

Value Chain Developments: Implications for Maritime Trade

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The Global Value Chain (GVC)/Production Network Phenomenon

Spread of GVCs and production networks the most fundamental change in 21st century trade

- **Not new but greatly accelerated**

Responds to technical feasibility of modularisation of production

- **Production process spread across multiple countries**
- **Spread of production networks**
- **“from trade in goods to trade in tasks”**
- **East Asia emerged as world centre of GVC/production network activity**

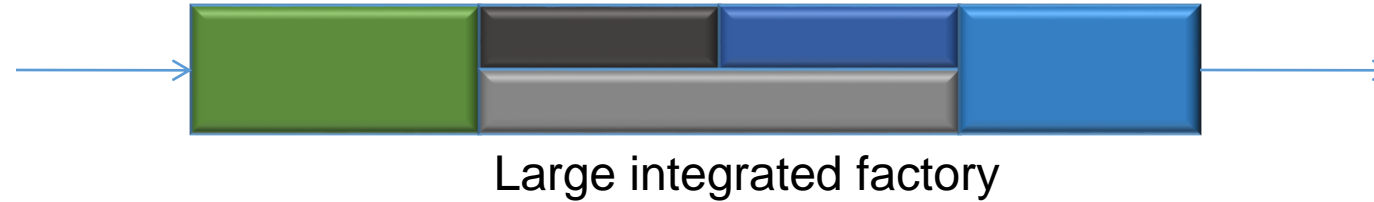
Key determinants

- **Production cost efficiencies**
- **Service link costs (transport, communications, finance, business services etc**

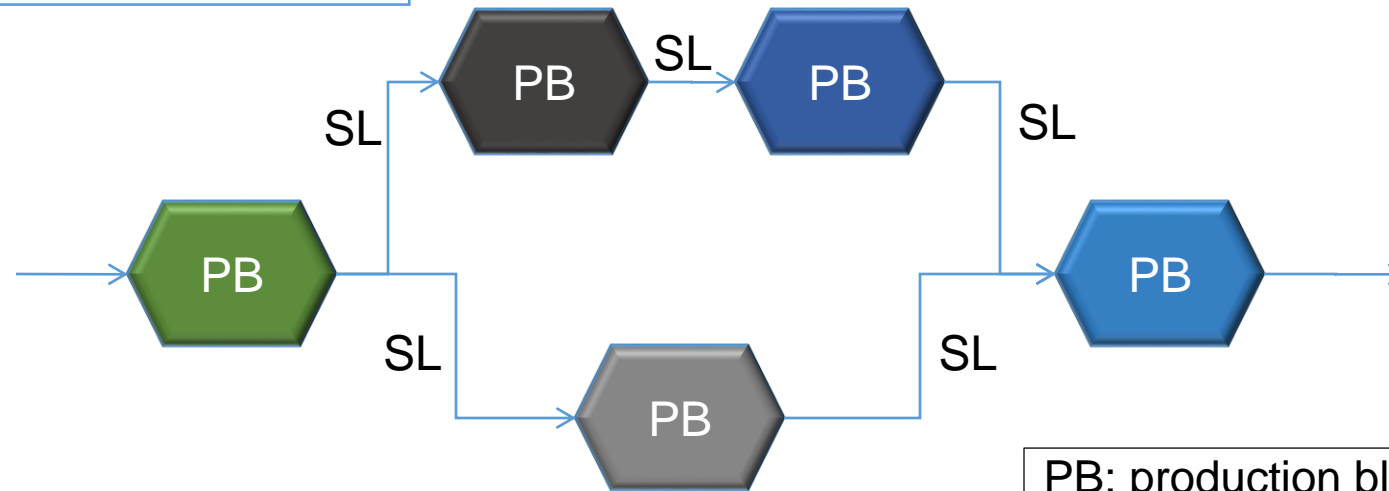
➤ The fragmentation theory: Production blocks and service links

