China from a Macroeconomist's Perspective

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China as number 1?

Gross Domestic Product: 2010 (bil. USD, at exchange rates)

1. United States: $14,660
2. China: $ 5,878
3. Japan: $ 5,459

(Some of the) Big Questions

1. **How big is China?**

   Measurement issues

2. **Why has China grown so quickly?**

   Sources of growth since 1980

3. **How has China's international trade changed?**

   China's trade with the world

4. **Why does China have large net export surpluses?**

   Or: Why does China save so much?

How big is China?

- As measured at exchange rates
  - Useful for measuring market size…
  - Doesn't take into account price differences across countries
- "Developmental" comparisons
  - Use Purchasing Power Parity GDP

PPP Adjusted GDP

- International Comparison Program
  - Prices in different countries of comparable goods
  - Construct GDP price indices
  - Deflate local currency GDP: "international $ GDP"
  - Defined relative to the United States

$$\frac{GDP_{LC}}{GDP_{I\$}} = PPP$$

- PPP reflects exchange rates and relative price differences

PPP Adjusted GDP, 2007

	PPP (relative to US)	FX (local cur/ USD)	$\frac{GDP_{i,FX}}{GDP_{US,FX}}$	$\frac{GDP_{i,PPP}}{GDP_{US,PPP}}$
China	2.2	7.61	0.25	0.87
Japan	126.4	117.8	0.32	0.30
U.S.	1.0	1.0	1.00	1.00

- Chinese prices are substantially lower!
- Many problems with PPP including: quality, rural/urban sampling, housing, government services…

GDP per Capita, 2007

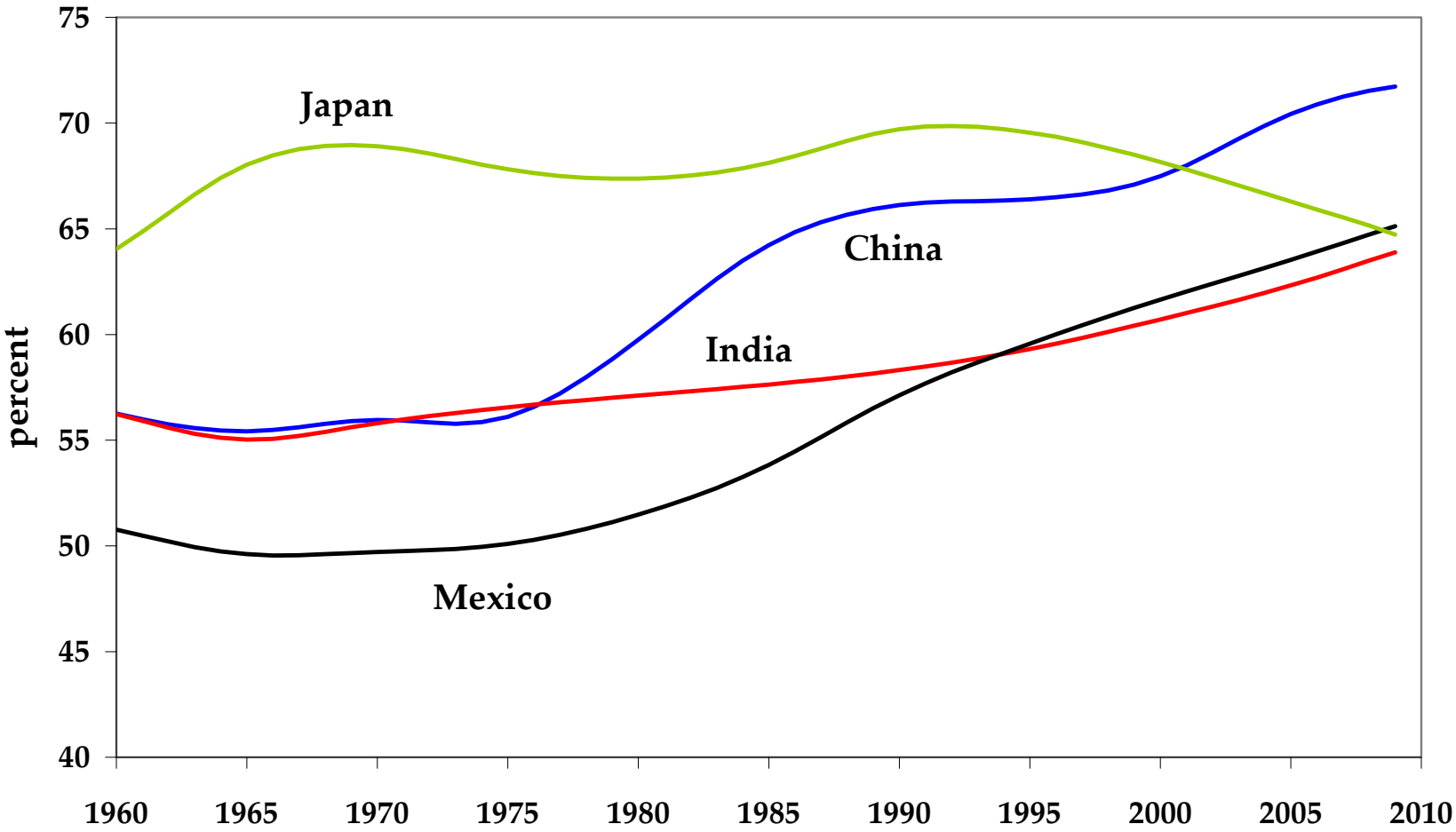
- "Big" doesn't mean "rich"
- Adjusting GDP for the population

	$\frac{GDP_{i,FX}}{GDP_{US,FX}}$	$\frac{GDP_{i,PPP}}{GDP_{US,PPP}}$	$\frac{GDP_{i,FX}}{GDP_{US,FX}}$	$\frac{GDP_{i,PPP}}{GDP_{US,PPP}}$
	Total	Total	Per Capita	Per Capita
China	**0.25**	**0.87**	**0.06**	**0.20**
Japan	0.32	0.30	0.76	0.70
India	0.08	0.34	0.02	0.09
Mexico	**0.07**	**0.10**	**0.18**	**0.26**
U.S.	1.00	1.00	1.00	1.00

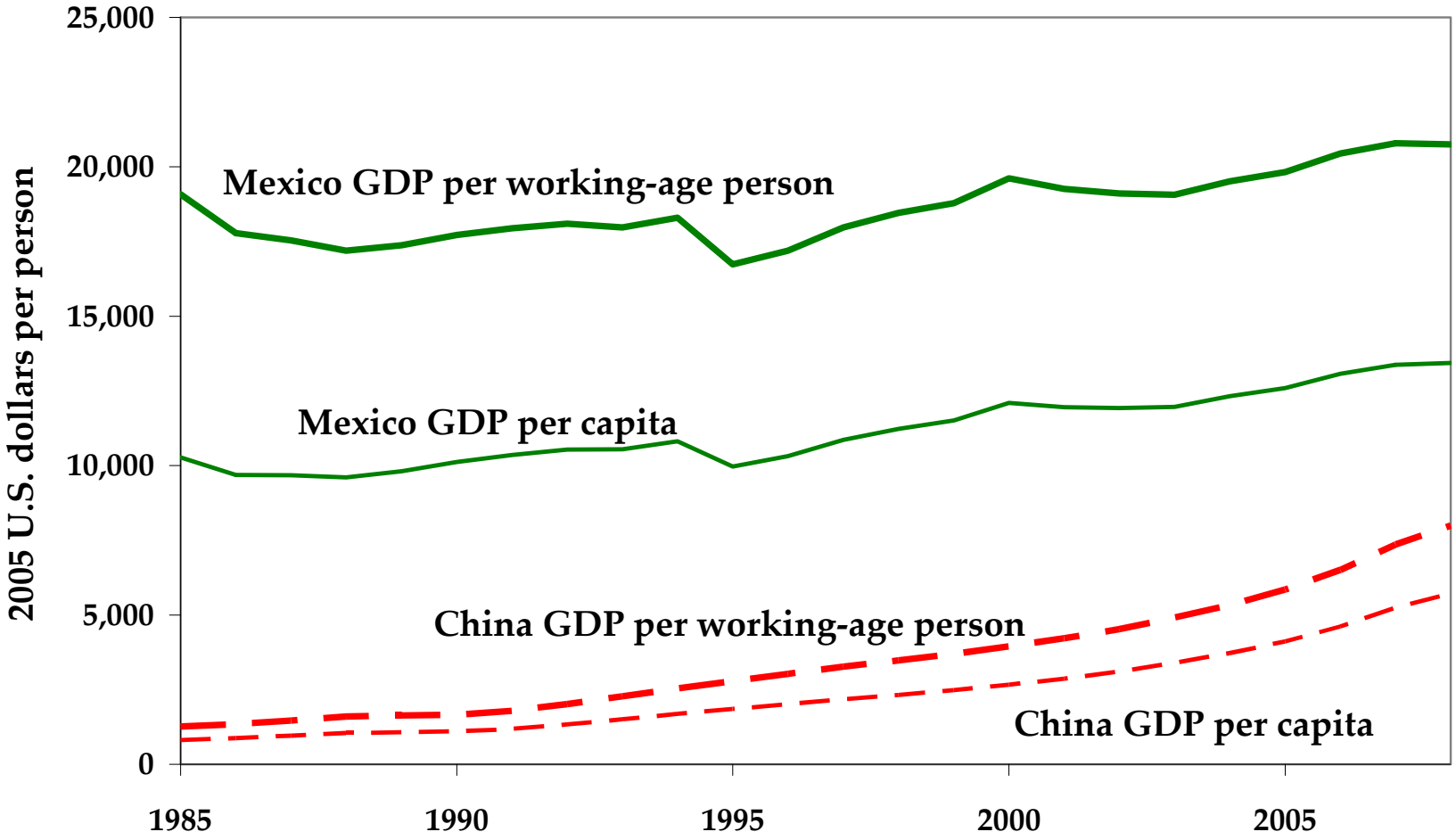
Demographics

- China has an aging population compared to countries at its level of development

