Evolution of Production Network: Measuring Trade in value-added (TiVA)

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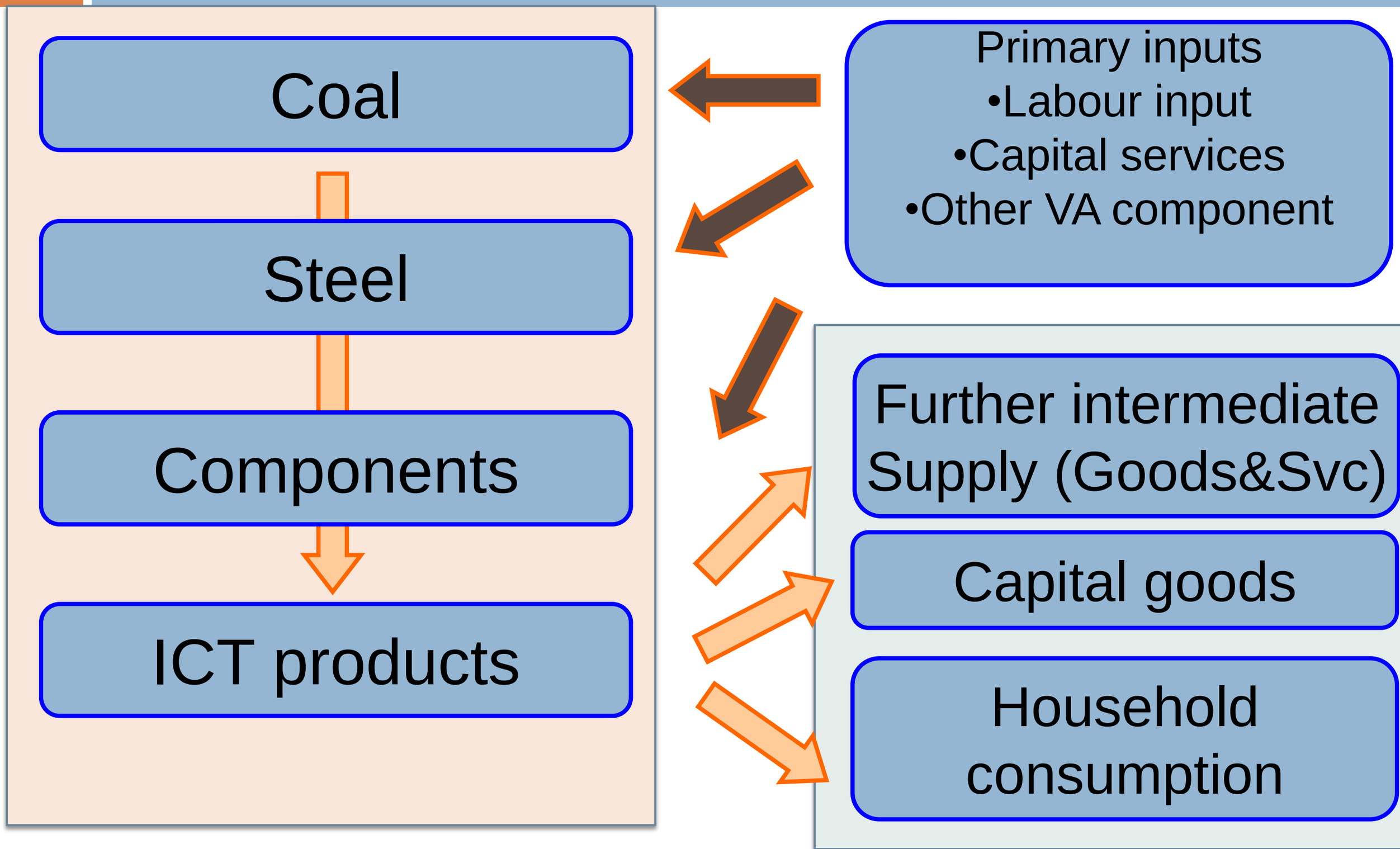
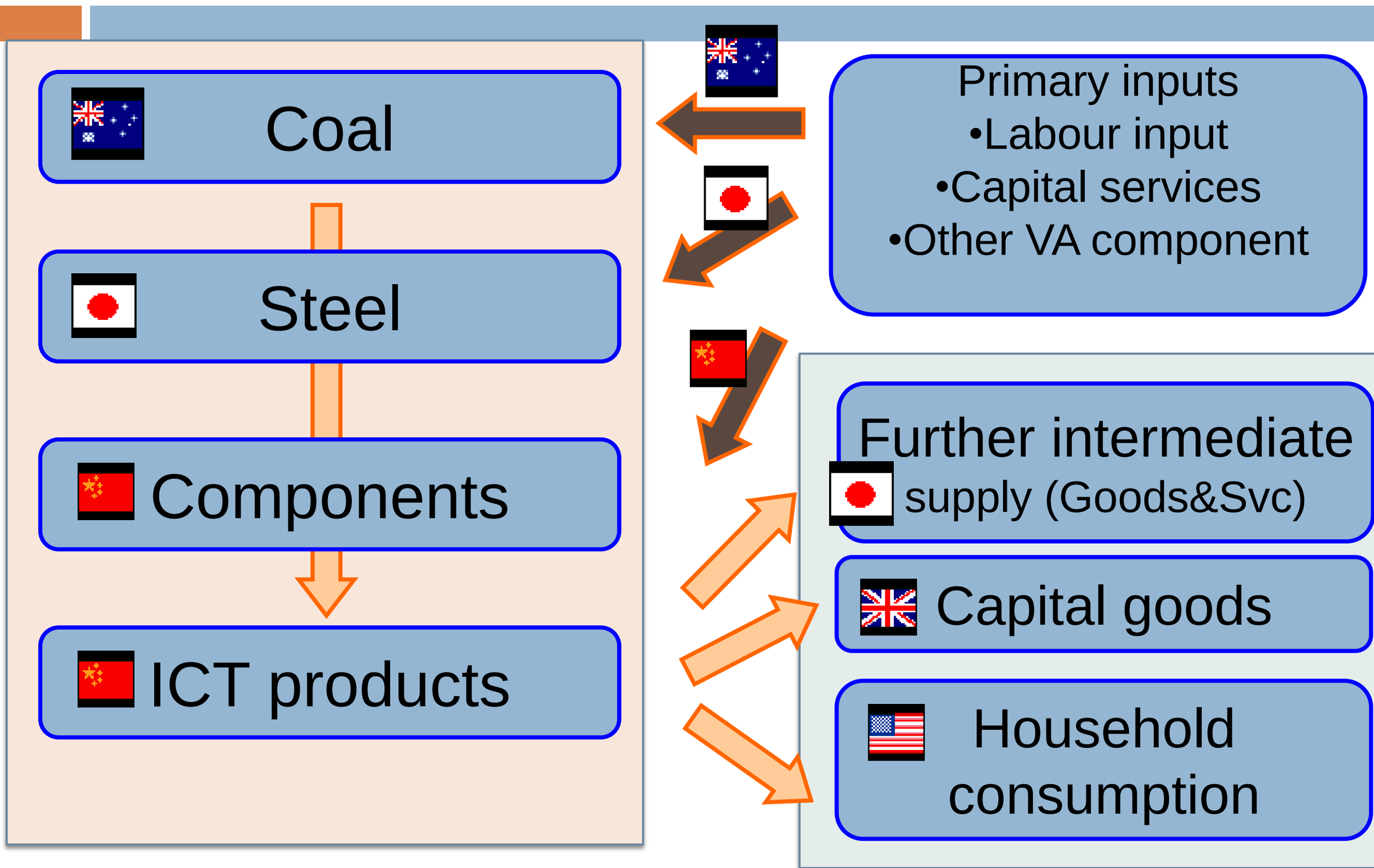
Domestic Production Network (GPN)



Global production network (GPN)



Expected outcomes

- Database compilation and model development
  - Bilateral trade by end-use
  - Expanded coverage of Input output tables
  - Intercountry inter-industry model
- ‘NEW’ Indicators
  - Trade network
  - Production structure and key sectors
  - Positioning in international production network
  - Economic integration via global production network

Main data sources: I-O and Bilateral trade in goods and services

- Analytical Harmonized Input-Output
  - 44 countries (33 OECD countries) + some additional
  - Years:1995,2000,2005
  - Industry: 37 sectors based on ISIC/NACE Rev 3 system
- Analytical Bilateral trade database
  - HS 6digit → ISIC Rev.3
  - HS 6digit → End Use (intermediate, HHCP, GFCF, Passenger cars, Personal computers)
  - Various adjustments: Re-exports (HKG), unallocated partners and sectors, missing links

* CIF/FOB and volume adjustments

Trade Indicators

Annual data

Detail sector information

Bilateral relationship

Sector composition of merchandise trade

- The world composition of traded goods remained stable in 1995-2005
  - Chemicals (10% to 11%)
  - Transport equipment (12% to 11%)
  - Communication equipment (8% to 10%)
  - General machinery (9% to 8%)
  - Textile products (8% to 6%)
  - Food manufacturing(6% to 5%),