Modularisation of Production is the Key

Before fragmentation

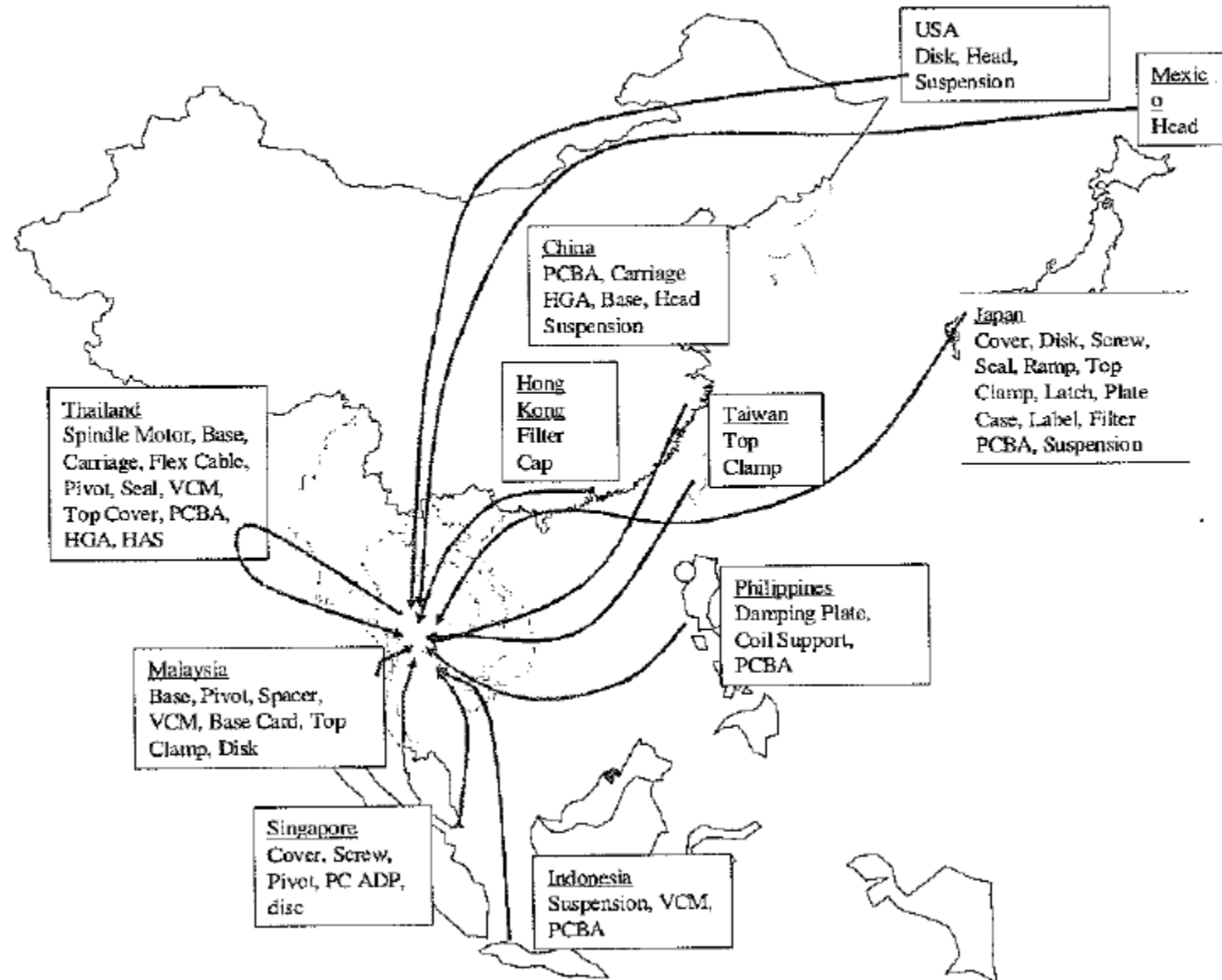


After fragmentation



PB: production blocks
SL: service links

A supply chain example. (This shows the nations where parts are sourced for a hard disk drive assembled in Thailand.)



Source: Baldwin (2008) based on data adapted from Hiratsuka (2005).

GVCS/Production Networks and Industrialisation

- **Comparative advantage defines location of production modules rather than of entire industries**
- **Provides low-cost developing countries with previously unavailable entry points into industrial development in a wide range of industries**
- **Unprecedented global spread of industry**
- **Rise of North-South production sharing**

