inefficiency

Decomposition of rates of return on capital

	1998	Rate change due to increase in			2003
	Rate of return on physical capital	Profit margin	Capital-output ratio	Depreciation rate	Rate of return on physical capital
Rate of return on physical assets ^a					
All enterprises	6.1	+2.1	+5.3	-1.3	12.2
State controlled companies	4.8	+3.6	+3.3	-1.6	10.2
Controlled directly by the state	3.9	+2.9	+2.8	-1.4	8.2
Controlled by state held companies	7.4	+5.8	-0.9	-0.6	11.7
Other forms of state control	8.5	+3.4	+6.0	-2.3	15.6
Collectively controlled	11.1	+0.2	+5.5	-0.4	16.3
Private companies	7.8	+1.2	+6.7	-0.7	15.0
Non-mainland controlled	4.7	+2.9	+8.3	-1.3	14.5
Controlled by individuals	12.0	+0.4	+4.6	-1.0	16.0
Controlled by non-state companies	8.6	+2.8	+2.1	-0.5	13.0

Source: China National Bureau of Statistics industrial microdata and OECD analysis.

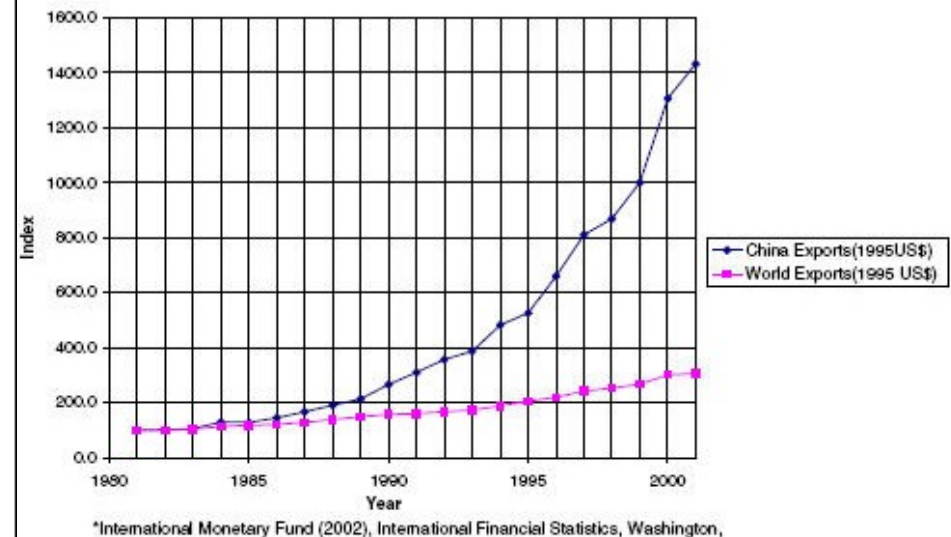
^a Rate of return on physical capital calculated as operating surplus divided by fixed assets and inventories.

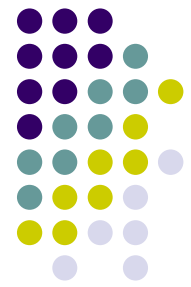


Application: Why China Grows So Fast

● International trade

- Spence, “There are no examples of sustained high growth in the postwar period that do not involve integration into the global economy”.

