Onshore or offshore: Value Chains in the Digital Age

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1. Background in East Asia and Asia-Pacific

- East Asia has led the development of international production networks (IPNs)(Ando and Kimura, 2005) or the second unbundling (Baldwin, 2016), particularly in machinery industries since the late 1980s.
- Two challenges
  - Globalization and/or anti-globalization
  - Digital technology
- How to reformulate development strategies in newly developed and developing countries? Two issues exist.
  - Revitalization of manufacturing and other existing activities
  - New frontier in services with communication technology

2. Two challenges

- Globalization and/or anti-globalization
  - Reduction in “transport costs” is enhancing mobility.
  - Rising protectionism, trade/investment diversion, uncertainty in investment
- Digital technology
  - Two faces of the same technological paradigm (Aghion, et al. (2014), Baldwin (2016))
    - Information technology (IT): robots, AI, machine learning, industry 4.0, …
    - Communication technology (CT): internet, smartphones, 5G, …
    - Concentration and dispersion forces in the international division of labor
  - How can they incorporate digital technology into development strategies?
    - Any policy needed for introducing IT?
      - Substitutability and complementarity between machines and humans
    - CT has already been penetrating into the daily life.
      - Soft and hard infrastructure

3. Manufacturing production networks passé? No!

- Still room for expanding and deepening production networks
  - Comparison with other regions (Ando and Kimura (2013, 2014))
  - Degree of participation in production networks within East Asia (Obashi and Kimura (2016), Kimura and Chen (2018))
  - Network trade grew even in the period of slow trade (Obashi and Kimura (2018))
- Still at the core of development strategies
  - Location advantages and service link costs (Jones and Kierzkowski (1990))
  - Fragmentation and agglomeration (Kimura and Ando (2005))
  - Physical and institutional infrastructure for connectivity (ERIA (2010, 2015))
- Still important in economic and social development
  - Internal labor movements and poverty alleviation (Kimura and Chang (2017))
  - Technology transfer/spillover (Kimura, Machikita, and Ueki (2016))
  - Robustness against disasters (Ando and Kimura (2012), Okubo, Kimura, and Teshima (2014))

The Fragmentation Theory a la Jones and Kierzkowski (1990)

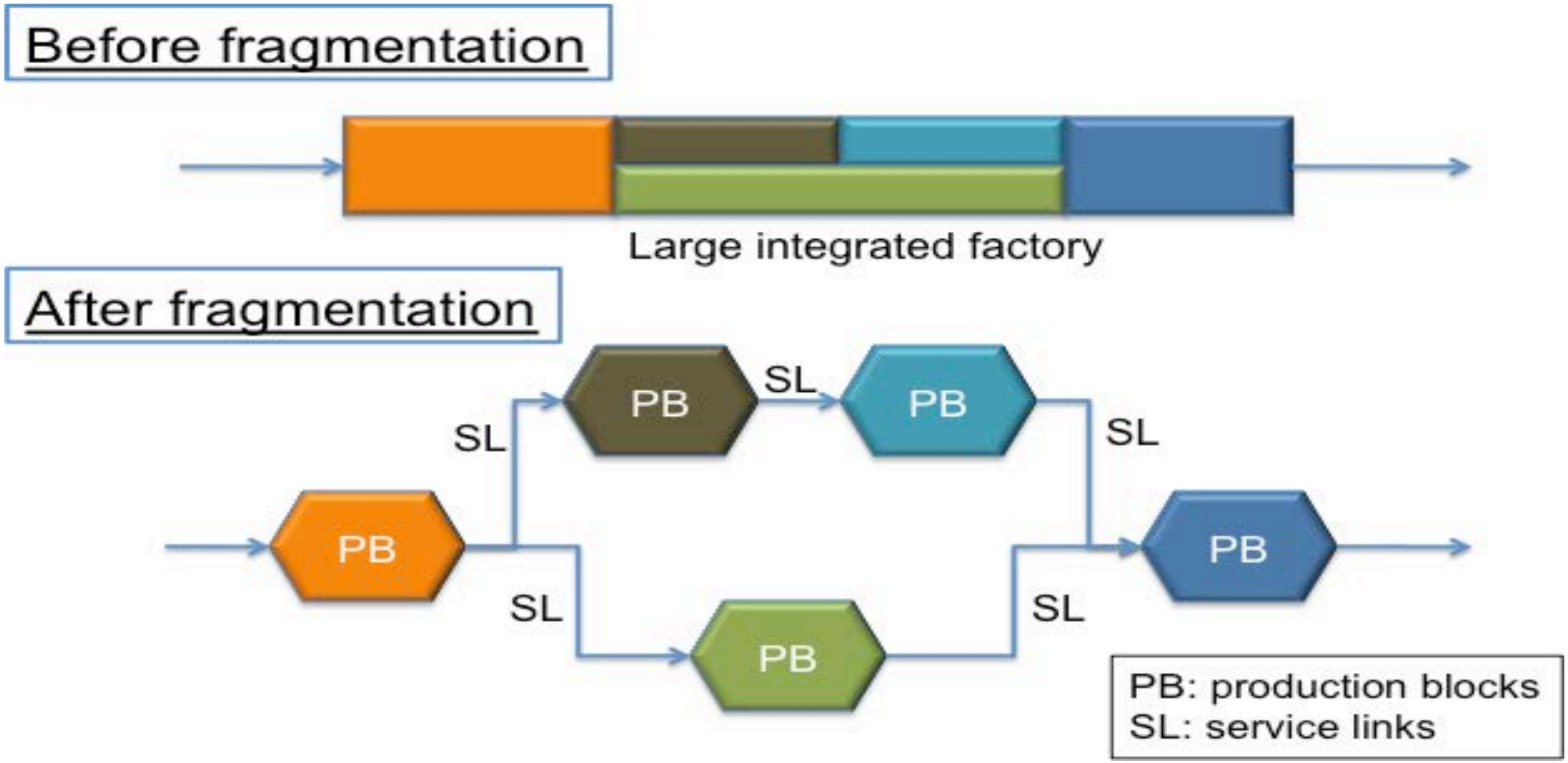
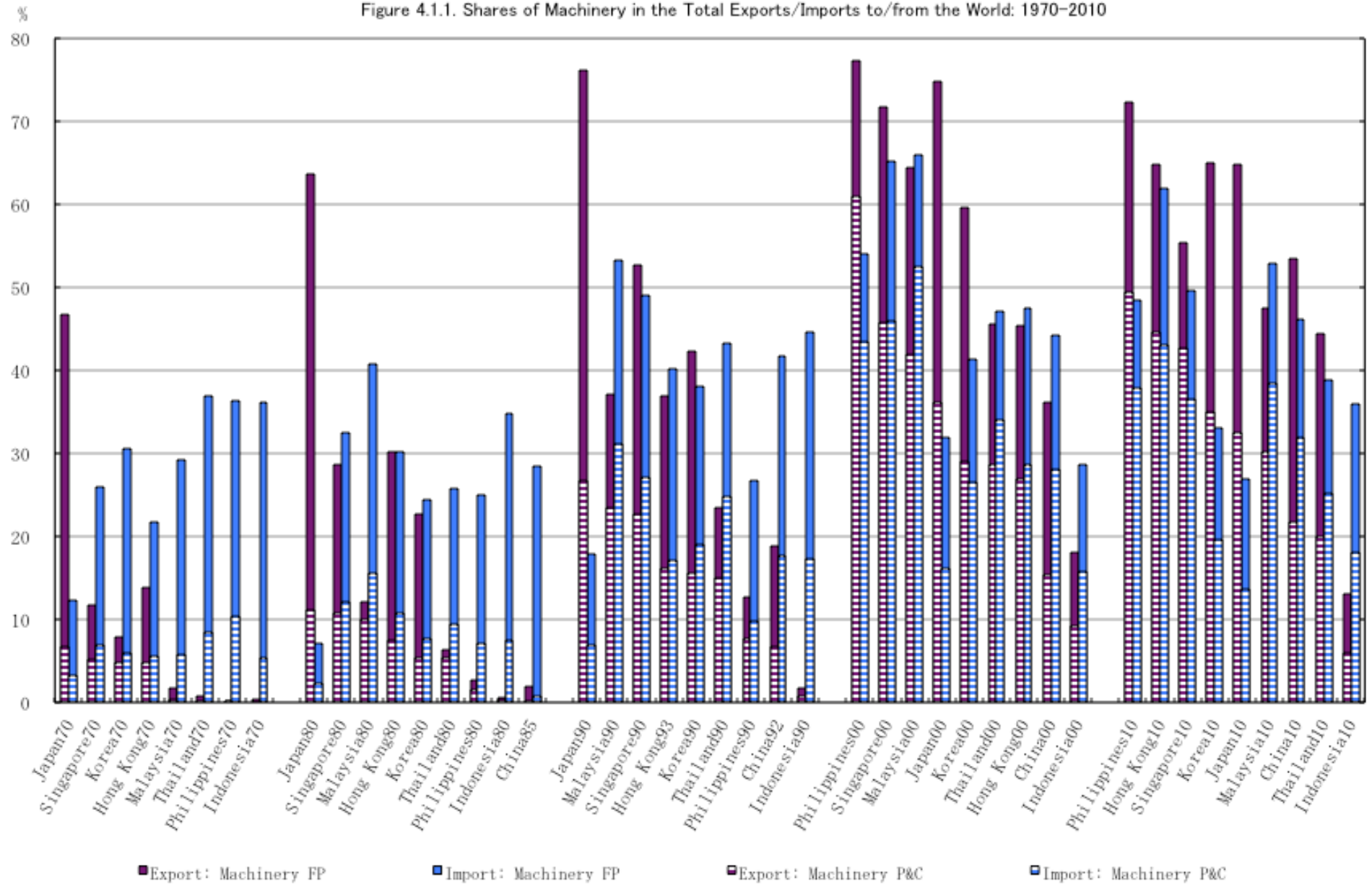
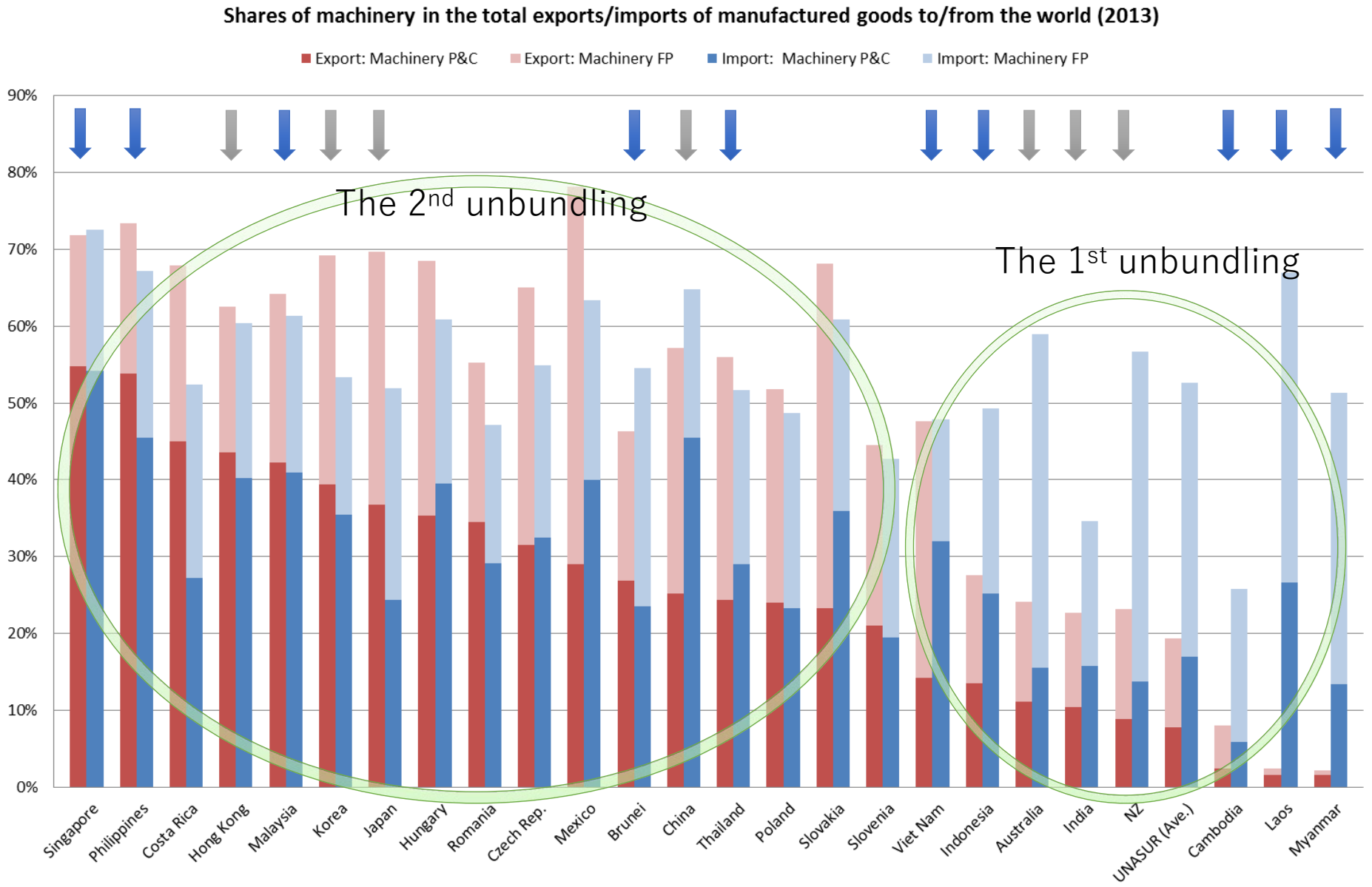


