

International Production Networks

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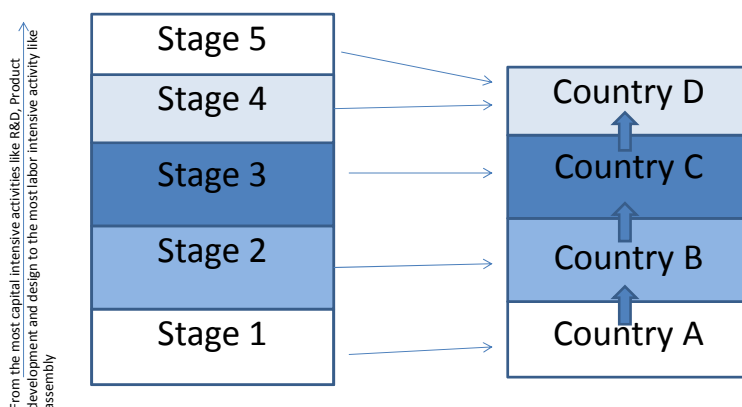
Lecture's Outline

- What are international production networks (IPNs)?
- Increasing importance of IPNs and its implication.
- Thailand and IPNs.
- Decoupling and re-balancing global trade

What are IPNs?

- IPNs are the breakup of the production processes, each of which can be relocated in countries in which the intensively used inputs are cheap.
- The nature of factor intensity of the given stage and the relative prices of factors in comparison with their productivity jointly determine which country produces what components.

