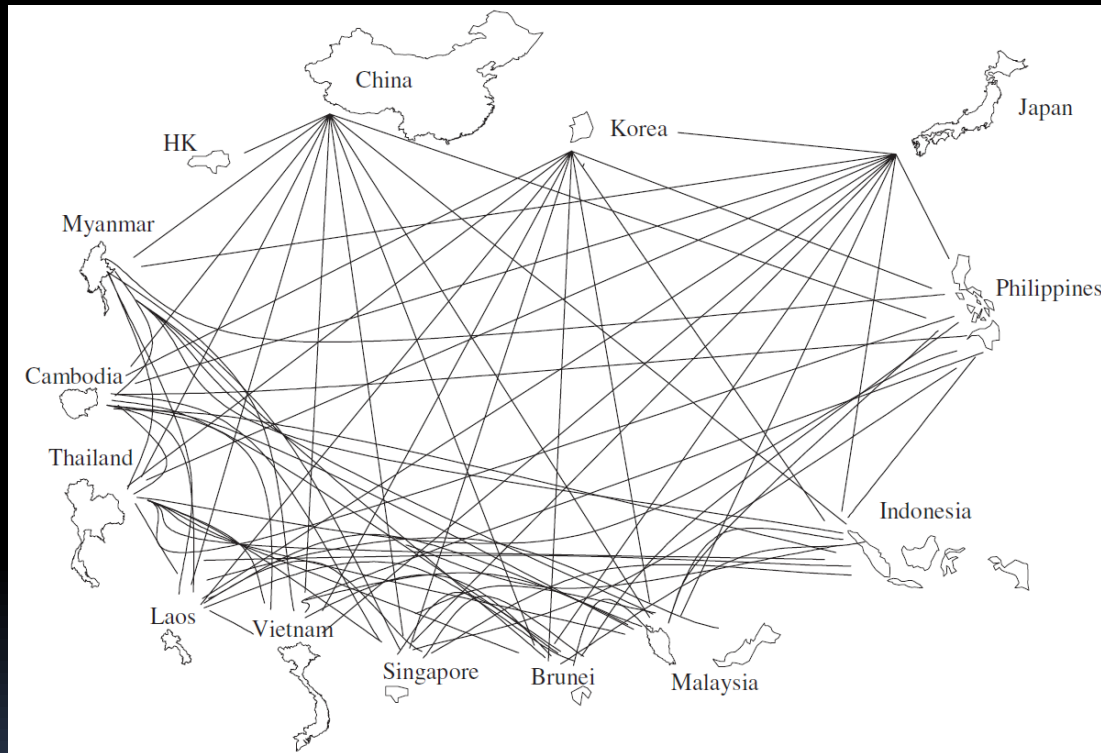


Fragmentation and Hierarchy in Global Production:

'Locating' China in the New International Division of Labor



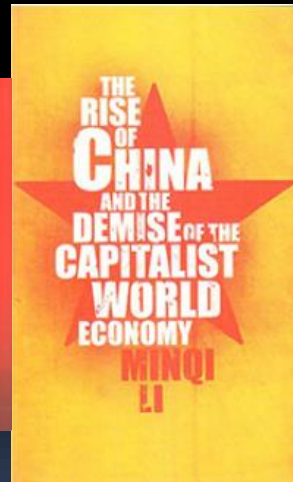
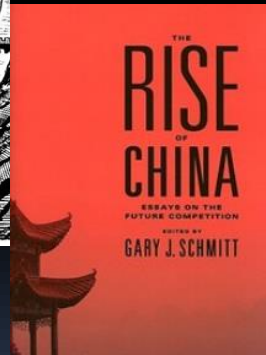
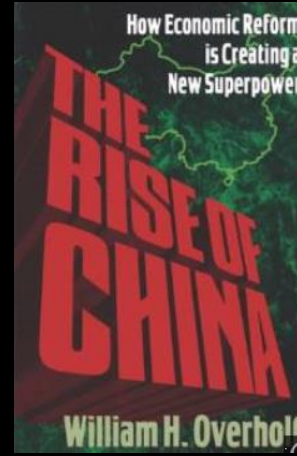
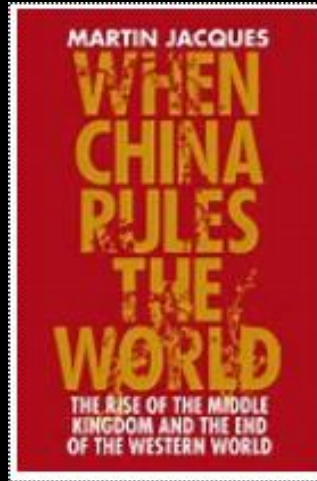
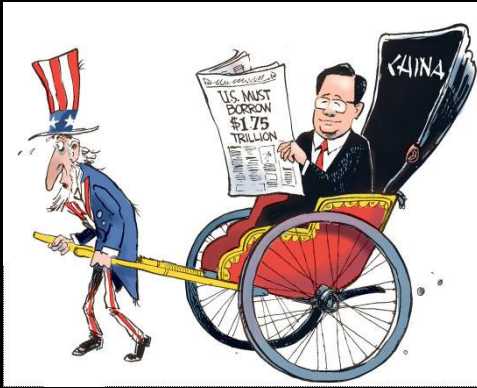
Mark P. Dallas
Political Science & Asian Studies
Union College

~Global Inequality~

In which country were you born?
Dumb luck!



The "Rise of China" Literature

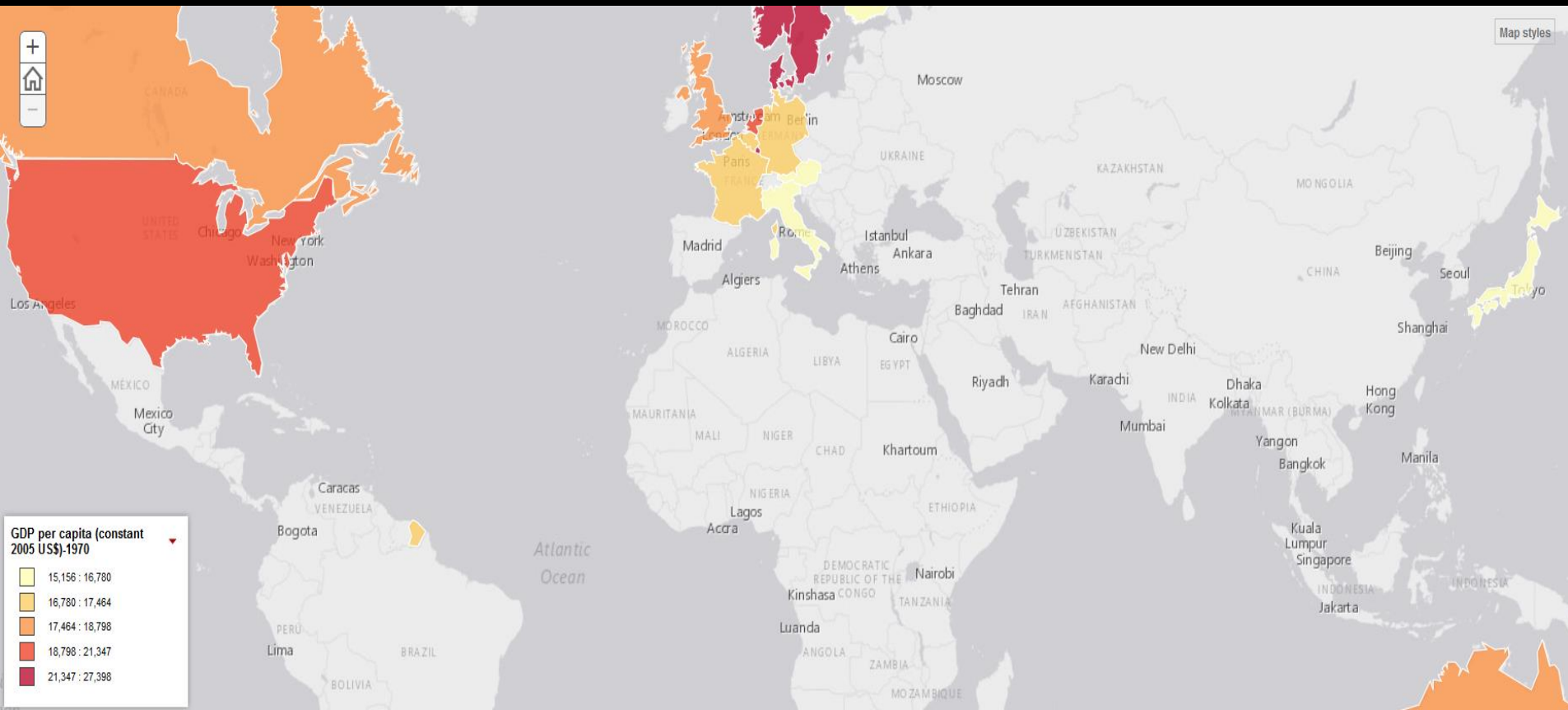


INTERNATIONALLY
HIERARCHY



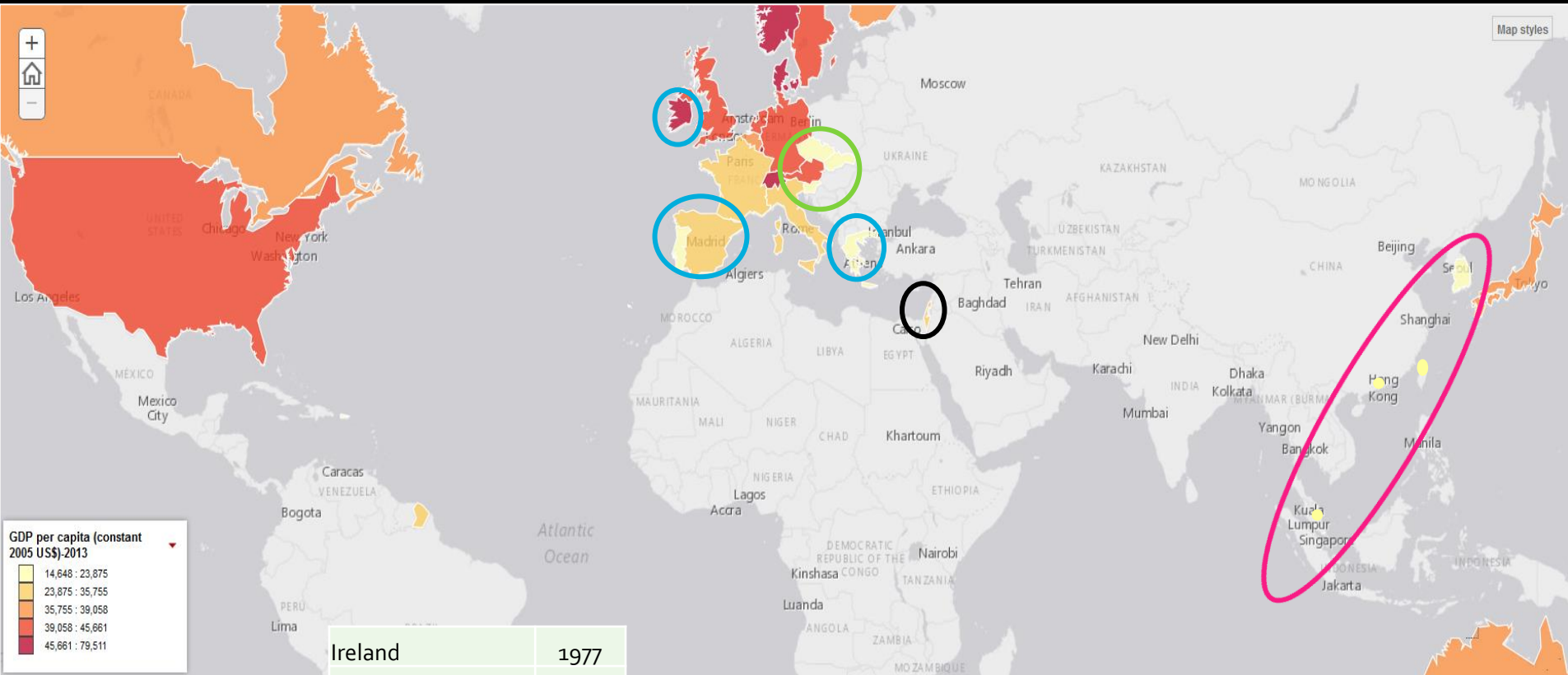
Macro-View

Advanced ('Rich') Countries ~ 1970 (\$15,000 GDP/capita in 2005 US\$)



Advanced ('Rich ')Countries – 2013

(\$15,000 GDP/capita in 2005 US\$)



“Newly Industrialized Countries” (NIC-12)

Ireland	1977
Greece	1978
Spain	1983
Hong Kong, China	1987
Singapore	1989
Portugal	1992
Israel	1995
Korea, Rep.	2000
Slovenia	2000
Slovak Republic	2012
Czech Republic	2014
(Taiwan, ROC)	

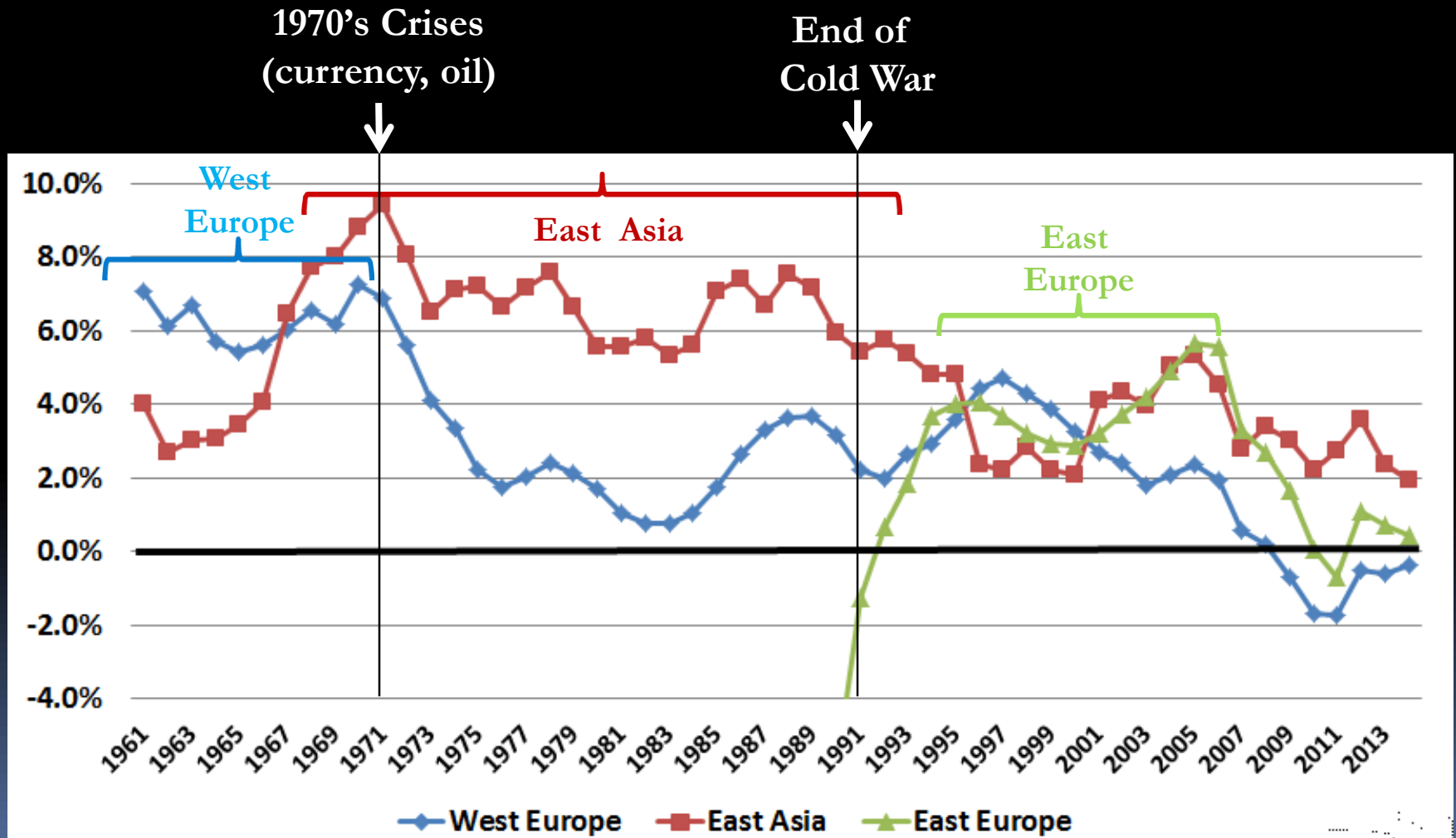
- ✓ Geographic Clustering: ‘Periphery’ of Advanced
- ✓ Small countries
- ✓ Deeply Integrated w/ Advanced: Trade & Investments

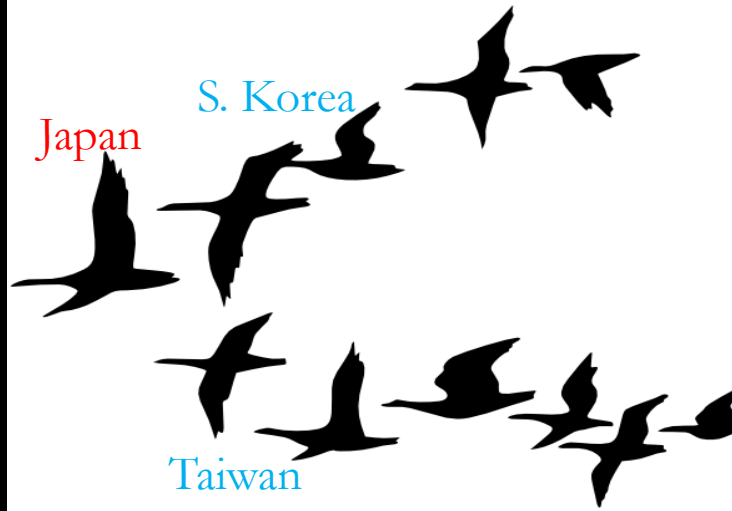
Steady High Growth Rates

‘Peripheral’ West Europe: Spain, Portugal, Greece, Ireland (& Israel)

East Asian ‘Tigers’: S. Korea, Hong Kong, Singapore & Taiwan

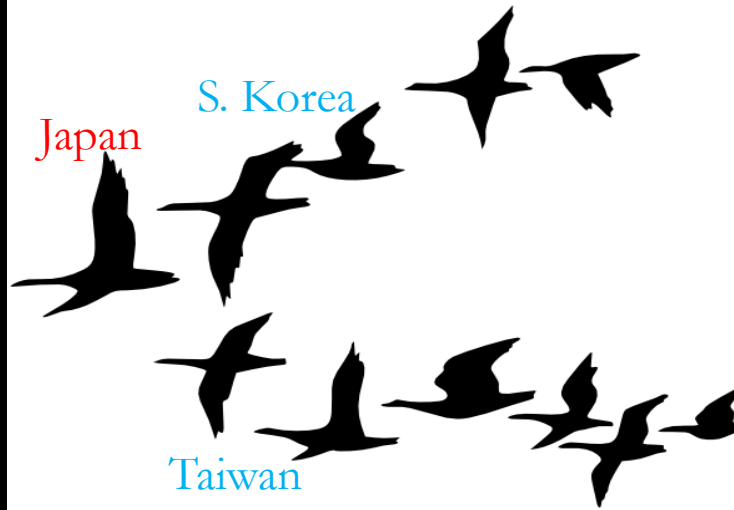
‘Peripheral’ East Europe: Slovenia, Czech, Slovak Republics



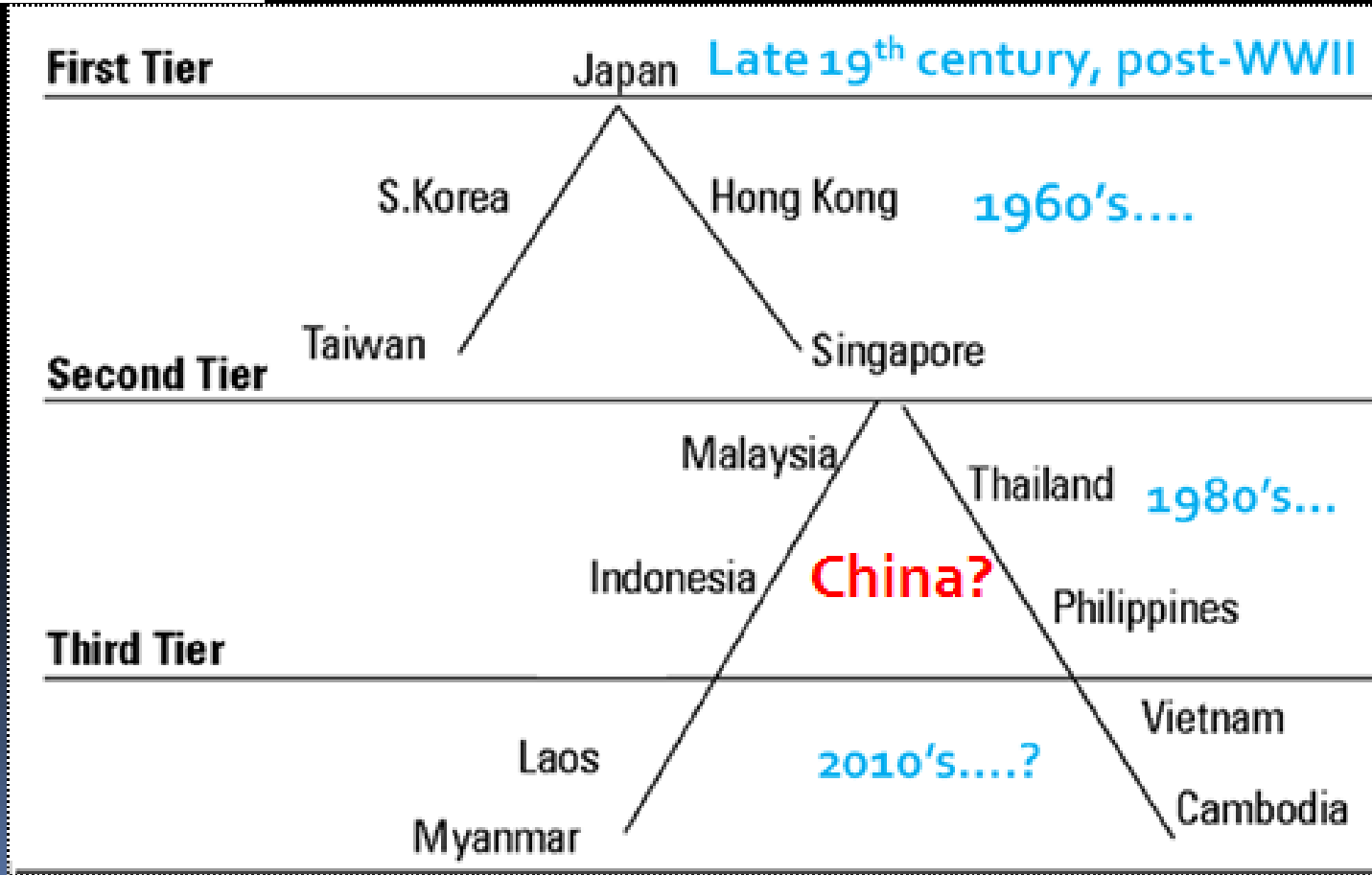


E.U. membership is very special....

‘Flying Geese’ Model of East Asian development



'Flying Geese' Model of East Asian development

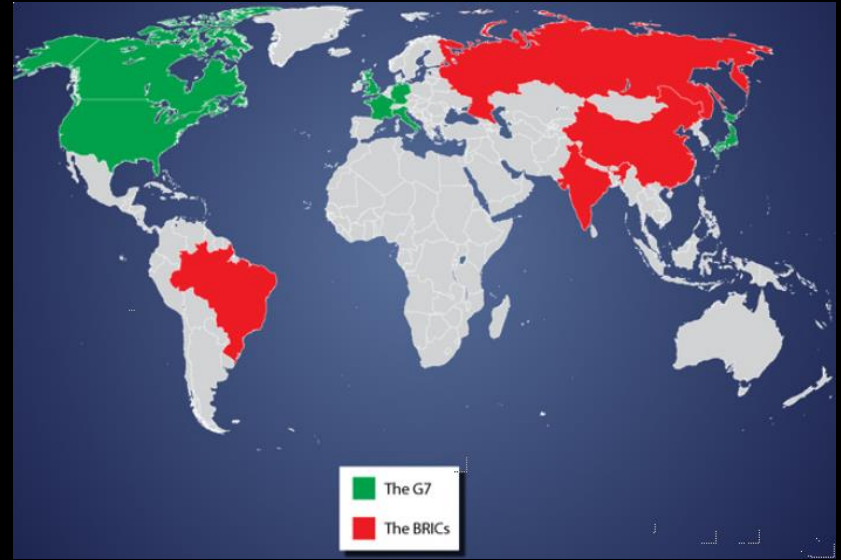


~International Hierarchy~

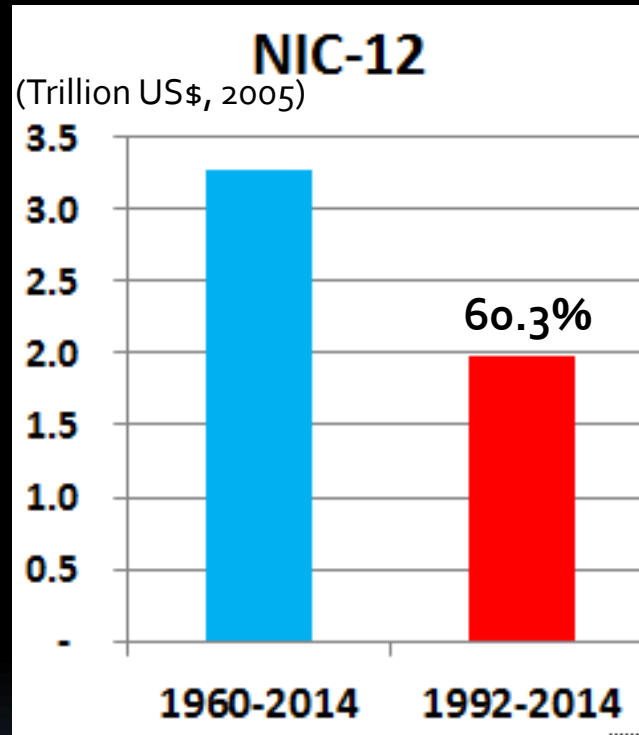
- ✓ Few countries have risen from 'middle' to 'high' income
- ✓ Peripheral countries have 'special' relationship with advanced countries
- ✓ 'Regional' factors? or Country-level factors?
(e.g. East Asia, EU...) (Policies, resources, absence of social cleavages)

Where does China fit?