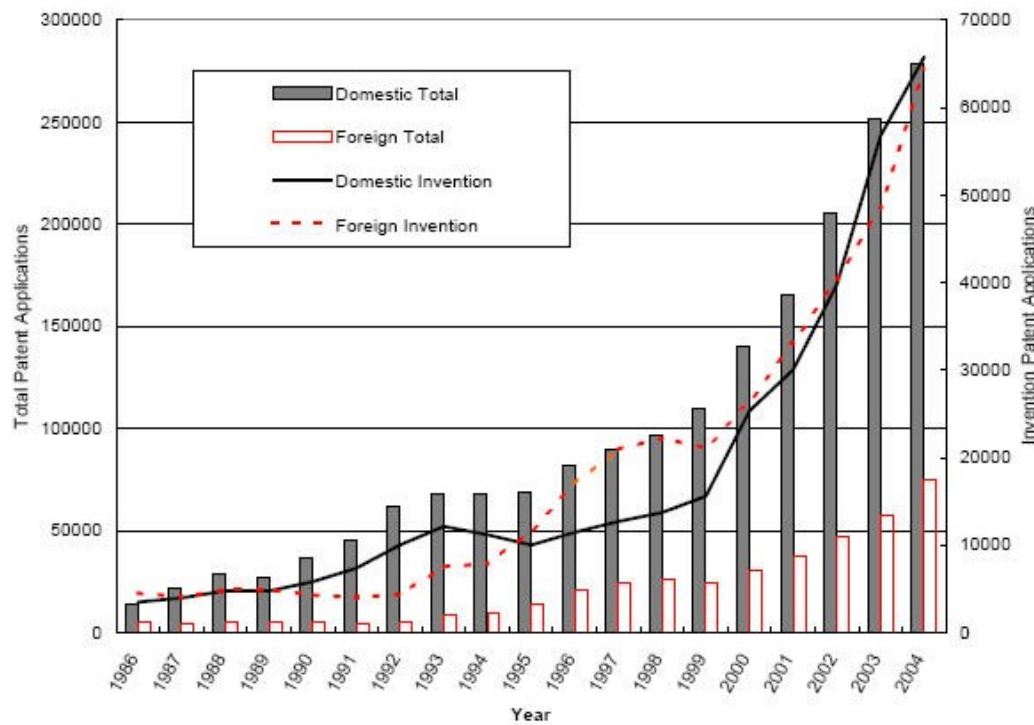




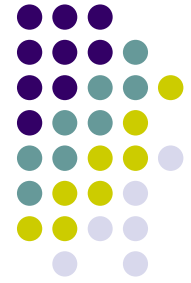
Application: Why China Grows So Fast

- Technology advancement: fast rising patent applications

Figure 1: Chinese Patent Applications, 1986-2004



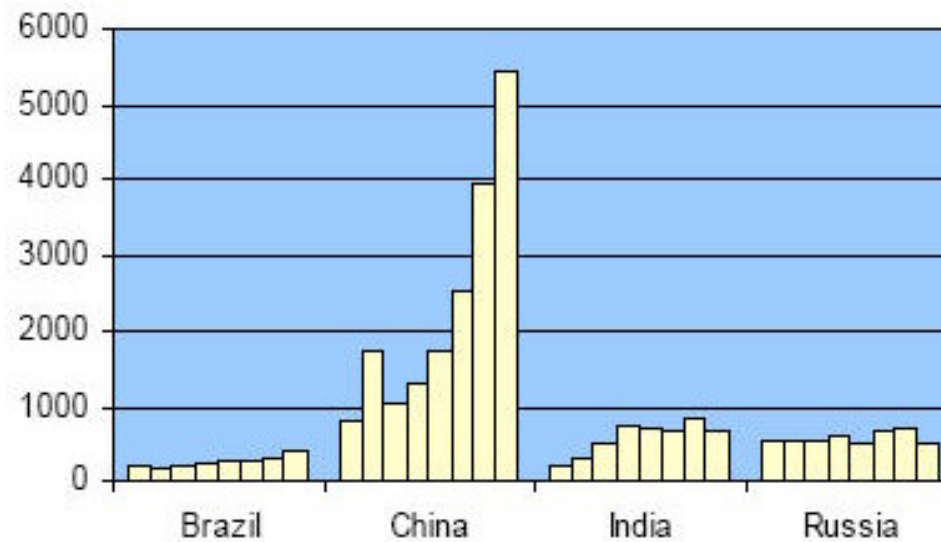
Source: web site of China's National Bureau of Statistics - www.stats.gov.cn.



Application: Why China Grows So Fast

- Technology advancement:
 - Fast rising patent applications: comparison among emerging economies

Number of international patent applications (PCT) in BRIC countries, 2000–2007



Source: WIPO (www.wipo.int)



