

APO-Keio Special Lecture

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# International Production Networks and a New Development Strategy in East Asia

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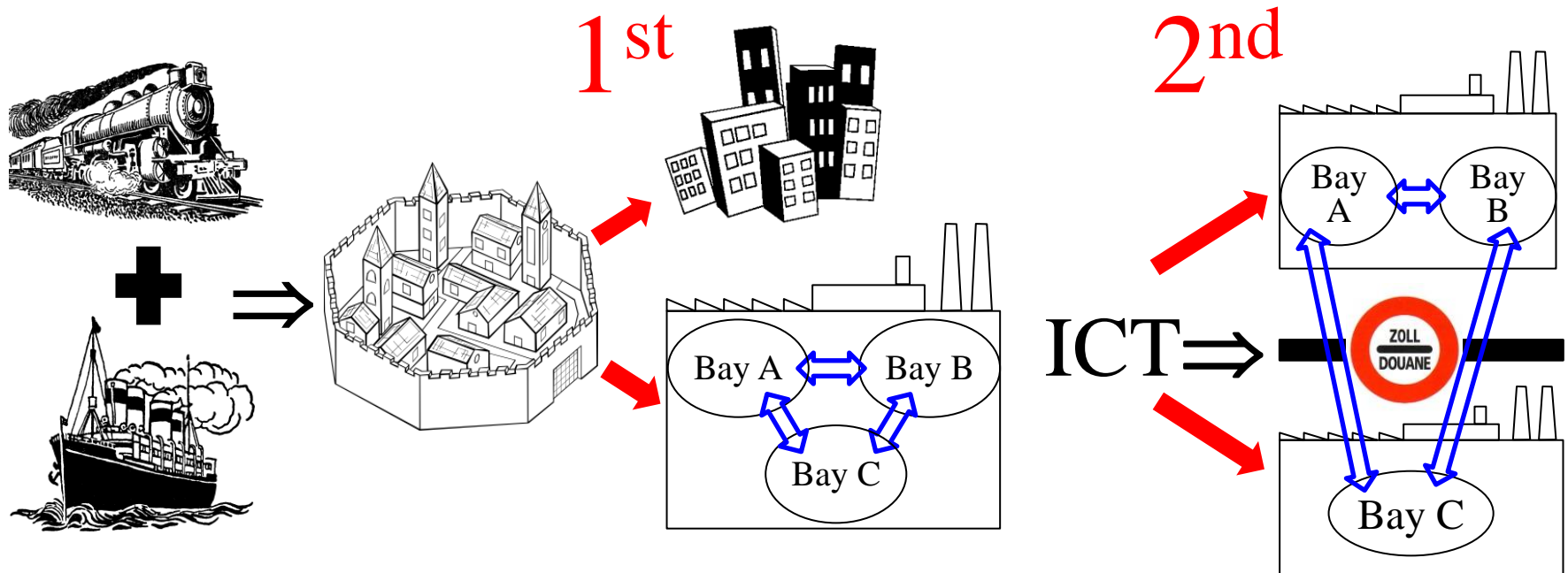
and East Asia (ERIA)

# 1. The 1<sup>st</sup> to the 2<sup>nd</sup> unbundling

- The international division of labor: from industry-by-industry to production process/task wise
- The 2<sup>nd</sup> unbundling in East Asia, most advanced, particularly in manufacturing
  - Dominance of machinery industries
  - Fragmentation of production and the formation of industrial agglomeration

# The 2<sup>nd</sup> Unbundling

- The 2<sup>nd</sup> 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 2<sup>nd</sup> unbundling in the manufacturing sector is most advanced in East Asia.

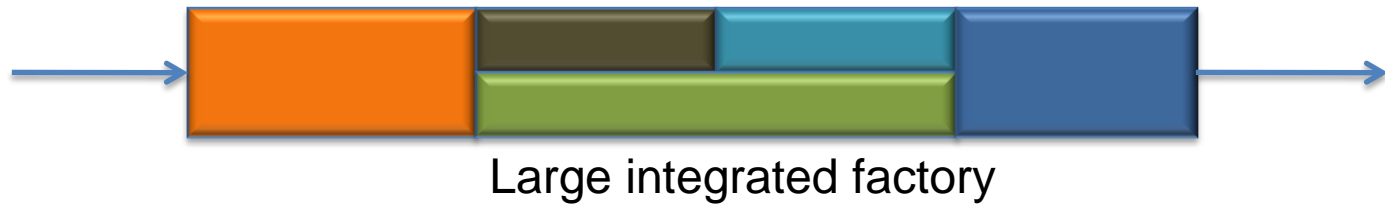


Source: Baldwin (2011).

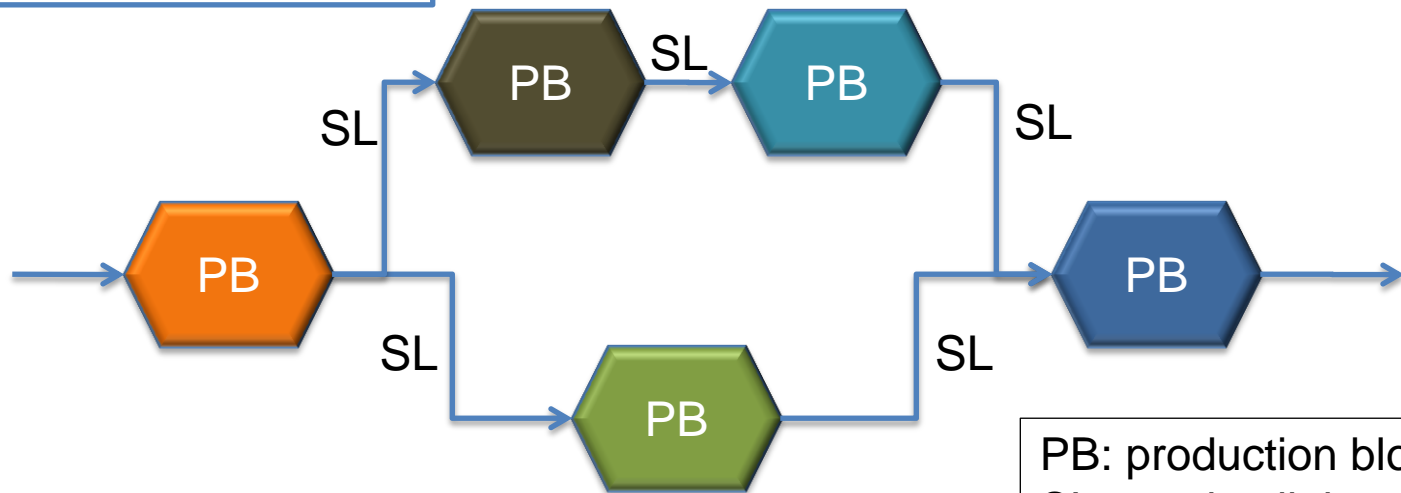
# ➤ The fragmentation theory: Production blocks and service links

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 (Jones and Kierzkowski (1990)).