NICs.....“BRICS”



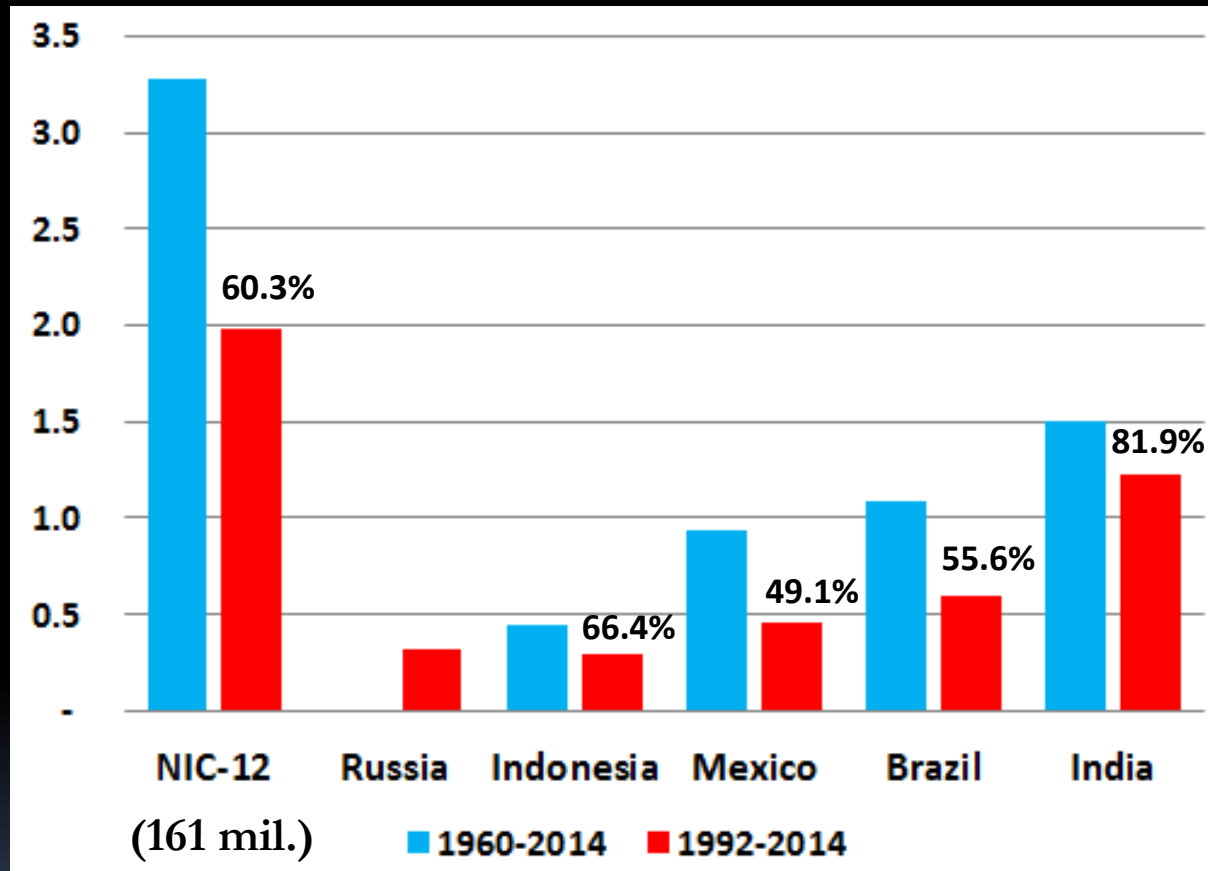
NIC-12 GDP Growth, 1960-2014



Post-
Cold War

NICs.....“BRICS”

(Trillion US\$, 2005)



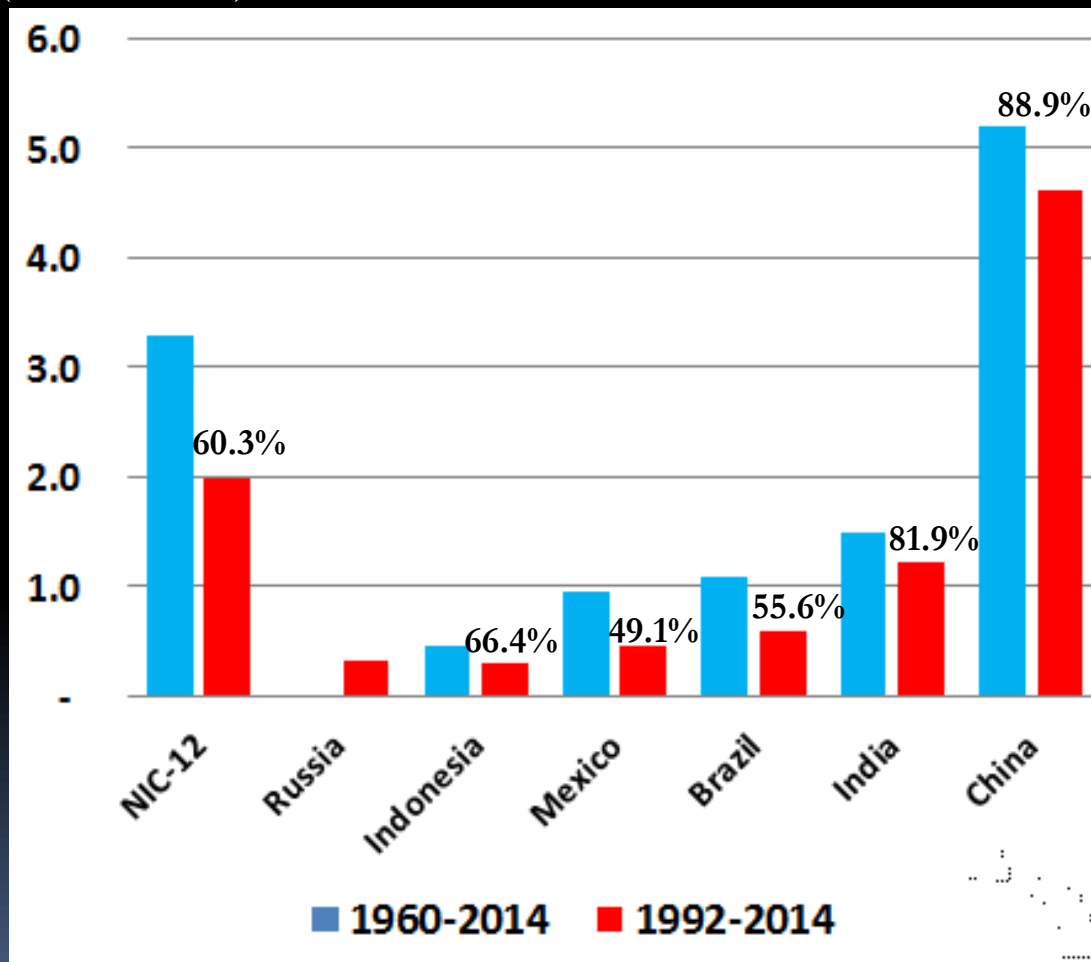
Post-
Cold War

NICs.....“BRICS”

China stands out....

1) Enormous contribution to global growth, esp Post-Cold War...

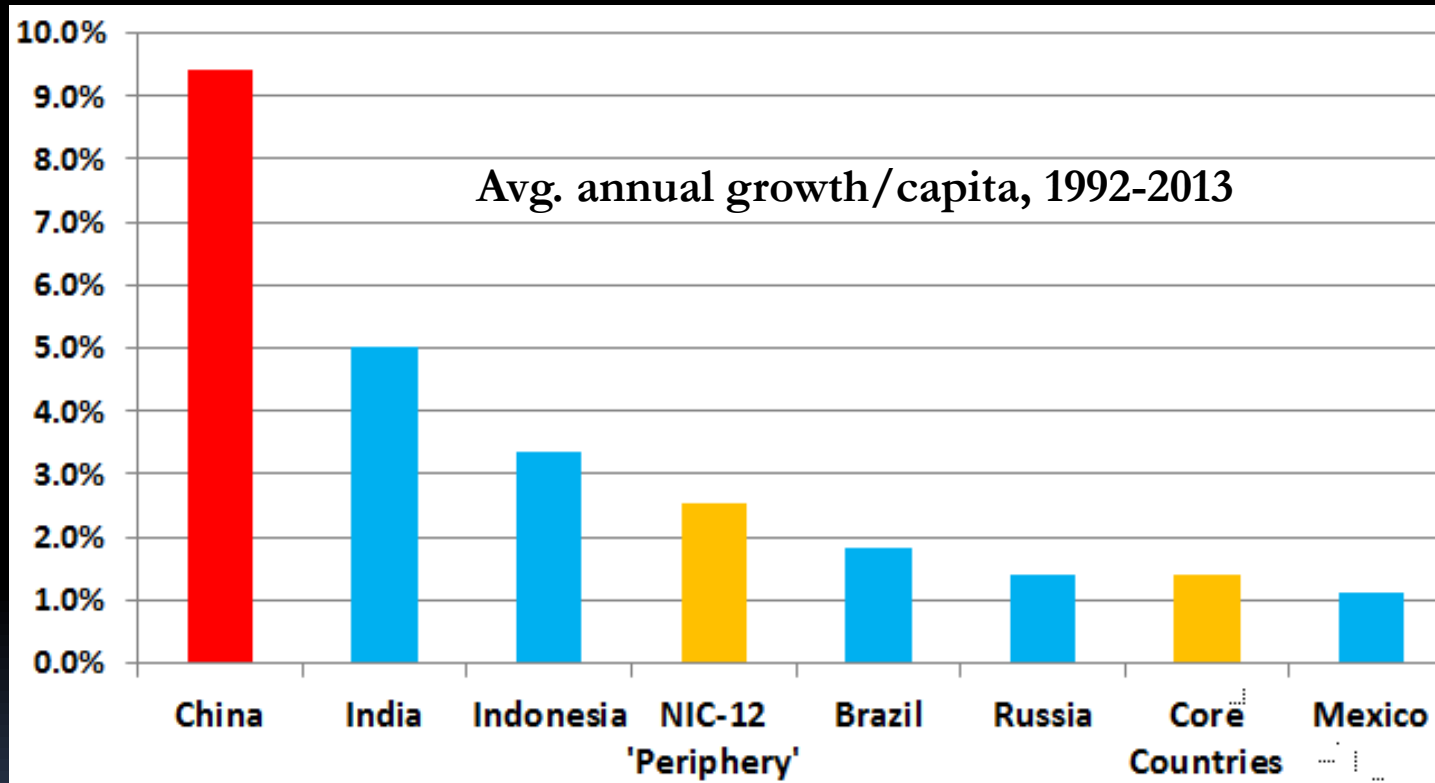
(Trillion US\$, 2005)



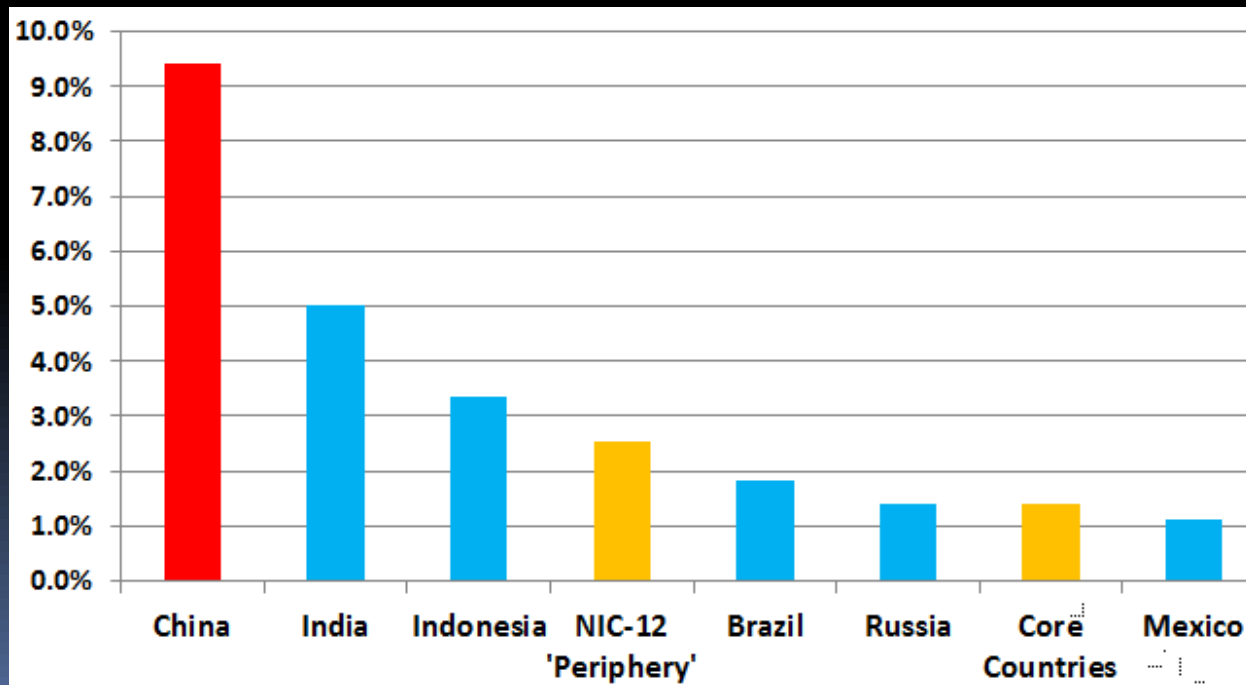
Post-
Cold War

2) 'Catch-up'?

Steady annual growth....



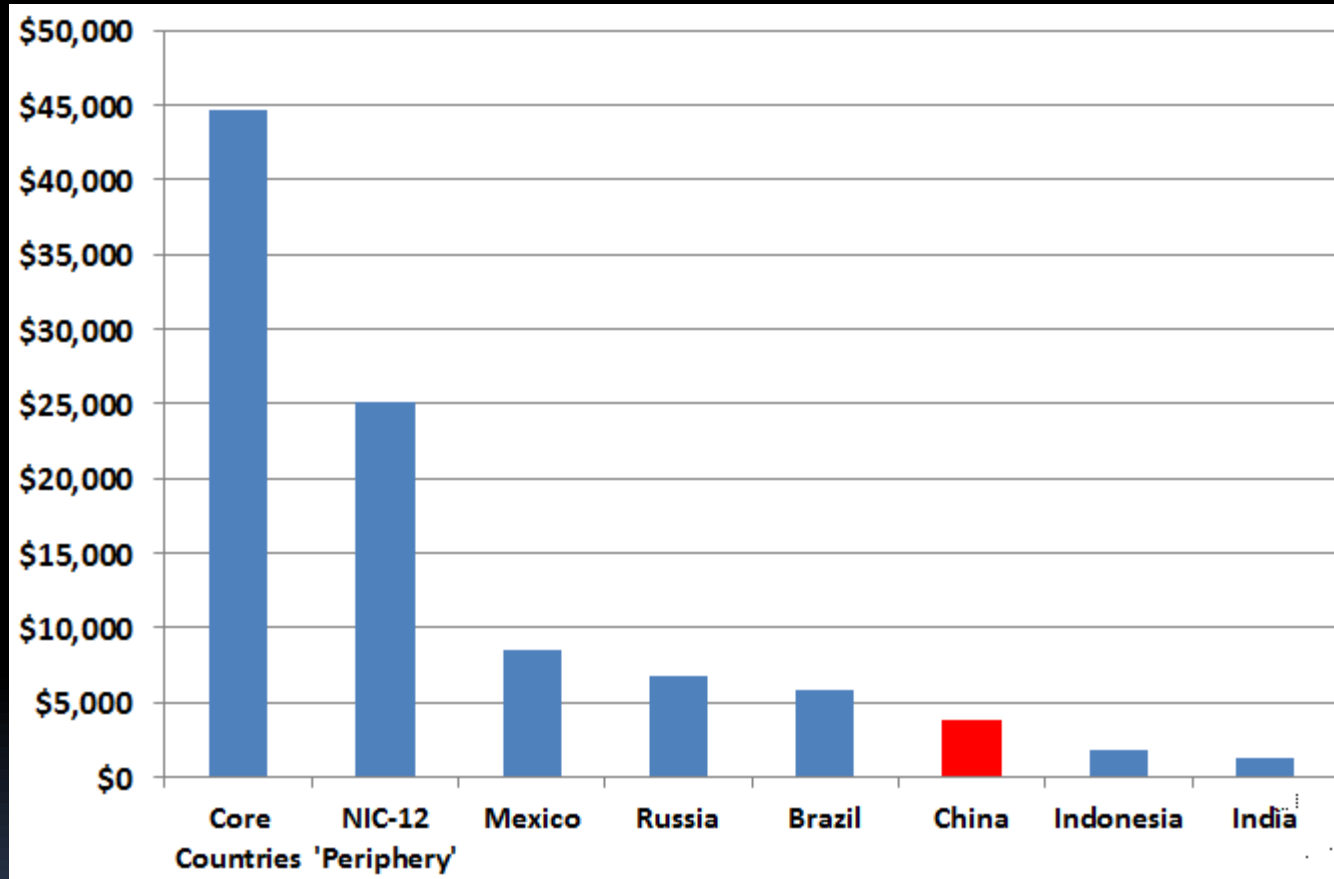
Headline News: China today....6.9%?6.8%?



3) But, still low in the hierarchy.....

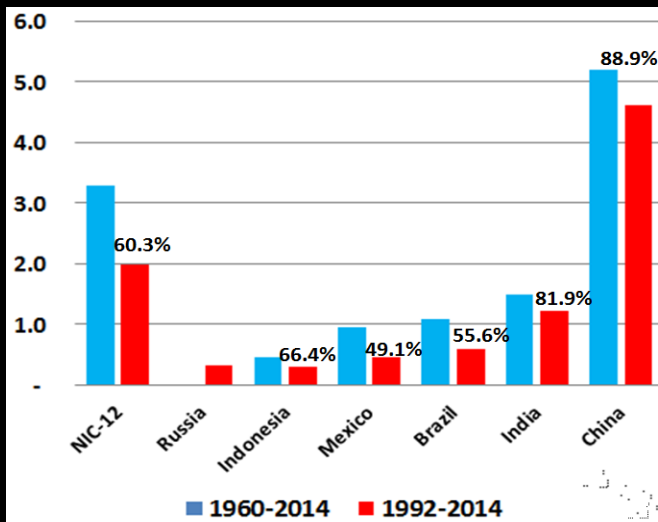
GDP/Capita (2013)

(Constant 2005 US\$)

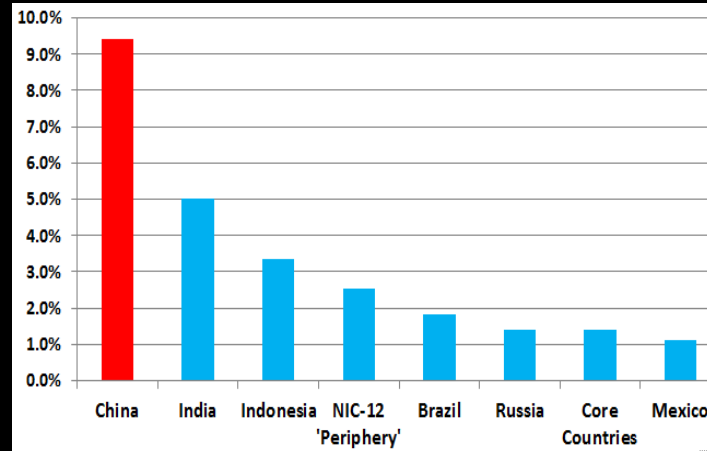


China

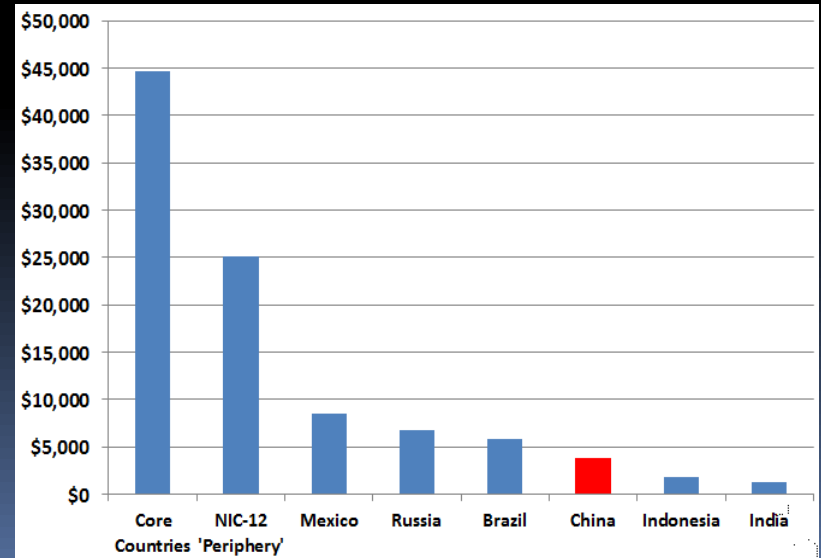
Huge.....



...‘Catching up’...



...but low on hierarchy



Micro-view

How does China fit into the international hierarchy?

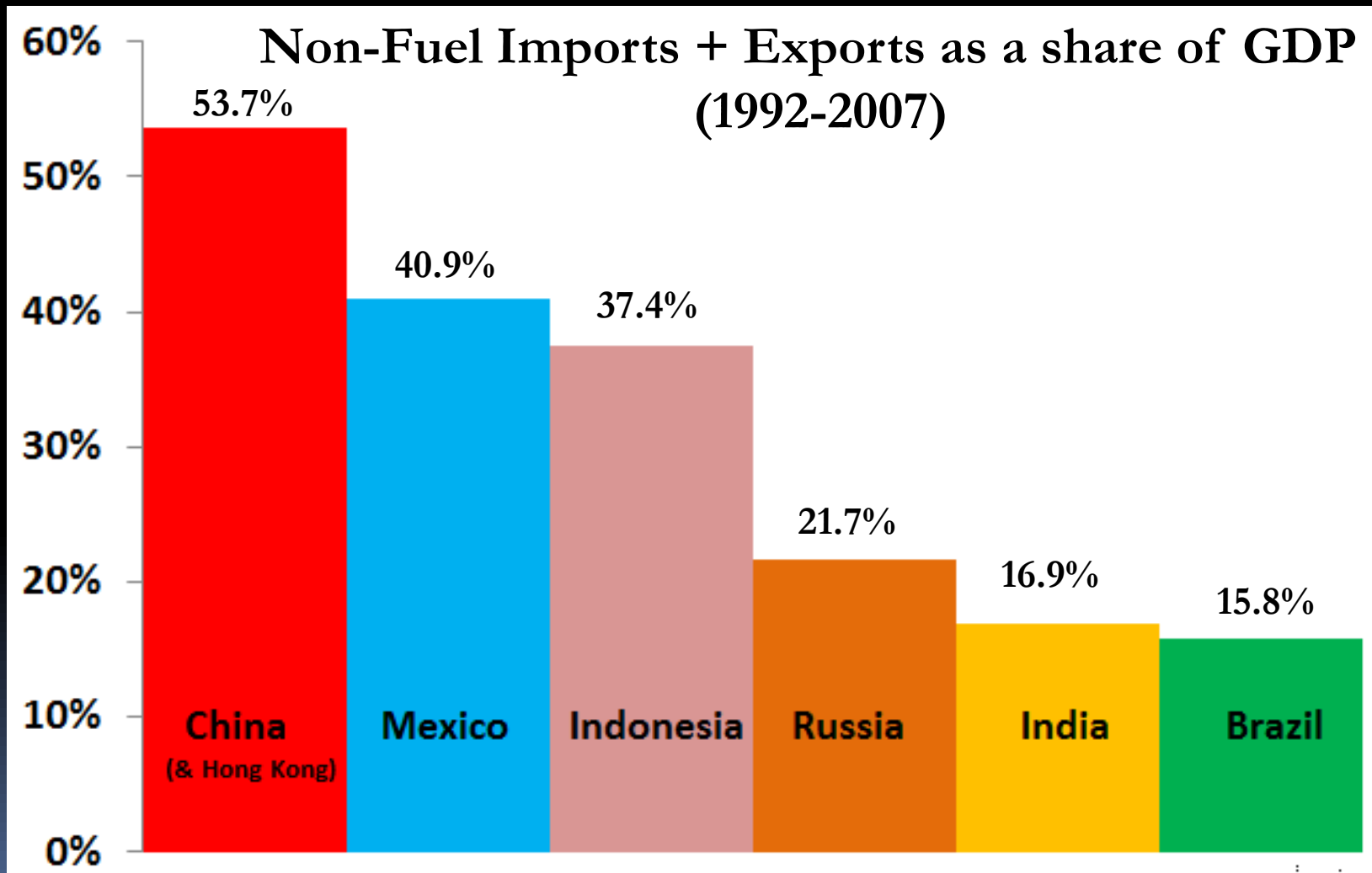
Is China on the NIC path, or not?