Fraction of population aged 15-64 years

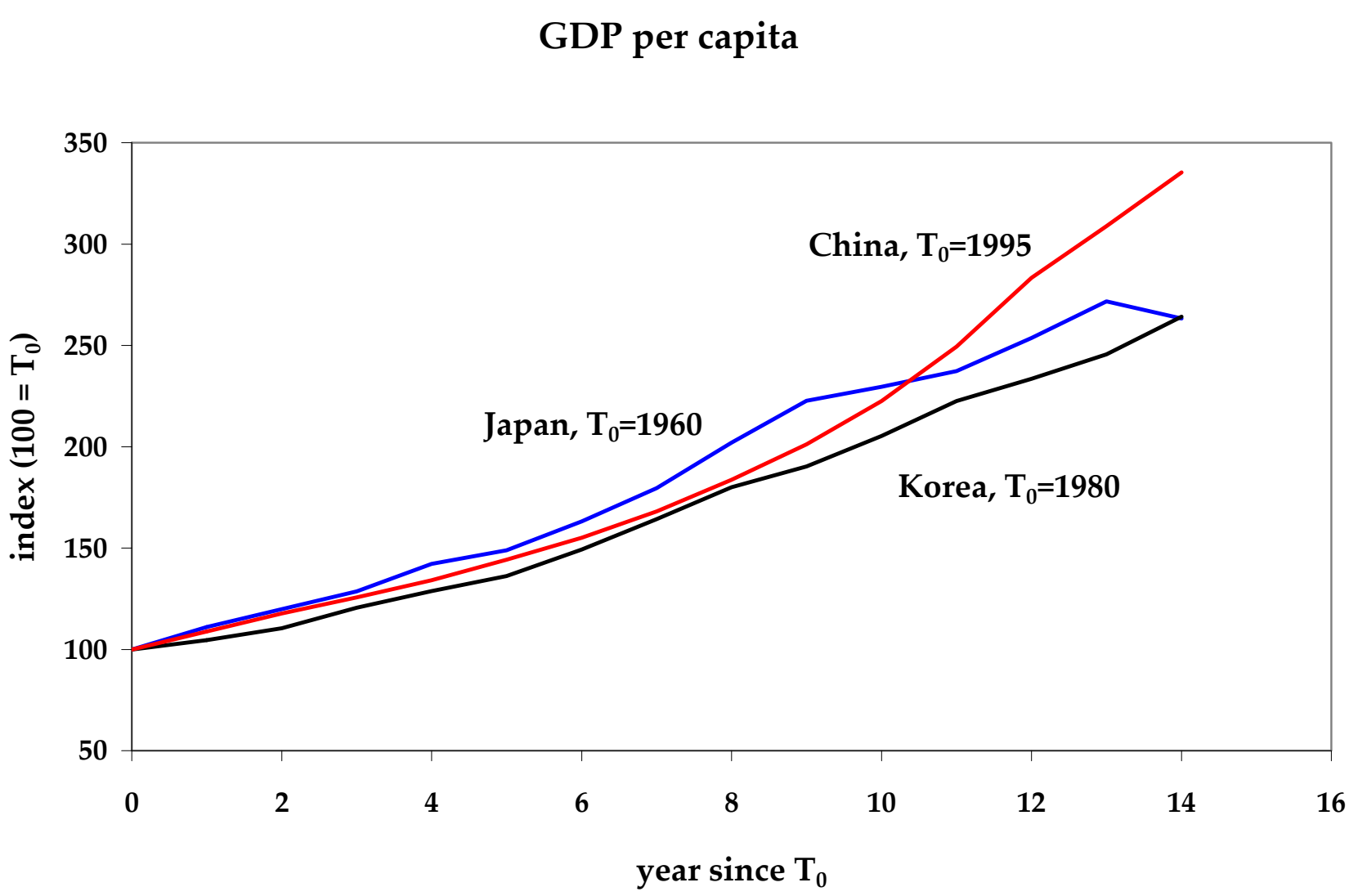


Purchasing power parity GDP in Mexico and China



Why has China grown so quickly?

- China's growth in last 20 years is impressive


GDP per capita
350
300
250
200
150
100
50
index (100 = T0)
China, T0=1995
Japan, T0=1960
Korea, T0=1980
0
2
4
6
8
10
12
14
16
year since T0

Why has China grown so quickly?

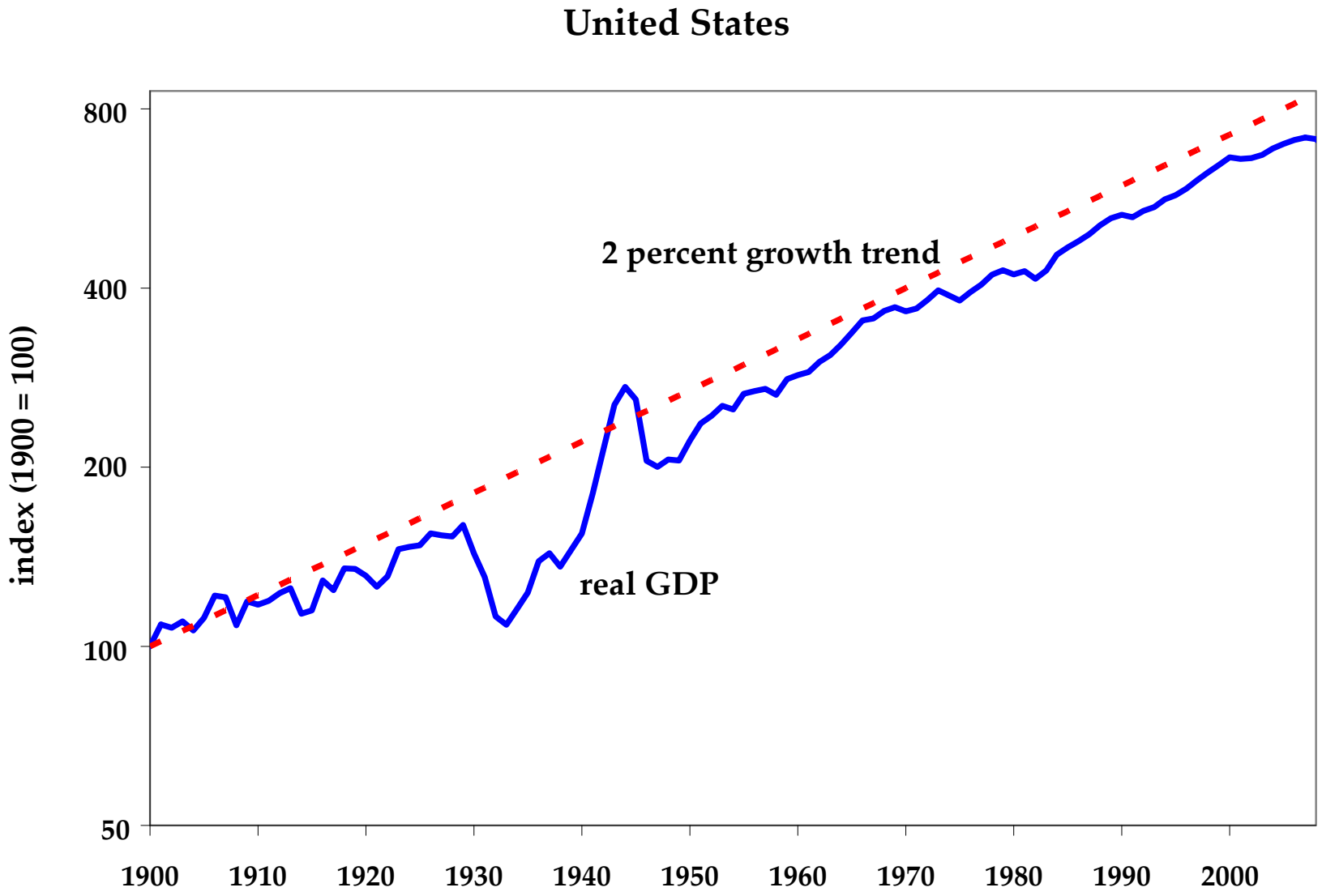
- China's growth in last 30 years is impressive
  - but not unprecedented
- A quick tour of the macroeconomist's toolkit
  - Two factors of production: labor and capital
  - Total factor productivity, A, measures includes everything else
- Useful for identifying sources of growth
- Common specification

