WORLD TRADE ORGANIZATION

IDE-JETRO

Trade patterns and global value chains in East Asia:

From trade in goods to trade in tasks

A. From trade in goods to trade in tasks: The rise of global value chains

Since ancient times, international trade has allowed consumers to purchase products that are not produced locally. Production can be separated from consumption, often by great distances. The notion is summed up in the famous example of English 18th century economist David Ricardo about Portuguese wine being traded for English cloth. Countries did not need to grow grapes to enjoy wine, he noted. Thanks to trade, they could "transform" the cloth they produced into wine.

Before the development of mechanized transport, such as railways and steam ships, international trade was reserved for the most expensive commodities, like spices or silk. With mechanization, land and sea transport became easier and more reliable, allowing production and consumption to be more geographically dissociated. The 19th century industrial revolution saw also the rise of large industries, with workers performing specialized tasks and progressively supplanting traditional craftsmen. While craftsmen worked close to their customers, usually in the same town, the industrial revolution created large industrial agglomerations able to serve national markets thanks to a new network of railways and intercity roads (see Figure 1).

The key to higher industrial productivity was to concentrate the various tasks involved under a single roof. By specializing in one or a small number of tasks, each worker could focus his/her energy and thereby perform more efficiently. But without proximity, it would have been impossible to coordinate the efforts of the various workers, or to combine their inputs into a single product. Thus, production remained largely enclosed within national borders and trade patterns reflected the respective productive specializations. As World Trade Organization (WTO) Director-General Pascal Lamy has noted: "In the 19th century, when Ricardo developed what was to become the foundations of international trade theory, countries exported what they produced. In fact, the industrial revolution took root in countries that had coal mines and iron ore. A Portuguese entrepreneur importing a steam engine from England would know that everything, from the steel of the wheels to the boiler pressure gauge, came from the United Kingdom."[1]

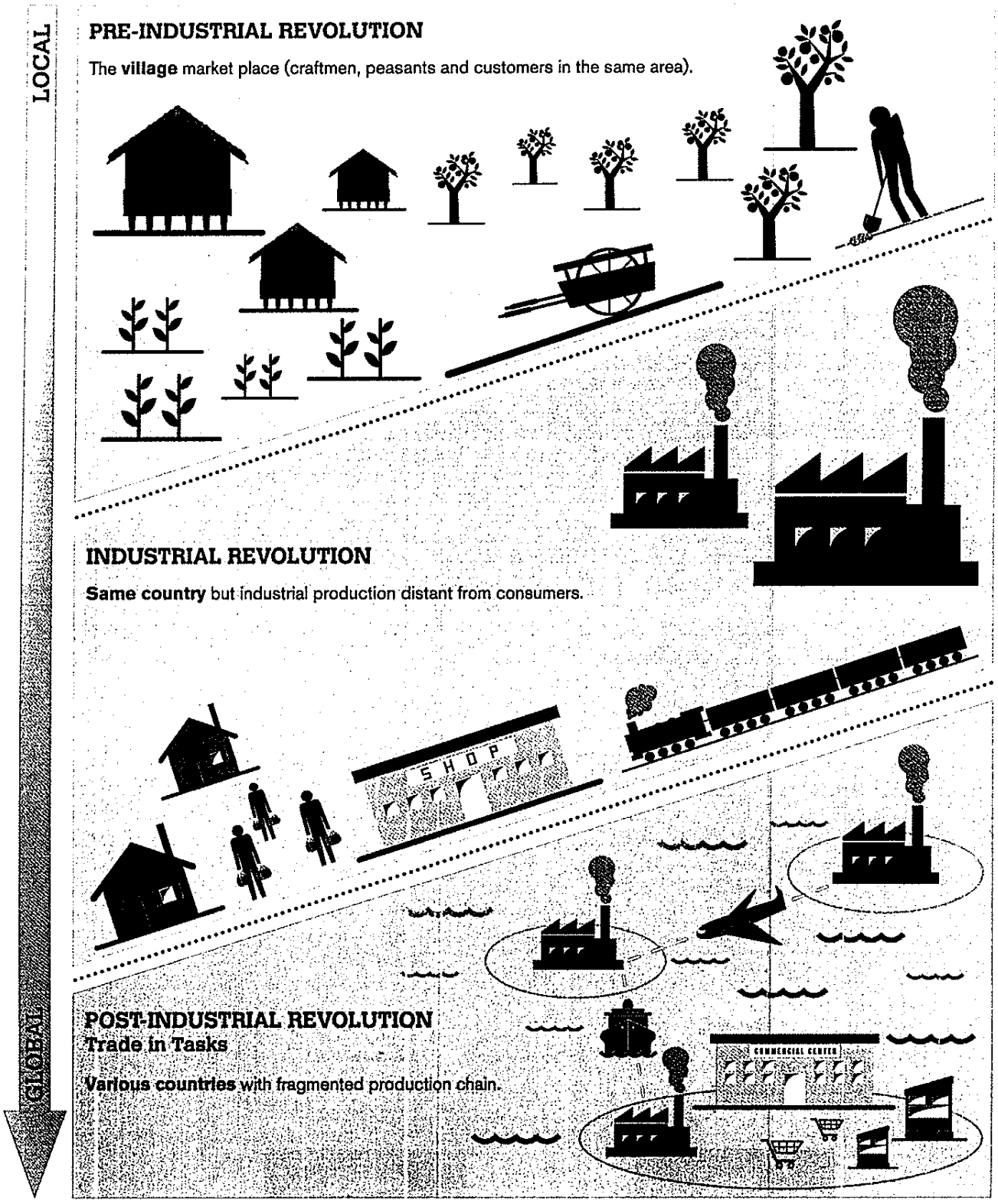
Another industrial quantum leap took place in the 1990s, thanks to the information technology (IT) revolution and the conjunction of a series of political and institutional breakthroughs. Together these facilitated the internationalization of industrial processes, opening the way to what became global manufacturing. Cheaper and faster intercontinental communication allowed far-flung businesses and production centres to coordinate more easily, leading to the unbundling of the production process and its international fragmentation. The US author Thomas Friedman has described these trends as forces that have "flattened" the world. Among them are the birth of the Internet, the development of workflow software, "in-forming" and advances in digital, mobile, personal and virtual communication technologies.