Why does China stand out among BRICs? (India vs. China)

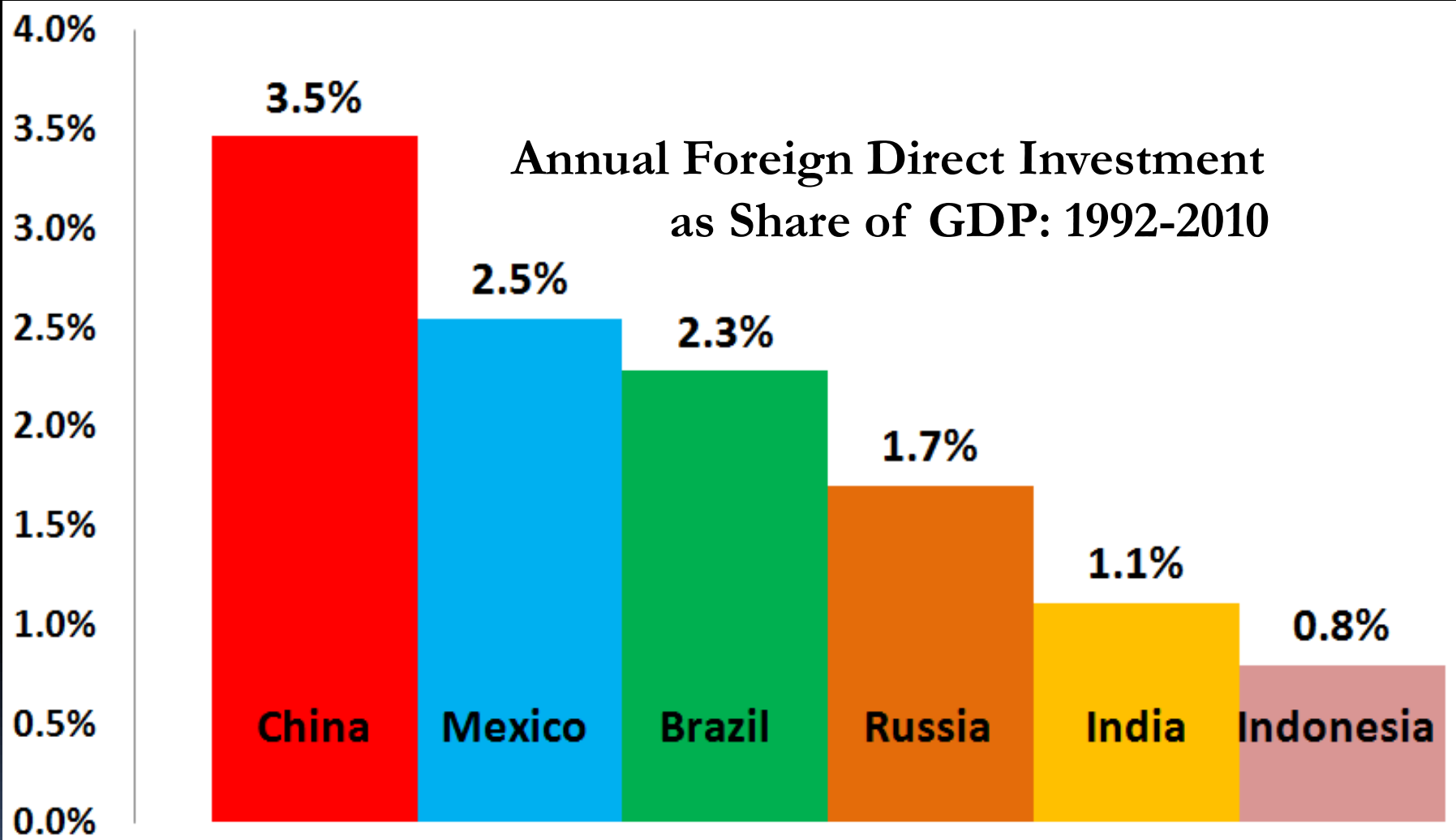
Role of East Asian region in China's rise? ('Flying Geese')

Relationship with Global Economy

China is more trade-oriented

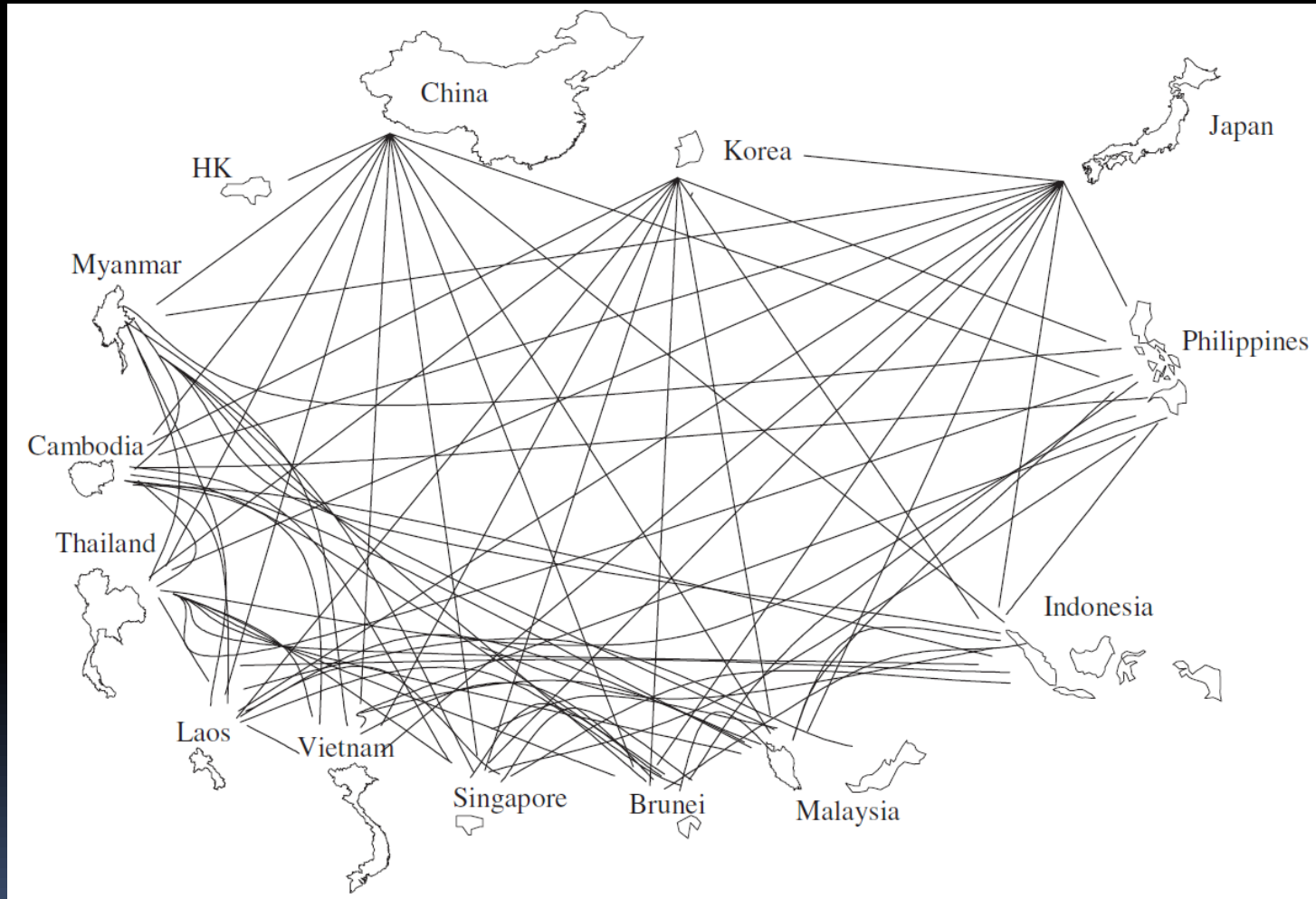


China's foreign investments (FDI) are outsized

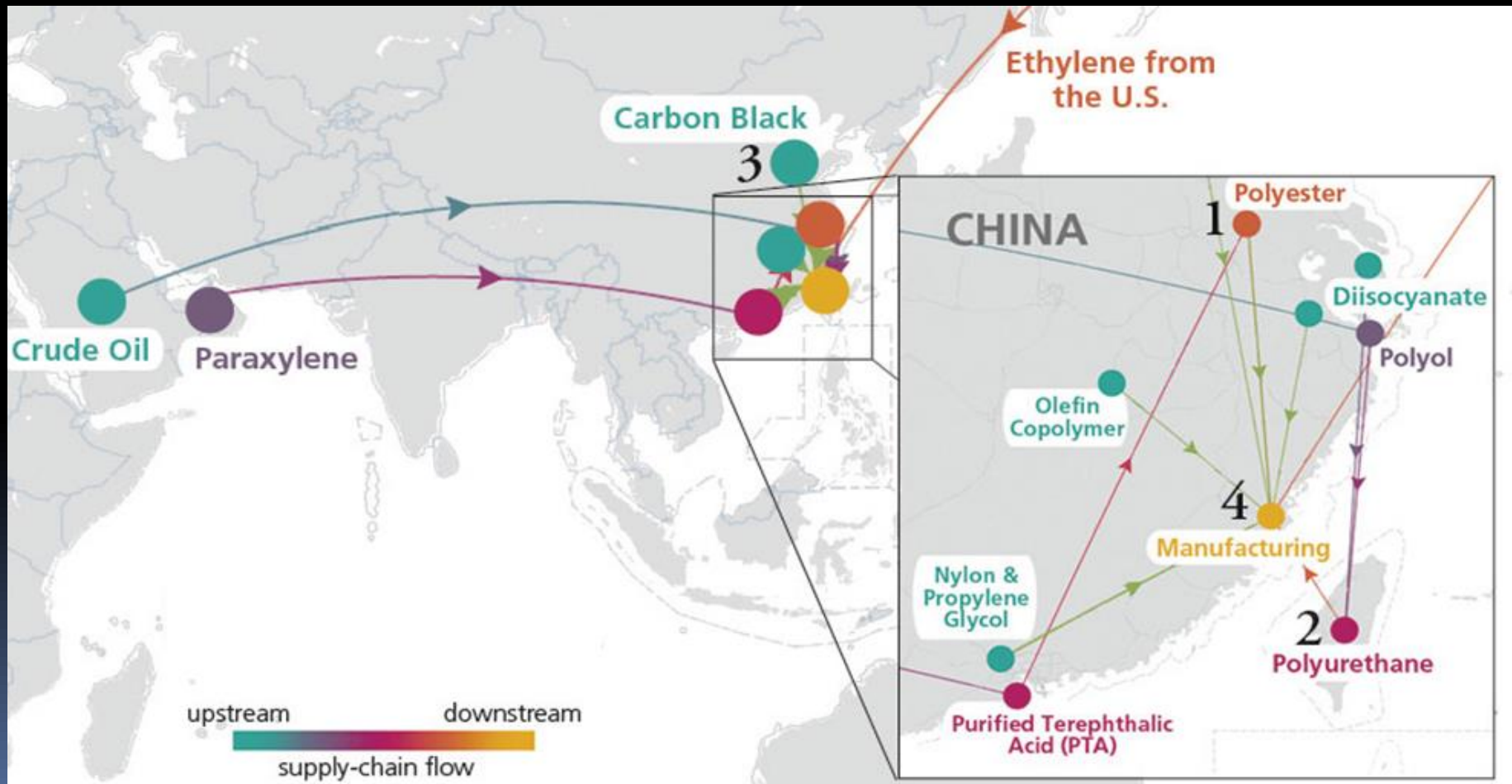


All Developing Economies *excluding* China = 2.7%

The New International Division of Labor



The Fragmentation of International Production & Information-Communications Technology Revolution



Production & Consumption Co-Located

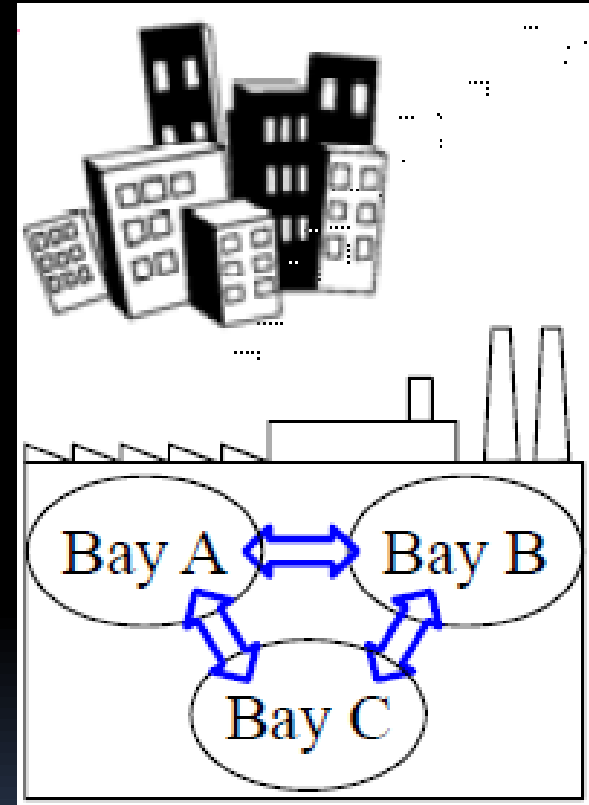
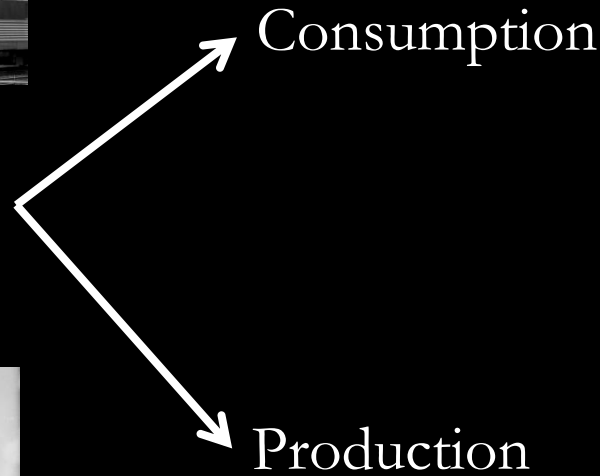
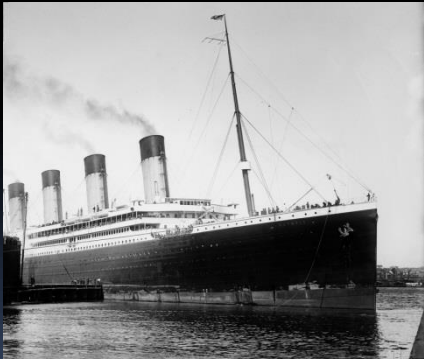


...today's 'buy local,' 'eat local' movements

Late 19th and 20th Century Industrialization

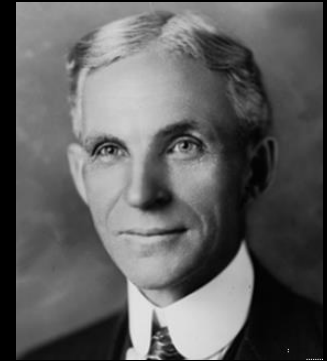


'Steam
Revolution'
(Trains/Ships)



Factory

Henry Ford's River Rouge Factory Complex

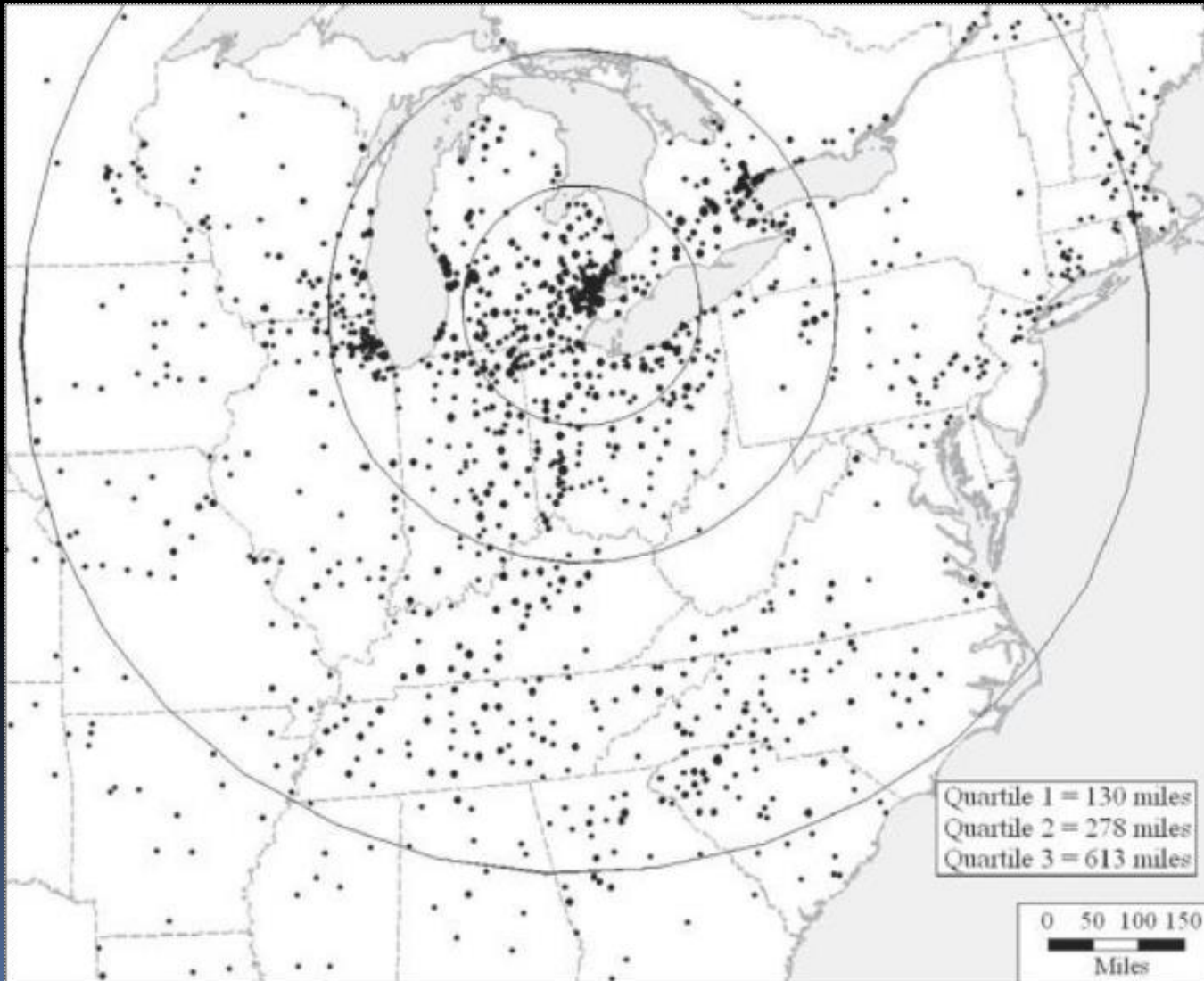


1) Large, vertically-integrated factories



2) National Agglomeration – Detroit ‘Motor City’

Ford's Suppliers Relative to Assembly Plants



3) Export 'Final Product'





Raw Materials: Agricultural, Mining & Food



Important raw materials exporters in Africa

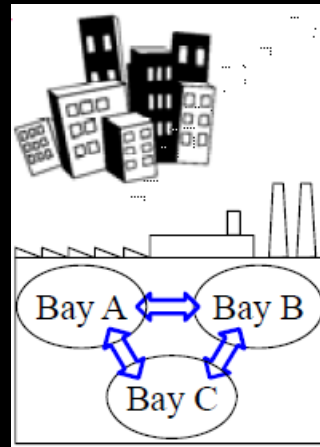
- Oil**
Ghana, Equatorial Guinea, Nigeria, Chad, Gabon, Angola, Cameroon, Congo (Brazzaville), Ivory Coast, Ghana, Libya, Senegal, Sudan, South Sudan, Tunisia, Uganda
- Gas**
Algeria, Mozambique, Angola, Equatorial Guinea, Libya, Nigeria
- Precious metals (gold, silver, platinum)**
Tanzania, Ghana, Guinea-Conakry, Mali, South Africa
- Coal**
Mozambique, South Africa
- Gems**
Angola, Zimbabwe, Botswana, Democratic Republic of Congo, Namibia, South Africa, Sierra Leone
- Metals (copper, iron ore, bauxite, zinc)**
Democratic Republic of Congo, Guinea-Conakry, Namibia, South Africa, Zambia
- Uranium**
Namibia, Niger



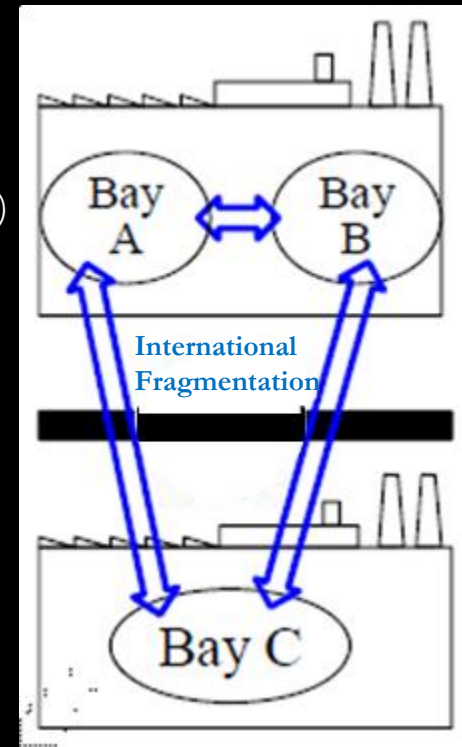
Source: UNCTAD Handbook of statistics

21st Century Industrialization

'Steam
Revolution'
(Train/Ships)



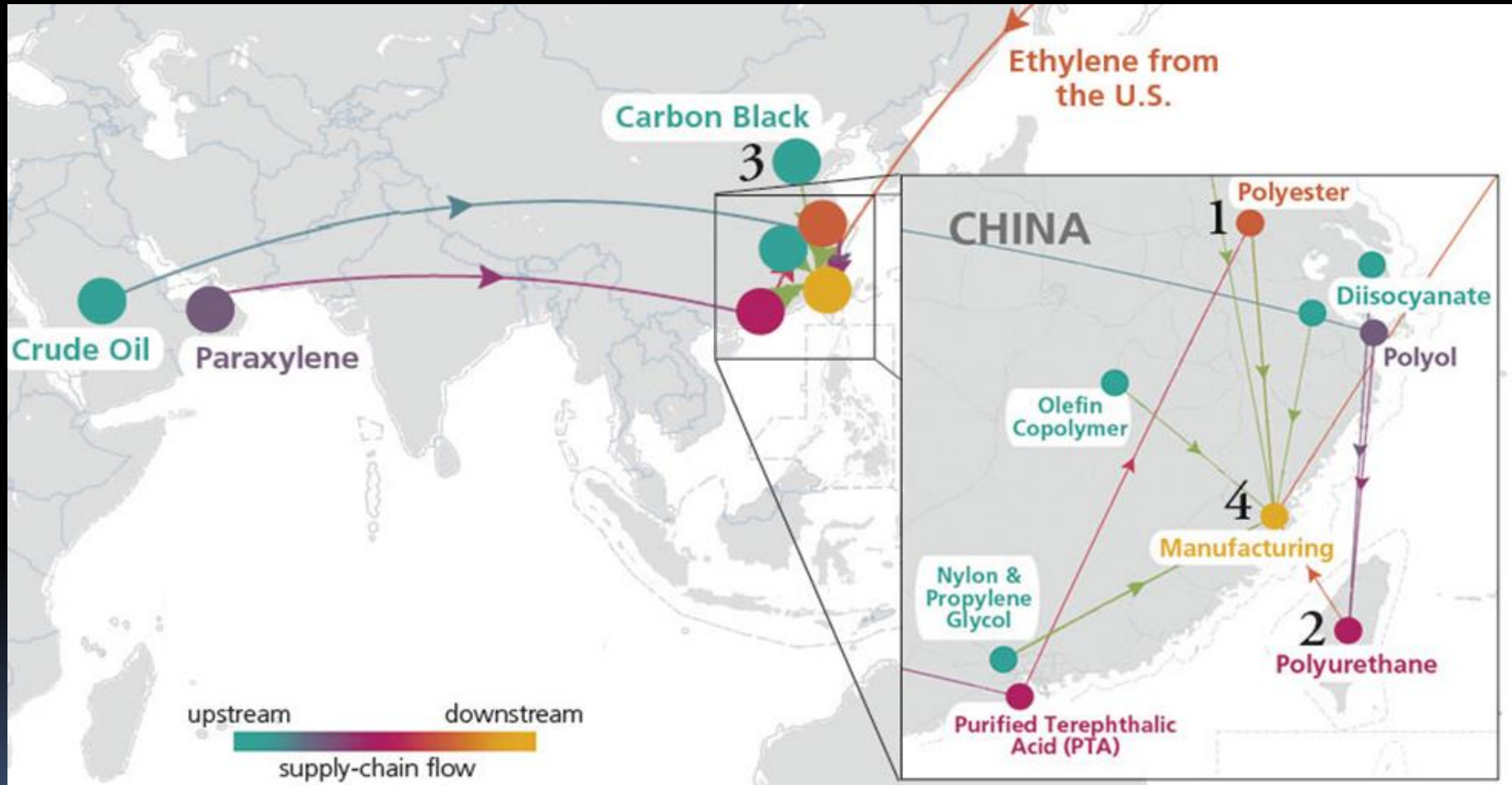
'Information-
Communication
Technology' (ICT)
Revolution



International Fragmented Production

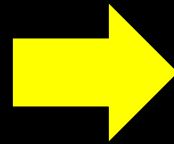
- De-Verticalization of firms
- De-Agglomeration of industries
- Internationalization
- Trade in 'Intermediate Goods' (parts/components – 50%+ global trade)

Fragmentation of International Production & China



Major Transformation in Production (~1980's – today)

Integrated & National
Production



International & Fragmented
Production



~Victor Fung, CEO



'Phantom' Corporation?