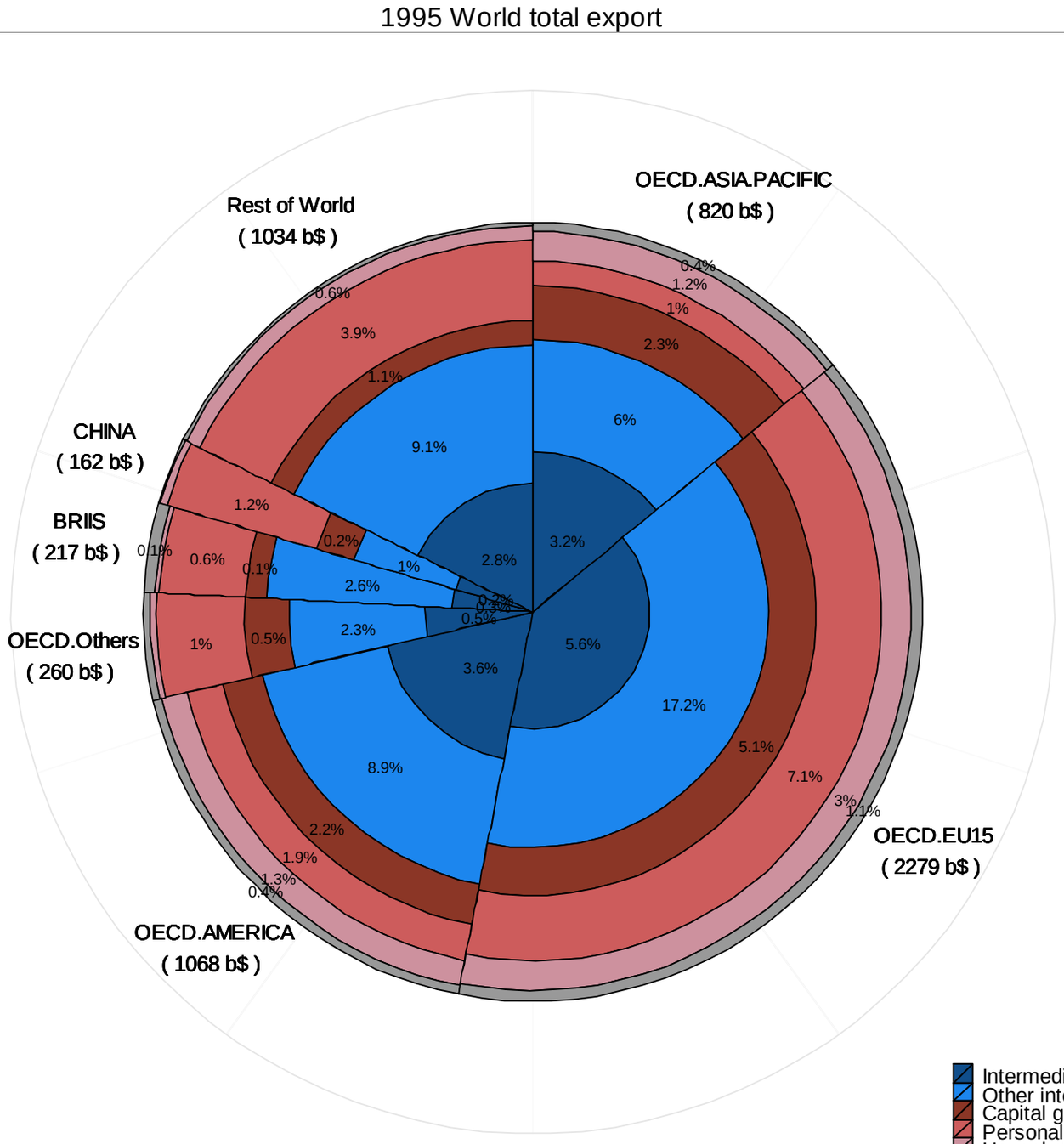
OECD ITCS Exports, May 2011

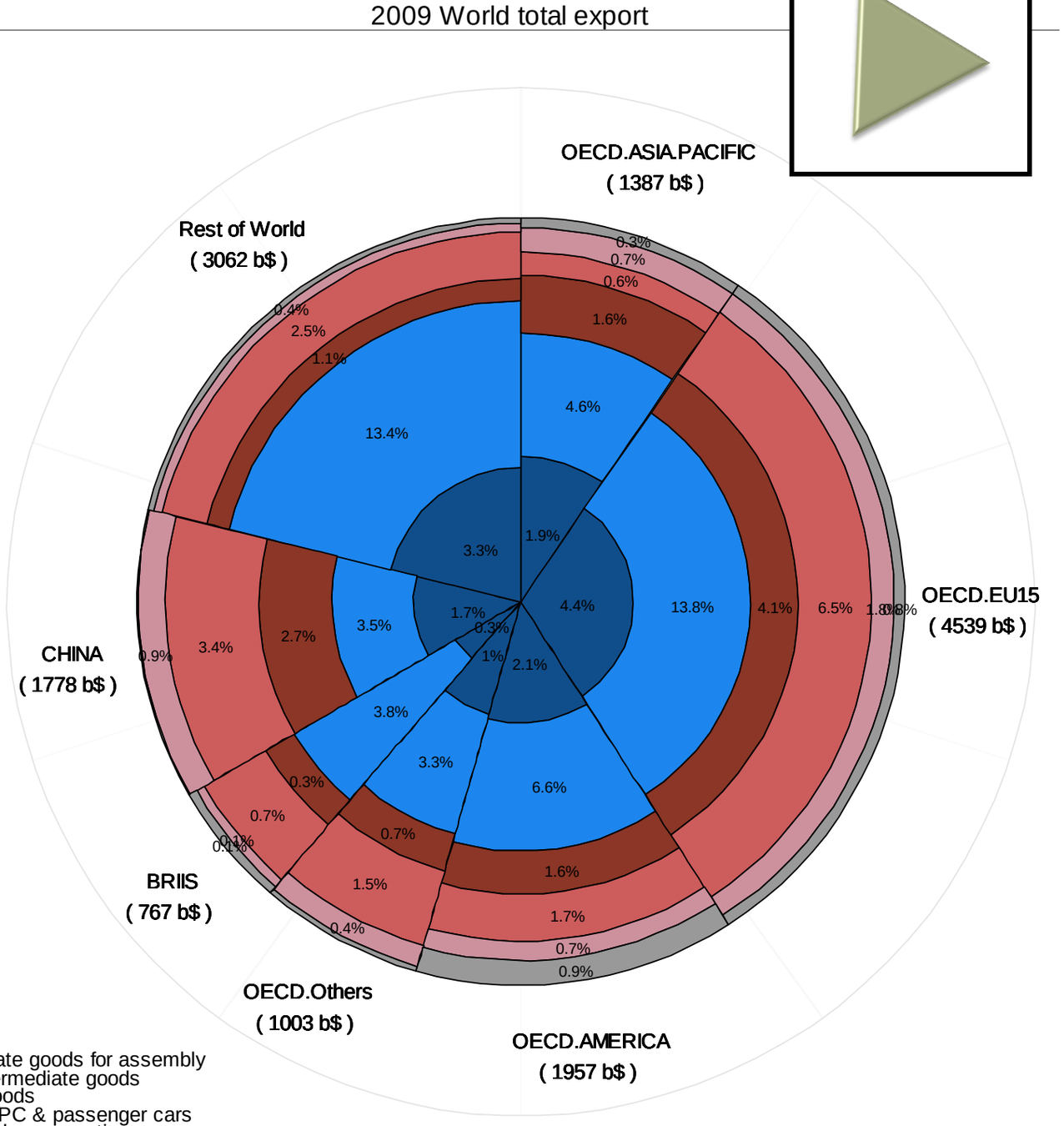
International specialisation

(increased shares 1995-2006, more than 10% share of total exports)

- Mining (ISIC 10-14) in CA, MX, BR, CL / RU /
- Textile (ISIC17-19) in IT
- Chemicals (ISIC24) in US / BE,DE,ES,FR, GB / IN, KR, SG, TW
- Machinery (ISIC29) in CZ, FI, JP
- Comm equip. (ISIC30) in MX / FI,HU / CN, MY, PH
- Computing machinery (ISIC32) in CN, TW, KR, PH, SG,TH
- Motor vehicles (ISIC34) in US, BR / DE, FR, PL,HU,CZ / JP, KR

