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The Integration of China and East European Countries in Global Networks

Are European Multinationals Different?

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Draft[1]

[1] *I am indebted to Vincent Vasques and Rachid Zairi for research assistance.*

Contents

Introduction

The emergence of high growth zones in Asia and to a lesser extent in Central and Eastern Europe tends to increase the mid-term world growth. This trend has nevertheless raised worries both in high-income countries and in some emerging countries because of short-term adjustment issues. This is due to the fact that high growth in emerging zones is partly based on the transfer of production from industrial countries to these emerging zones. Industrial production has thus been growing much faster in China than in high-income countries. As a consequence of this impressive growth of industrial production, China is regularly portrayed as the new "factory of the world".

China is nevertheless not seen as equally threatening around the world. At the end of the 1990s, as Chinese imports surged and shifted to higher value added products, Japan perceived China as a potential threat. Japanese firms had started to invest in China to manufacture state-of-the-art consumer products such as digital cameras. Hence the return of the fear of *hollowing out*. The perception of China has nevertheless begun to change around 2002, when Japan began to consider the vast opportunity represented by the development of China. According to some, such a change of attitude has been triggered by the fact that Japanese manufacturers seem to "have avoided head-to-head competition with producers in China and shifted domestic production to higher value added devices and materials" (Munakata 2003).[2] The attitude of the United States vis-à-vis China's economic performance has on the contrary become increasingly critical as the bilateral deficit has deepened. EU countries have weaker economic links with China, but they fear the combined emergence of new competitors from Asia and Eastern Europe. More generally, China is not the sole source of the rapidly increasing global manufacturing capacity. To the extent that decreasing capacity in high-income countries for the same products does not compensate increasing capacity in emerging zones, global over-capacity builds up.

In order to benefit from dynamic growth in emerging zones, high-income countries need to evolve towards more favorable specialization. Some countries may have a relatively more favorable specialization from the outset. Besides, some countries may prove more mobile. This paper examines the role of multinational companies in this dynamics.

Part one explains the emergence of global production networks and their impact on trade between low- and high-wage countries. Part two examines the differences between multinationals from Japan, the United-States and Europe, focusing on trade with China. It then examines intra-firm trade by companies located in France, comparing trade patterns with China on the one hand and CEECs on the other hand. The conclusion relates intra-firm trade, global production networks and the dynamics of international specialization.

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[2] Others however consider that Japanese firms have not yet organized to take full advantage of China's growth (Masuyama 2004).

1. Global production networks and vertical specialization

Since the 1980s, foreign direct investment has been particularly dynamic and has been one of the drivers of globalization. The expansion of multinational companies has increased global integration and has had an important impact on the qualitative composition of international trade. One characteristic of our integrated world is nevertheless that the cost of international transactions tends to fall and that all companies have an easier access to both foreign clients and foreign suppliers. This section discusses the development of global production networks (GPNs) as one major feature of this context. It then examines the consequences on the trade flows and their qualitative composition. It shows in particular that GPNs constitute a major channel for developing countries to increase their participation to world trade in manufactures, including in non-traditional sectors.

1.1 The emergence of Global Production Networks

The re-organization of production processes on a global basis has been one major feature of globalization. Since the 1980s, leading firms design global production networks, where manufacturing processes are divided in discrete production stages and assigned to different countries. While sectoral and product specialization has long been a basis for the development of trade, global production sharing operates an increasingly fine international division of labor both between and within industries.

GPNs organize the sourcing of specialized items and sub-systems from multiple locations across the globe. The emergence of such complex global networks, which require technical and commercial interactions between industrial suppliers and clients, results from a whole set of changes in the global competitive environment. Global competition and technological evolutions have been major incentives to fragment production processes. However, such a fragmentation and the related exchanges could not have been implemented if trade and foreign direct investment had not been eased by liberalization. As argued by Feenstra (1998), in the global economy, the disintegration of production has built upon the integration of trade. The emergence of GPNs thus depends on technological, economic and institutional factors. It is important to consider all three sets of factors in order to understand the dynamics and evolving morphology of GPNs, which typically span across different countries with contrasting comparative advantages.

Technological evolutions have created new opportunities and have had an impact on both the ability to fragment the production process in separable segments and the ability to source various components from distant suppliers. Since the 1980s, increasing codification of knowledge, standardization of interfaces and flexible manufacturing technologies have led firms to progressively disintegrate vertically integrated plants into networks of suppliers.[3]

Figure 1 shows the impact of increasing modularity along the value chain on the degree of firm vertical integration. Progress in transport and communication technologies has further allowed this general evolution to develop on a global scale. Disintegration among different production units along the value chain may occur within multinational companies, among

[3] This trend is related to the development of « markets for technology », where previously internal knowledge is exchanged between companies (Arora *et al.* 2001).

subsidiaries, or more radically, between independent companies. Besides, independent may be related to leading firms[4] through various contractual arrangements or alliances. Multinationals thus develop both an *internal network* of subsidiaries and an *external network* of contractors and allied companies. Both the internal and external networks are international in scope.

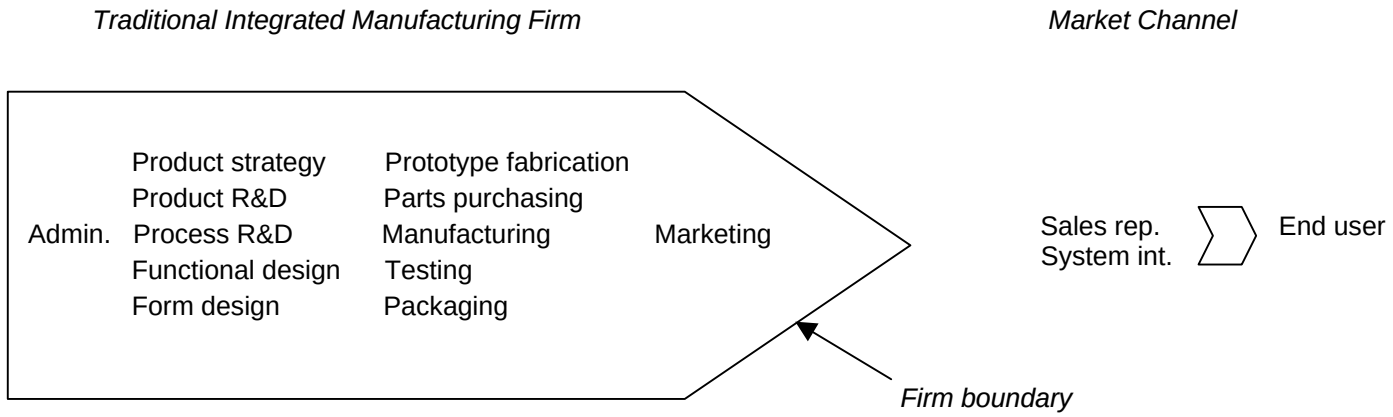
These technological evolutions, including the development of new information networks, have been fundamental because the fragmentation of the value chain between different partners implies exchanges of huge amounts of information. GPNs thus depend on ever more efficient logistics, but also on intense exchange of information around the globe.

Technological change has also had an influence through the evolution of the mix of products within manufacturing. The expansion of production in electronics in particular has stimulated the constitution of networks as these products typically involve separable steps. Besides, tough innovation-based competition generates a continuous flow of new products, and leading firms tend to focus on their core competences, including in particular, research, design and marketing. Manufacturing operations themselves may also lose their status of core competences as automation and modularity enable contract manufacturers to be efficient and reap economies of scale (Sturgeon 2002).