~Small statistical footprint~

- ✓ No Foreign Direct Investment
- ✓ Medium-sized? (~2,500 employees)
or
Large-sized? (1,000,000+ in network)

*“Think about the scope of what we do. We work with about 7,500 suppliers in more than 26 countries. If the average factory has 200 workers – that’s probably a low estimate – then in effect **there are more than a million workers** engaged on behalf of our customers. That’s why **our policy is not to own** any portion of the value that deals with running factories. Managing a million workers would be a colossal undertaking. We’d lose all flexibility; we’d lose our ability to fine-tune and coordinate...if we don’t own factories, can we say we are in manufacturing? Absolutely. Because, of the 15 steps in the manufacturing value chain, we probably do 10.”*

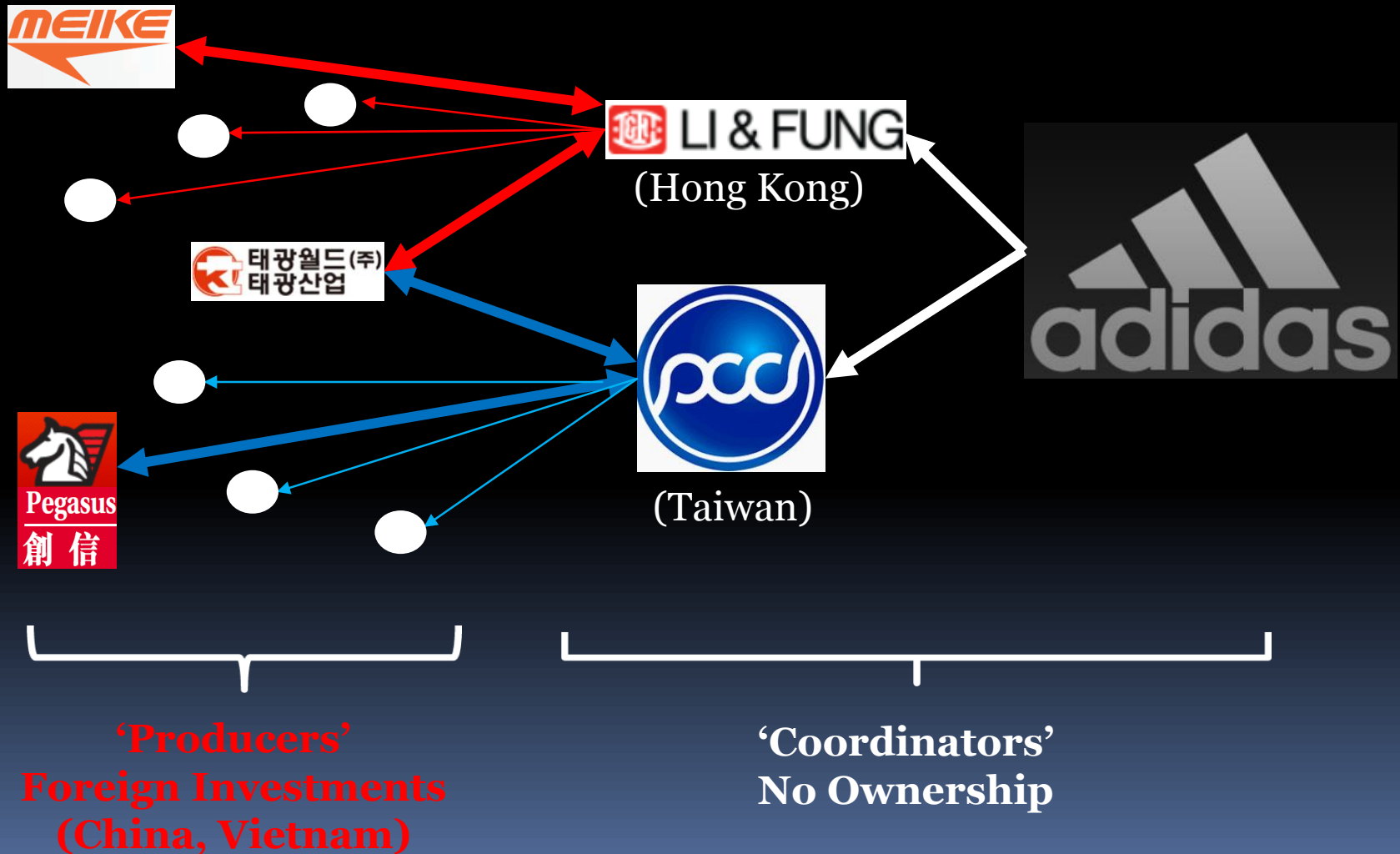


Year	Employees	# of Suppliers	Supplier Workforce	# of Supplier Countries
1998	2,572	7,500	~1,000,000+	26
2007	5,621	8,300	~2,000,000+	40
2014	25,781	~15,000	???	48



Year	Employees (mostly retail)	# of Suppliers	Supplier Workforce	% Female	# of Supplier Countries
2013	48,000	797	1,000,000+	72%	39

- 'Lead' Firm Coordinators
- Weak 'market' linkages: Trade ~ No Ownership, No Control
- **Strong 'relational' linkages: Trade ~ 'Control w/o Ownership'**
- FDI ~ Ownership & Control



Why important? Simple illustration....

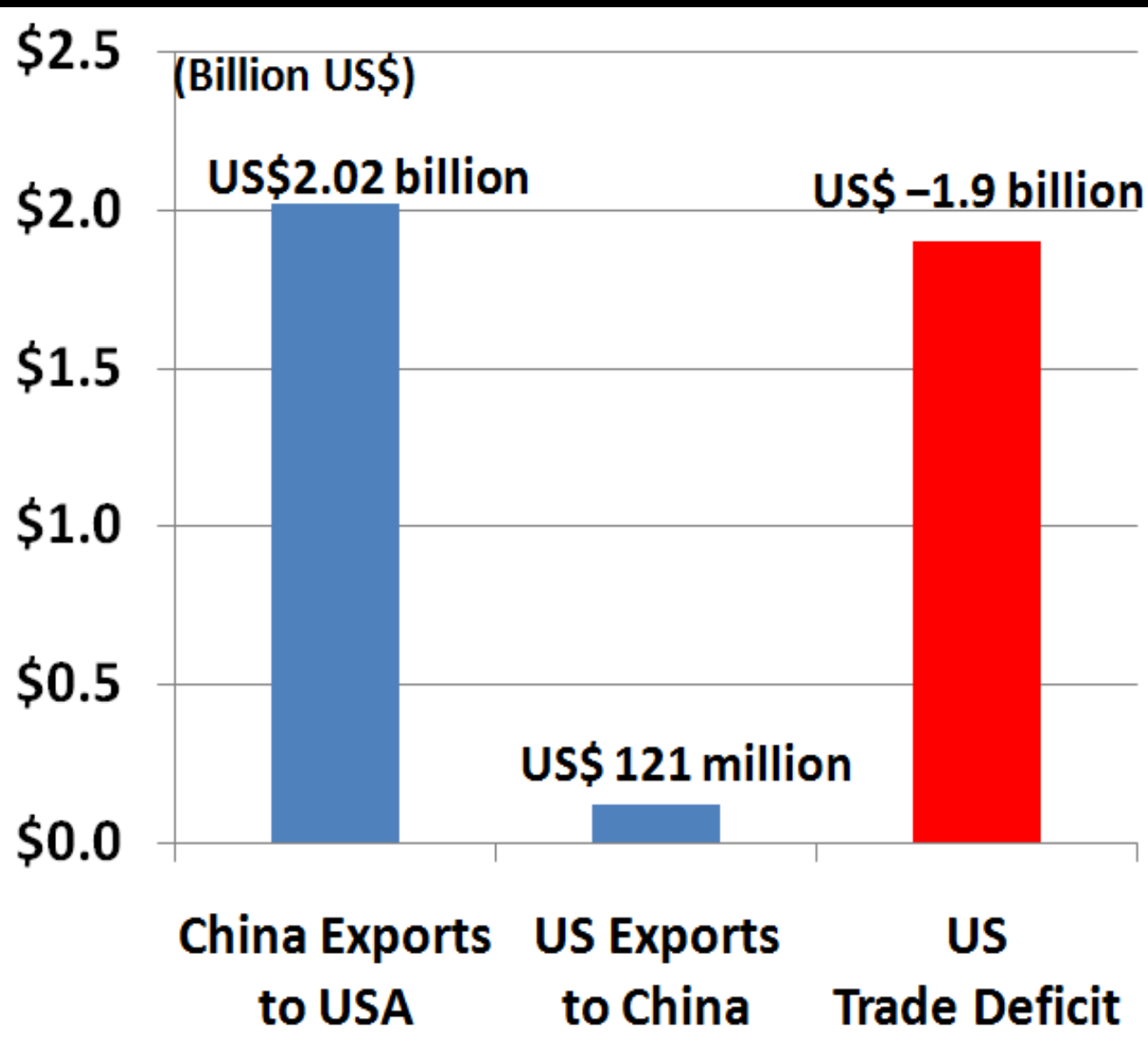


Reality is more complicated...



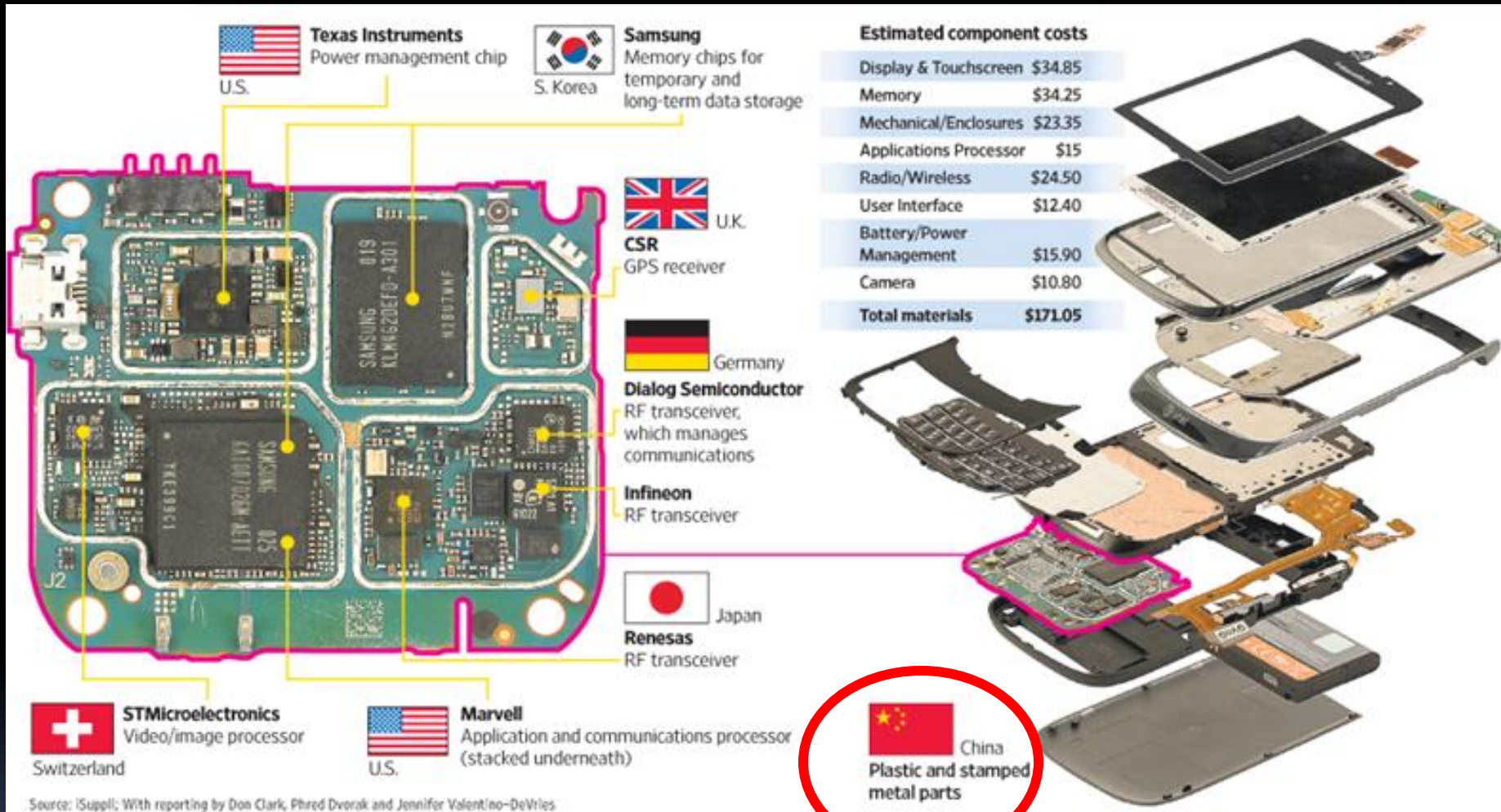
Traditional trade balance accounting...

iPhones net trade, 2009



But, China does not receive \$1.9 billion....

“International Fragmented Production”



Plus, Chinese assembly...

AAPL Suppliers

AAPL Suppliers:
 Wolfson (WLF.L) (Audio IC)
 Akamai (AKAM) (Internet Content Delivery)
 Jabil (JBL) (Internal Sub Assembly/ Casing)
 Flextronics (FLEX) (Power Plugs)

PC Suppliers:
 Hon Hai (2317.TW)
 Quanta (2382.TW)
 Intel (INTC)

iPod Nano Suppliers:
 Toshiba (8502.JP) (NAND flash)
 Samsung (05930.KS) (Apps processor, SDRAM)
 Cirrus Logic (CRUS) (Audio CODEC)
 STMicroelectronics (STM) (Accelerometer)
 Cypress Semiconductor (CY) (Touchscreen controller)
 Silicon Labs (SLAB) (FM radio tuner)
 Intersil (ISIL) (Video driver)
 Dialog (DIAL.KL) (Power management)

Apple TV Suppliers:
 SAMSUNG (05930.KS) (Apps processor, SDRAM)
 Toshiba (8502.JP) (NAND flash)
 Panasonic (6752.JP) (BT, WLAN, contains Broadcom components)
 Delta Electronics (2308.TW) (Power supply, Ethernet filter)
 Analogix (HDMI transmitter)
 Standard Microsystems (SMSC) (Ethernet transceiver)
 Dialog (DIAL.KL) (Power management)
 Texas Instruments (TXN) (Microcontroller)

iPad Suppliers:
 Broadcom (BRCM) (Multitouch controller, Microcontroller, BT, FM, WLAN, GPS)
 Wah Hong (8240.TW) (Other Components)
 Micron (MU) (Other Memory)
 TPK (3673.TW) (Touch Panel)

iPhone Suppliers:
 Hon Hai (2317.TW) (assemblies) – AT&T
 Infineon (IFXGn.DE) (baseband, GSM receiver) – AT&T
 Qualcomm (QCOM) (baseband/GPS) – Verizon
 Samsung (05930.KS) (NAND, Mobile DDR, Apps, LCD)
 Toshiba (8502.JP) (NAND) – AT&T/Verizon
 Coming (GLW) (display glass) – AT&T
 LG Display (034220.KS) (IPS LCD Panel) – AT&T
 Texas Instruments (TXN) (video driver, touchscreen controller) – AT&T/Verizon
 STMicroelectronics (STM.N) (accelerometer, gyroscope) – AT&T/Verizon
 Broadcom Corporation (BRCM) (BT, WiFi, GPS) – AT&T
 Skyworks Solutions (SWKS) (RF Chips) – AT&T/Verizon
 TriQuint Semiconductor (TWNT) (RF Chips)
 Avago Technologies (AVGO) (RF Chips) – Verizon
 Intersil Corporation (ISIL) (Analog Switch) – AT&T
 OmniVision Technologies (OVTI) – AT&T
 Intel (INTC) (NOR flash)
 Elpida (8665.JP) (DDR)
 Murata (6981.JP) (SAW module)
 Dialog (DIAL.KL) (Power management)
 Cirrus Logic (CRUS) (Audio CODEC)
 Wintec (Touch Screen)

iPad Suppliers:
 Hon Hai (2317.TW) (EMS)
 Infineon (IFXGn.DE)
 Qualcomm (QCOM)
 Skyworks (SWKS)
 Avago (AVGO)
 TriQuint (TQNT)
 LNA
 Murata (6981.JP)
 FEM
 TCXO (Baseband)
 Samsung (05930.KS) (Display, NAND flash, DRAM, Apps processor, LCD timing controller)
 LG Display (034220.KS) (Display)
 Toshiba (8502.JP) (Solid State Drive)
 STMicroelectronics (STM.N) (accelerometer, gyroscope)
 Wintek (2384.TW) (Touch Panel)
 Texas Instruments (TXN) (Touchscreen Driver)
 Apple 1 GHz A4 (Processor)
 DynaPack (3211.TW), Simplo (Battery)
 Wanshih Electronic (8134.TW) (PC mini coaxial cables)
 Innolux (3481.TW) (Touch Panel)
 Mag. Layers Scientific – Technics (Power Chock)
 Cheng Uei Precision Industries (2392.TW) (Connectors)
 G-Tech Optoelectronics (3149.TW) (Optical Glass Processing)
 TAOS (Ambient light sensor, light to digital converter)

AAPL Competitors

Handset:
 Motorola (MMI)
 HTC (2498.TW)
 Nokia (NOK)
 Samsung (05930.KS)
 SonyEricsson (SNE)
 LG (66570.KS)
 Research in Motion (RIMM)
MP3 Players:
 Microsoft (MSFT)
 Creative (8249.TW)
 Archos
 Toshiba (8502.JP)
 SanDisk (SNDK)
 Samsung (05930.KS)
 iRiver (080570.KR)
PCs:
 Hewlett-Packard (HPQ)
 DELL
 Acer (2353.TW)
 Lenovo (0992.HK)
 Toshiba (8502.JP)
 Fujitsu (6702.JP)
 Sony (6758.JP)
 Asustek (2357.TW)
Music and Video Services:
 Amazon (AMZN)
 Wal-Mart (WMT)
 Real Networks (RNWK)
 Yahoo (YHOO)

AAPL Customers

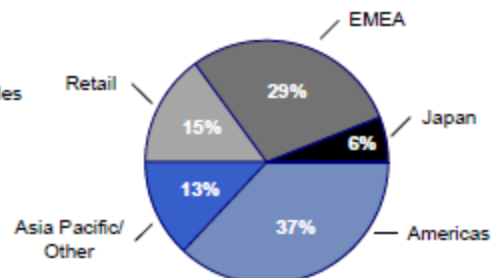
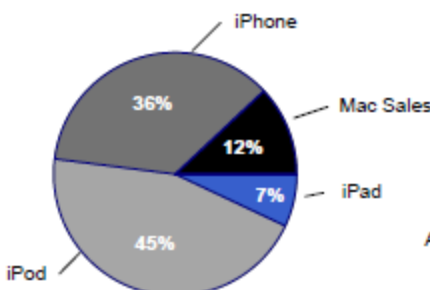
Major iPhone Providers:
 AT&T (T)
 Verizon (VZ) (US)
 T-Mobile (Germany)

Strategic Partners, Distributors, Resellers

Best Buy (BBY)
 Wal-Mart (WMT)
 Target (TGT)
 Ingram Micro (IM)
 Tech Data Corp (TECD)

AAPL

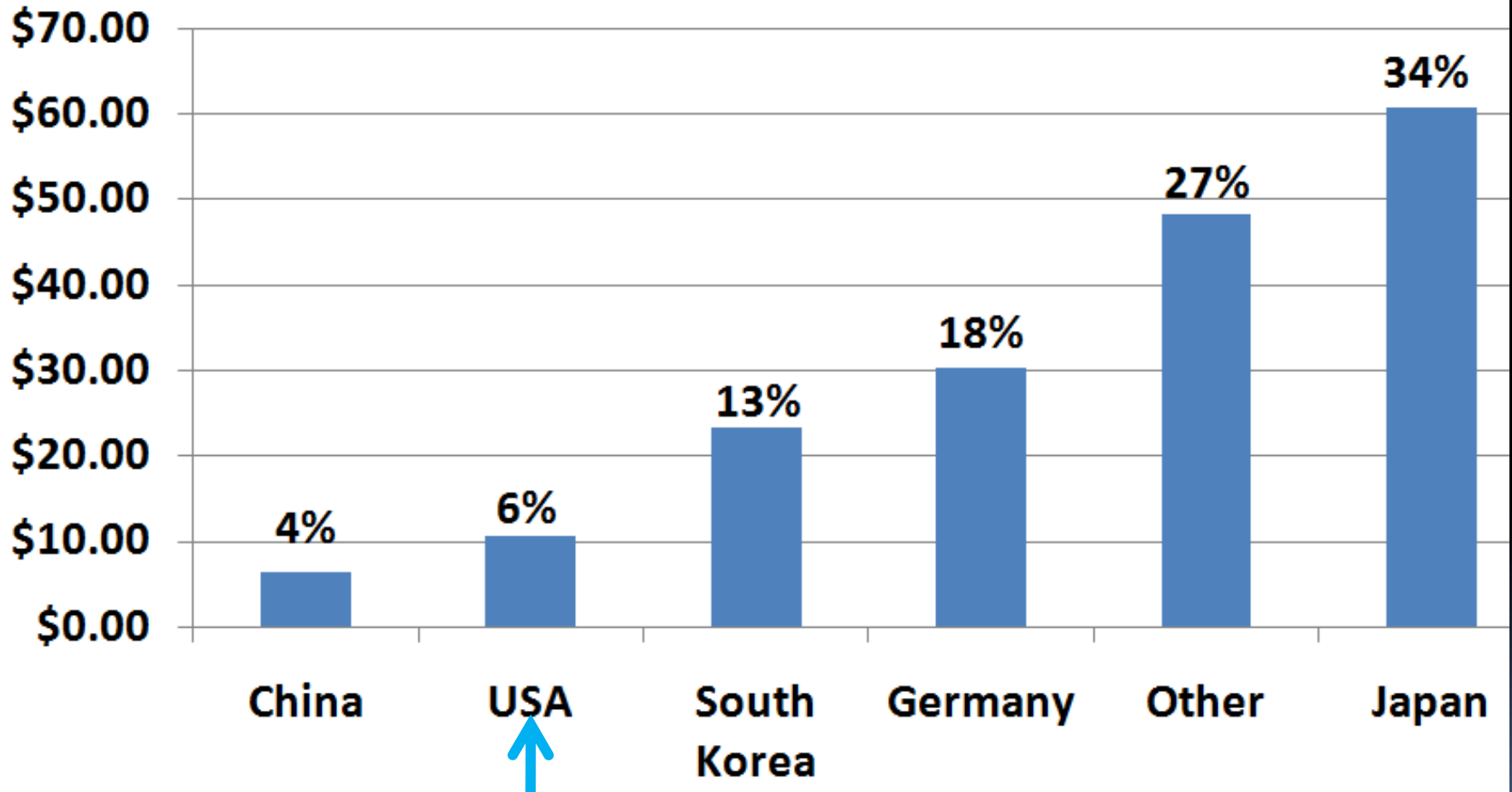
Arrows indicate direction of revenue flow



How much does China earn from 'Chinese' exports?

