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CAPACITY BUILDING WORKSHOP TRADE AND TRADE POLICY ANALYSIS FOR THE POST COVID-19 RECOVERY

TUESDAY, 7 DECEMBER 2021

10:00 - 11:15 AM BKK TIME (UTC+7)

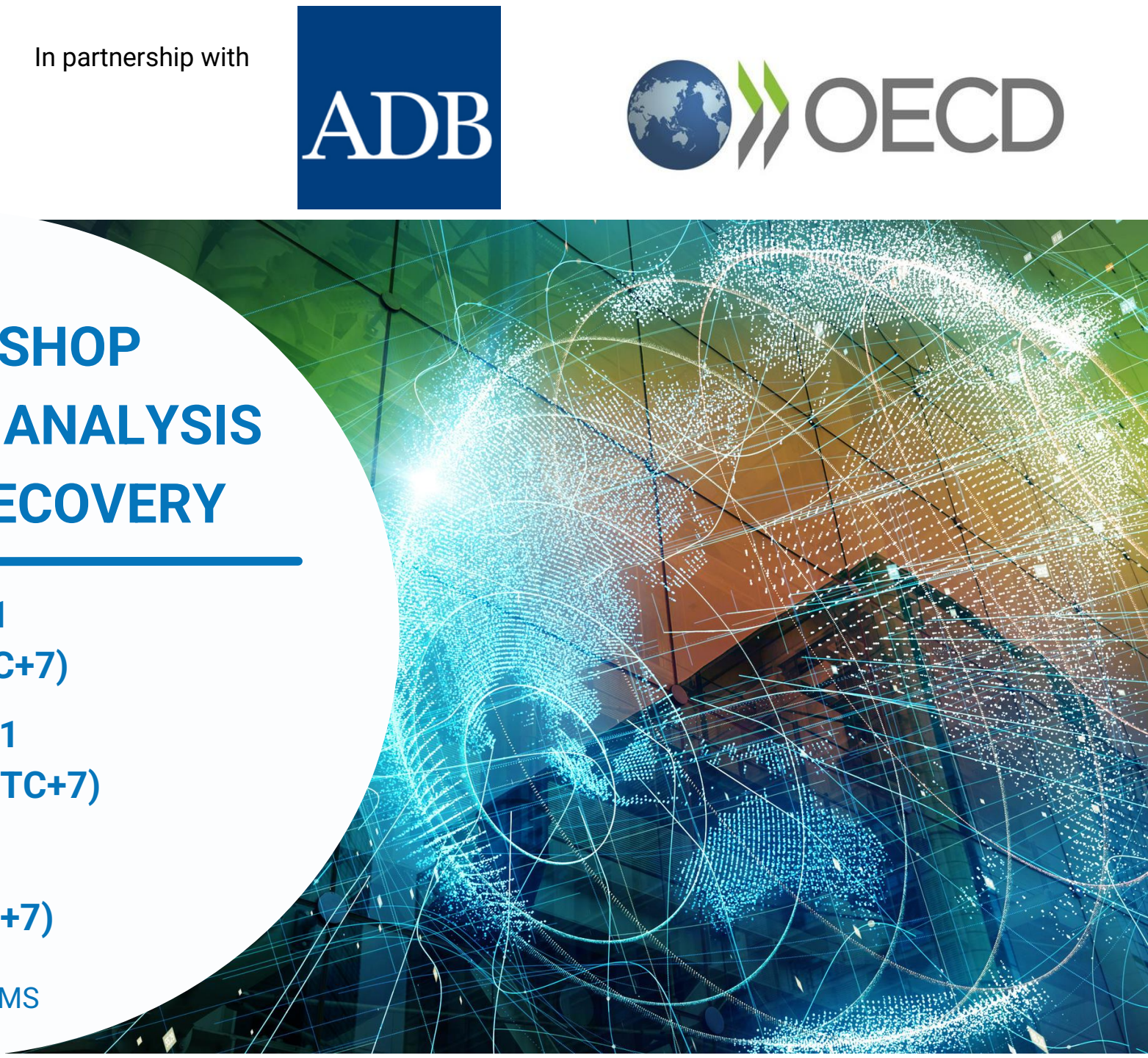
THURSDAY 9 DECEMBER 2021

09:30 AM - 15:45 PM BKK TIME (UTC+7)

FRIDAY 10 DECEMBER 2021

13:30 - 15:15 PM BKK TIME (UTC+7)

VIRTUAL MEETING, MS TEAMS



Understanding Global Value Chains and Trade in Value Added

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Learning Objectives

1.	<u>Globalization and GVCs</u> <ul style="list-style-type: none">• Defining GVCs• Value Chain Ecosystem: Reference Model• GVCs & IPNs• Different types of IPNs
2.	<u>Introduction to the Value Chain Approach</u> <ul style="list-style-type: none">• Emergence of GVCs• Analytical Approaches to GVCs• Typology of GVCs• Types of Upgrading• Organisation of GVCs
3.	<u>Ways to capture Value Addition in the Chain</u> <ul style="list-style-type: none">• Mapping GVCs by firm business records• Mapping GVCs by input-output tables• Input-output based analytical approaches
4.	<u>Trade in Value Added</u> <ul style="list-style-type: none">• From trade in goods to trade in tasks• Trend in intermediate and final goods
5.	<u>Current Developments</u> <ul style="list-style-type: none">• Covid-19 & GVCs

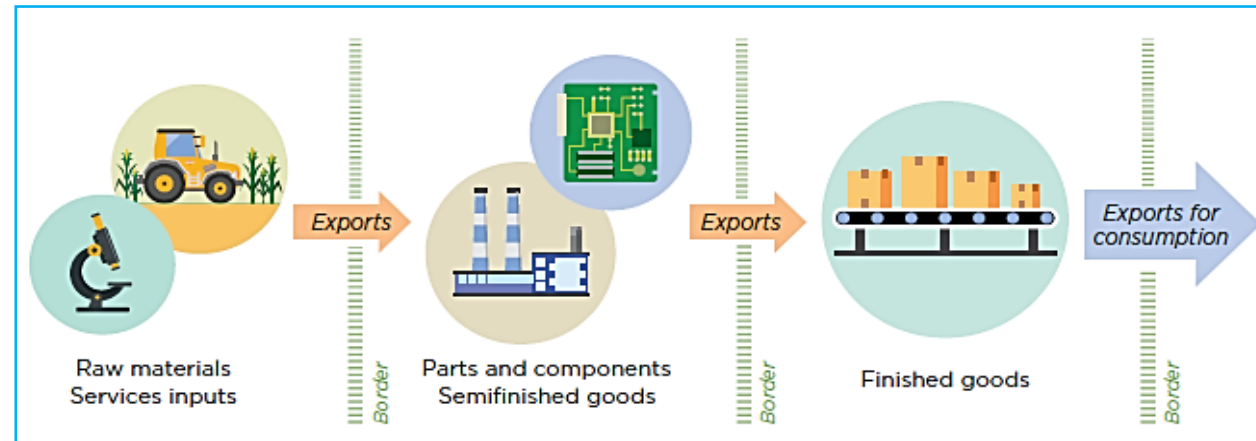


1. Globalization and GVCs



What are GVCs ?

- A GVC breaks up the production process across countries, with firms specializing in a specific task and stages of production rather than producing the whole product.