Figure 4.1.1. Shares of Machinery in the Total Exports/Imports to/from the World: 1970-2010

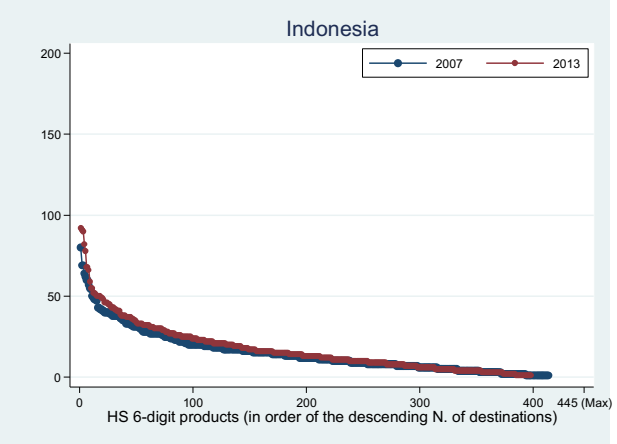


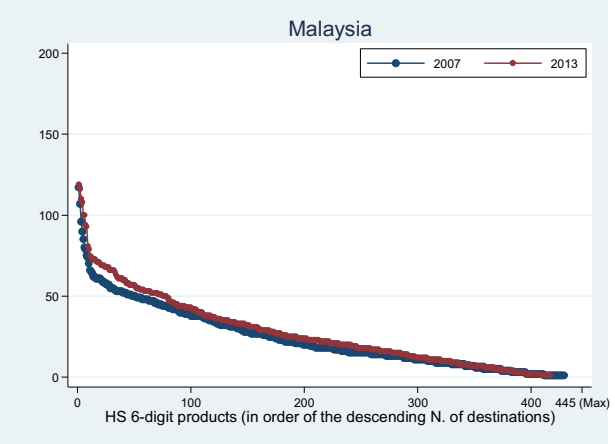
The data for 1970 and 1980 and those after 1990 are based on SITC and HS commodity classification, respectively. See the details for Kimura and Ando (forthcoming).
Note that exports/imports of machinery parts and components based on SITC are understated by about one-fifth compared with those based on HS.
Source: Kimura and Ando (forthcoming).

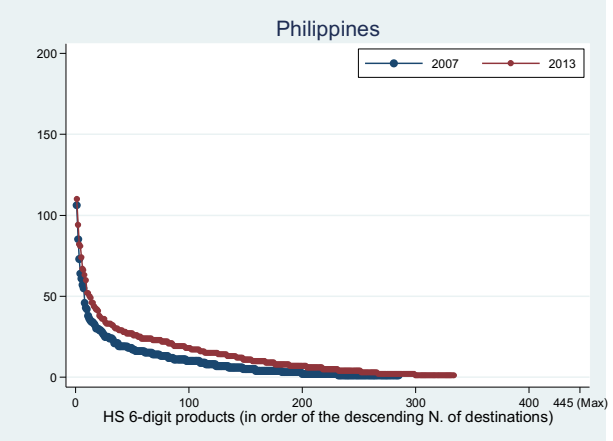


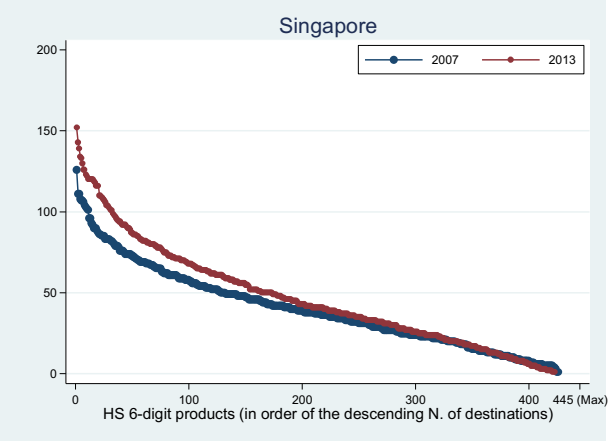
Source: Obashi and Kimura (2016).

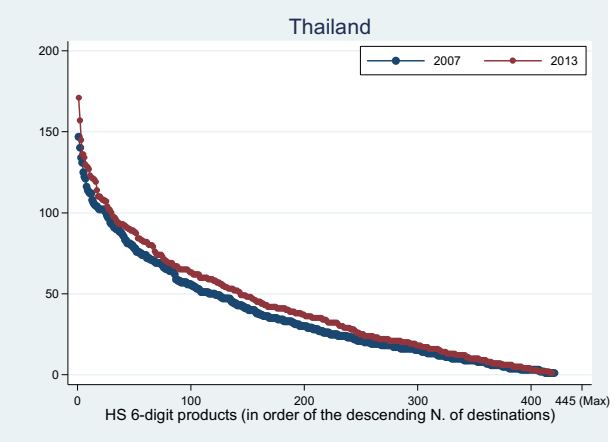
Number of destination countries in exports of machinery parts & components to the world, by HS 6-digit product