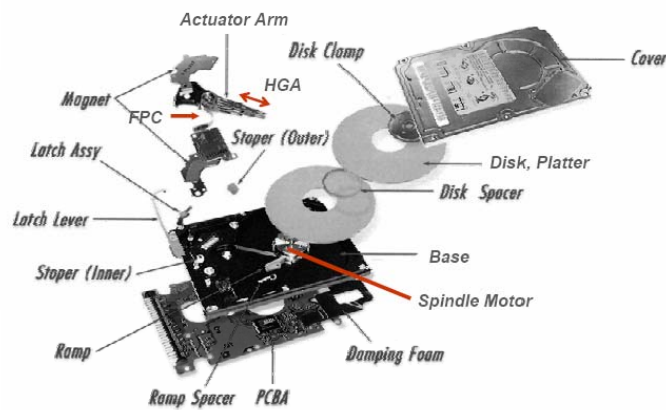
Examples

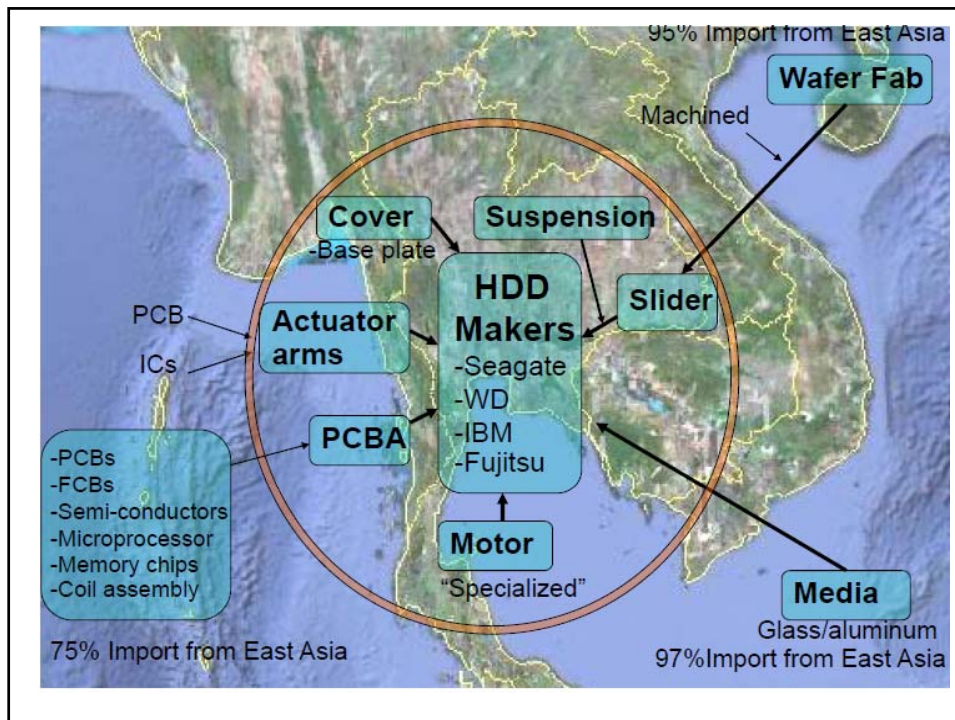


Example: Apple iPhone 3G

Component	Manufacturer/country	Cost (US\$)
Flash memory	Toshiba, Japan	24.00
Display module		19.25
Touch screen		16.00
FEM	Murata, Japan	1.35
Application processor	Samsung, Korea	14.46
SDRAM-Mobile		8.50
DDR		13.00
Baseband	Infineon, Germany	9.55
Camera module		2.80
RF Transceiver		2.25
Power IC RF function		1.25
Power IC application processor	Dialog Semiconductor, Germany	1.30
Bluetooth/FM/WLAN	Broadcom, USA	5.95
Memory MCP	Numonyx, USA	3.65
Audio codec	Cirrus Logic, USA	1.15
Other material	Other countries	48.00
Total material		172.46
Manufacturing cost (value added)	China	6.50
Total ex-factory price		178.96

Hard Disk Drive





IPNs are known in alternative terms

- **International production fragmentation** (e.g. Jones 2000; Jones & Kierzkowski, 2001; Athukorala, 2006; Athukorala & Kohpaiboon, 2010; Kohpaiboon, 2010)
- **Vertical specialization** (Hummels et al., 2001; Irwin, 2002)
- **International production sharing** (Ng & Yeats, 2001; Yeats, 2001)
- **Slicing the value chain** (Krugman, 1995)
- **Offshoring (international outsourcing)** (Rangan & Lawrence, 1999; Hanson et al. 2001; Bhagwati, 2010)

Measuring the importance of IPNs in the global trade

- Quantifying global production sharing
- Trade based on global production sharing: 'network trade' ('fragmentation trade')
- Network trade = parts and components + final assembly
- Data source: UN Comtrade database (SITC Rev. 3)

Network trade has grown at a much faster rate than total world manufacturing trade (%):

Share in world manufacturing trade of,

	P & C	Final assembly	Total network trade
1992/3	19.3	26.3	45.5
2010/11	26.2	29.4	55.6

- A shift away from mature industrial economies and towards developing countries

Developing-country share in world network exports :