## Before fragmentation

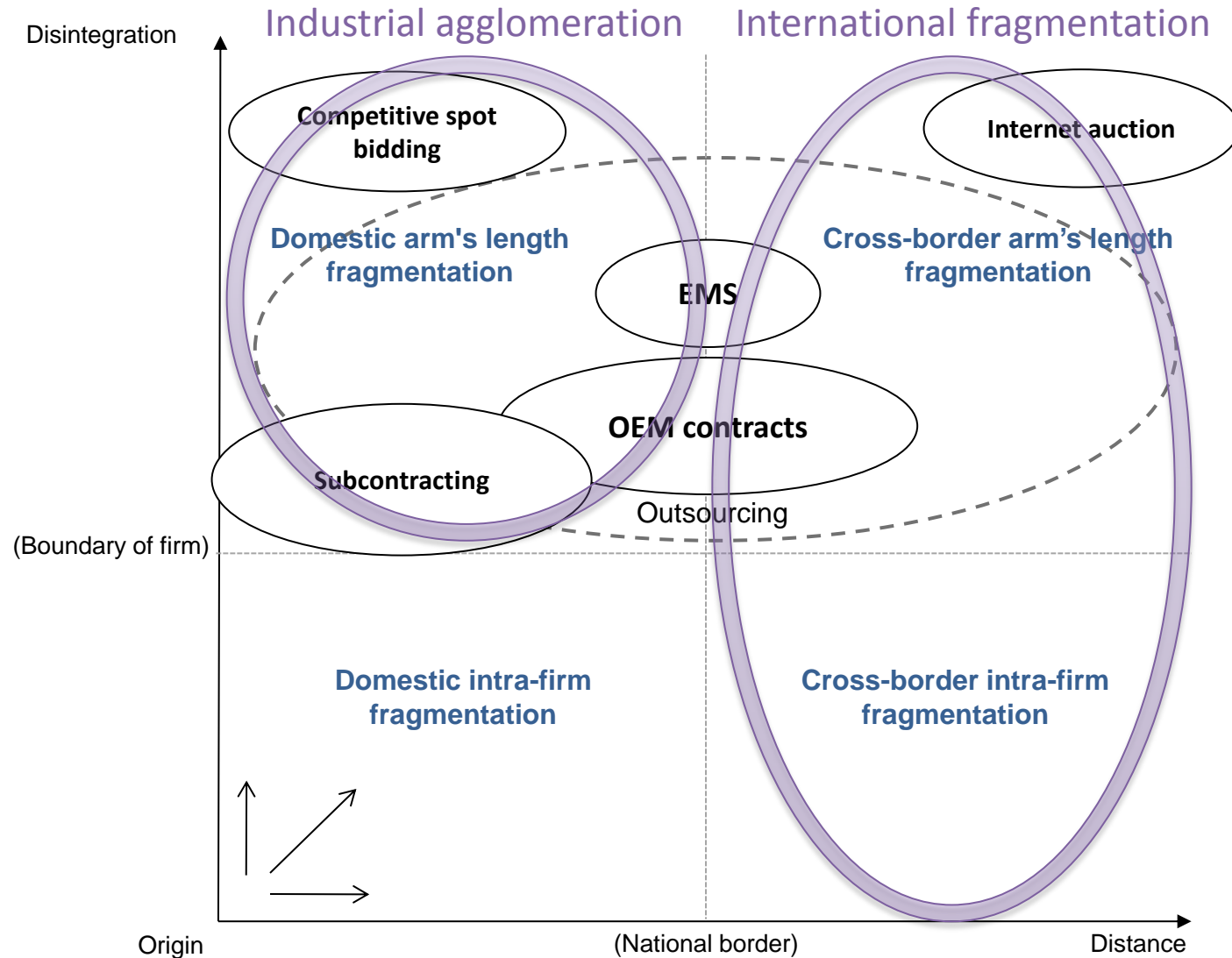


## After fragmentation



PB: production blocks  
SL: service links

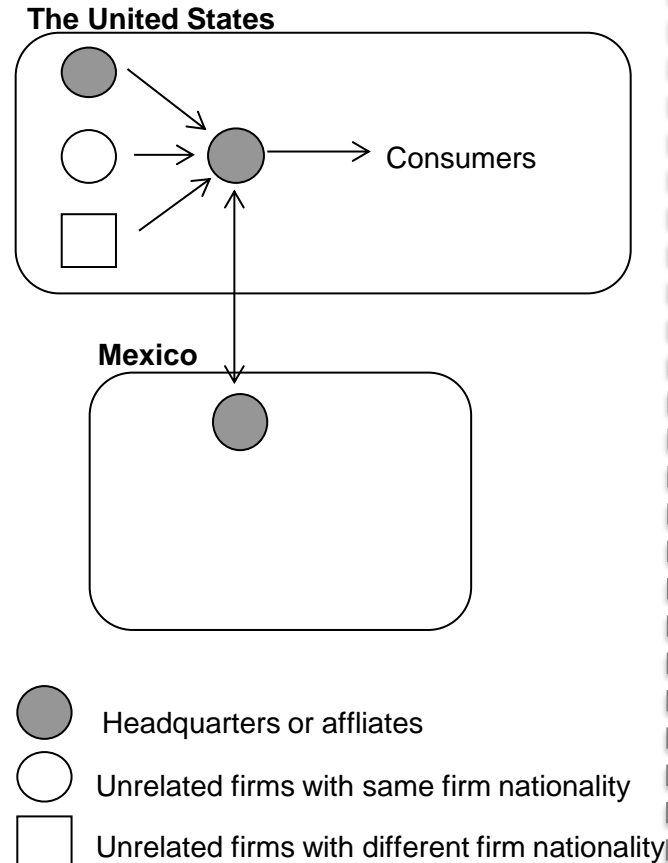
# ➤ Two-dimensional fragmentation: An illustration