Application: Why China Grows So Fast

- Technology advancement: fast catch-up in R&D investment

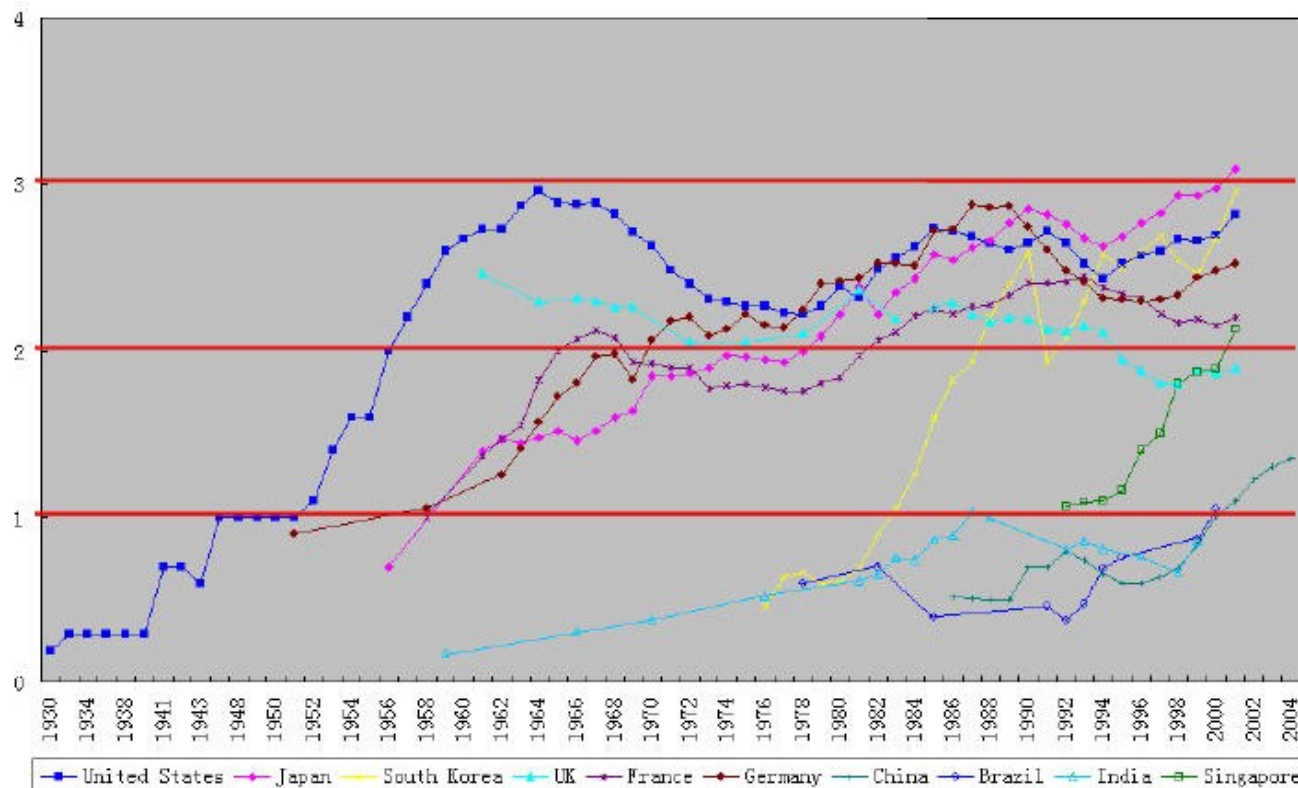
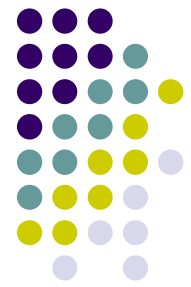


Figure 2. Historic R&D/GDP (or GNP) in 10 Countries

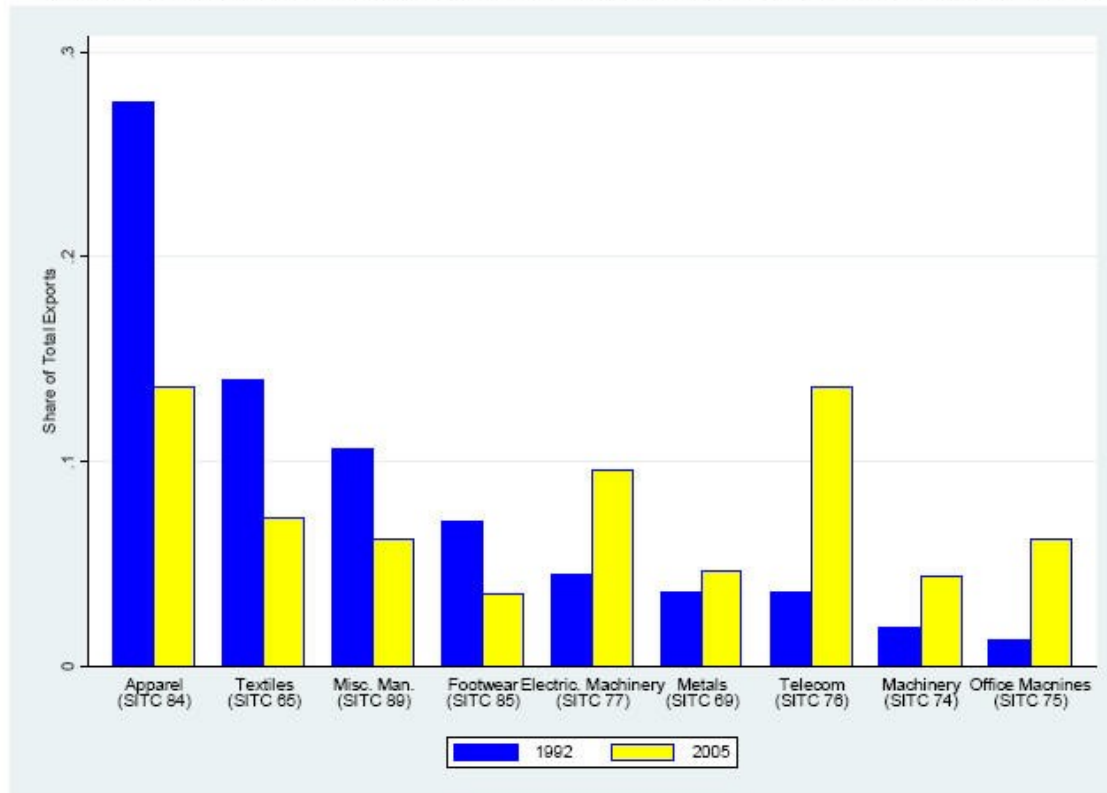
(R&D/GDP ratio (%) on the vertical axis)