	P & C	Final assembly	Total network
1992/3	20.8	22.9	40.1
2007/8	47.3	44.5	55.6

- Faster growth of network exports from East Asia

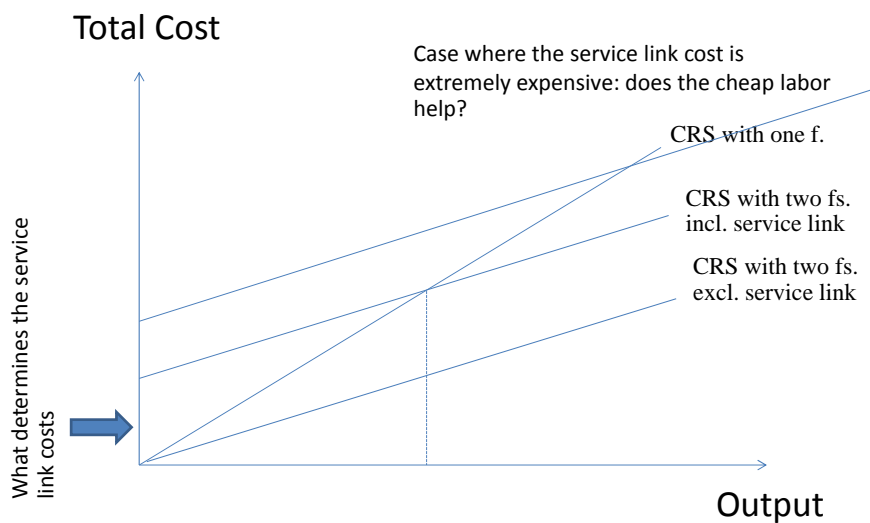
Development of IPNs

- IPNs started in the late 1960s but gain their relative importance in the globe in the past two decades.
- The process started in the electronics and garment industries and subsequently spread into many other industries; e.g. electrical appliances, machine tool, automobile (vehicles and parts), cameras and watches, pharmaceuticals, bio-medical equipment, solar panels, and light emitting diodes (LED)
- Now IPNs become a global phenomenon. More importantly, IPNs are far more important and growing rapidly in the Pacific Rim, particularly in East Asia than elsewhere in the world.

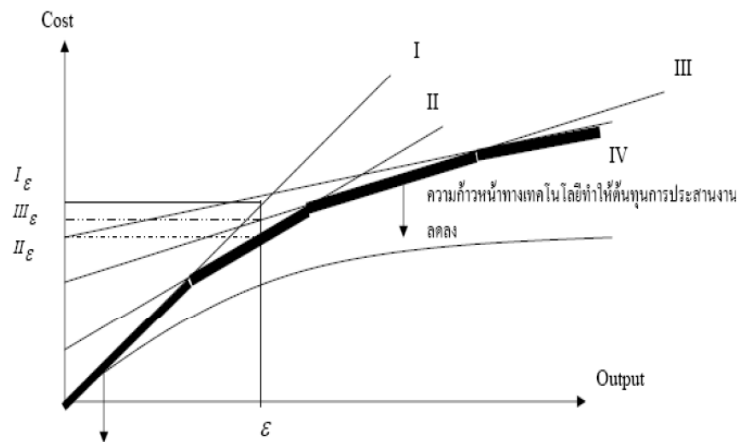
Three phases in the global spread of production sharing

- (1) two-way exchange between home and host country: parts and component assembly/testing in the host country to be incorporated in final assembly in the home country
- (2) component assembly networks encompassing many host countries (R&D, final assembly and head-quarter functions still in the home country)
- (3) Full-fledged production networks involving component production/assembly/testing and final assembly encompassing host countries (R&D and head-quarter functions are still predominantly in the home country)

Some Theoretical Concept of IPNs



Slice up four stages of production



Source: Jones & Kierzkowski (1990)

Factors causing the increasing importance of IPNs.

There are three mutually reinforcing factors that have contributed to the rapid expansion production fragmentation

1. Advances in production technology, enabling the industry to slice up the value chain into finer segments (tasks) (i.e. Modular System).
2. Technological innovations in communication and transportation that have contributed to significant reduction in the cost of 'service links' involved in coordinating international operations. **(In particular, rapid drops in air transportation costs played a key role)**
3. Liberalisation policy reforms in both home and host countries

The Role of MNEs/FDI (Trade-FDI nexus)

- MNEs are the key players in global production sharing:
- A close relationship between foreign direct investment (FDI) and trade in parts and components and final assembly
- In recent years, production sharing practices have begun to spread beyond the domain of MNEs:
 - As production operations in host countries become firmly established, MNE subsidiaries have begun to subcontract some activities to local (host-country) firms to which they provide detailed specifications and even fragments of their own technology.

But, the bulk of global production sharing takes place through intra-firm linkages rather than in an arms-length manner.

Implication of IPNs

1. Greater opportunity for countries to participate in the global trade. (No need to be able to produce the whole and complicated products).
2. Competition is more intense.
3. Trade and FDI become complement.

4. The conventional approach to trade flow analysis, which attributes the commercial value of a product to the last country of origin, is becoming increasingly misleading.

