

Japan's Integration into the World Economy in the 1990s

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Summary

In this study, indicators such as trade openness, intra-industry trade intensity, Feldstein-Horioka coefficients, royalties and license fee flows and outward production ratios are used to measure Japan's integration into the global economy in the 1990s. Among the OECD countries, Japan's integration level is at the lower end. However, contrary to the early 1980s, the level and structure of Japanese international economic relationships in the 1990s have been similar to those of other OECD countries. This holds for trade as well as for capital and knowledge flows, and can be found on all levels of aggregation: in company data as well as on sectoral or on an economy-wide level. The progress in globalization which had been made in the 1980s, has been consolidated but not expanded much in the 1990s.

1. Introduction

After a tremendous spurt in the second half of the 1980s leading to high expectations on the part of many observers, the globalization process of Japanese companies slowed down in the 1990s. Thus, there was no dawn of a Japanese era, with Japanese companies exporting not only their products but also their way of production and organization of business. Instead, the economic downturn in the early 1990s and slow growth rates thereafter held back not only Japanese companies' internationalization but also the entire economy's global integration, in contrast to developments in other OECD countries.

The period of increasing economic integration, which we call globalization, started in the mid 1980s. It is the process of converting separate national economies into an integrated world economy (Siebert and Klodt, 1999). Falling transport and communication costs, dismantled barriers to trade and international capital flows and liberalization efforts in various areas of the world have driven this development.

This paper evaluates Japan's integration into the world economy in the 1990s. In order to make such an analysis, a yardstick is needed. Since the aim of the study is to analyze the situation in Japan in the 1990s, Japanese economic integration is compared to the situation in the 1980s. Also, in order to evaluate the differences between the two periods, if necessary, other OECD countries have to be taken as benchmarks. Therefore the United States is used as well as European countries, since there are

various differences in the pattern of economic integration among the developed countries.

The second half of the 1980s saw a spurt in growth, investment, and internationalization of the Japanese economy. The strong appreciation of the yen after the 1985 Plaza Accord encouraged Japanese companies to push for other internationalization strategies besides exports. Although trade remained dominant (the trade surplus rose to record levels), foreign direct investment (FDI), the establishment of joint ventures and licensing agreements strongly gained importance (Nakakita, 1988). Backed by a booming home market, Japanese companies entered the large-margin, high-quality segments of many product markets. Their image changed from being cheap to being reliable, superior-quality suppliers of technology-intensive goods. With new goods and a very efficient production system, they increasingly gained market shares in developed countries.

This internationalization spurt in the late 1980s was clearly driven by competitive advantages of Japanese companies which stemmed from superior products, highly efficient production processes, and modern management approaches. Japanese companies possessed ownership advantages, stemming from their knowledge capital. The competitive edge seemed to be very large at this time, at least in some industries. Japanese exports con-

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tinued to grow in spite of the strong yen appreciation, Japanese branch plants mushroomed in the United States, the United Kingdom and other developed countries bringing with them Japanese production and management systems. Japanese companies became active players on M&A markets and bought real estate all over the world.

In the 1980s, Japanese companies shifted their focus away from Asia towards the developed countries. The share of their outward FDI stocks invested in developed countries stood at about 65% in the second half of the 1980s, compared to about 40% in the decades before. Europe's share doubled from 11.6% to 19.7% in the same period. Other indicators of the internationalization of Japanese companies, such as business or technology tie-ups, production cooperation or local production showed the same picture (Nakakita, 1988). Japanese companies' international activities became more diversified. They changed their internationalization strategy from regionalization to globalization in the 1980s.

The analysis reveals rapid progress in economic integration into the global economy in the late 1980s, and consolidation of this progress in the 1990s. Changes in foreign trade have been not so much quantitative but qualitative in nature. The sectoral and regional breakdown of trade has changed remarkably, while intra-industry trade has grown. Export and import structures have diversified. Production by Japanese companies' foreign affiliates shows the same change in sectoral and regional patterns, but the growth was much more dynamic than the growth of trade during the 1990s. Internationalization of production has been accompanied by growing intra-firm trade and increasing transfer of knowledge and technologies to and from Japanese companies.

In section 2, indicators of the intensity of foreign trade links, the degree of the internationalization of production, international portfolio investments, and international knowledge transfer are introduced, discussed and used to evaluate Japan's performance in the 1990s. In contrast to many other developed countries, globalization did not gain significant ground over this period. Section 3 concludes.

