Fragmentation and Hierarchy in Global Production:

‘Locating’ China in the New International Division of Labor

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Political Science & Asian Studies
Union College
~Global Inequality~

In which country were you born?
Dumb luck!
The “Rise of China” Literature
International Hierarchy
Macro-View

Advanced (‘Rich’) Countries ~ 1970
($15,000 GDP/capita in 2005 US$)
Advanced (‘Rich ‘)Countries – 2013
($15,000 GDP/capita in 2005 US$)

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

“Newly Industrialized Countries” (NIC-12)
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

1970’s Crises (currency, oil)
End of Cold War
E.U. membership is very special….

‘Flying Geese’ Model of East Asian development
‘Flying Geese’ Model of East Asian development

First Tier
- Japan
- S. Korea
- Hong Kong

Second Tier
- Taiwan
- Singapore
- Malaysia
- Thailand
- Indonesia
- Philippines

Third Tier
- China?
- Laos
- Vietnam
- Cambodia
- Myanmar

Late 19th century, post-WWII
1960’s...
1980’s...
2010’s.....?
~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

(161 mil.)
NICs…..“BRICS”

China stands out….

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

(Trillion US$, 2005)
2) ‘Catch-up’?
Steady annual growth....

Avg. annual growth/capita, 1992-2013
Headline News:
China today….6.9%? ….6.8%?
3) But, still low in the hierarchy....

GDP/Capita (2013)

(Constant 2005 US$)
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

Non-Fuel Imports + Exports as a share of GDP (1992-2007)

- China (53.7%)
- Mexico (40.9%)
- Indonesia (37.4%)
- Russia (21.7%)
- India (16.9%)
- Brazil (15.8%)
China’s foreign investments (FDI) are outsized

Annual Foreign Direct Investment as Share of GDP: 1992-2010

- China: 3.5%
- Mexico: 2.5%
- Brazil: 2.3%
- Russia: 1.7%
- India: 1.1%
- Indonesia: 0.8%

All Developing Economies excluding China = 2.7%
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)

Consumption

Production

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
**21st Century Industrialization**

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

**International Fragmented Production**

- ‘Steam Revolution’ (Train/Ships)
- ‘Information-Communication Technology’ (ICT) Revolution
- International Fragmentation
Fragmentation of International Production & China
Major Transformation in Production (~1980’s – today)

Integrated & National Production → International & Fragmented Production
‘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.”

~Victor Fung, CEO~
<table>
<thead>
<tr>
<th>Year</th>
<th>Employees</th>
<th># of Suppliers</th>
<th>Supplier Workforce</th>
<th>% Female</th>
<th># of Supplier Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>2,572</td>
<td>7,500</td>
<td>~1,000,000+</td>
<td></td>
<td>26</td>
</tr>
<tr>
<td>2007</td>
<td>5,621</td>
<td>8,300</td>
<td>~2,000,000+</td>
<td></td>
<td>40</td>
</tr>
<tr>
<td>2014</td>
<td>25,781</td>
<td>~15,000</td>
<td>???</td>
<td></td>
<td>48</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>Employees (mostly retail)</th>
<th># of Suppliers</th>
<th>Supplier Workforce</th>
<th>% Female</th>
<th># of Supplier Countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>48,000</td>
<td>797</td>
<td>1,000,000+</td>
<td>72%</td>
<td>39</td>
</tr>
</tbody>
</table>
- ‘Lead’ Firm Coordinators
- Weak ‘market’ linkages: Trade ~ No Ownership, No Control
- Strong ‘relational’ linkages: Trade ~ ‘Control w/o Ownership’
- FDI ~ Ownership & Control

**Diagram:**

- **‘Producers’** Foreign Investments (China, Vietnam)
- **‘Coordinators’** No Ownership

**Nodes:**
- MEIKE
- LI & FUNG (Hong Kong)
- Pegasus
- Adidas
- (Taiwan)
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...
How much does China earn from ‘Chinese’ exports?

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

**Production Costs per iPhone**

- **China**: 4%
- **USA**: 6%
- **South Korea**: 13%
- **Germany**: 18%
- **Other**: 27%
- **Japan**: 34%

Component parts only
How much does China earn from ‘Chinese’ exports?

