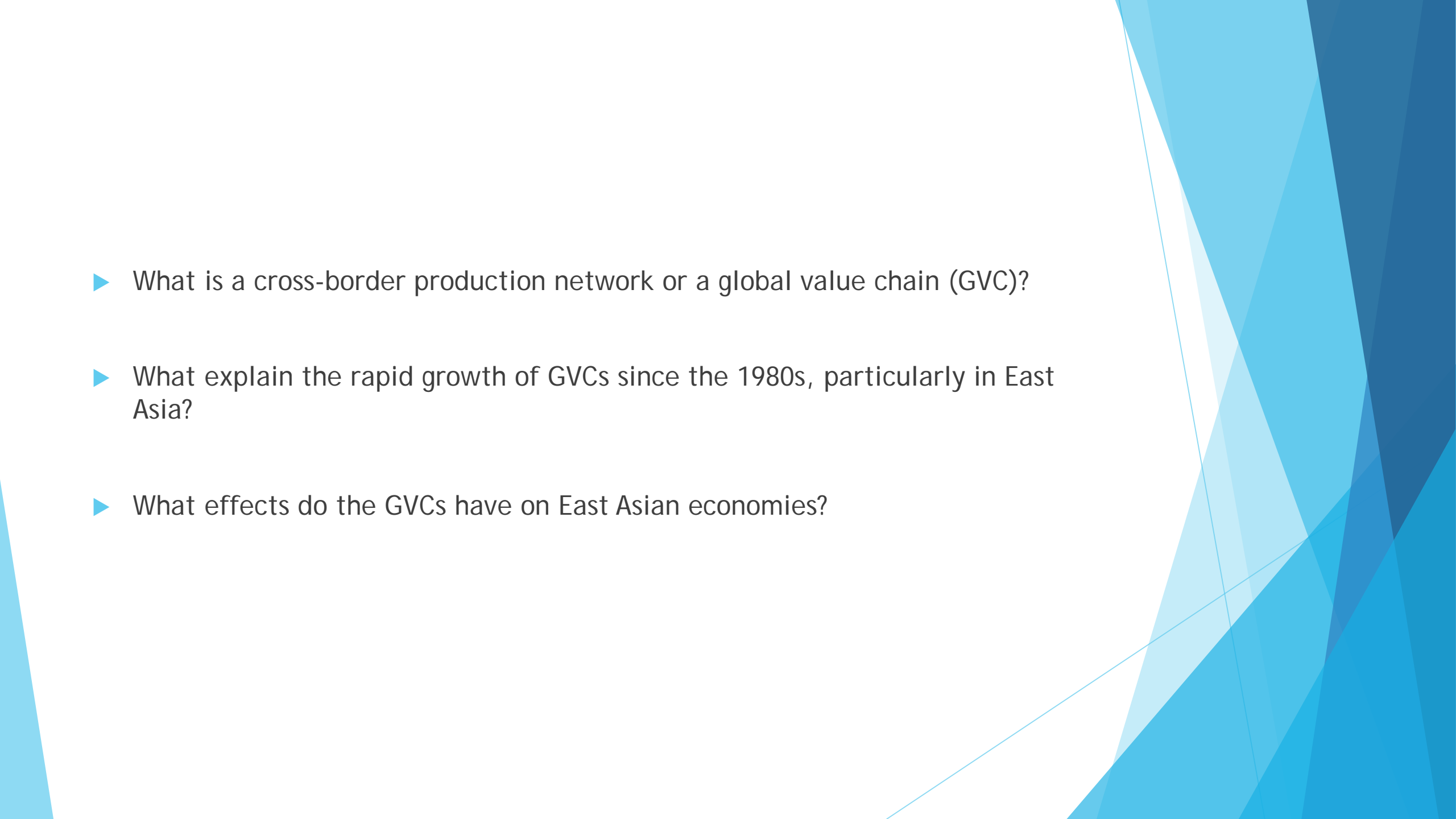


# Trade-Production Network

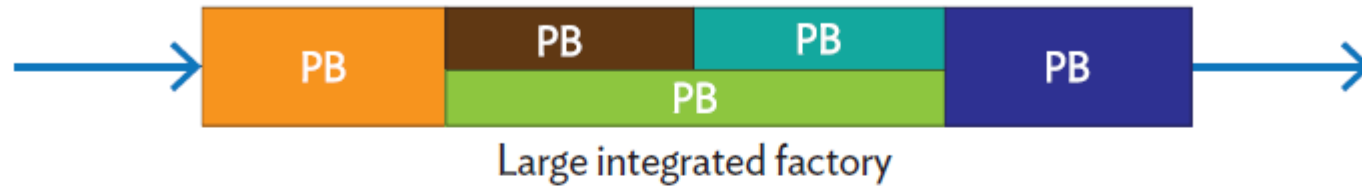
- 
- The background of the slide features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. These shapes are primarily located on the right side and bottom of the slide, creating a modern, dynamic aesthetic.
- ▶ What is a cross-border production network or a global value chain (GVC)?
  - ▶ What explain the rapid growth of GVCs since the 1980s, particularly in East Asia?
  - ▶ What effects do the GVCs have on East Asian economies?

# Cross-border production network and GVC

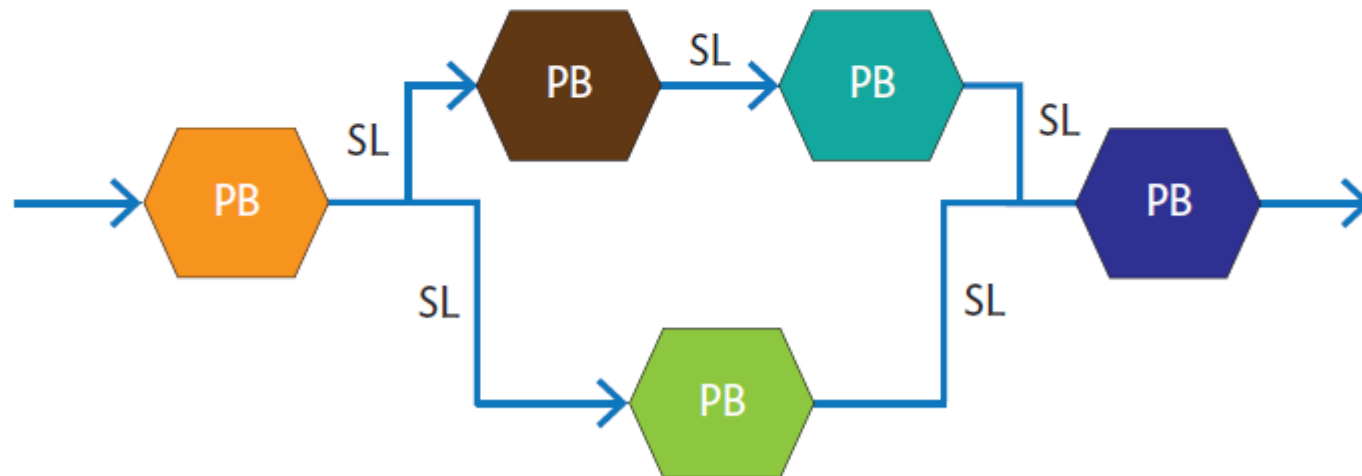
- ▶ GVCs divide the production of goods and services into linked stages of production scattered across international borders.
  - ▶ A production network or a global value chain for a particular good/industry.
  - ▶ An network at an aggregate level.
  - ▶ Rapid growth in the extent and complexity of GVCs since the late 1980s is unprecedented.
  - ▶ GVCs remap world trade.