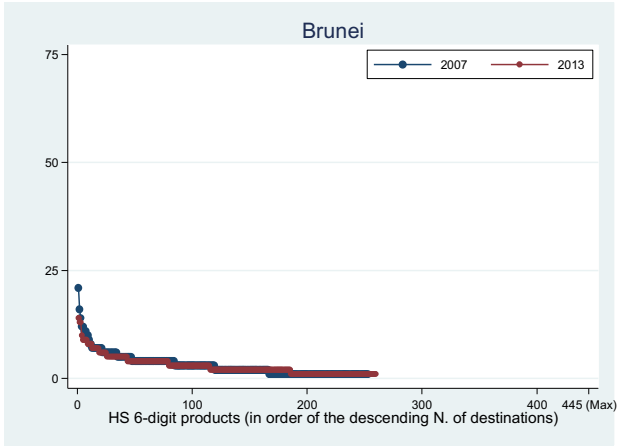


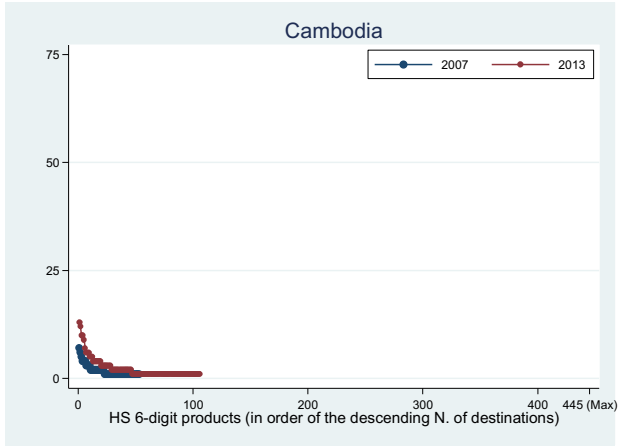


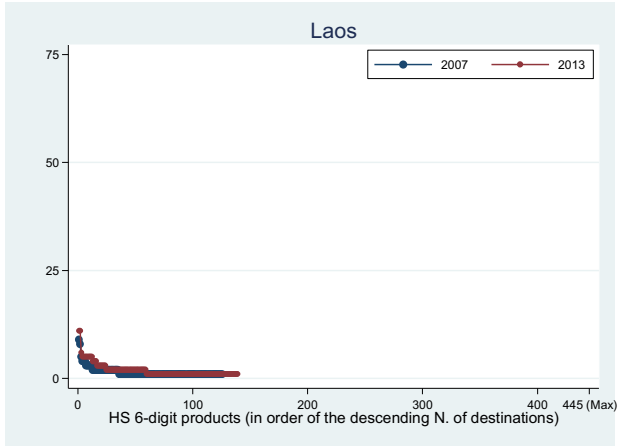


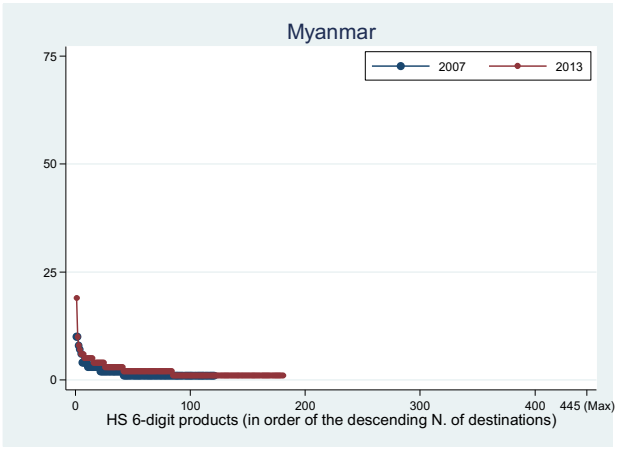
Source: Obashi and Kimura (2017).

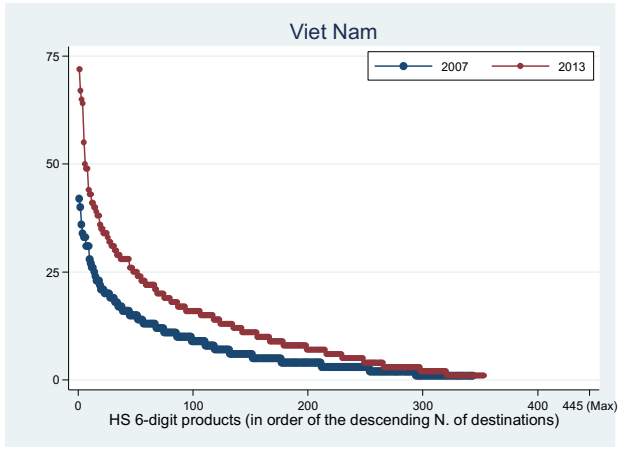
Number of destination countries in exports of machinery parts & components to the world, by HS 6-digit product (conti.)





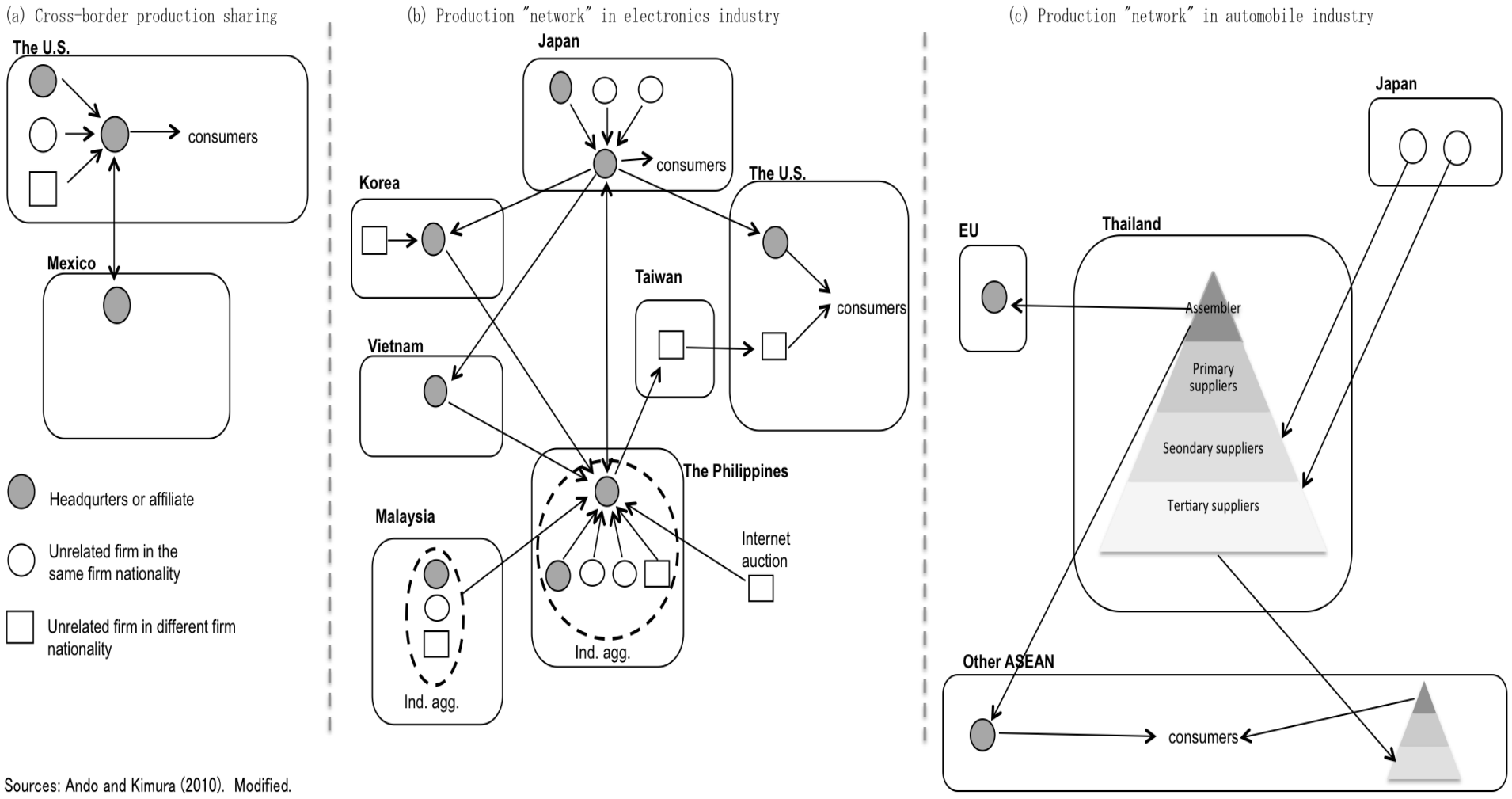






Source: Obashi and Kimura (2017).

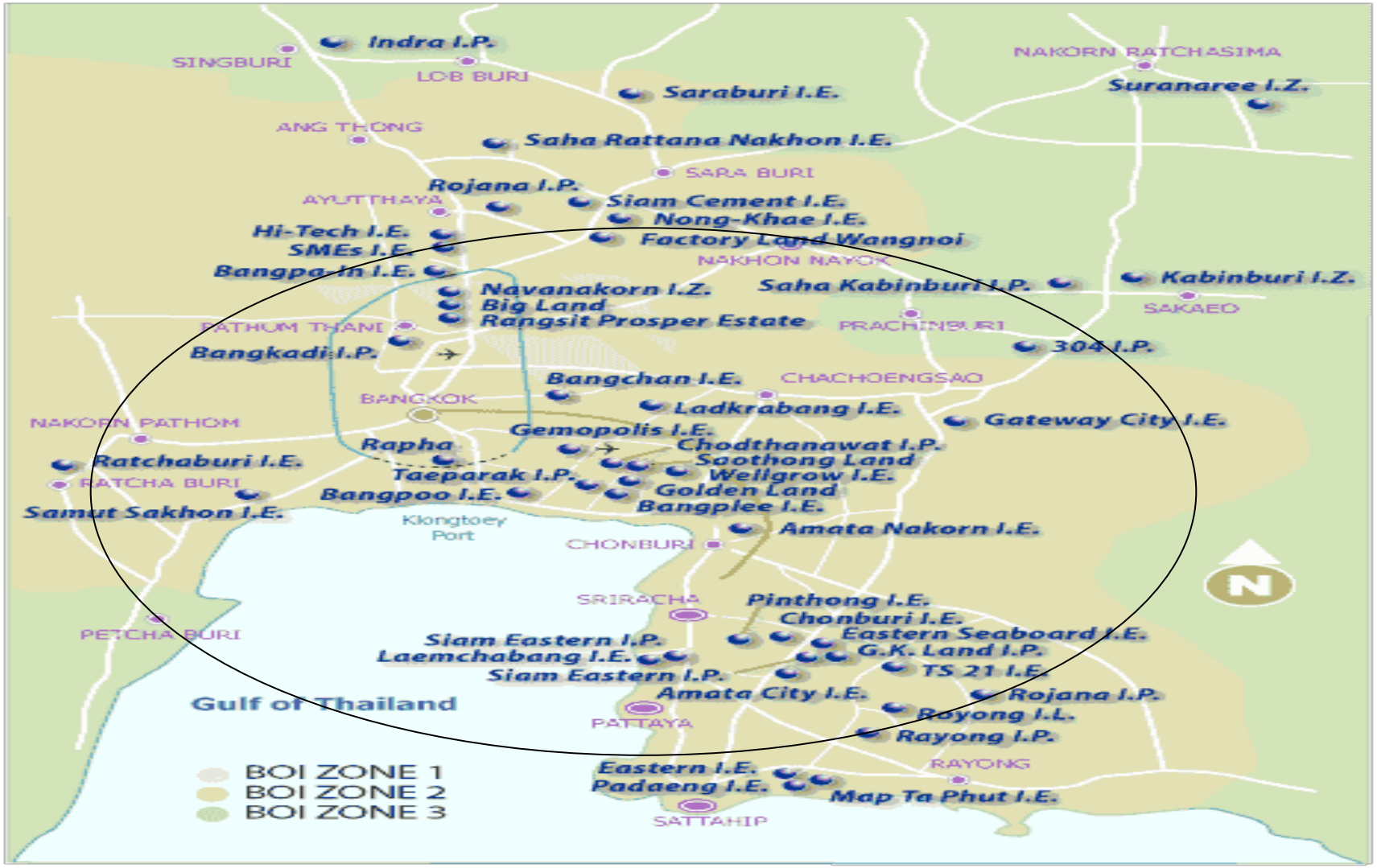
Figure 2.2. The Evolution of Production Networks: Illustrations



Sources: Ando and Kimura (2010). Modified.