Application: Why China Grows So Fast

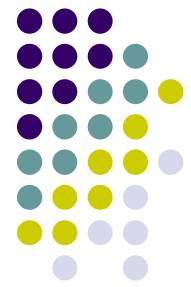
- Technology advancement: increasing sophistication of export?

Figure 2: The Reallocation of Manufacturing Exports Across Major Two-digit Sectors



* A sector is defined as major if the sector's share of total trade is above 3% in 1992 and/or 2005. These sectors account for about 70 percent of manufacturing exports.

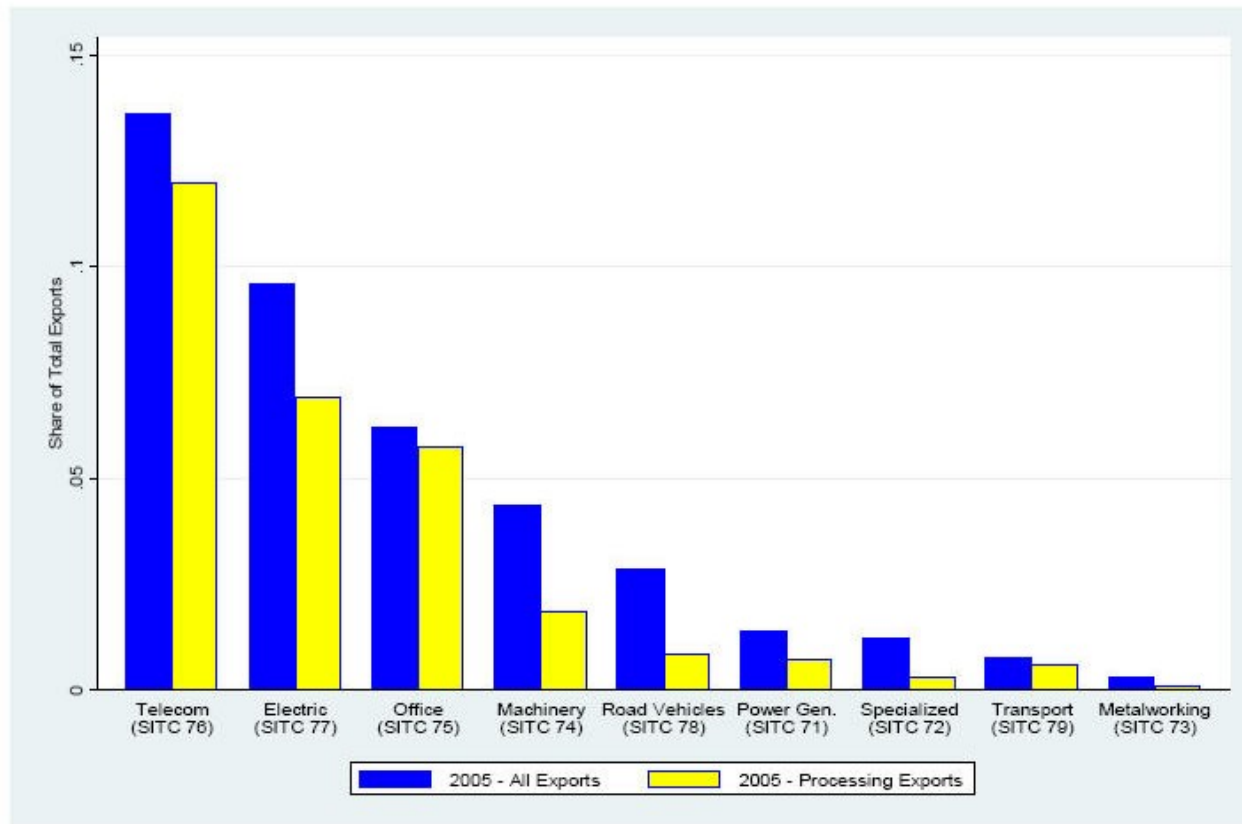
Source: Amiti and Freund, "An Anatomy of China's Export Growth".