2. Measuring the Degree of Japan's Integration into the World Economy

Various indicators could be employed for this analysis. However, here I focus on a few consensus measures of globalization. Trade, traditionally the most important channel of economic integration, is analyzed in the first subsection. Quantitative and qualitative changes in Japanese companies' trade links are examined. Some of these changes are related to the strong increase in the internationalization of production, which is analyzed in subsection two. The third subsection focuses on portfolio investment. After deregulation in the 1980s, Japanese compa-

nies have become very active players in the world capital markets, a position they have maintained in the 1990s. The last subsection analyzes the change in the international transfer of knowledge related to Japan. It also contains information on the internationalization of knowledge production.

2.1 Foreign trade

Measured by the traditional openness indicator, Japan did not become more open in the 1990s. If anything, one can observe decreasing openness over time (Table 1). Openness is here defined as exports plus imports relative to GDP. This indicator is widely used because it is easy to construct and very intuitive. However, it has a bias in cross-country comparisons, which is mainly due to the size of a country. Small countries tend to be more open than larger ones according to the openness indicator, since small countries cannot support all the industries and stages of production that large countries can (Hummels et al., 2001). Furthermore, the measurement of total trade relative to GDP might be problematic because GDP includes non-tradables. Their share in GDP has increased during the period analyzed. Using value added of manufacturing goods (tradables) as a basis would result in a different picture (Feenstra, 1998). Some bias may also stem from the fact that the nominator contains gross values (including intermediate goods), whereas the denominator does not.

Table 1

Openness, 1980–1999

	1980	1985	1990	1995	1999
Japan	0.24	0.22	0.17	0.14	0.16
USA	0.17	0.13	0.15	0.18	0.18
Germany	0.46	0.54	0.50	0.40	0.54
UK	0.40	0.45	0.40	0.45	0.40
Korea	0.63	0.57	0.51	0.52	0.64

Openness = (Exports + Imports) / GDP.
Source: IMF (2001); OECD (2000); own calculations.

With these limitations in mind, Table 1 can be used as a first indicator of Japan's globalization process. Japanese openness decreased from 24% in 1980 to 17% in 1990. Since then, the process has stagnated. In 1999, Japan has been the least open economy among these OECD countries, overtaken in the mid-1990s even by the much larger United States. Germany, the third largest economy shows a much higher degree of openness than Japan and the United States, which certainly is due both to its location in Central Europe and to the European integration process. The high level of openness of Korea results at least partly from its smaller size.

Table 2

Exports and imports of goods and services, 1980-2000

In billion US\$, 1995 prices and market exchange rates

	1980		1985		1990		1995		2000	
	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports	Exports	Imports
Japan	226.0	182.2	325.2	186.3	377.8	316.4	439.9	372.6	577.9	449.4
USA	330.5	319.1	337.2	482.0	568.3	621.0	797.8	870.9	1118	1505.2
Germany	318.5	321.7	485.8	342.1	570.7 ^{a)}	544.4 ^{a)}	603.4	587.6	901.1	852.2
UK	172.3	159.0	198.3	194.8	242.9	273.7	313.8	321.0	423.8	510.0
Korea	26.3	27.3	42.41	36.1	73.9	77.8	147.1	154.3	225.2 ^{b)}	141.9 ^{b)}

^{a)} 1991, ^{b)} 1998.
Source: OECD (2001); own calculations.

A falling and later stagnating openness indicator does not mean that Japanese companies stopped being highly active players in international trade. Japanese exports of goods and services have more than doubled in real terms since 1980 (Table 2). Falling openness results from slow import growth and a GDP growth which outpaced trade growth in these two decades. Since imports have not risen at the same speed as exports, the trade balance has displayed an increasing surplus over both decades. Table 2 shows also that Japanese exports have increased more slowly than those of Germany or the United States, and Japanese import growth has been much lower than German or US import growth.