## 2.1.1 Fragmentation of production

Before fragmentation



After fragmentation



PB = production block, SL = service link.

Source: Kimura and Obashi 2011.

**FIGURE A2: International Procurement: A HDD Assembler in Thailand in 2005**



Source: Hiratsuka, Daisuke (2006). Vertical Intra-Regional Production Networks in East Asia: Case of the Hard Disk Drive Industry in East Asia. (Chapter 6.) In *East Asia's De Facto Economic Integration*, edited by D. Hiratsuka. London: Palgrave Macmillan.

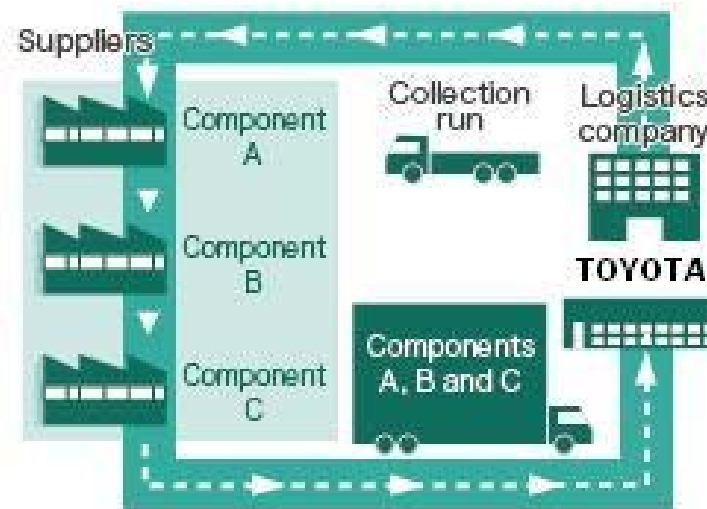
## HDD

- ▶ Just in Time warehouse
- ▶ More internationalization (50% local content)
- ▶ Lower transport costs
- ▶ Multiple suppliers, intra-firm trade

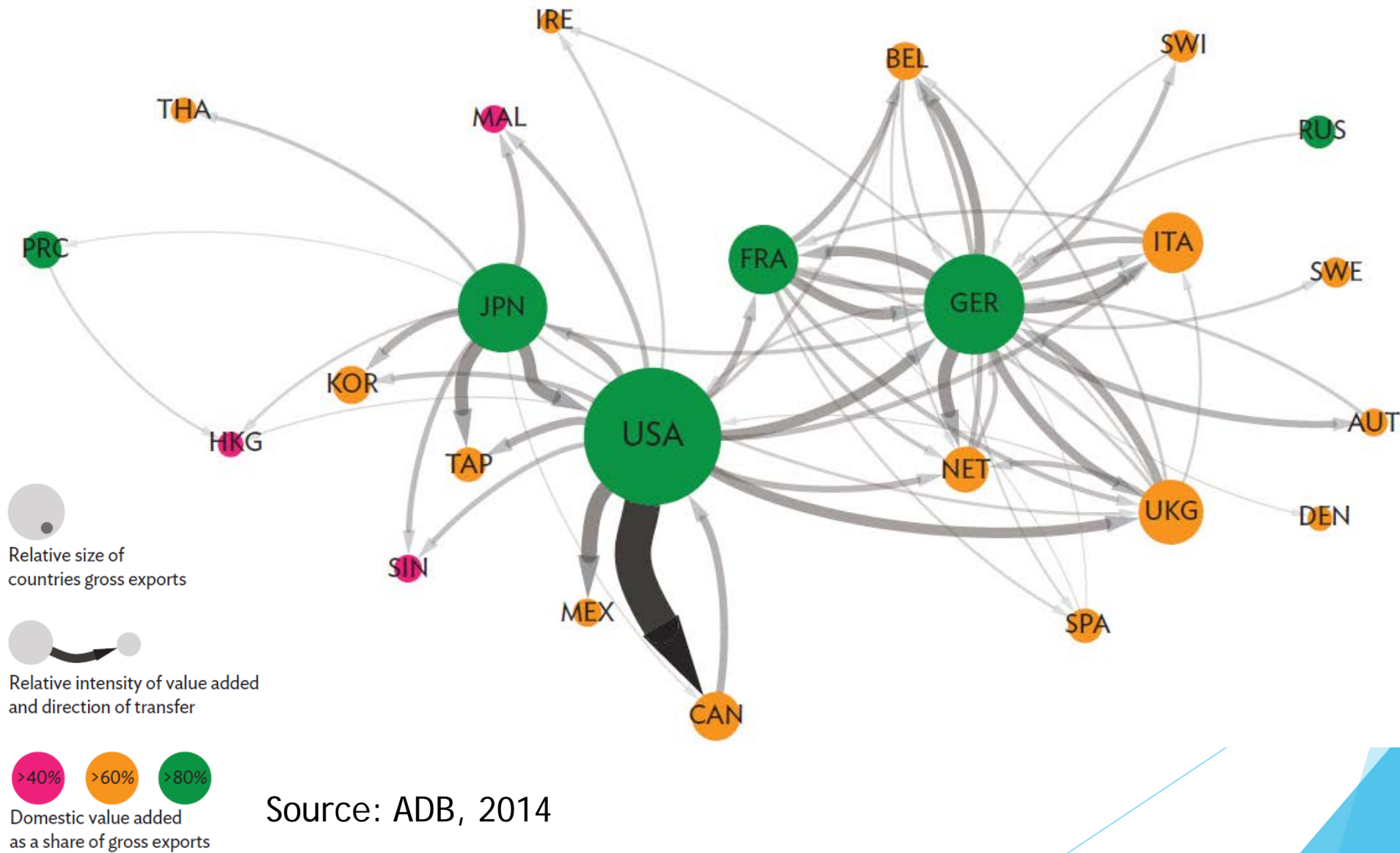


## Automobiles

- ▶ Milk-run system
- ▶ More local-procurement (100% local content)
- ▶ Higher transportation costs
- ▶ Horizontal multinational pattern:
  - ▶ Toyota has multiple automobile plants in East Asia

