

ADB-CAREC Workshop on Central Asia's Participation in Global Supply
Chains and Its Implications to Development Policies
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Regional Clustering of Supply Chains

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1. Outline

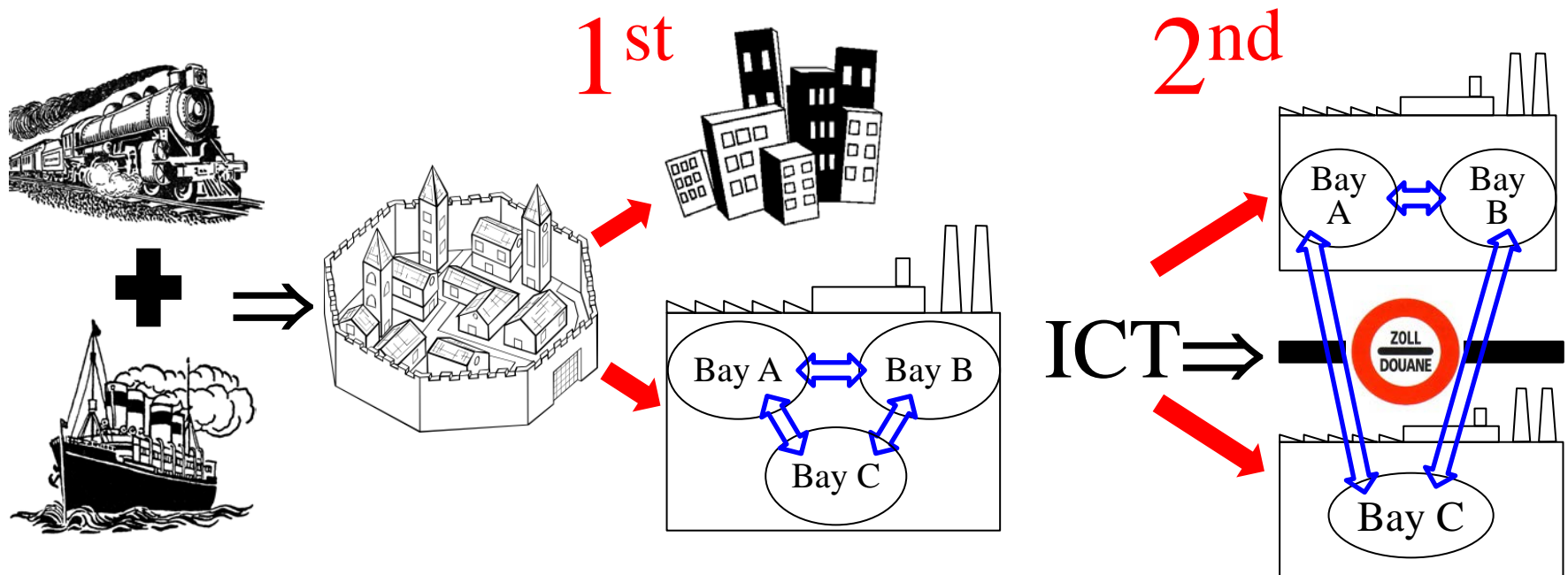
- Global value chains (GVC) vs. the 2nd unbundling/production networks
 - GVC (Elms and Low (2013)), trade in value added (Mattoo, Wang, and Wei (2013))
 - The 2nd unbundling (Baldwin (2011)), production networks (Jones and Kierzkowski (1990), Kimura and Ando (2005))
- Production networks are basically “regional.”
 - “Distance” and “scale” matter (Johnson and Noguera (2012)).
- There are still ways for Central Asia to take advantage of global value chains and/or the 2nd unbundling.

2. The 2nd unbundling

- The 2nd unbundling (international division of labor in terms of production processes and tasks) has substantially changed international trade since the mid-1980s (Baldwin (2011)).
- Development gaps nurture production networks (Jones and Kierzkowski (1990)).
- The 2nd unbundling is most advanced in machinery industries (Kimura and Ando (2005)).
- Keep good balance between agglomeration and dispersion forces.
 - New economic geography (Baldwin, Forslid, Martin, Ottaviano, and Robert-Nicoud (2003)):

The 2nd Unbundling

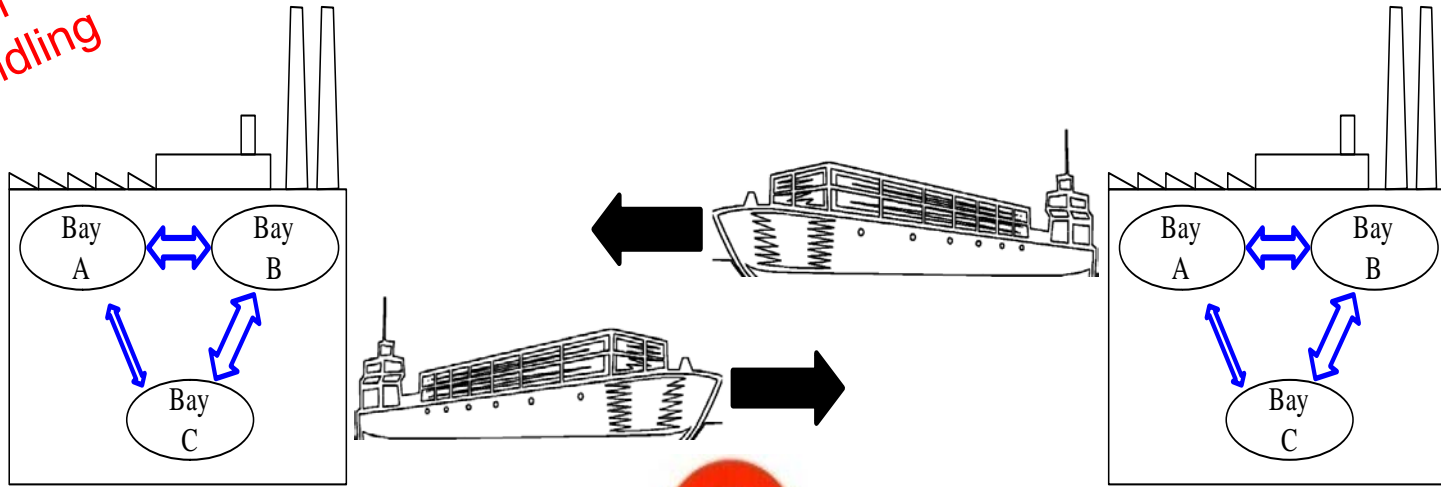
- The 2nd unbundling, i.e., international division of labor in terms of production processes and tasks, has developed since the 1980s, based on drastic reduction in coordination costs due to ICT revolution.
- The 2nd unbundling in the manufacturing sector is most advanced in East Asia.



Source: Baldwin (2011).

The 1st and the 2nd unbundling

The 1st
unbundling



The 2nd
unbundling



*Connecting factory & doing business abroad: The
“trade-investment-services nexus”*

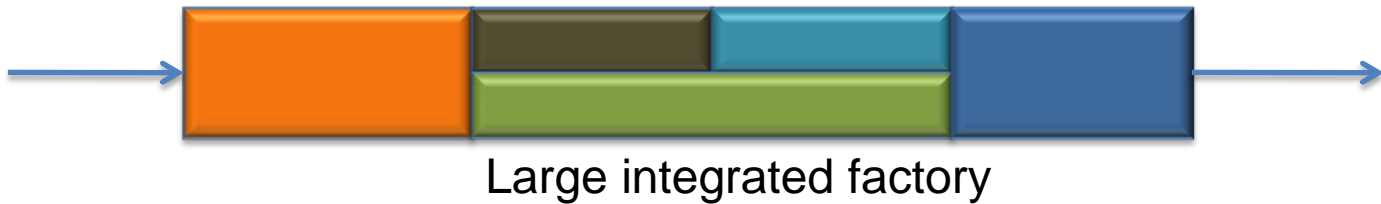
- 1) Two-way flows of goods, ideas, technology, capital, and technicians.
- 2) Investment and application of technical, managerial and market know-how abroad.

Source: The original is in Baldwin (2011), slightly modified by the author.