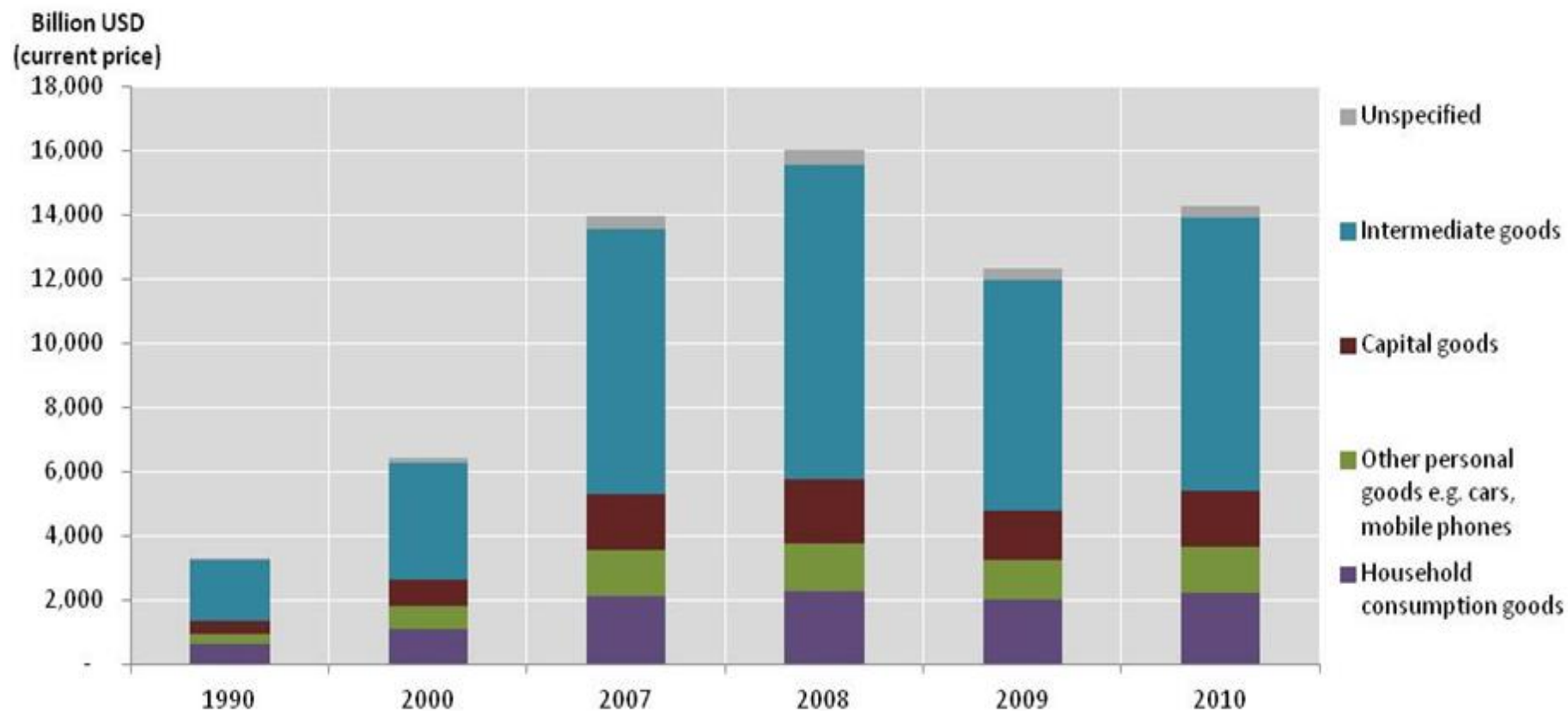
GVCs/Production Networks and World Trade

- GVCs/production networks stimulate expanded trade in intermediate goods
- Trade in raw materials and finished goods augmented by dramatic increase in trade in parts and components
 - Finished goods exported from country hosting the final module in the production sequence (often China in East Asia)
- Multiplication of shipments and border crossings associated with production process
- Intermediate goods account for over 50% of world trade
- Freight costs, port costs, border clearance costs become critical to efficient operation of supply chains
- Efficient logistics with on-time deliveries also critical
- Intermediate good exports linked to GVCs/production networks contribute substantially to recorded growth of world trade in early 21st century

Indicators of Fragmentation

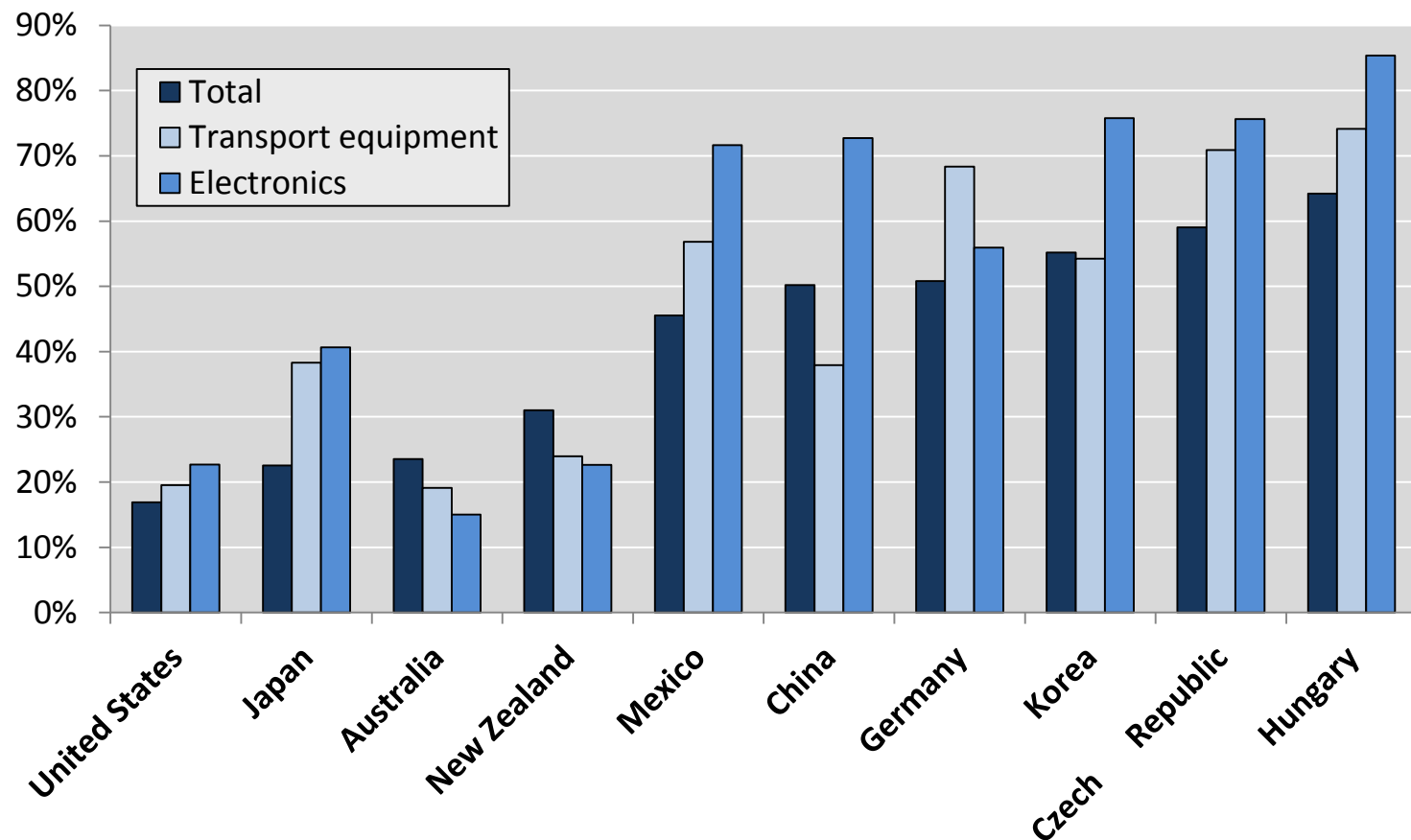
World Trade by End-Use (1990-2010)