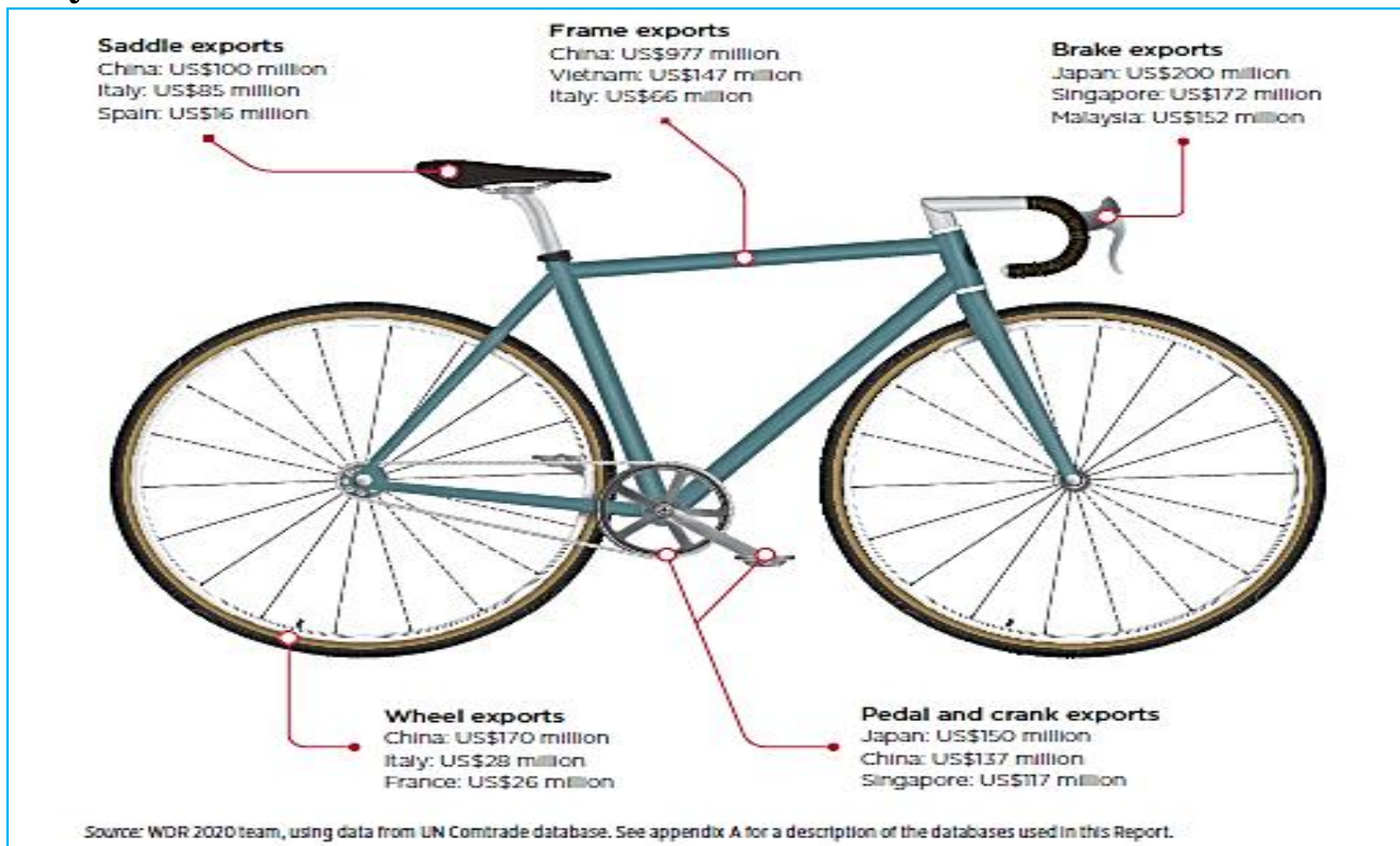


- With fragmentation, the carrying of specific parts of the production process in certain countries is eased when costs are minimized through economies of scale as well as specialization.
- Hyper-specialization and sustained firm-to-firm relationship builds which lead to increase in technology and knowledge transfer as well as access to capital.
- This allows firms to raise productivity and income and renders GVC trade more powerful than traditional trade in supporting growth and poverty reduction.



Where do Bicycles come from?

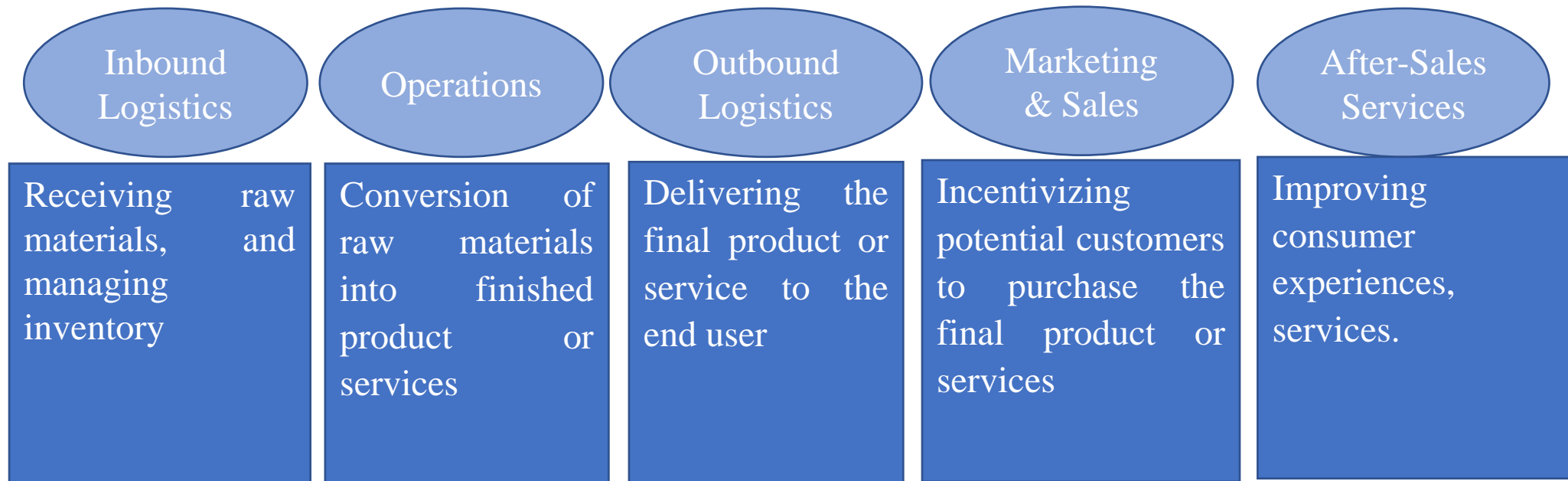
Bicycle Value Chain



Value-Chain Ecosystem

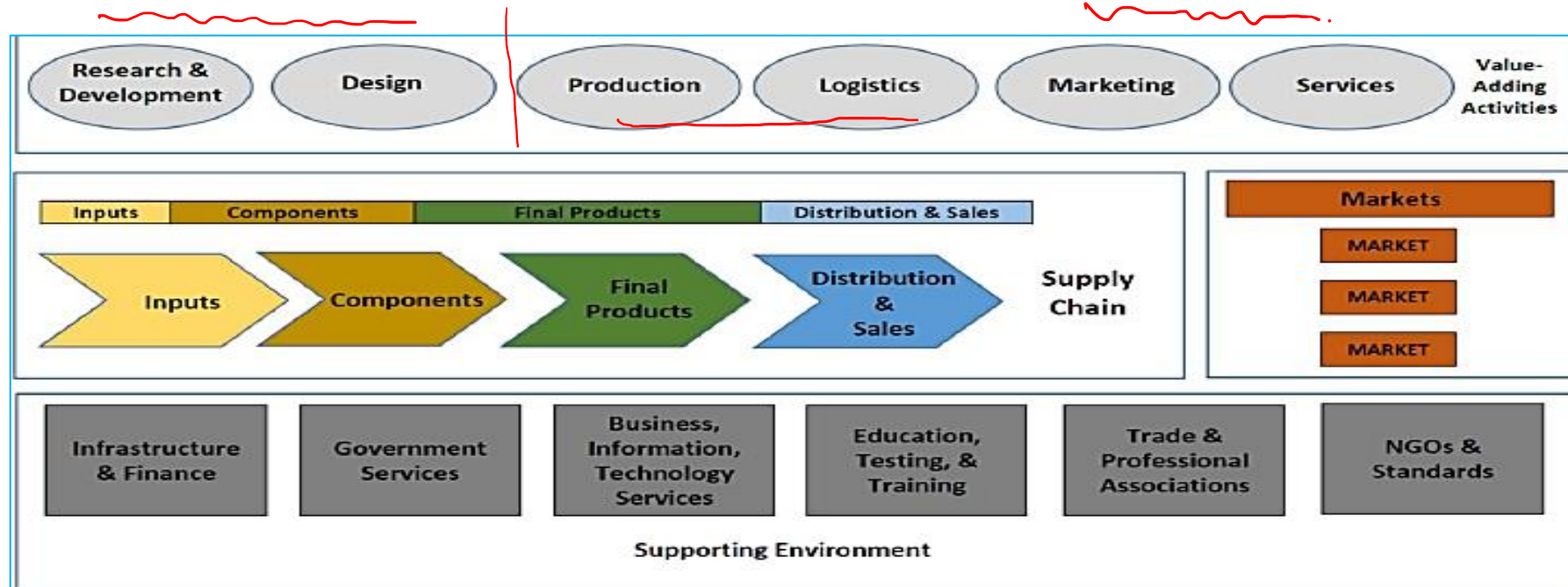
Porter (1985) identifies a value chain as a set of activities that a firm performs to deliver a valuable product or service to the market. The concept builds a corporate strategy to promote firm competitiveness by directing attention to the entire system of activities involved in producing and consuming a product.

A value chain can be broken down into:



Value Chain Reference Model

- Introduced by Stacy Frederick (2010 and 2014), the value-chain reference model (VCRM) provides a comprehensive picture of value chain ecosystem. It consists of four parts: value-adding activities, the supply chain, end-use markets, and the business supporting environment.
- The Supply Chain consists of: (1) supply of materials to a manufacturer; (2) the manufacturing process; and (3) the distribution of finished goods to final customers through a network of distributors and retailers.



GVCs & IPNs

- In global production fragmentation—production activities are increasingly carried out by various entities located in different countries that are linked horizontally, vertically, and diagonally (Henderson et al. 2002).
- GVCs have been recognized as an important driver of structural change in the world economy (Sturgeon and Memedovic 2011) and have become an important aspect of cross-border trade.
- This has led to increase in offshoring and outsourcing activities, the use of imported intermediate inputs, and trade in intermediate goods.