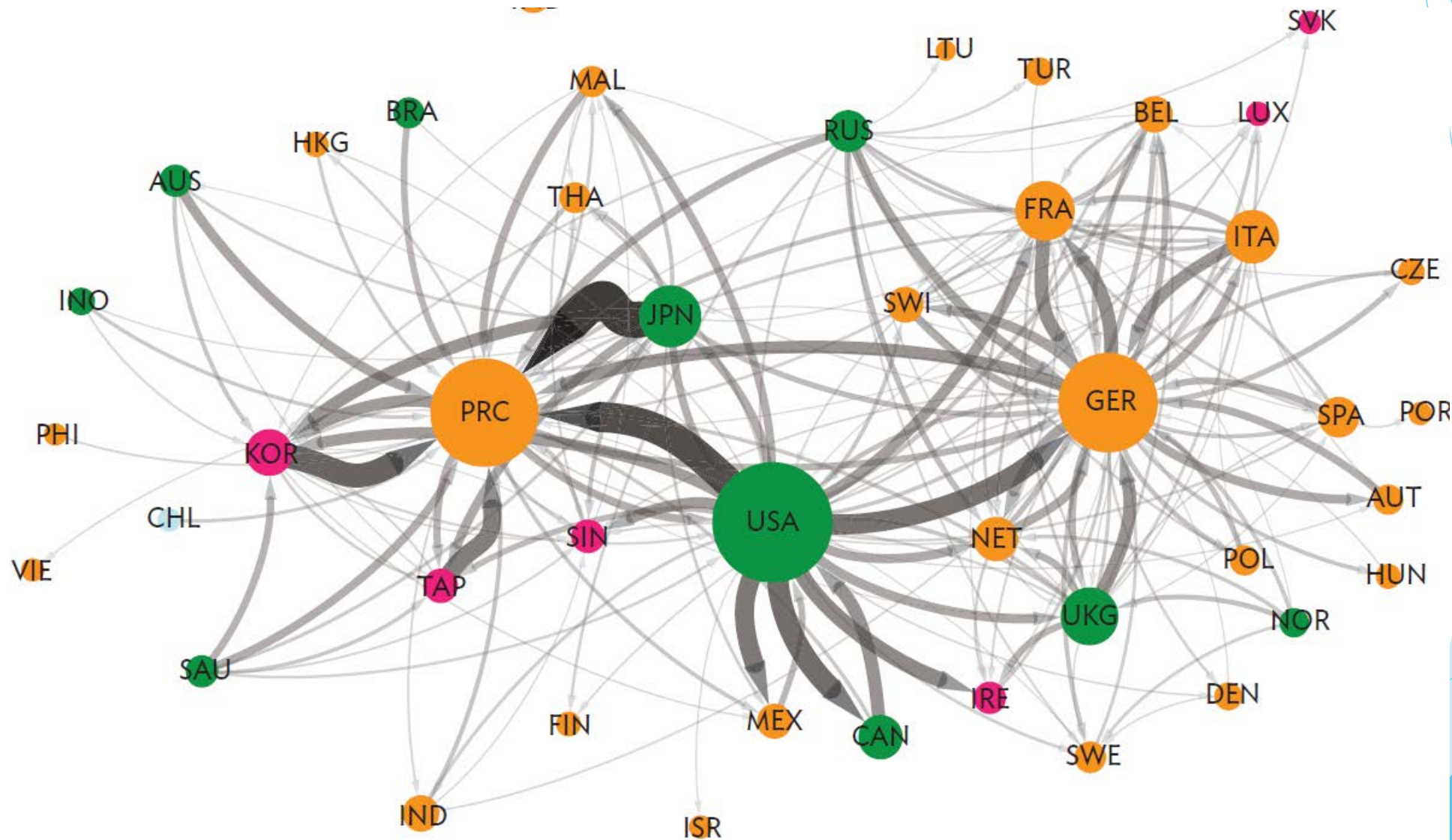


# The Global Value Chain in 1995





# The Global Value Chain in 2009



Source: ADB, 2014

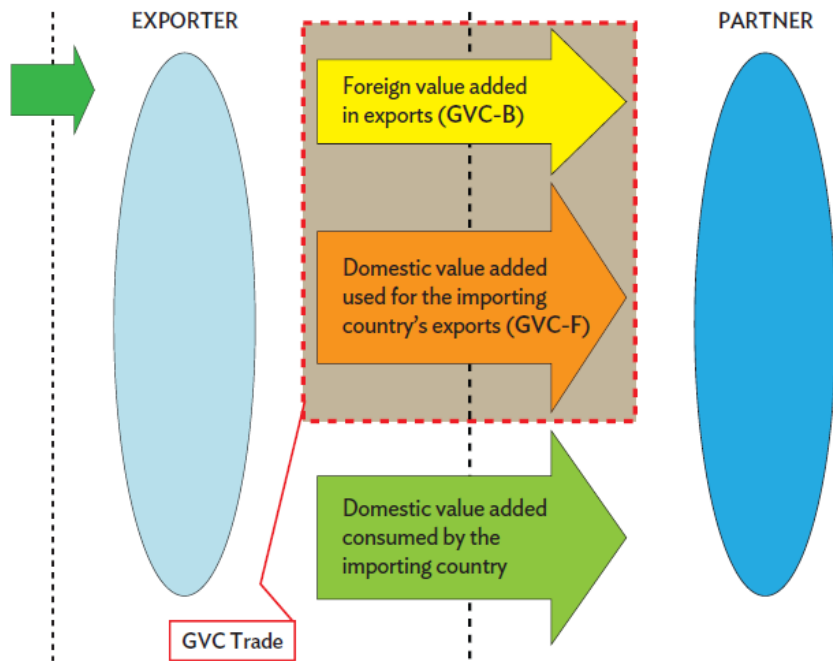


# GVCs and Trade Statistics

- ▶ Gross trade vs. value-added trade
  - ▶ The share of by less-skilled labor is falling within most GVCs, and the share of capital and of highly skilled labor is rising;
  - ▶ emerging economies increasingly focus on capital-intensive activities;
  - ▶ advanced nations increasingly specialize in activities carried out by highly skilled workers.
- ▶ In gross export terms, manufacturing trade comprises about 70% of world trade and services about 20%.
- ▶ In terms of value added, manufacturing and services trade are each about 40% of trade.
- ▶ Using value added rather than gross trade, US-China deficit down by 41%, US-Japan deficit up by 40%.

# Growth of GVCs

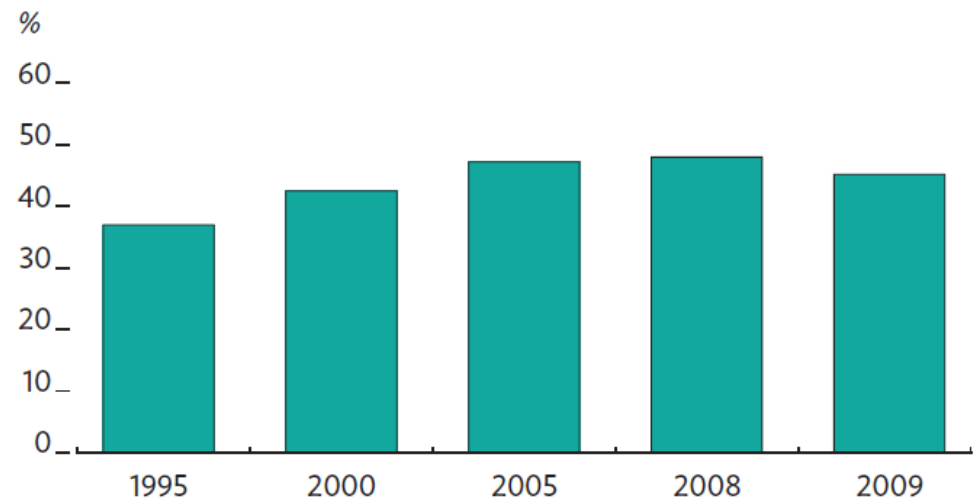
## 2.1.4 Gross export decomposition into GVC trade and regular trade



GVC = global value chain.