Intermediate Good Share Typically Around 60%

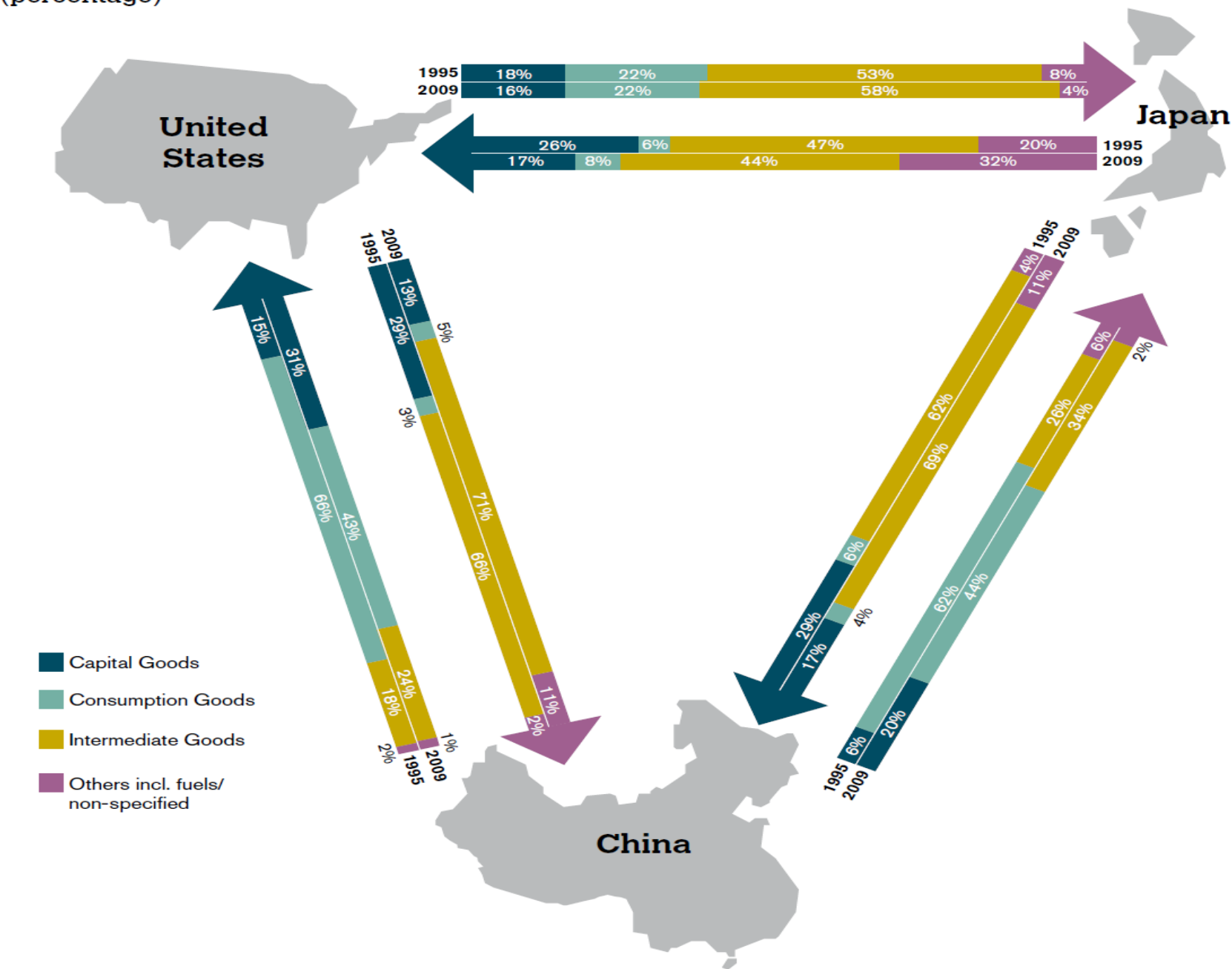


Source: OECD

Significant Share of Intermediate Imports Used in Exports



Bilateral trade flows between China, the United States and Japan, 1995 versus 2009, by type of good (percentage)



Source: UN Comtrade Database.