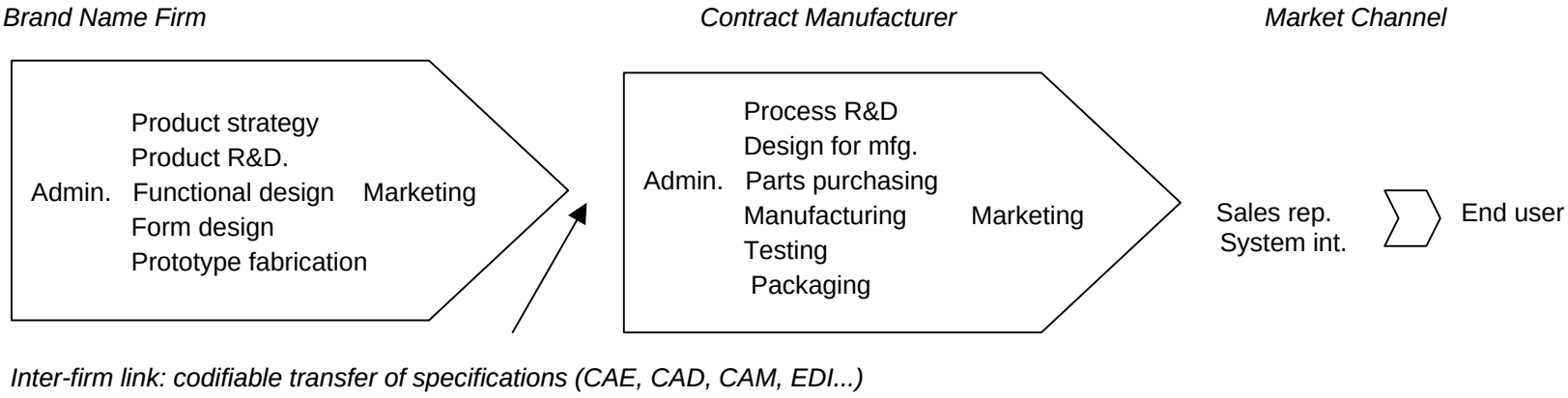
[4] Which are sometimes described as « flagship companies ».

Figure 1. Value chain modularity and vertical specialization among firms

1. Vertical Integration



2. Value Chain Modularity and Production Network

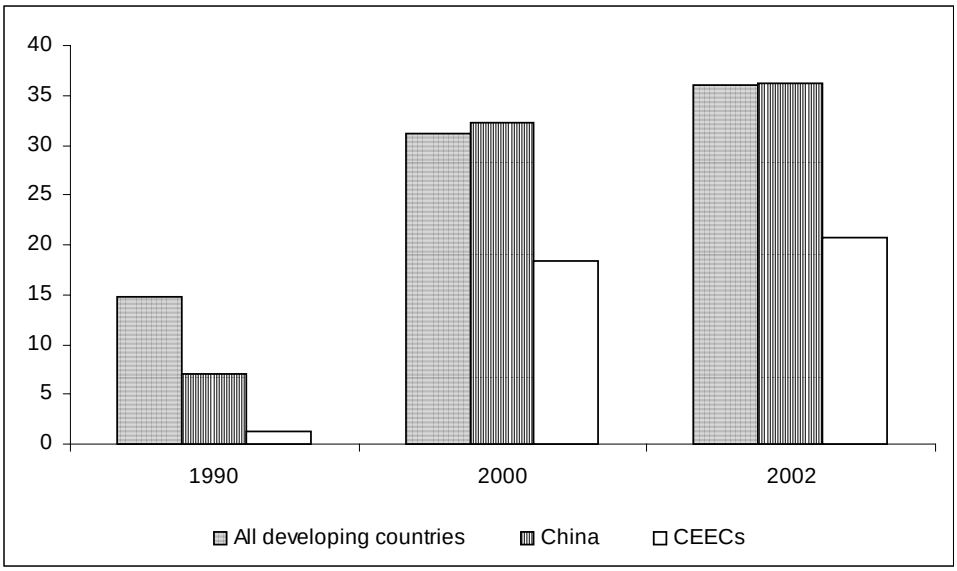


Source: Adapted from Sturgeon (2002)

Trade and foreign direct investment liberalization has constituted the second fundamental set of factors underlying the diffusion of the global production networks organization. Trade liberalization is important of course since GPNs are based on the international circulation of parts, components and final products. But GPNs also depend on the liberalization of factor movements, and more particularly of foreign direct investment. GPNs are to a large extent organized as intra-firm networks involving production sites in the home country and subsidiaries across the world. Some members of the network are independent producers, but the global architecture generally relies on a web of subsidiaries. Trade and FDI liberalization by developing and transition economies since the 1980s have thus created much more favorable conditions for the development of GPNs.

From the 1980s on, developing countries have been reversing their hostile policies towards FDI. Countries from Eastern and Central Europe have also opened to FDI during the 1990s. Since the 1980s, a large number of countries have actually sought to attract FDI through various promotion schemes. As a result, the role of FDI has dramatically increased in a number of developing countries (figure 2).

Figure 2. FDI intensity* in developing countries, China and CEECs



** FDI inward stock as a share of GDP*
Source: calculation from UNCTAD data

Some countries have more specifically promoted local assembly through special custom provisions. China for example has granted duty exemptions to selected categories of imports as part of the promotion of export oriented sectors (Lemoine and Unal-Kesenci 2002a). Other emerging countries from Asia or Eastern Europe have also tried to design supplier-oriented development strategies (Hobday 2000, Sturgeon and Lester 2003).

Finally, the emergence of GPNs depends on the availability and quality of adequate production capabilities around the globe. Here again, evolutions since the 1980s have been favorable as a number of emerging countries have greatly improved their manufacturing capabilities. Some have even started to nurture design and product development

capabilities in high tech sectors.[5] Multinational companies have contributed to the process through investment in equipment and training of the local work force, both in their subsidiaries and in various local suppliers. Increasing local capabilities and investment by multinationals to develop GPNs have thus interacted.

From the mid-1980s on, low and mid-income countries have steadily increased their trade openness, as measured by the share of trade in their GDP. As a group, they have become more open than high-income countries since the 1990s (Sachwald 2003). Developing countries have also increased their share of global trade, from about one fourth in 1980 to one third. Their specialization has simultaneously moved beyond resource intensive exports into manufactures. The share of manufactures in their exports has dramatically increased, from about 20% at the beginning of the 1980s, to 80%.

Table 1 shows that the evolution of the composition of exports from developing countries is not due to China alone. Table 1 also shows that, exports of traditional labor-intensive manufactures have not been the most dynamic segment of exports from developing countries. Exports of medium technology products and electronic products, which include numerous new products, have been the most dynamic.

Table 1. The structure of exports by developing countries, share by industry

Product categories	China		India		Low income less China and India	
	1981	2001	1981	2001	1981	2001
Primary products	36	5	29	14	74	27
Resource based manufacturing	18	7	25	30	17	14
Low tech—textiles	25	25	31	29	4	19
Low tech—other	9	20	6	8	1	5
Medium technology	9	17	7	10	1	10
- Of which automobile and components	0	1	1	1	0	1
High tech—electronic	1	22	1	3	2	22
High tech—other	1	2	1	3	0	1

Country groups defined by income status in 1981.