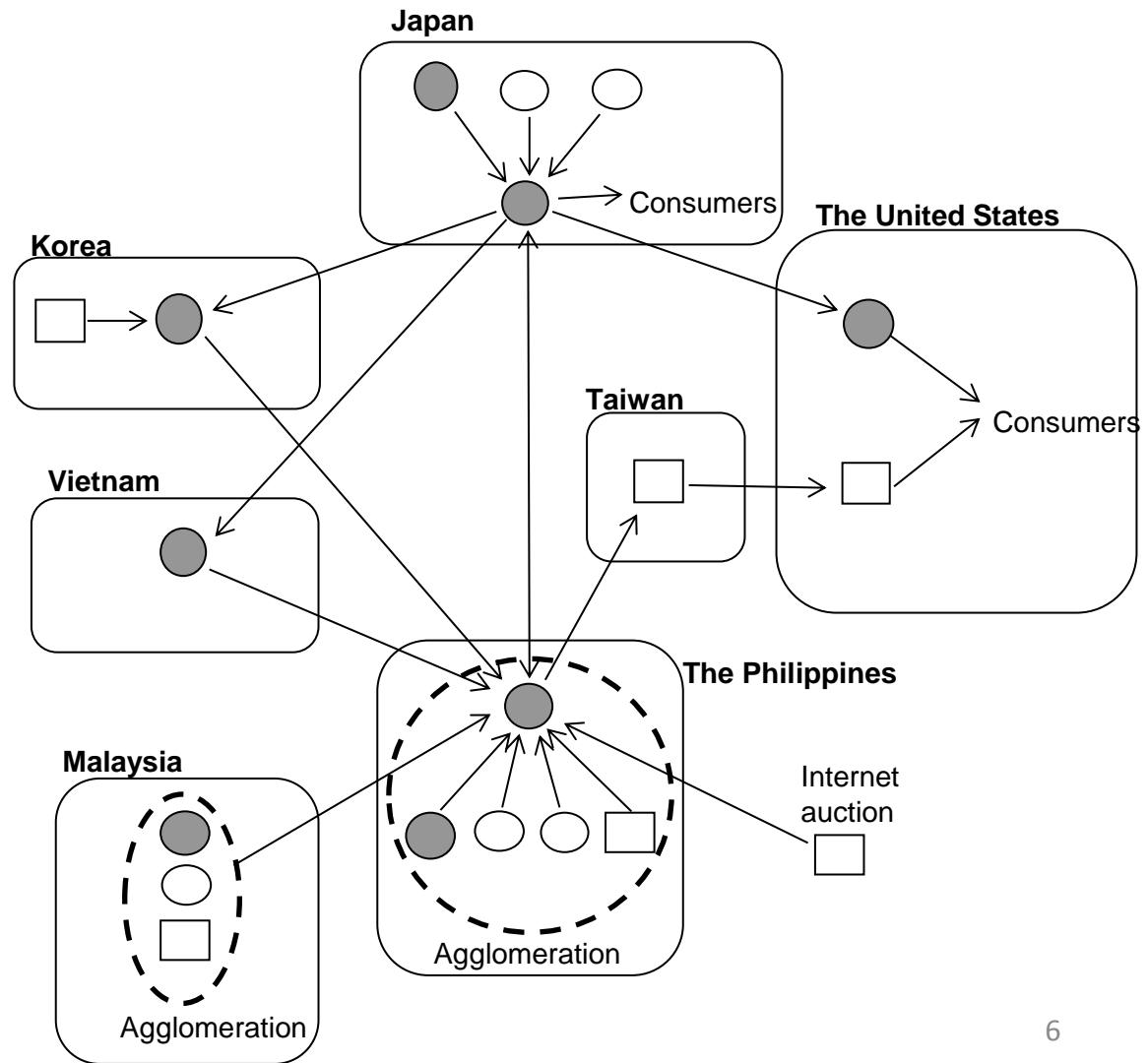
Source: Kimura and Ando (2005).