How Do We Define Value Chains and Production Networks?

- “Chain” maps the vertical sequence of events leading to the delivery, consumption, and maintenance of a particular good and service.
- A “network” maps both the vertical and horizontal linkages between economic actors, i.e., recognizing that various value chains often share common economic actors and are dynamic as they are reused and reconfigured on an ongoing basis.
- E.g- “original equipment manufacturer,” which is widely used in both the motor vehicle and electronics industry.



Different Production Networks

- Firms or countries are specialized in some but not all stages of the production process (Hummels, Rapoport, and Yi 1998).
- Technological change has enabled various tasks of a production process to be physically separable and tradable leading to intra-product specialization (Grossman and Rossi-Hansberg 2006).
- Productivity gains, economies of scale, and potential savings in learning costs encourage the creation of firms focusing on component production.

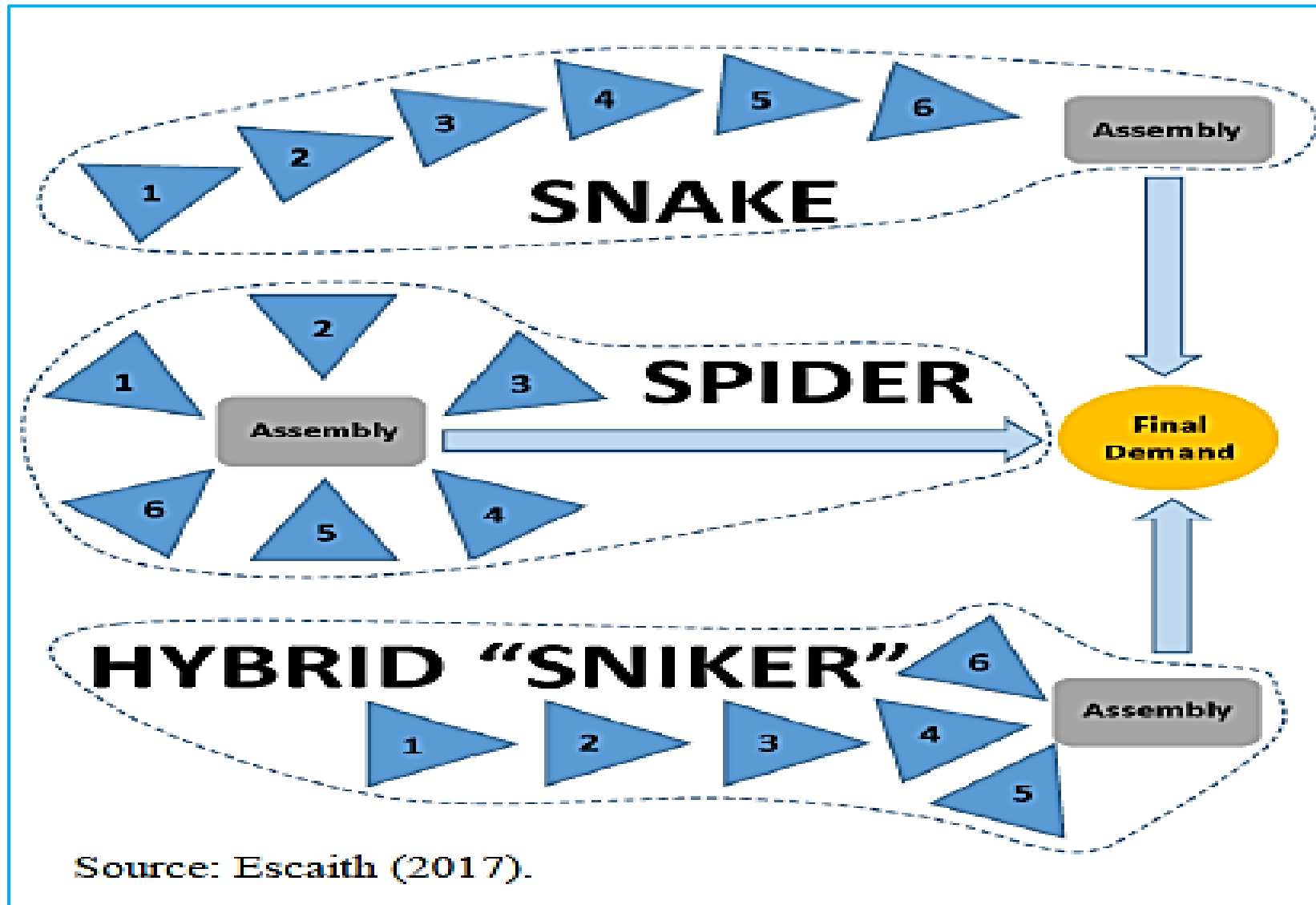
Different Shapes of Global Production Networks

Based on the configurations-

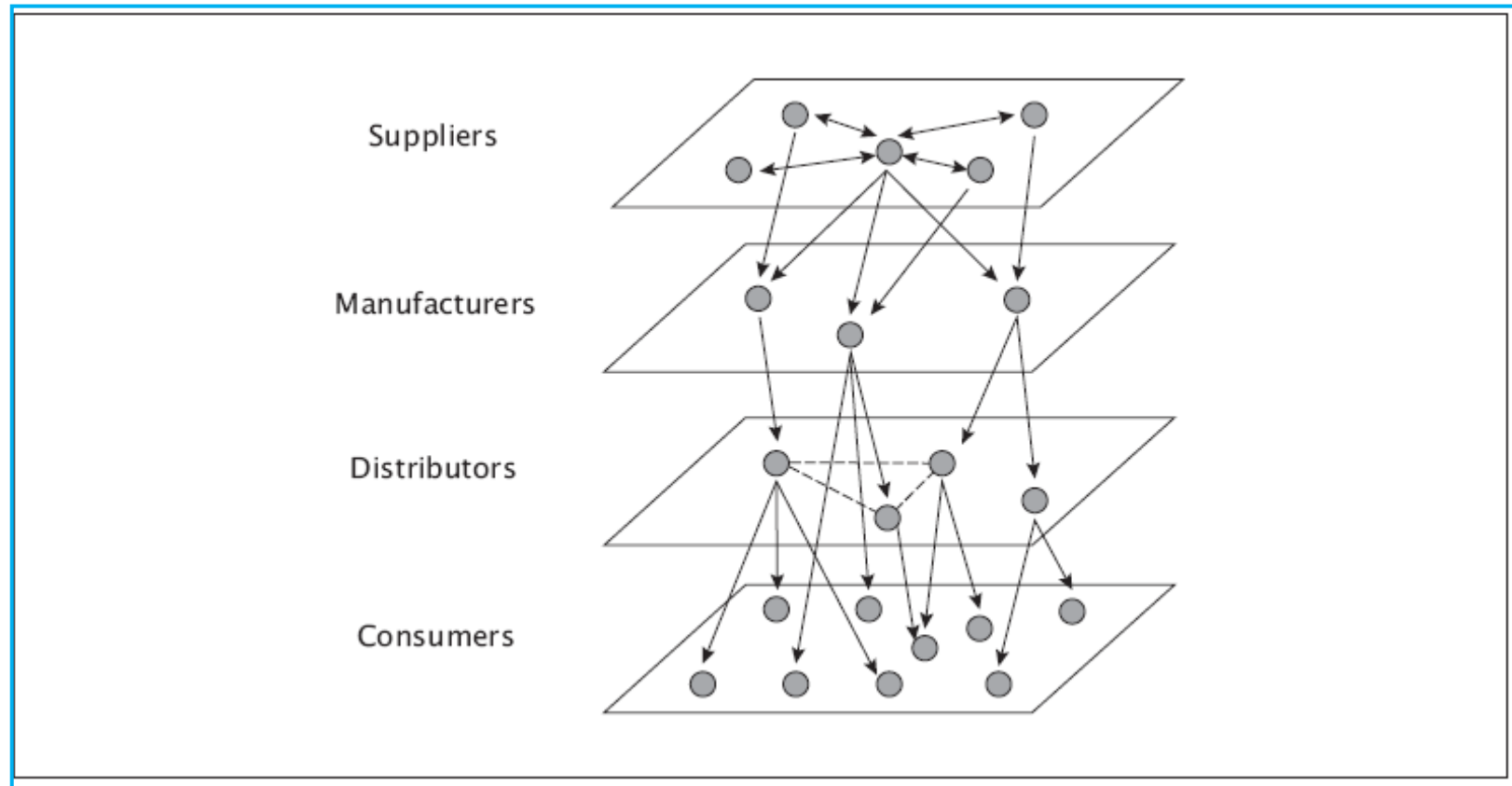
1. Spiders- It refers to multiple limbs (parts) coming together to form a body (assembly), being either the final product itself, or a component.
2. Snakes- goods moving in a sequence from upstream to downstream, with value added at each stage.
3. Snikers- combinations of the two- affecting production locations as well as interactions between firms.