Division of Revenue, *Manufacturing only*: iPhone, 2009

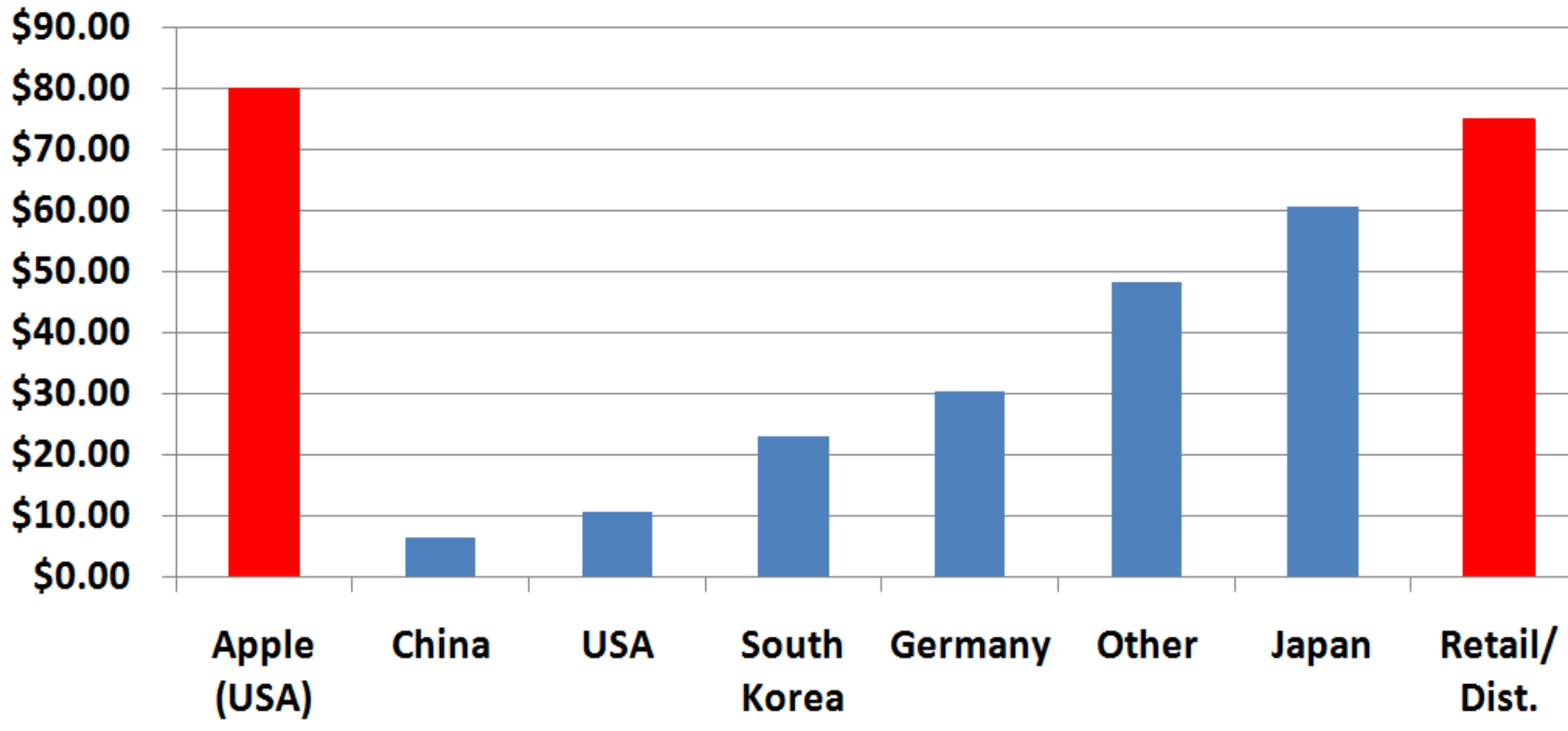
Production Costs per iPhone



Component parts only

How much does China earn from 'Chinese' exports?

Division of Revenue: Design....Production....Distribution, Retail



The U-Shape of Value Added

High
Value-added

Low
Value-added

Engineering
Design
Brand name

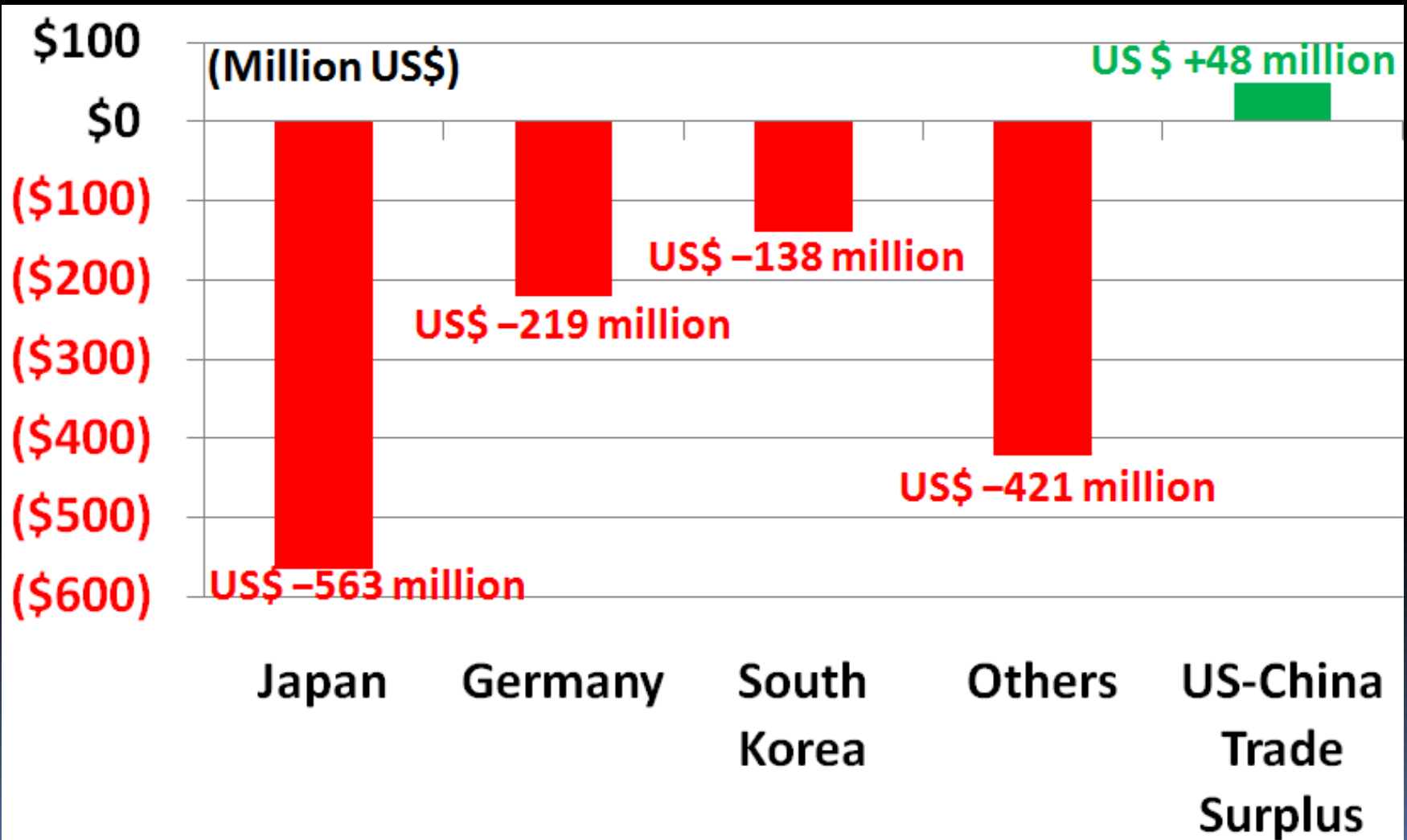
Manufacturing

Distribution
Retail
After sales service



'Value-added' approach to US trade

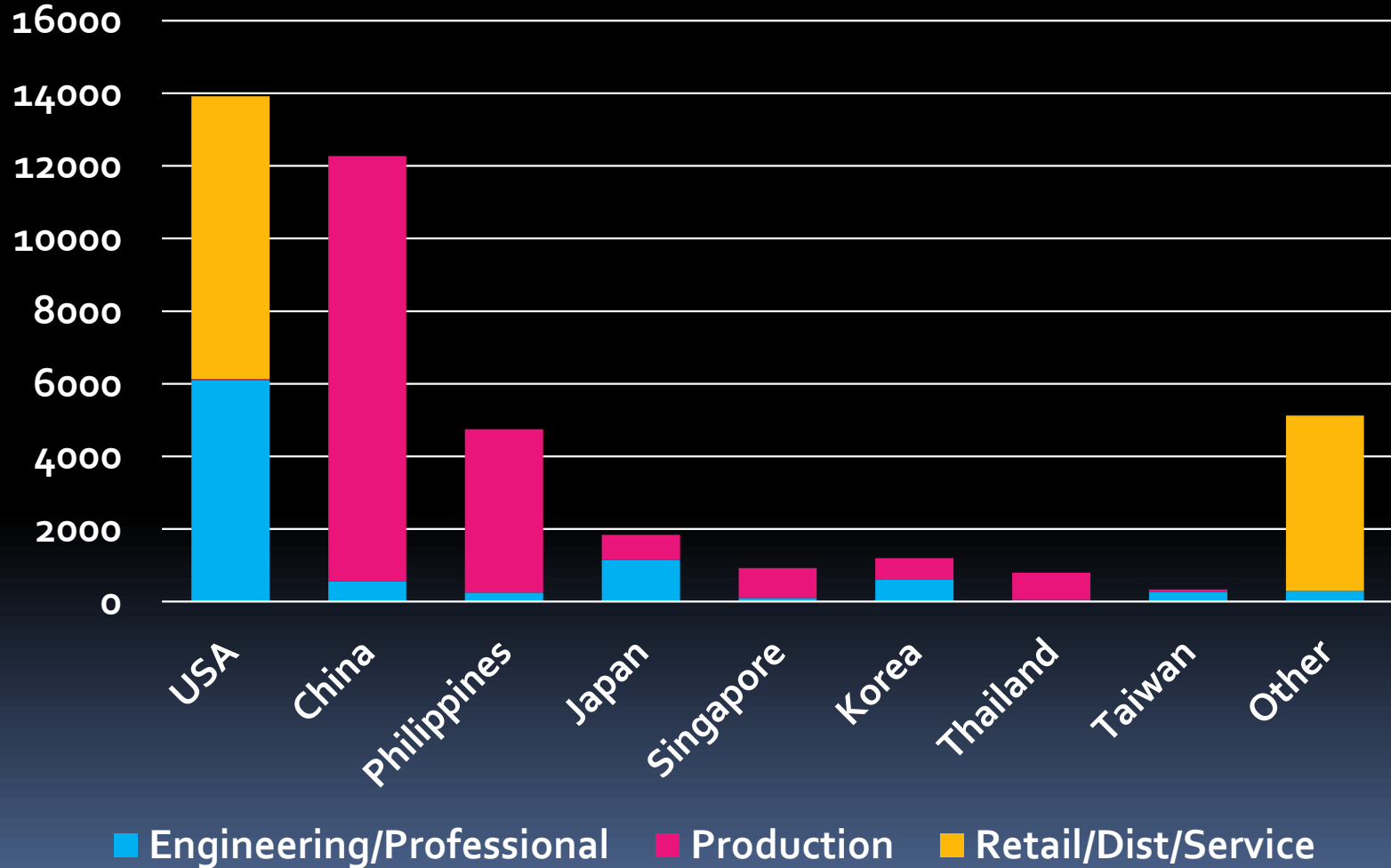
iPhone: US trade balance



Production of the iPod

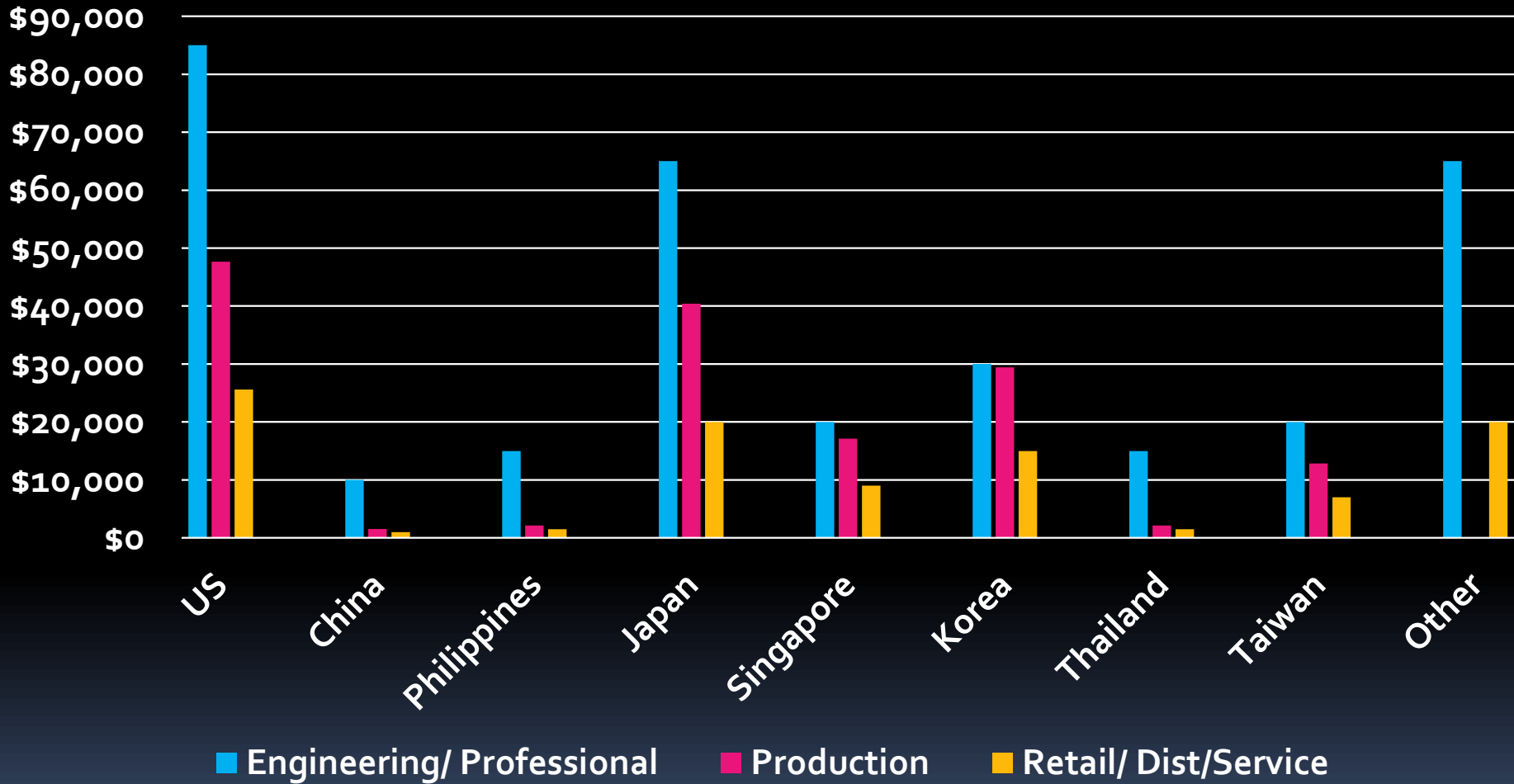
Where are the jobs created?

Number and Type of Employees by Country



How much does each employee earn?

Salary per Employee (US\$)





They both “make” our iPhones, iPods, iPads....



Terry Guo, CEO



✓ Owned by **Taiwanese Company**
(Hon Hai Precision)

- Factory in Shenzhen: ~300,000 workers
- Employs 1.3 million worldwide







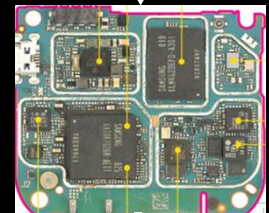
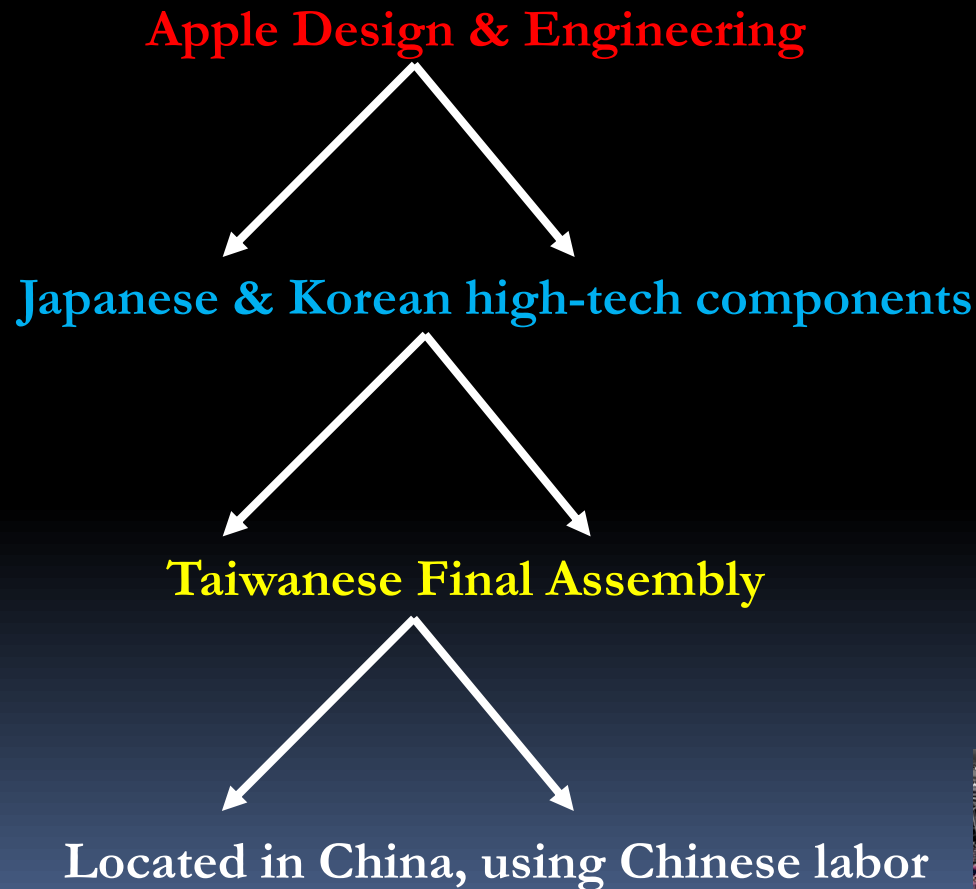
Photo by Kin Cheung / AP

Foxconn workers attend a rally Wednesday inside the Foxconn plant in Shenzhen, in south China's Guangdong province.

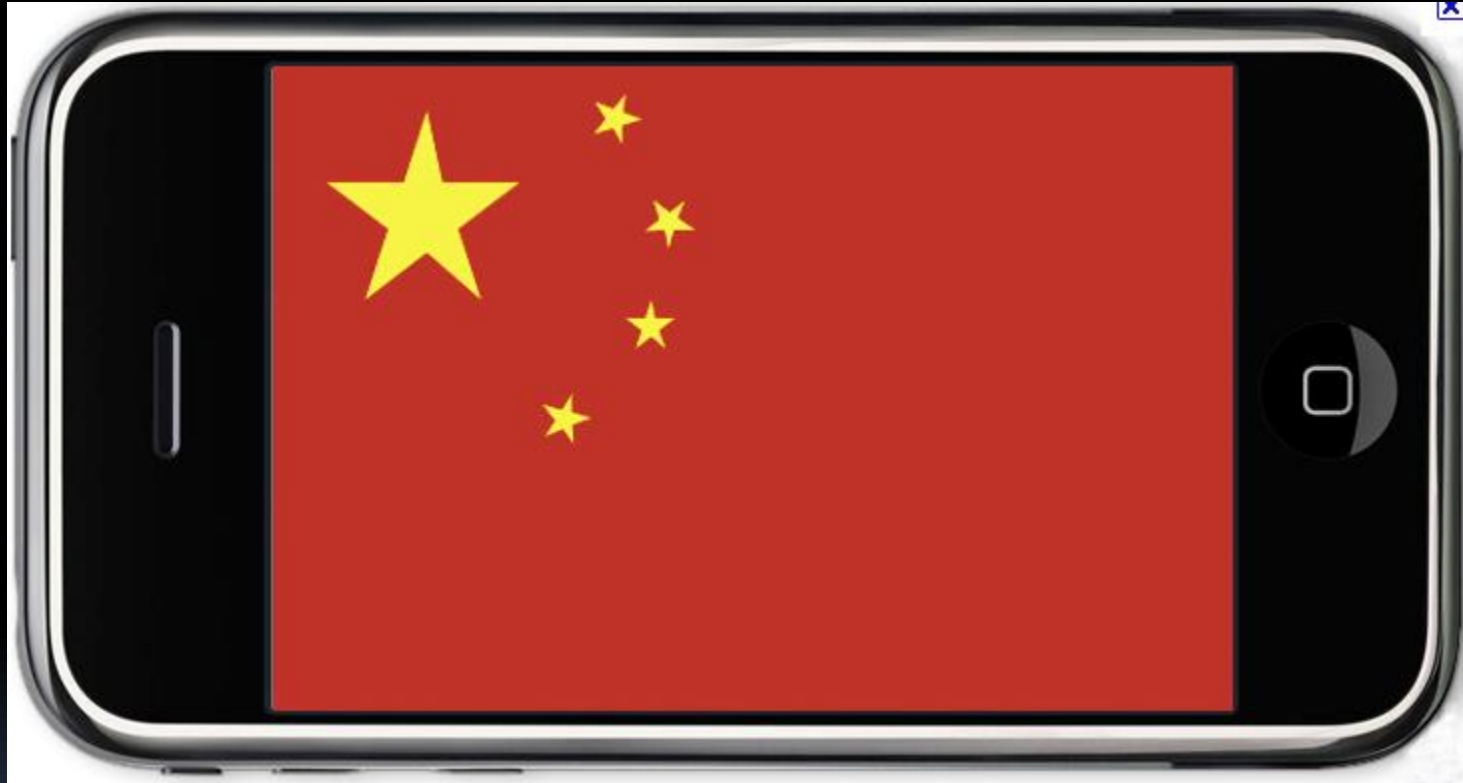


The New International Division of Labor

- ✓ International Fragmentation
- ✓ Functional Integration

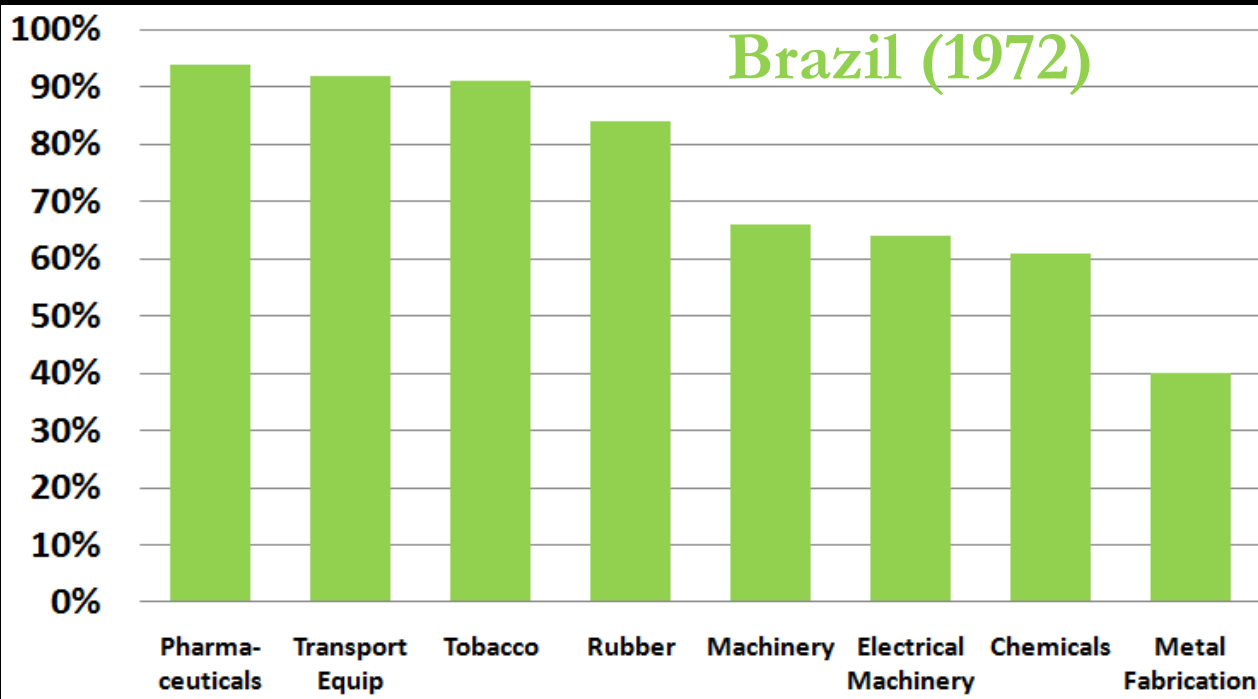


Propaganda or Reality? “Made in China”



**How representative is the iPhone?
Electronics are 'high-tech'**

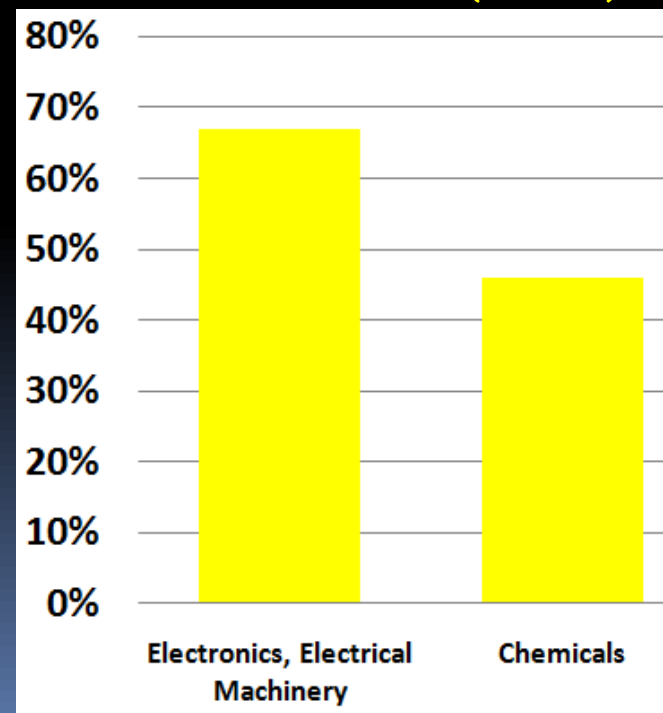
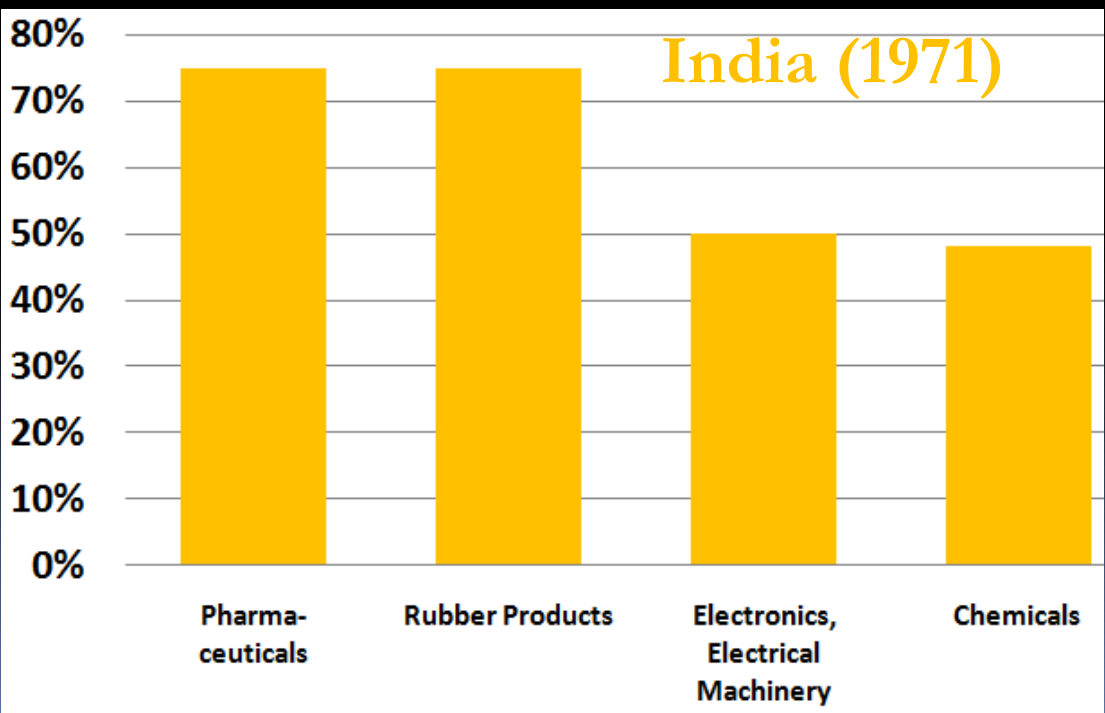
How about simpler 'low-tech' industries?