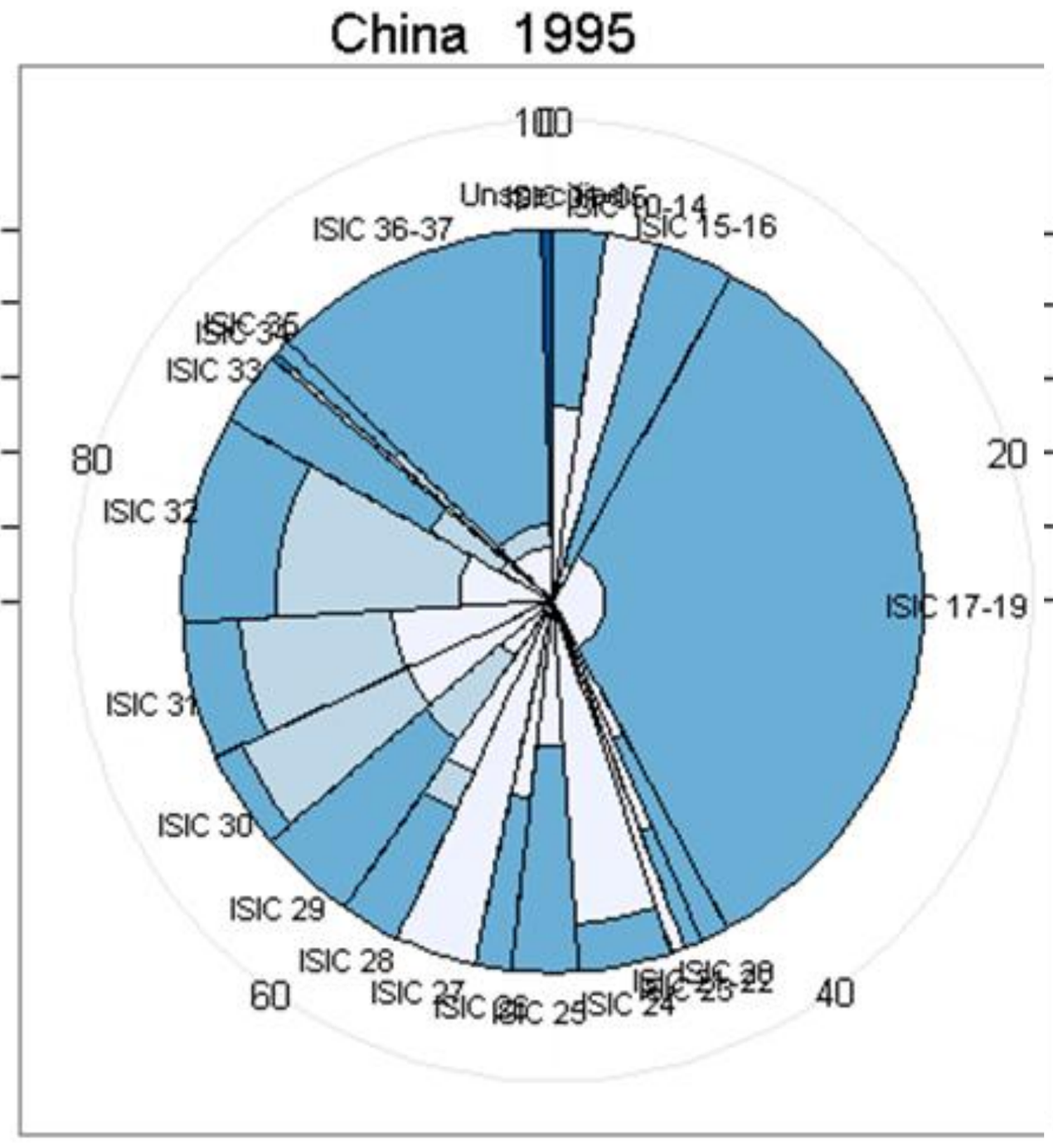
Export by Industry and End-Use

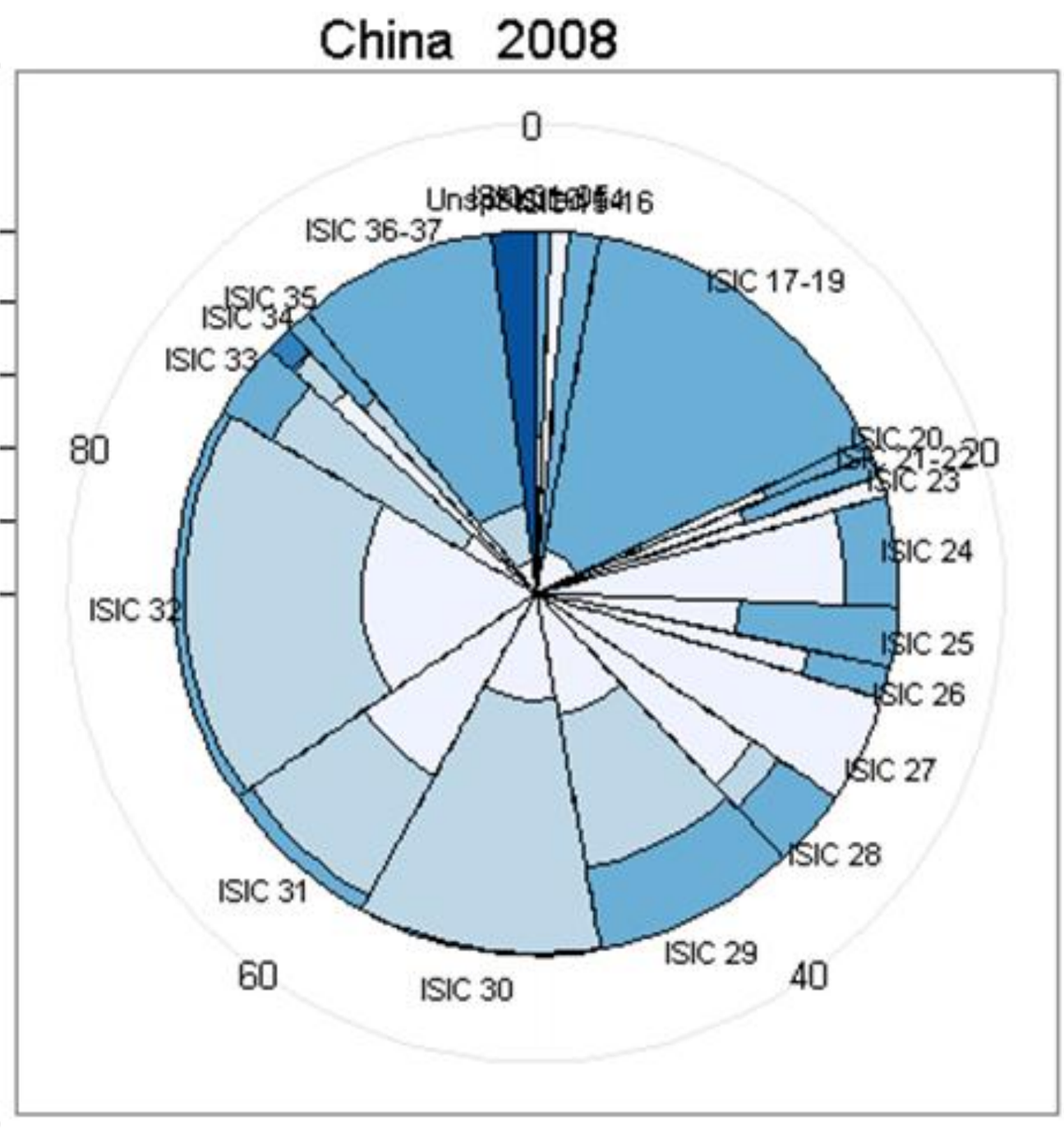




Intermediate goods for assembly
Other intermediate goods
Capital goods
Personal PC & passenger cars
Household consumption
Unspecified