# The evolution of the 2<sup>nd</sup> unbundling

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

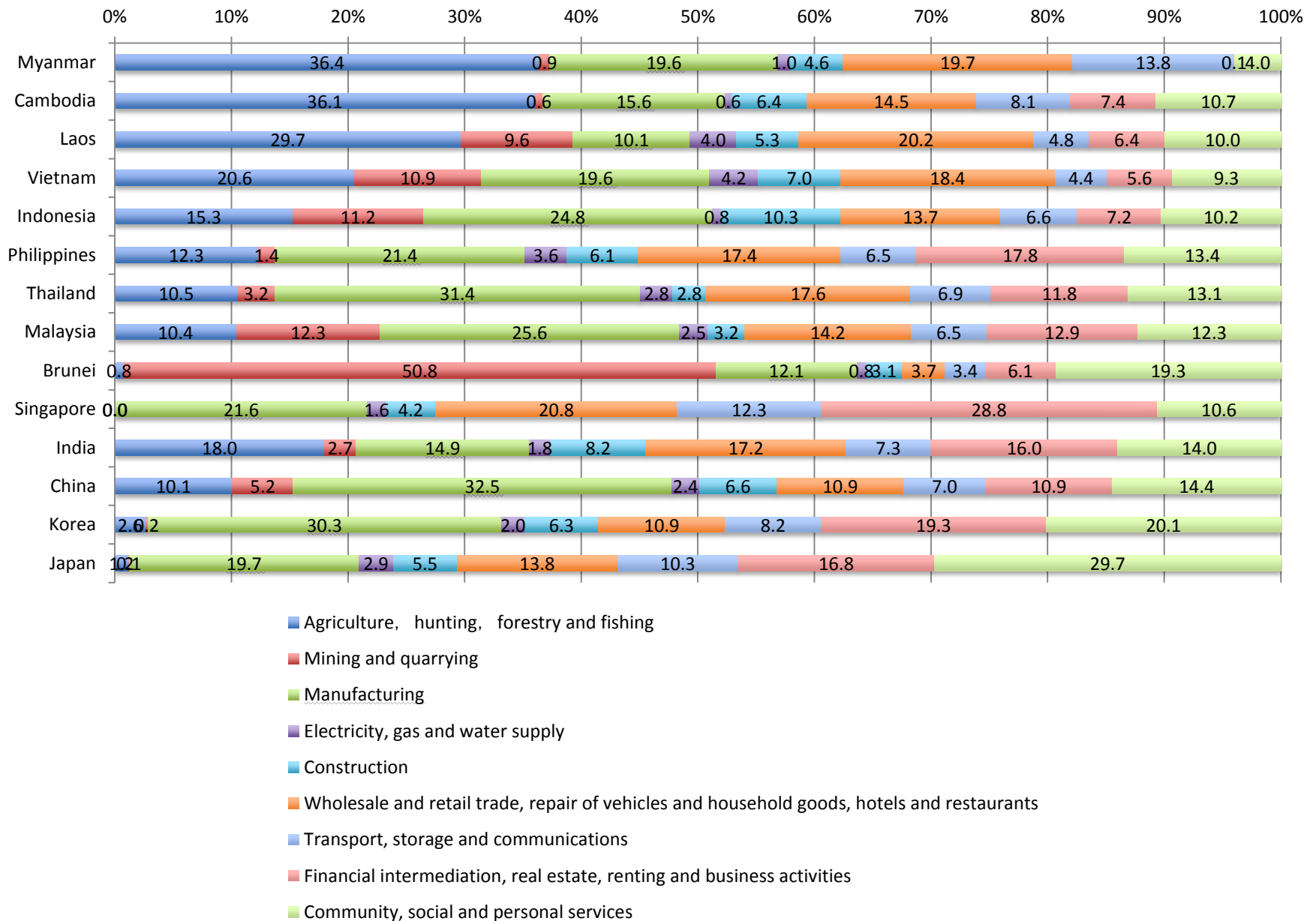


## Production networks ("networks"; fragmentation and agglomeration; intra-firm in short distance, arm's length in long distance)



Source: Ando and Kimura (2010).

# Industry shares of value added, 2010



## Industry shares of value added in manufacturing, 2010

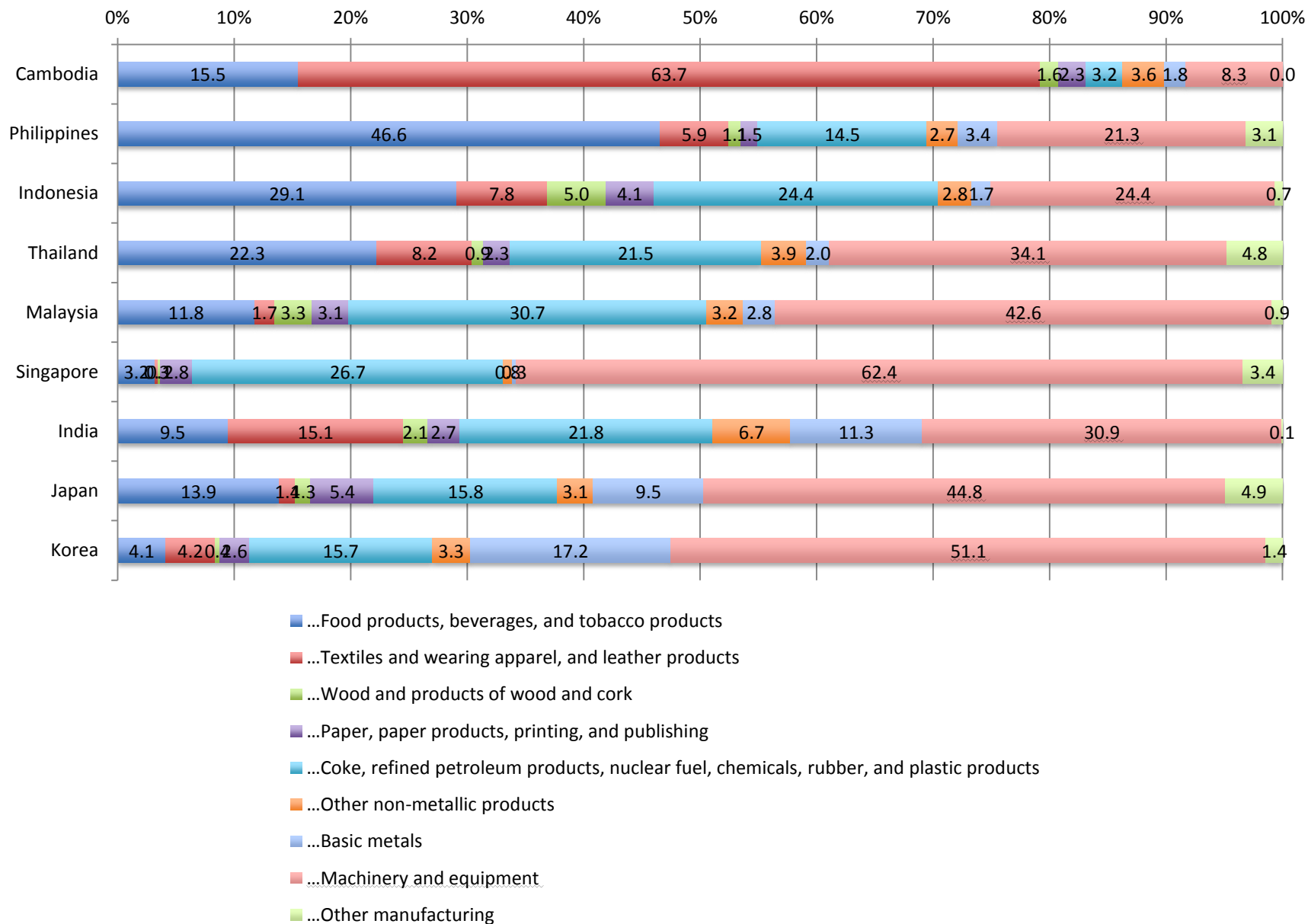
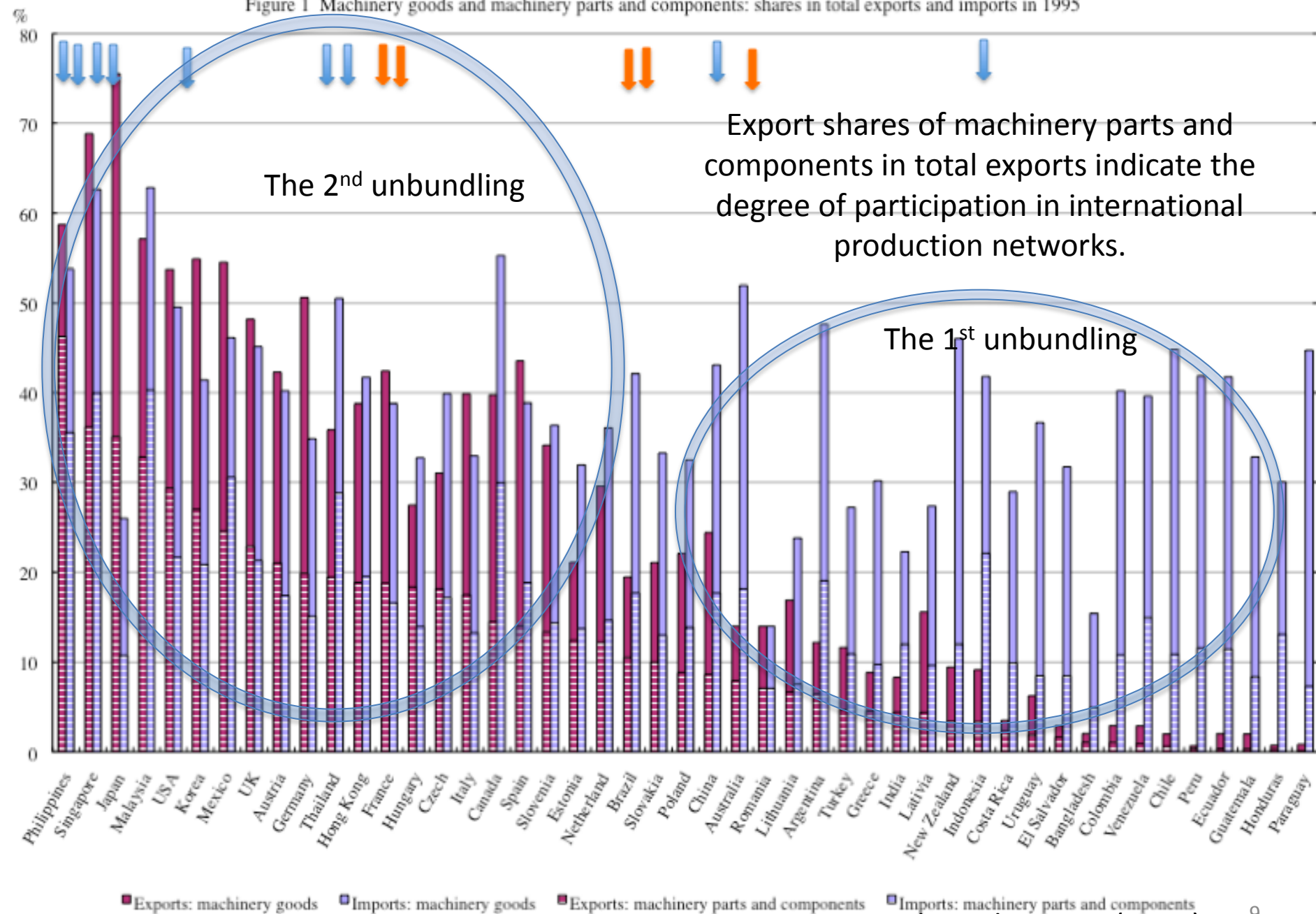