Source: Martin and Manole (2003)

During the 1990s, a number of CEECs have also increased their participation to world trade and have also done so by specializing more in manufacturing, including electronics (Radosevic 2002). Kaminski and Smarzynska (2001) explore the case of Poland in particular, where the share of skilled labor- and capital-intensive exports has increased while that of natural resource based and unskilled labor intensive has decreased. Both CEECs and a number of developing countries have increased their specialization in the car industry, one major sector of medium-technology manufactures. Exports of automobiles and components from low- and middle-income countries have grown particularly rapidly, at more than 20% per year between 1981 and 2001 (World Bank 2003).

Emerging countries have thus fully participated in the general evolution of trade in favor of R&D intensive products. High technology intensive manufactures have been the fastest growing product category in world trade between 1980 and 2000 (Mayer *et al*. 2003). High-income countries are specialized in these products, but emerging countries have tended to

[5] Ernst (2003) discusses the migration of some operations in chip design to Asia for example.

increase their contribution to global exports of these products too, partly through their participation to GPNs.

The development of GPNs is a quite general phenomenon, involving thousands of companies around the globe. GPNs are nevertheless much more pervasive and sophisticated in some industries. Due to their technical and economic characteristics, industries that manufacture equipment have developed GPNs the most. They first tend to involve production stages, such as design, component manufacturing and final assembly – which are physically separable. Second, these separable production stages exhibit different factor intensities, with assembly being typically less skill-intensive. This constitutes an incentive for companies to locate labor-intensive stages in labor-abundant countries.

Simple electronic products have been produced in low wage countries quite early and the production of some more sophisticated products such as hard disk drives has progressively organized through GPNs since the early 1980s (Mc Kendrick 2000). A wide array of electronic products are now the result of global production processes, including television and radio receivers, various office equipment or cameras. Electrical machinery, power and machine tools are also largely involved in global value chains (Kaminski and Ng 2001). Finally, the role of GPNs has markedly increased in the car industry since the 1990s, involving countries from all continents (Sturgeon and Lester 2003).

GPNs have also been developed differently by different multinational companies. One reason being that different leader countries are specialized in different industrial sectors. European countries tend to be more specialized in cars and machinery than in electronics. Japan and the United States both have strong positions in electronics, but focus on different products. The degree of development of GPNs also depends on manufacturing practices and traditions. American companies have been less focused on manufacturing than Japanese and Europeans, which may have influenced their earlier propensity to outsource in the office equipment and electronic industries (Mc. Kendrick 2000, Sturgeon 2002). A third reason for the various scopes and shape of GPNs is that they tend to have a regional focus. The relationship between the national origin of the leading company and the regional focus of its GPN will be explored below by comparing American and Japanese multinationals with European ones.

1.2 The impact of GPNs on trade flows and specialization

The development of GPNs involving companies from both high-income and lower-income countries has had a substantial impact on the location of manufacturing production and the specialization of countries. One difficulty in assessing this impact is that trade flows and specialization develop within industries.

A significant portion of trade within production networks is intra-firm, i.e. taking place among subsidiaries of multinational companies. Part of these exchanges nevertheless takes place between independent partners through outsourcing. Due to the variety of forms of GPNs, they generate various types of trade flows. As a result, different indicators have measured the phenomenon of international segmentation of production. Two main approaches have been developed to evaluate the impact of GPN on trade patterns. The first approach studies intra-firm trade. The second approach evaluates the share of production related flows of components in total trade. This second approach has often involved an evaluation of the vertical component of intra-industry trade (Box 1).

Box 1. Intra-industry and intra-firm trade

Intra-firm trade (IFT)

IFT takes place among subsidiaries of multinational companies. It may be horizontal, when subsidiaries exchange differentiated finished goods, or it may be vertical when the multinational has organized a global network with parts and components circulating between subsidiaries. Intra-firm trade is thus an important component of intra-industry trade. Horizontal intra-firm trade is also intra-industry trade. Vertical intra-firm trade may be more diverse though, especially if intra-industry is observed at a highly disaggregated level.

Intra-firm trade is not systematically recorded and some countries have conducted surveys to observe its evolution. This paper uses data from the U.S., Japan and mostly France. The last section of the paper is based on the latest French survey of intra-firm trade, which is presented in Appendix 1.

Intra-industry trade (IIT)

IIT has both a horizontal and a vertical component. The analysis of GPNs and associated trade flows focuses on vertical IIT (VIIT). Vertical flows are distinguished from horizontal flows within IIT on the basis of price differences between imports and exports. Differentiated products exchanged through horizontal IIT are supposed to have similar prices. On the contrary products with different levels of quality, or components are supposed to have substantially different prices. Hu and Ma (1999) for example define VIIT as the simultaneous exports and imports of 3-digit SITC products where the unit value of exports relative of the unit value of imports was outside the range of +/- 25%.

Vertical specialization

Vertical specialization can be evaluated based on the extent of VIIT. Another approach to estimate vertical specialization has been to calculate the rate of imported intermediate inputs used in the production of goods exported (Hummels *et al*. 2001, Martin and Manole 2003).

Estimates using different methods nevertheless converge to consider that vertical trading chains have taken an increasing role in international trade. Different methods also indicate similar sectoral and country differences.

According to the available estimates, the share of intra-firm trade has been increasing during the 1990s. Table 2 shows that intra-firm trade has increased in all the three countries for which we have surveys for the beginning and the end of the 1990s. Increase in intra-firm trade has been particularly rapid for Japanese multinationals, both on the export and import sides. American and French multinationals have increased their intra-firm trade in smaller proportions. Between 1993 and 1999, the share of intra-firm imports has more than doubled in the case of foreign multinationals located in France.

Table 2. Increasing intra-firm trade, in % of total trade

Country	Exports		Imports	
	1990[1]	1999[2]	1990[1]	1999[2]
United States *of which*	32.8	36.2	43.7	39.4
- domestically-based parent company	23.1	**27.7**	16.1	17.2
- foreign-based parent company	9.7	8.6	27.6	22.2
Japan *of which*	16.6	30.8	14.7	23.6
- domestically-based parent company	14.5	**28.6**	4.2	**14.8**
- foreign-based parent company	2.1	2.2	10.5	8.8
France *of which*	34.0	40.1	19.0	36.8
- domestically-based parent company	21.0	23.0	7.0	7.5
- foreign-based parent company	13.0	**17.1**	11.0	**28.3**

1. 1993 for French data.

2. For United States data for 1998.

Note: comparisons are indicative, as methodology is different in the different national surveys.

Sources: OECD (2002) and survey from the SESSI for France (see Appendix 1).

A large share of intra-firm trade between high-income countries is composed of finished goods destined to be distributed without additional processing taking place. Intra-firm trade between high-income countries is thus a way for multinational companies to produce and sell differentiated products. On the contrary, intra-firm trade with middle- and low-income countries tends to reflect the development of GPNs.

At the aggregate level, this expansion of the GPNs leads to an increasing share of intermediate inputs and components in trade by developed countries since the 1980s (Feenstra 1998, Barba Navaretti et al. 2002). As a consequence of this trend, the share of vertical IIT between industrial countries and less developed countries increases (Box 1). In the mid-1990s, vertical IIT already accounted for 80 to 90% of total IIT between the CEECs and the EU for example (Aturupane *et al*. 1999). Moreover, during the second half of the 1990s, trade in parts and components by CEECs has been very dynamic (Kaminsky and Ng 2001). By the mid-1990s, IIT between China and different high-income countries, as well as the share of vertical IIT in total IIT were already quite high (Hu and Ma 1999). As a result, China has a relatively high and growing index of vertical specialization (Martin and Manole 2003).