Recent Trends: Contrasting Perspectives

- 1) Sharp contraction in world trade from GFC followed by resumption of growth in world trade at much slower pace than before
 - Reflecting a slowing of impetus to world trade from fragmentation of production (Mattoo et al)
- 2) Manufacturing production still not very globalised (Richard Baldwin)
 - Domestic inputs continue to account for largest share of manufacturing output

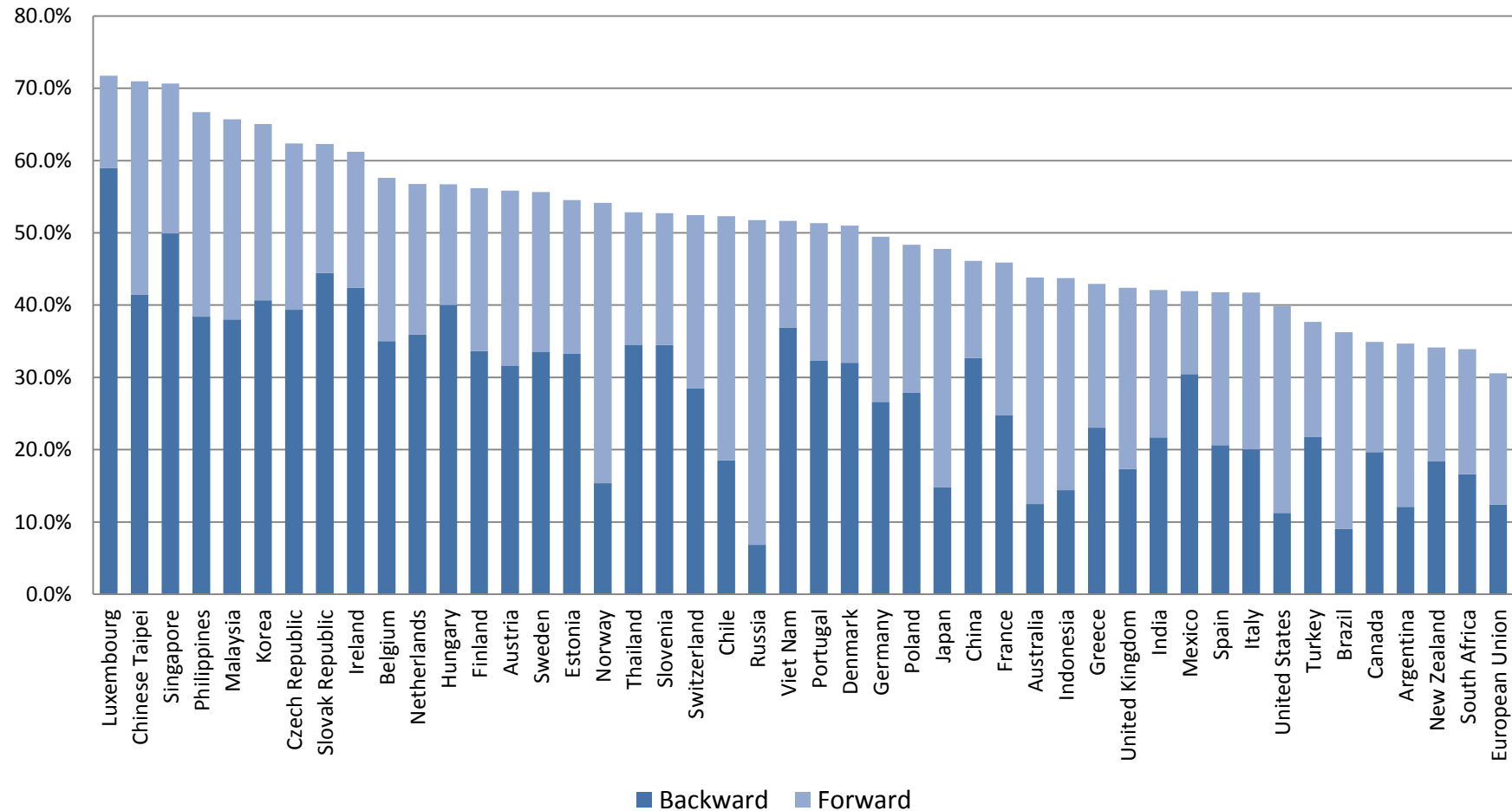
Input Composition of Global Manufacturing 2009	
Domestic Value Added	29%
Domestic Intermediates	55%
Imported Intermediates	16%