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

<table>
<thead>
<tr>
<th>Country</th>
<th>Design/Engineering</th>
<th>Production</th>
<th>Distribution</th>
<th>Retail/Dist.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple (USA)</td>
<td>$90.00</td>
<td>$80.00</td>
<td>$70.00</td>
<td>$60.00</td>
</tr>
<tr>
<td>China</td>
<td>$50.00</td>
<td>$40.00</td>
<td>$30.00</td>
<td>$20.00</td>
</tr>
<tr>
<td>USA</td>
<td>$20.00</td>
<td>$10.00</td>
<td>$0.00</td>
<td></td>
</tr>
<tr>
<td>South Korea</td>
<td>$10.00</td>
<td>$0.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Germany</td>
<td>$50.00</td>
<td>$40.00</td>
<td>$30.00</td>
<td>$20.00</td>
</tr>
<tr>
<td>Other</td>
<td>$50.00</td>
<td>$40.00</td>
<td>$30.00</td>
<td>$20.00</td>
</tr>
<tr>
<td>Japan</td>
<td>$70.00</td>
<td>$60.00</td>
<td>$50.00</td>
<td>$40.00</td>
</tr>
</tbody>
</table>

Value Chain

Design/Engineering ➔ Production ➔ Distribution ➔ Retail
The U-Shape of Value Added

- High Value-added
  - Design
  - Brand name
- Low Value-added
  - Engineering
  - Manufacturing
  - Distribution
  - Retail
  - After sales service
‘Value-added’ approach to US trade

iPhone: US trade balance

<table>
<thead>
<tr>
<th>Country</th>
<th>Trade Balance (Million US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US-China</td>
<td>+48</td>
</tr>
<tr>
<td>Japan</td>
<td>-563</td>
</tr>
<tr>
<td>Germany</td>
<td>-219</td>
</tr>
<tr>
<td>South Korea</td>
<td>-138</td>
</tr>
<tr>
<td>Others</td>
<td>-421</td>
</tr>
</tbody>
</table>
Production of the iPod

Where are the jobs created?

Number and Type of Employees by Country

- USA
- China
- Philippines
- Japan
- Singapore
- Korea
- Thailand
- Taiwan
- Other

Legend:
- Blue: Engineering/Professional
- Pink: Production
- Yellow: Retail/Dist/Service
How much does each employee earn?

Salary per Employee (US$)

- **US**: Engineering/Professional ($80,000)...
- **China**: Production ($20,000)...
- **Philippines**: Retail/Dist/Service ($10,000)...
- **Japan**: Engineering/Professional ($90,000)...
- **Singapore**: Production ($40,000)...
- **Korea**: Retail/Dist/Service ($10,000)...
- **Thailand**: Production ($20,000)...
- **Taiwan**: Engineering/Professional ($50,000)...
- **Other**: Engineering/Professional ($60,000)...

Color codes:
- Blue: Engineering/Professional
- Pink: Production
- Yellow: Retail/Dist/Service
They both “make” our iPhones, iPods, iPads....
✓ Owned by **Taiwanese Company**
   (Hon Hai Precision)

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

Apple Design & Engineering

Japanese & Korean high-tech components

Taiwanese Final Assembly

Located in China, using Chinese labor
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)

Brazil (1972)
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

China (1995)
Foreign Firm’s Share of Fixed Assets
All industries greater than 40% foreign ownership share

China (2010)
China (2004)

Two-digit level

Four-digit level

~Fragmented Industries

Cotton → Cotton Yarn → Cotton Cloth → Dye/Print → Garments

Upstream → Downstream

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

Upstream

Downstream
Share of Foreign Assets
~ Wood Industries ~

Over 15 years

1995-98

Upstream ➔ Downstream

2007-10

Timber and Wood Product Industries

- Sawn Timber
- Wood Chip Processing
- Plywood
- Fiberboard
- Flakeboard
- Wood Products
- Wood Furniture

Timber and Wood Product Industries

- Logging
- Sawn Timber
- Wood Chip Processing
- Plywood
- Fiberboard
- Flakeboard
- Wood Products
- Wood Furniture
Share of Foreign Assets

~ Leather, Fur, Feather Products ~

1995-98

Leather Industries

- Light Leather Processing
- Heavy Leather Processing
- Leather Apparel
- Leather Shoes
- Leather Luggage
- Leather Bags
- Other Leather Products

Fur Industries

- Fur Tanning
- Fur Clothing
- Other Fur Products

2007-10

Leather Industries

- Leather Tanning
- Leather Products

Feather (Down) Industries

- Feather (Down) Processing
- Feather (Down) Products
Share of Foreign Assets

1995-98
~ Food Processing ~

Grain Industries

- Milling
- Rice, Flour Products
- Starch Products
- Baked Foods

2007-10

Grain Industries

- Corn Milling
- Rice, Flour Products
- Starch Products
- Baked Foods

Meat Industries

- Livestock Slaughter
- Canned Meats
- Meat Products

Sugar Industries

- Cane, Beet Sugar
- Sugar Processing
- Candy

Meat Industries

- Livestock Slaughter
- Canned Meats
- Meat Products

Sugar Industries

- Sugar Processing
- Candy, Chocolate
Why is this happening?