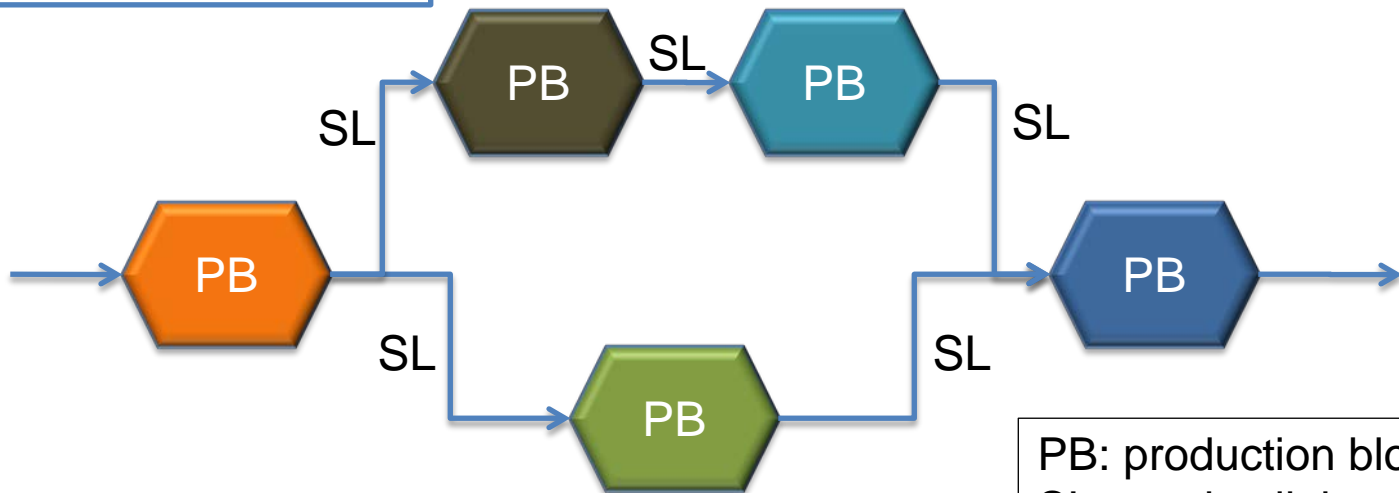
➤ The fragmentation theory: Production blocks and service links

Tradeoff between the reduction in production costs in PB and the enhancement of SL costs. Fragmentation of production occurs particularly between countries at different development stages.

Before fragmentation



After fragmentation



PB: production blocks
SL: service links

➤ Agglomeration and dispersion in new economic geography

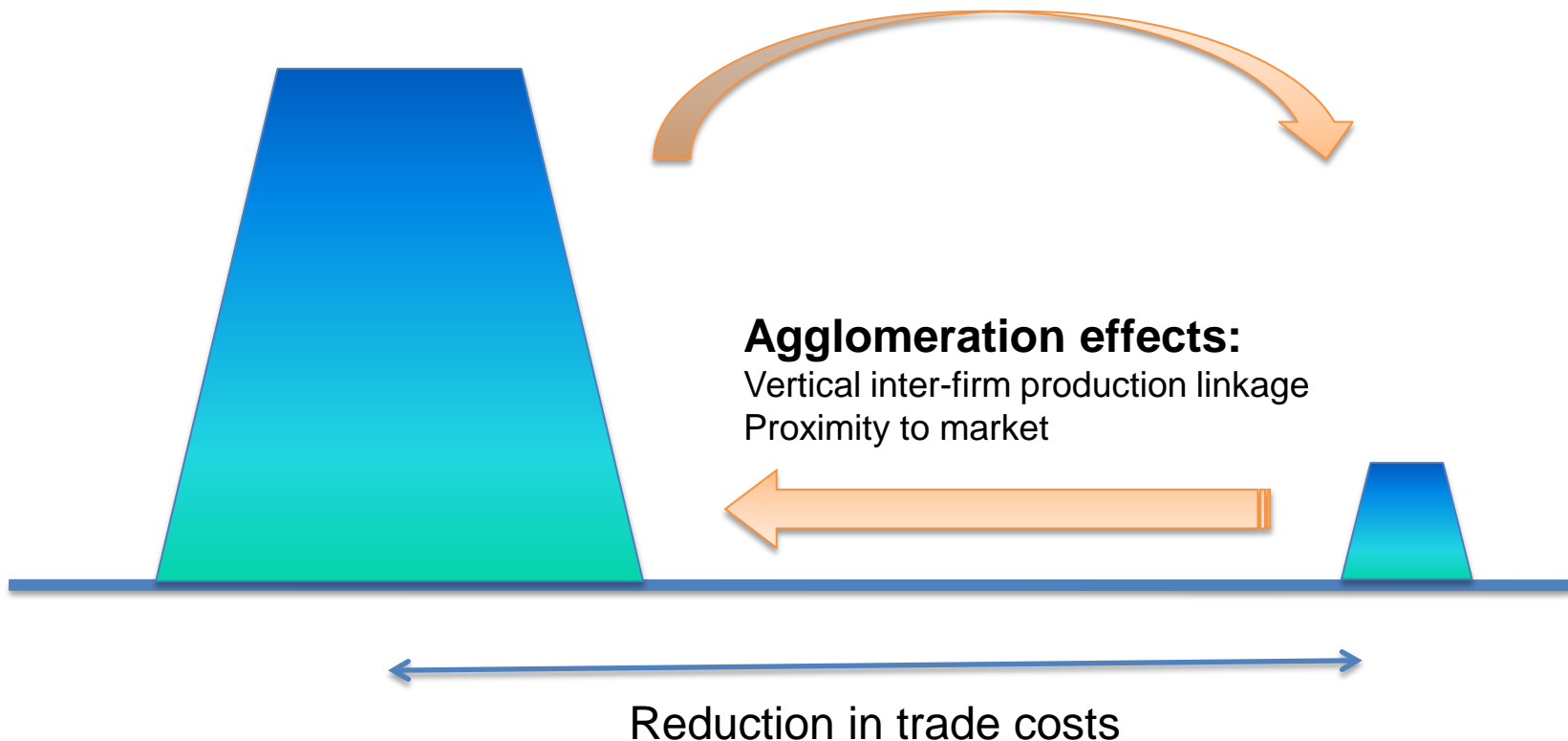
To achieve proper balance between agglomeration and dispersion effects, supplementary policies to enhance location advantages, particularly on the periphery side, are necessary.

Dispersion effects:

Avoiding congestion including wage hikes,
land price surge, traffic jam, pollution problems
Location advantages such as low labor costs

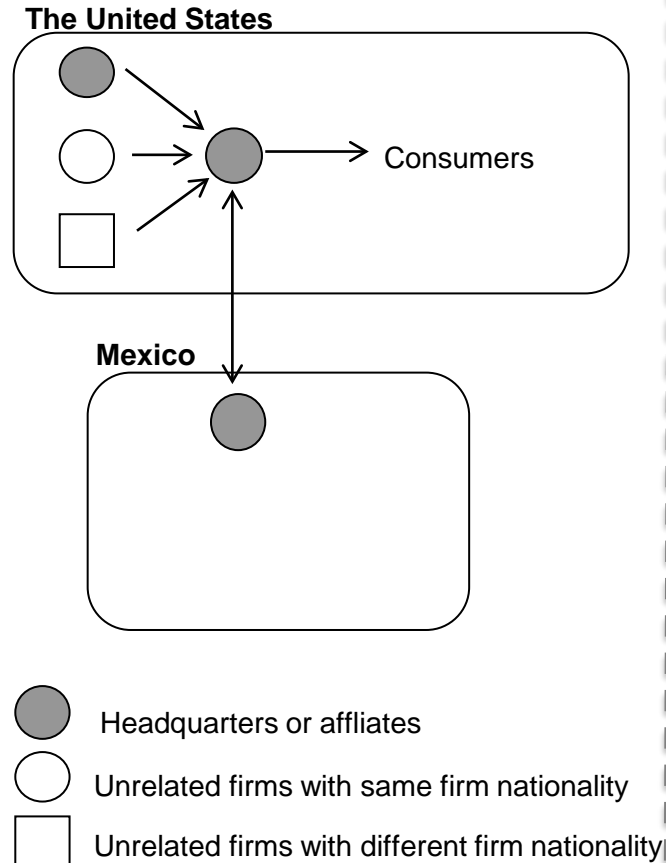
Agglomeration effects:

Vertical inter-firm production linkage
Proximity to market

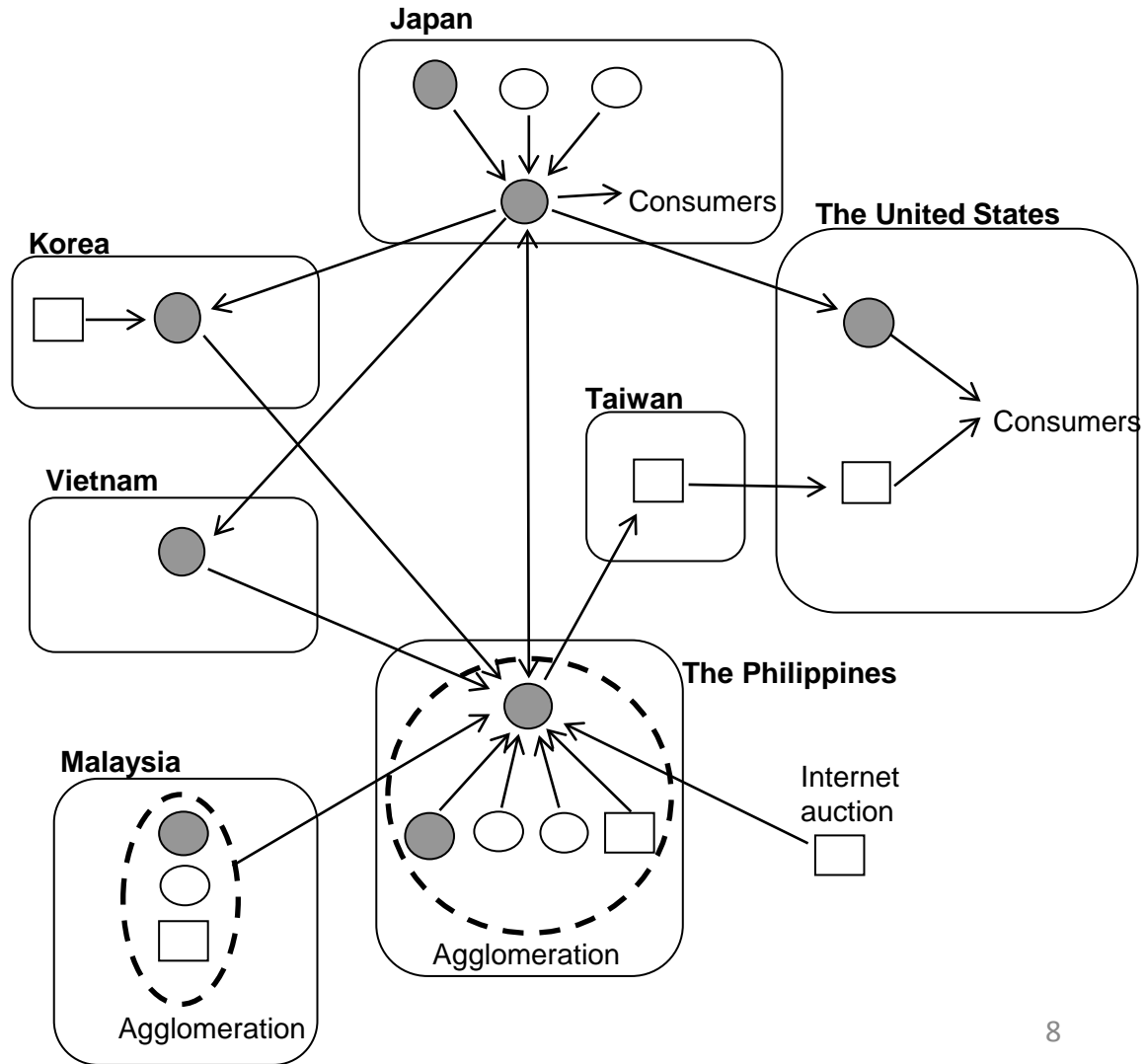


The evolution of the 2nd unbundling

Cross-border production sharing (back-and-forth; intra-firm)



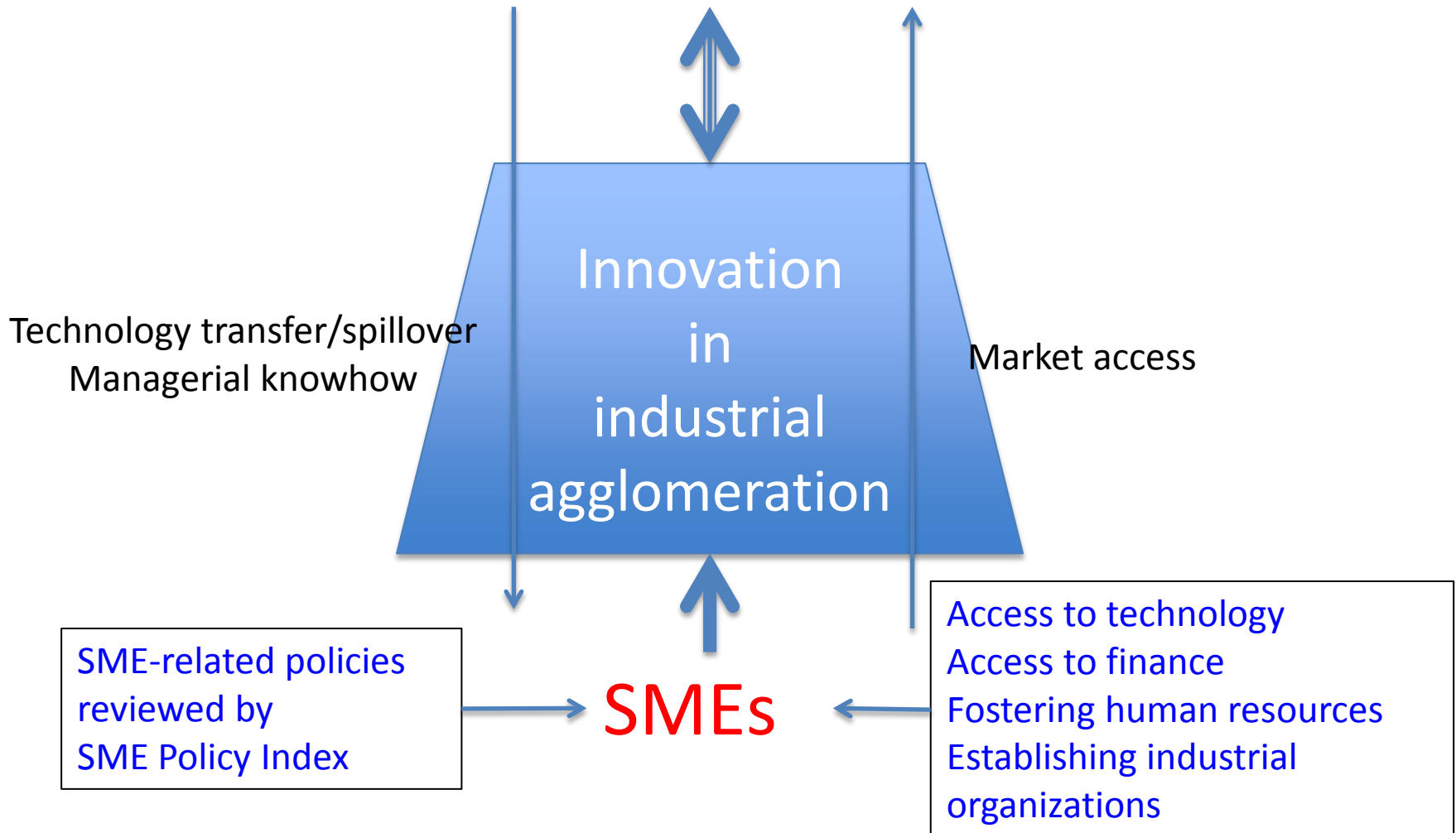
Production networks (“networks”; fragmentation and agglomeration; intra-firm in short distance, arm’s length in long distance)



Source: Ando and Kimura (2010).

Innovation in industrial agglomeration

International production networks



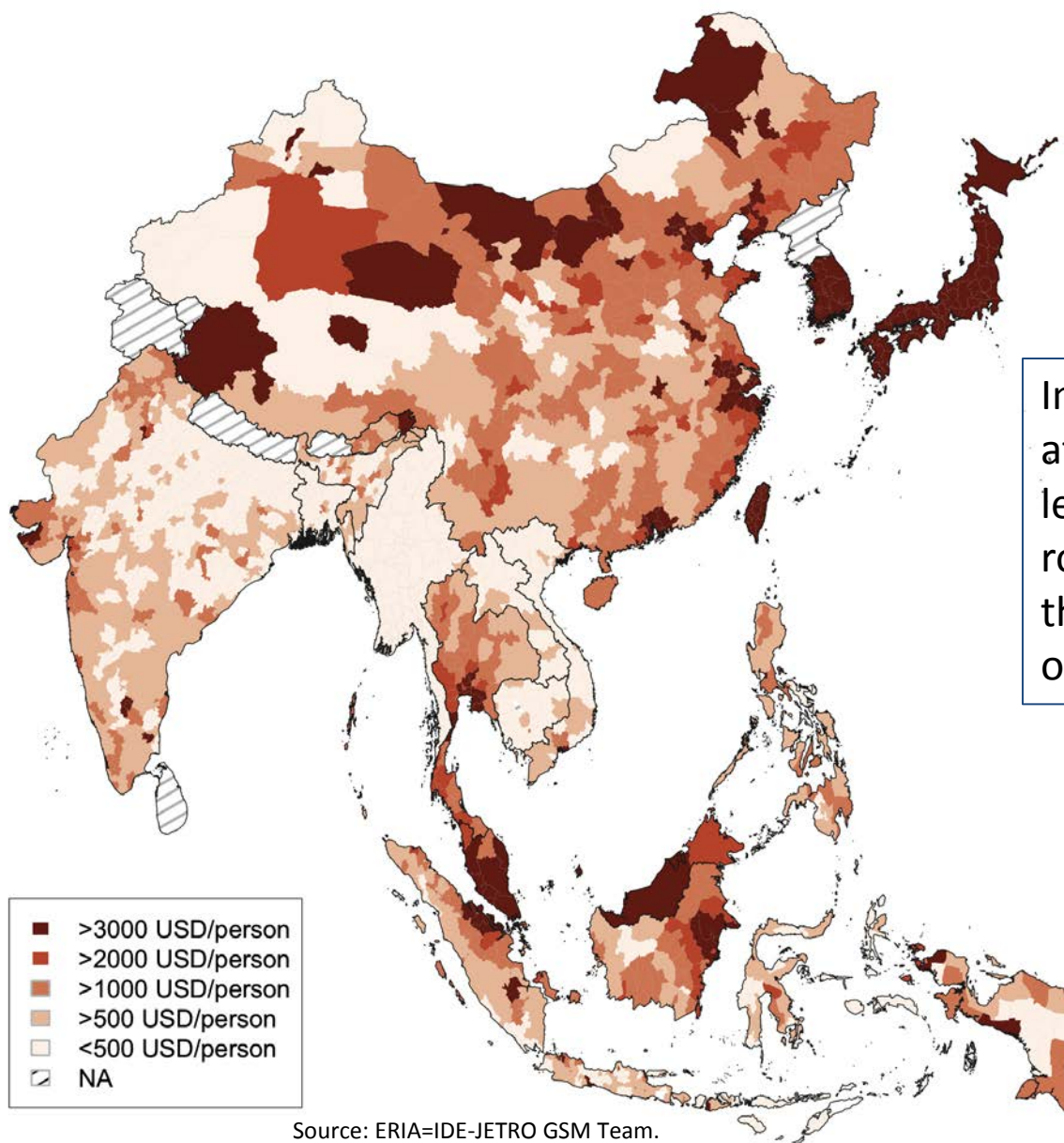
GDP per capita in 2018 in extended East Asian countries