Insights from New Databases (1)

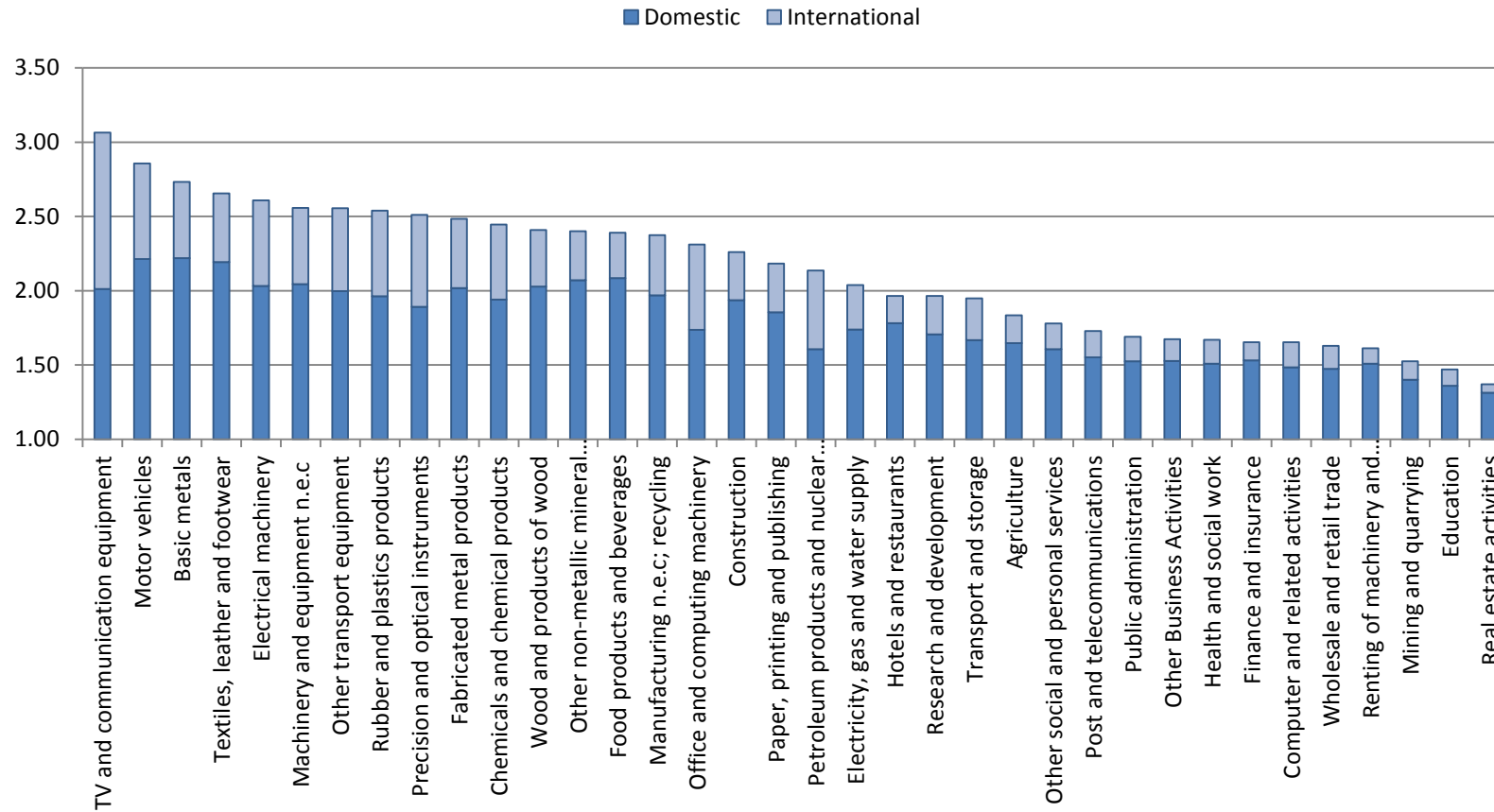
OECD's Trade in Value Added (TiVA) Database

- Separates share of export values into
 - Domestic production and imports
 - Exports of final and intermediate goods
- Shows proportion of exports attributable to production activity in the exporting country
- Highlights countries' participation in GVCs and length of GVCs in different sectors
- Provides new insights on trade balances
- Highlights critical role of services in globalised production
 - Services account for at least 48% of world exports on a value added basis

GVC Participation Index by Country (% of gross exports, 2009)