‘This phenomenon [global production sharing] calls for a change in analytical and statistical tools we use to measure and understand the real world’

Pascal Lamy, Director-General of WTO

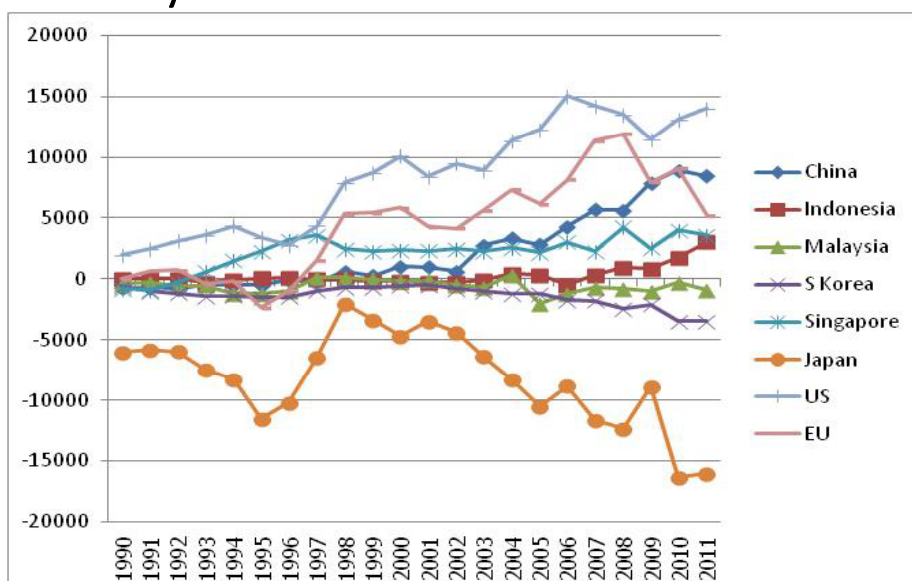
Financial Times, 24, January 2011

Thailand in IPNs

(a) Exports	Parts and components	Final assembly	Total network trade
Developing East Asia	35.2	27.3	62.5
China (PRC)	25.7	32.5	58.2
Taiwan	44.2	25.6	69.8
Korea, RP	43.2	28.4	71.6
ASEAN	44.7	24.8	69.5
Indonesia	21.54	17.7	39.1
Malaysia	54.6	22.2	78.8
Philippines	73.3	14.5	87.8
Singapore	49.5	17.2	66.7
Thailand	30.1	34.3	64.4
Viet Nam	11.2	7.6	18.8
India	12.3	4.2	16.5
Developed countries	25.2	23.6	48.8
Developing countries	47.3	44.5	55.6
World	29.2	23.6	52.8

(b) Imports	Parts and components	Final assembly	Total network trade
Developing East Asia	42.2	17.1	61.3
China (PRC)	44.0	19.8	63.7
Hong Kong, China	48.5	13.5	62.1
Taiwan	38.9	16.8	55.7
Korea, RP	31.9	17.4	49.3
ASEAN	47.9	16.2	64.1
Indonesia	21.8	15.8	37.7
Malaysia	50.0	22.0	72.0
Philippines	61.3	17.4	78.6
Singapore	60.4	17.3	77.7
Thailand	36.1	12.4	48.5
Viet Nam	19.1	9.7	28.5
India	22.9	17.0	39.9
Developed countries	23.4	25.5	48.9
Developing countries	33.6	19.9	53.5
World	27.3	23.3	50.7