GDP / capita (USD)	2000	2005	2010	2018 Estimate
Singapore	22,791	28,498	44,697	57,134
Brunei	18,477	26,587	31,982	43,537
Malaysia	3,992	5,421	8,634	14,567
Thailand	1,983	2,825	4,992	9,284
Indonesia	800	1,291	2,986	5,569
Philippines	1,055	1,209	2,155	4,191
Vietnam	402	637	1,174	2,474
Lao PDR	308	474	1,105	2,354
Cambodia	288	455	753	1,583
Myanmar	178	216	742	1,218
Australia	20,734	35,570	56,220	74,635
Japan	37,304	35,781	42,917	47,281
New Zealand	13,833	27,118	32,455	44,527
South Korea	11,347	17,551	20,540	33,644
China	946	1,726	4,423	10,711
India	465	727	1,356	2,249

Source: World Economic Outlook, International Monetary Fund.

Notes: grey indicates GDP per capita ≤ USD 1,000; yellow indicates USD 1,000 < GDP per capita ≤ USD 3,000; light orange indicates USD 3,000 < GDP per capita ≤ USD 10,000; green indicates GDP per capita ≥ USD 10,000.

Income levels at the provincial level (2005)



Income gaps are still huge at both country and provincial level. There is still a lot of room for taking advantage of the mechanics of fragmentation of production.

Source: ERIA=IDE-JETRO GSM Team.

Border development with enhancement of connectivity

GDP per capita (2005)

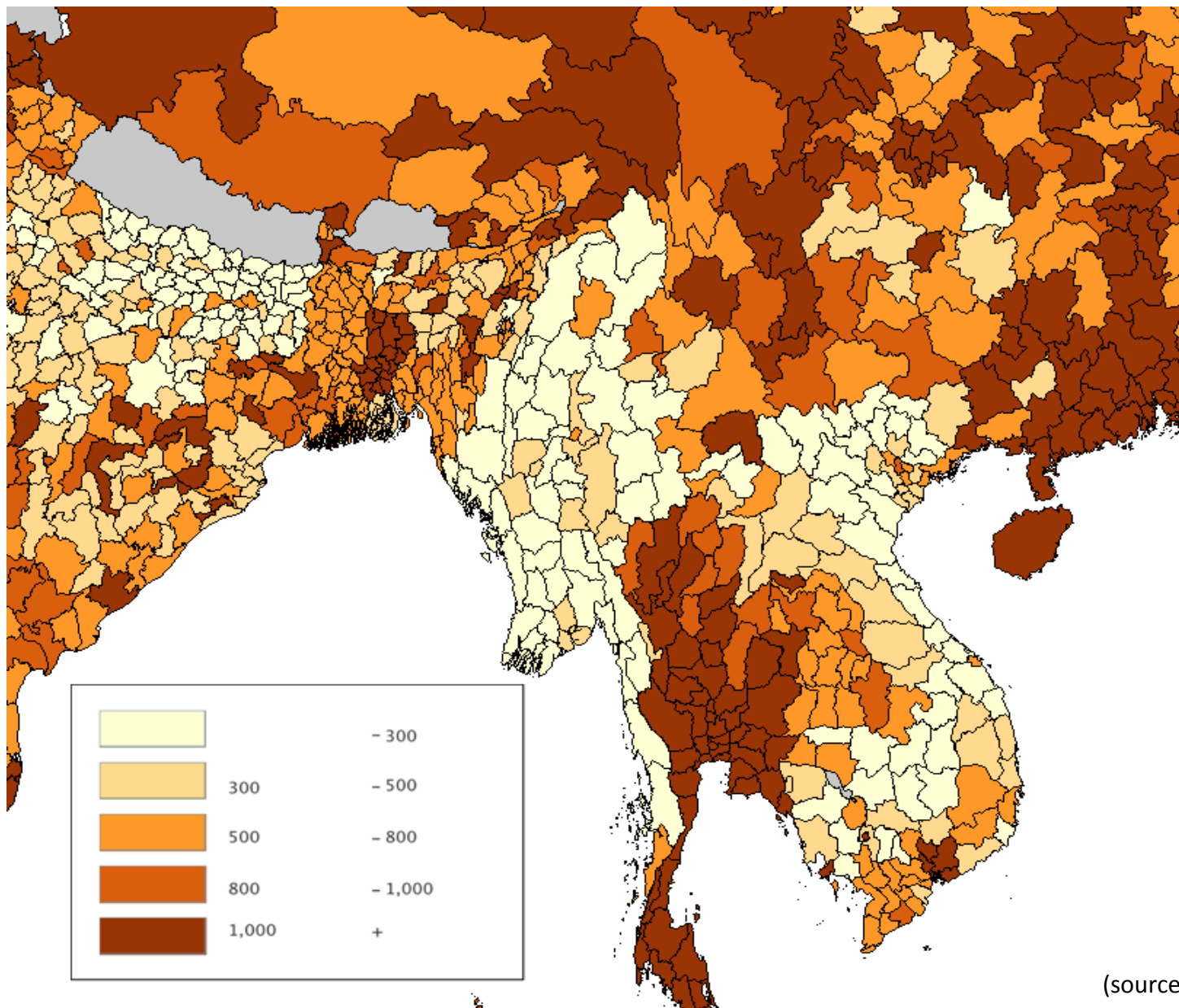
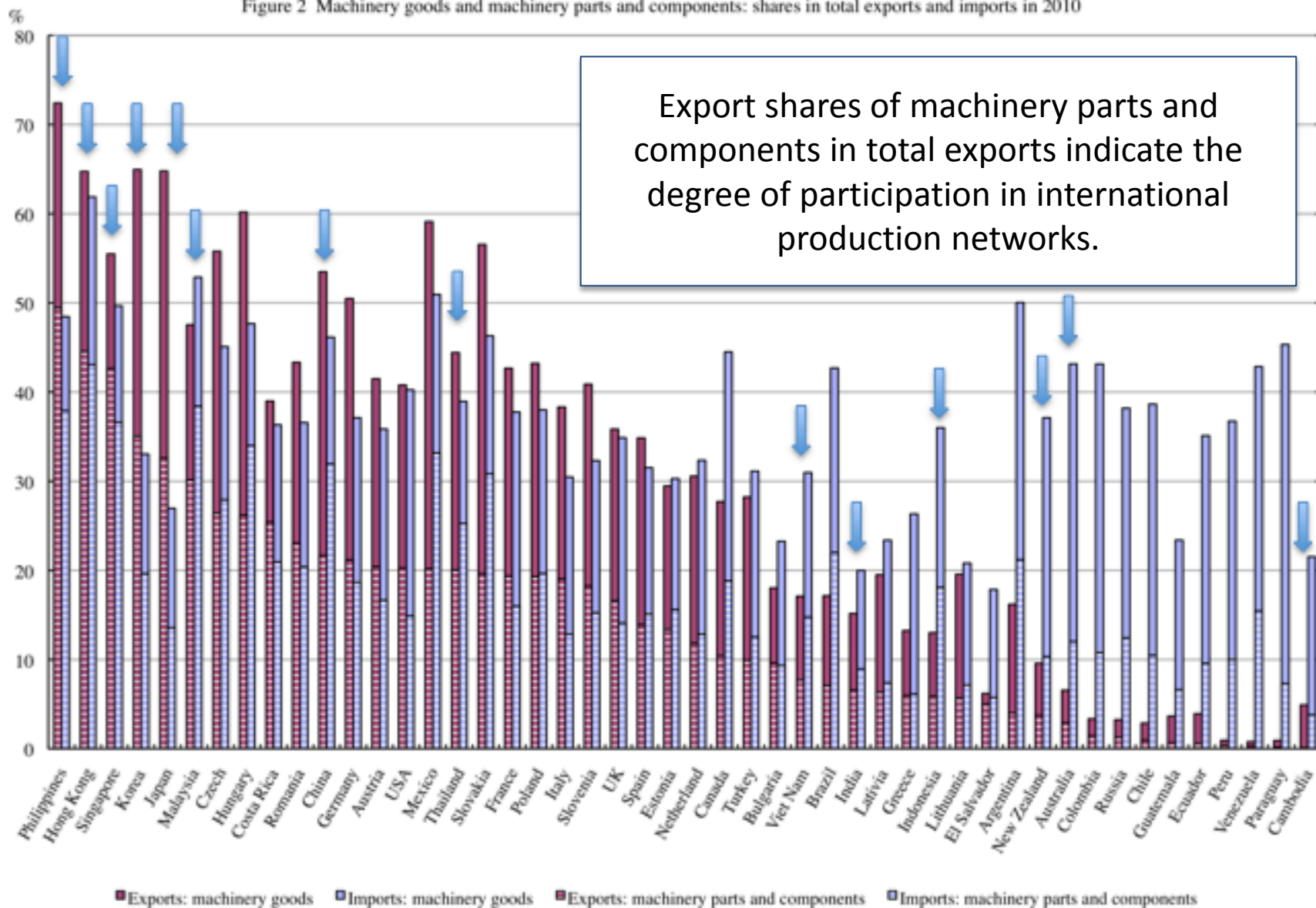