Source: ERIA (2015).

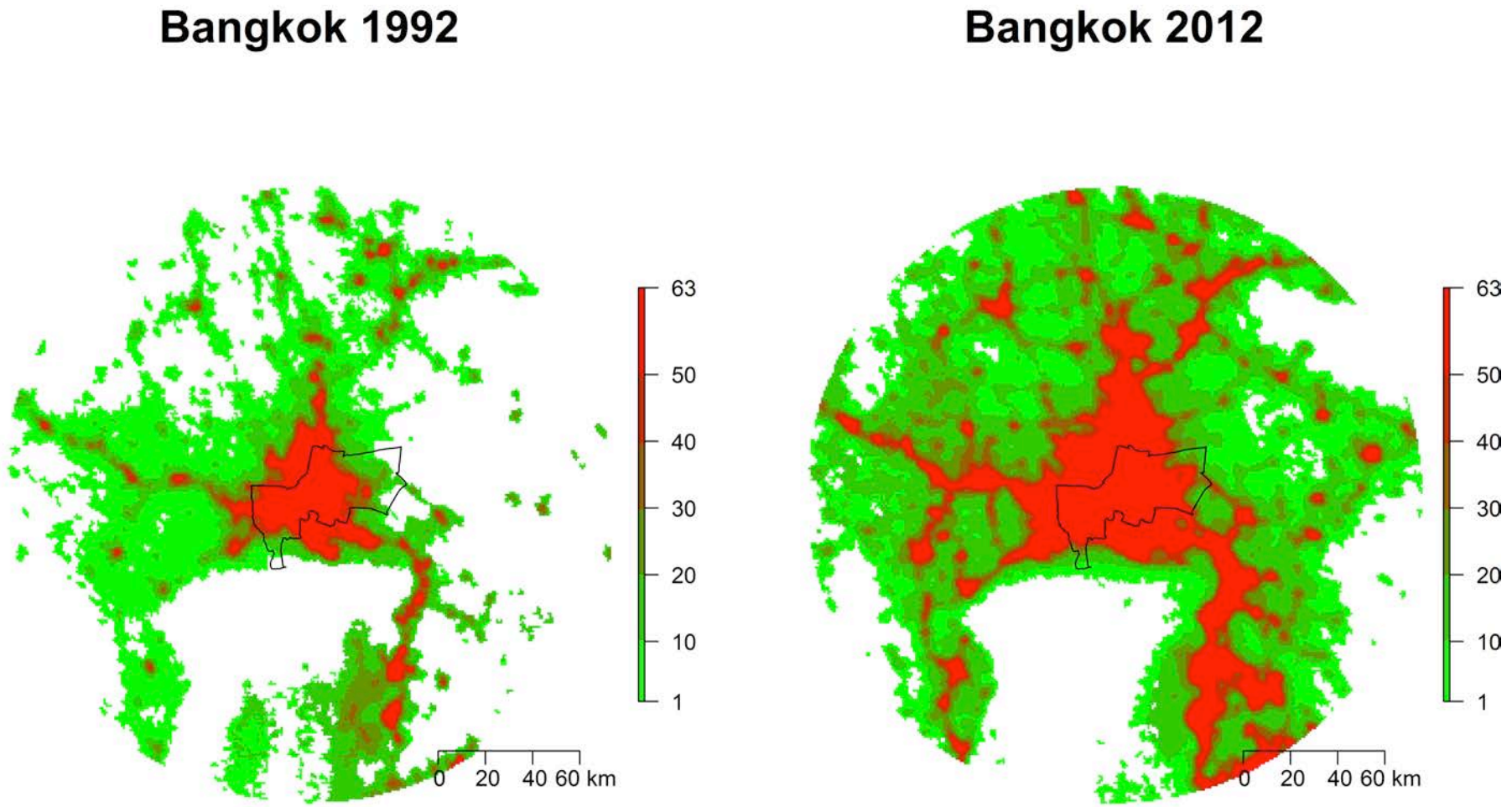
Industrial agglomeration in Bangkok Metropolitan Area



Note: The circle of 100km is added by the author (*Original source*: Board of Investment, Thailand)

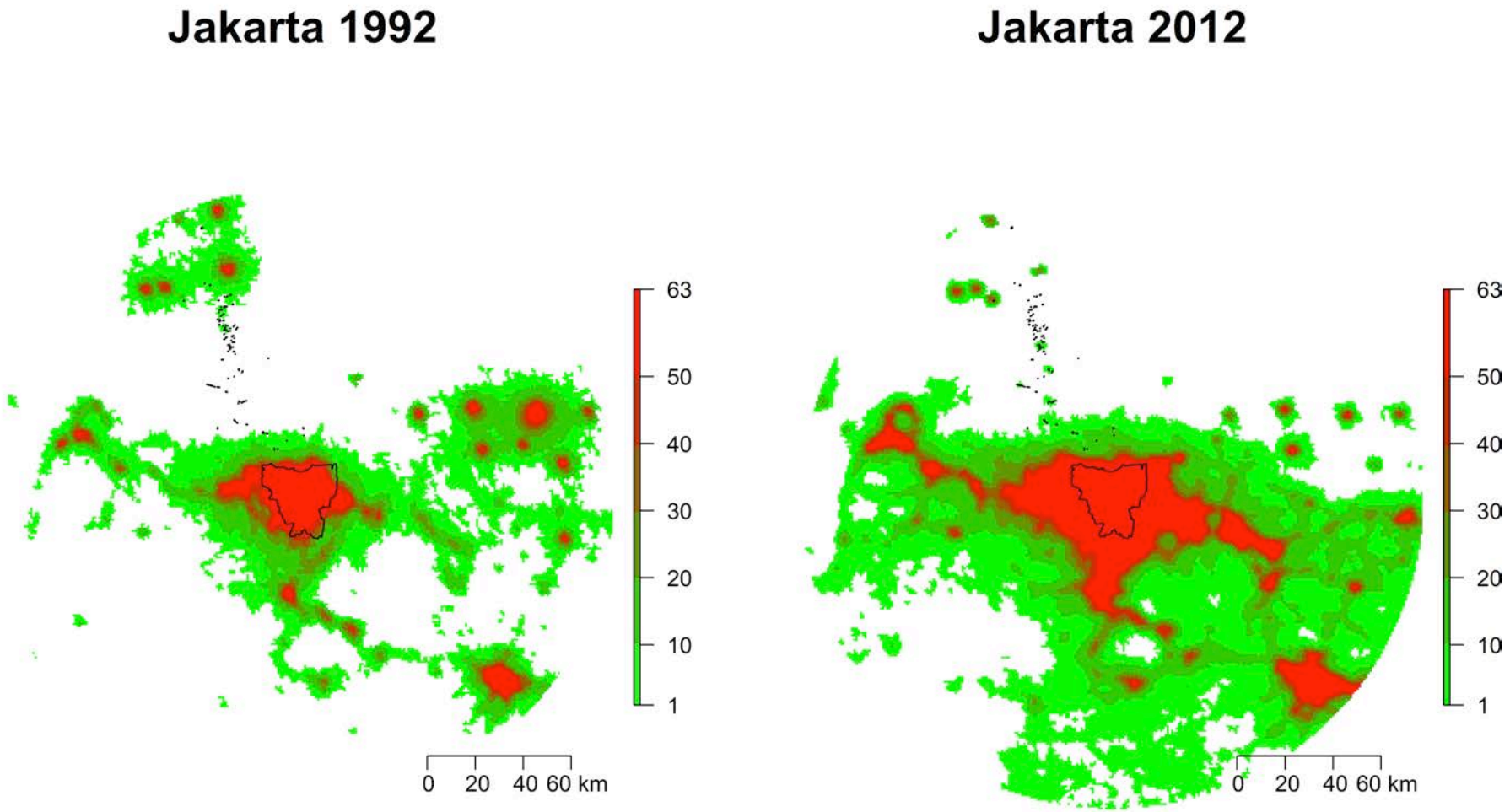
Source: ERIA (2010).