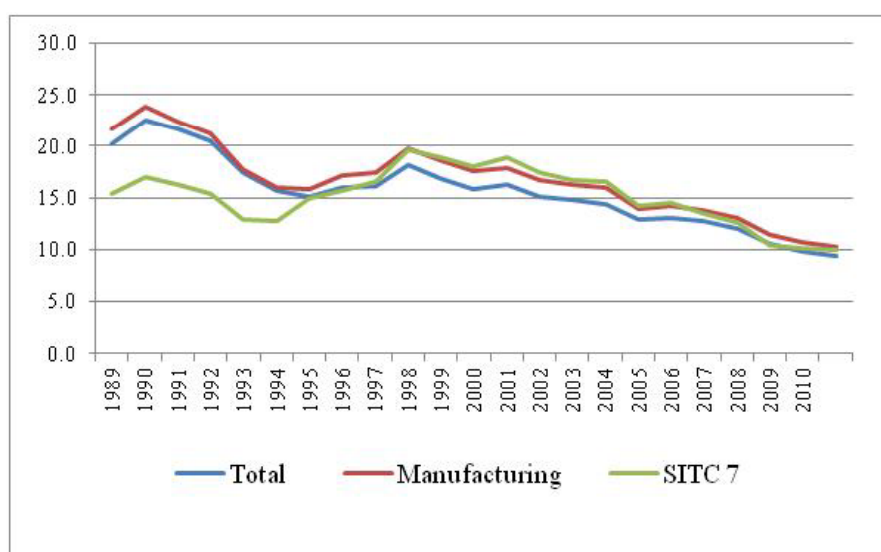
Analysis of Bilateral Balance of Trade



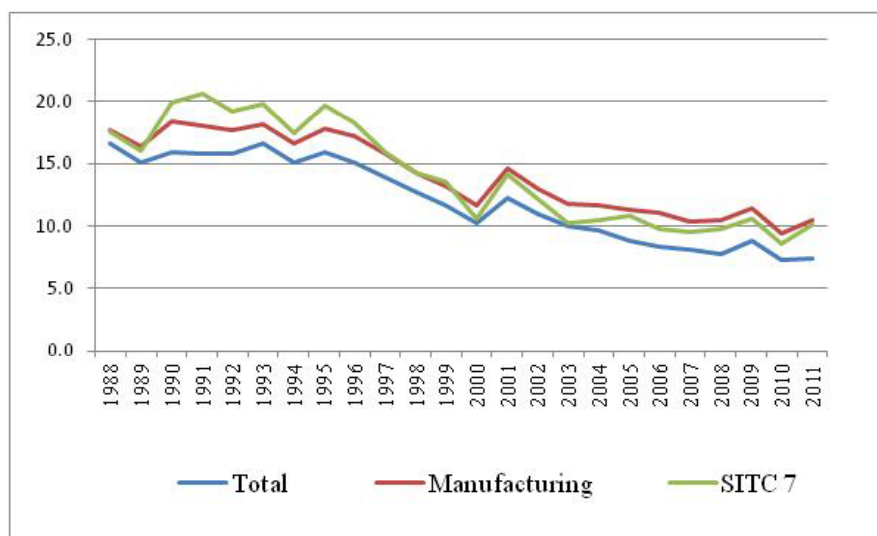
Fallacy of Decoupling Thesis

- The decoupling thesis, a popular theme in the Asian policy circles;
 “ the East Asian region has become a self-contained economic entity with potential for maintaining its own growth dynamism independent of the economic outlook for the traditional developed market economies”
- The thesis was formulated by the observed declining trend of EU and US in East Asian Trade.

Share of Thailand's export to EU



Share of Thailand's import from EU



- Implicit assumption: International trade is an exchange of goods that are produced from start to finish in just one country.
- The policy debate in East Asia has made a U-turn from the decoupling complacency to rebalancing of East Asian growth with a view to reducing its susceptibility to vagaries of the rest of the world (ADB 2009).
- It appears again in the recent European crisis (Drysdale, 2012)

Drysdale, P. (2012), ‘Can Asia Help Power World Recovery?’ *East Asia Forum 18 June*

‘Rebalancing global growth became the mantra for how to shape the contribution of emerging economies to ending the global recession, temporarily hiding the need to rein in structural deficits and financial imprudence in the developed world.

As Europe teeters toward another crisis, threatening to shatter confidence in America’s tentative recovery and global markets, the mood around the G20 summit has changed and emerging economies have come to be seen as the saviours of global economic growth, rather than the culprits of the current mess.

IPNs

US and Europe (60% of World Consumers)