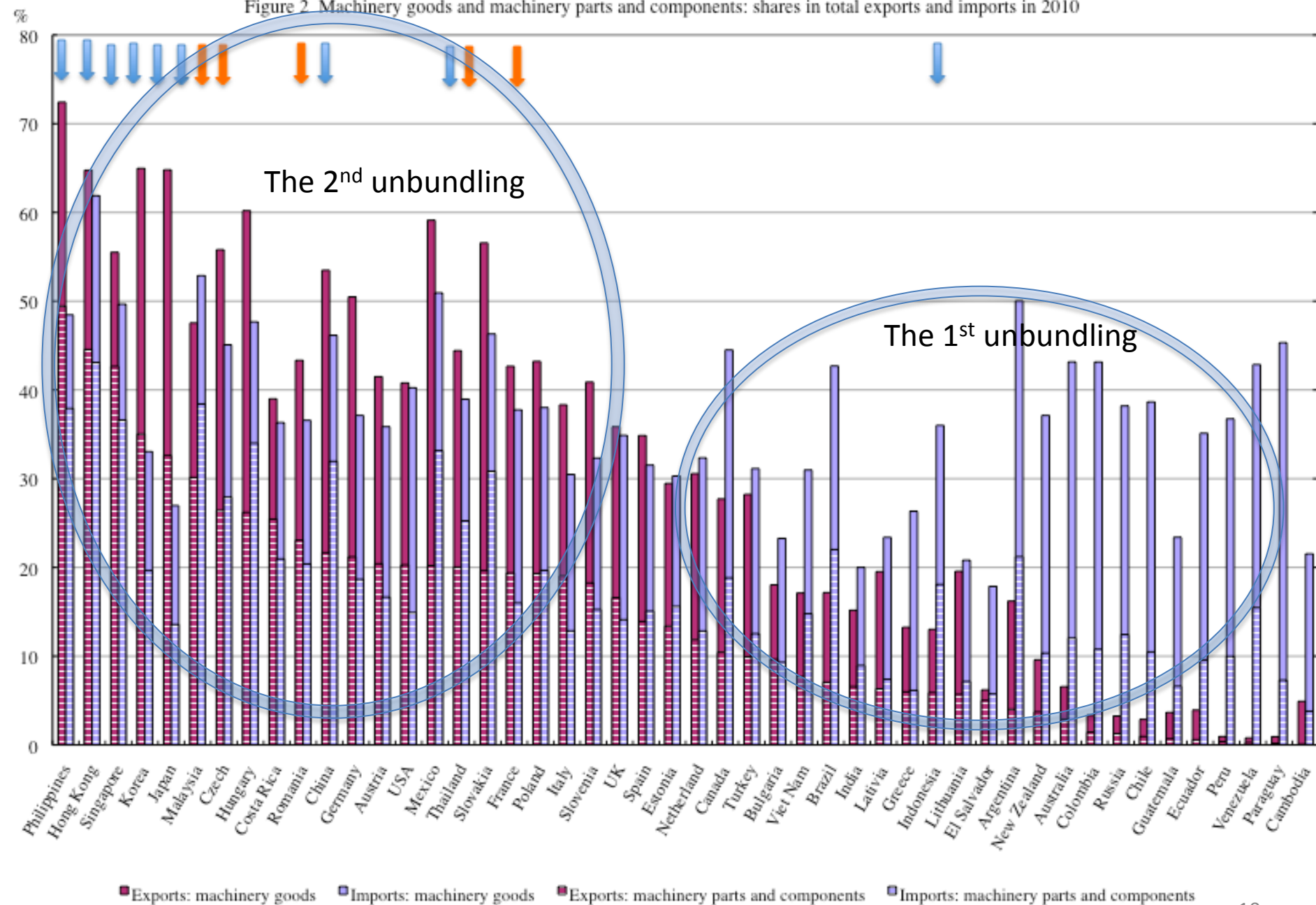


Figure 1 Machinery goods and machinery parts and components: shares in total exports and imports in 1995