‘Producers’
Foreign Investments
(China, Vietnam)

‘Coordinators’
No Ownership

(Hong Kong)

(Taiwan)
Conventional Trade Data

Footwear, 2007-2012

Manufacturing

Total U.S. Imports: Footwear

Production by Country

- China: 74%
- Vietnam: 9%
- Italy: 5%
- Indonesia: 3%
- Other: 9%
Manufacturing vs. Contracting: Footwear

Manufacturing

Total U.S. Imports: Footwear

<table>
<thead>
<tr>
<th>Production by Country</th>
<th>China</th>
<th>Vietnam</th>
<th>Italy</th>
<th>Indonesia</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>74%</td>
<td>9%</td>
<td>5%</td>
<td>3%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Contracting

U.S. Buyers' Contracts: Footwear

<table>
<thead>
<tr>
<th>Company</th>
<th>China</th>
<th>Hong Kong</th>
<th>Taiwan</th>
<th>Vietnam</th>
<th>Indonesia</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wolverine</td>
<td>56%</td>
<td>5%</td>
<td>7%</td>
<td>2%</td>
<td>30%</td>
<td></td>
</tr>
<tr>
<td>Reebok</td>
<td>49%</td>
<td>8%</td>
<td>31%</td>
<td>13%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adidas</td>
<td>25%</td>
<td>17%</td>
<td>24%</td>
<td>17%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>VCS Group</td>
<td>18%</td>
<td>30%</td>
<td>45%</td>
<td>7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brown Shoes</td>
<td>16%</td>
<td>30%</td>
<td>45%</td>
<td>11%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walmart</td>
<td>15%</td>
<td>45%</td>
<td>38%</td>
<td>3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nike</td>
<td>12%</td>
<td>20%</td>
<td>35%</td>
<td>17%</td>
<td>17%</td>
<td></td>
</tr>
<tr>
<td>Skechers</td>
<td>9%</td>
<td>48%</td>
<td>38%</td>
<td>2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stride Rite</td>
<td>4%</td>
<td>93%</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CJ Clark</td>
<td>2%</td>
<td>36%</td>
<td>32%</td>
<td>6%</td>
<td>25%</td>
<td></td>
</tr>
</tbody>
</table>

Total U.S. Buyers: Footwear

<table>
<thead>
<tr>
<th>Contracts by Country</th>
<th>China</th>
<th>Hong Kong</th>
<th>Taiwan</th>
<th>Vietnam</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>17%</td>
<td>43%</td>
<td>21%</td>
<td>7%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Foreign firms in Manufacturing AND Contracting
Production vs. Contracting: Toys

Manufacturing

Total U.S. Imports: Toys

<table>
<thead>
<tr>
<th>Country</th>
<th>China</th>
<th>Taiwan</th>
<th>Japan</th>
<th>Mexico</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production by Country</td>
<td>82%</td>
<td>3%</td>
<td>3%</td>
<td>2%</td>
<td>10%</td>
</tr>
</tbody>
</table>

U.S. Buyers’ Contracts: Toys

<table>
<thead>
<tr>
<th>Company</th>
<th>China</th>
<th>Hong Kong</th>
<th>Vietnam</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hasbro</td>
<td>87%</td>
<td>10%</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Dollar General</td>
<td>58%</td>
<td>39%</td>
<td>3%</td>
<td>1%</td>
</tr>
<tr>
<td>Family Dollar</td>
<td>18%</td>
<td>80%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Mattel</td>
<td>16%</td>
<td>72%</td>
<td>12%</td>
<td>5%</td>
</tr>
<tr>
<td>WalMart</td>
<td>10%</td>
<td>86%</td>
<td>5%</td>
<td>2%</td>
</tr>
<tr>
<td>Toys R Us</td>
<td>8%</td>
<td>79%</td>
<td>11%</td>
<td>2%</td>
</tr>
<tr>
<td>Spin Masters</td>
<td>5%</td>
<td>95%</td>
<td>14%</td>
<td>12%</td>
</tr>
<tr>
<td>Inter. Promotions</td>
<td>3%</td>
<td>71%</td>
<td>14%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Total U.S. Buyers: Toys

<table>
<thead>
<tr>
<th>Country</th>
<th>China</th>
<th>Hong Kong</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contracts by Country</td>
<td>30%</td>
<td>60%</td>
<td>10%</td>
</tr>
</tbody>
</table>
The “Rise of China” Literature
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)

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

China’s Quest for Natural Resources…..
China’s Imports of Crude Oil & Petroleum Fuels (1992 – 2013)

(Billion US$)
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 ~

(Consumer steel end-products only)

Steel Industries

1995-98

2007-10
Fragmentation of International Production

Production Networks & Organization

‘Lead’ Firms (Coordinators)
‘Subsidiaries’ & Offshoring (FDI)
‘Suppliers’ & Outsourcing (Trade)
‘Alliances’ (Co-production)
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.

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- ‘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.’

**Diagram:**

- ‘Producers’ FDI (China, Vietnam)
- ‘Coordinators’ No FDI