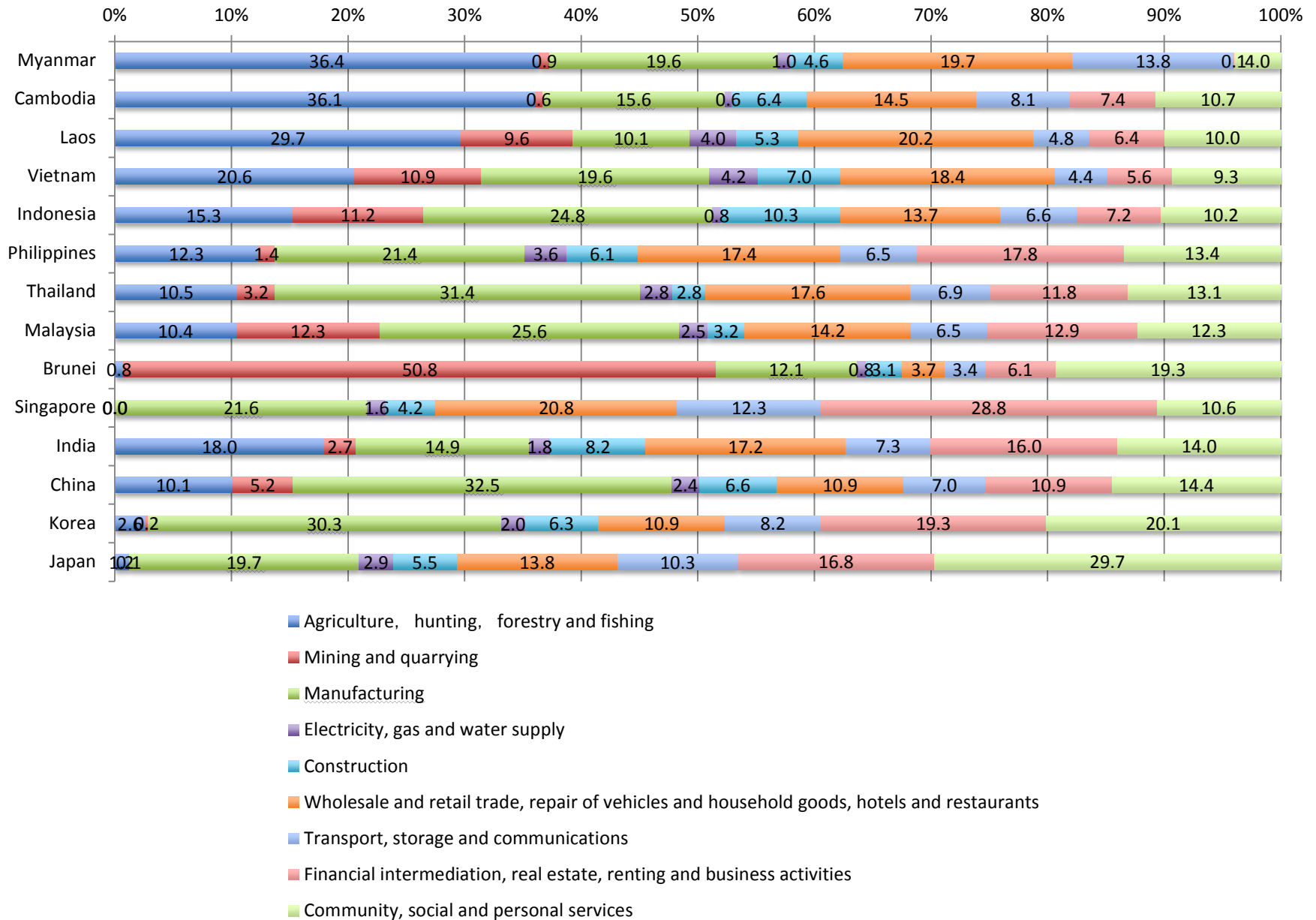
Figure 2 Machinery goods and machinery parts and components: shares in total exports and imports in 2010



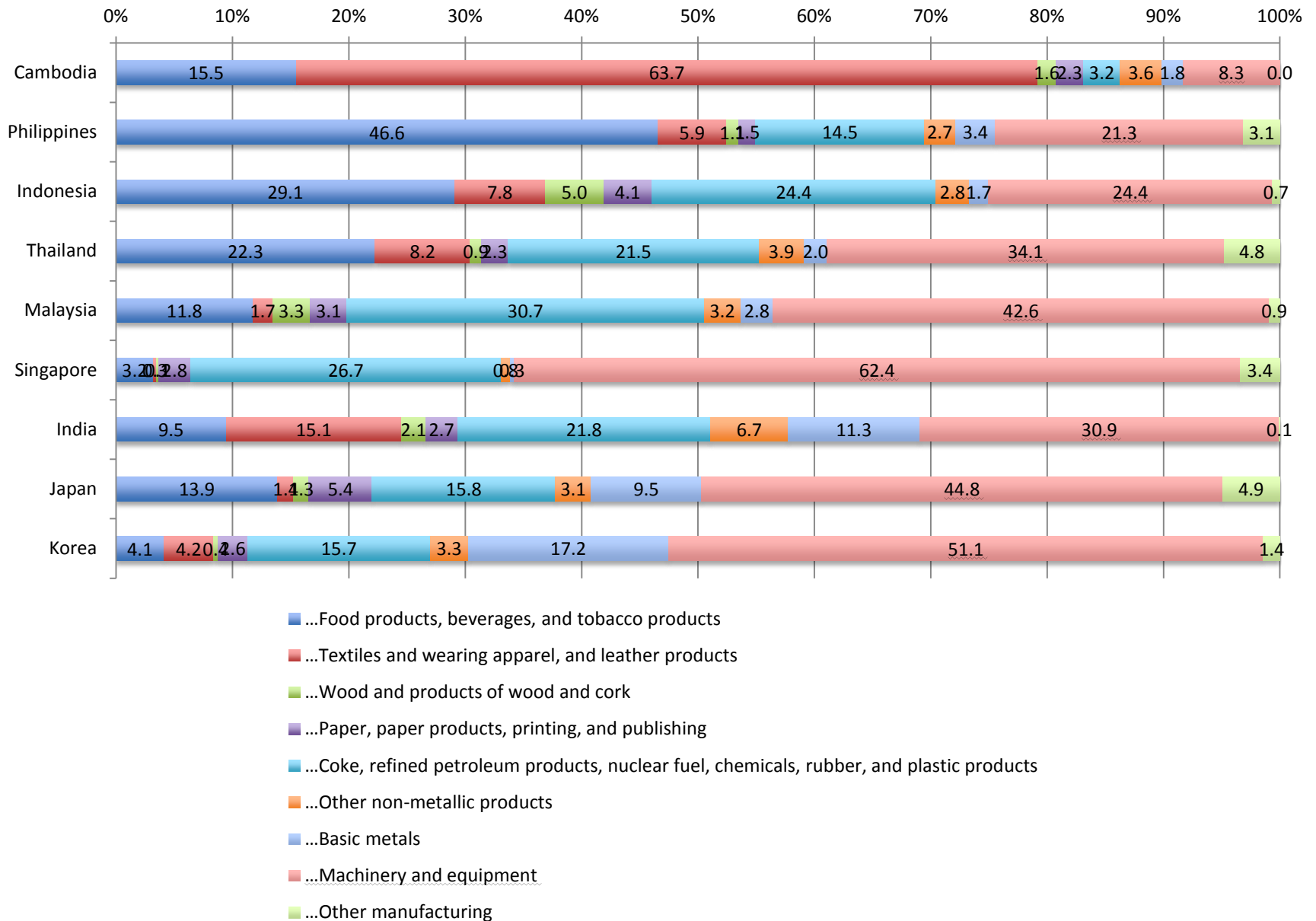
Data: authors' calculation, using data available from UN comtrade.