$$Y_t = A_t K_t^{\alpha} L_t^{1-\alpha}$$

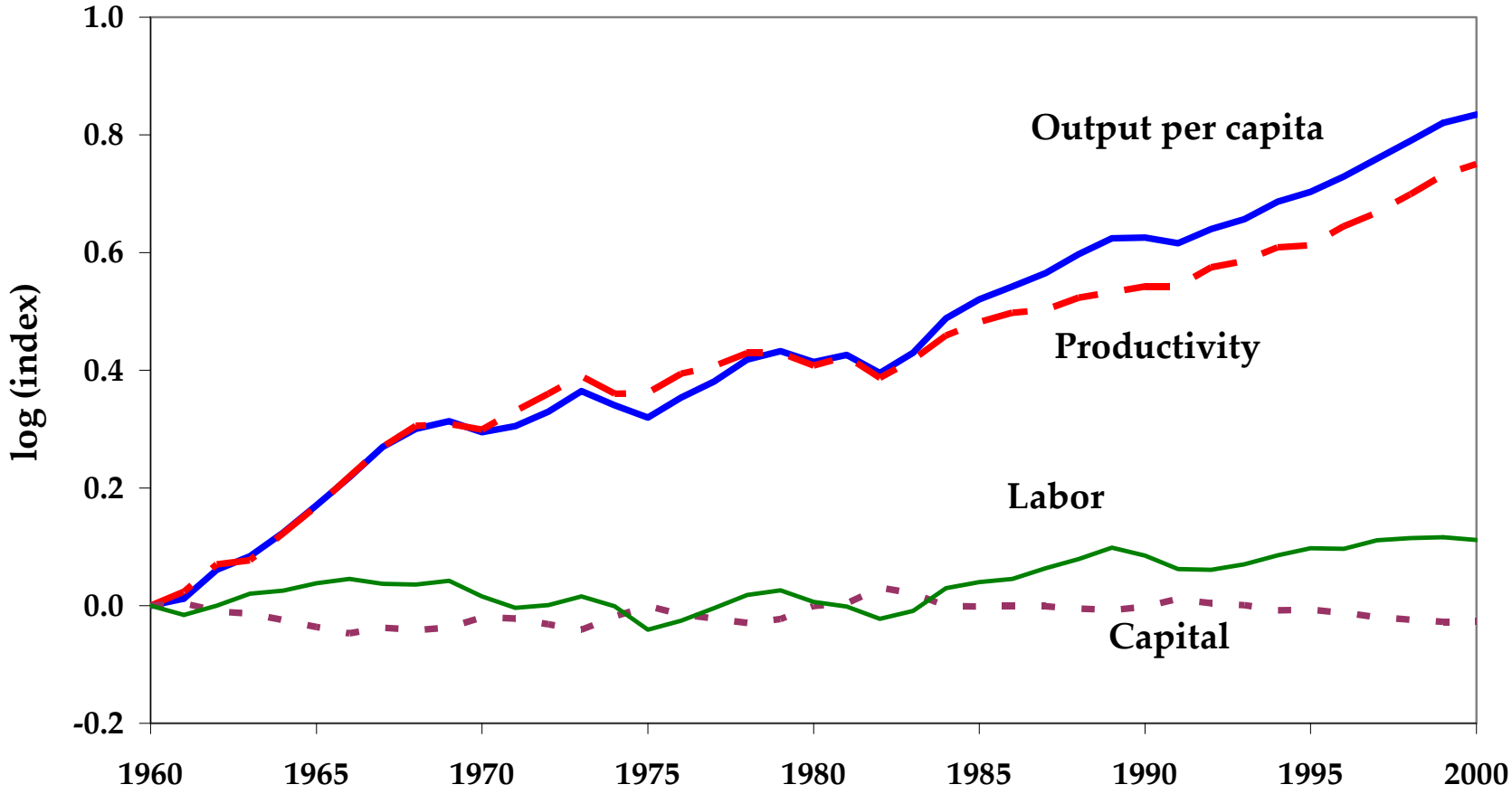
Neoclassical Growth Model

- When productivity grows at a constant rate
  - Output per "capita" grows at a constant rate
  - The capital-output ratio is constant
  - The worker-per-capita ratio is constant

- Pretty simple model. How well does it work?


United States
800
400
200
100
50
index (1900 = 100)
2 percent growth trend
real GDP
1900
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

Growth accounting for the United States, 1960–2000



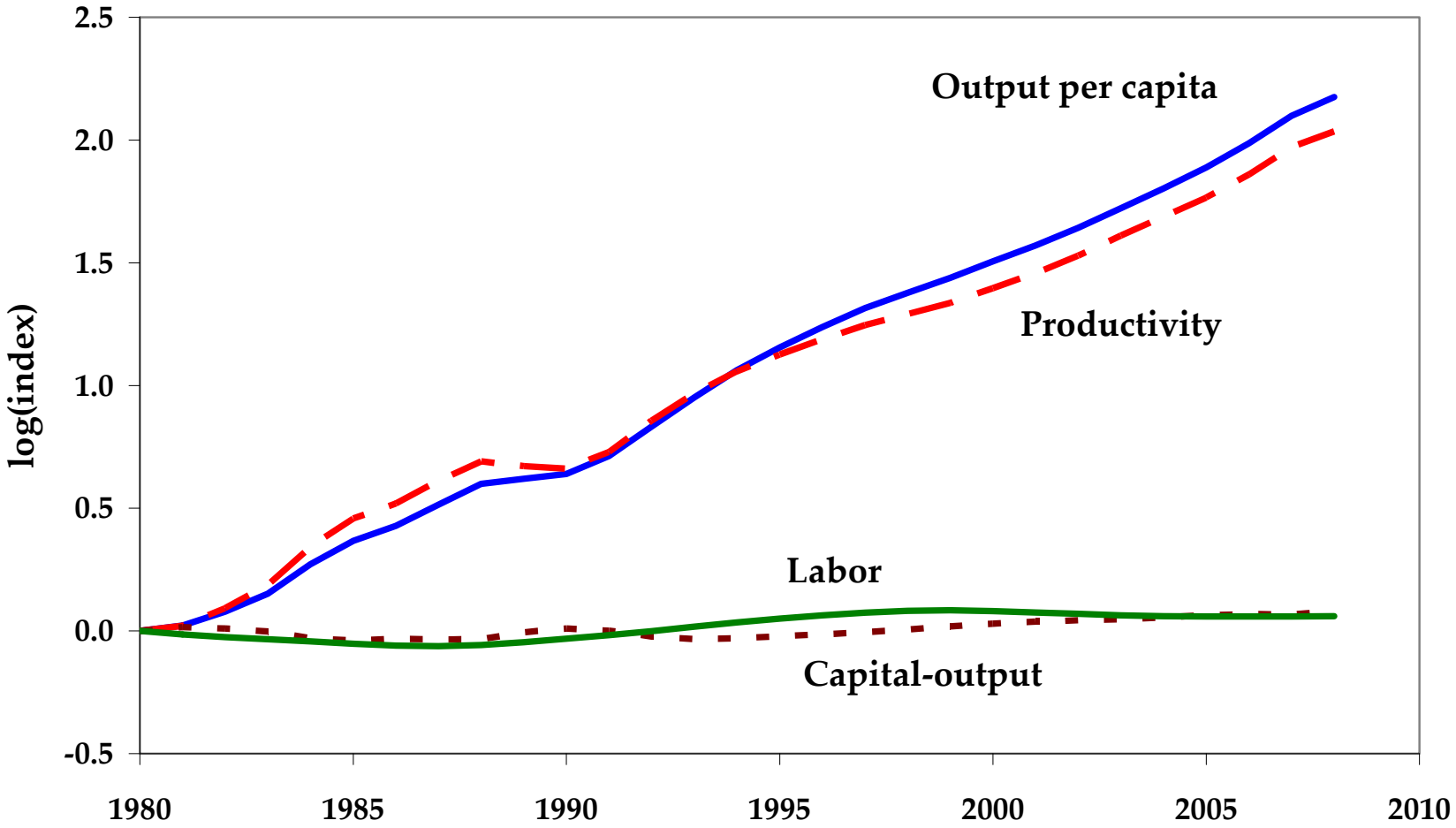
Sources of Growth, United States

- Quantify the sources of growth

Average annual growth rates

	Y/N	L/N	K/Y	A
1960-2000	2.08	0.28	-0.07	1.88

Growth accounting for China, 1980-2007



Sources of Growth, China

Average annual growth rates

	Y/N	L/N	K/Y	A
1980-2007	7.77	0.22	0.29	7.26

- Major source of growth in China is productivity
  - Not uncontroversial: e.g., work by Alwyn Young
- What does that rule out?
  - Capital deepening: China is accumulating capital, but at about the same rate as output growth
  - Increase in workers per working age person

Sources of Productivity Growth

- What does that leave? A lot.

- Increases in quality of capital used, management, practices, etc.

- Capital and labor reallocated across production units
  - Away from less efficient plants
  - Towards more efficient plants
  - From changes in subsidies/taxation
  - From entry and exit of plants

Microeconomics of Productivity

- Reforms since 1970s decreased influence of central planning and allowed new firm entry into sectors previously reserved for SOEs.

- 1980-1995, number of industrial plants grows 7-fold (Brandt, Rawski, Sutton 2008)

- Increase in access to FDI, increase in trade access
    - Allows entry into sectors that serve large markets

Turnover and Aggregate Productivity

- Decompose aggregate productivity growth (Brandt, Van Biesbroeck, Zhang 2009)
- In China
  - 50% from continuing firms
  - 50% from new entrants
- In U.S.
  - 80% from continuing firms
  - 20% from new entrants
- Moving China to U.S. levels of allocation increase aggregate productivity 30-50% (Hsieh and Klenow 2009)

An Open Question

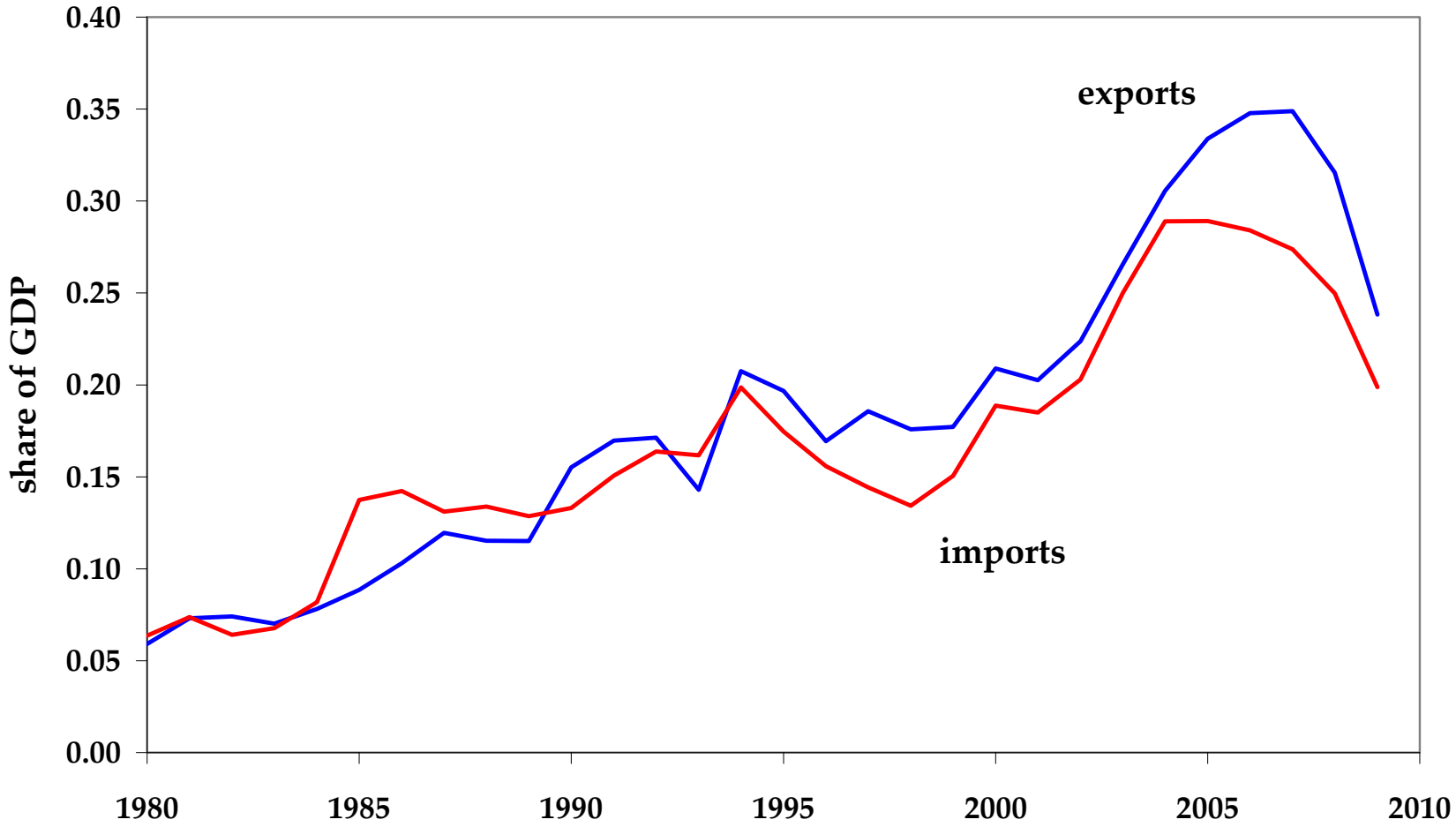
The reforms in China have been previously undertaken in a score of countries, yet these other countries have not had the same growth experiences. Why?