More generally, IIT has been increasing both in a number of high-income countries and in poorer countries. Table 3 indicates that among OECD countries, IIT has been increasing for mid-income countries that became more open to trade during the 1990s and for high-income countries that are the closest to the former. Since the creation of NAFTA, Mexican production facilities have thus become more tightly integrated into the production networks of American firms. IIT has also substantially increased for the countries which have become more integrated with EU members, including Portugal and future members from Central and Eastern Europe. The rapidly increasing rate of IIT in Korea and Japan may be due to both more open trade and tighter integration with lower-income countries in Asia. Overall, vertical IIT has played a larger role in raising the intensity of IIT than horizontal IIT by which

countries exchange similar but differentiated products.

Table 3. Intra-Industry Trade as a percentage of total manufacturing trade

	1988-91	1992-95	1996-2000	Change over the period
High and increasing intra-industry trade				
Czech Republic	n.a.	66.3	77.4	11.1
Slovak Republic	n.a.	69.8	76.0	6.2
Mexico	62.5	74.4	73.4	10.9
Hungary	54.9	64.3	72.1	17.2
Germany	67.1	72.0	72.0	5.0
United States	63.5	65.3	68.5	5.0
Poland	56.4	61.7	62.6	6.2
Portugal	52.4	56.3	61.3	8.9
High and stable intra-industry trade				
France	75.9	77.6	77.5	1.6
Canada	73.5	74.7	76.2	2.7
United Kingdom	70.1	73.1	73.7	3.6
Switzerland	69.8	71.8	72.0	2.2
Belgium/Luxembourg	77.6	77.7	71.4	- 6.2
Spain	68.2	72.1	71.2	3.0
Netherlands	69.2	70.4	68.9	- 0.3
Sweden	64.2	64.6	66.6	2.4
Denmark	61.6	63.4	64.8	3.2
Italy	61.6	64.0	64.7	3.1
Finland	53.8	53.2	53.9	0.1
Low and increasing intra-industry trade				
Korea	41.4	50.6	57.5	16.1
Japan	37.6	40.8	47.6	10.0

Note: Countries are classified as having a high level of intra-industry trade if intra-industry trade is above 50 per cent on average over all periods shown and "increasing" if intra-industry trade increases by more than 5 percentage points between the first and last periods.

Source: OECD (2002).

Trade within GPNs develops as multinationals expand their global operations. As a consequence vertical trade tends to be positively correlated with FDI, which has important consequences for the geographical orientation of trade flows and for their sectoral specialization. FDI is a channel for capital, but also technology transfer and various production and management know how transfers.[6] As a result, there are interactions between the home country and host country specialization.

Foreign firms have been playing a crucial role in the surge of exports from China. Chinese policy has strongly favored the use of imported inputs in labor-intensive production of manufactures and exports based on the processing of imported intermediates account for half of total exports (World Bank 2003, Lemoine and Unal-Kesenci 2002). As a result the intensity of vertical IIT is positively correlated with FDI (Hu and Ma 1999). The rate of

[6] This is a major theme of the literature on multinationals and development; for a recent survey, see (Sachwald and Perrin 2002).

growth of high tech exports by China has been particularly remarkable (table 1 above) and it is clearly related to FDI by leading companies and vertical trade with high-income countries. The diversification of exports by China towards more technologically advanced products such as electronics was achieved through specializing in processing and assembly in relation with foreign firms. For high tech sectors, comparative advantage only appears for final goods, while China exhibits a strong disadvantage for parts and components (Lemoine and Unal-Kesenci 2002).

Similarly, the diversification of trade by CEECs has been led by FDI and the integration of local subsidiaries and local firms into GPNs. Industrial specialization of these countries are still characterized by comparative advantage in labor-intensive industries and, for some of them, in resource-intensive sectors. There are however increasing differences between Central European countries and Balkan and Baltic States. In most Central European countries, there has been a trend towards an evolution of specialization since the mid-1990s (Freudenberg and Lemoine 1999, Kaminski and Smarzynska 2001, Boilllot *et al.* 2003). This evolution is partly driven by exports in new sectors, where FDI is high. As in the case of China comparative advantage in the manufacturing of parts increases through the integration into GPNs (Freudenberg and Lemoine 1999, Kaminski and Ng 2001).

Some CEECs have become involved in the global production networks of electronic goods, office machinery and telecommunication. The automotive industry however plays a relatively more important role in some CEECs. Since the mid-1990s, the automotive industry has been driving production sharing for a number of countries (Kaminsky and Ng 2001). In this industry, production networks mainly involve EU carmakers and CEECs trade in parts and components is especially concentrated toward the EU.

This rapid comparison between China and CEECs underscore both similarities in the dynamic evolution of trade and specialization, but also differences in the focus of the new specialization in manufactures. These differences are connected with the regional orientation of trade for each zone. Structure of trade between both emerging zones and high-income countries seem to be related to the specialization of the latter. Next section explores this hypothesis by looking at the relationships between multinationals' strategies, the specialization of the countries of origin and trade flows with emerging countries.

2. Are production networks of European multinationals different?

This section examines first the regional focus of production networks and whether American, Japanese and European multinationals build different types of GPNs. This issue is examined in more details in the case of France, by comparing intra-firm trade with China and CEECs.

2.1 The regional configuration of production networks

The analysis of trade flows indicates that multinationals build global networks, through which they organize both production and distribution activities. Distribution activities are conducted through subsidiaries located in high-income countries and typically generate horizontal intra-industry and intra-firm trade among similar countries. Production activities tend to be globally organized and involve FDI in emerging countries, so as to take advantage of their lower labor cost. And as we have seen GPNs generate intense vertical intra-industry trade flows between countries with different income levels. We now focus of the scope of these production networks and more particularly on the issue of

regionalization.

A detailed examination of the location of their new affiliates suggests that U.S. multinationals have been shifting activities towards low-income countries since the 1990s. Growth of U.S. majority-owned foreign affiliate activity has been the most dynamic for industrial machinery in non-OECD Asia, with an annual growth rate of 23% between 1982 and 1998 (Hanson *et al*. 2001). Computers and office equipment account for about two thirds of industrial machinery sales, but that fraction rises to more than 90% in non-OECD Asia. Besides, the export-to-sales ratios of U.S. foreign affiliates are highest in industries commonly associated with outsourcing: computer and office equipment, electronic equipment, as well as transportation equipment. Based on these observations, Hanson *et al.* (2001) study the determinants of the share of imports by affiliates for further processing in affiliates' total sales, which may be considered as a measure of vertical specialization by American multinationals. They find that vertical specialization is negatively correlated with GDP and per capita GDP. American multinationals thus tend to outsource more to low-labor-productivity countries. Vertical specialization is also negatively related to the distance from the United States, which is consistent with outsourcing requiring substantial back-and-forth movements of components and managers between parents and foreign affiliates.

Since American multinationals tend to prefer countries that are closer to the United States to organize vertical specialization, their production networks should have a regional focus. Data in table 4 confirms this hypothesis, especially for the industries in which GPNs are most developed. It shows in particular that U.S. affiliates in Mexico are the most involved in vertical specialization with their parent. Canadian affiliates are more involved in GPNs than other OECD countries, while low-income Asian countries are less involved than Mexico or other Latin American countries.