The numbers show a moderate increase of Japanese trade in the 1980s. Considering the direction of Japanese trade, a drastic change can be seen towards more trade with developed countries in the 1980s. This in turn was felt by European and US companies as tough competitive pressure at the time. The share of exports to and imports from the EU countries increased substantially. From 1980 to 1990, the joint share of exports to the US and Europe increased to more than 50%, import shares of these countries rose to about 40%. Other countries' shares fell (Figure 1). In the 1990s, this pressure on European and US companies was to some degree relaxed because Japanese foreign trade dynamics were concentrated on East and Southeast Asia, with China accounting for the largest increase. Especially imports from China increased remarkably. The shift towards East and Southeast Asia is partly due to the rapid development in this region in the first half of the 1990s, but it also indicates the revival of regionalization strategies in the 1990s after a more global orientation in the 1980s. However, the globalization shift in the 1980s was only stopped, but not reversed in the 1990s. Globalization was accompanied by East Asian regionalization strategies in the last decade.

The change in the direction of trade was related to a changing sectoral composition of trade of Japanese companies over time. Export and import structures diversified,

trade in manufacturing became much more important, especially on the import side. Even if one takes into account that the 1980 import structure was disturbed by the high fuel prices (fuel accounted for 49.8% of Japanese imports in 1980), the 1980 share of manufacturing goods imports was very low compared to other developed countries. Primary goods imports summed up to 67% of total imports. Manufacturing goods held a share of only 23%, compared to about two-thirds of total imports in other OECD countries. In 1999 it was quite the opposite. 62% of all imports are manufacturing goods, 23% primary goods. Most of the change occurred in the second half of the eighties, when manufacturing good imports increased by 20 percentage points (all data from OECD, 2000c). Given the increase of imports from developed countries, this is not surprising. Primary goods imports were, even at current prices, lower in 1999 than in 1980. They decreased from 93.7 billion US\$ to 72.4 billion US\$.

Changes on the export side occurred within exports of manufacturing goods. From 1980 to 1999 almost all exports were manufacturing goods. During the 1980s, the share of high technology (medium-high technology) exports increased from 13.8% (52.8%) to 23.5% (58.1%). Medium-low (low technology) exports decreased during this time from 26.9% (6.5%) to 14.6% (3.7%), respectively (OECD, 2000b). From 1990 to 1996, the last year for which the OECD reported these data, the shares were unchanged (Table 3).

With a converging sectoral composition of export and import structures and increasing trade with other developed countries, the level of intra-industry trade (IIT)¹ has grown over the two decades. The Grubel-Lloyd index increased for 18 out of 22 industries of the manufacturing

¹ The IIT coefficients were taken from OECD. The OECD uses the Grubel-Lloyd index which is very common. It is calculated as the value of total trade remaining after subtraction of the absolute value of net exports or imports of an industry over the sum of total exports and imports of this industry. The index varies between 0 (0%) and 1 (100%). If trade is mainly one-way, the IIT index is low.