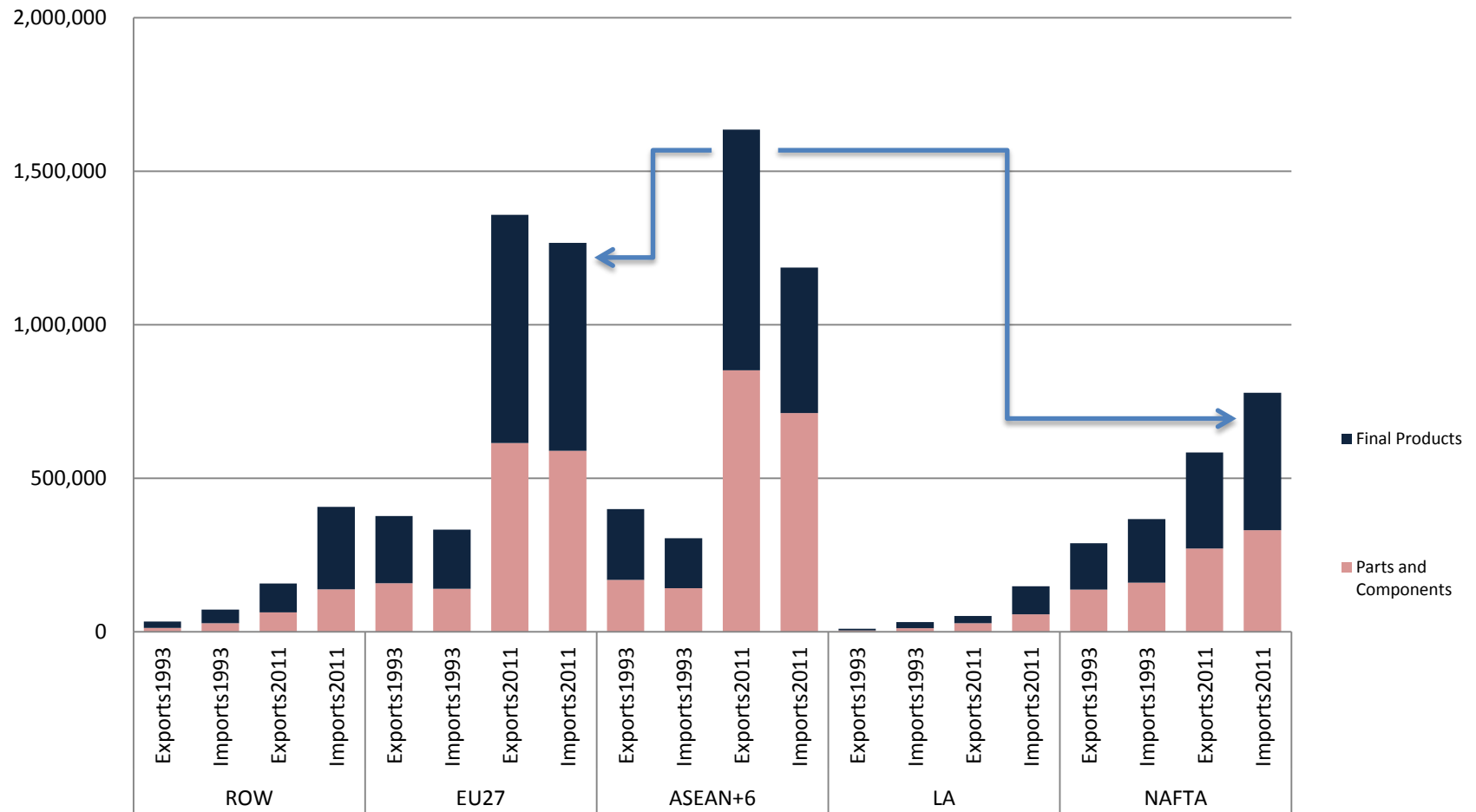
Source: Ando and Kimura (2013).

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



Source: Ando and Kimura (2013).

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



Source: Chang and Kimura (2013).

# The size of industrial agglomerations in East Asia

**Jakarta's cluster size**



**Bangkok's cluster size**



Source: ERIA.

## 2. Fundamental changes in development strategies

- Latecomers: jump-start industrialization by participating in international production networks
  - Reduction in three types of costs
- Middle-income countries: agglomeration, industrial upgrading, innovation

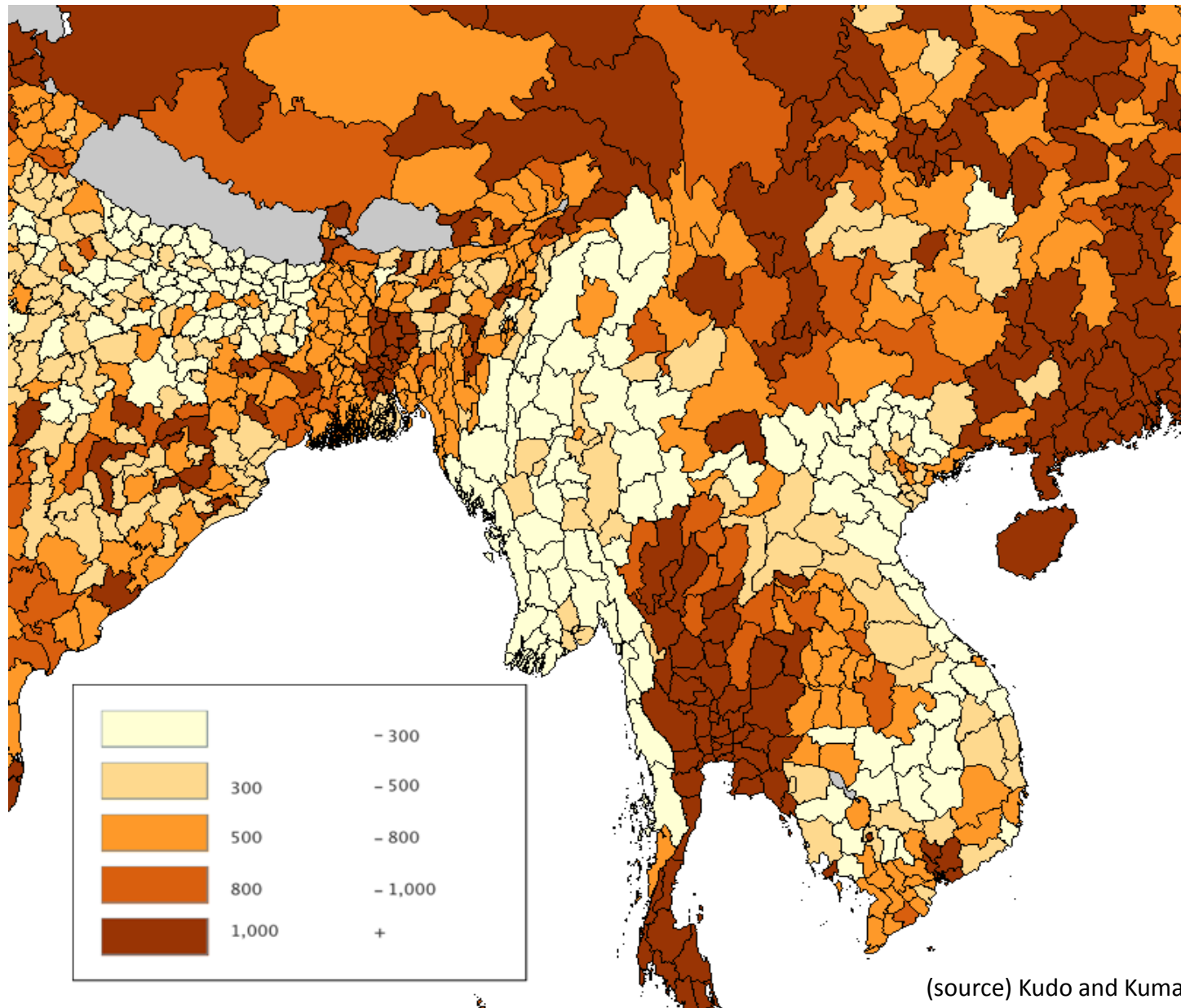
# Policies for enhancing the 2<sup>nd</sup> unbundling