Export by industry and enduse

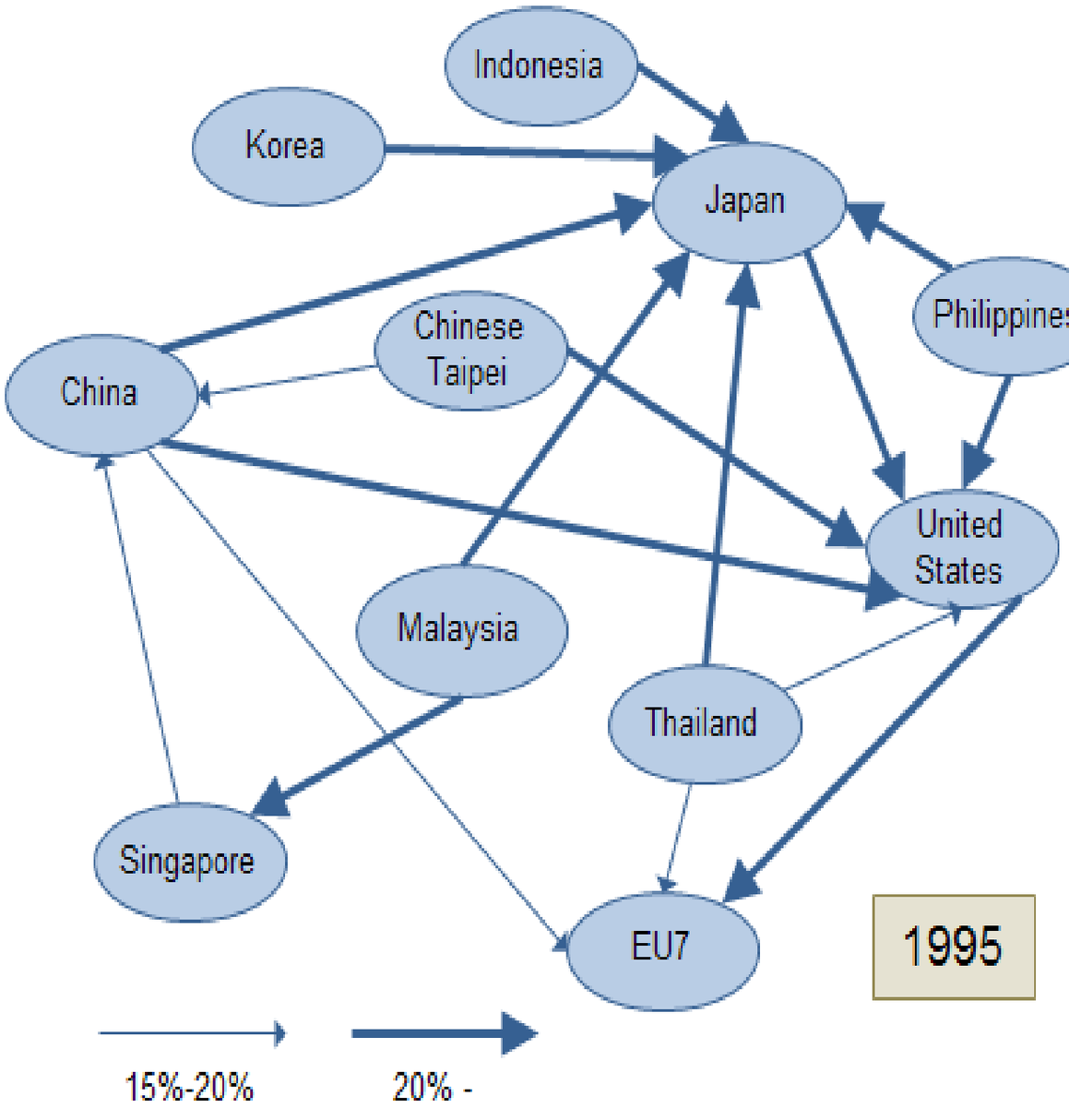


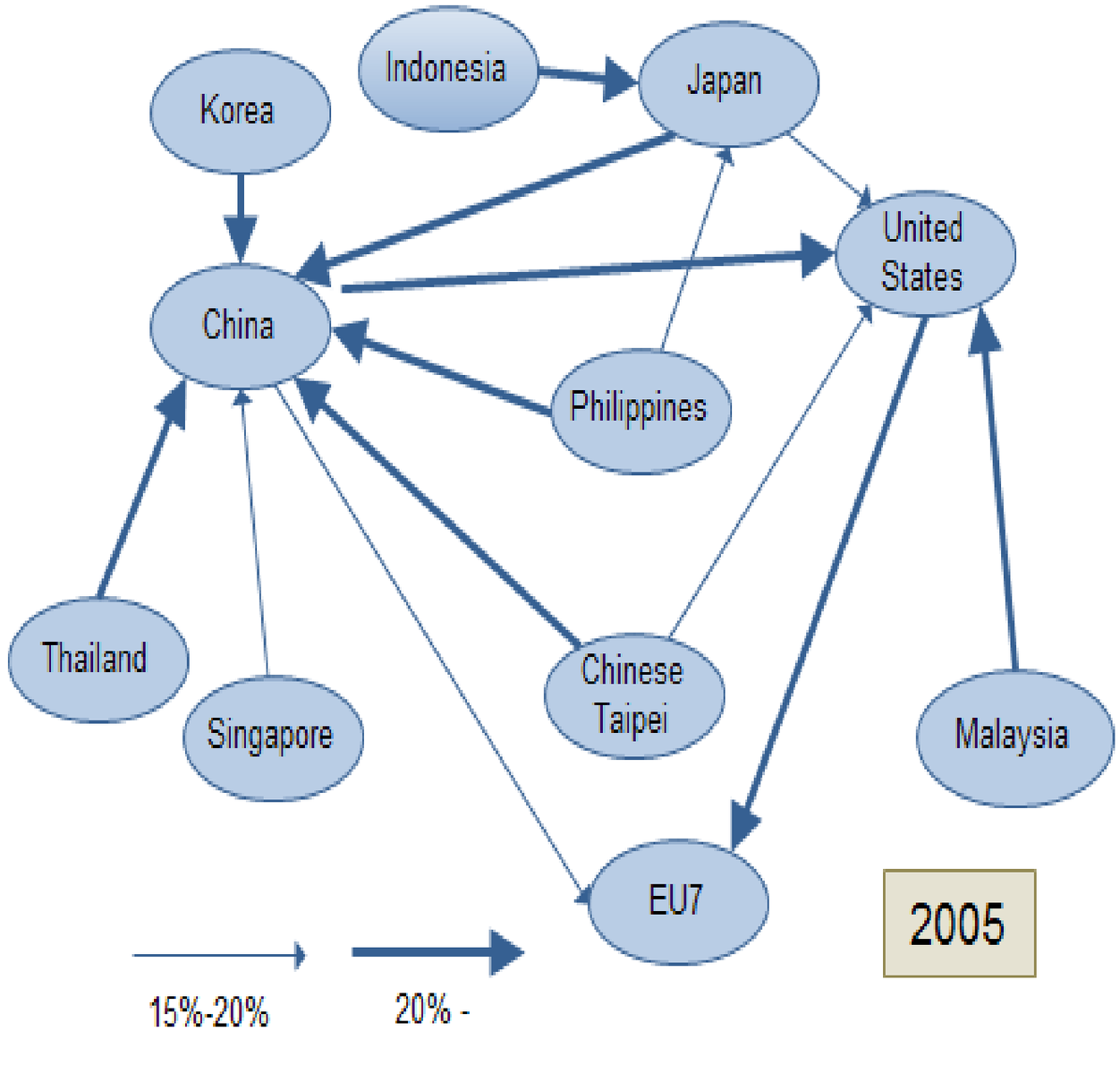


Counting the dominant partner links to identify the demand and supply hubs

- Demand hub (l)
  - Count the partners' export link that depends on country l's economy at given threshold *t*
    - export (k,l) / Σ_l export (k,l) > t %
- Supply hub(k)
  - Count the partners' import link that depends on country l's economy at given threshold *t*
    - import (k,l) / Σ_l import (k,l) > t %

Major Trade Partners for Asia's Intermediate Exports in Goods and Services



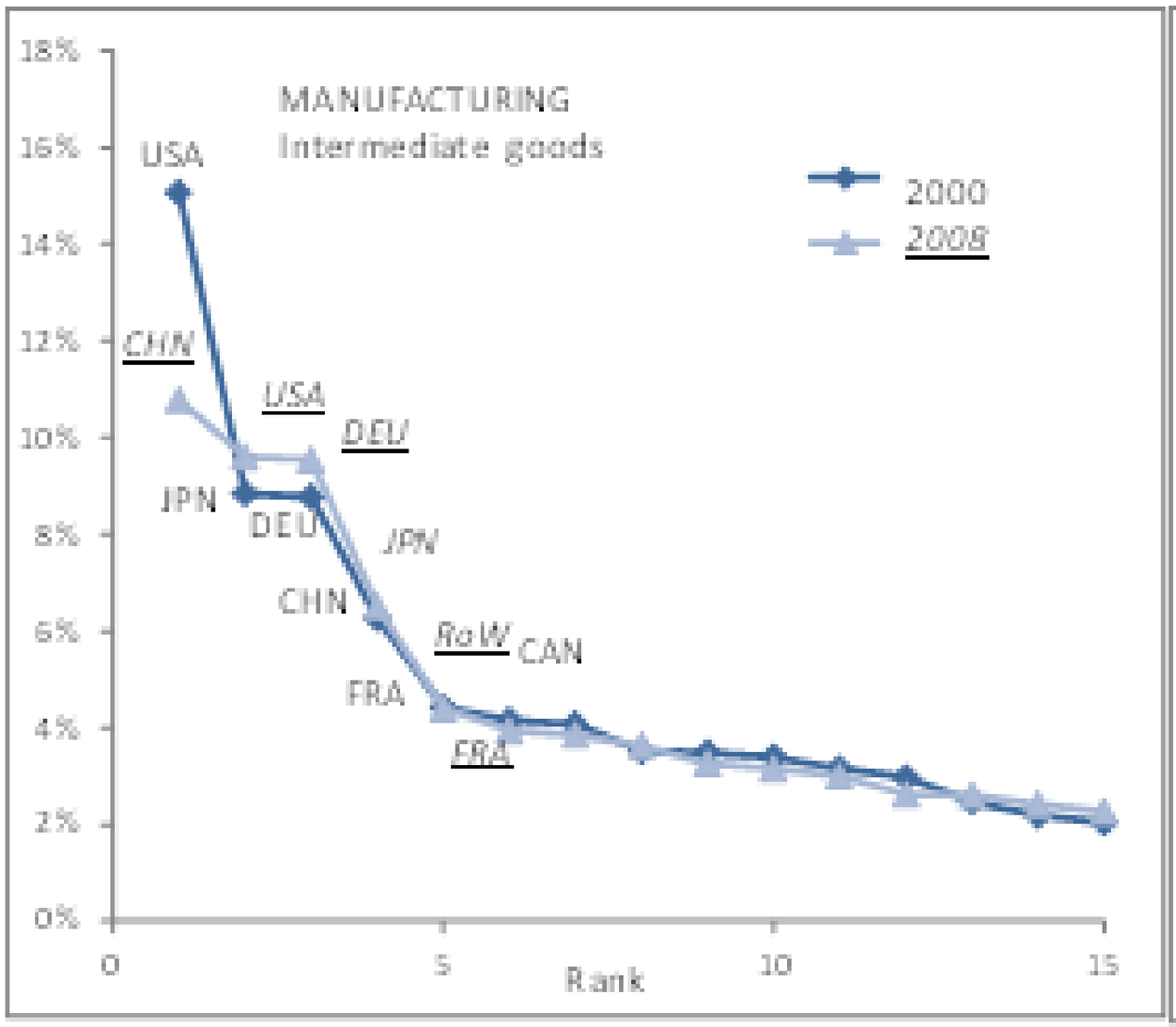


Notes: EU7 is Belgium, Germany, France, Italy, Netherlands, Spain and United Kingdom. Each arrow indicates that a partner's share of a country's total exports is greater than 15%.