Foreign investment in prior era....

Industries with greater than 40% foreign ownership

Taiwan (1976)



**Heavy industry,
Capital-intensive,
& High tech Manufacturing**

Explanation:

Foreign 'Ownership' advantages

Access to capital,

Advanced technology,

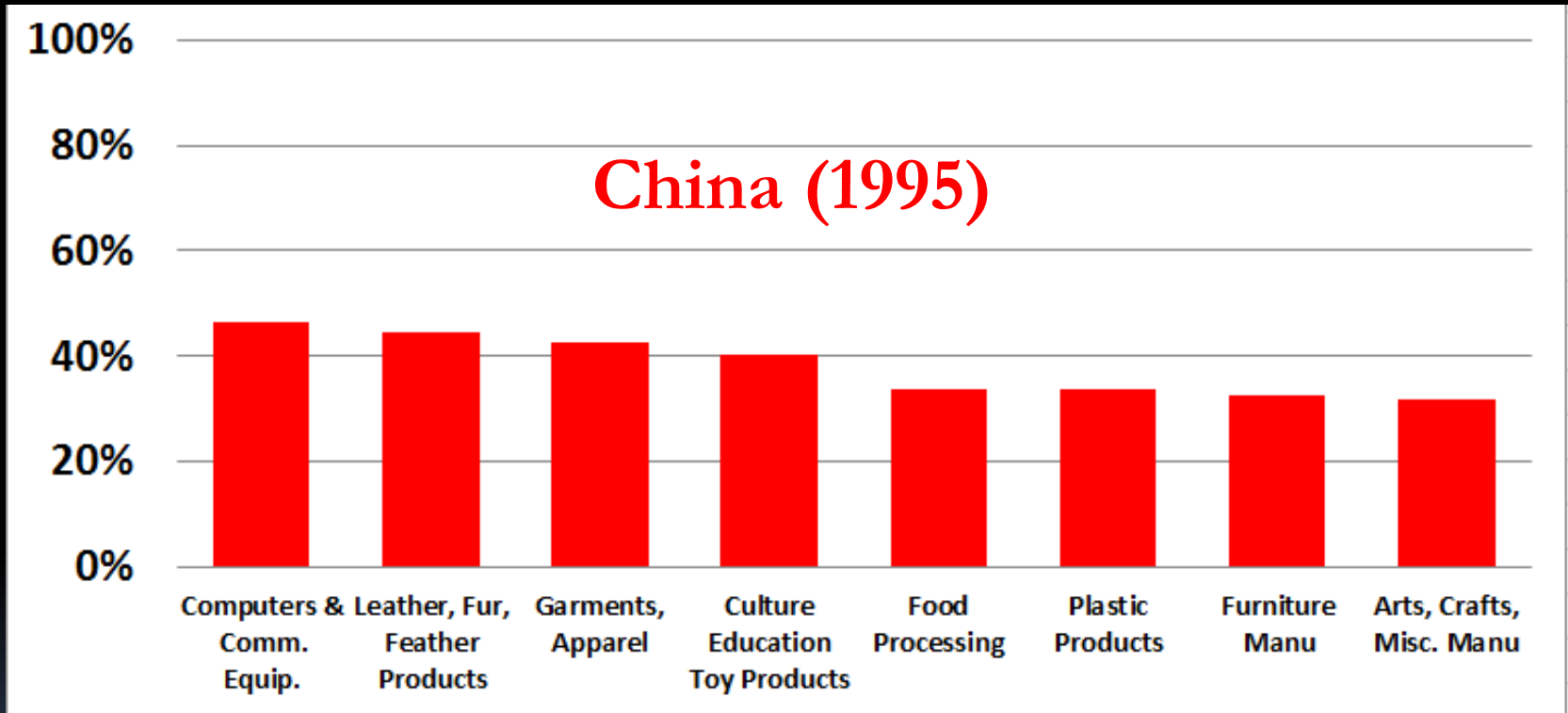
Knowledge, R&D,

International Oligopolies,

Managerial skill....

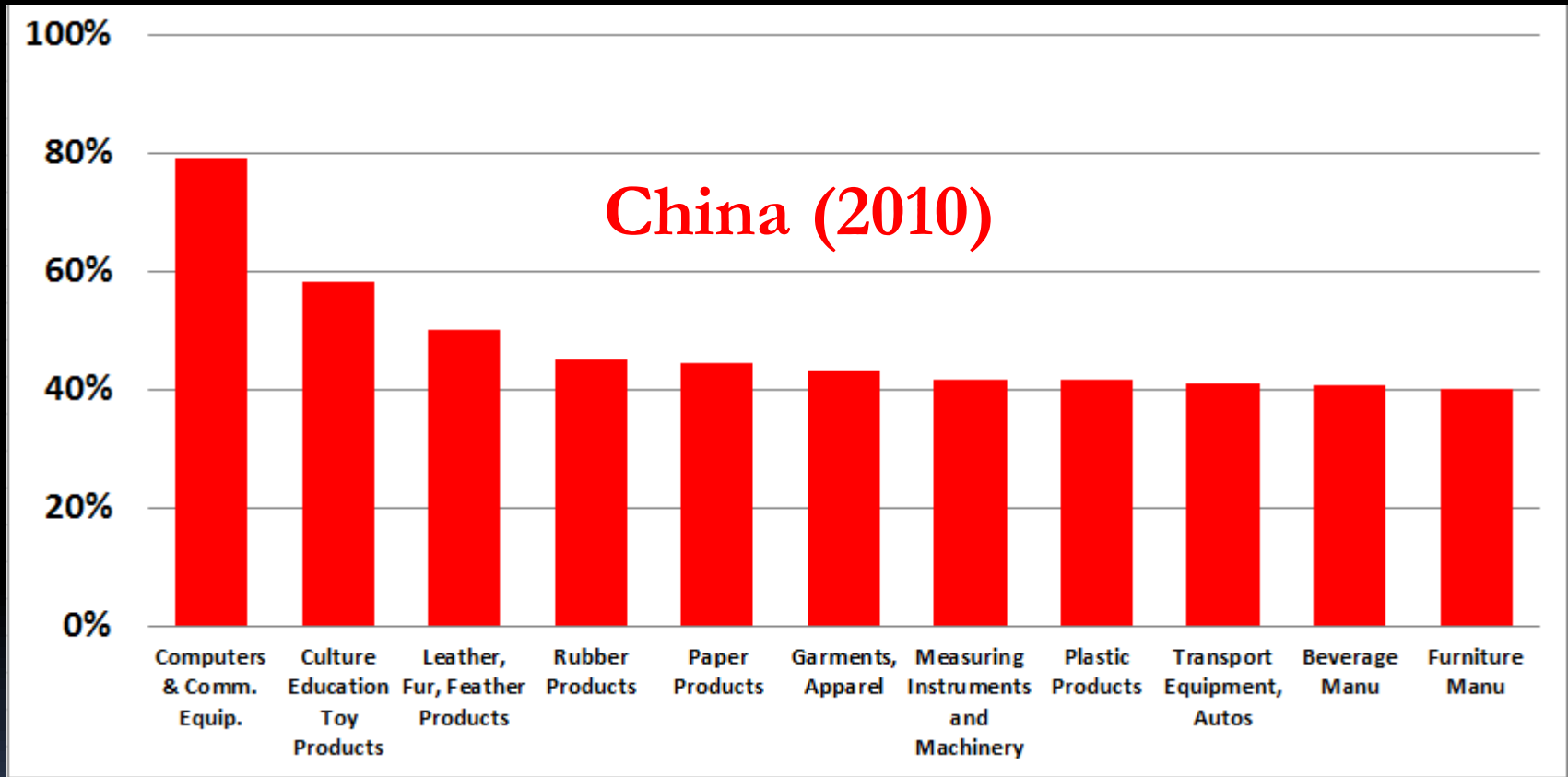
Foreign Firm's Share of Fixed Assets

All industries **greater than 30%** foreign ownership share

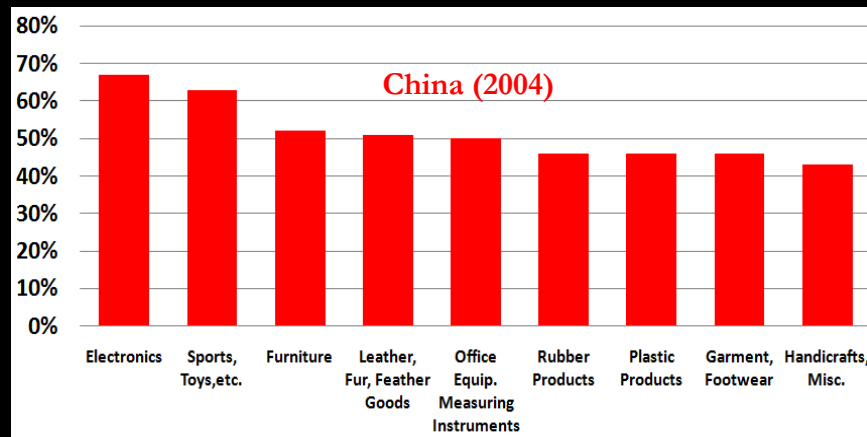


Foreign Firm's Share of Fixed Assets

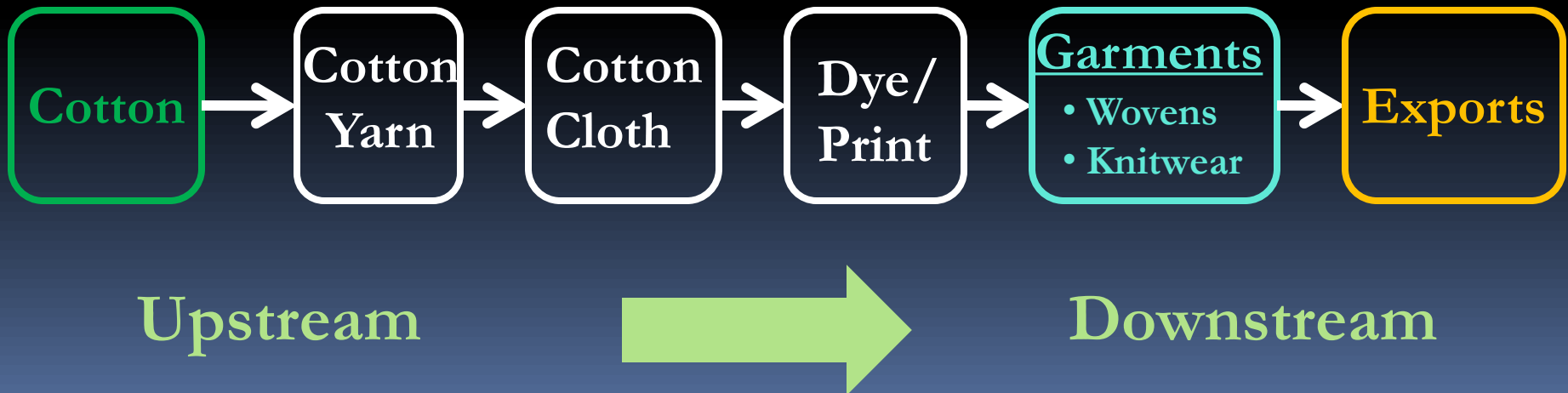
All industries **greater than 40%** foreign ownership share



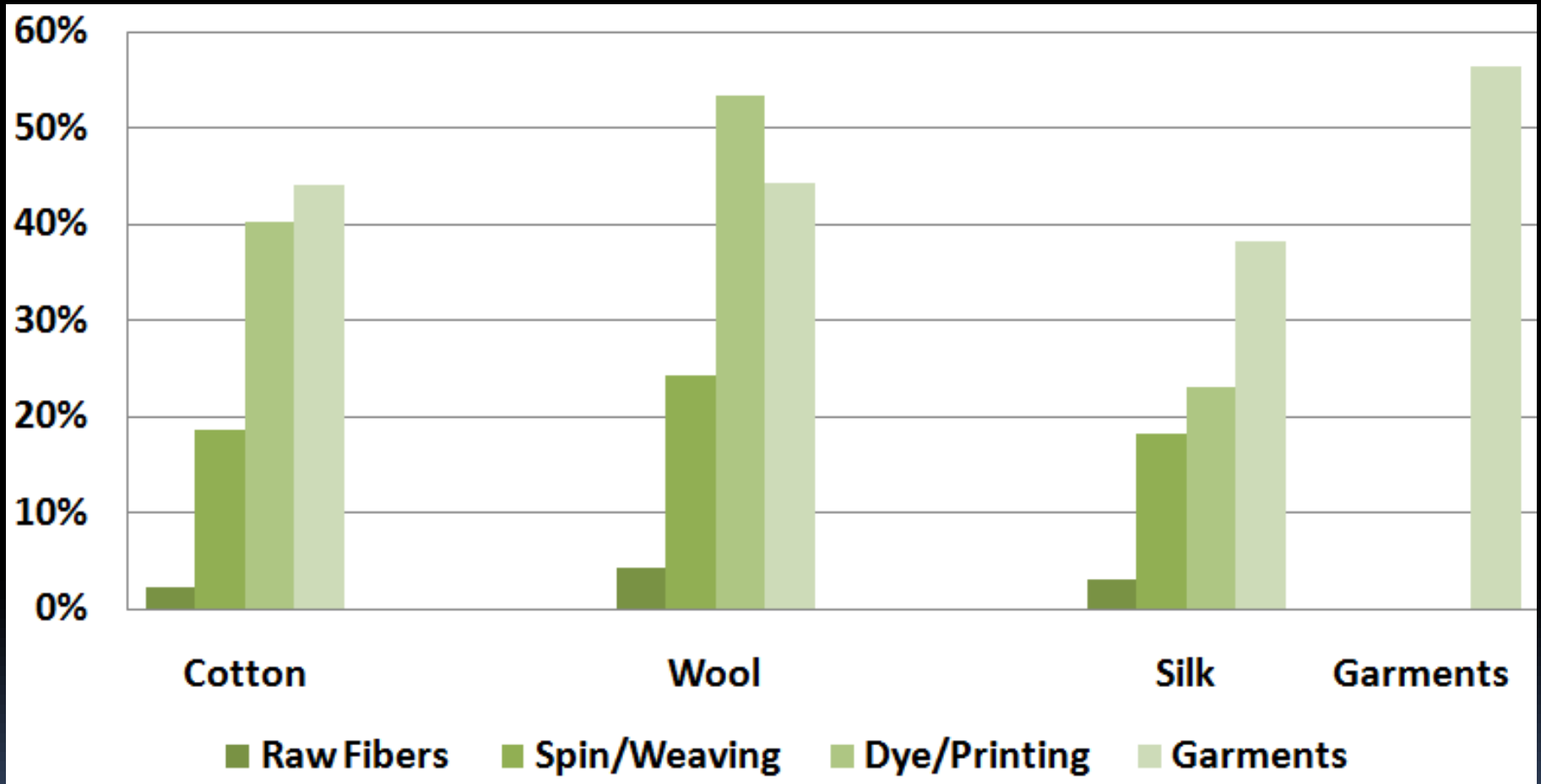
Two-digit level



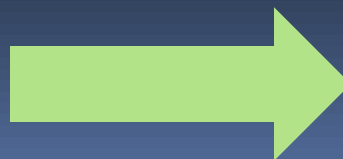
Four-digit level ~ Fragmented Industries