	Reduction in network set-up cost	Reduction in service link cost	Reduction in production cost per se
<b>High-level FTAs</b>	<ul style="list-style-type: none"> <li>• Investment liberalization</li> <li>• IPR protection</li> <li>• Competition policy</li> </ul>	<ul style="list-style-type: none"> <li>• Tariff removal</li> <li>• Trade facilitation</li> <li>• Enhancing institutional connectivity</li> </ul>	<ul style="list-style-type: none"> <li>• Liberalization of production-supporting services</li> <li>• Investment liberalization</li> </ul>
<b>Development agenda</b>	<ul style="list-style-type: none"> <li>• Investment facilitation/promotion</li> </ul>	<ul style="list-style-type: none"> <li>• Enhancing physical connectivity (including hard and soft logistics infrastructure development)</li> <li>• Reducing transaction cost in economic activities</li> </ul>	<ul style="list-style-type: none"> <li>• Upgrading infrastructure services such as electricity supply and EPZs</li> <li>• Enhancing agglomeration effects through SME development</li> <li>• Strengthening innovation</li> </ul>

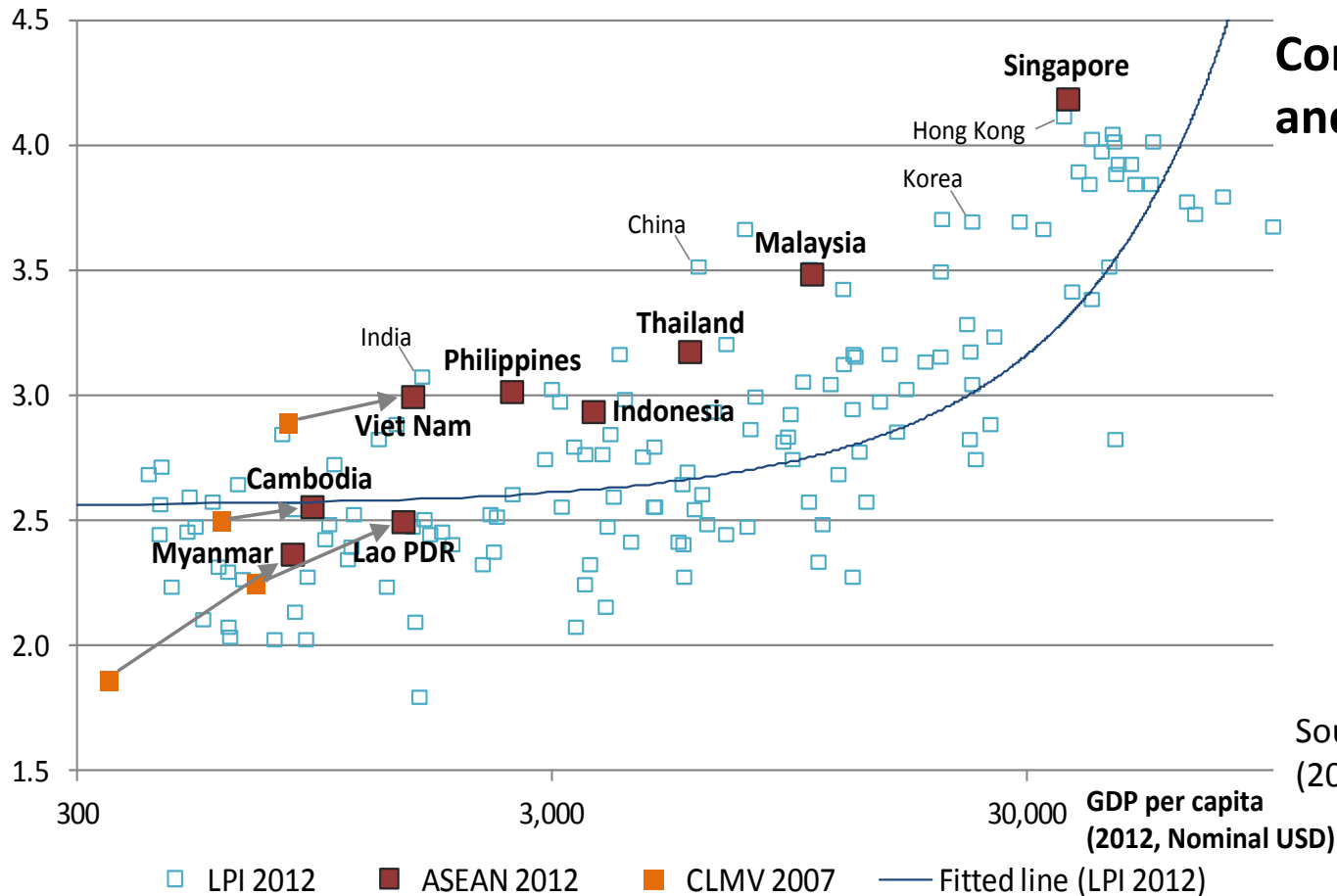


# Border Development with Enhancement of Connectivity

GDP per capita (2005)