Snake, Spider, and Sniker production configurations



Network and Chain (Net-chain) Approach among the Actors of Production



Source: Lazzarini et al. (2001).



2. Introduction to the Value Chain Approach



Analytical Approaches to GVCs

Major Theories	Other field Theories
The initial theory of production fragmentation (Jones and Kierzkowski 1990). Slicing of production process due to increased transportation and communication services.	Conceptualized first in the discussions of the Global Value Chains Initiative (2000–05), sponsored by the Rockefeller Foundation, and further crystallized by Gereffi, Humphrey, and Sturgeon (2005) , focusing on the governance structure of organizing IPNs.
Trade in Intermediate goods (Feenstra and Hanson, 1996; Campa & Godberg, 1997; Yeats 1998). This has led to outsourcing and offshoring of certain functions.	Roots in Development theory, business management to industrial organization theory, a comprehensive study on the structure and mechanism of value distribution among countries led to the term “global value chains” (Gereffi, Humphrey, and Sturgeon 2005).
Unbundling (Baldwin 2006). This process captures the vertical specialization.	The empirical aspect of GVC studies is relatively newer.
Trade in tasks on factor productivity (Grossman and Rosi-Hansberg, 2008).	Value-added analyses earlier were based on firms’ business records (Dedrick et al., 2008; Xing and Detert, 2010). Now complemented by input-output analysis, using multi-country input-output databases, such as trade in value added (Johnson and Noguera 2012, Koopmans et al, 2014) and supply chain length (Dietzenbacher, Romero, and Bosma 2005; Fally 2011)

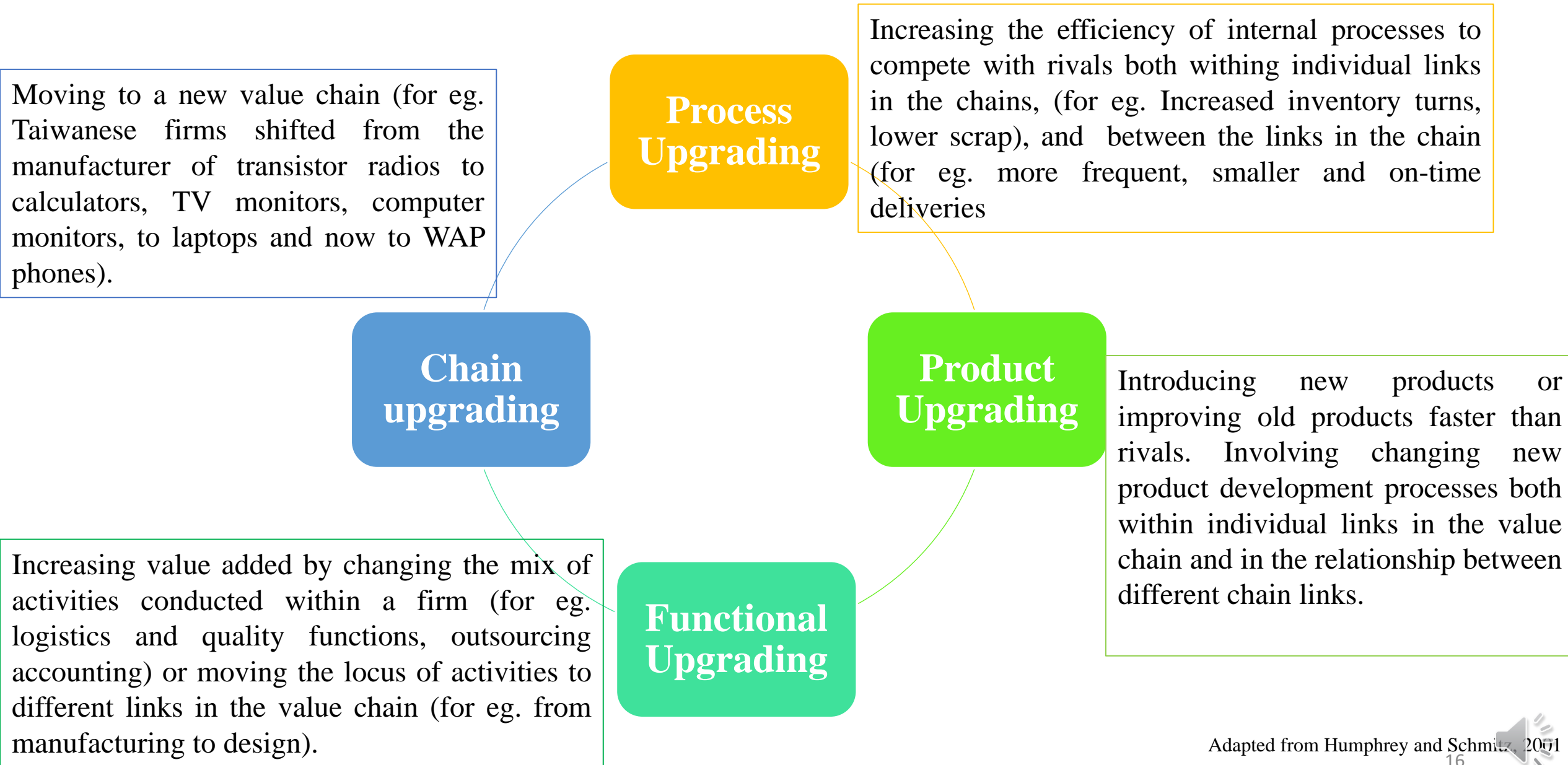


Complexity in Governance

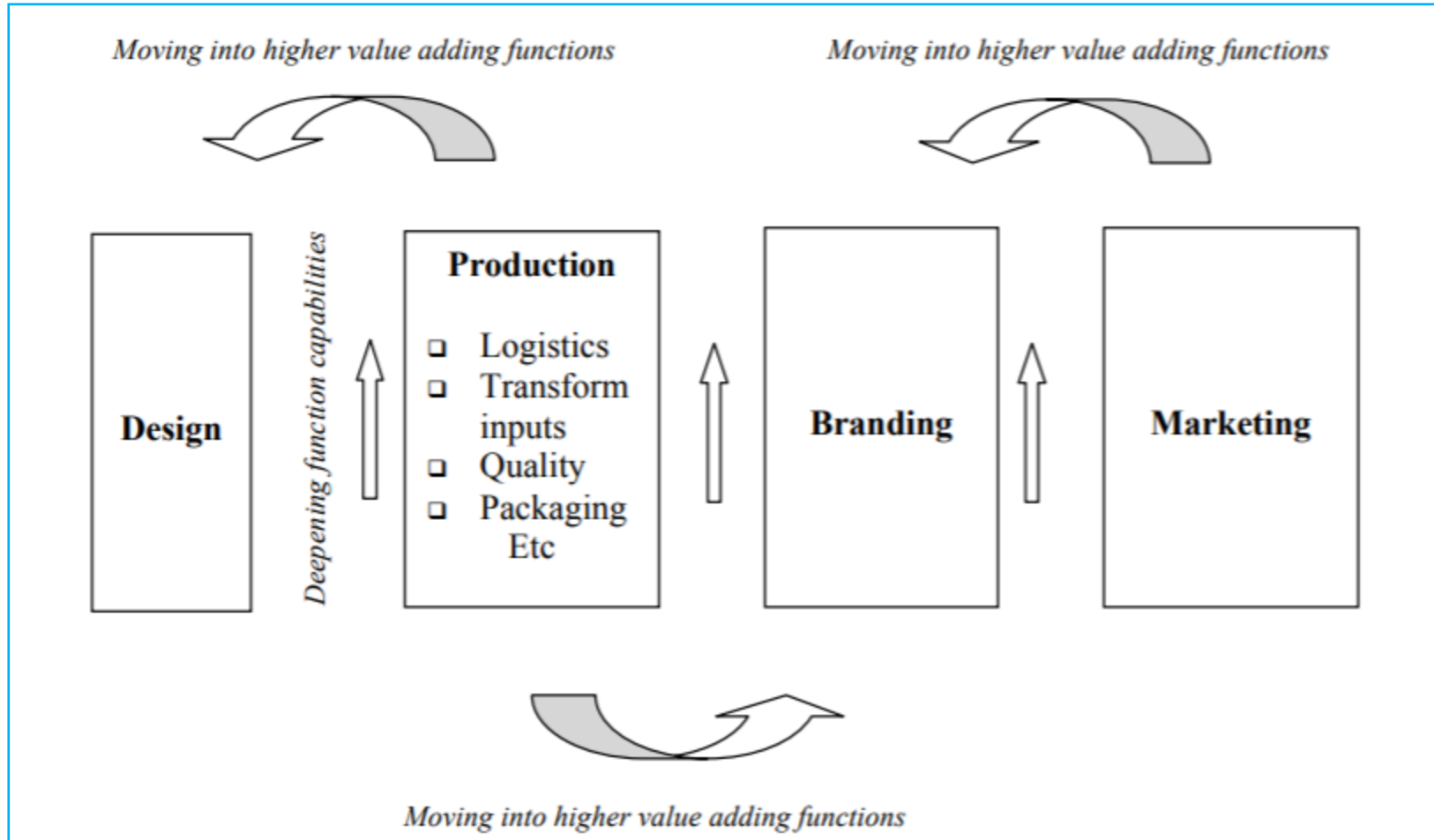
Key variable: Linkage type	Complexity of transactions	Ability to codify transactions	Capabilities in the supply-base	
Market	<div>Low ✓</div>	<div>High ✓</div>	<div>High</div>	<div>High</div>
Modular	<div>High</div>	<div>High</div>	<div>High</div>	<div>High</div>
Relational	<div>High</div>	<div>Low</div>	<div>High</div>	<div>High</div>
Captive	<div>High</div>	<div>High</div>	<div>Low ✓</div>	<div>Low ✓</div>
Hierarchy	<div>High</div>	<div>Low ✓</div>	<div>Low</div>	<div>Low ✓</div>
Characteristics: Linkage type	Stylized network form Lead firm(s)—Supplier(s)	Requirement for explicit coordination	Tolerance of distance	Supplier switching costs/asset specificity
✓ Market		<div>Low</div> <div>High</div>	<div>High (Global)</div> <div>Low (Co-located or internalized)</div>	<div>Low</div> <div>High</div>
Modular				
Relational				
Captive				
✓ Hierarchy				