On the institutional side, tariff cuts and multilateral agreements boosted trade. For example, trade in intermediary products, the backbone of geographically fragmented supply chains, was facilitated by international accords, such as the WTO Information Technology Agreement (ITA)[2] on computers, semi-conductors and a host of related goods. Asia also benefitted from regional trade pacts, including those established under the Association of Southeast Asian Nations (ASEAN) and the Asia Pacific Economic Cooperation forum (APEC).

The integrated factory floor, which had dominated manufacturing since the 19th century, has been replaced with a network of individual suppliers specializing in specific services or phases of production. In this second great unbundling, as defined by Richard Baldwin of the Graduate Institute of International Studies in Geneva, production is "sliced and diced" into separate fragments that can be spread around the globe.[3] Princeton University economists Gene Grossman and Esteban Rossi-Hansberg[4] have called this new paradigm "trade in tasks". Countries no longer export exclusively finished products, but tend to specialize in specific stages of the production process. These various steps to obtain finished products can be associated through the notion of a "value chain", which refers to the entire sequence of productive (i.e. value-added) activities,[5] from the conception of a product to its manufacturing and commercialization. The possibility of slicing up and optimizing value chain activities among multiple companies and various geographical locations has even spawned a broader term - the "global value chain" (GVC). With specialization in specific tasks and their close integration into a highly coordinated business model, these chains of related activities result in the

Figure 1

From local to global production and markets



Source: WTO Secretariat.

creation of more "added value" than the sum of the value of the constituent parts and processes. This does not only apply to manufacturing, but also to distribution and retail sales, which have also undergone profound changes and exhibit similar ranges of complexity and interdependence. Today's most integrated value chains combine two interlinked business models: a demand chain and a supply chain (see Box 1).

A supply chain comprises not only various business functions, but also a number of firms specialized in different productive tasks (see Figure 2). Hence, the efficiency of the entire industrial chain depends highly on the way companies are interconnected. This brings in the concept of "vertical integration", which describes the degree to which a company owns its upstream suppliers and downstream buyers. For most of the 20th century, vertical integration was conducted domestically. But since the late 1990s, it has been increasingly internationalized, leading to the concept of vertical specialization (see Box 2).