Source: Ma and Van Assche, unpublished.

## 2.1.5 GVC share of manufacturing export, selected economies



GVC = global value chain.

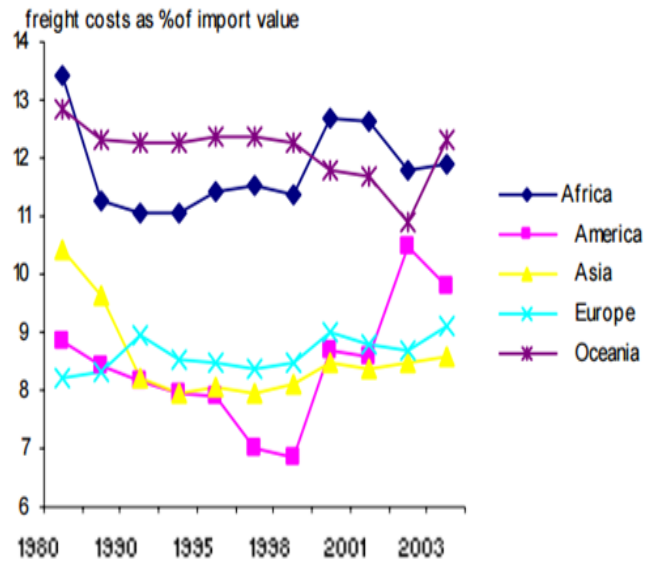
Note: ADB estimates using the data from the trade in value added indicator of the Organisation for Economic Co-operation and Development and the World Trade Organization.

Source: Ma and Van Assche, unpublished.

# Key drivers

- ▶ Comparative advantage, wage differentials
- ▶ Reduction in trade cost:
  - ▶ lowered tariffs (e.g. China's accession to WTO)
  - ▶ Fall in shipping/transport cost
- ▶ Improved coordination:
  - ▶ Rise in information and communication technology
  - ▶ Easier travel of managerial and engineering expertise (air aviation)
- ▶ Technology transfers between countries
- ▶ Regulatory flexibility encourages offshoring

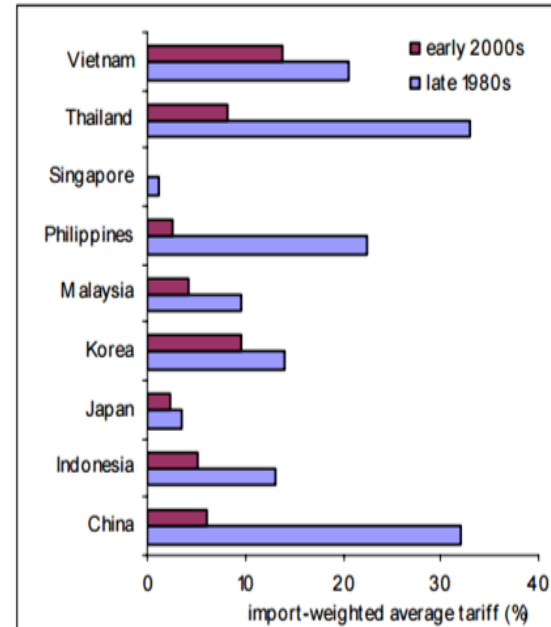
**Figure 1 Freight Costs among Developing Countries:  
Asia Is Doing Well**



*Source:* UNCTAD, various.

*Note:* Freight costs are typically around 4 percent of import value in developing countries.

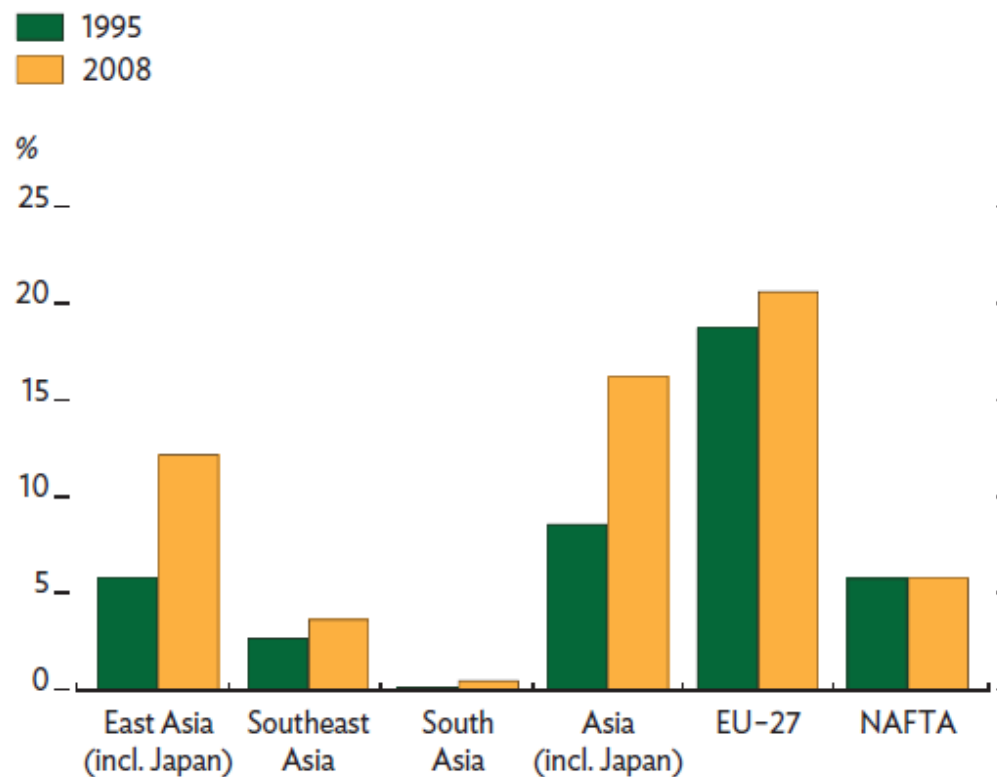
**Figure 2 Low Protection**



*Source:* World Bank 2005.