City Size with Nighttime Light from Satellite



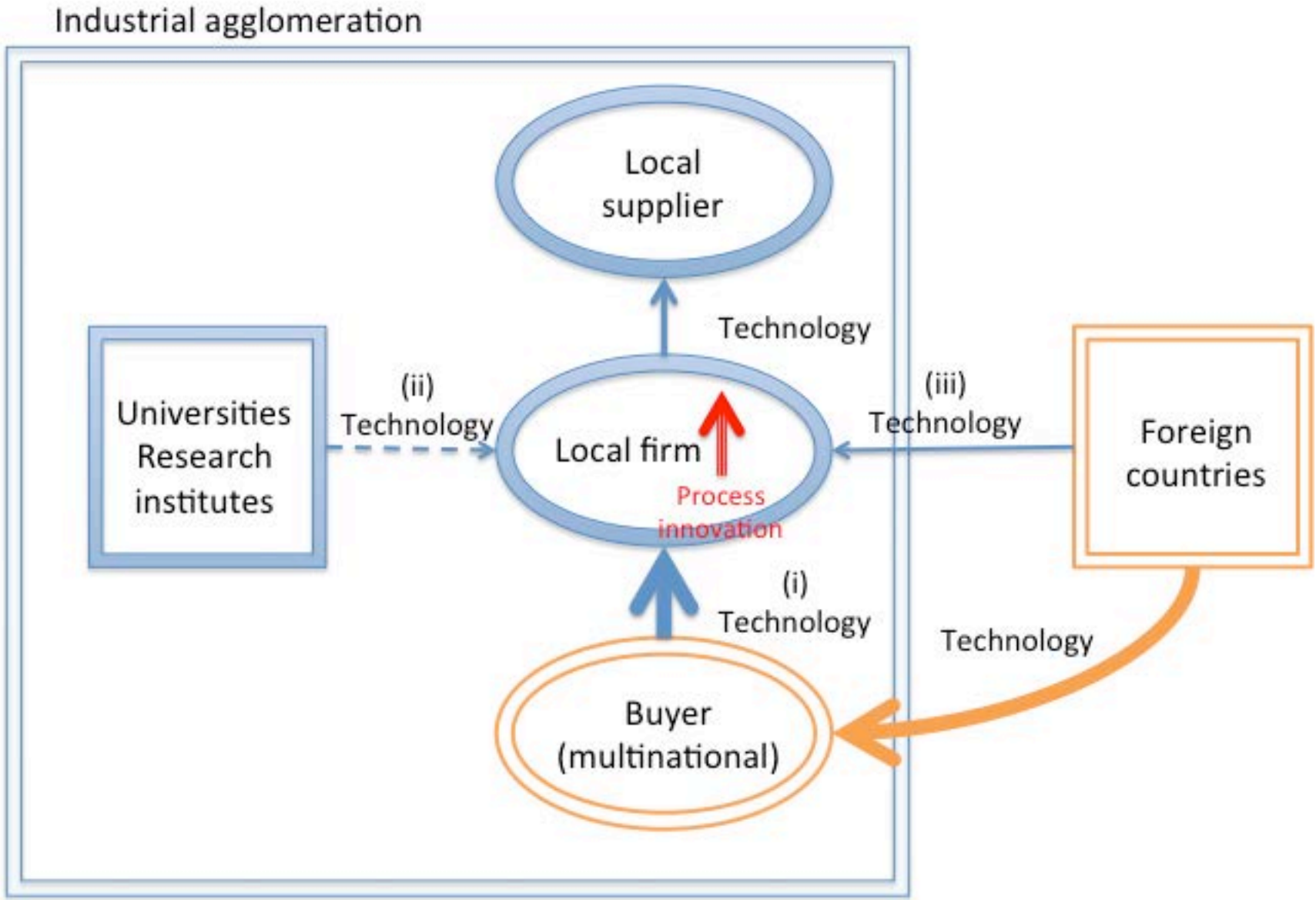
Source: ERIA-IDE GSM Team. Appeared in ERIA (2015).

Figure 4.3.1. City Size with Nighttime Light from Satellite (conti.)



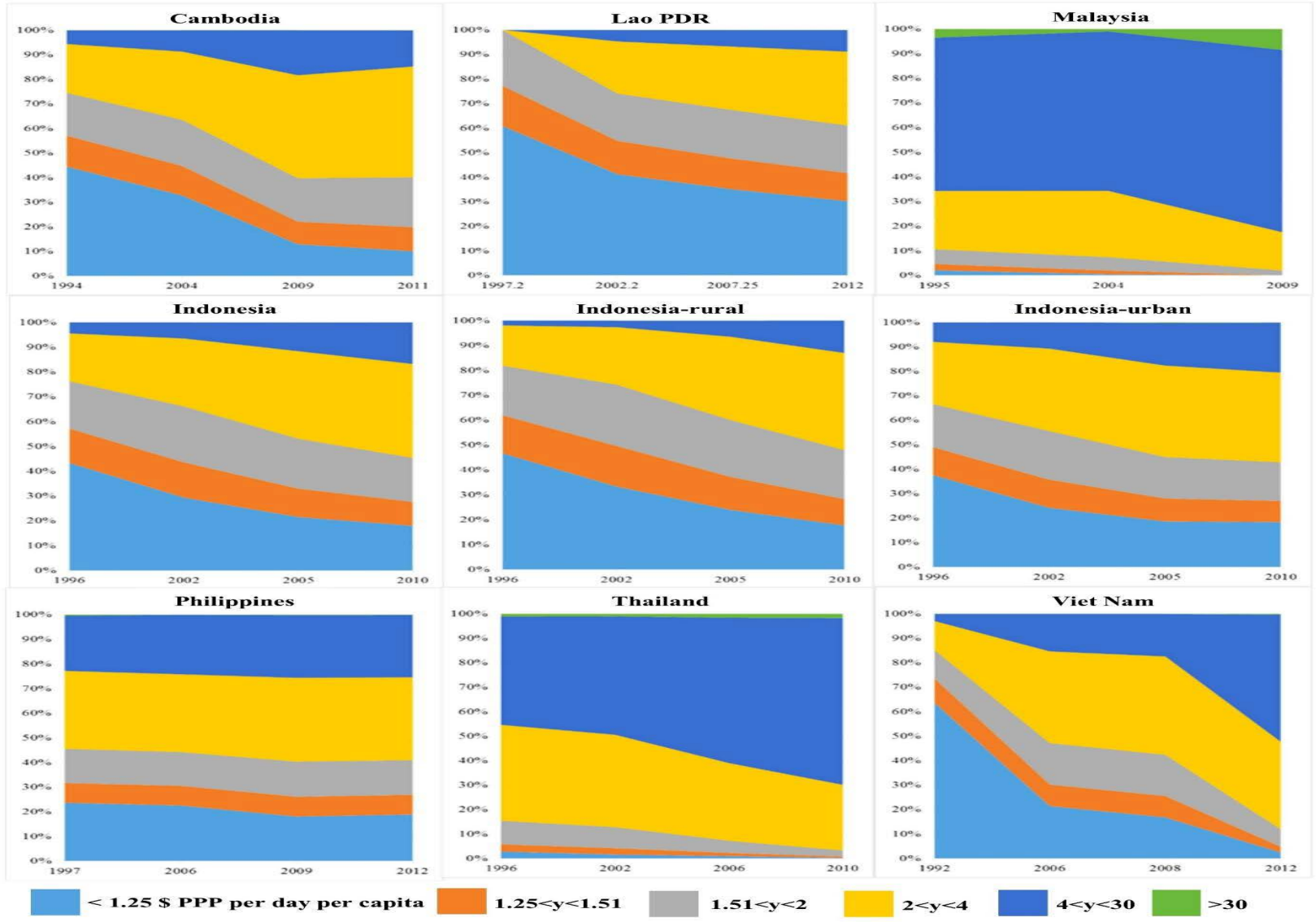
Source: ERIA-IDE GSM Team. Appeared in ERIA (2015).

Three Channels to Get Access to Technology



Source: ERIA (2015).

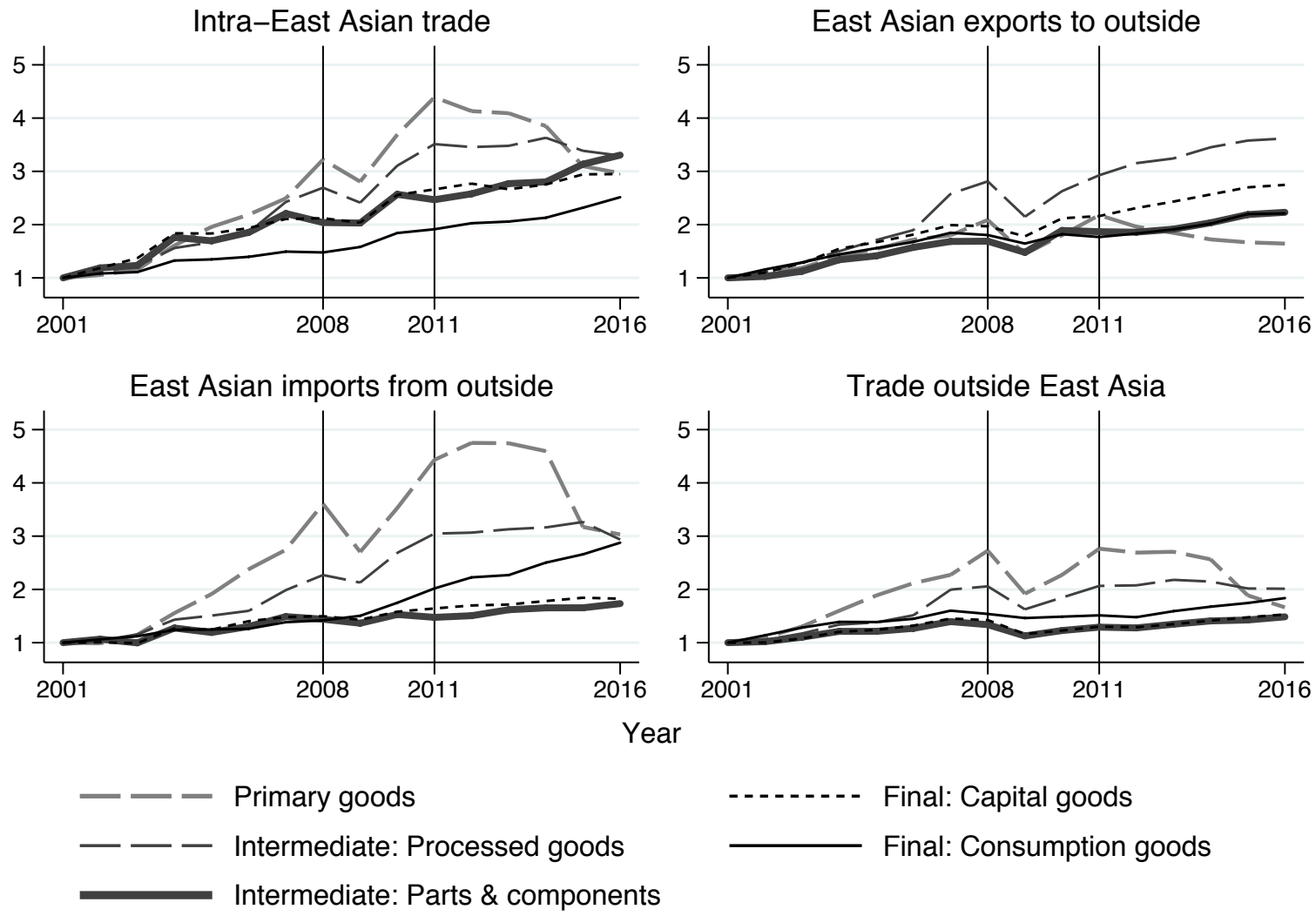
The Trend of Population Distribution by 'Income Class' in Seven ASEAN Member States



Source: World Bank, PovcalNet. http://iresearch.worldbank.org/PovcalNet/index.htm (accessed 3 February 2015).

Source: Intal, et al. (2015).