Box 1: Value chains and supply chains

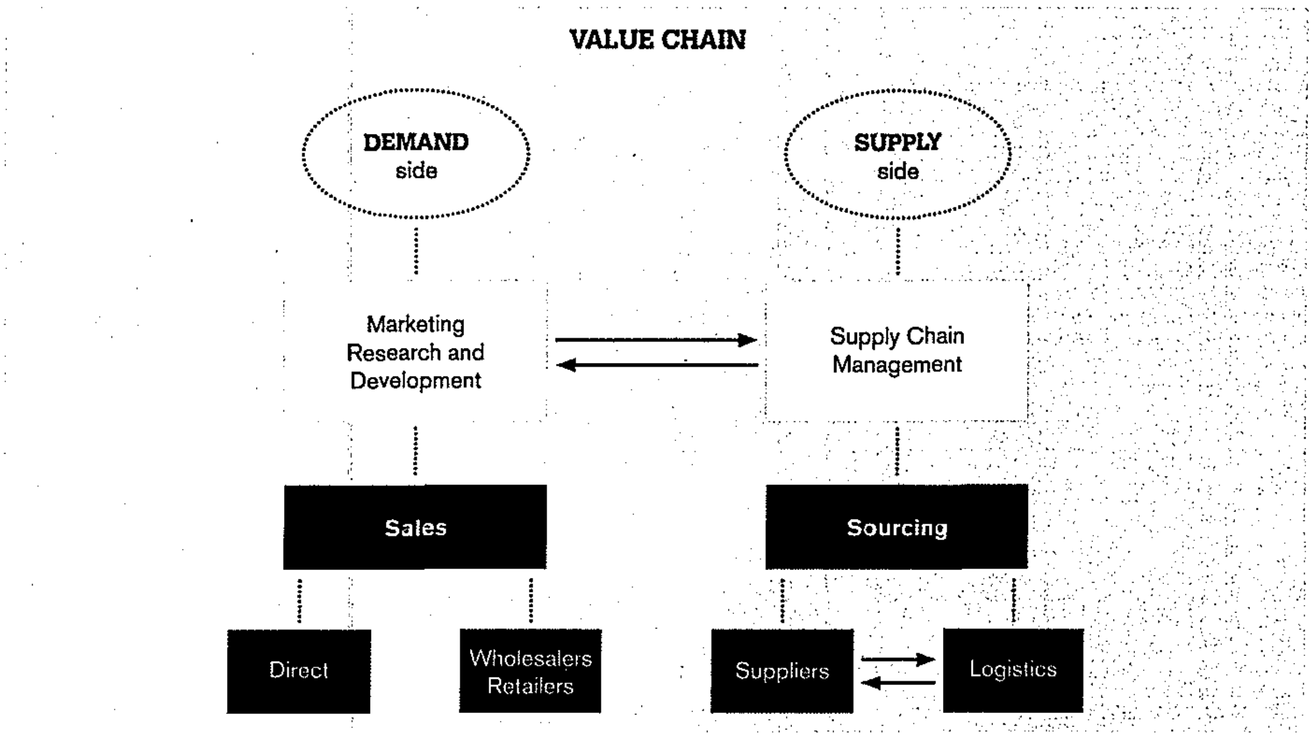
The value chain analysis [illegible] Harvard Business School. In these chains, [illegible] task is organized to create and optimize a specific aspect of the [illegible] global value chains are able to benefit from the respective comparative [illegible] and supply chains into place, varying the final products and [illegible] characteristics. At the same time, they standardize the production of [illegible] with maximum efficiency among the different suppliers.

The electronics industry, one of the world's most important goods-producing sectors, is a [illegible] concomitant differentiation/standardization process. Customers can customize their appliance [illegible] which will be assembled accordingly, using hard disks or other hardware components that are standardized [illegible] interchangeable "almost-commodities", although they have been made by numerous international suppliers.

The notion of "supply chain" relates to that of "value chain", but is more closely connected to industry and engineering. The Council of Supply Chain Management Professionals (CSCMP) defines the supply chain as follows: "All activities involved in sourcing and procurement, conversion, and all logistics management activities. Importantly, it also includes coordination and collaboration with channel partners, which can be suppliers, intermediaries, third-party service providers, and customers." Coordinating the timely operation of industrial networks is a complex exercise, involving the provision of logistic services and supported by advanced information and decision systems (see Chapter III on infrastructure services).