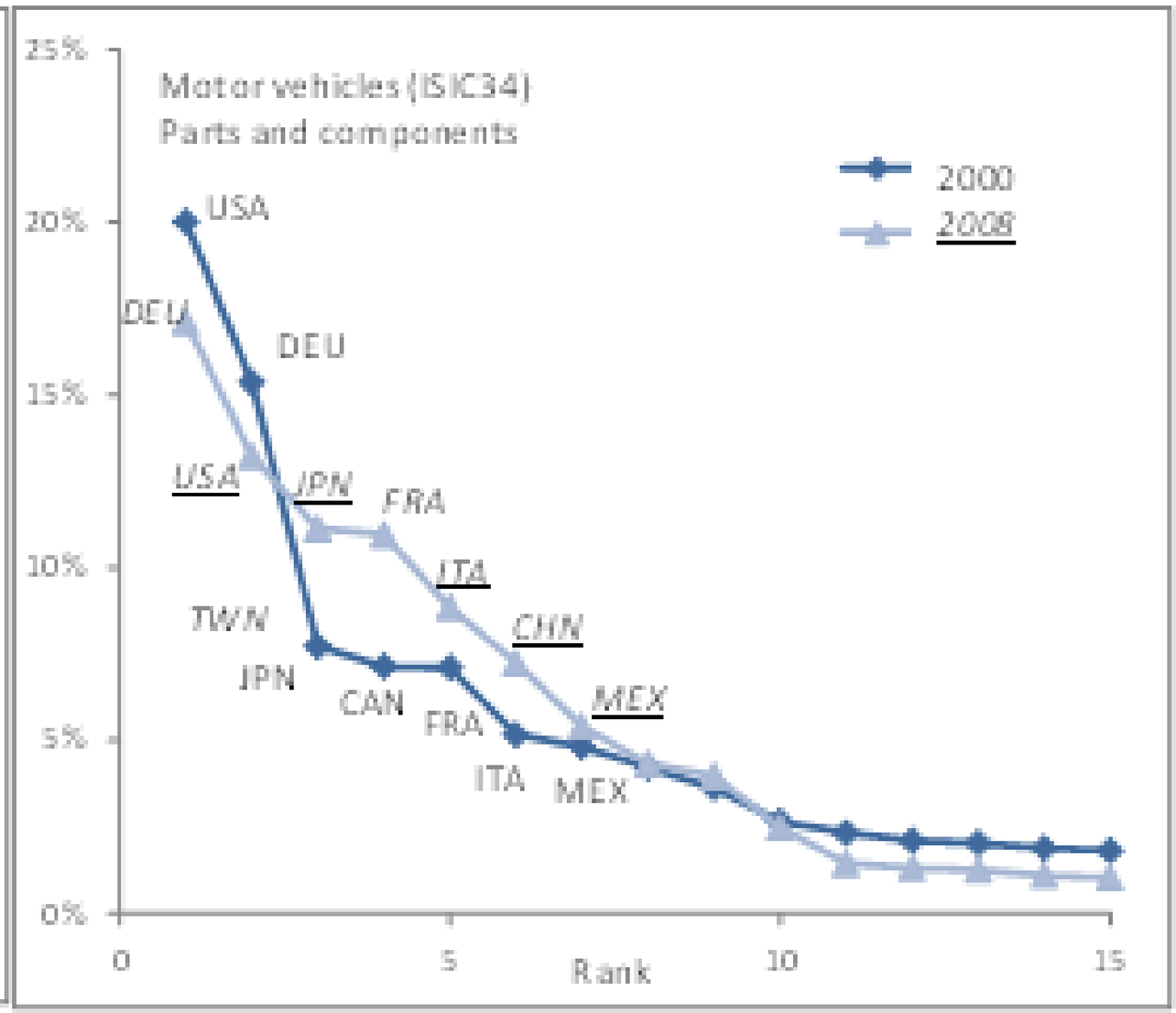
Source: OECD Input-Output Database, March 2010; IDE-JETRO Asian International Input-Output Database 2006; OECD Bilateral Trade Database, March 2010; OECD Trade in Services, January 2010.

Global share of intermediate exports (2000, 2008)

Manufacturing parts



Motor vehicle parts



Findings (trade indicators)

- Significant changes in industry and category components of exports in most Asian economies (China's machinery, textile, etc)
- Asian and North American production networks have integrated. However structure of Europe basically remains stable after the mid1990s.
- China replaced Japanese and US positions as manufacturing hub in Asia-Pacific region. However, Japanese share of parts and components in some sectors (Electronics and motor vehicles) remains high.

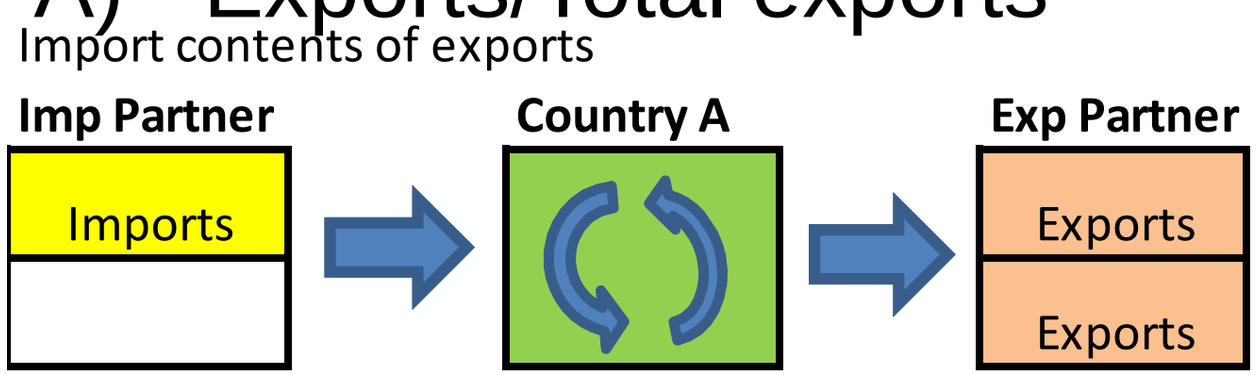
Trade in value-added

Input-output model is useful data source to link international trade and domestic primary contents

Indicators (vertical specialization)

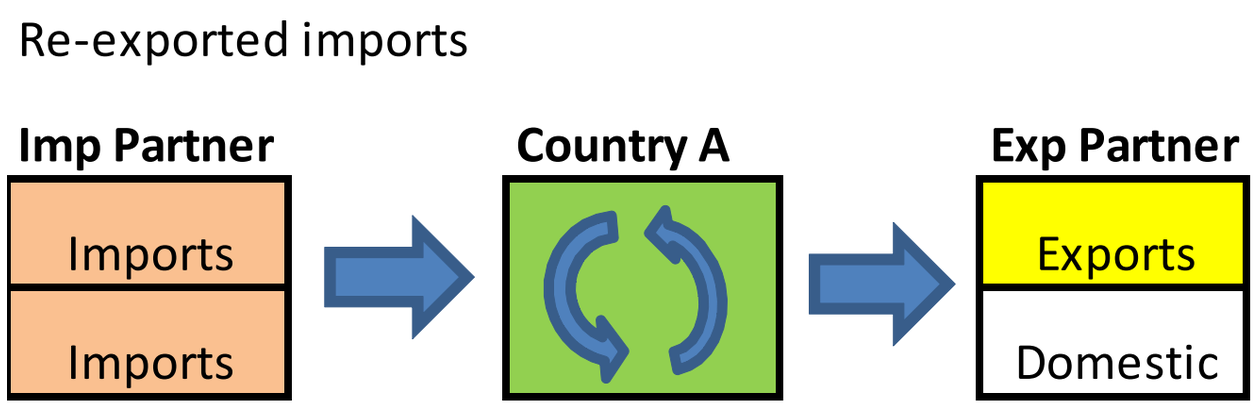
Import contents of exports
= M $(I-A)^{-1}$ Exports/Total exports

(Hummels et al 2001)