- **Complexity of transactions.** If the lead firms demand complex or less standard products from their suppliers, it is difficult for them to exchange necessary information of product specification with suppliers as the tacit knowledge needs to be exchanged with them.
- **Ability to codify transactions.** If it is possible to codify complex information needs to exchange with suppliers, lead firms can easily exchange that information with suppliers in codify form without any fear of leakage.
- **Capabilities in the supply base.** If the suppliers are competent and flexible enough to produce a product as per lead firms' requirement, lead firms require no monitoring and supervision to suppliers' activities. However, if the suppliers are not competent to supply the product specified by lead firms, lead firms require to monitor and supervise suppliers' activities to make them capable to supply that output.

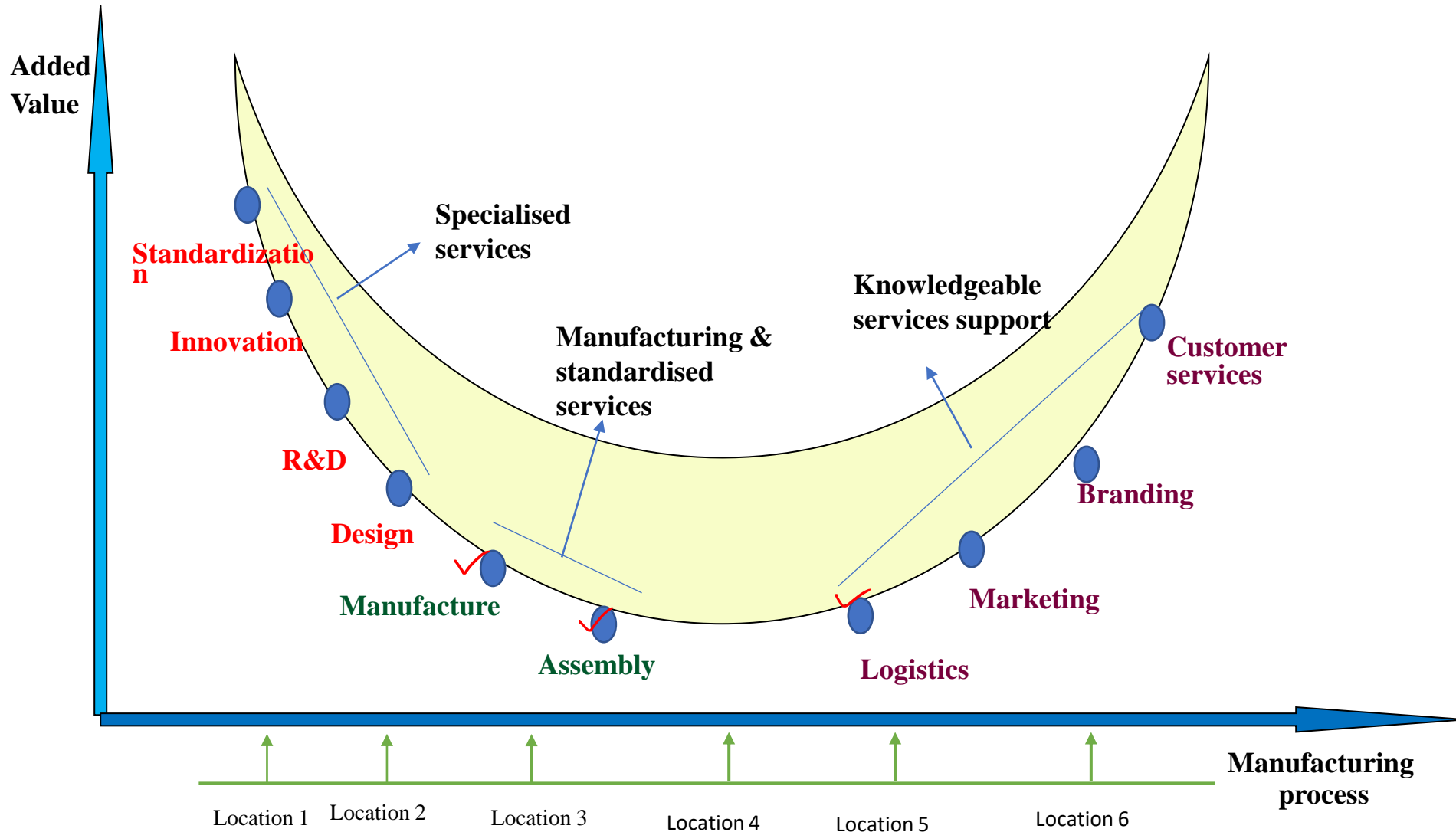
Different types of Upgrading



Functional Upgrading



Value Chain Disaggregation Smile Curve



Adapted from
Mudambi, 2007,
WTO, 2005



3. Ways to Capture Value Addition in the Chain



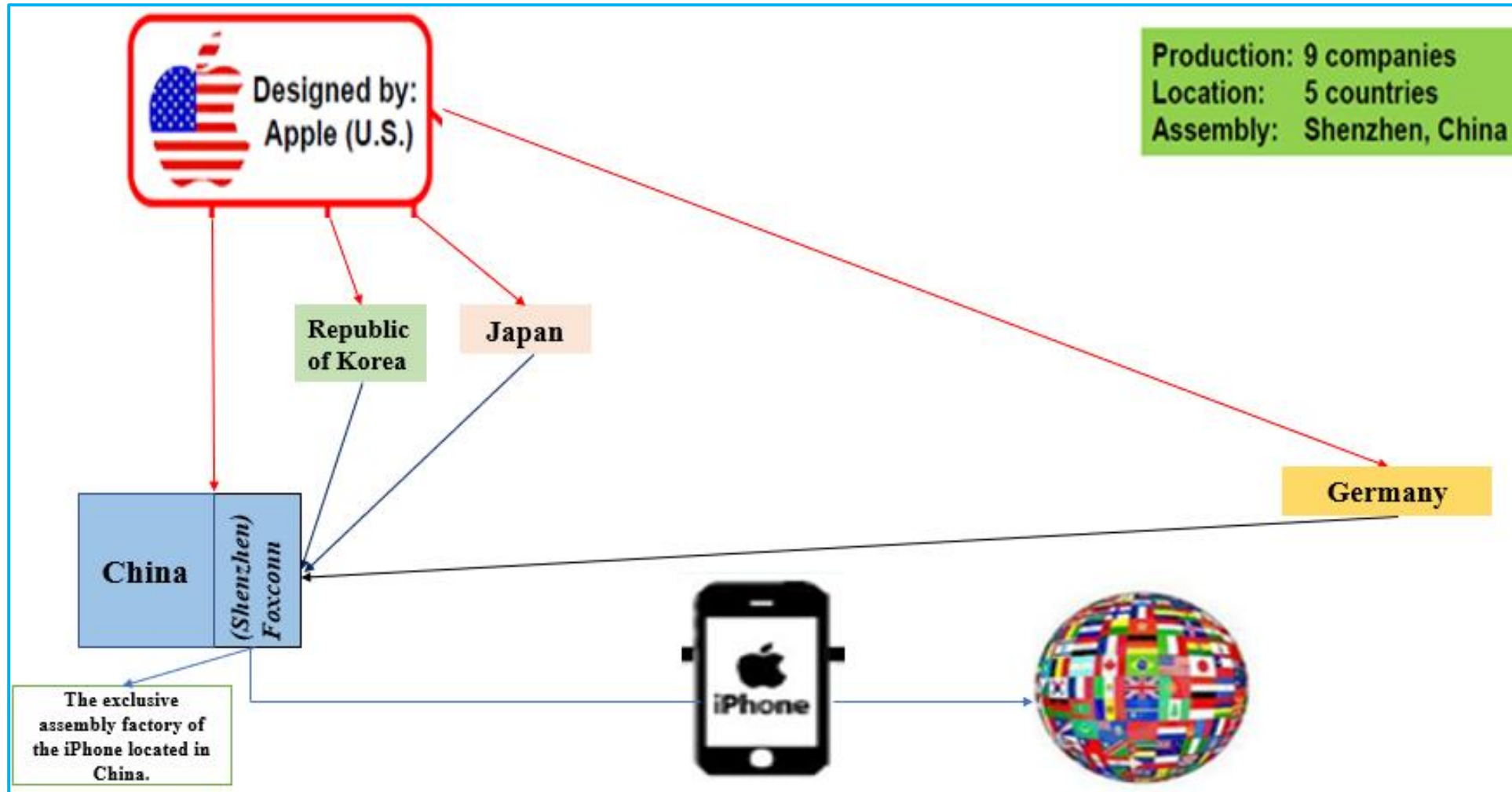
Empirical analysis on GVCs

Mapping global value chains by firm business records

- Studies have illustrated the concept of value-added trade using Apple's emblematic devices: first the iPod (Linden et al. 2009) and then the iPhone (Xing and Detert, 2010) and the iPad (Linden et al., 2011).
- All these hi-tech products are assembled in the People's Republic of China, making a significant contribution to China's exports.
- Chinese value-added represents only a small share of the value of these electronic devices that incorporate components from Germany, Japan, Korea and other economies that manufacture intermediate inputs.
- Many other studies present similar evidence. For example a recent WTO report calculated that the US-China trade balance in 2008 would be about 40 per cent lower if estimated in value-added terms.
- Also, in a report from USITC, showed a 50 per cent reduction in the EU15-China trade balance, and the Japan-China trade balance switching from a surplus in gross terms to a deficit in value-added terms.



International Production Network of iPhone

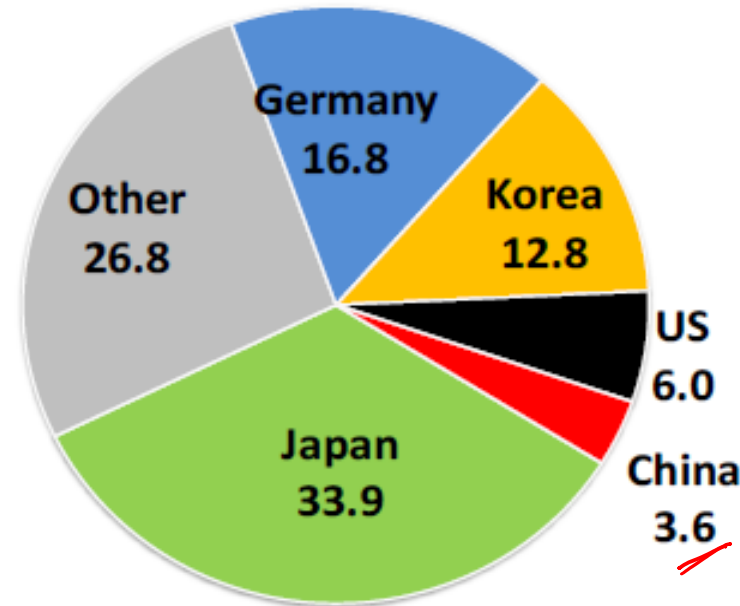


Value Chain of iPhone

Table 1 . Apple iPhone 3G's Major Components and Cost Drivers

Manufacturer	Component	Cost (USD)
Toshiba (Japan)	Flash Memory	\$24.00
	Display Module	\$19.25
	Touch Screen	\$16.00
Samsung (Korea)	Application Processor	\$14.46
	SDRAM-Mobile DDR	\$8.50
Infineon (Germany)	Baseband	\$13.00
	Camera Module	\$9.55
	RF Transceiver	\$2.80
	GPS Receiver	\$2.25
	Power IC RF Function	\$1.25
Broadcom (USA)	Bluetooth/FM/WLAN	\$5.95
Numonyx (USA)	Memory MCP	\$3.65
Murata (Japan)	FEM	\$1.35
Dialog Semiconductor (Germany)	Power IC Application Processor Function	\$1.30
Cirrus Logic (USA)	Audio Codec	\$1.15
Rest of Bill of Materials		\$48.00
Total Bill of Materials		\$172.46
Manufacturing costs		\$6.50
Grand Total		\$178.96