Figure 2

Schematic presentation of a value chain



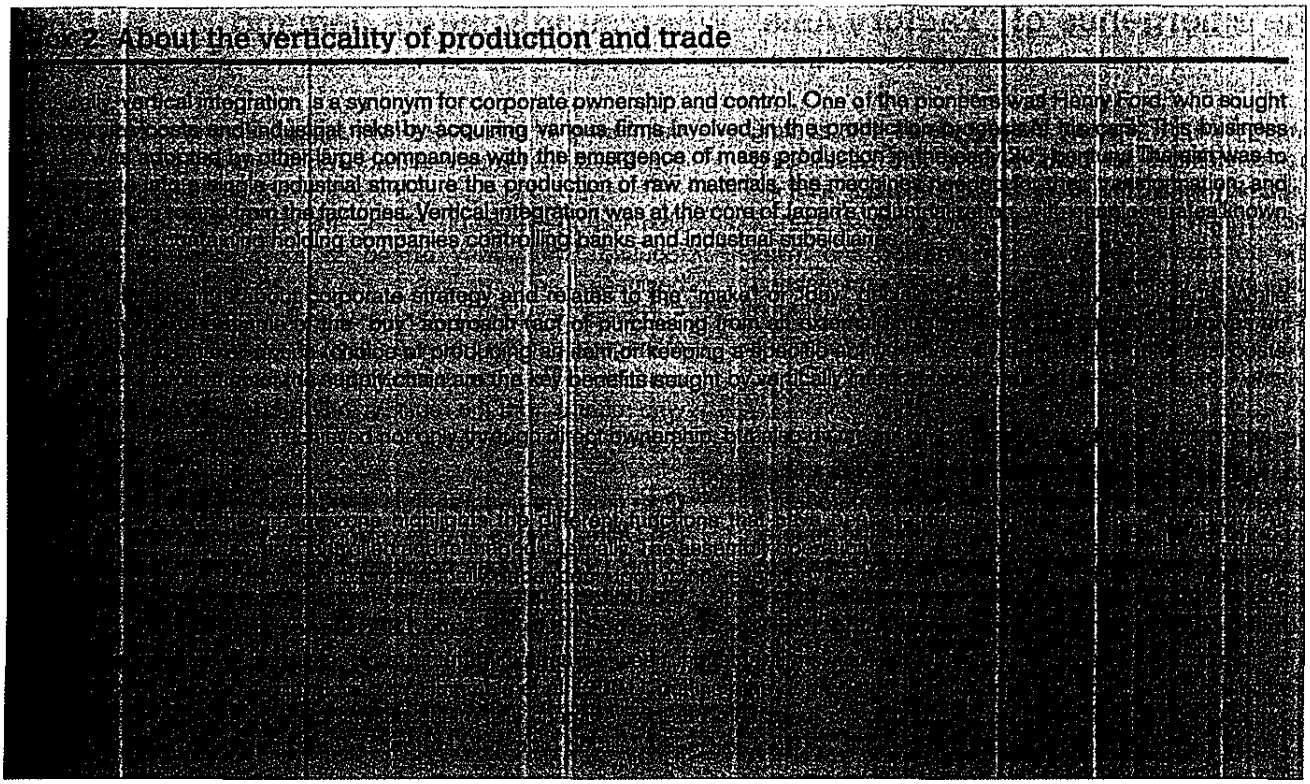
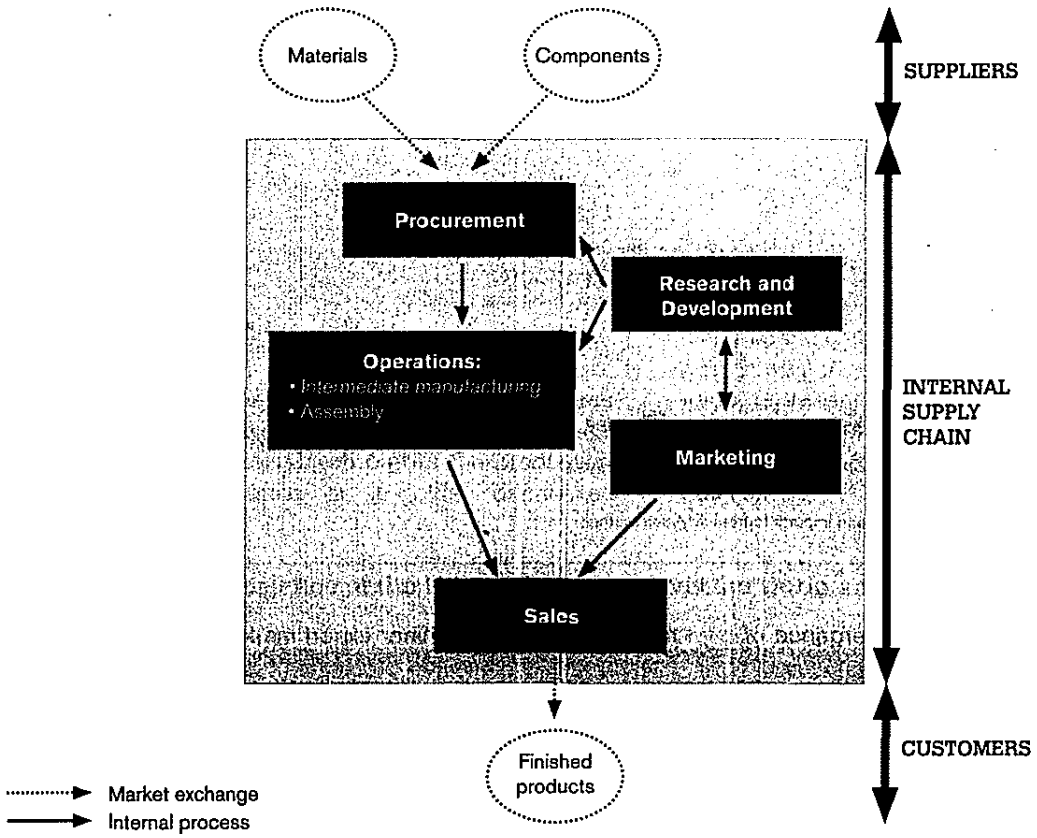