Table 4. Affiliate imports of goods for further processing as a share of American affiliate total sales in 1994, %

	World	Canada	Mexico	Other Latin America	Non OECD Asia
Total manufacturing	12.2	33.5	42.3	21.1	14.3
Industrial machinery and equipment	10.9	36.7	44.3	23.8	8.7
Electronic and other electric equipment	22.2	21.2	131.6	96.1	25.9
Transportation equipment	23.2	49.6	56.1	36.7	7.0

Source: Hanson *et al.* (2001)

Table 5 confirms the regional configuration of GPNs. It both looks at reverse flows from affiliates abroad to parents and compares American and Japanese multinationals. It shows that multinationals tend to focus on the local markets, but that this tendency is stronger in high-income countries. Europe is in a specific situation since regional integration and the limited size of each national market compound as incentives for multinationals to organize horizontal intra-firm trade. The table further shows that exports to the home country are more intense from low-income countries that are closer, such as Mexico in the case of the United States and China in the case of Japan.

Table 5. Destination of sales by subsidiaries of Japanese and US Firms, by Location, 1999

Destination of sales	Location of Operation						
	Japan	U.S.	Europe	East Asia (exc. Japan)	China	Latin America	All countries
U.S. Subsidiaries							
Local Market	90.1	-	56.7	39.6	50.4	65.1	57.7
Exports to other countries	7.1	-	37.5	32.8	29.6	13.1	27.2
Export to the U.S.	2.8	-	5.8	27.6	20.0	21.8	15.1
Japanese Subsidiaries							
Local Market	-	90.4	60.1	48.2	47.0	77.3	70.0
Exports to other countries	-	7.3	36.3	28.5	21.8	17.7	20.4
Exports to Japan	-	2.3	3.6	26.0	31.2	5.0	9.6

Source: Fukao *et al*. (2003), based on data from the Department of Commerce (U.S.) and METI (Japan)

According to table 5, both Japanese and American subsidiaries in East Asia nevertheless tended to export a substantial part of their total sales to other countries than the home country. This fits well with the emerging regional division of labor in East Asia and to the increasing role of China. It also suggests that East Asia is attractive even for American companies as a manufacturing platform.

Table 6 focuses on the case of China and allows us to have a more precise assessment of the role of China in the production networks of multinationals from different home countries. Subsidiaries with Asian parents exhibit the tightest production links with their parent and intense vertical intra-firm trade. Trade for processing represents more than 40% of both their imports and exports. American affiliates export a similar share of their production after processing in China, but import much less for processing into China. American parents have not organized to export intensely components to their Chinese subsidiaries, which suggests that they rely relatively more on local or regional sourcing.

These patterns could be related to the more general approach of American firms to outsourcing, which has been discussed above in section. The major contract manufacturers in electronics, such as Flextronics or Solectron, are American. As they focus on manufacturing operations and efficiency, they are very more mobile and keen to take advantage of low cost capabilities in emerging regions, especially Latin America and Asia. As a result, they may be quicker to localize production facilities in new areas, which could lower intra-firm trade between the home country and low cost regions.

European multinationals exhibit yet another behavior, with a much lower rate of vertical intra-firm trade. Their subsidiaries have only one third of their exports being classified as “processed exports”. Moreover, a very small portion of the imports by French and German subsidiaries is aimed at further processing. This dovetails with conclusions from studies on trade, which have emphasized that European firms tend to focus on sales to the Chinese domestic market, including in particular for machinery. An analysis of Chinese trade by stages of production shows that China has its largest trade deficit for capital goods with Europe. In high tech products, 43% of Chinese imports of capital goods come from Europe,

28% from Asia and 26% from America.[7] For the same products, capital goods represented 65% of imports from Europe in 1999, while parts and components represented only 30%.

Table 6. Share of Foreign Subsidiaries in Chinese Trade, in % of Total Trade by Partner, 1999

	World	Japan	Korea	Taiwan	U.S.	E.U. 15	Germany[2]	France[2]	UK[2]
Total exports	100	100	100	100	100	100	100	100	100
Exports by foreign firms	45	55	44	50	54	42	38	42	42
- of which after processing[1]	38	43	36	42	48	36	33	37	38
Total imports	100	100	100	100	100	100	100	100	100
Imports by foreign firms	52	63	58	65	43	49	60	39	59
- of which for processing[1]	32	43	44	50	**21**	**12**	**11**	**6**	19

1. China's custom data distinguishes "ordinary" trade and "trade processing".
2. For France, Germany and the UK, data is for 1997. Data for other countries were little different in 1997, which means that in 1999, the contrast was certainly still very strong with European countries.

Source: Lemoine and Unal-Kesenci (2002b); personal communication of data by the authors for France, Germany and the UK.

European multinationals, which have a limited presence in China through FDI (table 7), thus also exhibit a different profile from both American and Japanese multinationals.

Table 7. Origin of FDI in China, in $bn. and % for the share in 2002

	1996	2000	2002	Share in 2002	
Japan	3.7	2.9	4.2	8.5	
United States	3.4	4.4	5.4	10.9	
Germany	0.5	1.0	0.9	1.8	
France	0.4	0.9	0.6	1.2	4.8
UK	1.4	1.2	0.9	1.8	
Hong Kong	21.3	15.8	18.3	37.1	
Others	9.5	12.2	19.0	38.5	
Total	40.2	38.4	49.3	100	

Source: People Bank of China, quoted in Artus (2003).

European multinationals are on the contrary the first investors in CEECs followed by the American multinationals (table 8). Japan has very little FDI in the CEECs. Germany is by far the first investor and some investment from the Netherlands, actually initially originates from other countries. France is thus probably the second main investor. This difference has an impact on trade flows, with CEECs being a larger destination for German exports than for French exports.

[7] Calculated from data for 1999 in Lemoine and Unal Kesenci (2002a) on trade in high tech products broken down by stages of production.

Table 8. Origin of FDI in CEECs, share in total stock in 2002

	Share in %
Germany	22.1
Netherlands	16.2
France	13.3
United States	11.1
Austria	7.9
Italy	5.3
UK	4.9
Japan	1.0
Total in $bn	**117.4**

Remark, total EU is 80%

Source: DREE, Ministry of Finance, France

Next section explores whether the more intensive involvement of French multinationals in CEECs generates a different trade pattern with Eastern Europe by exploring the characteristics of intra-firm trade. It examines in particular the intensity and distribution of vertical specialization with China and CEECs.

2.2 China and CEECs in French intra-firm trade

French trade with China and CEECs has been increasing since the 1990, but remains relatively low. The share of trade with China in French international exchanges is much lower than for Japan and the United States, but also lower than for Germany, the largest EU economy. Since the end of the 1990s, the share of German exports going to China has increased, while the share of French exports to China is less dynamic. As a result, the share of China in total exports, which was similar and around 1% for both countries in the early 1990s, is now around 2% for Germany. The share of German exports to CEECs has consistently been higher for Germany and at the beginning of the 2000s, it is around 8%, as opposed to 3% for France.

The geographical structure of French trade partly reflects the development of French multinationals. French firms have rapidly internationalized from the end of the 1980s on and have to a large extent caught up with firms from other high-income countries. During the 1990s, French firms have in particular actively invested in the United States. French multinationals nevertheless remain quite centered on the EU. This major characteristic has to be emphasized when discussing the development of GPNs by French firms.

Intra-EU trade represents two thirds of total French trade. The weight of EU is even higher in French IFT, reaching 70%. As a consequence of the completion of the Single market in the early 1990s, French and European multinationals have rationalized their production sites at the regional level, which has generated intense intra-firm intra-regional trade. The share of IFT with the EU is higher than the share of intra-firm in total French trade (table 9). The share of IFT is generally high with all the Triad zones, but American subsidiaries exhibit a relatively low rate of intra-firm imports, while on the contrary Japanese subsidiaries exhibit a relatively low intra-firm export rate (table 9).