China and Mexico: Kehoe and Ruhl (2010)

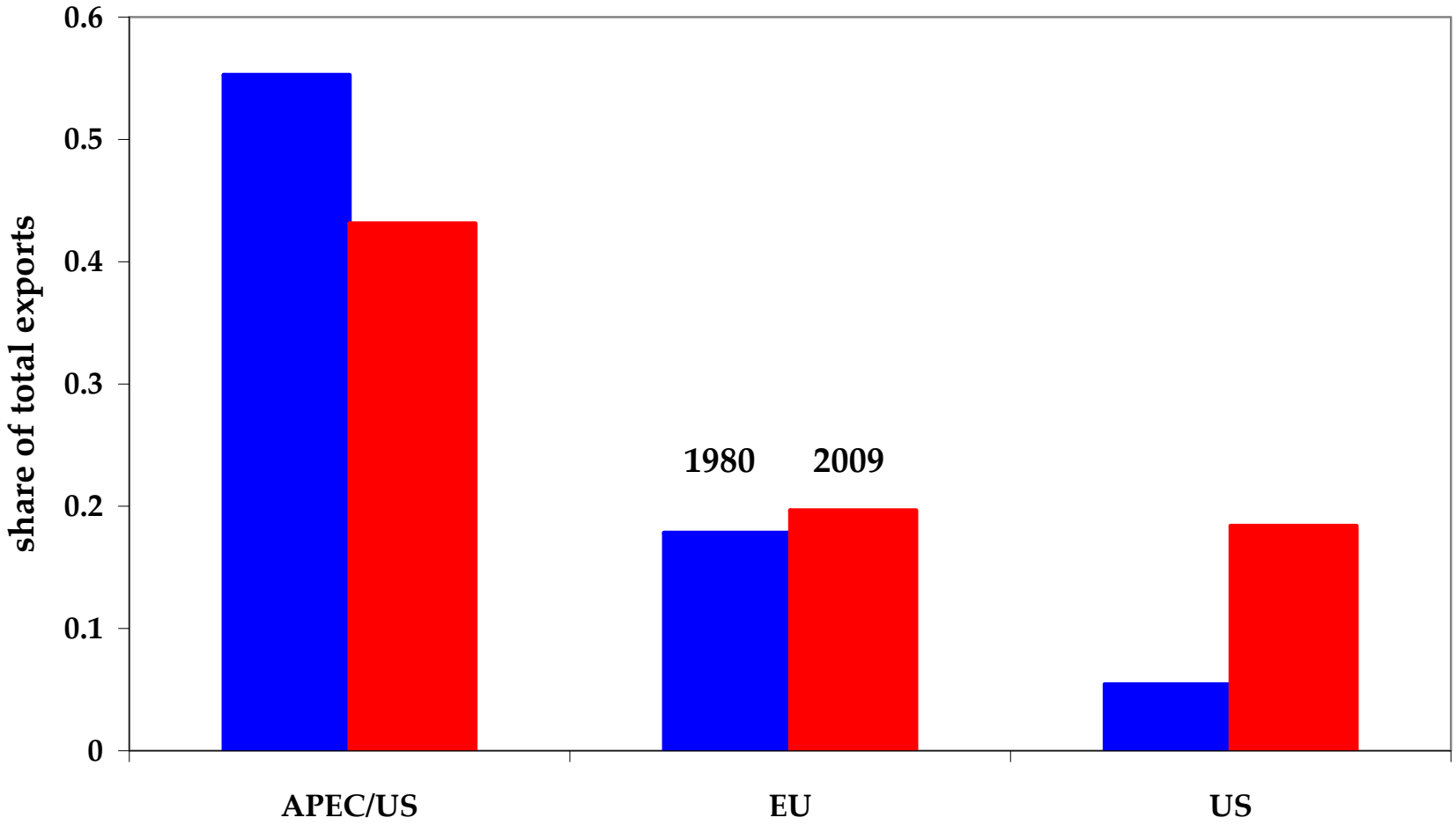
How has trade changed?

- In the aggregate
- The composition of trade partners
- The composition of goods being traded

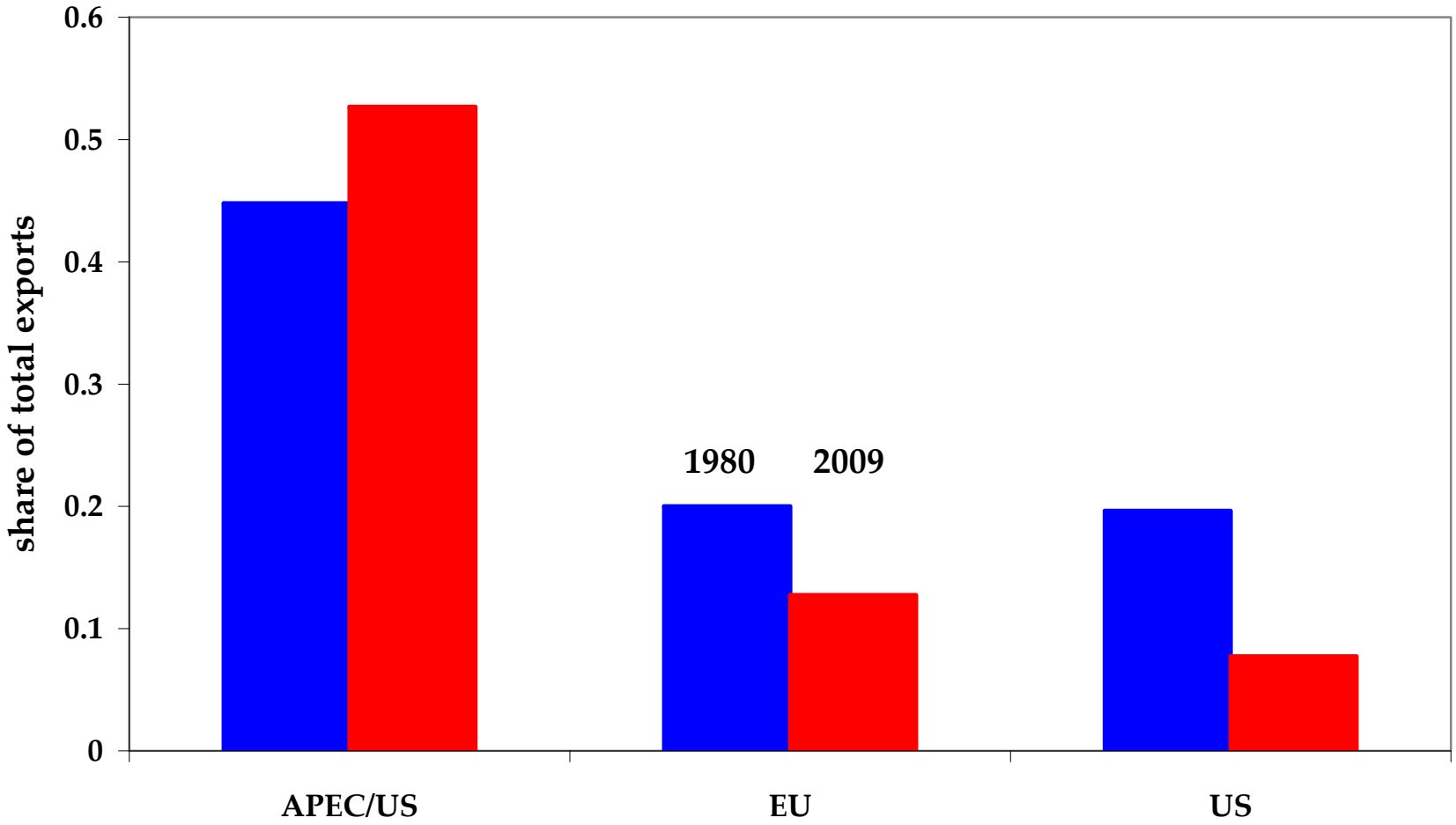
Chinese Exports



Chinese Exports



Chinese Imports



Composition of Exports in China

- Based on Kehoe and Ruhl (2009)
- Trade grows from 2 forces
  - More trade in goods already traded
  - Trade in goods not previously traded
- Data: detailed trade by product data
  - About 800 product categories
  - Covers the universe of trade in goods