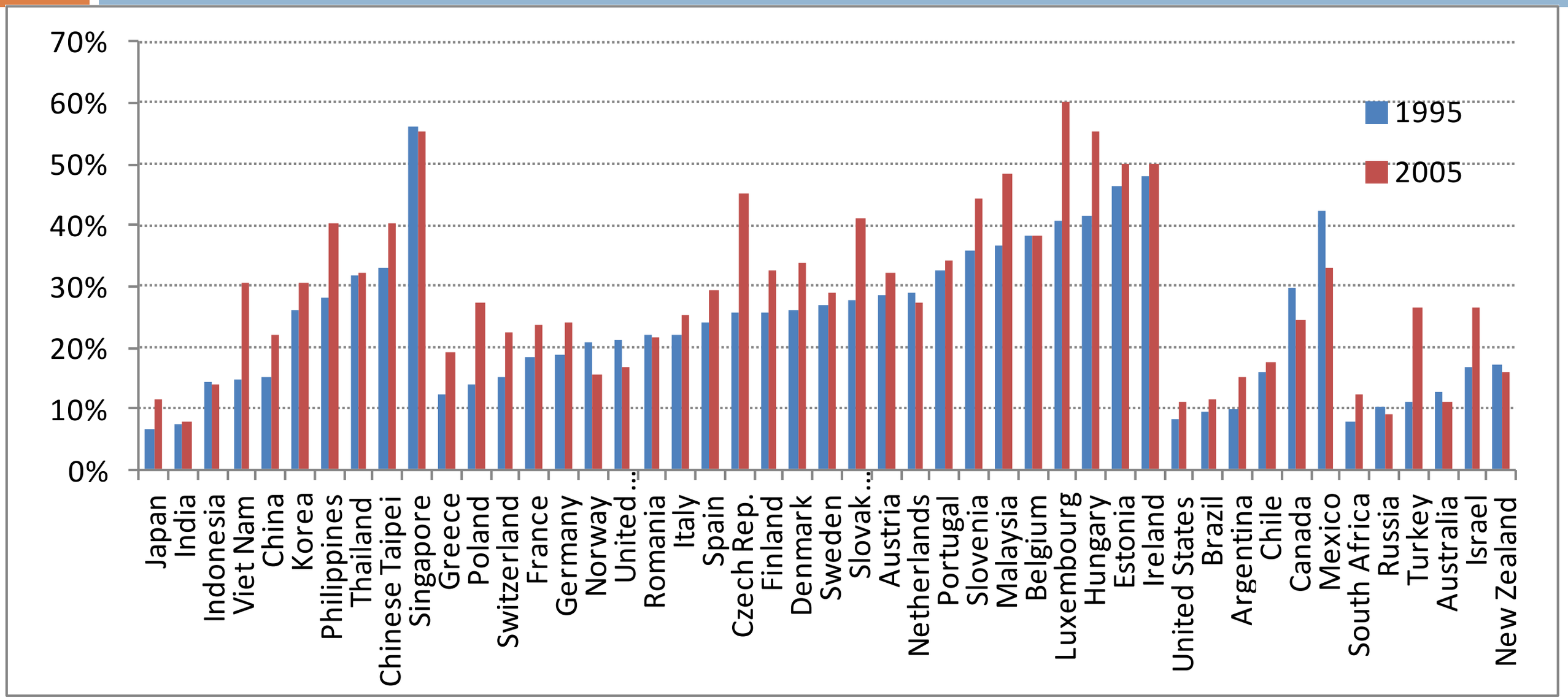


Re-exported imports
= Imports $(I-Gd)^{-1}$ e/Total imports

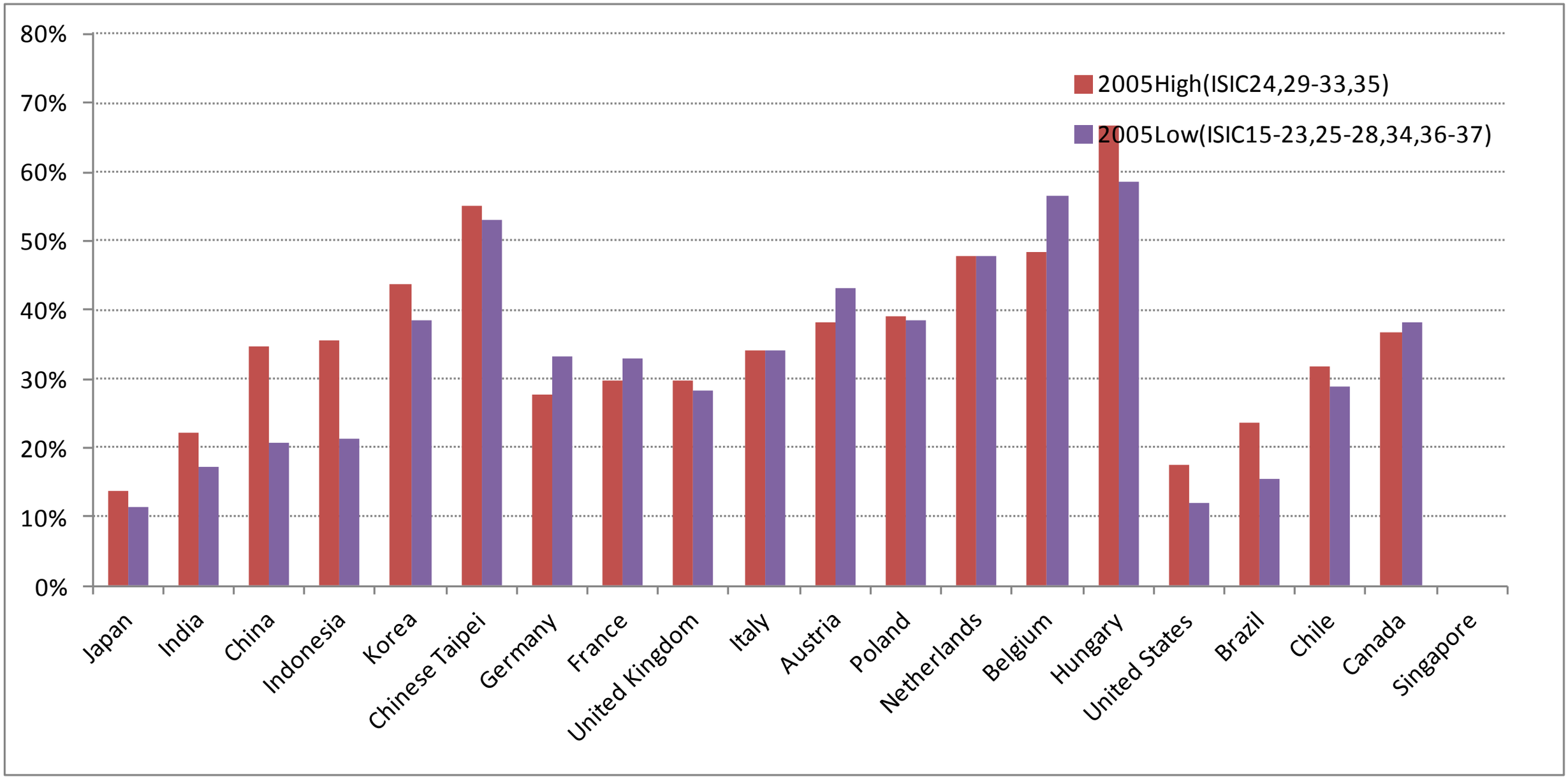
(Meng et al 2010)



Import contents of exports (ICE)



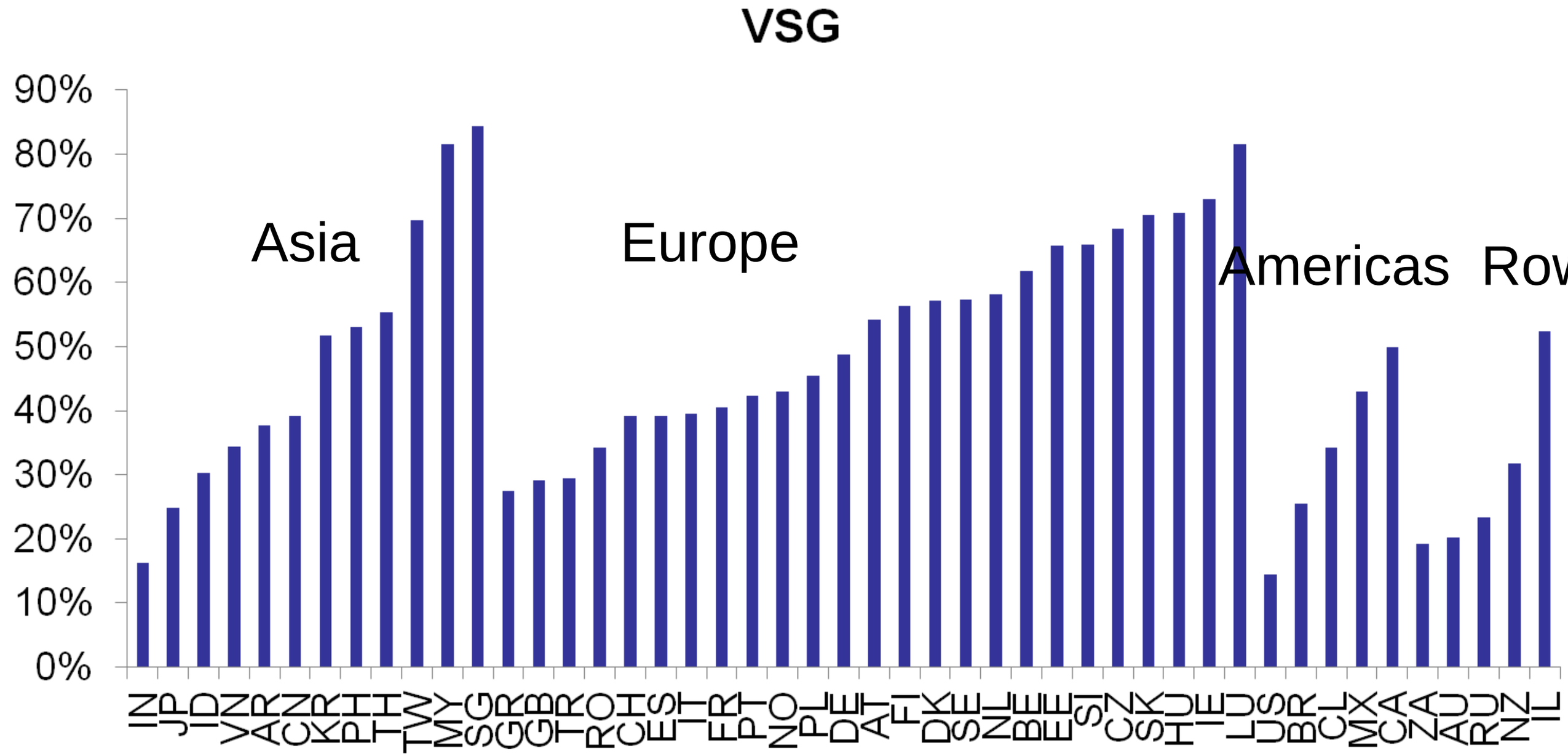
Import contents of exports (ICE) by industry group