Parts & components trade, particularly intra-EA, grew even in the slow trade era (2011-2016)

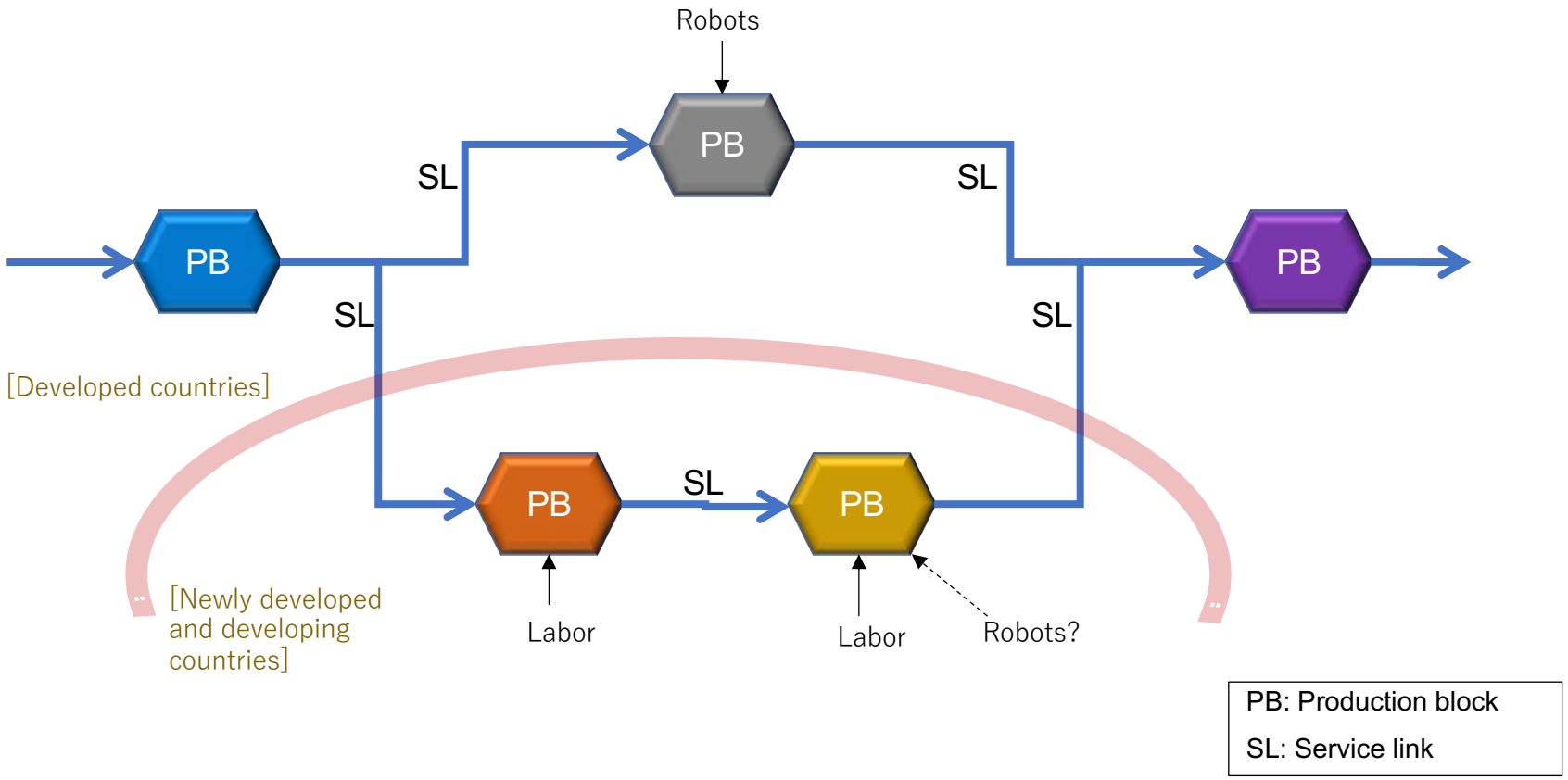


Source: Obashi and Kimura (2018).

How to keep and activate production blocks in LDCs?

- Fear of “reshoring”
  - In developed countries (DCs), the substitution of labor by machines proceeds.
    - Cheap labor in LDCs may not be needed anymore; production blocks may come back to DCs (reshoring; from offshore to onshore).
- However, the “substitutability” is not that simple.
  - Largely, “manual, routine” works versus “cognitive, multi-task, human” works
  - However, actual substitution occurs at a very micro/individual level.
- A production block consists of a combination of various factor inputs.
  - Possibility of seeking “complementarity”
- The cost of introducing robots may not be much more expensive in LDCs than in DCs.
- The whole operation will become more machine-intensive.
- A tentative results of Kimura and Obashi (2019) show that the introduction of industrial robots seems to enhance network trade in East Asia, particularly with larger usage of cross-border service outsourcing.
- At least, the usage of IT should not be excluded from the beginning.

The introduction of robots in international production networks: an illustration



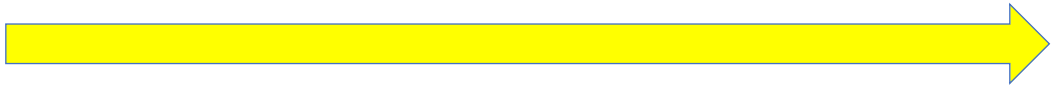
4. Communication technology for development

- CT penetration is fast in LDCs due to young population, lenient regulatory framework, and weaker vested interest.
- New businesses are mushrooming.
  - Social media, B-to-B/B-to-C e-commerce, matching and sharing, service outsourcing, e-payment/fintech, …
- Usage of IT and CT in traditional industries
  - Agriculture/fishery, cottage industries
  - Transport, catering, lodging
  - Finance
  - Governments
- Cross-border service outsourcing (the third unbundling or “remote intelligence (RI)”) as a new form of international division of labor? (Baldwin (2016, 2019))

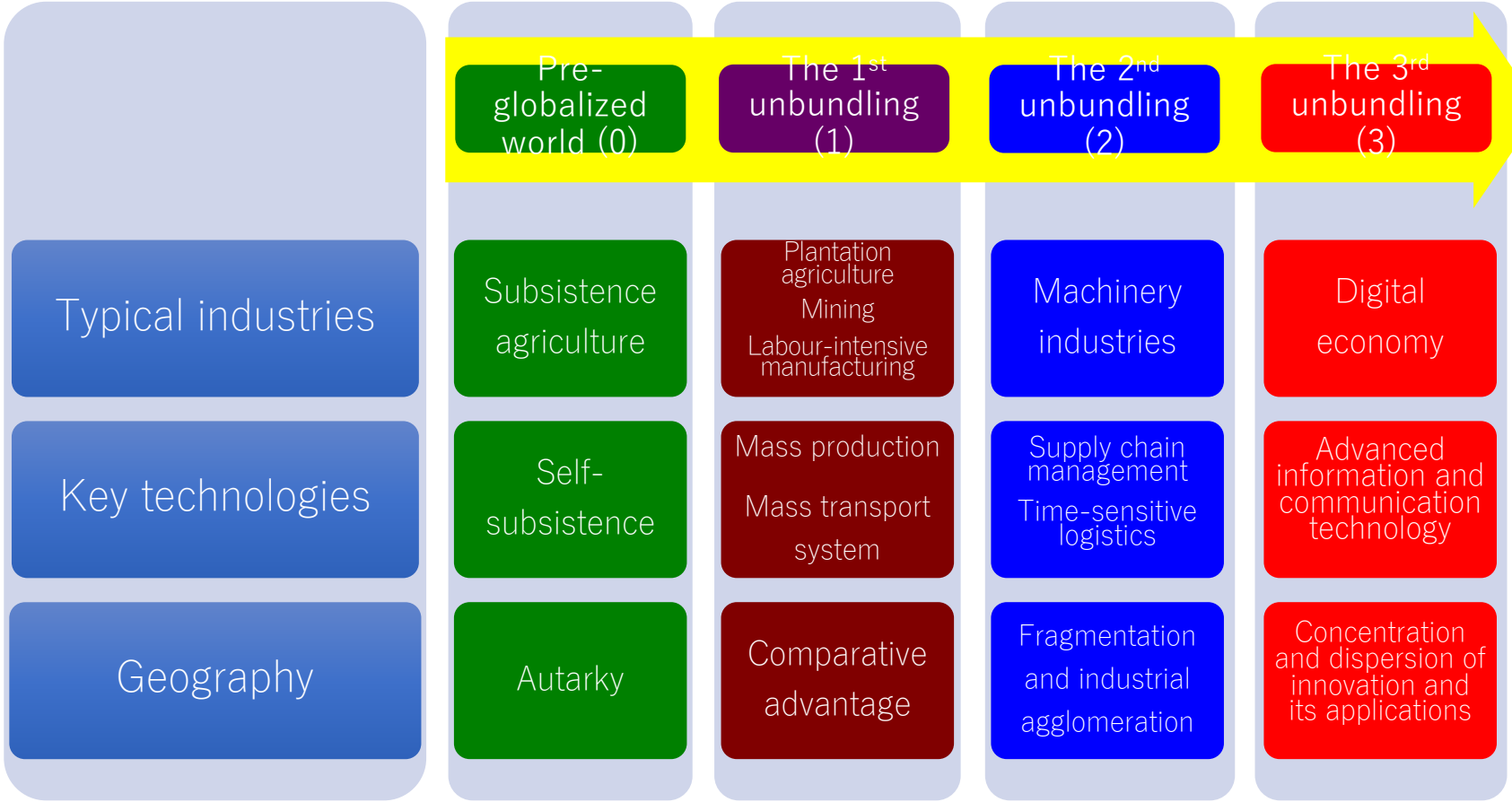
“Unbundlings” to overcome distance a la Baldwin (2016)

	Pre-globalized world (0)	The 1st unbundling (1)	The 2nd unbundling (2)	The 3rd unbundling (3)
Trade costs Communication costs Face-to-face costs	High High High	Lower High High	Lower Lower High	Lower Lower Lower
What starts moving?	None	Goods	Ideas	People
International division of labor	Autarky	Industry-wise (Production and consumption are fragmented)	Task-wise (An industry is fragmented)	Person-wise (A task is fragmented)
Dominant years	- 1820	1820-1990	1990-2015	2015-

Source: Kimura (2018).