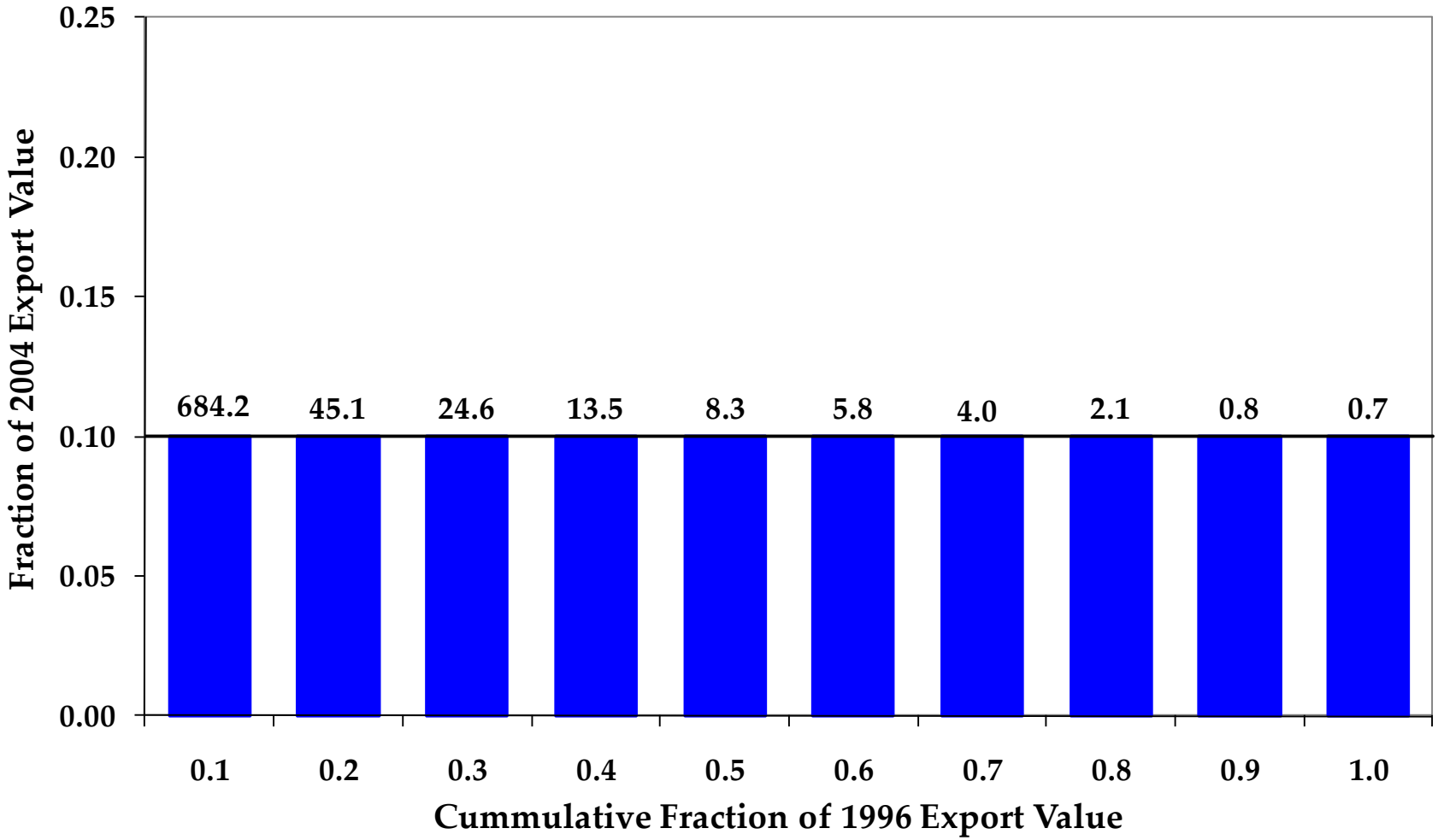
Newly Traded Goods

1. Rank codes from lowest value of exports to highest value of exports based on average of 1996-98.

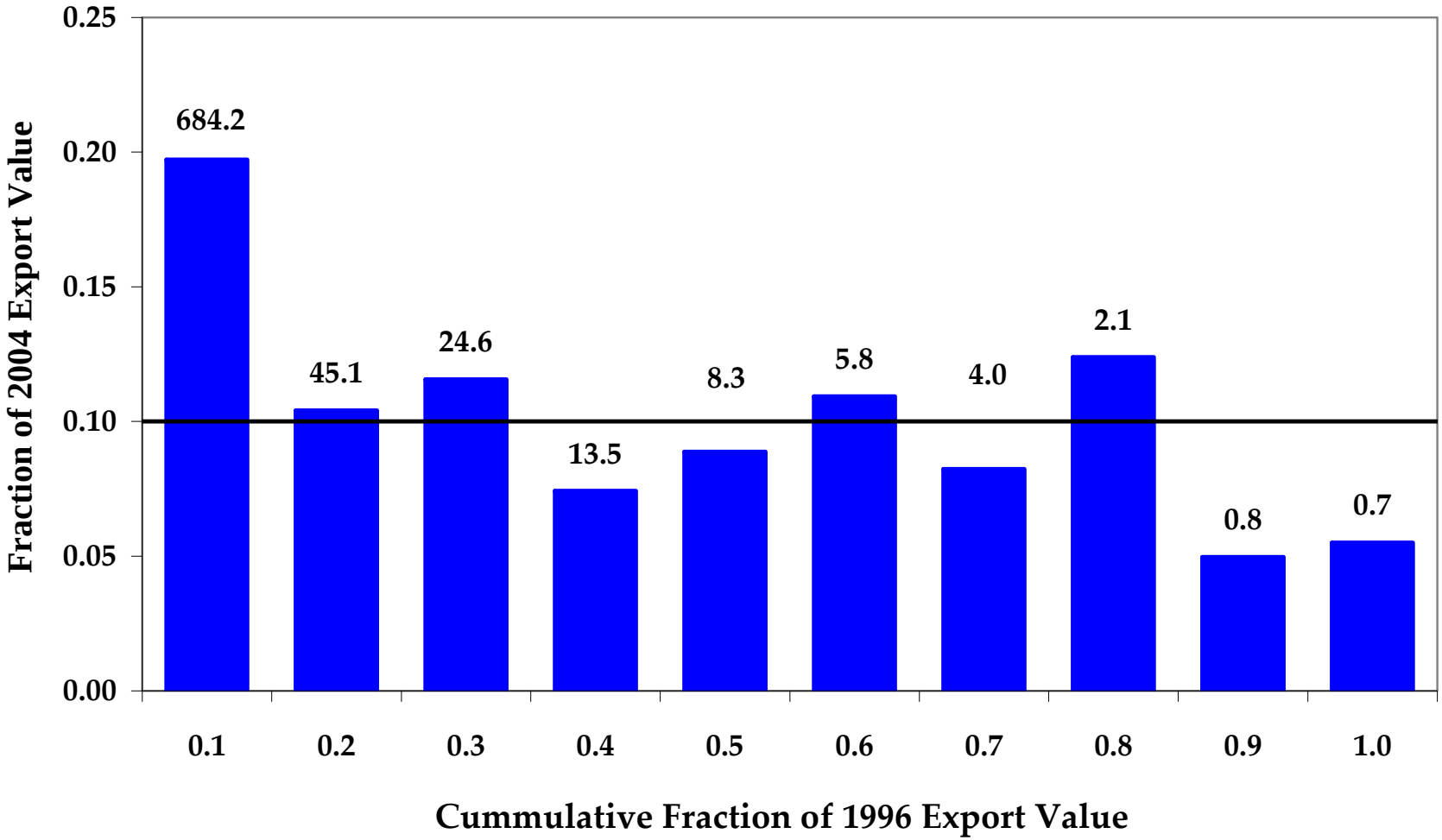
2. Form sets of codes by cumulating exports: the first 684.2 codes make up 10 percent of exports; the next 45.1 codes make up 10 percent of exports; and so on.

3. Calculate each set's share of export value in 2004.

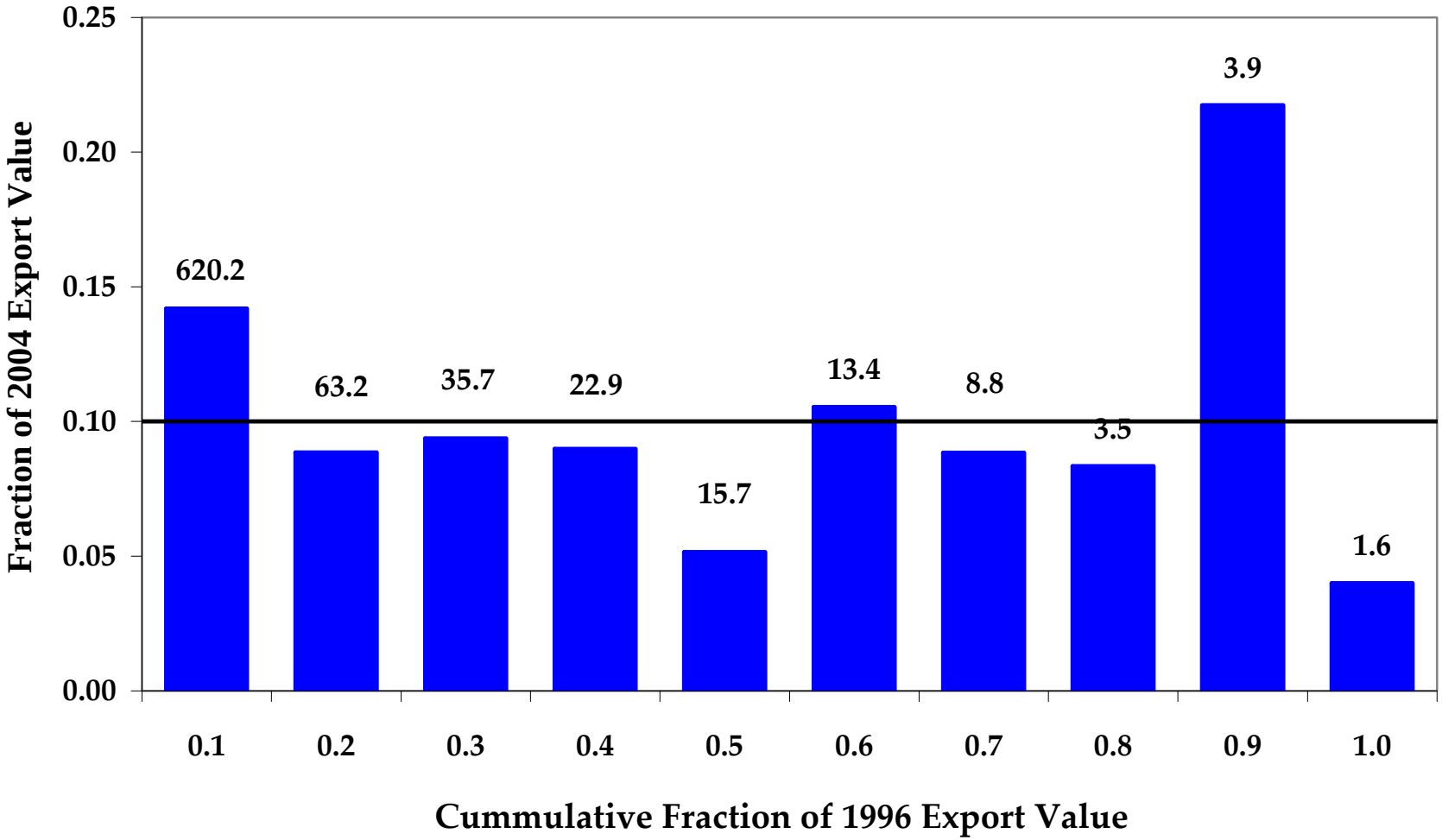
Composition of Exports: China to U.S.