Figure 1

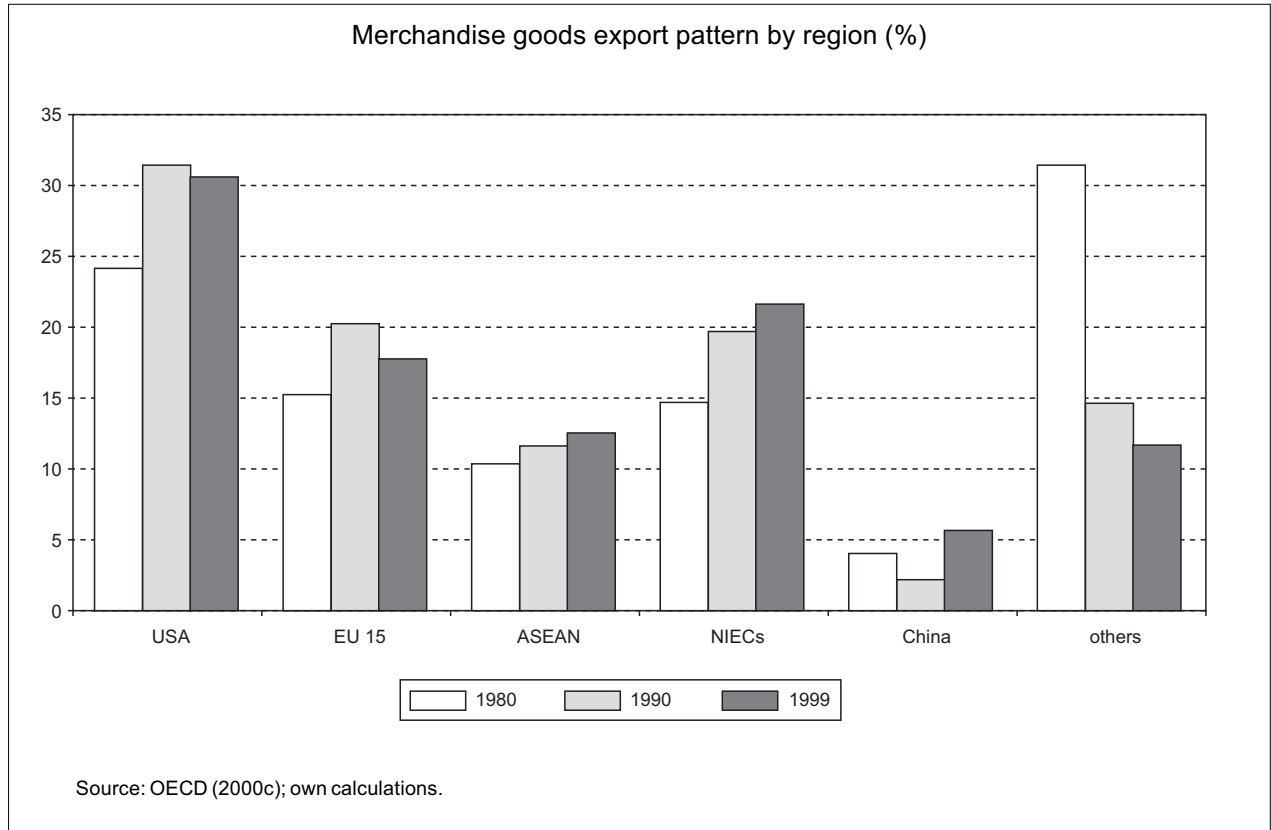


Table 3

Changing skill intensity of Japanese exports
% of total exports

	1980	1985	1990	1996
High-technology exports ^{a)}	13.8	20.4	23.5	23.6
Medium high ^{b)}	52.8	55.1	58.1	58.6
Medium low ^{c)}	26.9	19.7	14.6	14.7
Low-technology exports ^{d)}	6.5	4.8	3.7	2.9

^{a)} Drugs, office & computing equipment, radio.
^{b)} Chemicals excluding drugs, non-electrical machinery excluding office & computing equipment, electrical machinery, other transport equipment, motor vehicle, professional goods.
^{c)} Petroleum, rubber, non-metallic minerals, basic metal, metal products, shipbuilding, other manufacturing.
^{d)} Food, textiles, apparel & leather products, wood products & furniture, paper products & printing.
Source: OECD (2000b).

sector. Only four low technology industries (textiles, apparel and leather, wood products and furniture, paper and allied products, and shipbuilding and repairing) showed decreasing IIT coefficients. Japanese companies lost comparative advantages in these fields, Japan became a net importer in these industries. Chemicals, basic metals, electrical machinery, office and computing equipment, and professional goods are industries with especially large intra-industry trade (OECD, 2000b).

The high share of exports which are high or medium-high technology products reflect in part the large share of these products in the production set of Japanese companies. But this composition of exports also results from the much higher export share of production (ESP) of high and medium-high technology products (Table 4). Different sectoral developments are apparent. Whereas in some industries (textiles, metal products, motor vehicles), the export share has fallen, it has risen in others (non-electrical machinery, office and computing equipment, professional goods). In 1996, the average export share of production was far larger in high and medium-high technology industries (21.8%, 23.3%, respectively) than in medium-low and low technology industries (6.9%, 1.6%). The latter are more import oriented.

To measure the globalization of industries Makhija, Kim and Williamson (1997) used export shares of production (ESP)² and the IIT coefficient to analyze the degree to which firms are exposed to global competition. Export shares of production of a national industry provide an assessment of the extent of an industry's international linkages, which is necessary for a global industry but not sufficient. Export dominance in a given industry leads to competition patterns very different from an industry in which export and import levels are more similar. To account for these differences, a second indicator has been used: the IIT coefficient. It separates purely export oriented industries from truly global industries.