Lower transport costs, much lower tariffs

## 2.2.2 GVC trade share of world manufacturing exports, by region and subregion

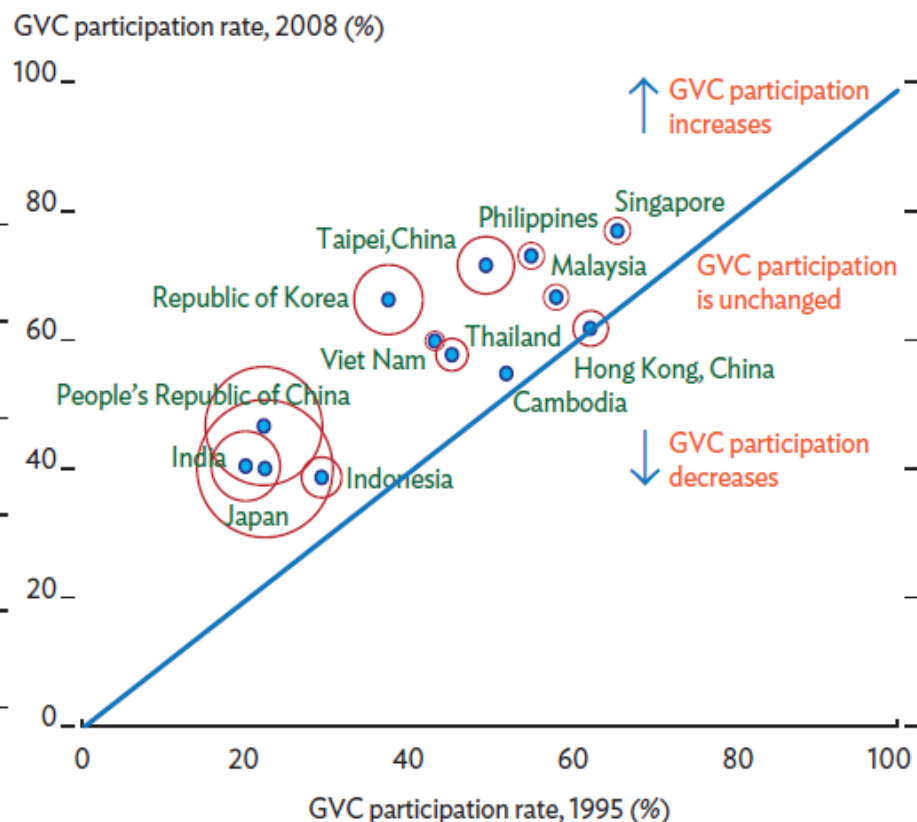


EU = European Union, NAFTA = North America Free Trade Agreement.

Note: ADB estimates using the data from the trade in value added indicator of the Organisation for Economic Co-operation and Development and the World Trade Organization.

Source: Ma and Van Assche, unpublished.

## 2.2.3 Asian countries' participation in manufacturing GVCs, 1995 and 2008



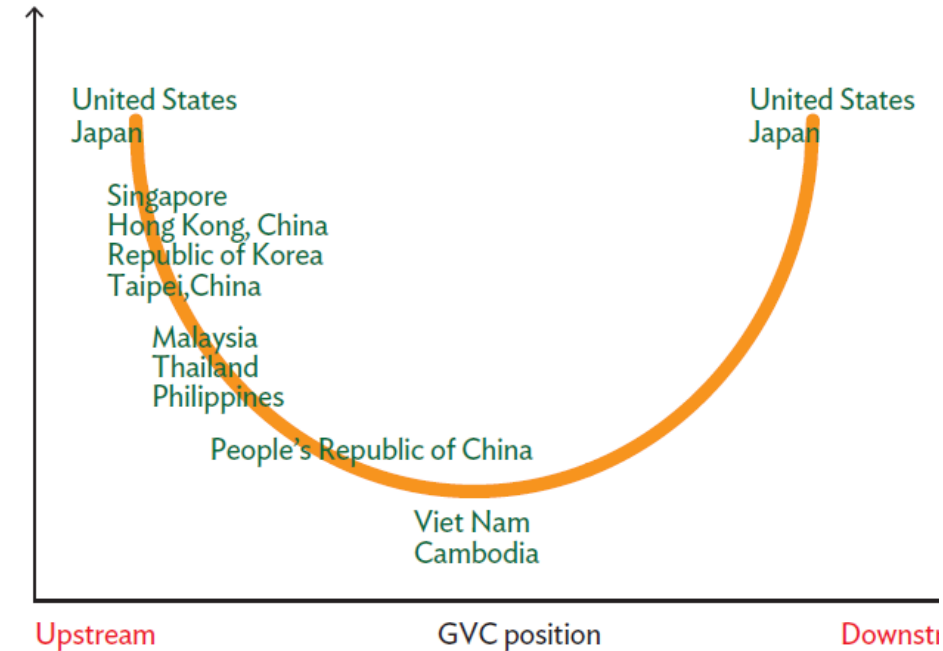
GVC = global value chain.

Note: ADB estimates using the data from the trade in value added indicator of the Organisation for Economic Co-operation and Development and the World Trade Organization. Red bubble size represents an economy's real GDP in 2008.

Source: Ma and Van Assche, unpublished.

## 2.2.4 Smile of value creation

GDP per capita, value added

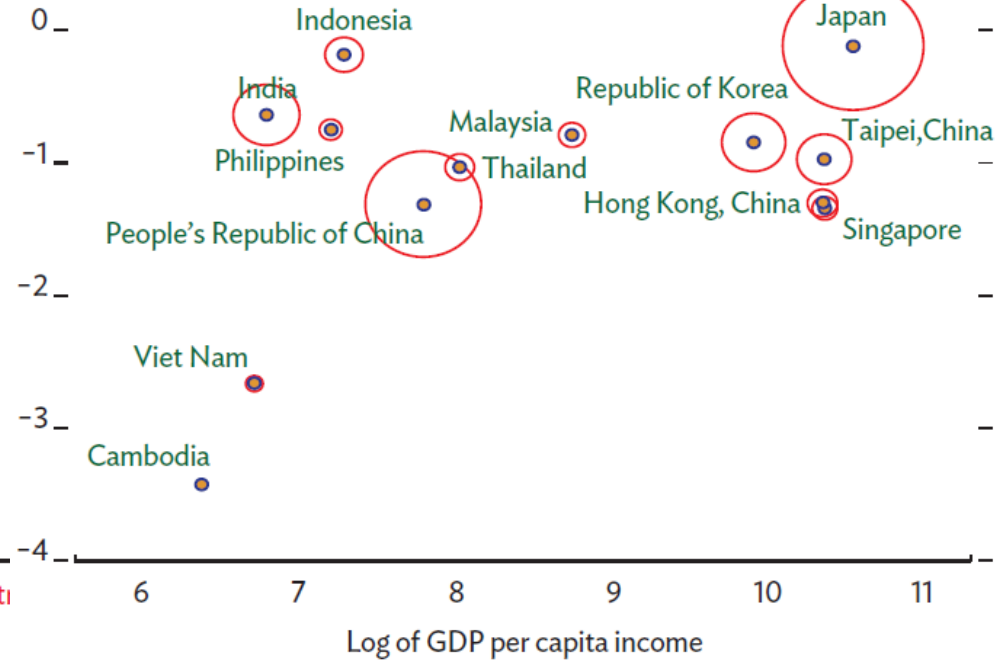


GDP = gross domestic product, GVC = global value chain.

Source: Ma and Van Assche, unpublished.