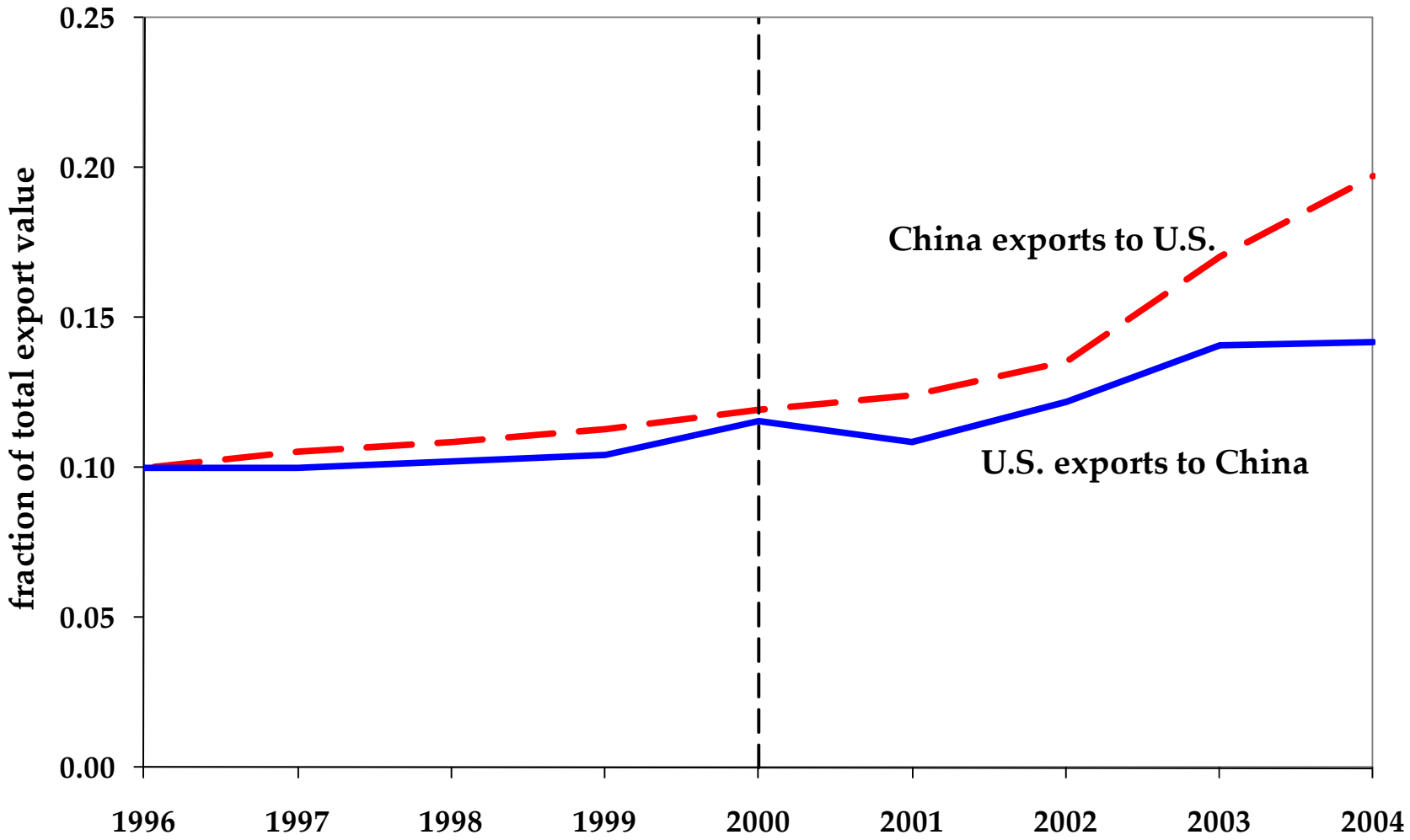
Composition of Exports: China to U.S.



Composition of Exports: U.S. to China



Least Traded Goods: China and the U.S.



Newly Traded Goods Measurement

- National accounts do a poor job of accounting for newly traded goods
- Leads to a systematic overestimate of prices
- Which leads to an underestimate of real output
- Using a method developed by Feenstra (1994) to correct for this bias, Kehoe and Ruhl (2010) find for 1998-2008:
    - Chinese import prices biased downward about 5%
    - Welfare gain of almost 1% from new varieties

Unbalanced Trade in China

- China runs (relatively) large trade surpluses
- The U.S. runs (relatively) large trade deficits
- Consequence of savings demand in each country
- Simple accounting identity