Figure 3

An example of vertical integration



Source: WTO Secretariat.

B. The emergence of "Factory Asia": When supply meets demand

The emergence of "Factory Asia" reflects the coming together of demand for both massive and customized manufacturing emanating from the US market, with an adequate supply potential in Asia. This process started with the appearance of mass consumption and mass marketing in the United States in the 1960s, and reached a climax in the 2000s with a period of sustained household consumption and the accession of some Asian economies (e.g. China, Chinese Taipei) as members to the WTO.

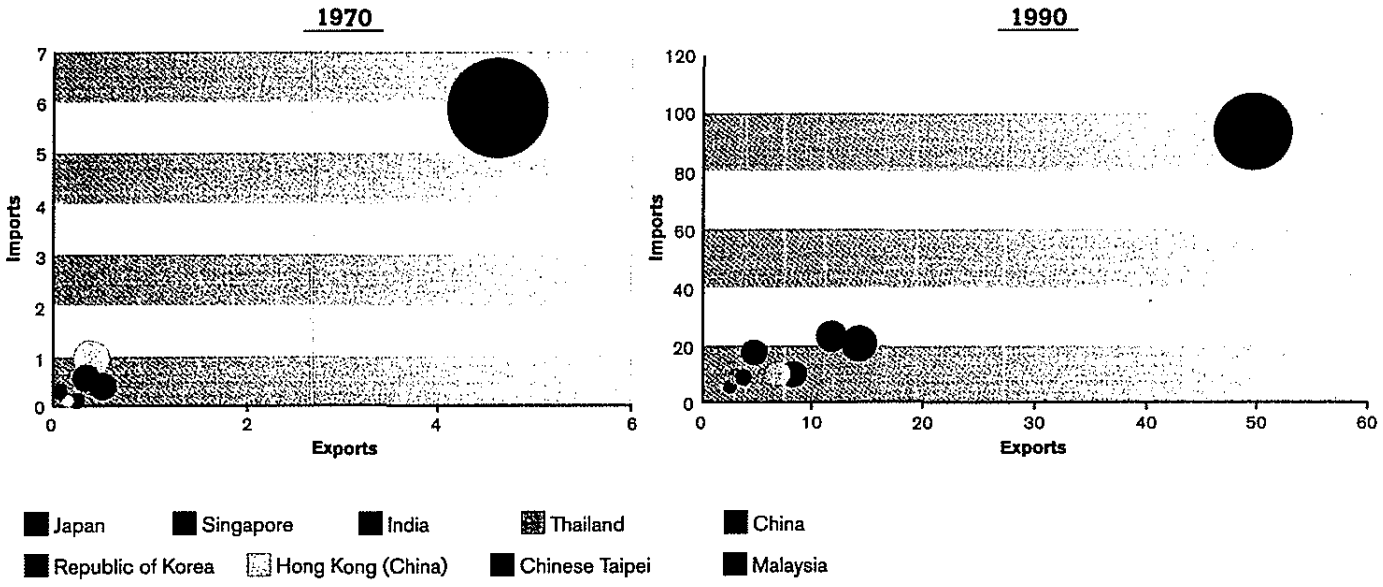
The process of "factory-less" industries started in niche markets, with firms focusing on developing their branding and marketing comparative advantages, while outsourcing production to external suppliers, initially within the country, but increasingly also using foreign suppliers. For example, Nike, a major sportswear and equipment supplier based in the United States, started its operations in the 1960s distributing athletic shoes from Japan before launching its own line of footwear, manufactured mostly in Asia.