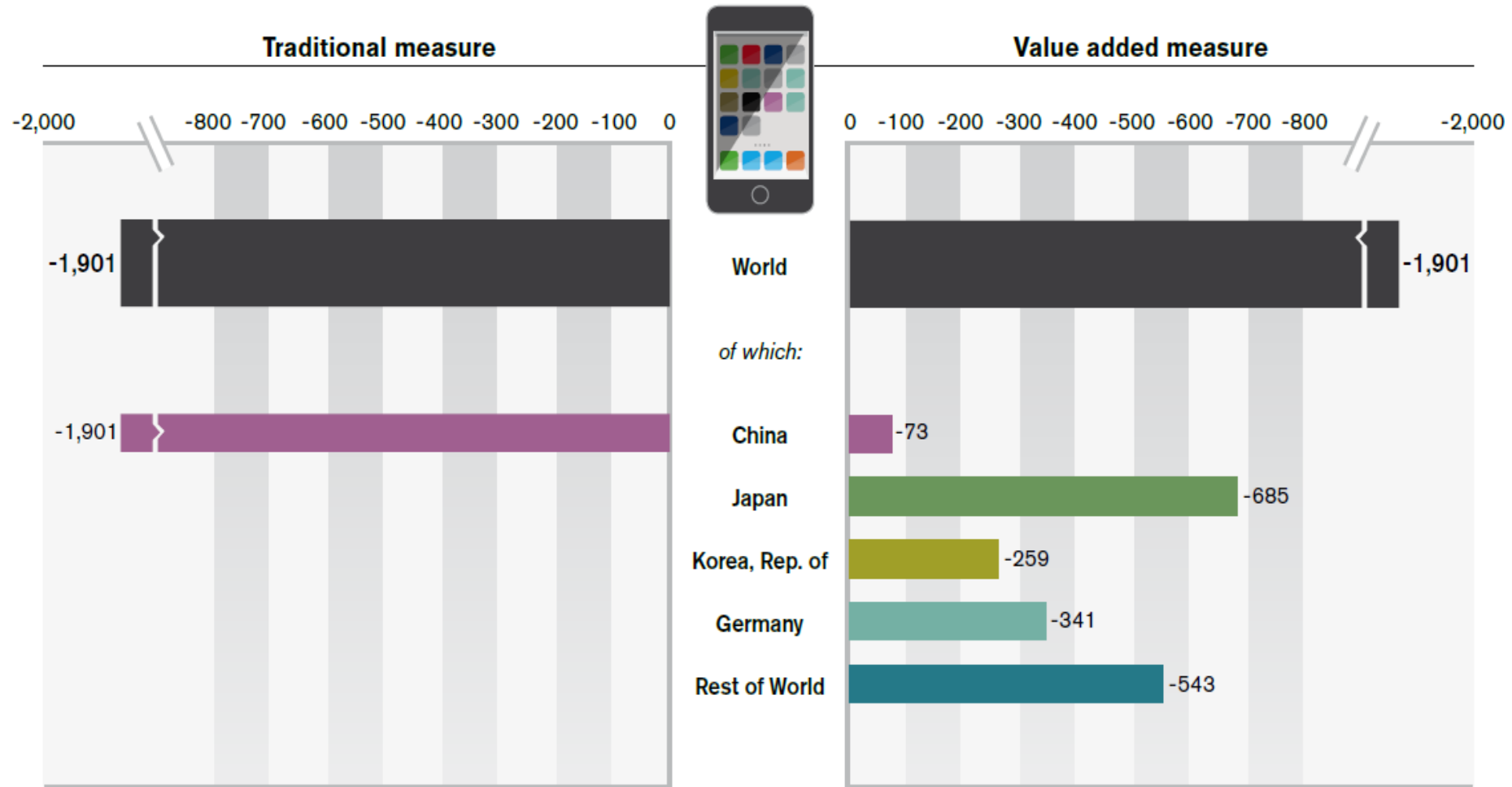


Indicators of Fragmentation: Length of GVCs, by Industry (2009)



Implications for Trade Balances

2009 US trade balance in iPhones (in millions of US\$)



Source: Meng and Miroudot (2011).

Source: WTO-IDE/JETRO (2011): Trade Patterns and Global Value Chains in East Asia