Textile & Garment Industry: Share of Assets owned by Foreign Firms



Upstream



Downstream

Share of Foreign Assets

~ *Wood Industries* ~

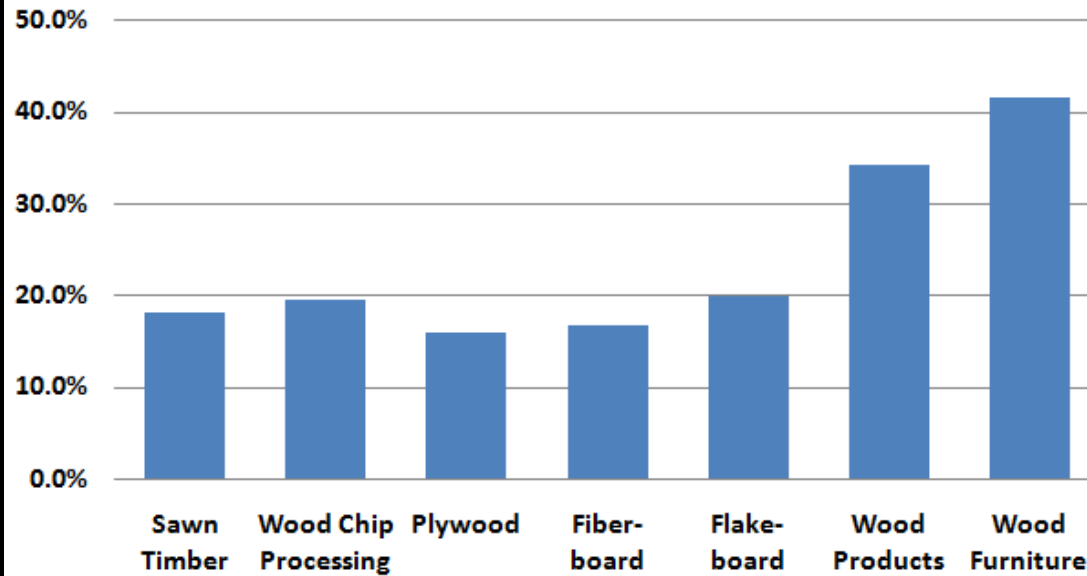
2007-10

Upstream  Downstream

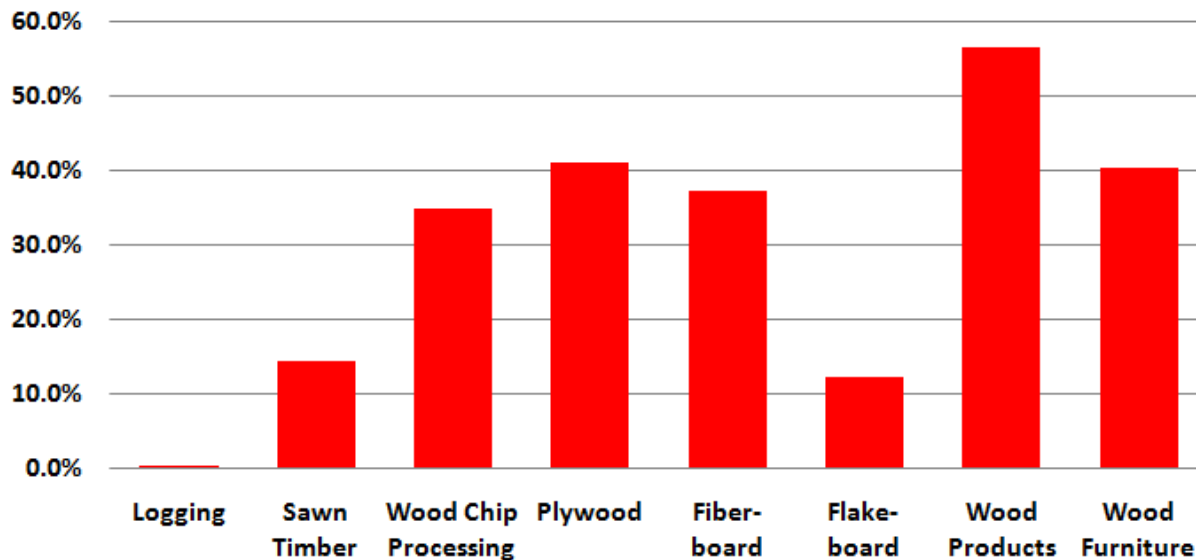
Over 15 years

1995-98

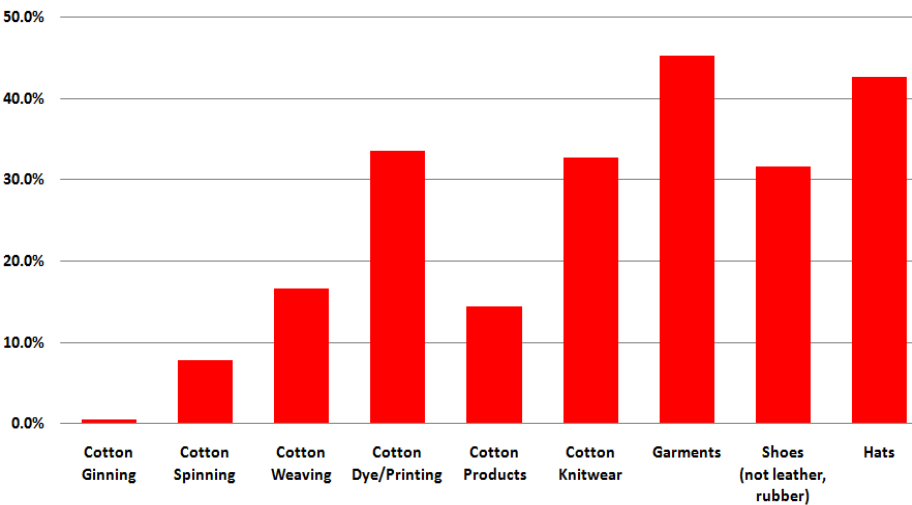
Timber and Wood Product Industries



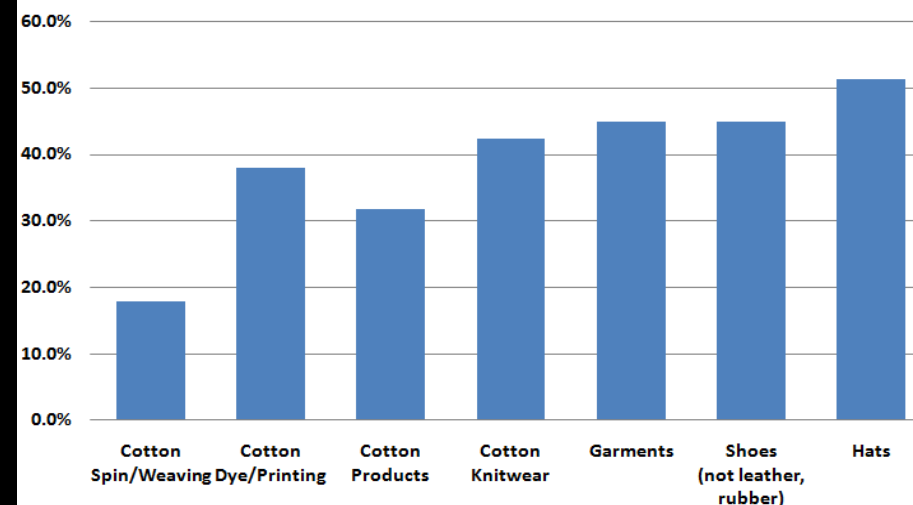
Timber and Wood Product Industries



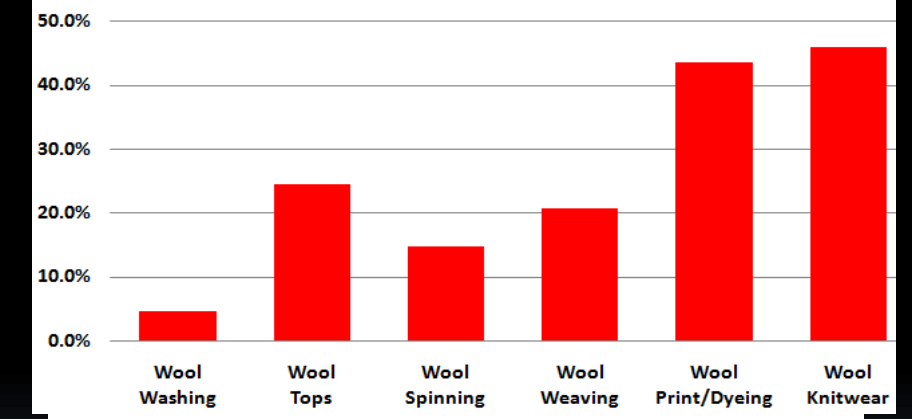
Cotton Textiles, Garments and Apparel



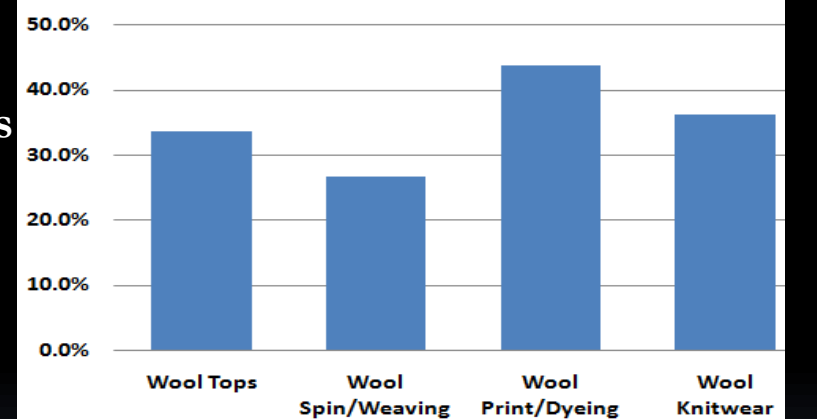
Cotton Textiles, Garments and Apparel



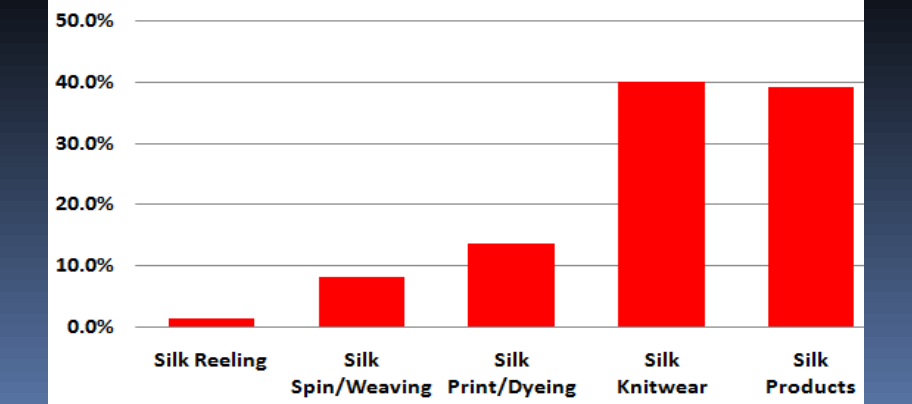
Wool Textiles and Garments



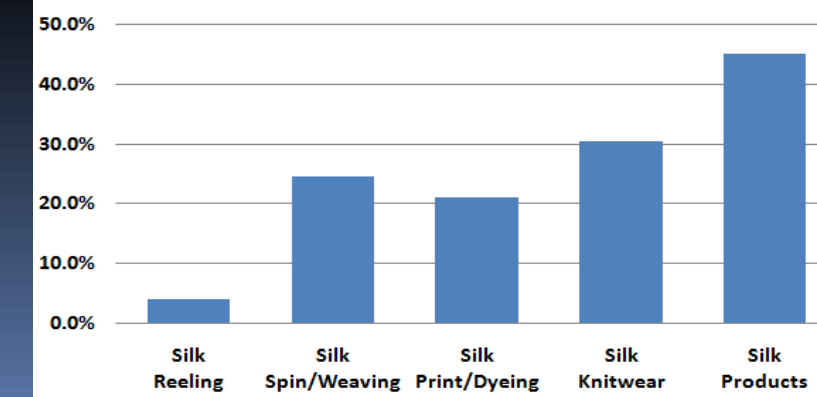
Wool Textiles and Garments



Silk Textiles and Garments



Silk Textiles and Garments



Textile-Garments

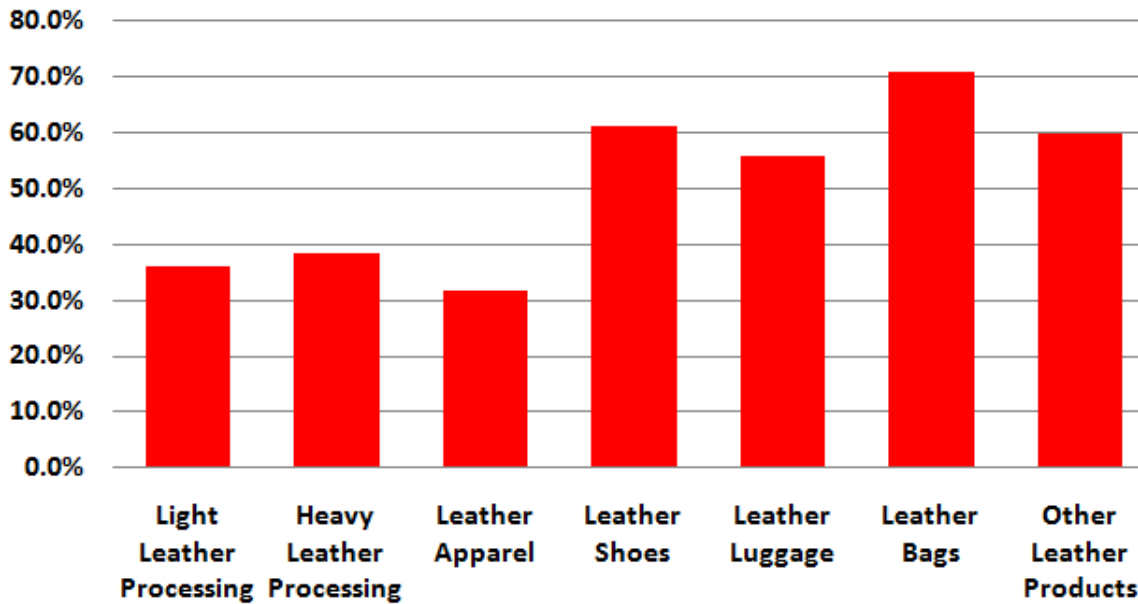
1995-98

Share of Foreign Assets

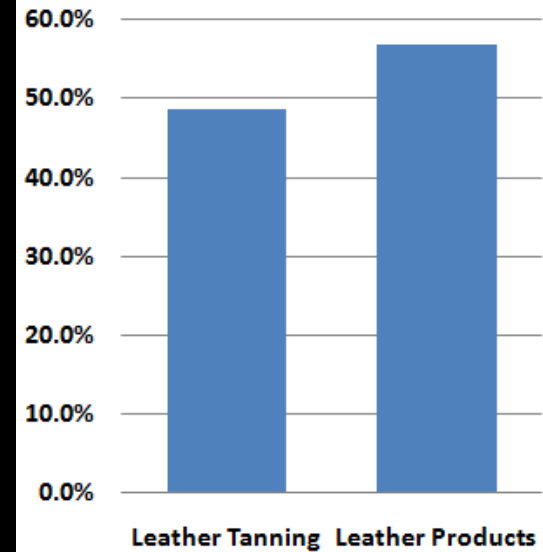
2007-10

~ *Leather, Fur, Feather Products* ~

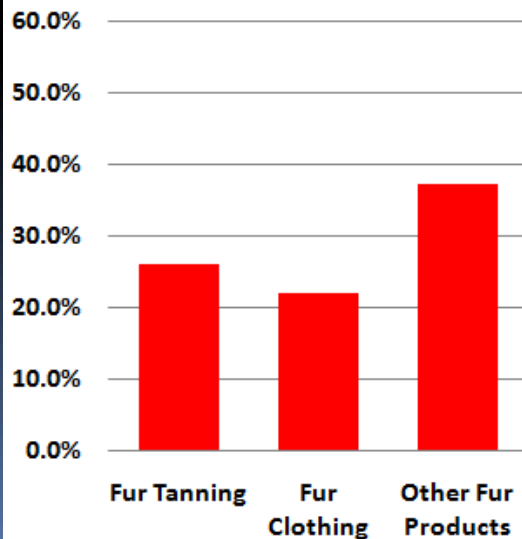
Leather Industries



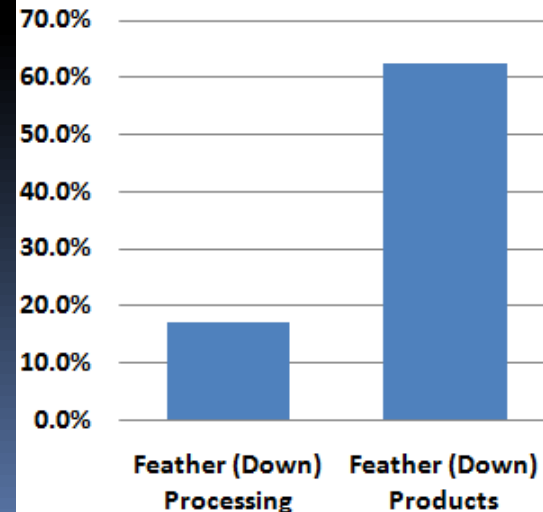
Leather Industries



Fur Industries



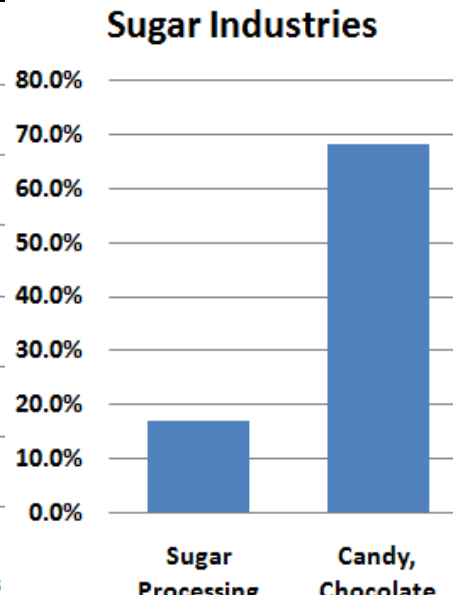
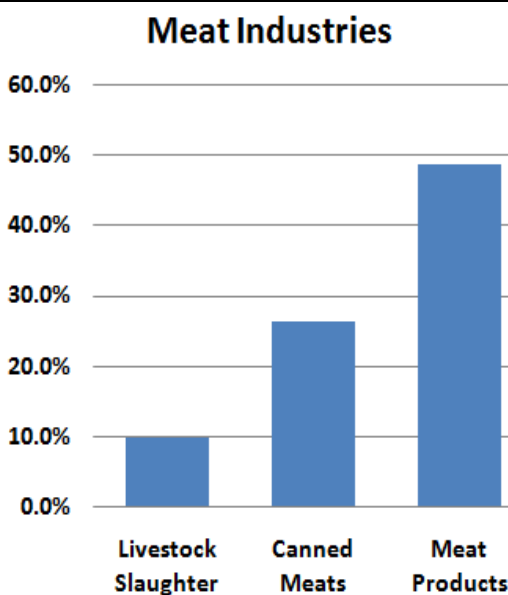
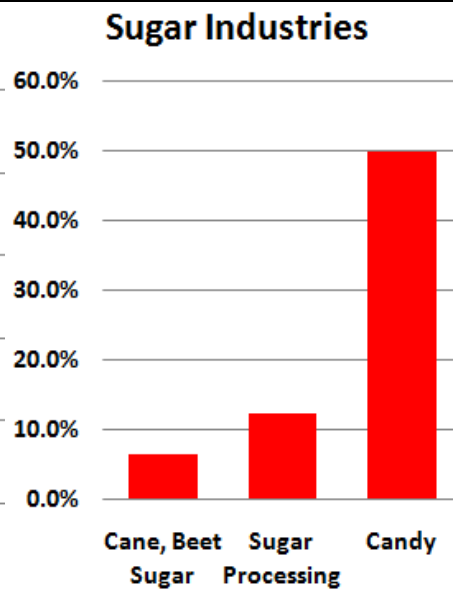
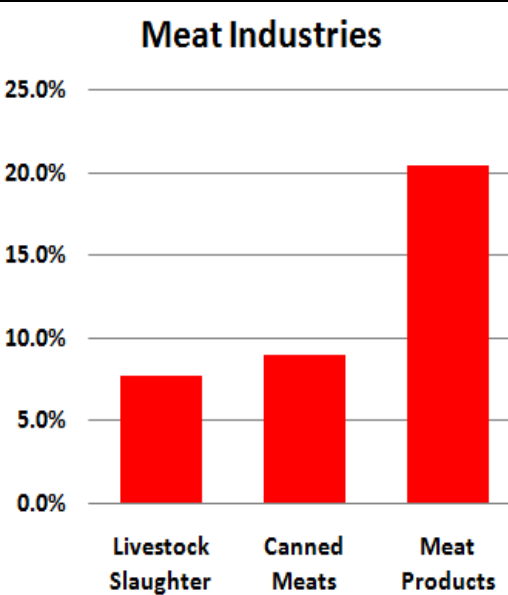
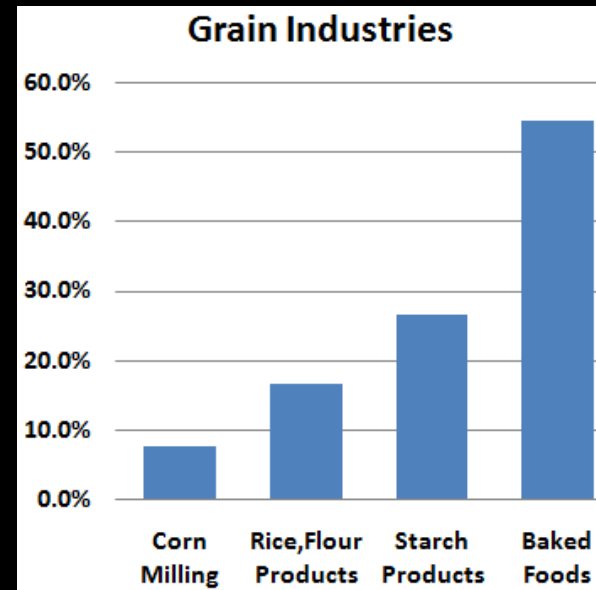
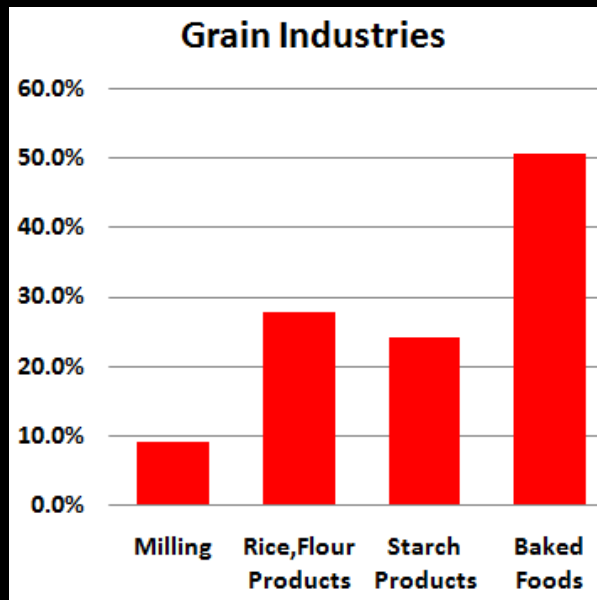
Feather (Down) Industries



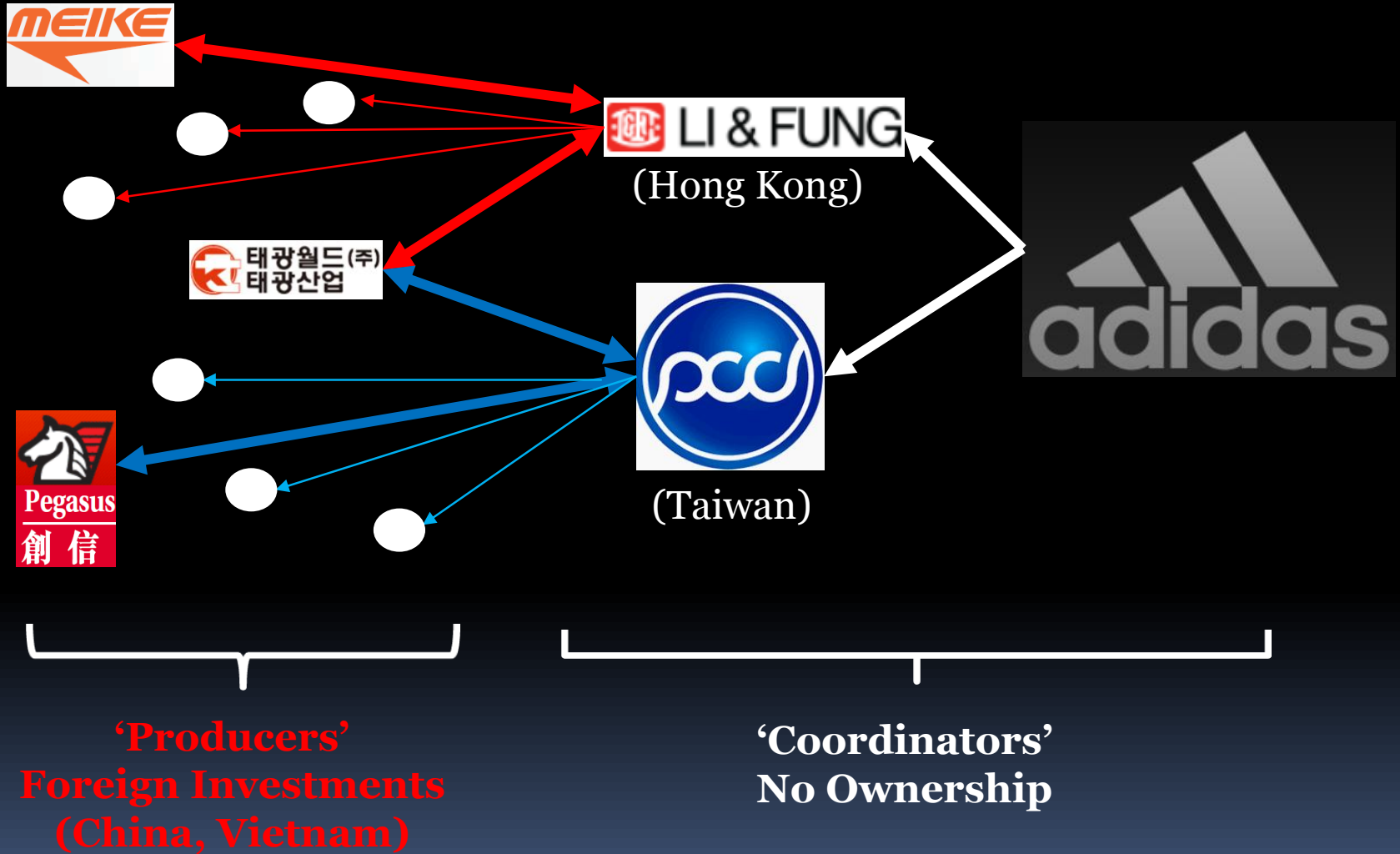
1995-98

Share of Foreign Assets ~ *Food Processing* ~

2007-10



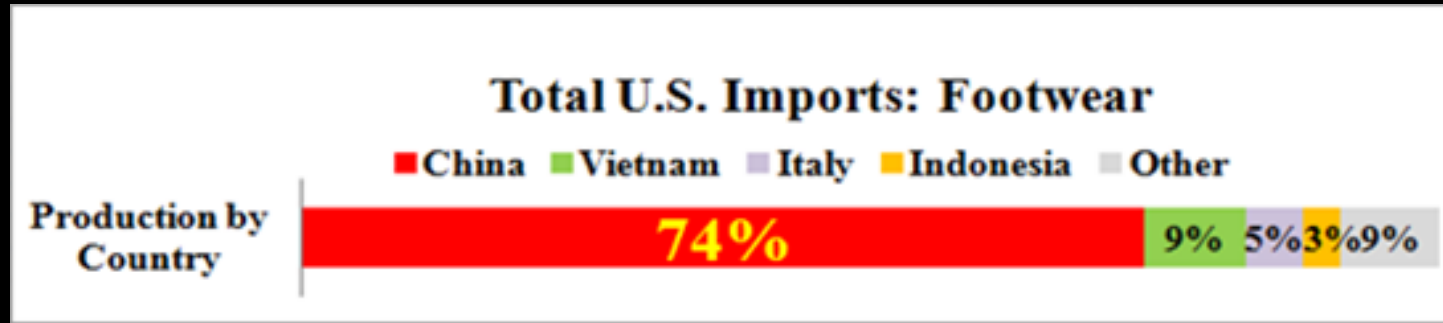
Why is this happening?