LPI 2012



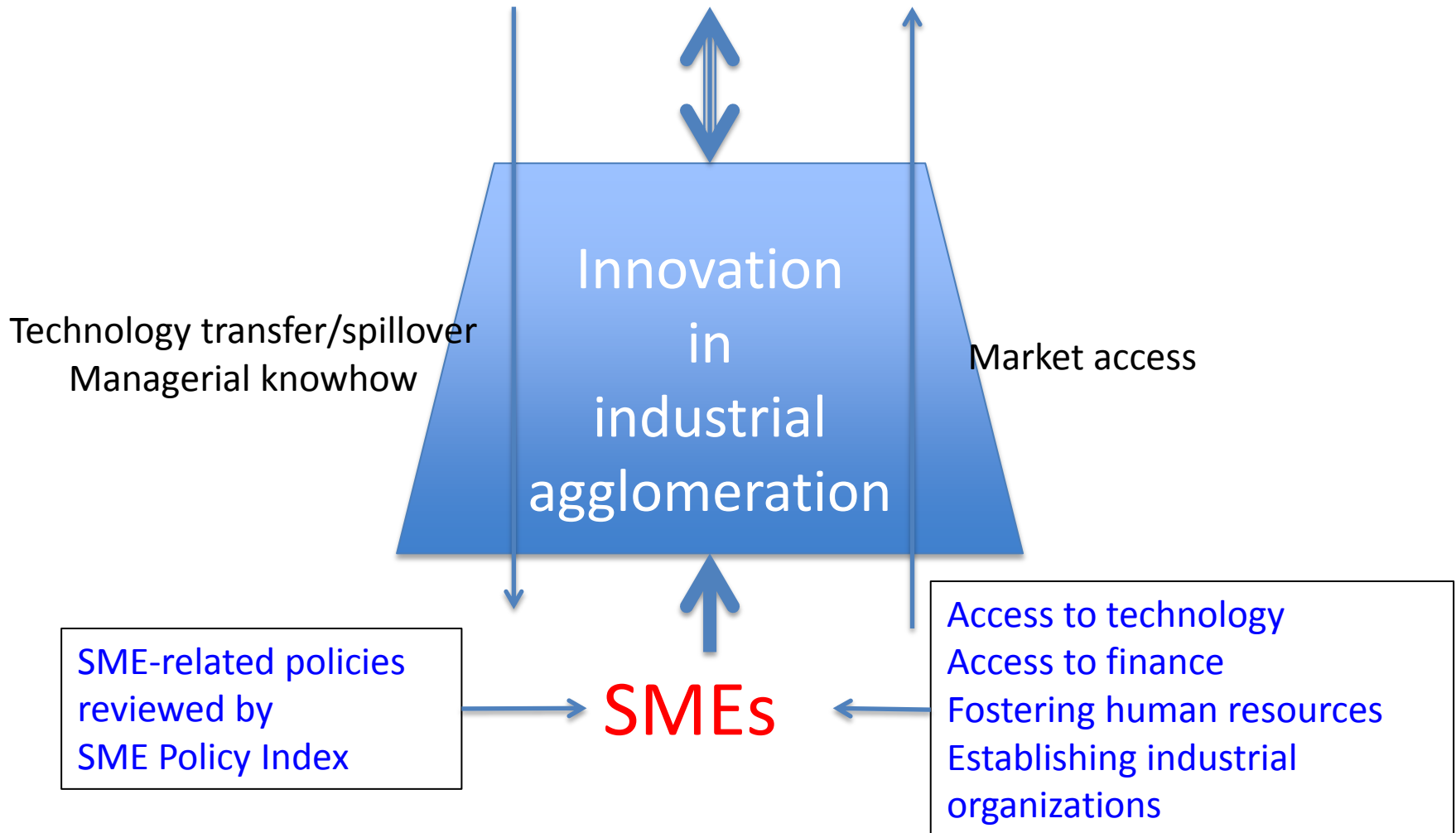
Source: Modified from ERIA (2010)

- LPIs in forerunner ASEAN and East Asia are relatively higher compared with the indices obtained by regression
  - = higher LPI compared with GDP/GNI per capita
  - = better access between primary cities to primary ports
  - = high competitiveness in the global market



# Innovation in industrial agglomeration

## International production networks



**Table 4. Research and development expenditure (% of GDP) in  
ASEAN**

Indonesia (2001)	Malaysia (2002)	Singapore (2002)	Thailand (2002)	Philippines (2002)	Brunei D. (2002)	Cambodia (2002)	Lao PDR (2002)	Myanmar (2002)	Vietnam (2002)
0.048	0.653	2.153	0.244	0.146	0.016	0.0450	0.036	0.162	0.193

*Source:* World Bank - World Development Indicators (WDI), themselves from the United Nations Educational, Scientific, and Cultural Organization (UNESCO) Institute for Statistics.

*Notes:* Expenditures for research and development are current and capital expenditures (both public and private) on creative *work undertaken systematically to increase knowledge, including knowledge of humanity, culture, and society, and the use of knowledge for new applications. R&D covers basic research, applied research, and experimental development.*

**Table 5. Research and development expenditure (% of GDP),  
comparison with selected neighboring countries**

China (2002)	Japan (2002)	Korea, Rep. (2002)	India (2002)
1.070	3.165	2.404	0.737

Source & notes: c.f. previous table.

Source: ERIA (2012).

# 3. Impact on developed countries

- International production networks, important sources of competitiveness of corporate firms
- Can be good for the whole country, too.
  - Relative expansion of domestic operations by expanding multinationals (Ando and Kimura (2012a))
- Stability/resiliency of production networks
  - Ando and Kimura (2012b) on Japan's exports with the GFC and the East Japan Earthquake
  - Todo, Nakajima, and Matous (2014) on factory operations with the East Japan Earthquake

Outward foreign direct investment and domestic employment by Japanese manufacturing firms:  
 The ratio of firms that expand domestic employment

		1998-2002	2002-2006	2007-2009
Firms that do not have an affiliate in East Asia		32%	51%	41%
Firms that have affiliates in East Asia: The number of affiliates	Increases (including the first direct investment)	33%	64%	52%
	Keep the same number	25%	54%	43%
	Decreases (including withdrawal)	25%	50%	40%
All manufacturing firms		32%	53%	42%

Source: Ando and Kimura (2012a).

## 4. Implication for productivity studies

- Industry-level productivity to be elaborated.
  - Different activities by production processes/tasks; international relation-specific division of labor
  - Mixture of multinationals and local firms
- Economic environment outside a firm matters.
  - E.g., service link costs crucial to production networks
  - E.g., agglomeration effects (+/-)
- Evolving nature of technological progress
  - New type of middle-income countries
    - Dependency on multinationals, tech. gaps, small R&D

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