Table 9. Intra firm trade as a share of total French trade, in %, 1999

	Imports	Exports
EU	38.8	45.1
U.S.	34.3	51.6
Japan	51.8	44.3
China	15.3	22.3
CEECs	37.0	38.5
Total trade	36.8	40.1

IFT flows among Triad countries are mainly distribution oriented as three fourth of the products that are shifting within multinationals are sold without any further transformation (appendix 1 on the survey). European groups exhibit a distinctive behavior, with most of their intra-firm imports coming from their home country. 90% of imports by German subsidiaries in France are intra-firm and more than three fourth of these imports come from Germany. The profile is similar for Italian and British subsidiaries, but quite different for extra-European multinationals. American subsidiaries in France for example exhibit a quite even distribution of their intra-firm imports, including in particular the U.S. (14%), Germany (19%), the UK (19%) and Ireland (12%). Japanese subsidiaries source most of their intra-firm imports (53%) from Japan, but also 11% from the UK and about 20% from outside the Triad.

French IFT is thus mainly horizontal IIT among Triad countries and even more intensely within the EU. European firms have specialized their production sites in Europe so as to reap more economies of scale. This is the case in particular in automobiles and pharmaceuticals, the two sectors in which IFT is the most intense. The situation is nevertheless quite different for IFT with countries from outside of the Triad.

IFT is relatively less important with emerging countries (table 9), where French industrial multinationals have yet relatively little operations. A comparison with the previous survey conducted in 1993 nevertheless shows that IFT with emerging countries increases. It is the highest for Latin America, for which 39% of exports are intra-firm. It has remarkably increased with emerging Asia[8]: from 4.4% of imports in 1993 to 21.8% in 1999, and from 7.8% of exports to 32.1%. This rate is approaching that of IFT with CEECs (table 9). IFT with China has also increased, but remains much lower than with CEECs. These observations confirm the relationship between FDI and IFT.

IFT with both CEECs and China has also very different characteristics from IFT with high-income countries. A comparison between the two zones further shows that the regional focus of GPNs also has an impact on the products being exchanged through IFT.

Studies have generally been interested in the share of IFT in total trade in order to evaluate the role of multinationals in total trade, as in table 9. In order to study in detail IFT and the organization of GPNs, it seems at least as interesting to examine *IFT intensity*, which I define as the share of IFT in total exports or imports of a specific industrial group.[9] Table 10 shows IFT intensity and clearly indicates the differences between groups from different home countries. French groups tend to have a lower IFT intensity than foreign

[8] China, Hong Kong, Indonesia, Korea, Malaysia, Philippines, Singapore, Taiwan, Thailand.

[9] See the definition of groups (which are basically multinationals) in appendix 1. In 1999, overall, trade by industrial groups represented 75% of French exports and 64% of French imports of industrial products.

multinationals, except for trade with CEECs. In that case, firms from other EU countries trade relatively more with CEECs from their own territory. The IFT intensity of French firms is on the contrary very low with China, reflecting their limited presence in the country.

A comparison of IFT with China between tables 9 and 10 further indicates that multinationals represent a small share of total French imports from China. Intra-firm imports from China represent 15% of total trade and intra-firm import intensity for industrial groups 44%. This suggests that independent firms make a substantial share of imports from China, which may be smaller firms or various distribution channels, importing directly from Chinese partners. Such a discrepancy does not exist on the export side, with groups being the major actors.

Table 10. Intra firm trade from French and foreign-owned firms in France, in % of total trade by industrial groups

Trade partner	Imports			Exports		
	All industrial groups	French groups	Foreign owned firms	All industrial groups	French groups	Foreign owned firms
EU	59.5	31.8	73.1	60.0	58.3	62.7
U.S.	55.6	14.5	67.1	61.0	59.0	64.6
Japan	72.0	2.31	81.0	59.2	58.1	62.2
China	43.8	**25.7**	**51.9**	23.0	**12.2**	**54.3**
CEECs	39.0	**44.8**	**27.3**	49.0	**50.1**	**48.2**
Total trade	56.8	31.6	70.1	54.0	50.0	59.2

IFT between France and China

Table 11 shows that IFT with China is very intense for some products. Logically, intra-firm imports tend to be composed of products for which China is expected to have a comparative advantage, such as leather or toys. Conversely, intra-firm exports include products for which France exhibits a comparative advantage, such as car components, railway cars and pharmaceuticals. As shown in the table, some products exhibit both intensive intra-firm imports and exports. This could indicate either vertical quality IFT or vertical division of labor between France and China.

Table 11. IFT intensity by industrial groups in their trade with China, in %. Products for which IFT intensity is the highest.

	IFT as a share of imports from China		IFT as a share of exports to China
Transformed leather	100	*Products from printing*	100
Paints, varnishes, ink	100	Films and cinema services	99.5
Musical instruments	100	Jewels and coins	92.1
Boilers	100	Watches and clocks	91.4
Synthetic fibers	90.9	Electronic components	88.4
Knives and tools	87.9	Products for emission and transmission of sounds and images	81.8
Products from printing	76.3	*Car components*	80.1
Products for the reception, recording and reproduction of sounds and images	76.1	Car bodies and trailers	78.7
Toys and games	72.7	Railway cars	75.3
Other machines with specific use	71.1	Glass and glass articles	73.8
Optical and photographic equipment	67.1	Rubber products	72.2
Domestic appliances	66.7	*Products for the reception, recording and reproduction of sounds and images*	65.3
Electrical distribution equipment	60.4	Soap, perfumes and detergents	58.2
Car components	59.9	Pharmaceuticals	57.8
Average on total imports by industrial groups	**43.8**	**Average on total exports by industrial groups**	**23.0**

Table 12 allows distinguishing between the two hypotheses in the case of consumer electronics.[10] Exports of these products are essentially for resale on the Chinese market. Intra-firm exports are also essentially for resale, but nearly 30% are for further transformation in China, which suggest that there is some segmentation of production taking place. There is a similar pattern for products for emission and transmission of sounds and images.

The average share of trade for transformation is not higher than for intra-firm trade with the world, but there are specific products for which that share is high.

[10] The category « Products for the reception, recording and reproduction of sounds and images".

Table 12. Uses of selected products from IFT with China, in % of IFT by product*

Imports			Exports		
	Resale	**Transformation**		**Resale**	**Transformation**
Office equipment, data processing	96	4	Boilers	73	27
Products for the reception, recording and reproduction of sounds and images	72	28	*Products for the reception, recording and reproduction of sounds and images*	97	3
Basic chemicals	1	99	Jewels and coins		100
Electrical engines, generators and transformators	67	33	Watches and clocks		100
Toys and games	98	2	Electronic components	58	38
Products for emission and transmission of sounds and images	66	34	Products for emission and transmission of sounds and images	99	1
Apparel	90	10	Car components	100	
Plastic products	72	28	Electrical engines, generators and transformators	30	70
Optical and photographic equipment	77	23	Railway cars	90	10
Plastic products	72	28	Pharmaceuticals	100	
Travel goods	87	13	Basic chemicals	87	13
Sport goods	100		Mechanical equipment	48	47
Domestic appliances	99	1	Measure instruments	19	76
Average on all products	**68.7**	**30.1**	**Average on all products**	**64.8**	**31.1**

**Intra-firm trade may also be used for investment. This use is generally very low and not reported here. Finally, some firms did not answer this question from the survey (appendix), but they represent a very low share of trade.*

Table 13 shows that the products for which IFT is intense are not necessarily the most intensely traded between France and China by industrial groups. The main point to be noticed is that aerospace products represent about a third of exports by industrial groups to China and these products are exported directly to the clients. Aerospace is a sector in which France has traditionally had a strong comparative advantage and which is still highly concentrated in high-income countries.