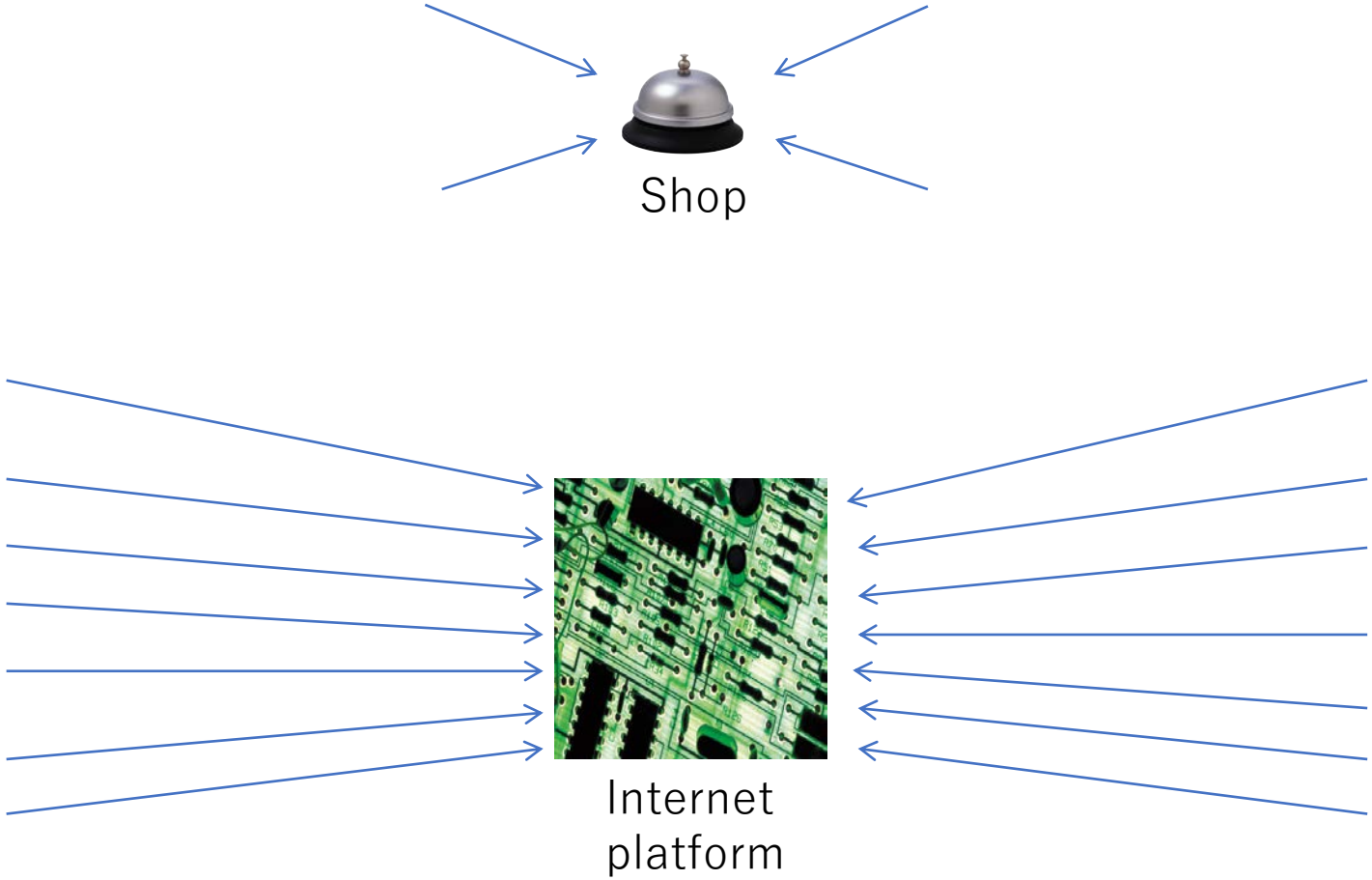


“Unbundlings” and industrialization



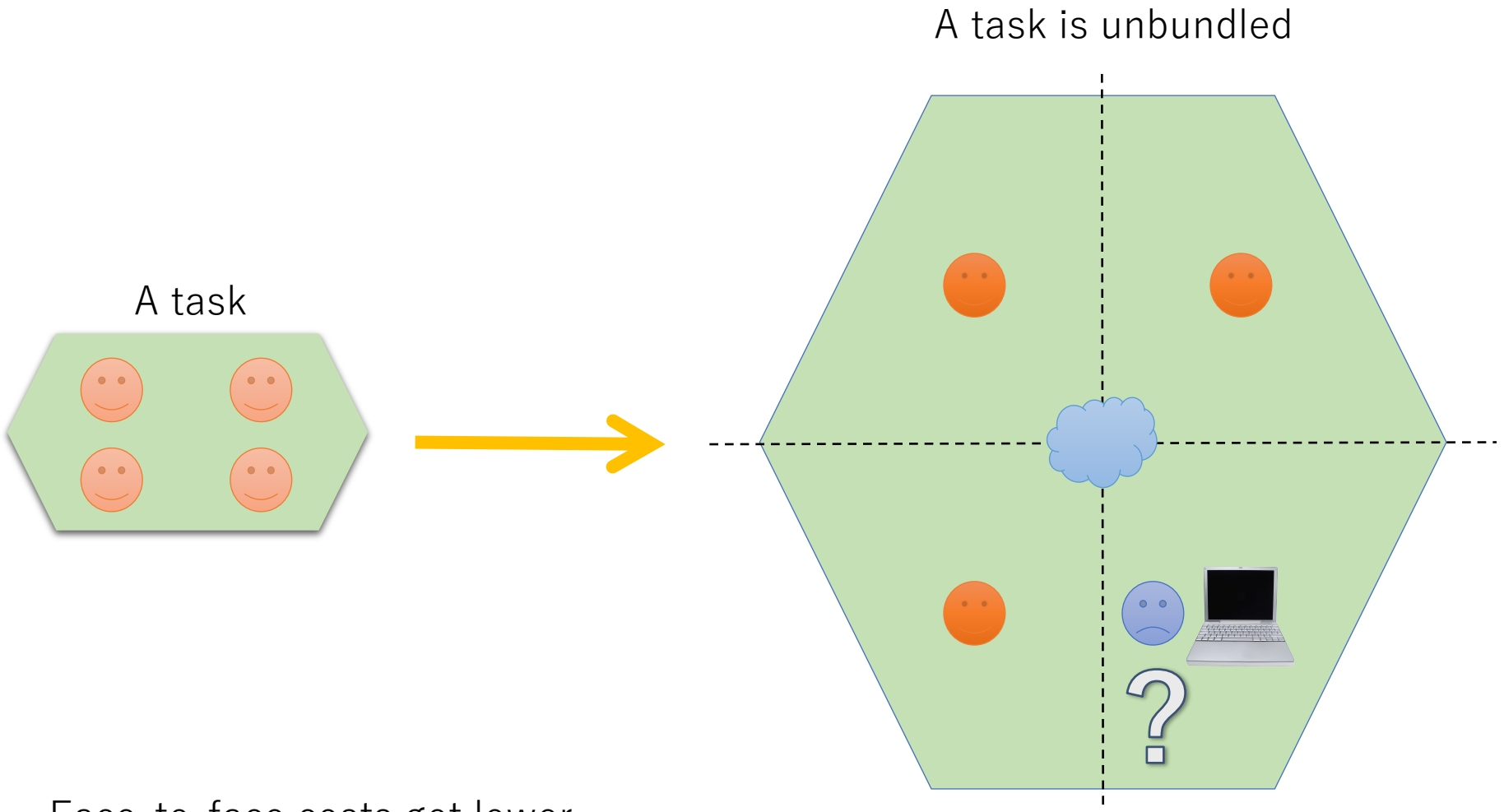
Source: The author.

Reduction in B2C, C2C matching costs



Source: The author.

The 3rd unbundling



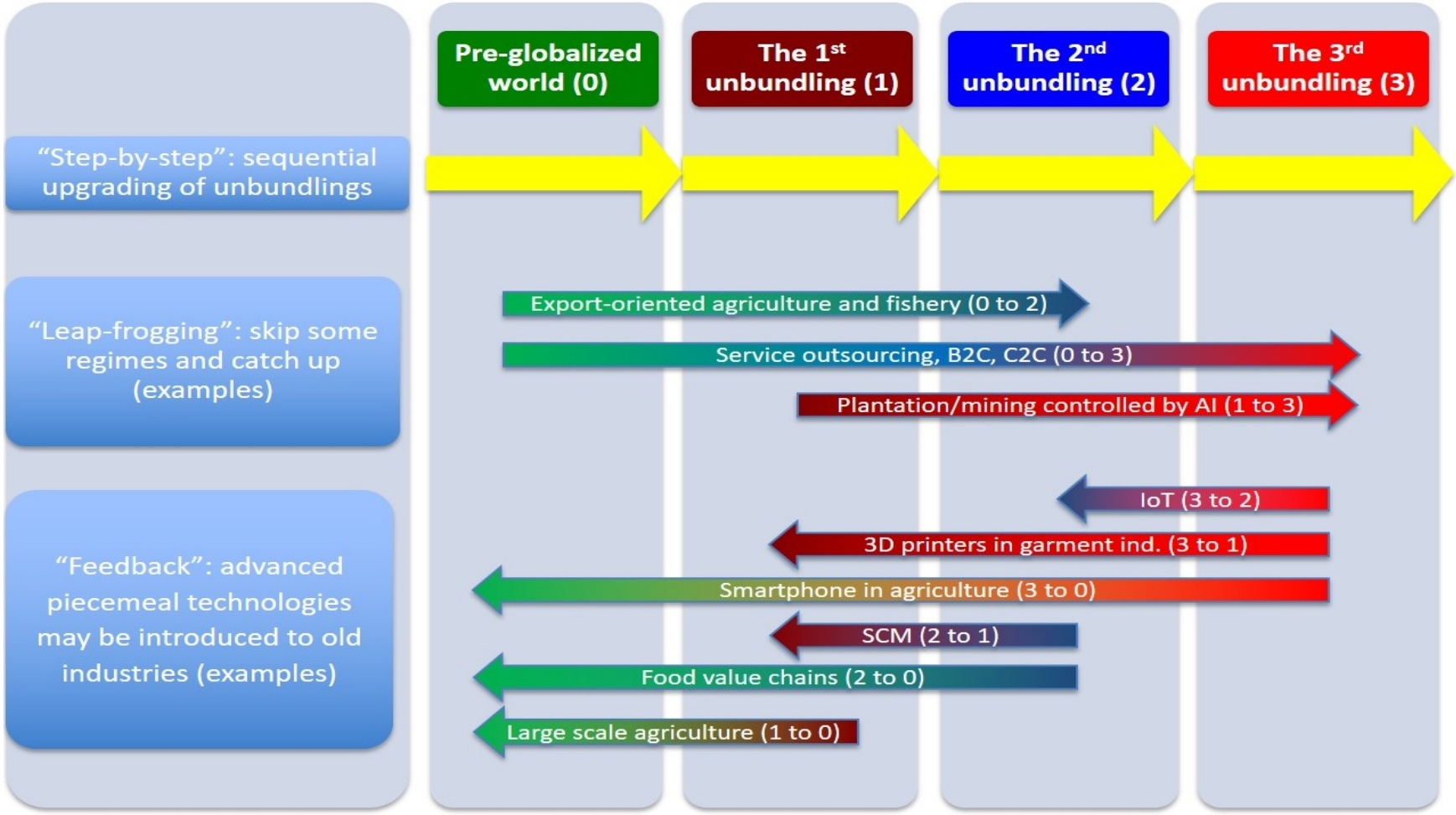
Face-to-face costs get lower.
A task can be unbundled; person-to-person matching becomes easier.