Table 4

Export share of production^{a)}
of Japanese industries (%)

	1980	1985	1990	1996
Food	1.4	1.0	0.7	0.6
Textiles	9.3	9.1	5.7	6.9
Chemicals	6.9	8.5	10.0	12.5
Primary metals	10.6	11.0	6.4	7.2
Metal products	14.4	10.8	5.9	7.2
Non-electrical machinery	15.8	20.8	20.5	25.2
Electrical machinery	21.5	22.9	17.3	18.3
Motor vehicle	42.4	57.3	42.3	34.9
Professional goods	44.5	45.2	49.4	68.5
High technology ^{b)}	21.5	23.7	20.5	21.8
Medium high ^{c)}	21.2	25.6	21.1	23.3
Medium low ^{d)}	8.5	8.8	5.9	6.9
Low technology ^{e)}	3.1	2.8	1.9	1.6
Manufacturing ^{f)}	11.4	14.4	12.0	13.3

^{a)} Exports/production output.
^{b)} Drugs, office & computing equipment, radio.
^{c)} Chemicals excluding drugs, non-electrical machinery excluding office & computing equipment, electrical machinery, other transport equipment, motor vehicle, professional goods.
^{d)} Petroleum, rubber, non-metallic minerals, basic metal, metal products, shipbuilding, other manufacturing.
^{e)} Food, textiles, apparel & leather products, wood products & furniture, paper products & printing.
^{f)} Manufacturing is the weighted average of all industries given in this table.
Source: OECD (2000b).

Makhija, Kim and Williamson (1997) followed Porter in defining a global industry "as an industry in which a firm's competitive position in one country is significantly affected by its position in other countries or vice versa" (Porter, 1986, p. 18). According to them, this is ensured by a combination of high international linkages with high levels of integration of value-added activities. They define "high" as a mean larger than 0.5 (or 50%) of both indicators. Makhija, Kim and Williamson (1997) analyze the level of globalization of nine chemical (ISIC 35) and 18 manufacturing industries (ISIC 38) of the G5 countries between 1970 and 1986. They find national and sectoral differences with European industries being more global than their Japanese or US counterparts. No Japanese industry proved to be, what they call "integrated globalized", i.e. showing an ESP and IIT coefficient higher than 0.5. One chemical and nine manufacturing industries had ESP>0.5 but IIT<0.5, Makhija, Kim and Williamson termed these "simple global industries". Over time, Japanese manufacturing industries trend towards "simple globalized industries".

Taking the Makhija, Kim and Williamson criterion to the more aggregated OECD data (OECD, 2000b), "professional goods" was the only integrated global Japanese industry in 1996. Almost half of the industries have ESP and

² Exports over production. A ratio of 0 (0%) indicates that no goods are exported; 1 (100%) states that all goods, which are produced, are exported.

IIT coefficients lower than 0.5 (10 out of 22). The others are characterized by IIT coefficients larger than 0.5 and ESP coefficients smaller than 0.5. Such industries are called “multidomestic industries” in their study. Makhija, Kim and Williamson’s framework reveals a slow globalization process of Japanese industries in the 1990s. The weakness of this approach is, as the authors admit, the rather arbitrary cut-off point of 0.5.

ESP and IIT coefficients capture globalization of industries comprehensively, if all tangible and intangible assets flows are embodied in international trade. To a certain degree this can be assumed, but there are also other channels of globalization, which are worth looking at. One of them is the internationalization of production, to which I turn in the next section.

2.2 Internationalization of production

The globalization spurt of the Japanese economy in the second half of the 1980s was not driven by trade but by internationalization of production. FDI by Japanese companies in foreign countries increased twenty-fold (in nominal terms) from 1980 to 1990. Its share of worldwide FDI outflows increased from a meager 5.1% in 1980 to 20.2% in 1990. Certainly, these numbers overstate the increase, since FDI flows are very volatile and 1990 was the peak year of Japanese companies’ foreign investment. However, comparing five year averages for Japanese outward FDI of the first and the second half of the 1980s, outward FDI flows in the second half were still 7.7 times higher than FDI flows in the first half.³ In the second half of the 1980s, the first heyday of globalization, Japanese companies were the largest source of FDI worldwide.

The 1990s have seen a relative and an absolute decline of Japanese outward FDI activities in the first half of the decade, and a strong increase since 1997 (METI, 2001). Inward FDI remained very low over the whole period. It did not show an increase until very recently. But the advent of the international cross-border merger activity has almost doubled Japanese FDI inflows in 1999 and in 2000.