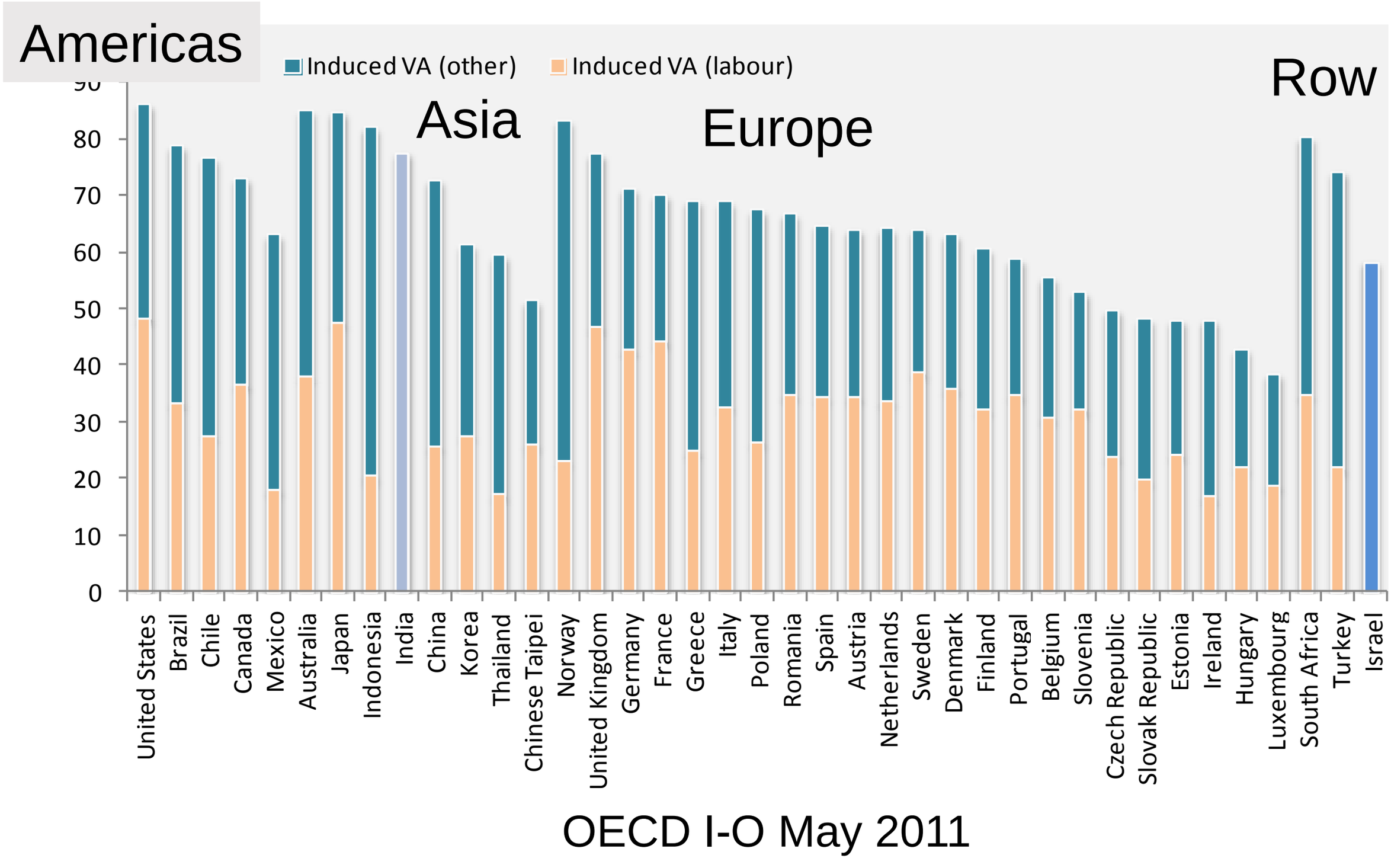
Notes: Higher technology-intensive manufacturing group is defined as ISIC Rev.3 24, 29-35; lower technology-intensive manufacturing group is defined as ISIC Rev.3 15-23, 25-28, 36-37; services sector is ISIC Rev.3 50-95.

Sources: OECD Input-Output Database, October 2010

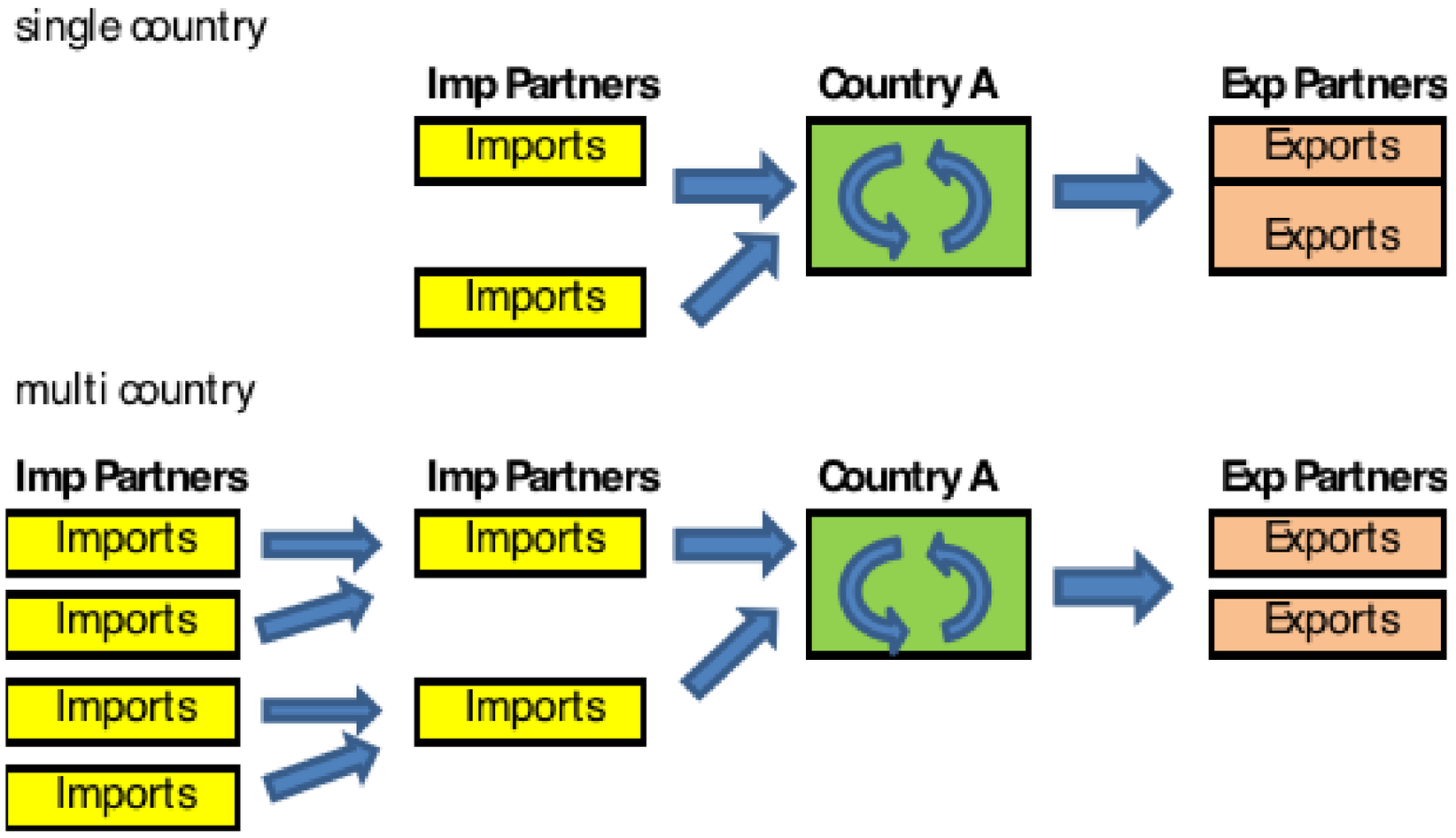
Intermediate imports end up in exports



Contribution of exports on GDP: Induced value-added (% of exports)