## 2.2.5 Asian economies' position in manufacturing GVCs, 2008

Log of the ratio of forward and backward linkages



GVC = global value chain.

Note: estimates using the data from the trade in value added indicator of the Organisation for Economic Co-operation and Development and the World Trade Organization. Red bubble size represents an economy's real GDP in 2008.

Source: Ma and Van Assche, unpublished.



### 2.2.1 Relative intensity in GVC trade by region, 2008

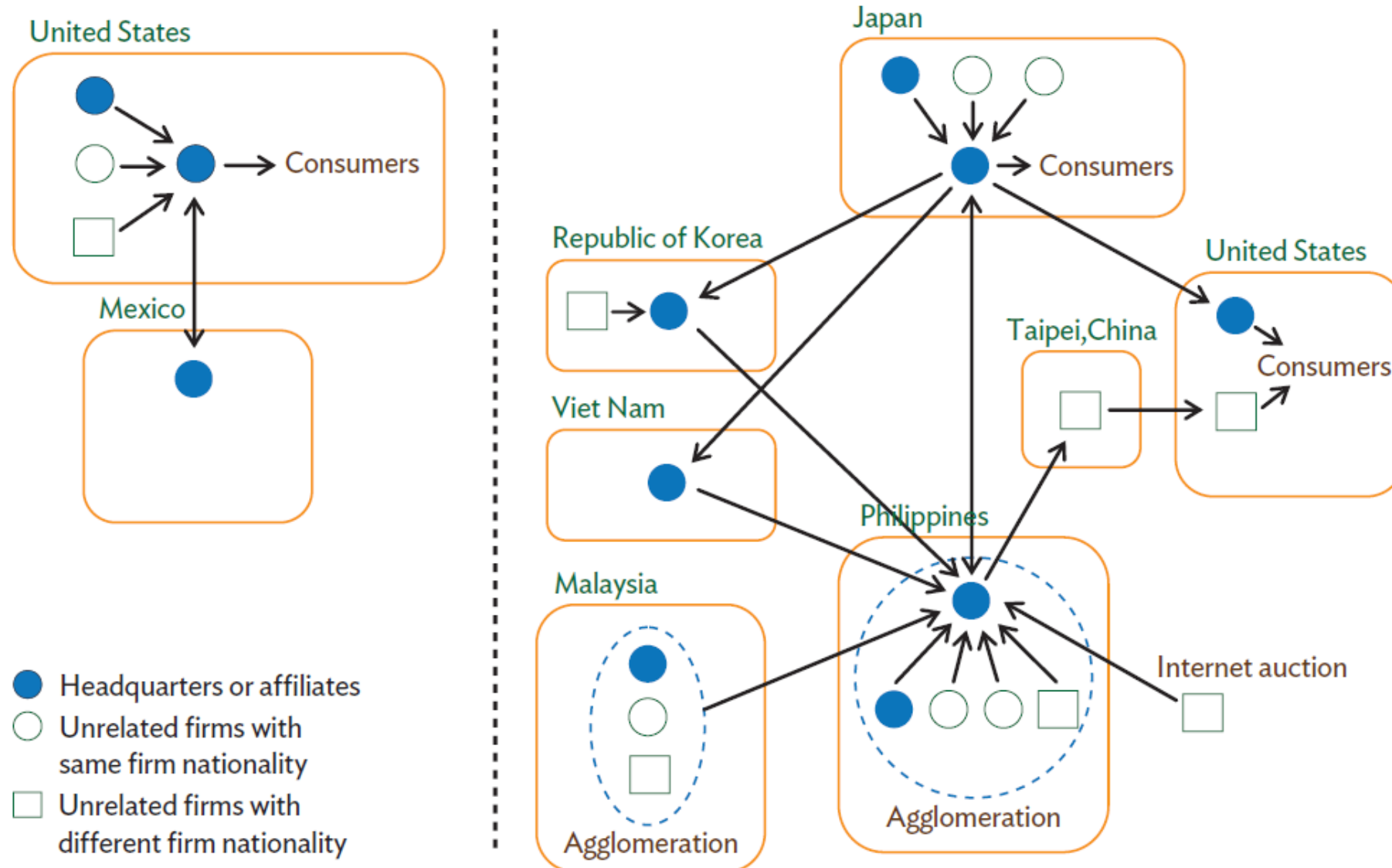
| Industry  | EU-27 | NAFTA | Asia | East Asia | Southeast Asia | South Asia |
|---|-------|-------|------|-----------|----------------|------------|
| Electrical and optical equipment                      | 0.56  | 0.93  | 1.76 | 1.75      | 1.94           | 0.46       |
| Textiles, textile products, leather, and footwear     | 0.63  | 0.36  | 1.29 | 1.18      | 1.48           | 2.71       |
| Machinery and equipment                               | 1.24  | 0.80  | 0.83 | 0.83      | 0.82           | 0.70       |
| Chemicals and nonmetallic mineral products            | 1.11  | 1.05  | 0.81 | 0.76      | 0.91           | 1.34       |
| Basic metals and fabricated metal products            | 1.08  | 0.96  | 0.78 | 0.90      | 0.33           | 1.28       |
| Transportation equipment                              | 1.31  | 1.48  | 0.64 | 0.75      | 0.27           | 0.61       |
| Food products, beverages, and tobacco                 | 1.28  | 0.76  | 0.55 | 0.30      | 1.32           | 0.99       |
| Wood, paper, paper products, printing, and publishing | 1.09  | 1.08  | 0.54 | 0.50      | 0.69           | 0.44       |

EU = European Union, GVC = global value chain, NAFTA = North American Free Trade Agreement.

Source: Estimates by Ma and Van Assche (unpublished) using data from the trade in value added indicator of the Organisation for Economic Co-operation and Development and the World Trade Organization.

A value greater than 1 indicates that GVC participation is higher than the global average.