Demand-driven supply chains are not limited to brand-focused firms. They extend to most areas of retail business. Large retailers in the United States or in the European Union (EU) operate as wide-ranging value chain managers, deciding on the range, price and quality to be produced. They drive international chains of suppliers, who receive from the retailers their production standards, delivery times and costs.

Over time, the geographical distribution of trade between the United States and its main Asian partners changed. In the 1970s, Japan dominated trade between Asia and the United States. With minor changes, the same pattern remained up to the early 1990s (see Figure 4).

Figure 4

Total US trade with selected Asian partners, 1970 and 1990 (in billions of US$)



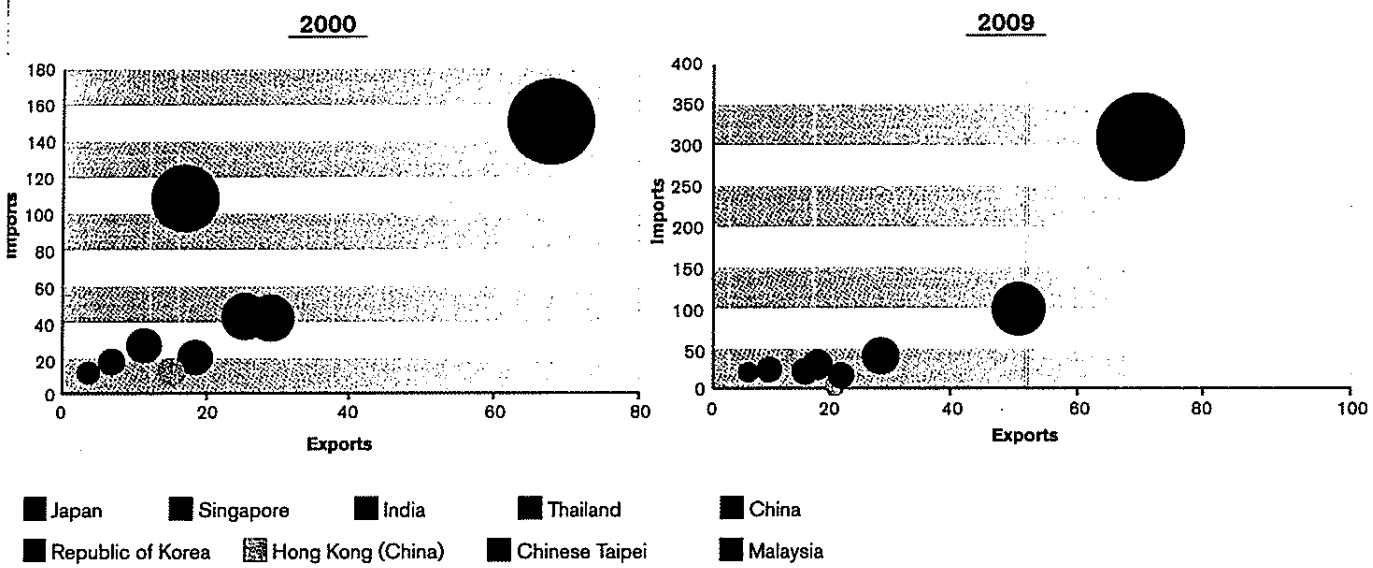
Note: The size of the bubbles represents the sum of US exports and imports to/from its Asian partner.