Source: Ando and Kimura (2013).

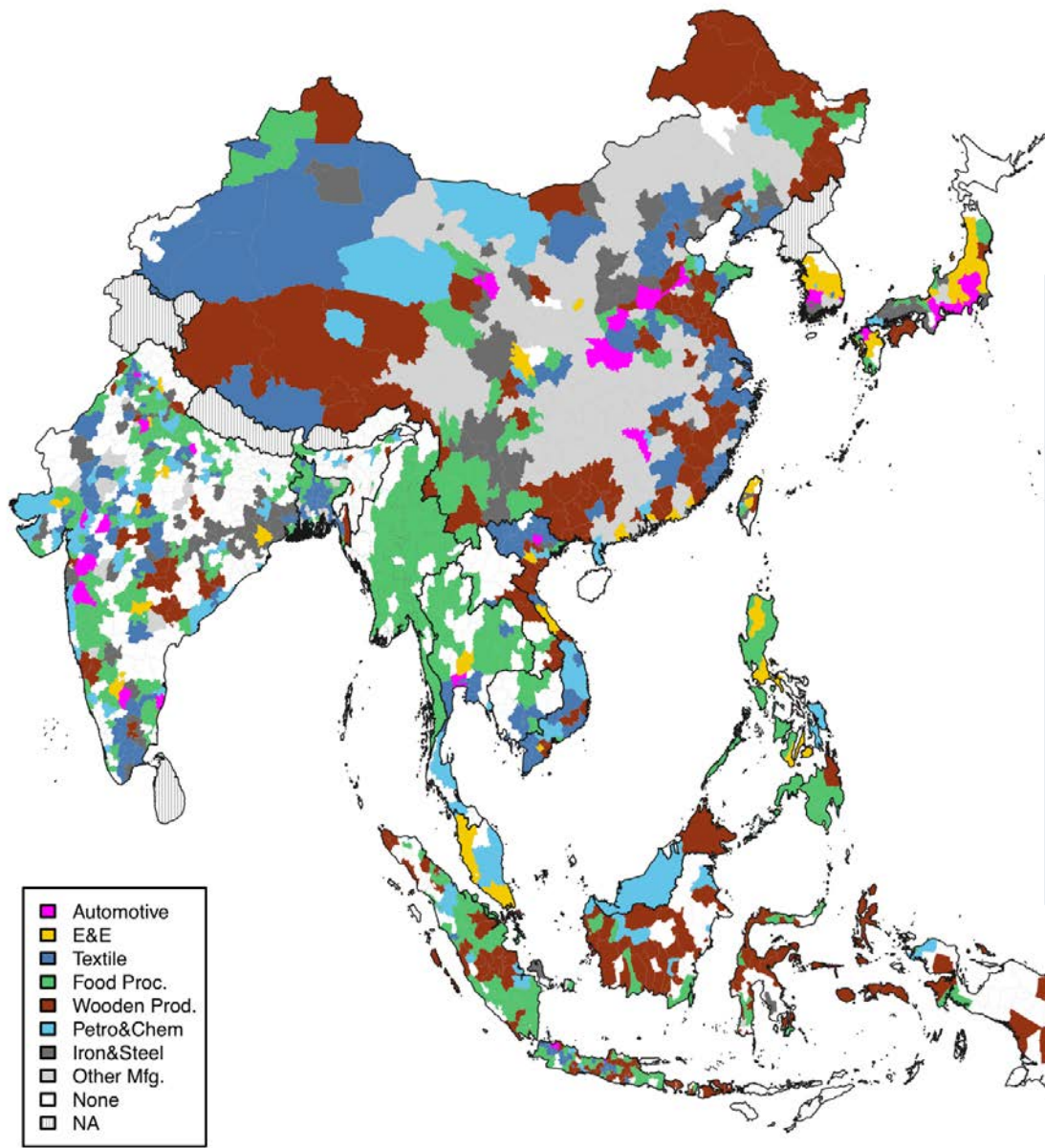
Industry shares of value added, 2010



Industry shares of value added in manufacturing, 2010



Location of manufacturing sub-sectors (2005)

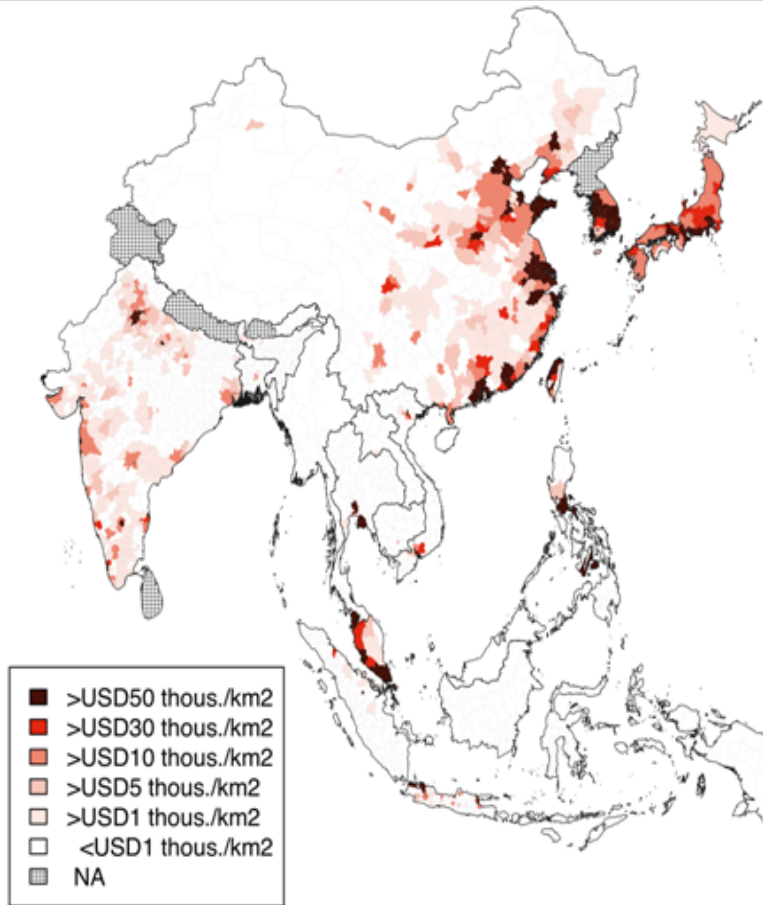


Automotive and E&E:
connected with
regional production networks
with fast, high-frequency
transactions.

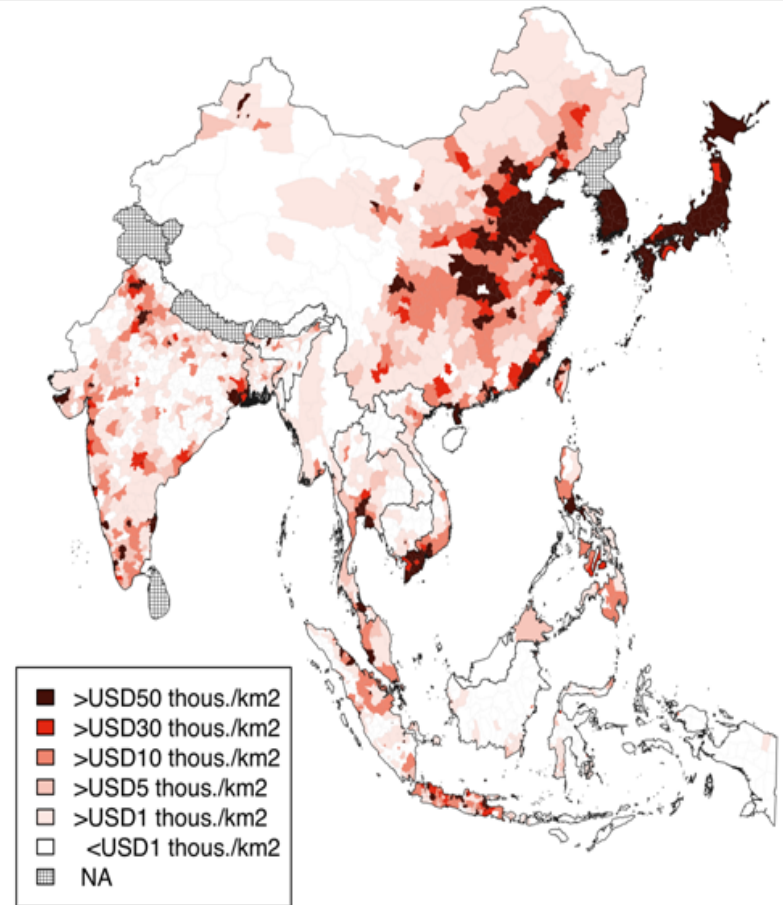
Textile and others:
sometimes linked to
global value chains typically
with slow, low-frequency
transactions.