## 2.2.1 Production networks: The US-Mexico nexus versus East Asia

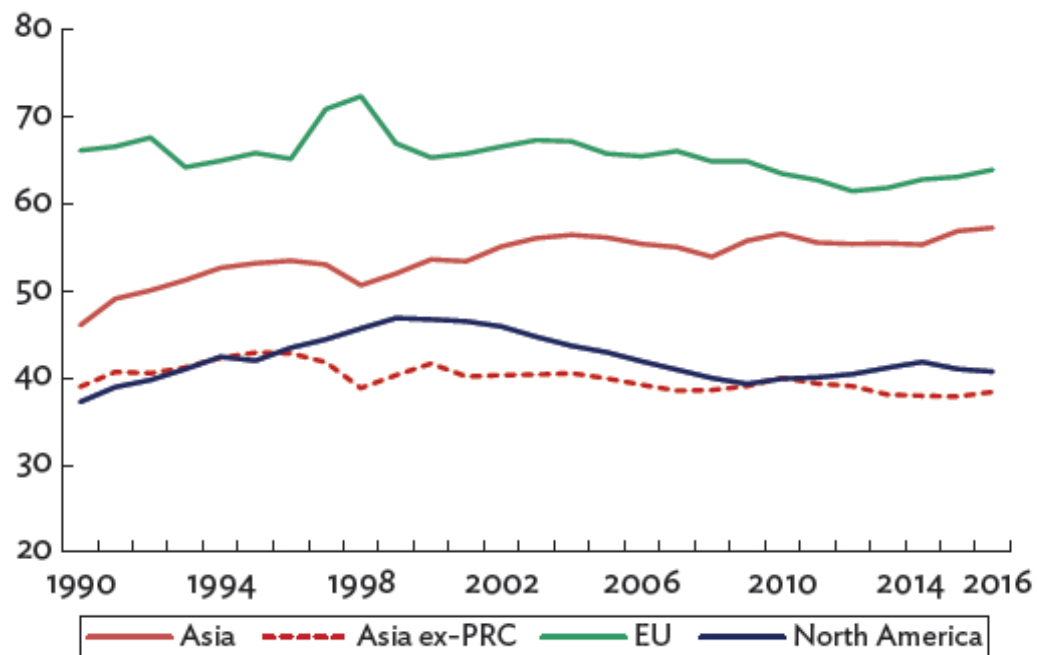


Source: Kimura and Obashi 2011, based on Ando and Kimura 2009.

# Why East Asia?

- ↳ Regional supply chains emerge in mid-late 1980s as a result of Japanese conglomerates.
- ↳ Japanese companies deployed massive FDI to move production offshore.
- ↳ Multinationals from other developed economies invested and established subsidiaries to establish competitiveness in region.

**Figure 2.5: Intraregional Trade Share—Asia, European Union, North America (%)**

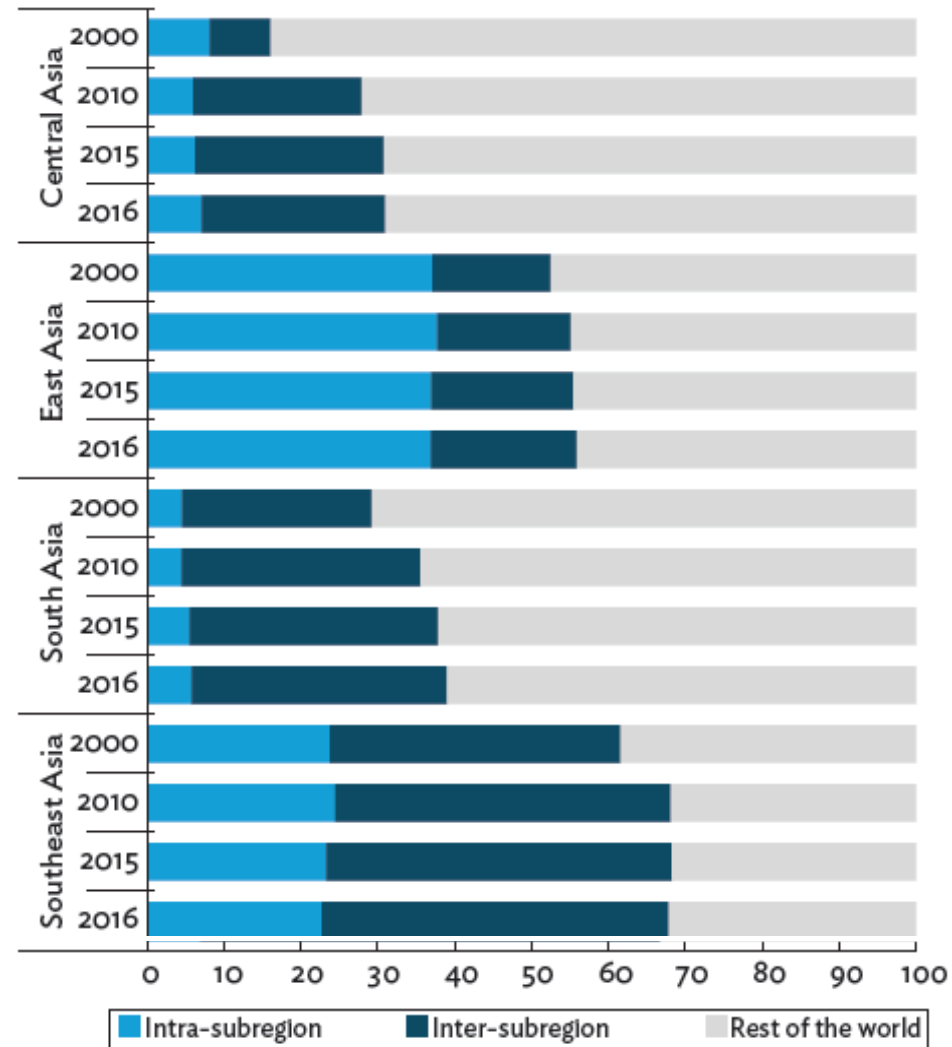


EU= European Union, PRC= People's Republic of China.

Notes: EU refers to aggregate of 28 EU members. North America covers Canada, Mexico, and the United States.

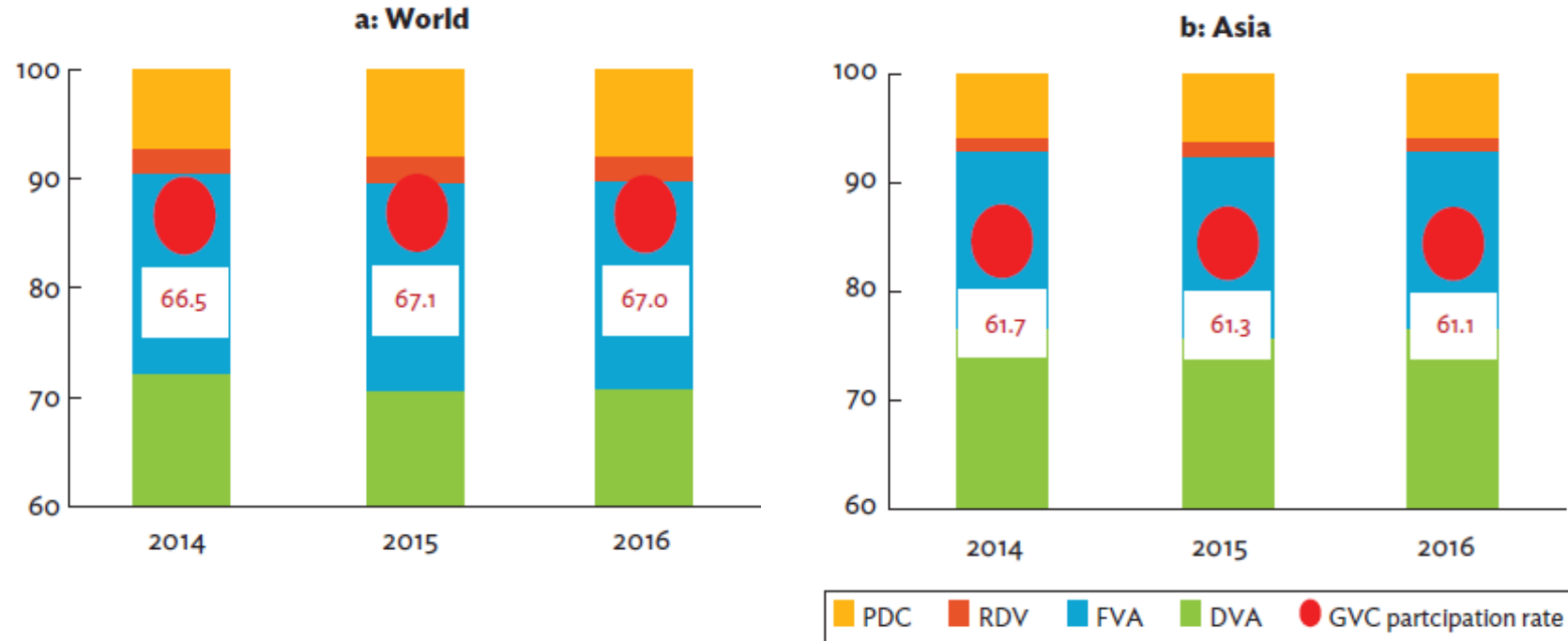
Source: ADB calculations using data from International Monetary Fund. Direction of Trade Statistics. <https://www.imf.org/en/Data> (accessed July 2017).

