“The development and future of Factory Asia”

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RIETI seminar: *Ideas for a research agenda*

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Overarching question

• How to make global value chains (GVC) work for developing nations?
• Study Factory Asia = best example.
Some background

- Globalisation changed
- Today’s process should not be studied using only 20th century tools.
- KEY change:
  - “De-nationalisation of comparative advantage”
Globalisation changed

G7 nations’ share of global GDP, 1820 – 2010.


Source: unstats.un.org; 6 risers = Korea, India, Indonesia, Thailand, Turkey, Poland
‘Smile curve’: Distribution of value

Pre-fab services  Fabrication  Post-fab services

Share of value added

Post-1990 value distribution

1970s & 1980s value distribution
Global GDP shares, 1960-2012

Post-1990:
• G7 share loss goes to 10 developing nations.
• RoW see little change.

China, Brazil, Mexico, Poland, India, Turkey, Russia, Korea, Indonesia, Venezuela
People in poverty (under $2/day)

Millions under $2/day by national income class

Post 1993
- Hi-middle poverty plummets.
  - 650 million fewer poor!
- Others’ poverty keeps rising.

1990
Globalisation: 3 cascading constraints

Steam revolution

ICT revolution

Pre-globalised world

1st unbundling

2nd unbundling
20th century comparative advantage

- Goods = ‘bundle’ on national knowhow, labour, capital, institutions, etc.
- National economies only connected via competition in goods markets.
21st century comparative advantage

1) Supply-chain linkages: Cross-border flows of goods, know-how, ideas, capital & people.
2) Doing business abroad: Application of tangible & intangible assets in developing nations.

- Goods = mixture of national knowhow, labour, capital, institutions, etc. (e.g. hi-tech + low wages).
- National economies connected via much richer flows: knowhow, goods, services, people, capital, etc.
Why it matters

• OLD: Study national performance looking at national factors.
  – ‘Team Japan’ versus ‘Team Germany’
  ⇒ Regress growth/exports/etc on national right-hand side variables.

• NEW: Study national performance looking at regional and national factors.
  – ‘Factory Asia’ versus ‘Factory North America’
  ⇒ Regress growth/exports/etc on national & regional right-hand side variables and/or allow interactions depending upon supply-chain exposure.
First steps in study GVC and development

• Shifting resources to trade sectors is pro-development.

• Growth in value added exports is one measure of this.

• First axis of investigation:
  – Is rapid value-added export growth related to supply-chain participation?
Value added v. Gross exports

Total export growth, 1995-2009

- East Asians
  - JPN
  - TWN
  - HKG
  - PHL
  - KOR
  - MYS
  - IDN
  - THA
  - SGP
  - BRN
  - KHM
  - CHN
  - VNM

- G7 nations
  - FRA
  - ITA
  - CAN
  - USA
  - GBR
  - DEU

- Primary exporters
  - ZAF
  - AUS
  - CHL
  - NOR
  - BRN
  - RUS
  - BRA
  - SAU

- Other EMs in GVCs
  - PRT
  - SVN
  - MEX
  - TUR
  - CZE
  - HUN
  - POL
  - SVK
  - ROU

Gross export growth
VA export growth

Total export growth, 1995-2009

- East Asians
  - JPN
  - TWN
  - HKG
  - PHL
  - KOR
  - MYS
  - IDN
  - THA
  - SGP
  - BRN
  - KHM
  - CHN
  - VNM

- G7 nations
  - FRA
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  - CAN
  - USA
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  - DEU

- Primary exporters
  - ZAF
  - AUS
  - CHL
  - NOR
  - BRN
  - RUS
  - BRA
  - SAU

Gross export growth
VA export growth
Special interest of VA exports

• Indirectly measures growth in domestic resources in trade sector (worldclass).

• Close to many development mechanisms:
  – Technology adoption;
  – Skill upgrading;
  – Formation of domestic industrial capacities:
    • Human, institutional, infrastructure, etc.
How measure supply chain participation?

• TiVa has several; many more construct-able.
  – FVA (Foreign Value Added share)
  – REI (Reexported intermediates)

• REI seems to work better.
First look at relationship

Hope

• Faster domestic value-added export growth correlated with faster REI growth.

• Plot vertical axis = Growth in domestic value added in exports

• Plot horizontal axis = Growth in REI trade (supply-chain participation)

Data

• Plot all nations, all 18 goods sectors.