Conventional Trade Data

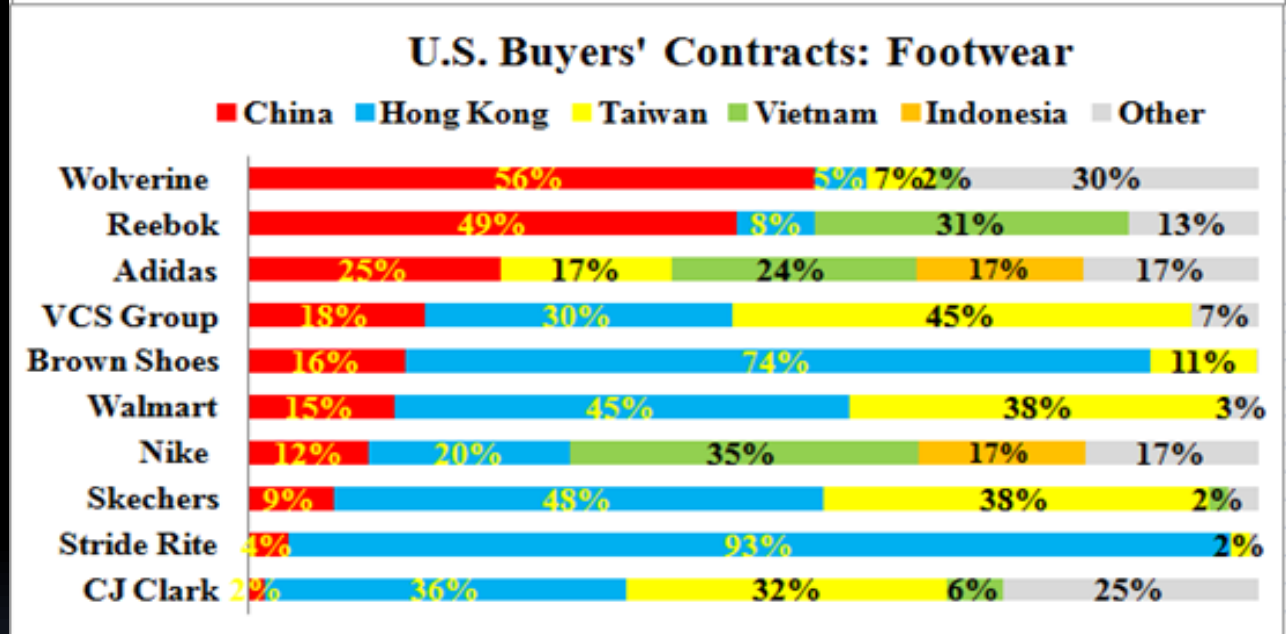
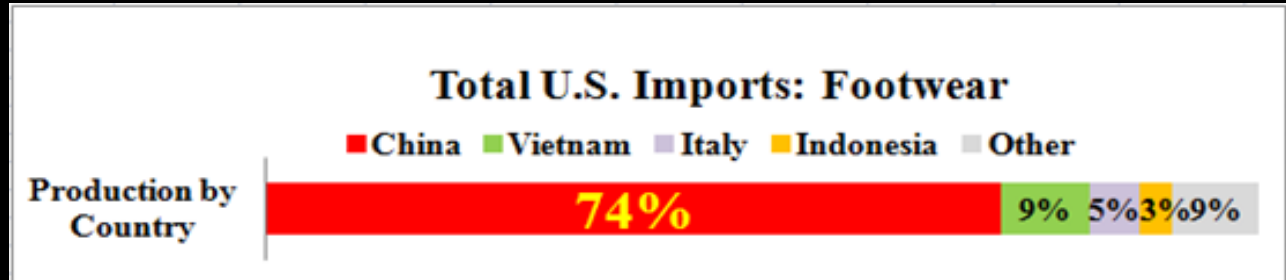
Footwear, 2007-2012

Manufacturing

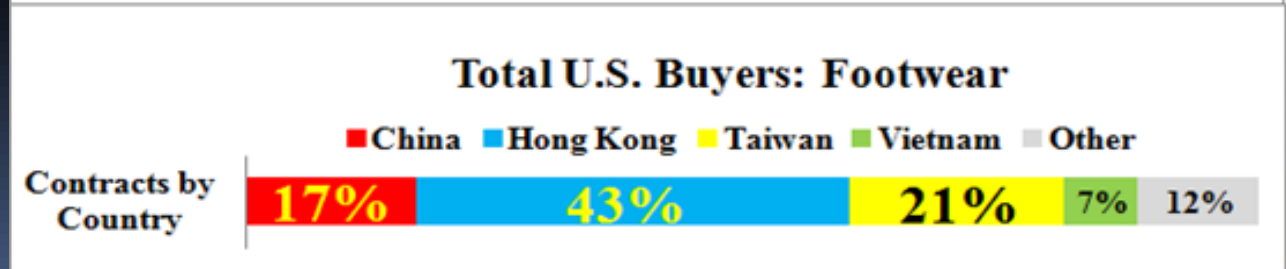


Manufacturing vs. Contracting: **Footwear**

Manufacturing



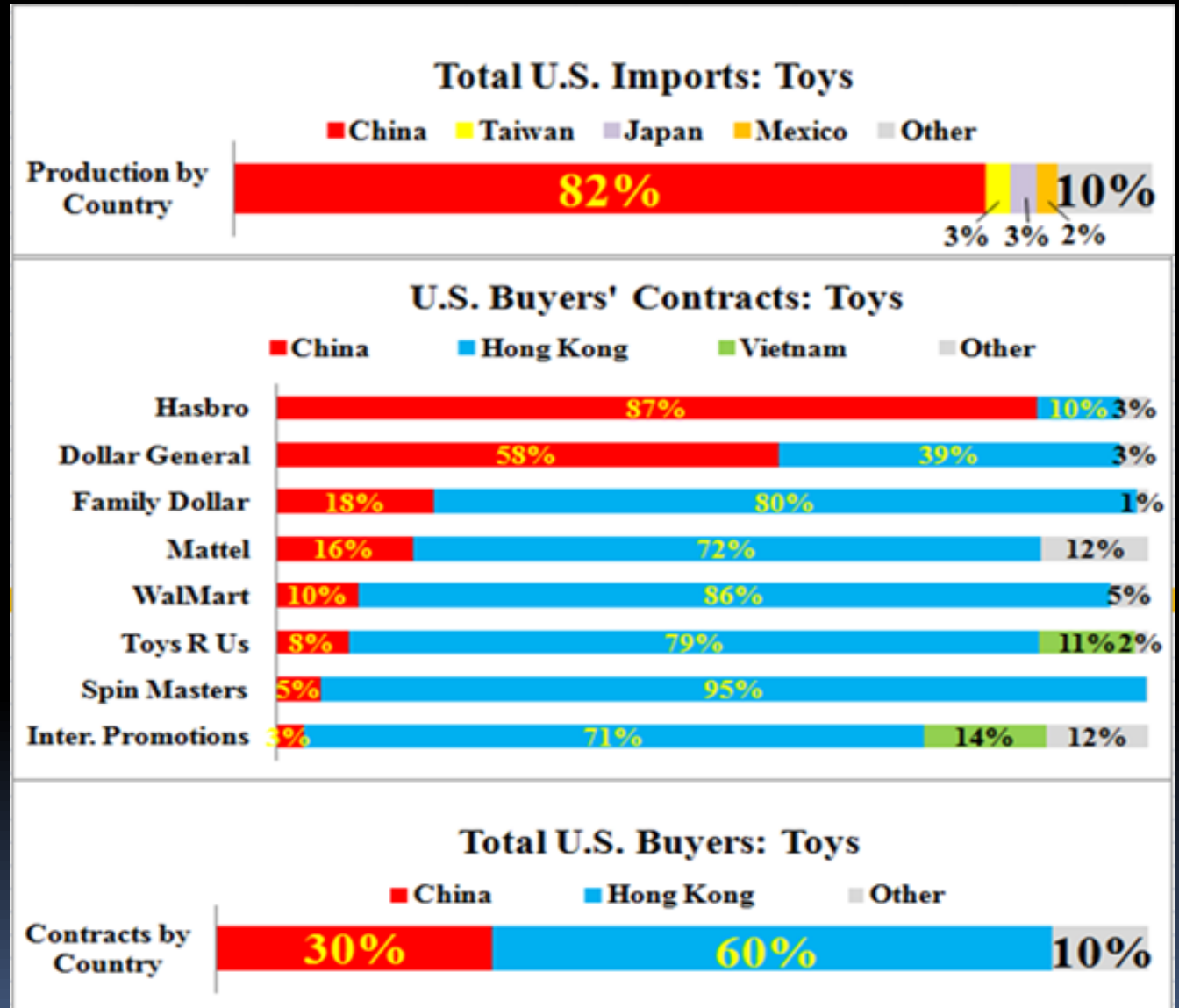
Contracting



Foreign firms in Manufacturing *AND* Contracting

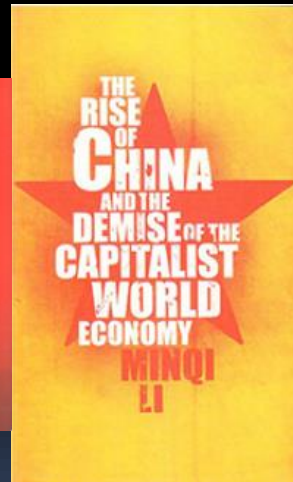
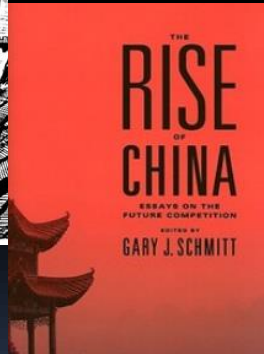
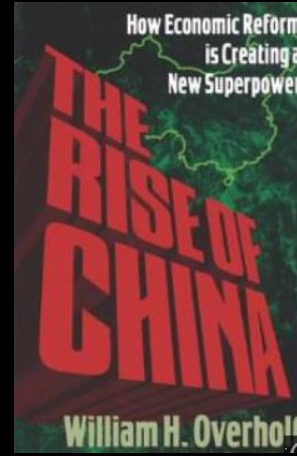
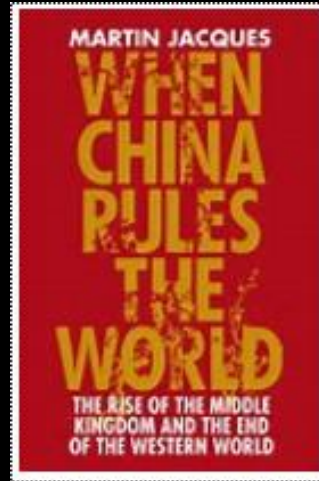
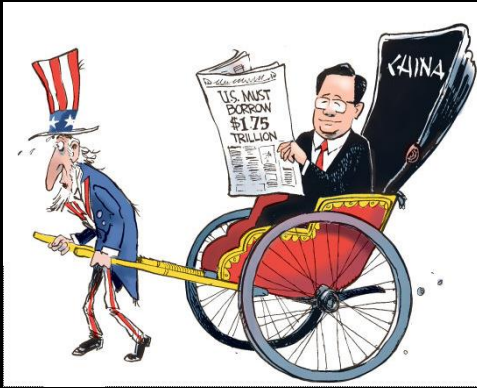
Production vs. Contracting: Toys

Manufacturing



Contracting

The "Rise of China" Literature



微信号: gsp31@163.com










Is 'position' in the division of labor *everything*?

Does China's **SIZE** not matter?

Yes, **SIZE** matters...in certain arenas

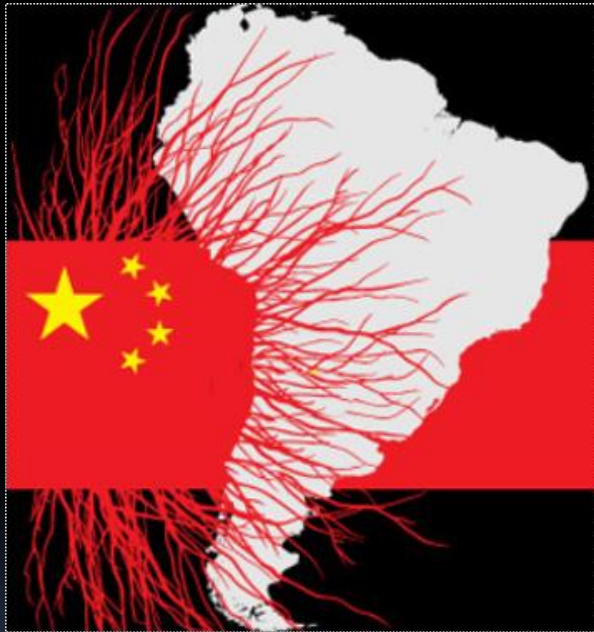
SIZE Matters too...

Military Spending (2014, estimates)

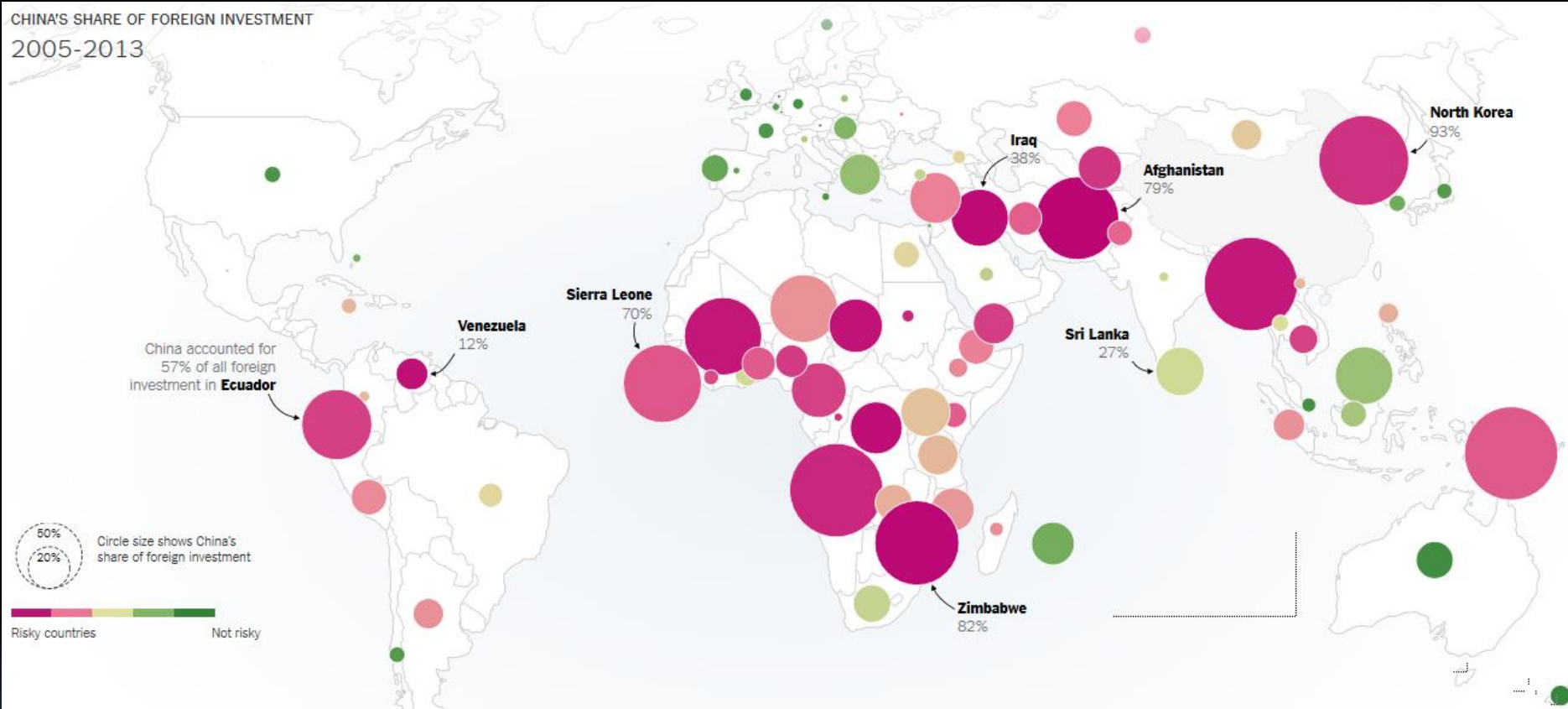
	Country	Spending (\$ Bn.)	% of GDP
—	World total	1,776.0	2.3%
1	United States 	610.0	3.5%
2	China 	216.0	2.1%
3	Russia 	84.5	4.5%
4	Saudi Arabia 	80.8	10.4%
5	France 	62.3	2.2%
6	United Kingdom 	60.5	2.2%
7	India 	50.0	2.4%
8	Germany 	46.5	1.2%
9	Japan 	45.8	1.0%
10	South Korea 	36.7	2.6%
11	Brazil 	31.7	1.4%

SIZE Matters too...

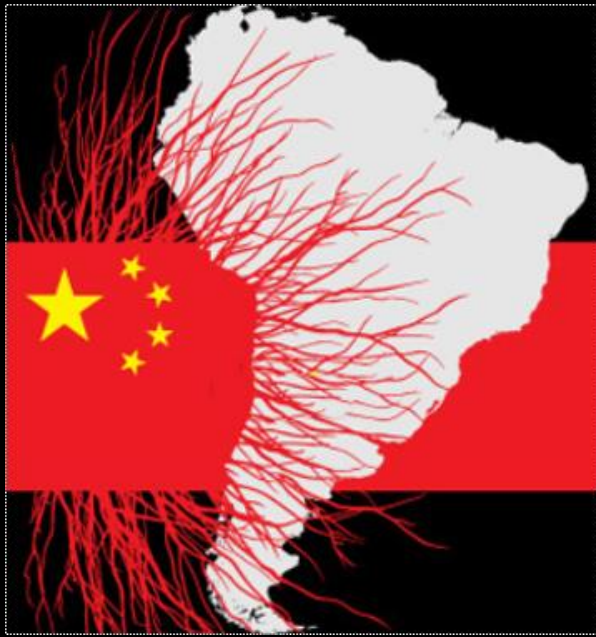
China's Quest for Natural Resources.....



China's *Outward* Foreign Investments



Least Developed Countries & Fragile States



Mutual Benefit?

(Neo) Imperialism?

Great Power Rivalry?

CONCLUSIONS

International hierarchy is a key form of global inequality

**Prospects for rising in international hierarchy:
Difficult but not impossible**

**Fragmentation & internationalization of production
change the game of rising through the hierarchy**

Data and observation are critical

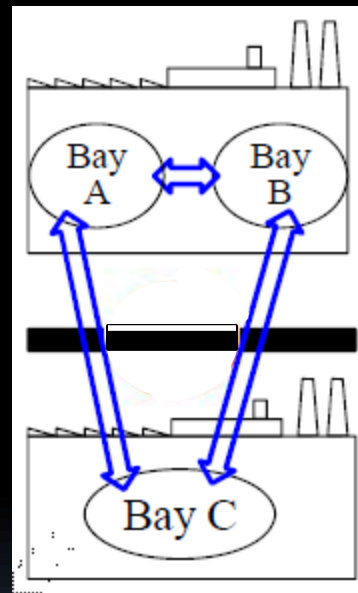
Interpretation of China's position is critical.

Prospects for other countries?

Thanks!

Questions?

Mark Dallas



Share of Foreign Assets

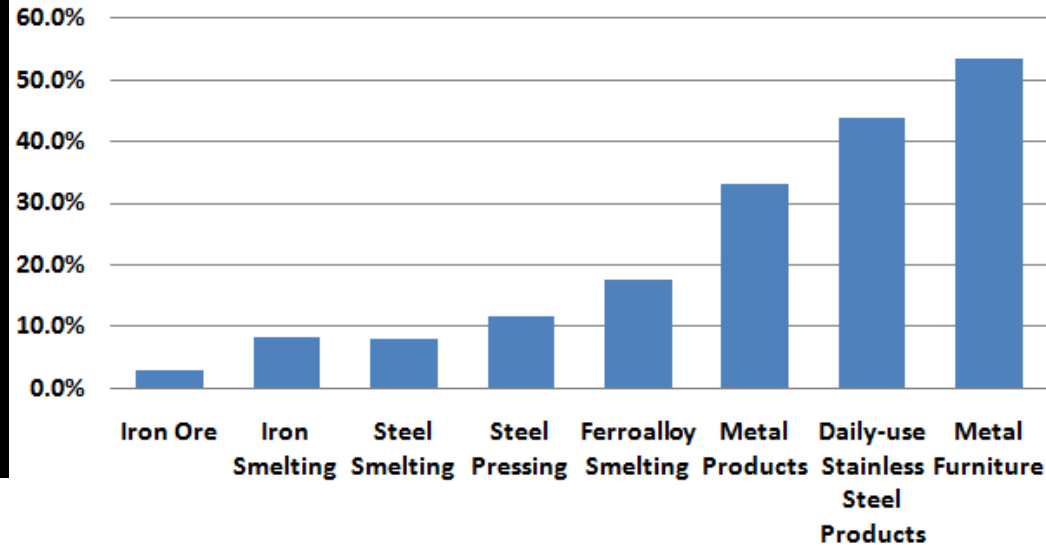
~ *Steel Industries* ~

2007-10

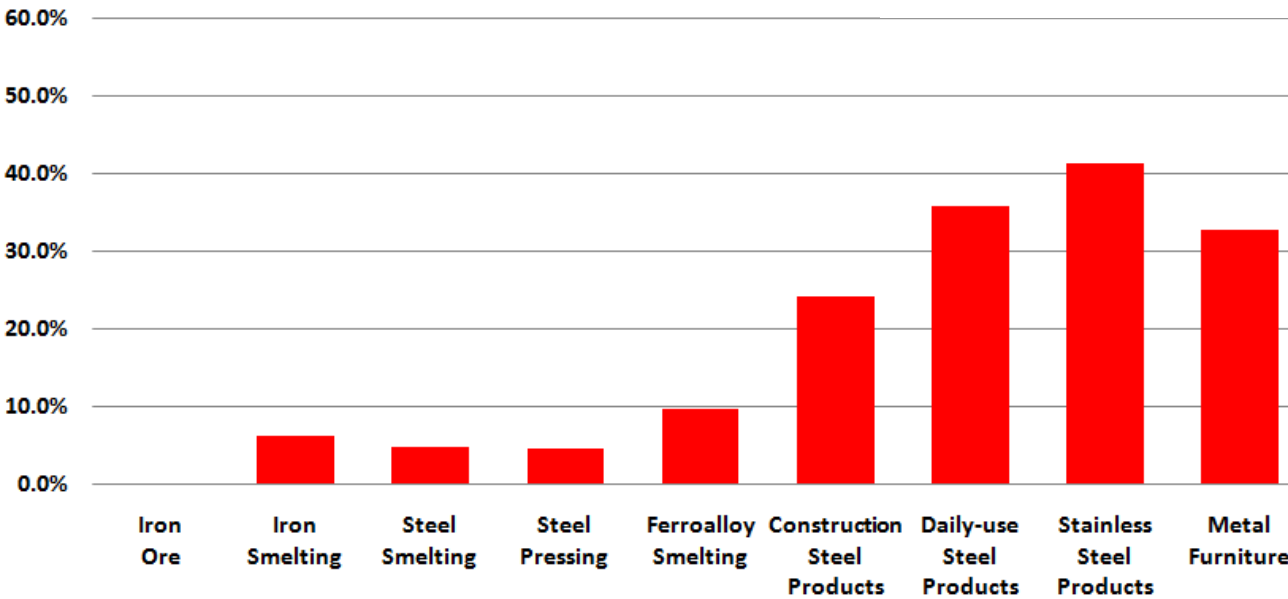
(Consumer steel end-products only)

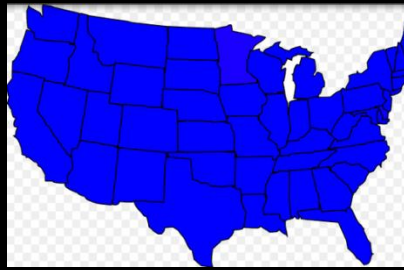
1995-98

Steel Industries



Steel Industries





Fragmentation of International Production

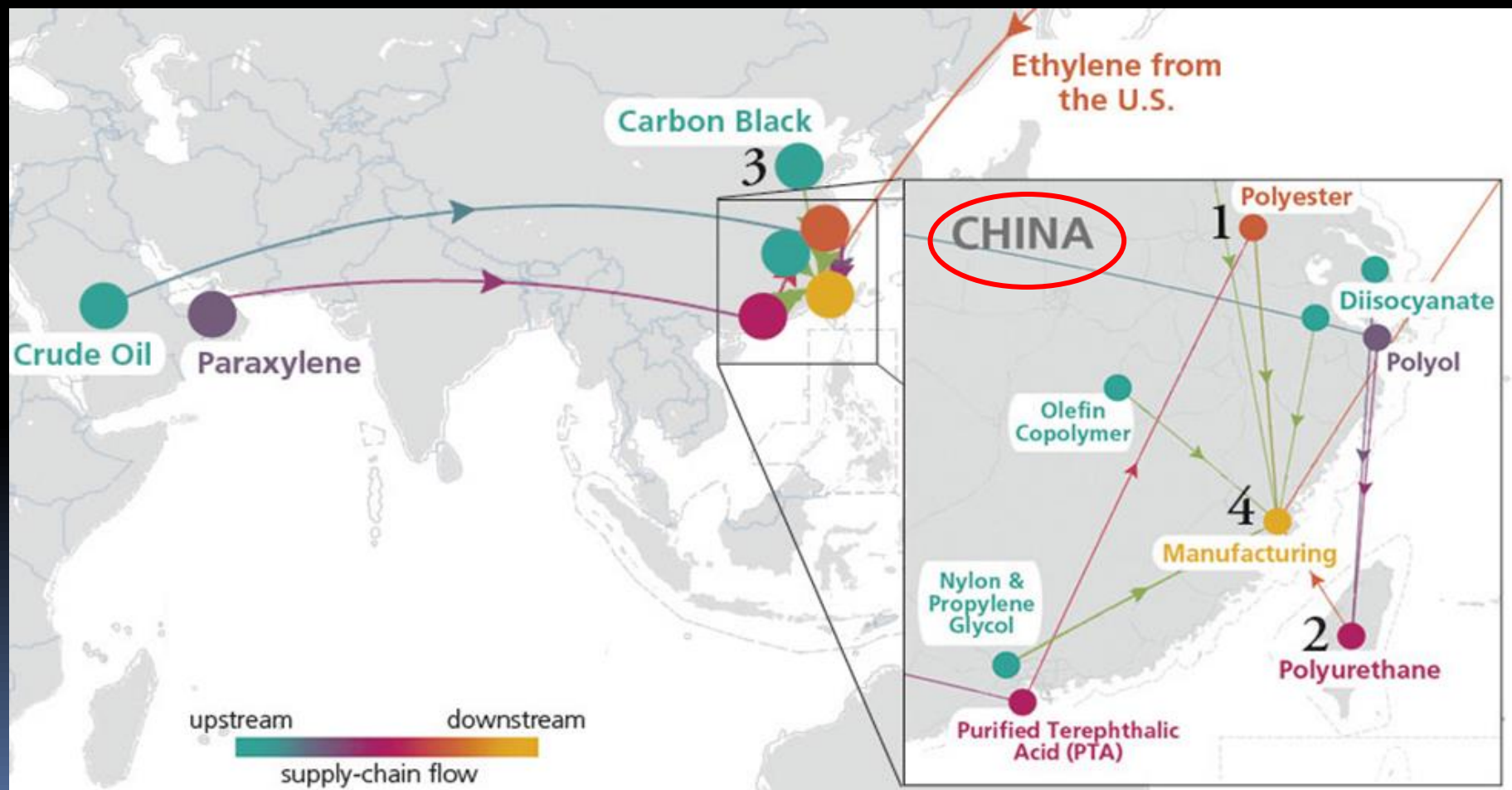
Production Networks & Organization

‘Lead’ Firms (Coordinators)

‘Subsidiaries’ & Offshoring (FDI)

‘Suppliers’ & Outsourcing (Trade)

‘Alliances’ (Co-production)





~Victor Fung, CEO



'Phantom' Corporation?

~Small statistical footprint~

- ✓ No Foreign Direct Investment
- ✓ Medium-sized? (<10,000 employees)
or
Large-sized? (1,000,000+ in network)

*“Think about the scope of what we do. We work with about 7,500 suppliers in more than 26 countries. If the average factory has 200 workers – that’s probably a low estimate – then in effect there are more than a million workers engaged on behalf of our customers. That’s why our policy is **not to own** any portion of the value that deals with running factories. Managing a million workers would be a colossal undertaking. We’d lose all flexibility; we’d lose our ability to fine-tune and coordinate...if we don’t own factories, can we say we are in manufacturing? Absolutely. Because, of the 15 steps in the manufacturing value chain, we probably do 10.”*

- 'Lead' Firm Coordinators
- Weak 'market' linkages: Trade ~ No Ownership, No Control
- **Strong 'relational' linkages: Trade ~ 'Control w/o Ownership'**
- FDI ~ Ownership & Control: Logic varies by 'linkage.'