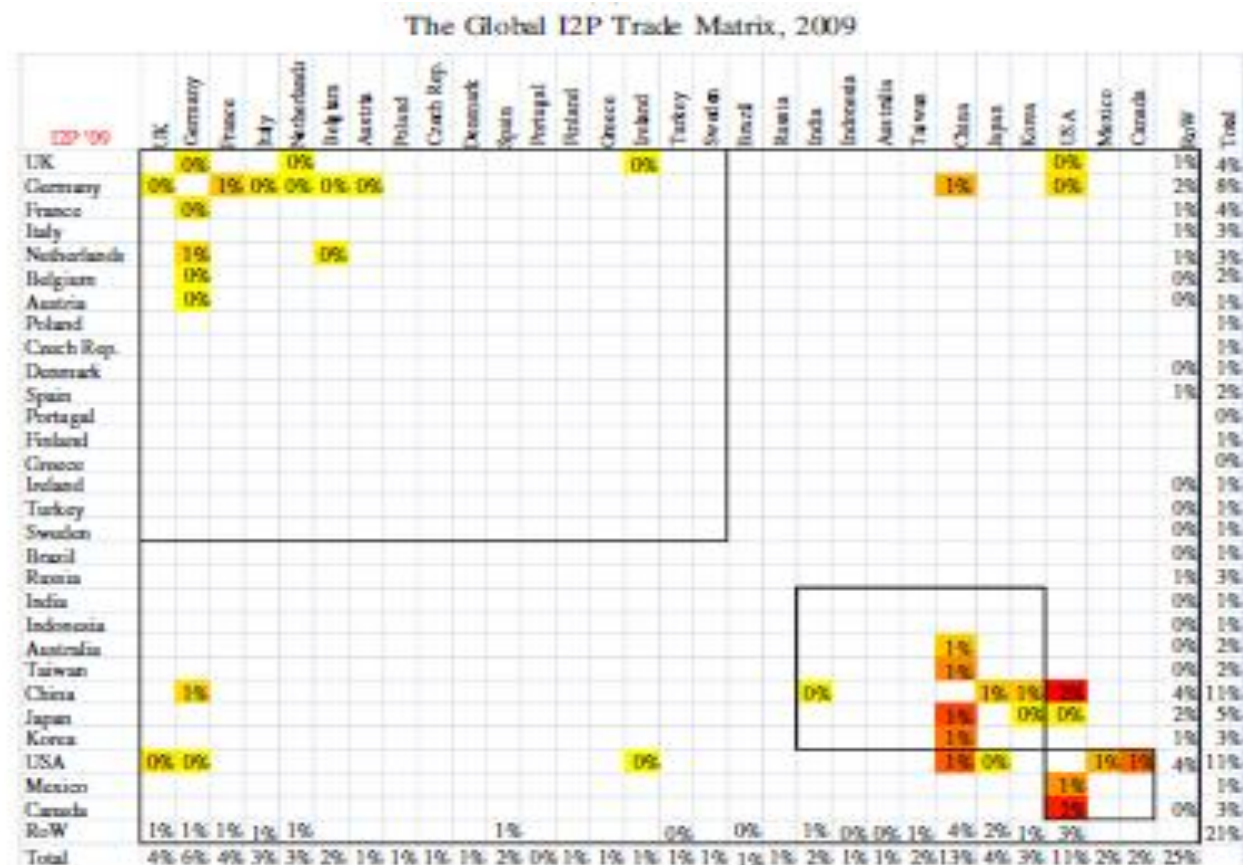
Insights from New Databases (2)

World Input Output Database (WIOD)

- Aims to track input-output relationships between industries and across countries
 - Allows “mapping” of value chains
 - Country coverage not yet complete
- Key insight from WIOD Database (Richard Baldwin): international supply chains are *not* global, they are predominantly regional, concentrated within three regional blocs
 - “Factory Asia” (dominated by China and Japan)
 - “Factory Europe” (dominated by Germany)
 - “Factory North America” (dominated by USA)
- Four dominant economies in these “factories” account for 60% of world manufacturing output and dominant share of intermediate inputs
- Germany, USA and Japan function as “headquarter economies” with advanced technology and high wages
- Supply chain trade has been shifting heavily toward Factory Asia, especially China

Global Trade Matrix for Intermediate Goods Used in Productions

(Source: Baldwin and Lopez-Gonzalez 2014)



Note:

Bilateral purchases of intermediates by row nation from column nation as per cent of all I2P flows in WIOD database; flows under 0.3 per cent set to zero.

Features of the Three Regional Supply Chain Blocs

“Factory Europe” and “Factory North America”

- “Hub and Spoke patterns centred on “head quarter economies” as hubs

“Factory Asia”

- More complex “production network” pattern, wider extra-regional connections (especially with “Factory North America”)
 - Japan acts as a “headquarter economy” but with declining influence
 - China resembles a “headquarter economy” on the sales side (numerous import clients), but resembles a “factory economy” on the sourcing side (sources mainly from Japan, USA, Germany and Korea)
 - Korea mixes characteristics of both “headquarter” and “factory” economy
- Heavily dependent on North America and Europe as markets for finished goods
- Trade flows mainly across water (by sea and air)

Key Role of Logistics in Supply Chain Developments

Logistics becomes key to supply chain competitiveness

- Often outsourced to 3PLs
- Supply chains efficiency depend on efficiency of links between supply chain units
 - Essential to ensure inputs reach intended location within a specified time range
 - “containers embedded in value chains are simultaneously transport, storage, and management units”
 - Linking production, distribution and consumption in cost-effective manner

Meeting the Needs of Supply Chains: Some Logistics Challenges for Maritime Transport

- Ensuring schedule reliability
 - Will require careful integration of levels of feederisation
 - Provide flexibility by developing multiple networks
- Limitations on port facilities, bottlenecks, disruptions threaten supply chain sustainability
 - Pressure on multimodal integration to serve hinterland
 - Can trigger new developments to increase flexibility
 - Multi-port regional gateways
 - Move container sorting further inland (away from ports) using rail or barge links
- Repositioning of empty containers an ongoing problem