• Growth from 1995 to 2009.
Little correlation

REI vs Growth in Domestic VA in exports
But theory to rescue

• The correlation should depend upon:
  – Nations:
    • Headquarter v factory economies
    • Primary-resource exporters v manufactures exporters
  – Sectors:
    • GVC sectors (mech & elec machinery, chemicals, etc)
    • nonGVC sectors
Thinking about nation groups

**VA export growth composition, 1995 to 2009**

- **East Asia**
- **Primary**

**Manufactures**
- **Services**
- **Primary**

**PHL**
- Manufactures: 75%
- Services: 75%
- Primary: 25%

**CHN**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**TWN**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**KOR**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**THA**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**IDN**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**MYS**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**SGP**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**JPN**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**THA**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**KHM**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**BRN**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**HKG**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**BRA**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**KHM**
- Manufactures: 75%
- Services: 25%
- Primary: 0%

**Primary**
- Manufactures: 0%
- Services: 0%
- Primary: 100%
Thinking about nation groups

VA export growth composition, 1995 to 2009

Manufactures

Services

Manufactures Services

Primary

0% 20% 40% 60% 80% 100%

PRT
TUR
ROU
MEX
POL
CZE
SVN
HUN
SVK
GFR
FRA
USA
DEU
ITA
CAN
JPN

Other supply-chain traders

G7
Aside: BRICS asunder

VA export growth composition, 1995 to 2009

Manufactures  Services  Primary
Relationship by nation groups?
Relationship by sector: Primary

01T05: Agriculture, hunting, forestry and fishing

10T14: Mining and quarrying

15T16: Food products, beverages and tobacco
Relationship by sector: Light manuf

**17T19: Textiles, textile products, leather and footwear**

**20T22: Wood, paper, paper products, printing and publishing**
Relationship by sector: heavy manuf

23T26: Chemicals and non-metallic mineral products

27T28: Basic metals and fabricated metal products
Relationship by sector: GVC manuf

30T33: Electrical and optical equipment

34T35: Transport equipment

29: Machinery and equipment, nec
Relationship by nation & sector

15T16: Food products, beverages and tobacco

20T22: Wood, paper, printing & publishing

17T19: Textiles, leather & footwear

- EA EMs
- G5
- Oth EM
- SCTers
Relationship by nation & sector

23T26: Chemicals & non-metallic mineral prod

27T28: Basic metals and fabricated metal products

EA EMs
G5
Oth EM
SCTers
Facts to theory

• How does unbundling happen?
  – Fractionalisation of production process;
  – Geographical dispersion of stages.
Production unbundling: Some theory

The TOSP framework

Tasks: A B C D E F G H I J K L

Occupations: Occupation Occupation Occupation Occupation Occupation

Stages: Stage Stage

Product: Product
Trade-off: Specialisation vs coordination costs

Marginal costs (coordination): \( \chi(n-1/2) \)

Marginal benefits (specialisation): \( a'[n;\alpha] \)

Number of stages/occupations

\[ a'[n;\alpha] = \frac{\text{euros}}{(n-1/2)} \]
Trade-off: Specialisation vs coordination costs

Better IT lowers benefit of fragmentation (automation)
Trade-off: Specialisation vs coordination costs

Better CT lowers cost of fragmentation (coordination easier)
Geographical dispersion

- Odd economics:
  - Clustering/agglomeration
  - Convex coordination costs

\[ \chi \cdot n_s \cdot (1 - n_s) \]

Total cost of coordinating given number of stages in two locations
Research agenda?

- Link between domestic value-added exports and development (industrial production, GDPPC, etc).
  - Finer look at domestic value added exports and domestic value added, by sector, nation groups, etc.
- ‘Dense-ifying’ participation in value network
  - Not really a ‘chain’; IO matrix, not a IO column.
- Does the partner matter?
  - Does the REI-growth link vary by source of intermediates?
- What institutional & policy variables determine supply-chain participation (as measured by REI)
Three policy issues

• Geography matters
  – Geography is an important determinant of the ease of participating in Factory Asia.
  – This is nothing more than an assertion that forward and backward linkages matter at the regional level as well as at the national or industrial district level.
  – ERGO: Policy to foster participation in Factory Asia should have a geographical dimension as well as the usual income level dimension.
  – In particular, proximity may be less important for certain sectors and distant nations may be well advised to focus on these.
Three policy issues

• Size matters.
  – Nations that have over a billion consumers (the PRC and India) can pursue policies that smaller nations cannot.
  – In essence the two giants can leverage their local market as a powerful attraction force for supply chain segments.
  – ERGO: Policy recommendations should not blinding point to China’s success as the right way forward. Costa Rica’s success in supply-chains maybe be more relevant to some small Asian nations.
Three policy issues

• Regulatory network effects matter.
  – Factory Asia requires firms’ tangible and intangible assets to be protected inside the participating nations.
  – Disciplines for these are emerging from mega-regionals.
  – Asian policy should focus on what this means for Factory Asia; one-size may not fit all, but one-size disciplines may foster the development and spread of Factory Asia.
Thank you for listening.

Please look at:

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