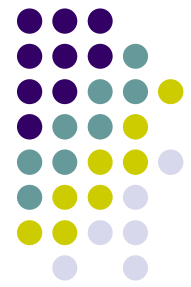


Application: Why China Grows So Fast

- Technology advancement: increasing sophistication of export?

Figure 3: Machinery Exports and Processing Trade

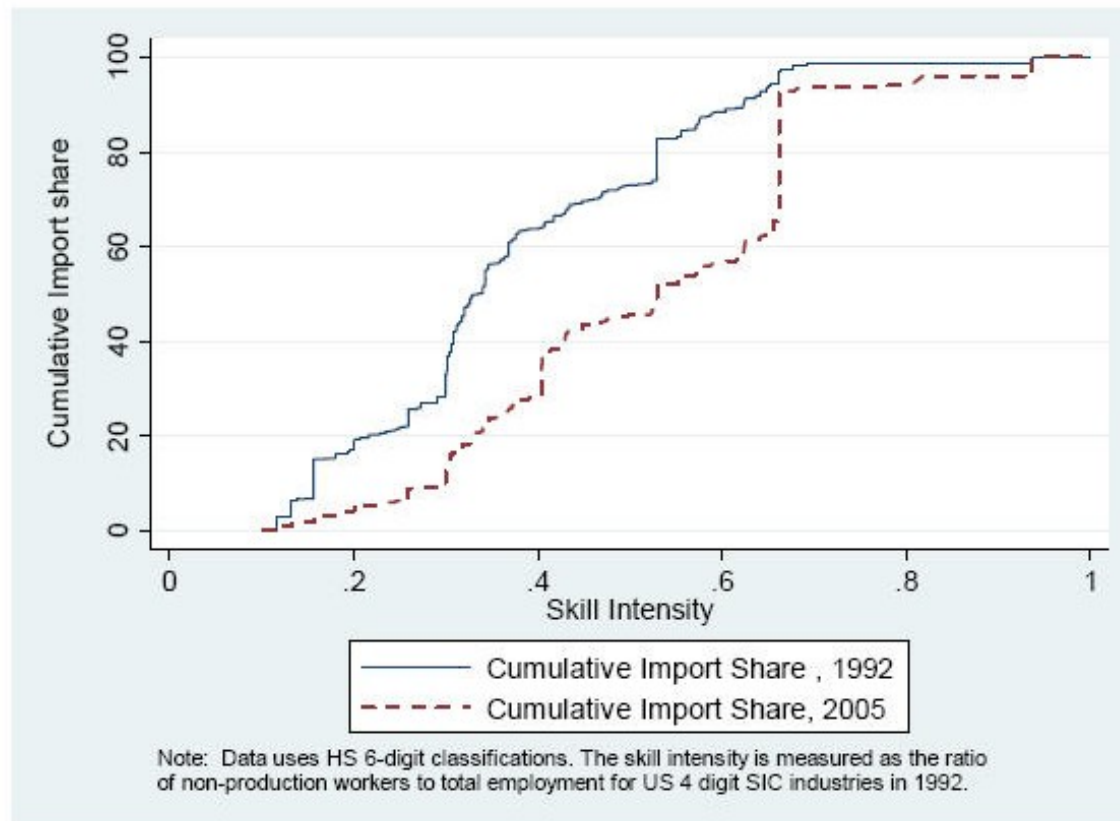


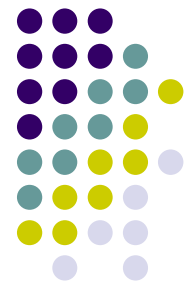


Application: Why China Grows So Fast

- Technology advancement: increasing sophistication of export?

Figure 6: Cumulative Import Share and Skill Intensity
Processing Trade





Application: Why China Grows So Fast

- Technology advancement: increasing sophistication of export?

**Figure 5: Skill Intensity of China's Manufacturing Exports
Excluding Processing Trade**