**Figure 2.7: Asia Intra- and Inter-subregional Trade Shares (%)**



Source: ADB calculations using data from International Monetary Fund. Direction of Trade Statistics. <https://www.imf.org/en/Data> (accessed July 2017).

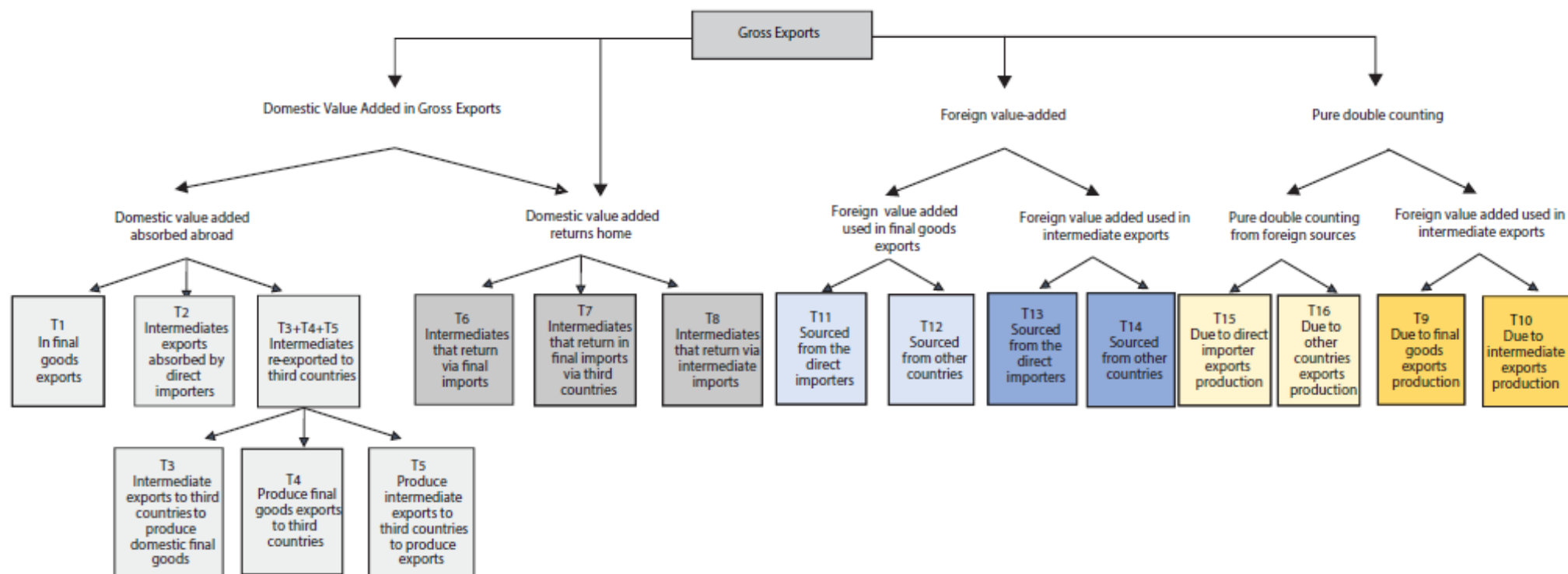
**Figure 2.8: Components of Gross Exports (%)**



DVA = domestic value added, FVA = foreign value added, GVC = global value chain, PDC = purely double-counted terms, RDV = returned value added.  
Sources: ADB calculations using 2014–2016 ADB Multi-Regional Input-Output Tables, and methodology by Wang, Wei, and Zhu (2014).



## Annex 2b: Decomposition of Gross Exports



Source: Wang, Wei, and Zhu (2014).

The GVC participation ratio is measured as:  $[\text{gross exports} - (T1+T9+T10+T15+T16)]/\text{gross exports}$ .

# GVCs and economic performance

- ▶ Reallocation according to comparative advantage
- ▶ Further specialization:
  - ▶ Through task specialization within industries
  - ▶ Specialize in segments of demand, either stable or unstable, due to labor market flexibility
- ▶ Economies that have found their niche within GVC have reaped income and employment dividends


### 2.1.3 GVC trade growth versus income, employment, and output growth, 1995–2009

| Dependent variable     | Real GDP per capita growth | Industry-level employment growth | Industry-level output growth |
|------------------------|----------------------------|----------------------------------|------------------------------|
| GVC trade (growth)     | 0.12*<br>(0.037)           | 0.10*<br>(0.016)                 | 0.19*<br>(0.042)             |
| R <sup>2</sup>         | 0.65                       | 0.41                             | 0.65                         |
| Number of observations | 221                        | 1,236                            | 1,248                        |

\* = significant at 1%, ( ) = standard error, GDP = gross domestic product, GVC = global value chain, R<sup>2</sup> = coefficient of determination.

*Notes:* ADB estimates using data from the trade in value added (TiVA) indicators of the Organisation for Economic Co-operation and Development and the World Trade Organization, and employment data from the World Input–Output Database. The dependent variable is annualized growth between periods (1995, 2000, 2005, 2008, and 2009). All estimates include year and economy fixed effects, while the industry-level employment and output growth estimates also include industry fixed effects.

*Source:* Ma and Van Assche, unpublished.

- 
- ▶ Being part of a GVC exposes an economy to potential contagion from adverse shocks that hit others in the chain
    - ▶ The 2011 earthquake in Japan, floods in Thailand
    - ▶ Flexible labor and capital markets can help contain the impact within the affected sector
    - ▶ A shock to one economy may become an opportunity for others in the network
  - ▶ Effects on skill premium?

# Policies to promote GVCs

- ▶ Further trade liberalization:
  - ▶ Lower tariffs; reduced uncertainty in tariffs;
  - ▶ Remove non-tariff barriers - harmonize product and process standards.
- ▶ Trimming transport costs and delays
- ▶ Infrastructure and institutions