Source: The author.

5. New development strategies

- ASEAN and developing Asia is now having new opportunities for reaping benefits from new technologies.
- Although the main stream of development must be “step-by-step”, we must incorporate “leap-frogging” and “feedback” in our development strategies.
- IT
  - The cost of IT is coming down; opportunities of introducing IT should not be missed.
  - The formation of “innovation hubs” is important for catching up with the advancement of IT and thinking of its application.
- CT
  - Already there.
  - Need to take care of potential “digital divide” even though the nature of inclusiveness exists.
  - Institutional setting of securing almost free flow of data is necessary.

Industrial dynamism among unbundling regimes



Source: Kimura (2018). Slightly modified.

Required policies for unbundlings

	Pre-globalized world (0)	The 1st unbundling (1)	The 2nd unbundling (2)	The 3rd unbundling (3)
(i) International commercial policies (FTAs) and behind-the-border issues: Institutional connectivity		Trade liberalization - GATT/WTO round negotiations - GSP	Trade liberalization and facilitation - FTAs - Tariff removal - E-customs, TBT - Services (B2B) and investment liberalization for GVCs	Trade liberalization - De minimis - Modes 3 and 4 in services (B2B, B2C, C2C) - (Cross-border) e-commerce and e-payments - Free flow of data Trade facilitation - SPS - Standards and conformance Backup policies and regulations - Consumer protection - Competition policy - Taxation - Cyber-security
(ii) Hard infrastructure and physical economic/living environment: Physical connectivity		Medium-grade connectivity - Road networks - Ports and airports Infrastructure services	High-grade connectivity - Full-scale port with container yard - Full-scale airport - Multi-modal (cargo, passenger) Urban/sub-urban development for industrial agglomeration - Logistics (highway system) - Mass economic infrastructure services (special economic zones/industrial estates, electricity, energy, water)	ICT connectivity - Internet connection - Integrating connectivity Metropolitan development and urban amenities (Glaeser, et al. (2001)) - Urban transport (LRT, subway, airport access, access to resorts) - Residential environment (children's education, medical services, safety) - Other urban amenities ("consumption")
(iii) Human aspects and inclusiveness: People-to-people connectivity	SME development - e.g., cottage industry	SME development - e.g., exporting primary products Human resource development - Primary and secondary education	SME development - e.g., supporting industry Human resource development - Managers, engineers	SME development - e.g., venture, start-ups Consumer (people)-centered policies - Consumer protection/privacy - Human resource development for innovation and new businesses - Movements of educated people - Avoid digital divide R&D capabilities and innovation hub

Source: The author.

Two faces of digital revolution for AMSs

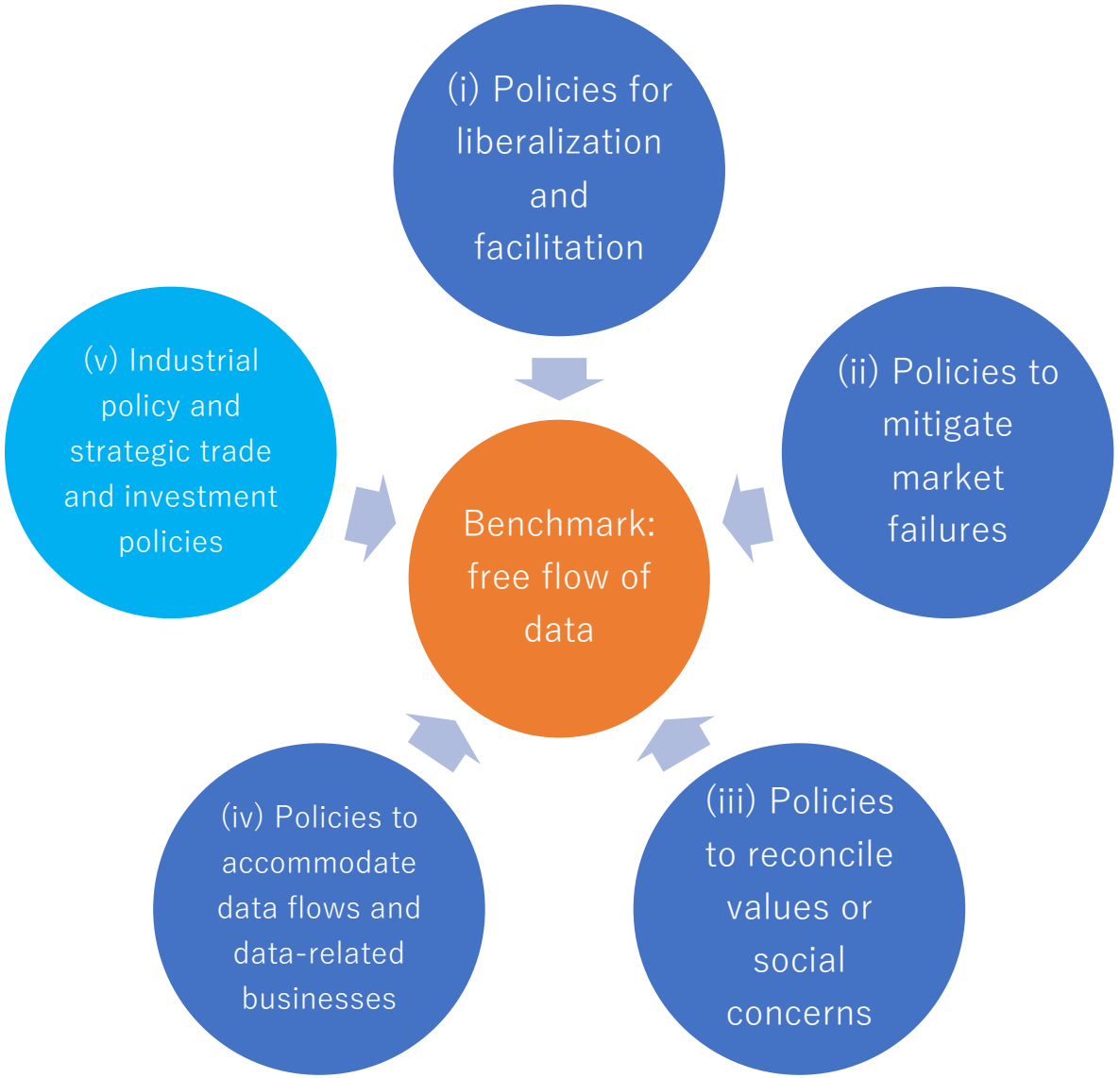
IT (e.g., AI, robotics, big data)

- Faster data processing, reduce # of tasks => generate "concentration forces," however,…
- Focus on applications
  - Need innovation hubs as a window to follow up new technologies.
  - Utilize complementarity of machines and human beings to deepen/upgrade roles in international production networks; recent study on robots and network trade
  - Introduction in services sectors
- Policies
  - Introduction of IT such as robotics to be mildly promoted.
  - Human capital
    - Demand for programmers, computer engineers, obvious.
    - Shift from manual, routine jobs to cognitive, flexible, multi-task, and human-to-human jobs.
    - Effects at the individual level, unpredictable.

CT (e.g., internet, smartphones, 5G)

- Overcome distance, encourage dom./cross-border division of labor => generate "dispersion forces"
- Lower matching costs for B-to-C and C-to-C already make new businesses mushrooming.
  - Social media, transport, tourism, e-commerce, e-payments, fin-tech, …
  - Domestic and cross-border
- Policies
  - Digital connectivity to avoid digital divide
    - Can be achieved with private incentives and proper regulation/modest public expenditure.
  - Human capital
    - Platform providers
      - Programmers, computer engineers, entrepreneurs for start-ups
    - Platform users
      - Ordinary people with entrepreneurship
  - Regulatory framework for "almost free flow of data"
    - Principles
    - Back-up policies (so far fragmented)
      - Consumer protection, privacy, cyber-security
      - IPR protection, competition policy, taxation

Free flow of data as a benchmark and supporting policies (T20, TF8, Policy Brief #4)



(i) Policies for further liberalization and facilitation
Non-discrimination for digital content, customs duties on electronic transmissions, customs duties on parcels, Electronic authentication and signatures

(ii) Policies to correct or mitigate market failures
Competition policy, consumer protection, IPR protection

(iii) Policies to reconcile values or social concerns with economic efficiency
Data and privacy protection, cybersecurity, other general exceptions

(iv) Policies to accommodate data flows and data-related businesses in the domestic policy regime
Taxation, e-payments/fintech/other industrial regulations, AI, information disclosure of firms and statistics, due process for government access to privacy/industry data

(v) Industrial policy and strategic trade and investment policies

6. Conclusion

- Facing two challenges, (anti-) globalization and digital technology, ASEAN and developing East Asia must reformulate their development strategies.
  - Keep and expand international production networks in manufacturing with IT and CT.
  - Take advantages of dynamism of digital economy, particularly with CT.
- For IT, think of its application.
- For CT, a series of policies for the flow of data and data-related businesses must be prepared.
- Focus of economic integration will shift to consumer/people oriented policies.

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