Production networks and distribution of the industries: A few clusters in ASEAN (2005)

E&E industry



Food processing industry



Source: IDE-GSM team

3. Transactions in production networks








- Four layers of transactions (Kimura (2010))
 - Local, sub-regional, regional, and global
 - Gradation from the 2nd to the 1st unbundling
- Better logistics links make unbundling be upgraded from the 1st to the 2nd. Find bottlenecks!
- Electronics vs. automobiles
 - Service link costs, trust, power balance, modular vs. total integration
- Once participating in production networks in machinery industries, other manufacturing and services will find new business models.

Four layers of transactions in production networks: illustration

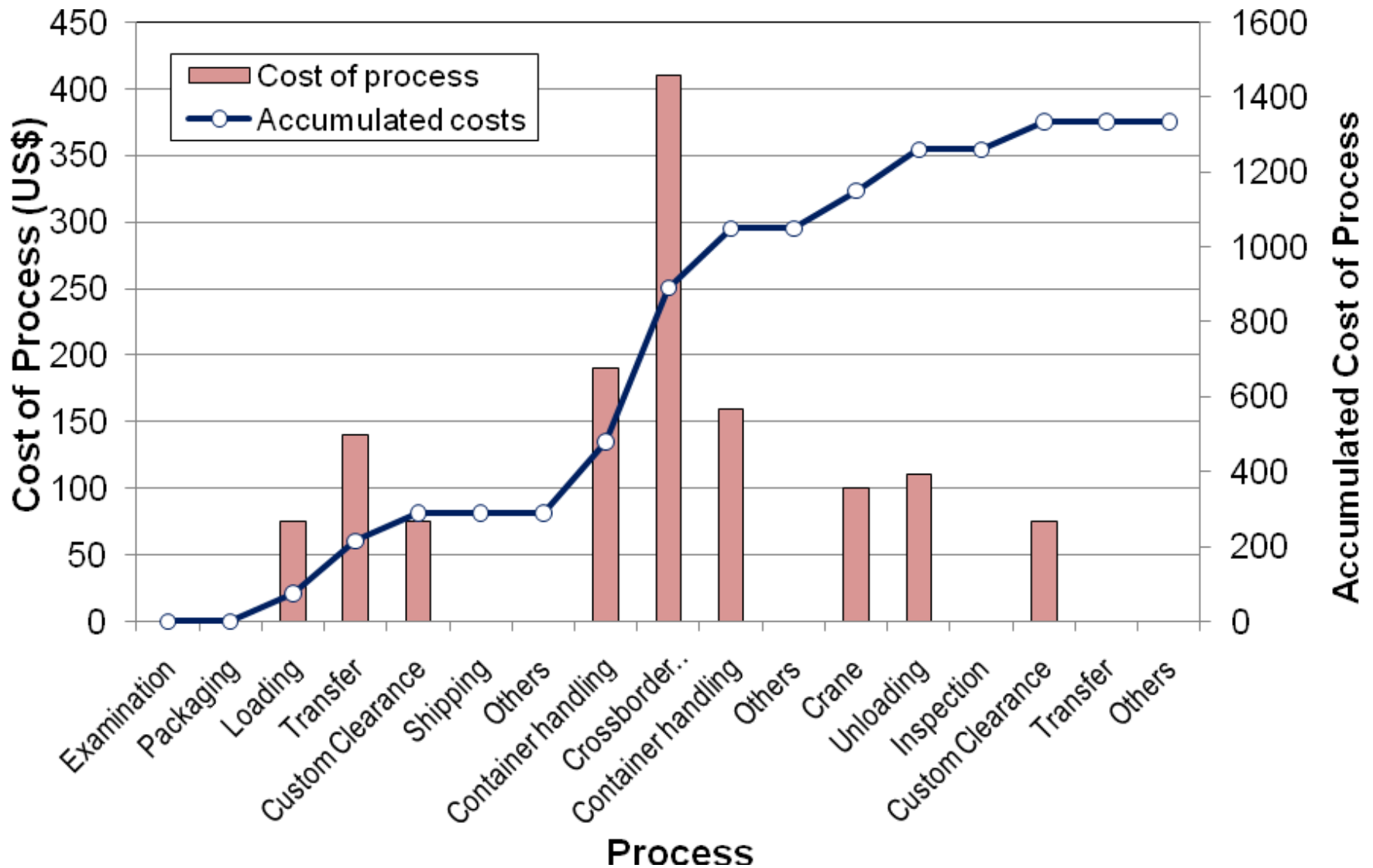
	Layer 1 (within industrial agglomeration)	Layer 2 (within sub-region)	Layer 3 (within region)	Layer 4 (global)
Lead time	Less than 2.5 hours	One to seven days	One to two weeks	Two weeks to two months
Frequency of transactions	Once per day or more	Once per week or more	Once a week	Once a week or less
Transport mode	Trucks	Trucks/ships/airplanes	Ships/airplanes	Ships/airplanes
Trip length	Less than 100km	100-1,500km	1,500-6,000km	More than 6,000km

Source: Kimura (2010). Slightly modified.

Determinants of the layer choice

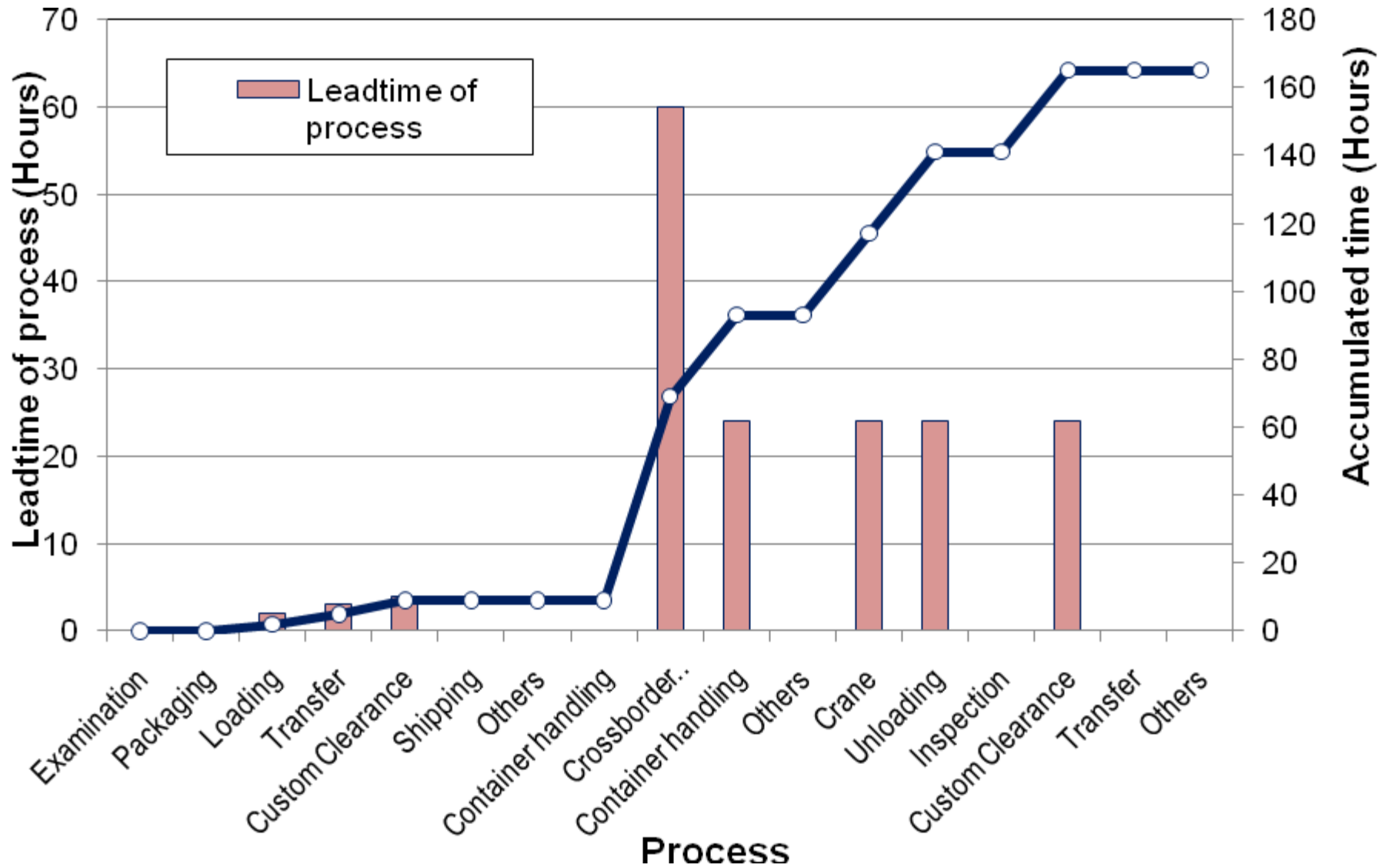
	Layer 1	Layer 2	Layer 3	Layer 4	
<Fragmentation (geographical)>					
Network set-up costs	small			large	
Service link costs (e.g., transport costs)	large				small
Location advantages (e.g., wages, economies of scale)	small			large	
<Fragmentation (disintegration)>					
Intimacy in inter-firm relationship					
Intra-firm vs. arm's length (inter-firm)	Intra-firm			Arm's length (inter-firm)	
Trust	weak			strong	
Power balance	unbalanced			balanced	
Architecture of firm-to-firm interface					
Modular vs. total integration	integration			modular	

➤ The relation between processes and costs



Source: JETRO (2009).