Source: Based on UN Comtrade Database.

The situation started to change with the emergence of China. First China emerged from the other group of Asian economies as a challenger to Japan, and then, in the late 2000s, it overtook Japan to become the main US trading partner (see Figure 5). Interestingly enough, China, as a partner, rose first as a major source of imports, while it remained a relatively minor export market for the United States, smaller than the Republic of Korea or Chinese Taipei. But during the 2000s, it also became a major US export market, while Japan receded into a distant second place.

Figure 5

Total US trade with selected Asian partners, 2000 and 2009 (in billions of US$)



Note: The size of the bubbles represents the sum of US exports and imports to/from its Asian partner.

Source: Based on UN Comtrade Database.

The rise of China to become the main trading partner of the United States is not independent of the relative decline of Japan and other partners like Chinese Taipei or the Republic of Korea. An increasing share of supply chains producing for the US market relocated to China, inter alia because of lower costs and the more favourable trade environment that were a consequence of China's accession to the WTO in 2001. In other words, the emergence of China as the leading partner redistributed Asian trade with the United States. But it did not create an additional source of trade imbalance for the United States, which had been suffering from a structural deficit in merchandise trade since the mid-1970s. As a matter of fact, Asia's contribution to the overall US trade deficit with the rest of the world has been decreasing, representing only half in the 2000s, compared with over three-quarters in the 1970s (see Table 1).

The redistribution of trade among Asian trading partners of the United States is typical of the surge in international and regional supply chains, with part of the production initially located in Japan or in other economies transferring to China. Usually, it has been the last stage of the supply chain, the assembly of the final products, which has relocated to China, with the production of the core components remaining within the original country. So, while customs statistics showed China to be the principal country of origin for US imports, most of the content of the products, and their economic value, was still originating in the traditional Asian partners of the 1980s, and even from within the United States itself. As will be seen in Chapter IX, the actual geographical origin of traded goods can be assessed more realistically through a trade in "value added" approach.

In addition, the increasing fragmentation of value chains also led to an increase of trade flows in intermediate goods among Asian partners, especially in the manufacturing sector. In 2009, trade in intermediate goods was the most dynamic sector of international trade, representing more than 50 per cent of non-fuel world merchandise trade and 64 per cent of the total imports of the Asian region (see Chapter VIII for more details).

Table 1

Merchandise trade balance of the United States vis-à-vis the world and Asia (average, in billions of US$ and percentage)

	1970s	1980s	1990s	2000s
World (value)	-11	-111	-186	-670
Asia (value)	-8	-67	-133	-341
Asia (share in %)	76	60	72	51

Source: Based on UN Comtrade Database.