iPhone Manufacturing Cost Distribution by County (%)



Source: Xing and Detert (2010)

Following a gross export analysis in 2009, USA had trade deficit with China of around US\$ bil 1.9 due to export of iPhone (11.3 million units)


In terms of contribution by China (US\$ 6.5), the total export value of 11.3 million units is just US\$ 73 million

Mapping global value chains by input-output tables

- It provides a comprehensive map of international transactions of goods and services in a massive dataset.
- It combines the national input-output tables of various countries at a given point of time.
- It provides a possibility to identify the vertical structure of international production sharing.
- Input-output analysis covers an entire set of industries that make up an economic system, thus enabling the measurement of cross-border value flows for a country or region.
- Theoretically, such analysis has the capacity to track the value-added generation process of every product in every country at every production stage.
- For a comprehensive picture at the macro level of the gap between value added and gross trade, as well as an economy's participation in global production chains (Koopman, Wang, and Wei 2014,)—the issue of “double-counting” is addressed.
- A problem in conventional gross trade statistics, mainly caused by intermediate goods crossing borders multiple times, approaches based on conventional trade data risk overstating domestic value-added content of exports (Johnson and Noguera 2012).



Brief Summary

Approach		Level of detail	Measurement type
1. Case studies : geographical decomposition of a product value into the components and services used for its production <ul style="list-style-type: none"> ○ Examples: iPhone, iPod, iPad, Barbie doll... 	<p>Bottom up approach</p> 	Product level	<i>Not applicable</i>
2. Trade statistics : focus on the role of intermediates in foreign trade <ul style="list-style-type: none"> ○ Use of BEC or BOP (e.g. business and computer services) classifications ○ Estimation of vertical specialization or shares of parts and components in total trade ○ Strengthening linkage between trade and business statistics 		Product/sectoral / product group level	Direct measurement (based on raw reported data)
3. Input-output tables : combining national accounts with trade statistics <ul style="list-style-type: none"> ○ Decomposition of gross trade into its foreign and domestic value added contents 		Sectoral level (aggregated)	Indirect measurement (estimates)
	Top down approach		

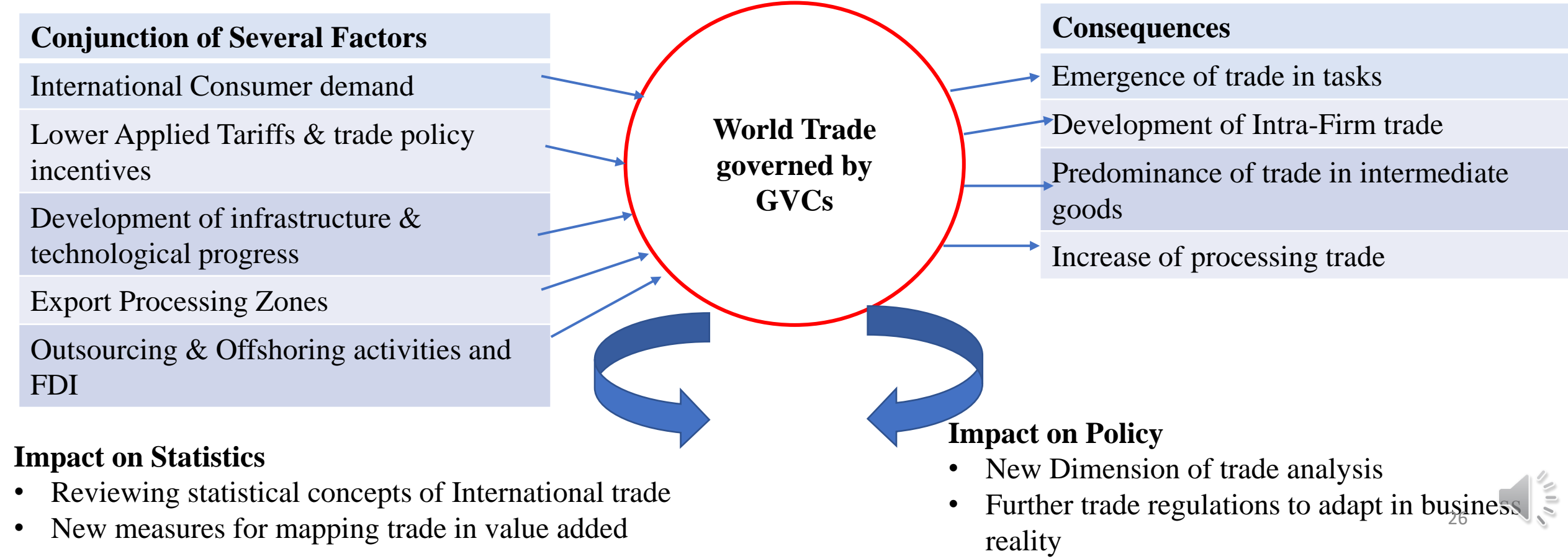


4. Trade in Value Added



From Trade in goods to Trade in tasks

- Instead of trade being an exchange of goods, it “increasingly involves bits of value being added in many different locations” (Grossman and Rossi-Hansberg (2008)). Trade in tasks is therefore a theory of offshoring – the consequence of the separation of tasks in space and time.
- Thus, the specialization is based on the comparative advantage of “tasks” that the countries complete at a specific step along the global value chain.