It is also interesting to notice that the main import, office equipment, is not included in table 13, which means that it is not intensely traded within firms. Similarly, apparel constitutes one of the main products imported by multinationals in France, but not as intra-firm trade. Products that are both IFT intense and represent a substantial share of imports include consumer electronics, toys and photographic material. Toys are quasi exclusively for resale, but there is some segmentation in photographic material. On the import side, only consumer electronics and electronic components are both IFT intense products and among the major imports from China. Overall, consumer electronics[11] seem to be the major product for which firms have developed fragmentation of production between France and China. Groups from

[11] Products for the reception, recording and reproduction of sounds and images.

different nationalities participate in this process, including in particular Japanese companies.

Table 13. Product distribution of trade with China by product, in % of total trade by industrial groups

	Share in imports from China		**Share in exports to China**
Office equipment, data processing	18.2	Aerospace products	31.3
Products for the reception, recording and reproduction of sounds and images	11.9	Boilers	10.5
Basic chemicals	9.1	*Products for emission and transmission of sounds and images*	7.6
Electrical engines, generators and transformators	4.9	Equipment for the distribution of electricity	4.9
Toys and games	4.8	Other machines with specific use	4.2
Products for emission and transmission of sounds and images	4.7	Mechanical equipment	3.9
Apparel	4.5	*Electronic components*	3.8
Plastic products	4.1	Basic chemicals	3.3
Optical and photographic equipment	3.9	Oil and natural gas	2.9
Other electrical material	3.0	General machinery	2.3

Italics indicate items for which IFT intensity is high, based on table 12.

Table 14 shows that groups from different nationalities exhibit quite different behavior with respect to IFT with China. The share of French groups in total IFT with China is much higher on the export side than on the import side. The profile of Japanese groups is symmetrical. Moreover, Japanese groups have a very high share of resale in imports and a very high share of transformation of exports. These observations together with the participation of Japanese groups in INF of consumer electronics mentioned above suggest that they integrate the French market into their global networks of distribution and source products from China. American groups have a more balanced behavior, but also actively participate to IFT from France to China as well as from China to France. German companies are much less active, and presumably organize their IFT with China from their home country.

Table 14. IFT flows with China according to the nationality of the parent company: share in total IFT and by type of use in %

Nationality of the parent company	**Imports**			**Exports**		
	Weight in total IFT	Share of resale in own IFT	Share of transformation in own IFT	Weight in total IFT	Share of resale in own IFT	Share of transformation in own IFT
French	18.2	61.0	39.0	39.4	63.1	39.4
German	3.6	87.9	7.8	2.4	8.0	83.0
American	23.1	81.7	10.0	17.1	63.6	32.6
Japanese	25.4	79.3	20.3	0.5	9.6	84.1
Total	100	68.7	30.1	100	64.8	31.7

IFT between France and CEECs

On average, IFT is more intense with CEECs than with China, especially on the export side. Table 15 also shows that it is much higher for a whole series of products. Besides, the mix of products is also different from China, both on the import and export side. Some products are nevertheless common, including on the export side electronic components, railway cars and rubber products. On the import side, common items are more numerous, including consumer electronics, products from printing, toys and optical products. The products that are intensely traded within firms both on the import and export side are on the contrary different from China, including cars, concrete, and lamps.

Table 15. IFT intensity by industrial groups in their trade with CEECs, in %. Products for which IFT intensity is the highest.

	IFT as a share of imports from CEECs		**IFT as a share of exports to CEECs**
Products from printing	100	Lignite	100
Soap, perfumes and detergents	100	Electronic components	95.4
Concrete and plaster products	100	Wooden boxes	92.3
Motorcycles and bicycles	100	Office equipment, data processing	92.2
Cars	99.9	*Cars*	84.6
Lamps and lighting material	99.9	Oil and natural gas	83.9
Domestic appliances	97.7	Car components	83.0
Optical and photographic material	95.2	*Lamps and lighting material*	80.6
Products for the reception, recording and reproduction of sounds and images	94.1	*Concrete and plaster products*	79.7
Accumulators and batteries	94.0	Railway cars	78.8
Watches and clocks	93.9	Agrochemicals	78.3
Paper and paperboard articles	93.4	Equipment for electrical distribution and control	73.9
Toys and games	93.1	Rubber products	73.0
Wooden frames	90.1	Arms and ammunitions	70.9
Average on total imports by industrial groups	**61.3**	**Average on total exports by industrial groups**	**55.0**

As in the case of China, trade by industrial groups is quite concentrated (Table 16). The difference with China is that in the case of CEECs, the products that account for a substantial share of trade by industrial groups are also more intensely traded within firms. This is the case in particular for cars and car components, which together account for 22% of both imports and exports by industrial groups. Electronic components and data processing products account for another 11% of intra-firm exports and 6% of intra-firm imports.

Table 16. Product distribution of trade with CEECs by products, in % of total trade by industrial groups

	Share in intra-firm imports from CEECs		Share in intra-firm exports to CEECs
Cars	17.2	*Cars*	16.4
Products for the reception, recording and reproduction of sounds and images	15.5	*Electronic components*	8.6
Apparel	5.4	Pharmaceuticals	6.3
Car components	5.2	*Car components*	6.1
Other metal work	4.2	*Products for emission and transmission of sounds and images*	5.4
Electronic components	3.7	Basic chemicals	3.6
Non ferrous metals	3.3	Other machinery for specific use	3.4
Rubber products	3.2	Office equipment, data processing	3.1
Basic chemicals	2.9	Other chemical products	2.9
Office equipment, data processing	2.7	*General machinery*	2.9

Italics indicate items for which IFT intensity is high, based on table 15.

Table 17 suggests that there is some vertical specialization going on between France and CEECs. Cars represent a substantial share of trade by groups, have a high intra-firm intensity and are both imported and exported mostly for resale. This indicates intense vertical quality intra-firm trade. Table 17 suggests that there is more vertical specialization in the case of car components. Car components are nevertheless mainly exported for resale. This may be due to the fact that component suppliers have tended to follow car makers in CEECs and that components are to a certain extent being produced within CEECs, and also in connection with other European countries (Brocard and Darmaillacq 2003). More generally table 17 indicates vertical specialization for a number of products, even if the overall rate of transformation on the import and export sides is relatively low.

Table 17. Uses of the products for which IFT represents a large share of total trade by firms*, in % of IFT by product

Imports			Exports		
	Resale	**Transfor-mation**		**Resale**	**Transfor-mation**
Cars	99	1	Cars	88	12
Products for the reception, recording and reproduction of sounds and images	87	13	Electronic components	8	**92**
Apparel	98	2	Pharmaceuticals	97	2
Car components	23	77	Car components	88	9
Other metal work	86	5	*Products for emission and transmission of sounds and images*	66	34
Electronic components	13	87	Basic chemicals	66	34
Non ferrous metals	98	2	Other machinery for specific use**	39	32
Rubber products	95	5	Office equipment, data processing	99	1
Basic chemicals	88	12	*General machinery*	35	60
Office equipment, data processing	87	13	Other textile products	5	95
Lamps and lighting material	100		Soaps, perfumes, detergents	91	9
Average on all products	**78**	**20**	**Average on all products**	**65**	**32**

** Based on the list in table 16*

***Intra-firm trade may also be used for investment. This use is generally very low and not reported here. It is nevertheless 29% in the case of "machinery for specific use".*

Overall industrial multinational groups play a relatively more important role in trade with CEECs than with China. Intra-firm trade is also more intense and diverse. It is particularly intense in the car industry, but also in for some electronic components and products. IFT with CEECs is mostly aimed at resale, but there is some vertical specialization in specific sectors.