C. Growing vertical specialization in Asia and regional clustering of tasks

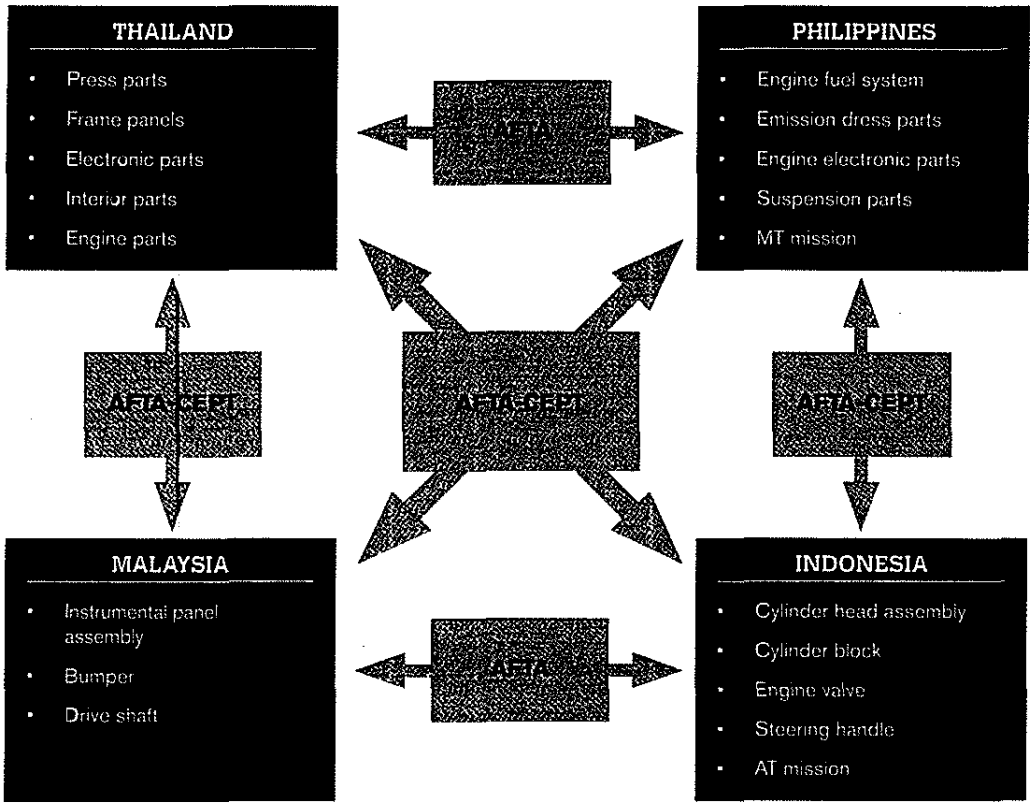
When investing in East Asia, international firms pursue two different types of objective. Some respond to the logic of trade in tasks and geographical fragmentation by staging production along a global supply chain (vertical specialization). Others produce the same type of goods that they do at home, with a view to entering the Asian market using the "build-where-you-sell" strategy (horizontal diversification of production). Consumer electronics correspond more to the vertical specialization pattern, where lead firms, selling branded products in final markets, place orders for key components with suppliers and have them assembled in a third, low-cost, country.[8] The automobile industry is a typical example of horizontal diversification; a Toyota car produced in Thailand may differ only slightly from the same model built in Japan.[9]

The division between the two types of investment is not clear-cut, and many foreign affiliates operating in East Asia have progressively adopted the characteristics of both vertical and horizontal multinationals.[10] Vertical specialization started first. In the 1970s, according to Sturgeon and Kawakami (2010), US semi-conductor firms, whose production was very labour intensive, located assembly plants in East and South-East Asia, and Japanese companies located low-cost transistor radio production in Chinese Taipei and in Hong Kong (China). As household income in developing Asia rose, so did foreign direct investment for horizontal diversification. In 2001, only 40 per cent of Japanese companies' overseas production in Asia went to local consumers. Now the proportion is 62 per cent and growing as export-oriented industries based in low-cost Asian countries build a domestic market and related consumption capacity.

Both horizontal and vertical production patterns can coexist, and the flexibility in sourcing components from various countries, while exporting the resulting final goods, is closely linked to trade policies. As shown in Figure 6, Japanese automobile assemblers procure key parts from four ASEAN countries, taking advantage of the ASEAN Free Trade Area (AFTA).

Figure 6

Complementary parts supply system of an automobile assembler in ASEAN



Note: the ASEAN Free Trade Area - Common Effective Preferential Tariff (AFTA-CEPT) is a cooperative arrangement among ASEAN member states to reduce intra-regional tariffs and remove non-tariff barriers.

Source: Hiratsuka (2010).

Endnotes

[1] Inaugural speech to the conference on "Globalization of the Industrial Production Chains and Measuring International Trade in Value Added" at the Senate in Paris on 15 October 2010.

[2] The Ministerial Declaration on Trade in Information Technology Products (ITA) was concluded at the WTO Singapore Ministerial Conference in December 1996. The ITA eliminates duties on IT products covered by the Agreement. Developing country participants were granted additional time to implement their commitments for some products.

[3] See Baldwin (2006).

[4] Grossman and Rossi-Hansberg (2006).

[5] Sturgeon (2001).

[6] Porter (1985).

[7] The "make-or-buy" decision process was extensively developed by Williamson (1991).

[8] The classical example is the iPod, designed and developed by a US firm and "made in China" out of US or Korean components and licences which constitute most of the factory cost of the appliance.

[9] "Leaving home: Japan's big companies are shipping production abroad", The Economist, 18 Nov 2010.

[10] See Hiratsuka (2010).