Like Japanese trade structure, regional and sectoral compositions of FDI have become similar to structures of FDI flows and stocks of other developed countries. Figure 2, which depicts the regional distribution of Japanese outward FDI stocks, largely resembles the levels and changes in the regional distribution of exports shown in Figure 1. Starting with high shares of FDI stocks in Asia, the 1980s brought about a change in the direction of activities towards developed countries. Their share has increased from about a third to about 70%. That is especially impressive since Figure 2 shows stocks and not flows of outward FDI. The shares of outward FDI flows which have been directed towards the EU and Nafta were even higher, peaking at 71.5% in 1990.

The largest share was invested in the United States but European countries received a large amount of FDI as well. Among the European countries, the United Kingdom has attracted most Japanese FDI. The NIEs’ share⁴ has remained stable, but ASEAN countries⁵ and others have lost shares to the EU and NAFTA.⁶ The change in the regional distribution came along with changes in the sectoral composition of FDI flows of Japanese companies.

In the 1990s, China received more Japanese FDI than before, in absolute terms and relatively to other countries. NIEs’ share has fallen slightly in the 1990s, ASEAN’s share was stable over the whole decade, after a spurt in the early 1990s up to the Asian crisis, when these countries attracted about 10% of Japanese FDI outflows. Besides the smaller share ASEAN countries received after the crisis, the revaluation of invested capital stocks due to the strong devaluation of the currencies in some of these countries contributed to falling shares of ASEAN in total Japanese outward FDI stocks in the late 1990s. European countries and the United States further gained shares in Japanese outward FDI, although not at the same high speed as in the 1980s and not at the speed expected (and feared in Europe and the United States) at the beginning of the last decade. In 1999, Japan showed the same regional pattern as other OECD countries, 70% of FDI stocks are intra-OECD positions (UNCTAD, 2000).

Thus, the trend towards globalization did not change, but the speed of integration slowed down significantly during the 1990s. Japanese outward FDI stocks had grown tenfold in the 80s from 16.9 billion US\$ in 1980 to 201.4 billion US\$ in 1990. Until 1999, the stock rose to 249.1 billion US\$, an increase of about 25%, which is less than the growth of total FDI worldwide in the 1990s (UNCTAD, 2000). Furthermore, inward FDI remained very low. Truly global competition takes place on all markets including the home market. But foreign companies have invested less than a fifth of the amount in Japan that Japanese companies have invested in foreign countries. This gap emerged in the 1980s and could be closed only partially in the 1990s in spite of efforts to stimulate inward FDI. Over the whole period, the ratio of inward to outward FDI stocks was much lower than in other developed countries. A comparison for 1999 is given in Table 5.

³ All data are the author’s own calculations based on IMF (2001).

⁴ NIEs stands for Newly Industrializing Economies and refers to a group of Asian countries including Hong Kong, Singapore, Taiwan, and South Korea.

⁵ Here only Brunei, Indonesia, Malaysia, the Philippines, and Thailand.

⁶ This does not mean that these countries received less FDI in real or nominal term in 1990 than in 1980. It is only their share in total Japanese FDI stocks which has decreased. But since the total FDI has increased so markedly, ASEAN countries stocks have increased as well in real and nominal terms.