A new measure of Trade in Value Added Terms

- Biases in the present Traditional statistics:

Multiple counting of trade flows in intermediate goods and services.

Difficult attribution of the country of origin of an imported product.

Measuring trade in value added terms allows:

To circumvent the biases observed with traditional statistics.

To take into account the specificity of trade occurring between the different actors of a production chain.

Better evaluation of the actual contribution of international trade to an economy (incl. development, employment, environment)

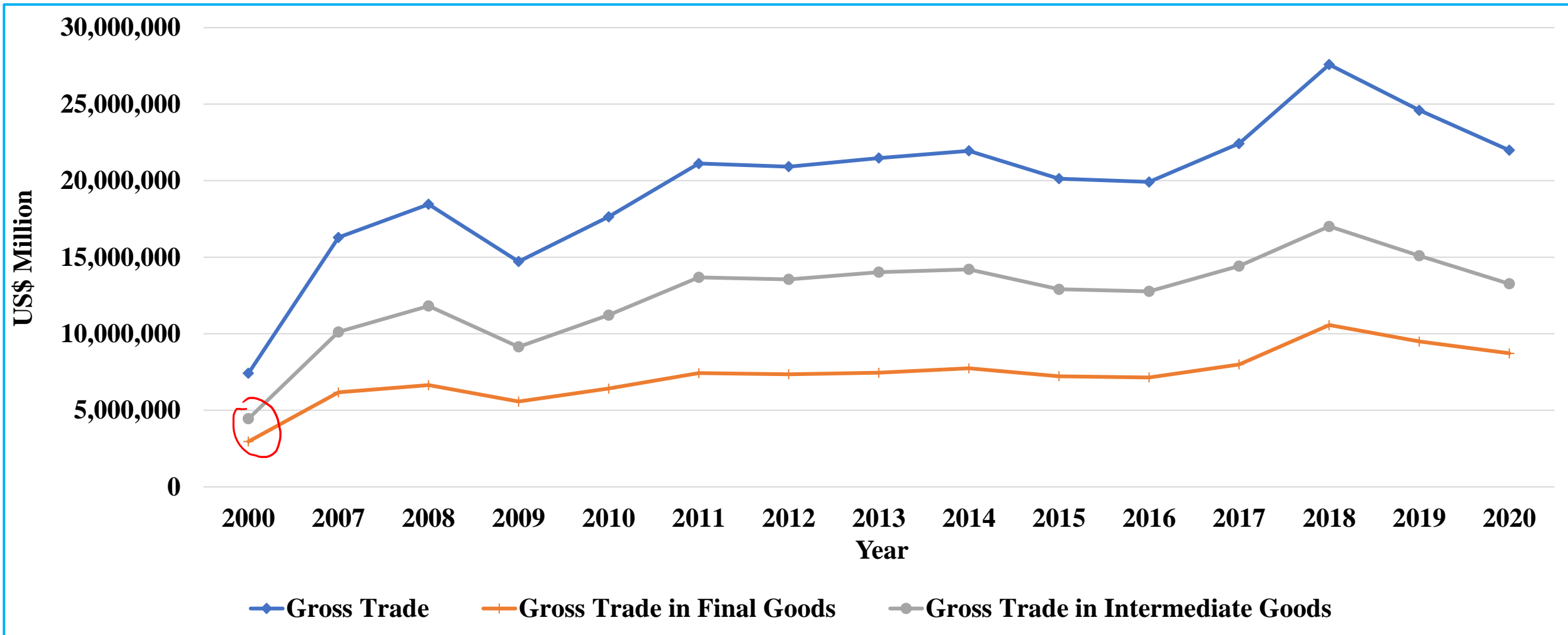
Highlighting the interdependency of economies along with counter-productive effects of protectionist measures on economies and enterprises they are supposed to protect

Better evaluation of the contribution of the services sector on trade

More realistic evaluation of bilateral trade balances and regional trade



World Trend in Intermediate and Final Goods



Note: Final and Intermediate goods are defined following UNCTAD's classification

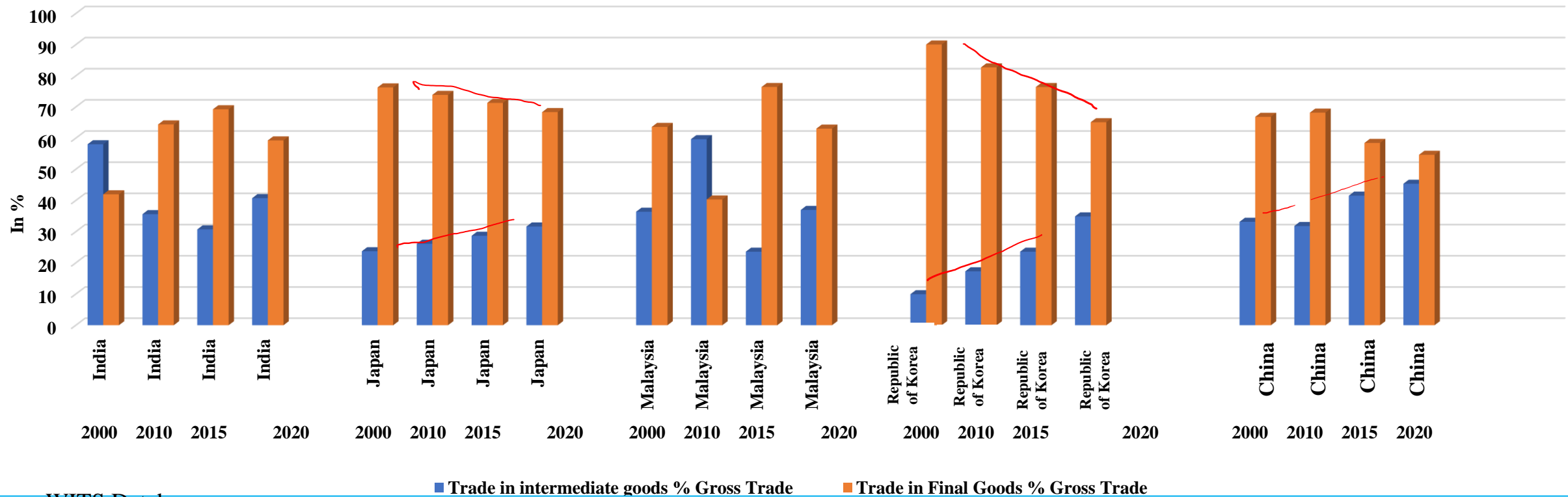
Source: WITS Database



***Sectoral Trade Performance of final and
intermediate goods for Asia-Pacific
Countries***



Transport Equipment

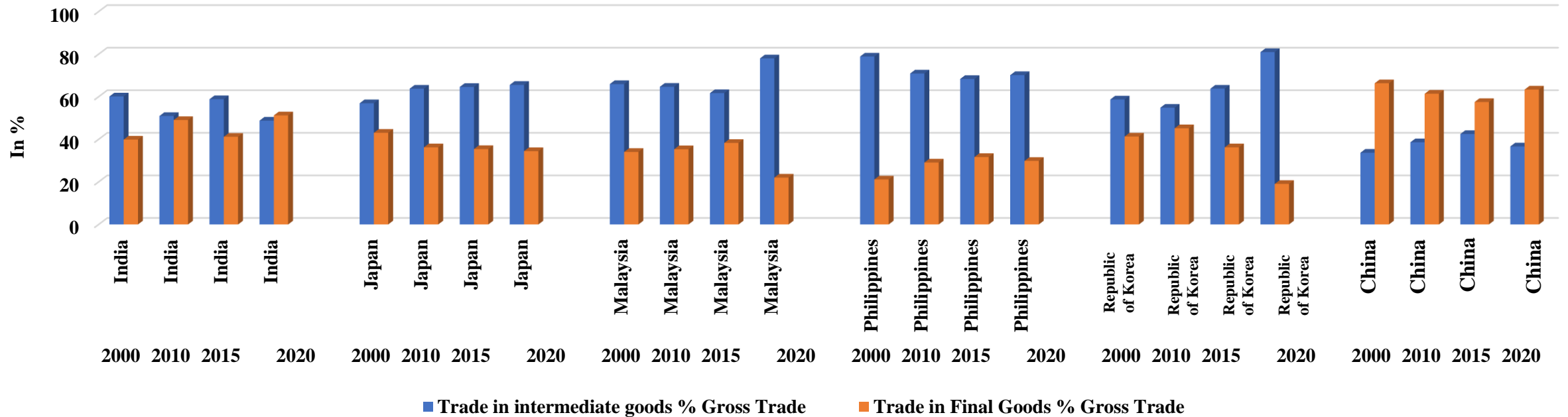


Source: WITS Database

- Belongs to high technology-intensive category.
- The trade in parts and components has increased over time for all countries.
- S.Korea and Japan demonstrate similar trade patterns.
- In 2020, China's trade of intermediate goods was the highest.