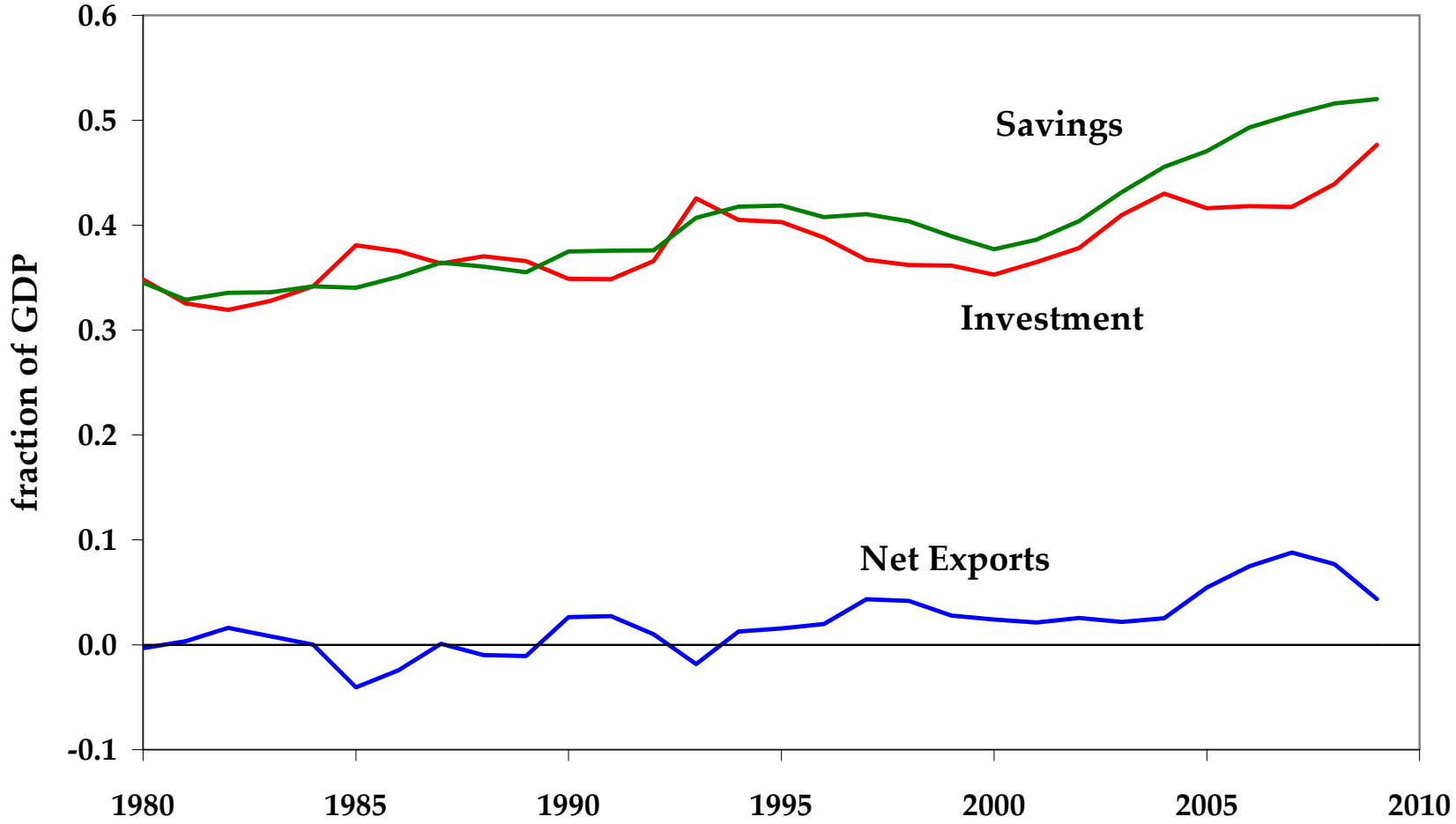
$$Y = C + I + G + NX$$

$$S = Y - C - G$$

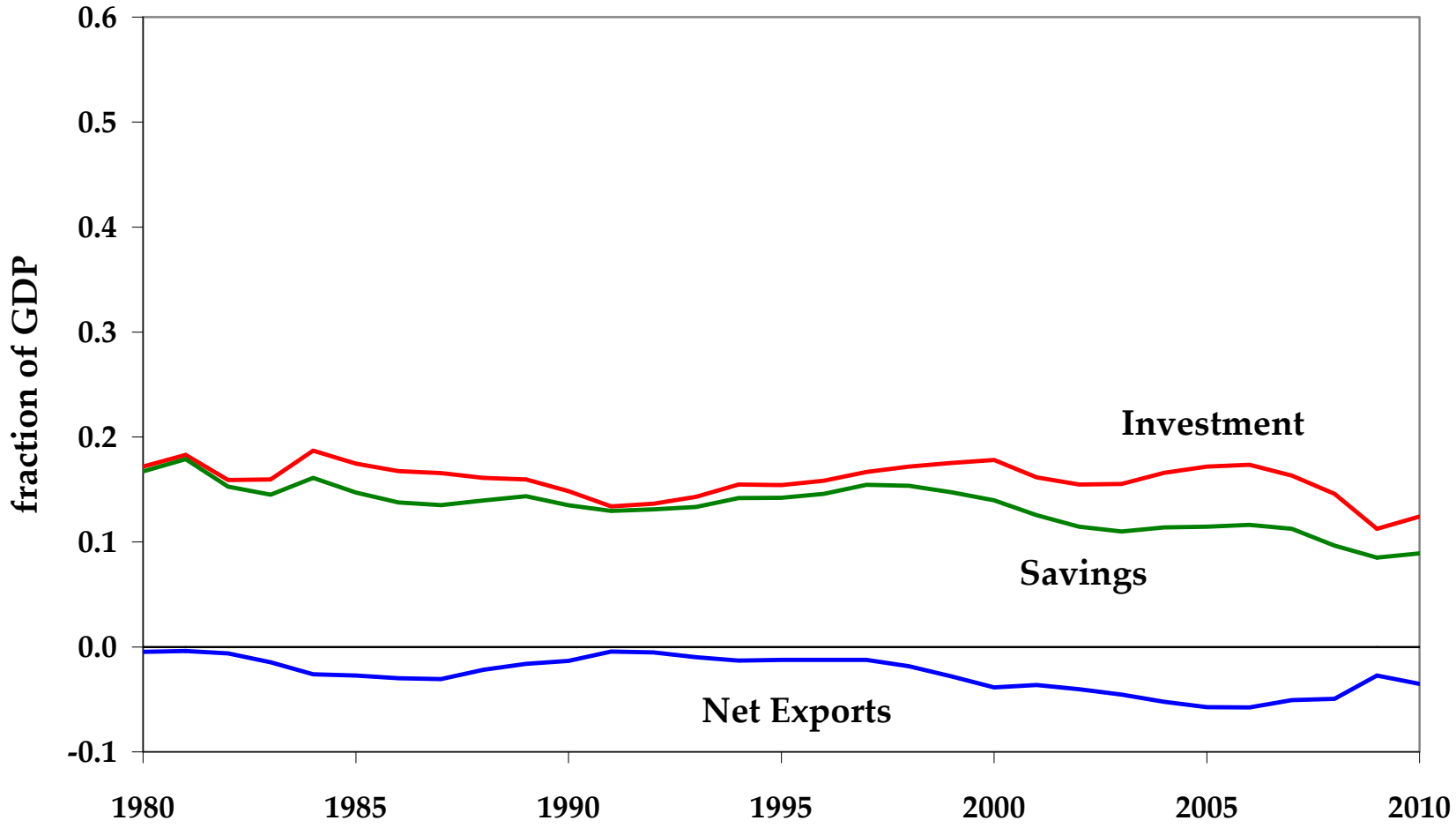
$$S = I + NX$$

- When $S > I$, net exports are positive

Savings in China



Savings in United States



Unbalanced Trade

- Recast the question from:

  "Why does China export so much?"

  to:

  "Why does China save so much?"

- More broadly:

  "Why doesn't capital flow to poor countries?"

- Economists are making progress, but still an open question.

Savings in China

- Demographics (again!)
  - Aging populations saving to fund old age
  - Research: responsible for 1%-2% of US deficit
- Firms save; low dividend payments, esp. SOEs
- Governments don't spend
  - China gov't expenditures: 14% of GDP
  - U.S. gov't expenditures: 20% of GDP
- Domestic financial system weakness
  - Incentive to move capital to other countries
- Local experts: Dave Backus, Tom Cooley

(Some of the) Big Questions

1. **How big is China?**

   FX vs. PPP matters; per capita matters a lot

2. **Why has China grown so quickly?**

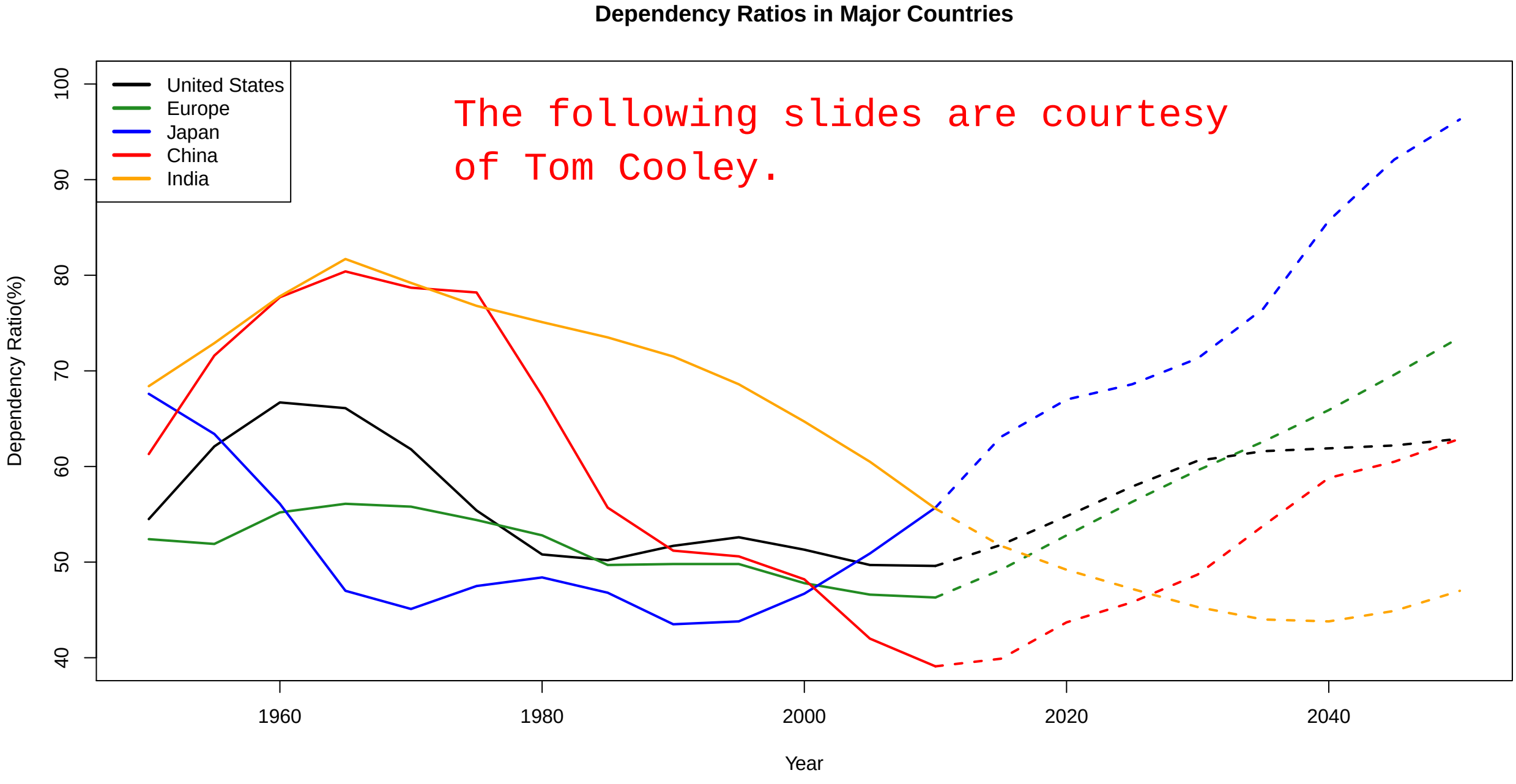
   Things that *look like* productivity have grown

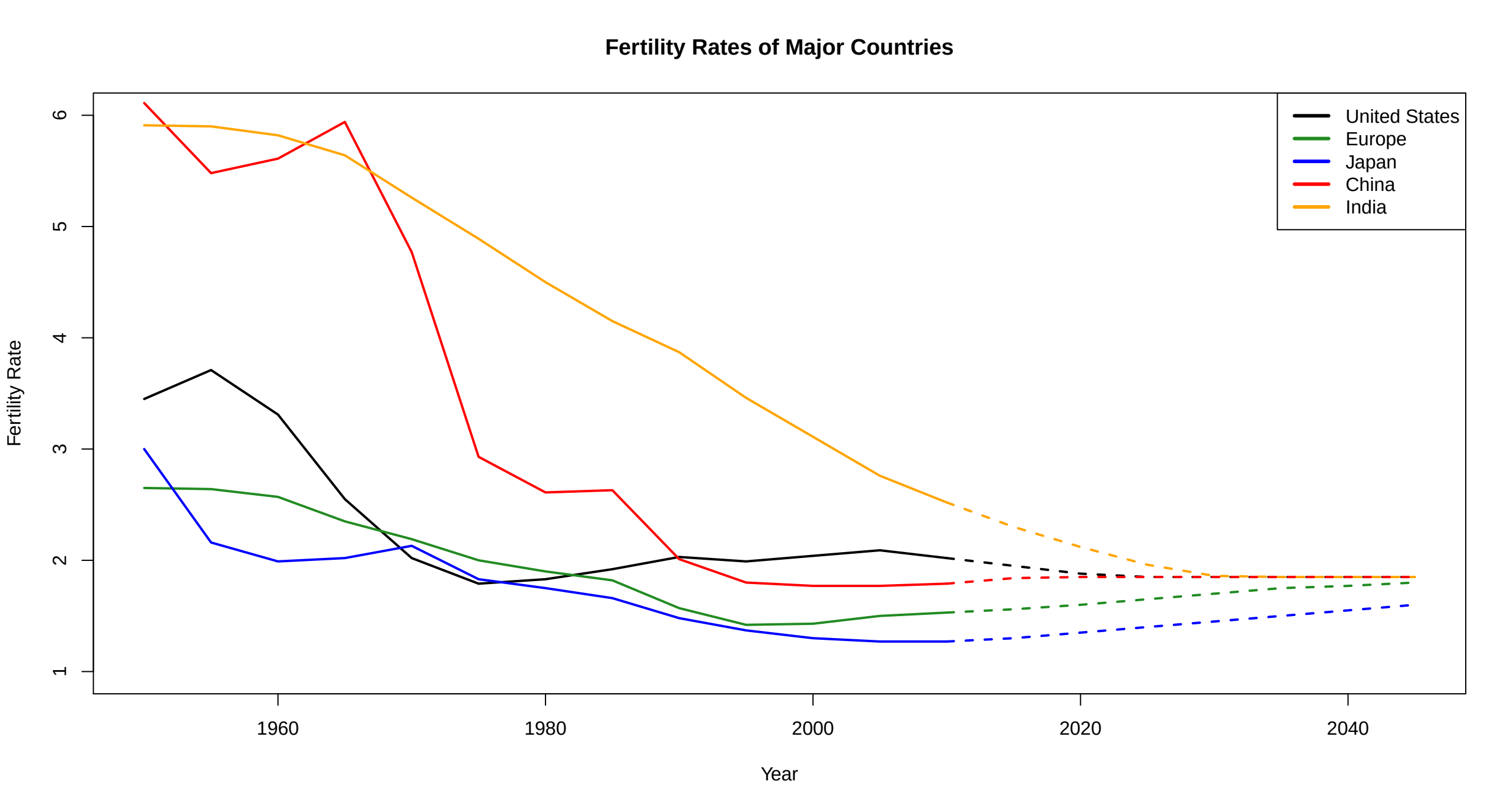
3. **How has China's international trade changed?**