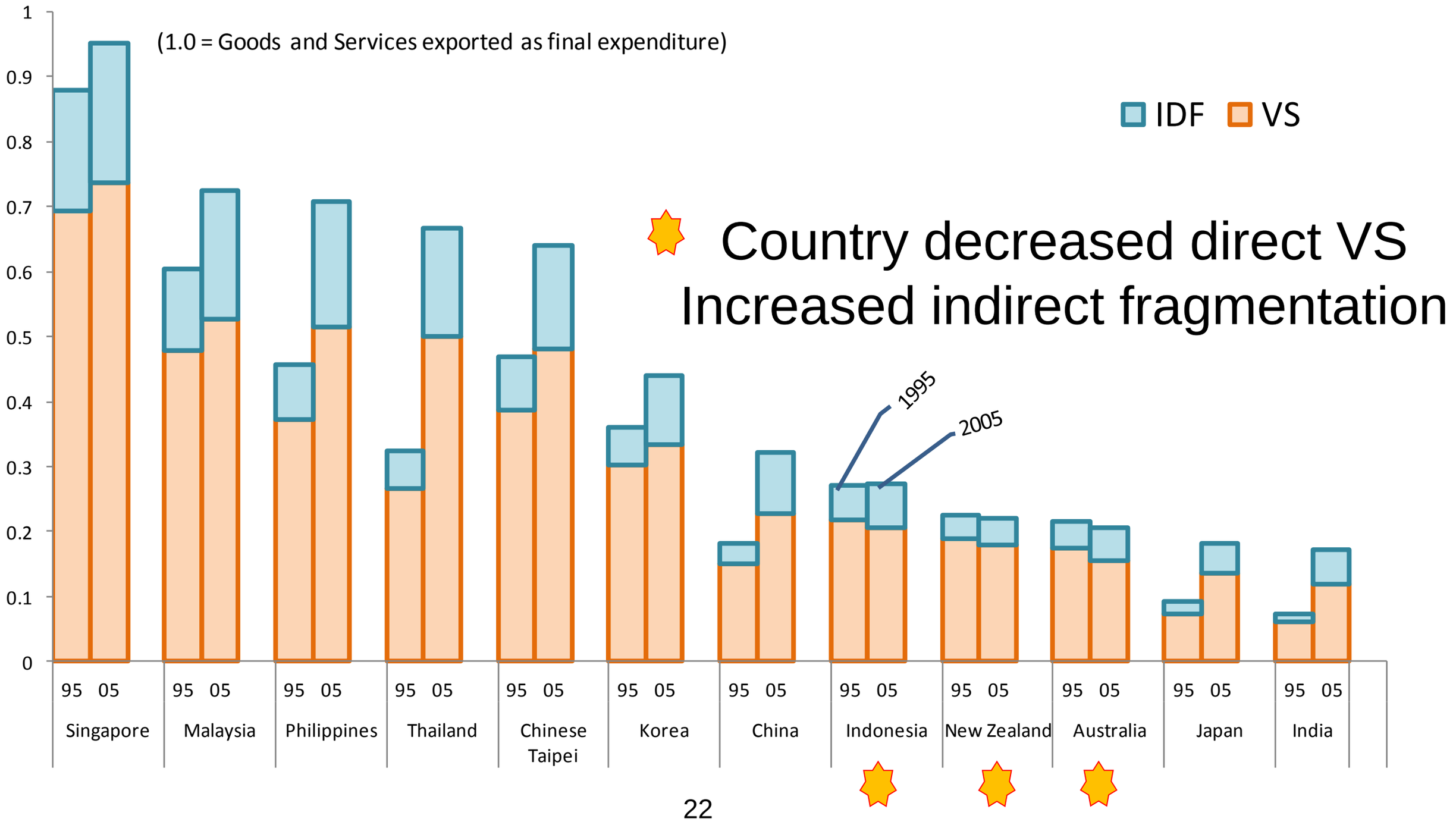


Intercountry-based production fragmentation indicator

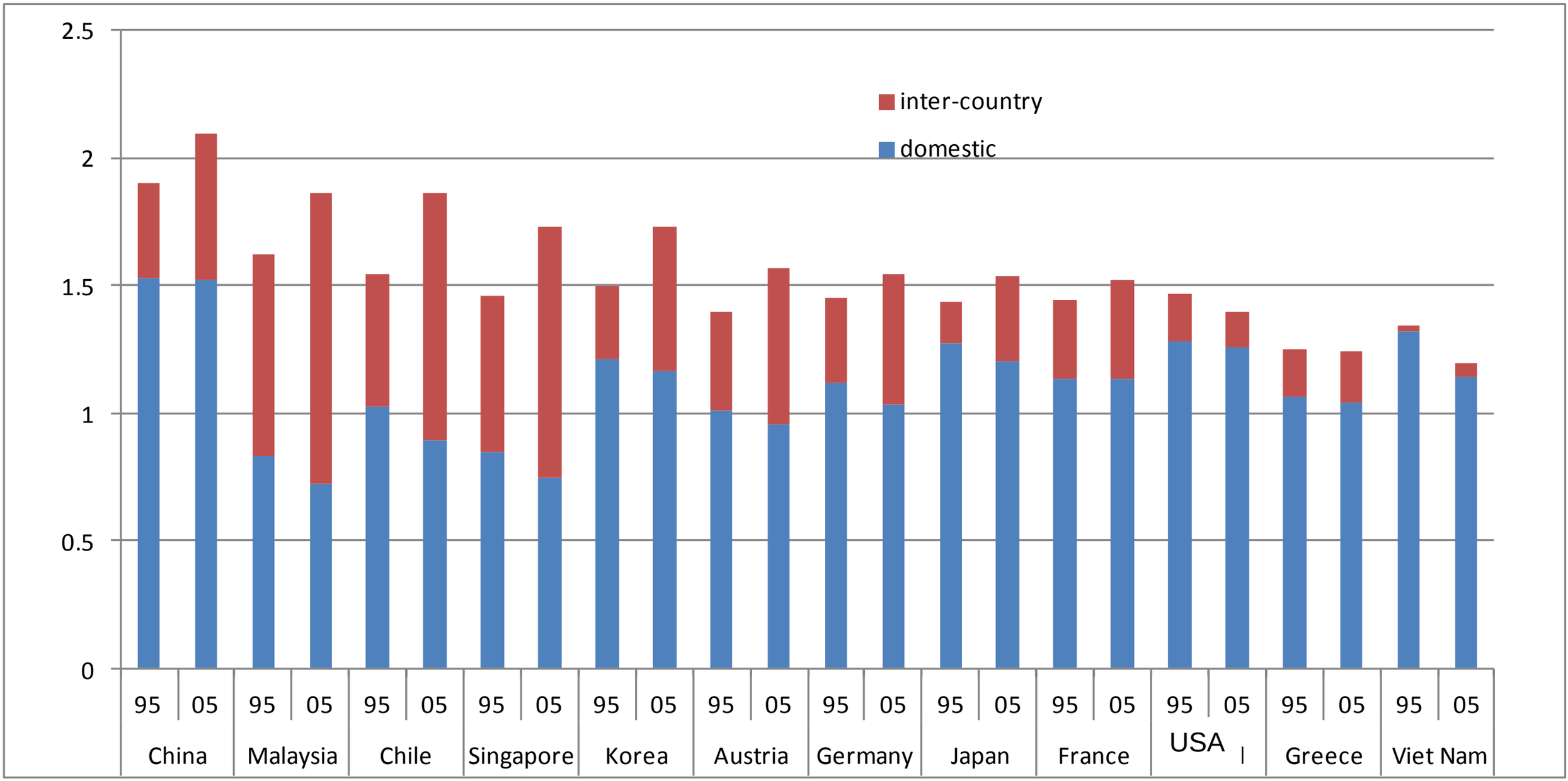


1. Induced global trade / Exports
2. *Average Propagation Link* another advanced indicates the complexity of inter-industry transactions (both domestic and foreign)

Fragmentation index (1995/2005)



APL: Domestic and inter-country length (total,1995/2005)

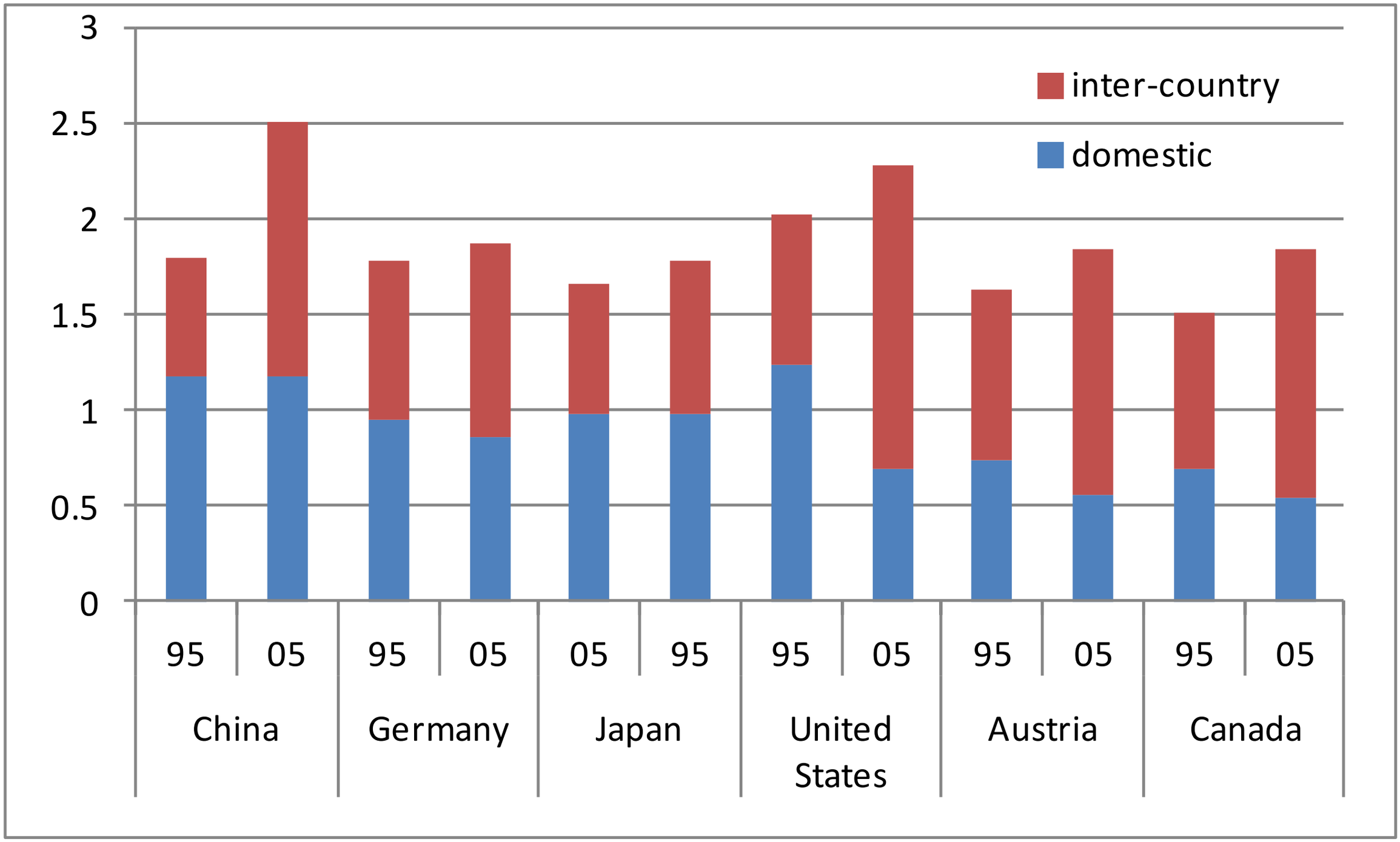


Findings (inter-country model)

- Increased inter-country spillover effects => decreased domestic contribution of exports on output and GDP. In particular, final demand in developing economies induces more value-added in neighbour developed economy.

- Production chains become more complex in inter-country parts (intermediate trade + APL) due to the production propagations in foreign area.

Domestic and inter-country length (Electric Machinery,1995/2005)



Example of specific products import contents