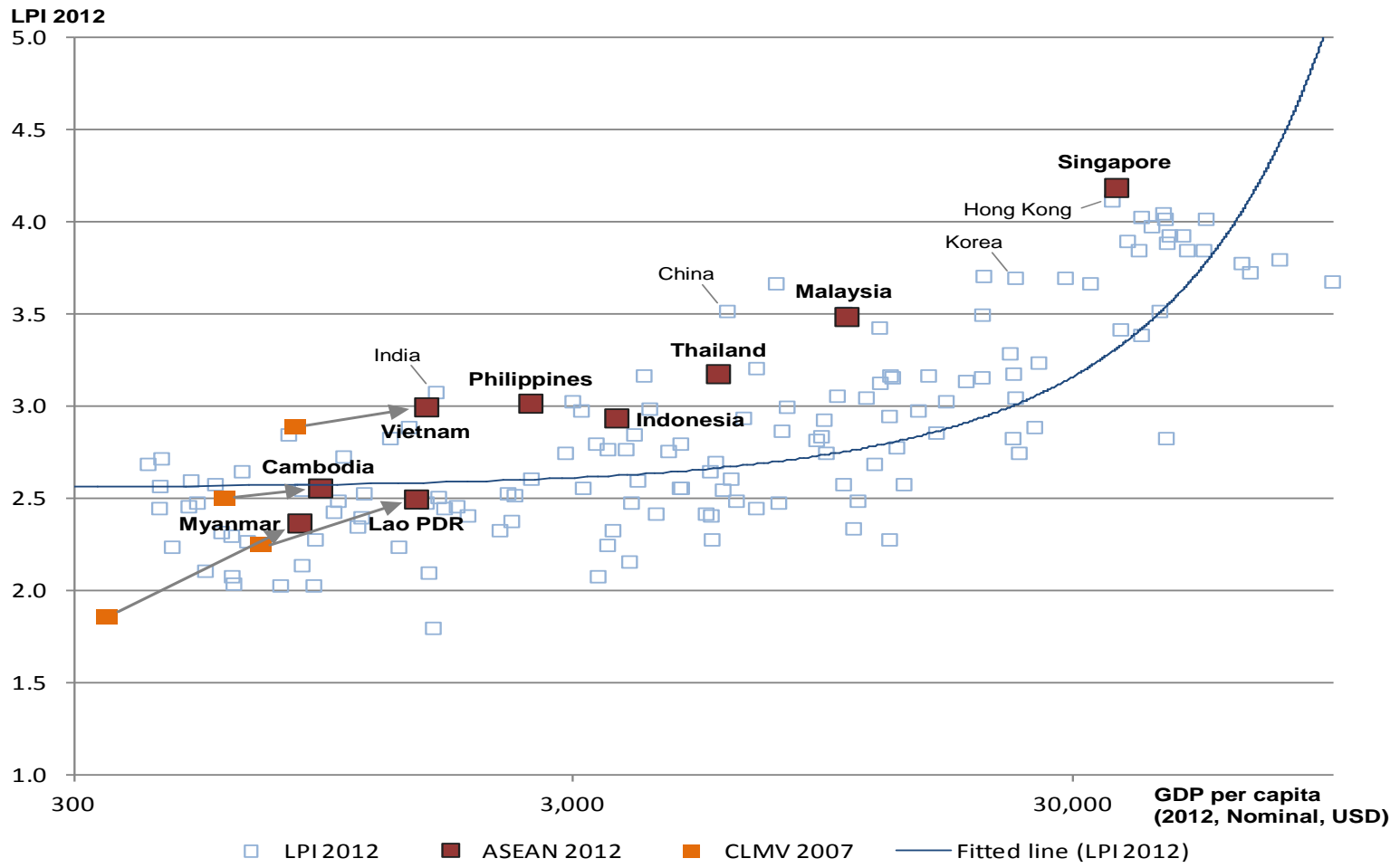
➤ The relation between processes and lead time



Source: JETRO (2009).

Logistics Performance Indexes and GDP per capita

- Logistics Performance Indexes (LPIs) in forerunner ASEAN and East Asia are relatively higher than the world average; CLMV has room for improvement.

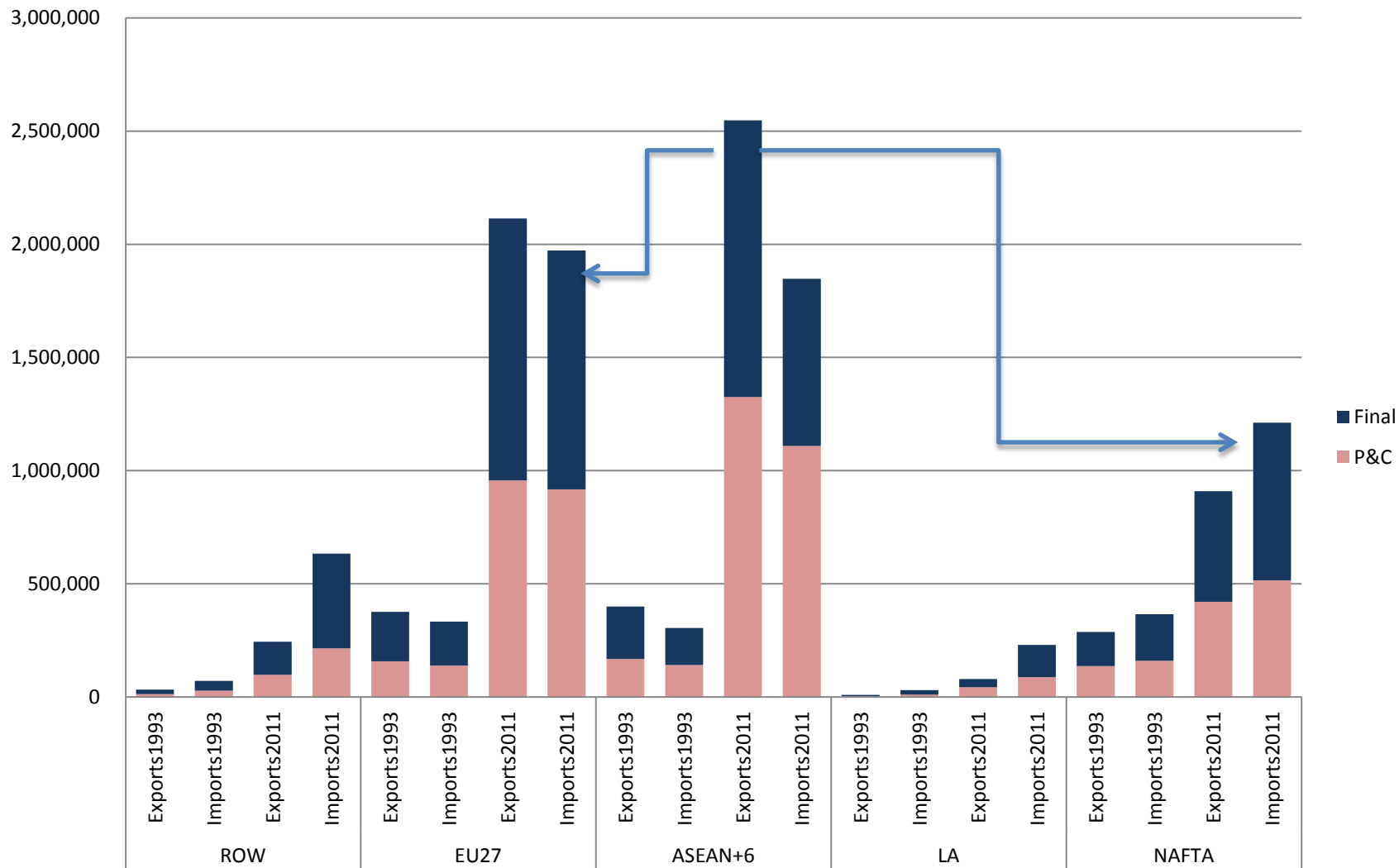


Source: Modified from ERIA (2010), original data from the World Bank.

4. Three centers and their evolution

- Three centers of production networks in machinery industries
 - East Asia, North America, and EU
- In electronics, East Asia has dominated NA and EU by supplying parts and components.
 - Production networks in electronics can be global.
- In automobiles, each region has developed its own industrial agglomeration.
 - Due to economic logic and policies, production networks in automobile industry are mainly local, supplemented by sub-regional/regional.

Machinery exports and imports by regions (US\$ millions)



Source: Chang and Kimura (2013).

5. How can Central Asia take advantage?

- Slow global value chains for natural resources
- Long-distance but punctual/reliable logistics links by railway
 - Revolution in inter-continental links? Check economic viability!
- The 2nd unbundling in electronics industry?
 - Reliable air links are the key.
- Services?
 - Not easy to upgrade, but have a dream with creativity.

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