Electrical & Optical Equipment

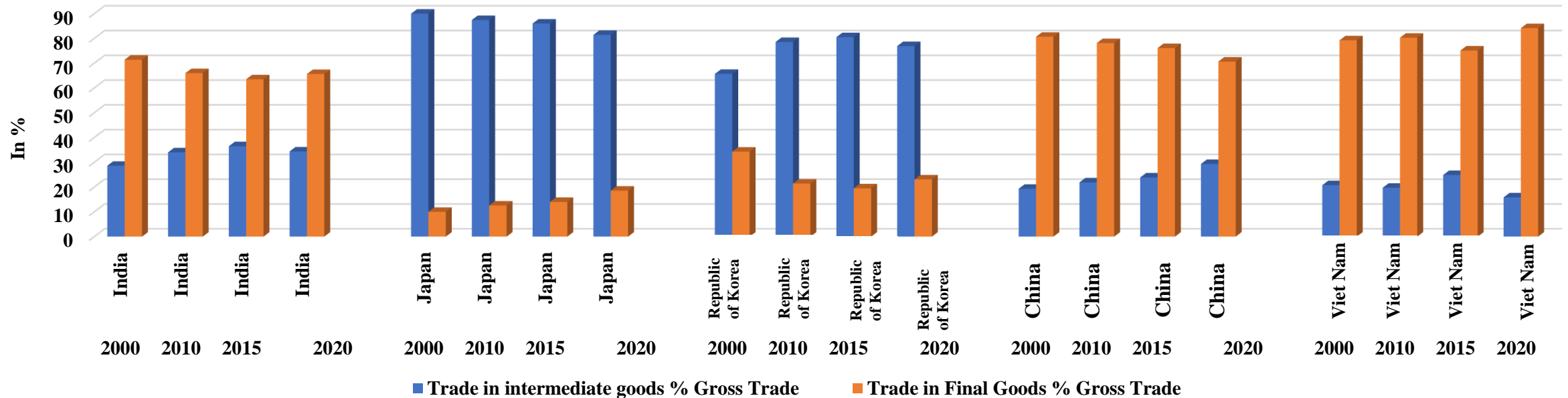


Source: WITS Database

- Belongs to high technology-intensive category.
- Except for China, other major Asian countries have become manufacturing hub of parts & components for electronics sector.
- China majorly deals with assembling of the final goods.
- Malaysia and S.Korea witnessed maximum trade of intermediate goods in 2020.



Textile & Textile Products

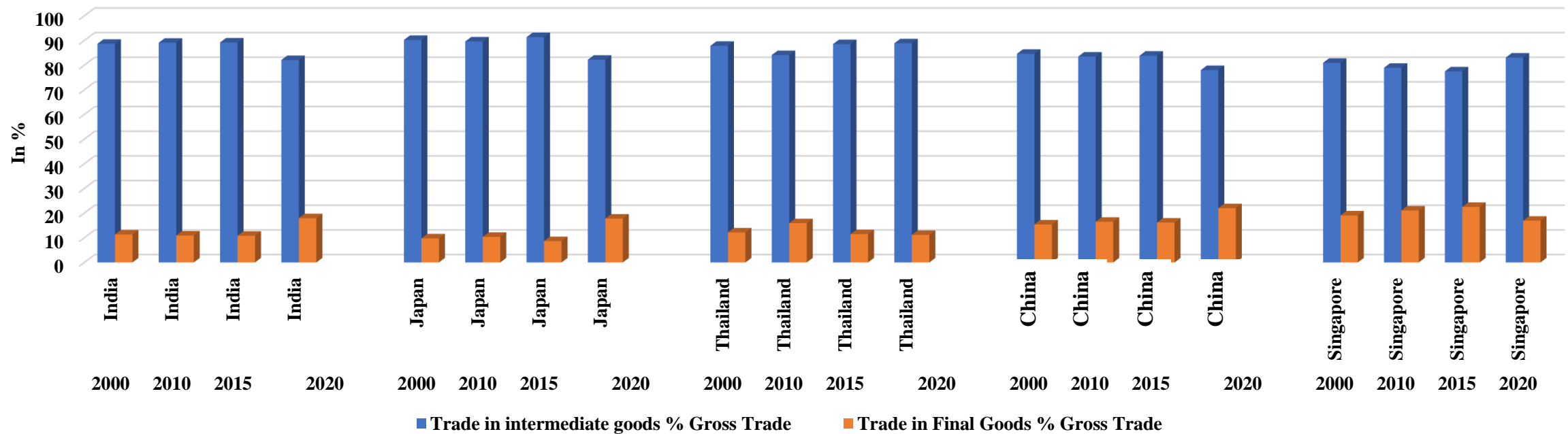


Source: WITS Database

- Belongs to low technology-intensive category.
- China, India and Vietnam have become the hub for production and distribution of textile and clothing.
- The trend shows that S.Korea and Japan trade intermediate textile and clothing products the maximum



Chemicals & Chemical Products



Source: WITS Database

- Belongs to high technology-intensive category.
- A highly fragmented sector of all.
- For all these countries, almost 90% of trade is of the intermediate products.



5. Current Developments



Covid-19 and GVCs

1. COVID-19 has reignited an old discussion regarding the risks of global production's supply chain. Government lockdowns have also influenced the availability of domestic inputs.
 2. There is no evidence that economies would have fared better without GVCs.
- Before COVID-19 crisis, there was evidence of a decline in fragmentation of production across borders. Since 2011, the expansion of GVCs had declined (OECD, 2020).
 - Reducing the use of foreign inputs led to less trade in intermediate goods and services.
 - Indicators measuring the length of value chains confirm that GVCs have become shorter (Miroudot and Nordström, 2019). This was also due to trade tensions and rising protectionism.
 - Additional economic vulnerabilities during a pandemic and the closure of factories in China have resulted in a GVC 'concussion' (Baldwin, 2020) and reignited a debate on the risks associated with international production.
 - Thus, a need to rethink GVCs and make them more resilient, for example by diversifying supplier base or by reshoring some activities (Javorcik, 2020) is the need of the time.



Covid-19 and GVCs

Direct Impact

1. Due to health concerns, enterprises operating in GVCs cease production.
2. This direct effect is not limited to GVCs, but rather to areas where the virus has propagated. COVID-19 has had a direct impact on the majority of countries and businesses.

Indirect Impact

1. Supply Chain disruption- when one location's functioning gets hampered by second location(while it gets directly impacted).
2. Example-natural disasters, Disruption in international transport networks, restrictions on the movement of people, custom and logistics issues.

Demand Impact

1. Volatility in demand. Example- surge in demand for medical supplies or a shift in demand of food due to hotels being shut.
2. Demand for inputs produced in other nations falls as demand for final goods falls in a given country.
3. When a worldwide crisis occurs, this phenomena might occur in numerous areas at the same time (simultaneous reduction in demand in many countries, as observed with COVID-19).

Trade & Investment

1. During the covid period there was an export ban on certain medical supplies by few countries. This led to protectionism of production to promote greater security of supply.
2. Some uncertainty about future trade & investment environment impacts the organisation of value chains.



Examination of GVCs resilience

- Despite the disruptions, several GVCs continued to operate (although with lesser output) during the COVID-19 crisis.
- **IT and electronics value chain**, with the production of smartphones grew manifolds.
- **Food supplies** (a critical activity) have proven to be quite resilient.
- International supply chain disruptions have been modest so far. With the most substantial bottlenecks occurring in domestic processing and retail distribution (i.e. the domestic portion of value chains) (OECD 2020b).
- During the COVID-19 crisis, the **medical supplies and equipment** business fuelled certain GVC-related tensions.
- Supply shortages in **face masks and, personal protection equipment (PPE)**, as well as important respiratory medical devices like **ventilators**, raised concerns about the industry's strong trade interdependencies (OECD, 2020c).



Way Forward

- Through better risk management at firm-level, more resilient production networks can be achieved.
- Putting greater emphasis on risk awareness, greater transparency in the value chain and promoting agility is the need.
- With supplier diversification and ‘just in case’ processes, sourcing strategies may be modified according to the level of acceptable risk.
- Governments can support efforts of firms to build more resilient GVCs by collecting and sharing information on potential concentration and bottlenecks upstream.
- By developing stress tests for essential supply chains and by creating a conducive regulatory environment, even policy uncertainties can be avoided.



Thank You