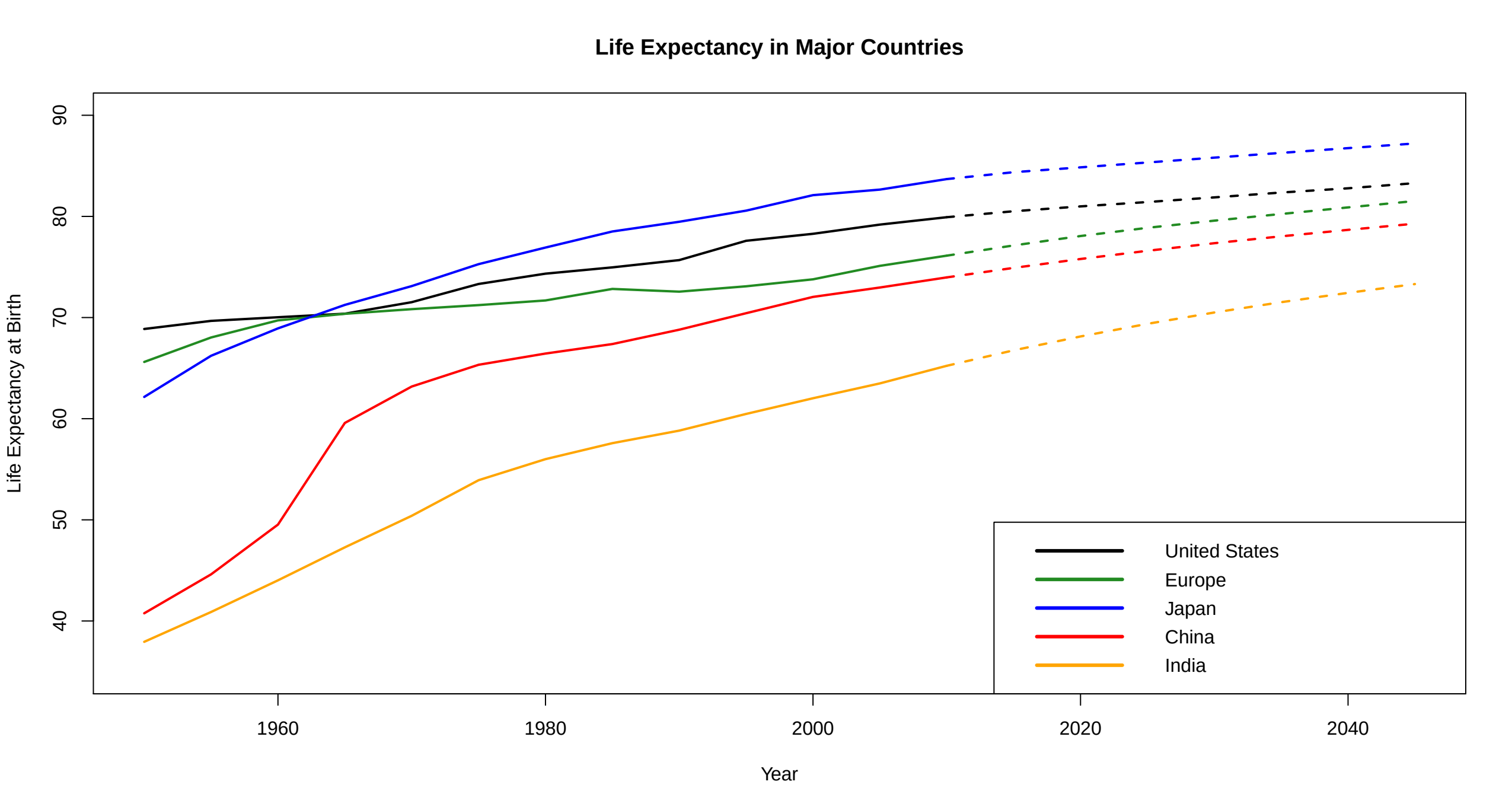
   Many newly traded goods; shift in exports to U.S.

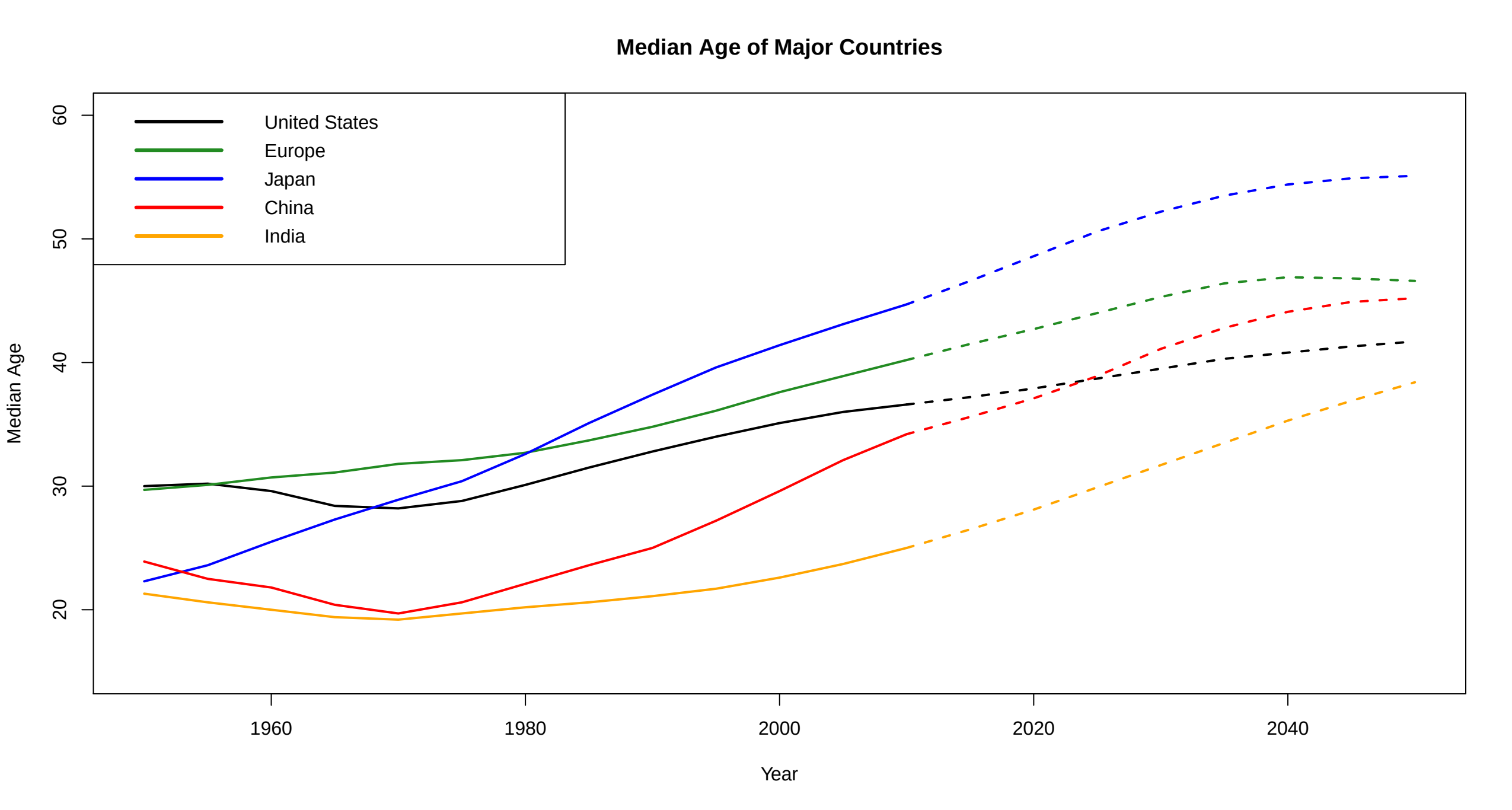
4. **Why does China have large net export surpluses?**

   More savings than investment; demographics, financial system issues


Dependency Ratios in Major Countries
United States
Europe
Japan
China
India
The following slides are courtesy of Tom Cooley.
Dependency Ratio(%)
100
90
80
70
60
50
40
1960
1980
2000
2020
2040
Year


Fertility Rates of Major Countries
United States
Europe
Japan
China
India
Fertility Rate
1
2
3
4
5
6
1960
1980
2000
2020
2040
Year


Life Expectancy in Major Countries
Life Expectancy at Birth
90
80
70
60
50
40
1960
1980
2000
2020
2040
Year
United States
Europe
Japan
China
India


Median Age of Major Countries
United States
Europe
Japan
China
India
Median Age
20
30
40
50
60
1960
1980
2000
2020
2040
Year