Table 18. IFT flows with CEECs according to the nationality of the parent company: share in total IFT and by type of use in %

Nationality of the parent company	**Imports**			**Exports**		
	Weight in total IF imports	Share of resale in own IFT	Share of transformation in own IFT	Weight in total IF exports	Share of resale in own IFT	Share of transformation in own IFT
French	26.6	79.6	24.2	61.9	74.8	20.2
German	23.4	86.2	16.7	3.7	63.7	28.4
American	13.1	54.8	38.2	13.6	66.8	23.5
Japanese	3.9	30.6	69.4	0.9	47.4	48.1
Total	100	77.4	22.2	100	69	23

Table 18 shows that subsidiaries from different origins have a quite different way to integrate CEECs in their global networks. French groups represent the majority of export flows to CEECs by multinationals, and these exports are mainly for resale, but with a

substantial minority for transformation. The role of French firms is more modest on the import side and equivalent to that of German groups. German firms have intense relationships with CEECs from their home country, but nevertheless seem to organize transformation in CEECs from France. They exhibit a very high share of resale for imports, but a substantial share of transformation for exports. American subsidiaries have a lower share of IFT, but exhibit an even higher propensity to organize vertical specialization between France (or the EU) and CEECs. Japanese subsidiaries trade very little with CEECs, but also exhibit a high rate of transformation.

These patterns suggest that all firms located in France have started to integrate CEECs into their European networks. As in the case of trade with the EU, IFT focuses on resale, except for Japanese firms, which exhibit the highest shares of transformation. In the case of CEECs, resales do not necessarily mean horizontal IFT, but rather vertical IFT based on quality differences. In the case of the car industry in particular, CEECs are specialized in the cheaper segments of the market.

These trade patterns further indicate that CEECs play a more important role than China in the industrial networks of French firms (table 10), but vertical specialization with China is relatively more important (tables 14 and 18). The same is true for foreign firms, even if there are also specific national profiles. Japanese firms thus tend to be more involved in vertical specialization, both in the case of China and CEECs (tables 14 and 18).

These comparisons between, IFT with China and CEECs confirm the role of regional proximity. Trade patterns are also influenced by the differences in wage levels and specialization of home countries. For example, the comparative advantage of France and Germany in the care industry strongly influences the organization of production networks with CEECs. American and Japanese firms play a relatively more important role in electronic GPNs.

Summary and Conclusions

Summary of main results

The examination of French IFT confirms a number of conclusions drawn from the comparison of multinationals' behavior in Asia and in China in particular. One such conclusion is the focus of European groups on the Chinese local market. American and even more Japanese companies tend to be more involved in vertical trade with China. These differences may be related to the international specialization of European countries. In the case of France for example, aerospace products represent a major export to China, and it does not generate much intra-firm trade or vertical specialization. On the contrary, there is intense IFT, including for transformation, in consumer electronics, for which European countries typically have no comparative advantage.

The role of wage levels in the location of production and trade flows is often underscored. This consideration is indeed important when comparing the role of China and CEECs in world trade and their respective positions in GPNs. The examination of French IFT nevertheless draws attention to the importance of the specialization of flagships' home country. The comparison between the car industry and electronics is a case in point.

French IFT patterns also confirm the regional focus of GPNs. The geographical patterns of IFT with CEECs are strongly influenced by the proximity with EU countries, in particular

France and Germany. Conversely, American and Japanese firms weigh relatively more in IFT with China.[12]

Finally, the examination of French IFT reminds us that multinationals are only one type of actor in world trade and in the development of global sourcing. The share of IFT in total trade is lower for exchanges with CEECs, and even more with China, than the average for the world. Most imports from China and exports to China in particular are not traded within multinationals. This is again related to specialization patterns. High-income countries have long lost their comparative advantage in textiles and other labor-intensive goods, where traditional patterns of country specialization develop, with companies from low wage countries and SMEs being important actors. In such sectors, some products may exhibit high IFT intensity (table 11), but the share of IFT in total trade tends to be relatively low. Conversely, some products, such as apparel, represent a large share of imports by industrial groups in France, but exhibit a low IFT intensity. In labor-intensive sectors, IFT may nevertheless be quite intense if marketing plays an important role. This seems to be the case for toys and game for example.

Vertical specialization and the hollowing out syndrome

The technological and institutional dynamics that stimulate the development of GPNs should allow yet further vertical specialization in a number of sectors. Leading companies are only one type of actors in this global process. They can nevertheless use GPNs to increase their competitiveness by focusing their resources and efforts on core competences. American companies in electronics and data processing have thus strategically outsourced a large part of their manufacturing operations in order to focus on R&D, design and marketing and to speed up innovation. By doing so, they have also created a new business segment for contract manufacturers, some of which have become (American) multinationals on their own. European carmakers have also operated some vertical disintegration and expanded their GPNs to strengthen their competitiveness. Leading companies are demanding ever more competences and flexibility from electronic contract manufacturers or automobile suppliers, which in turn implies that these companies also have to keep upgrading their capabilities.

Leading companies and some of their contractors thus tend to integrate new suppliers into their global strategy. Early movers may reinforce their competitive advantage by exploiting new opportunities to simultaneously lower manufacturing costs and speed up new product development. In such a perspective, the relocation of some manufacturing activities abroad should not be seen by high income countries as a symptom of hollowing out and industrial decline, but rather as an opportunity to speed up the evolution of international specialization.

The sheer pace of some evolutions may be impressive. Despite anecdotes, it nevertheless seems that international specialization and in particular the specialization of China in labor intensive products, does not change rapidly (Roland Holst 2003, Ahearne *et al*. 2003). The objective for high income countries to reinforce their comparative advantage in knowledge-intensive products and services thus seems reasonable. Besides, firms from high income countries also benefit from the expansion of business opportunities in China. These should further develop as China becomes more open to trade and does not focus so much on building a global manufacturing platform.

[12] Differences between imports and exports have been discussed in the paper.

The rapid evolution of some emerging countries as well as in the constant restructuring of GPNs call for further research and the examination of more recent data. It seems particularly interesting to observe the interactions between leading firms' strategies and the evolution of national specialization. On this issue, comparisons among both home countries and host countries should bring interesting insights.

Appendix 1. The French Survey on Intra-Group Trade

The « survey on international intra-group exchanges » has been conducted by the SESSI from the French Ministry of the Economy, Finance and Industry. It deals with intra-firm trade by industrial groups located in France.

This second survey was launched in 2000, and questionnaires asked about 1999 operations. The first French survey of this kind on intra-firm trade had been conducted for 1993 operations.

The scope of the survey was industrial or wholesale companies located in France and being majority owned by industrial groups. International industrial groups (IIG) are defined as groups possessing at least one manufacturing subsidiary and at least one subsidiary abroad. All subsidiaries taken into consideration are majorit-owned.

The survey has been limited to firms with substantial international exchanges, i.e more than EURO 1 millions for the sum of exports and imports. The survey focused on manufactures, except military equipment.

4,305 companies belonging to 2,114 IIG have responded to the survey. These companies represent 52% of the population, but 78% of international exchanges by IIGs.

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