Figure 2

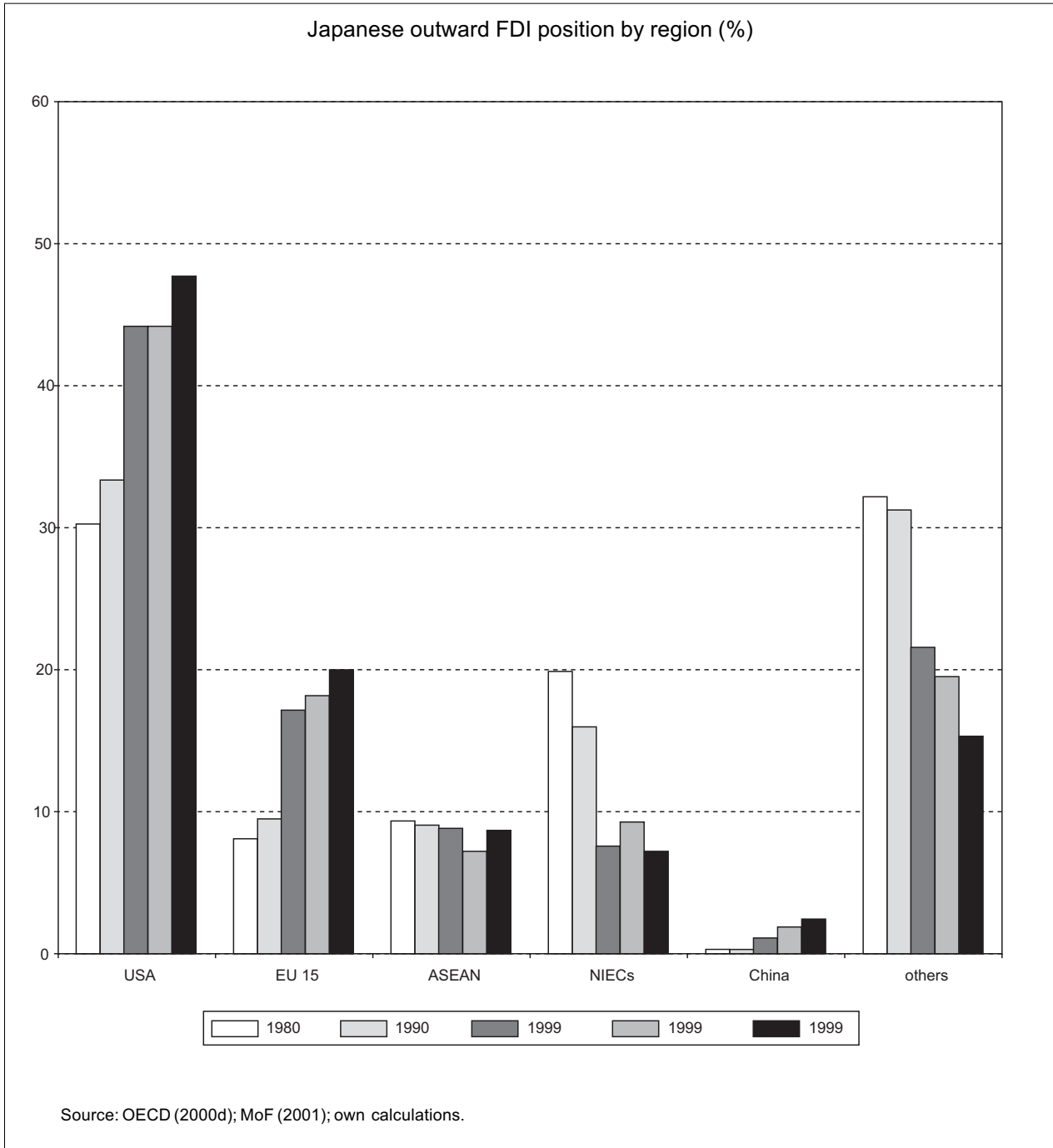


Table 5

Ratio of inward direct investment to outward direct investment 1999 (%)

Japan	18.5
United States	102.5
United Kingdom	70.3
Germany	35.7
France	84.5

Source: Bank of Japan (2000).

In 1998, Japanese companies employed 2.75 million employees in foreign countries, most of them in Asia (56.1%). 19.2% of the employees in foreign countries had jobs in non-manufacturing, the remaining 80.8% in manufacturing. The dominance of the manufacturing sector in 1998 regarding employment is greatest in Asia (manufacturing employment share of 88.1%) and lowest in Europe (68.3%). North America generates the highest sales of Japanese foreign affiliates. In 1998, North American affiliates accounted for sales of 421 billion US\$ (42% of total

sales). European sales were second (26%). The differences between the shares in employment and sales are due to differences in productivity in the host countries and the larger share of non-manufacturing activities, most notably trade, with a high sales-labor ratio in the developed countries (MITI, 2000).

Japanese companies have become increasingly international, with assets and labor employed in many countries, and intense capital and trade links between the units. Since 1990, Erasmus University and UNCTAD (various issues) have published a ranking of what they call the world's largest transnational corporations (TNC). The companies are ranked according to the amount of foreign assets they hold. The highest ranked Japanese company is Toyota. In 1998, 17 Japanese companies ranked among the world's top 100 TNC, five more than in 1990. For the world's top 100 TNCs, a transnationalization index is calculated, which aims at measuring the extent to which a firm's activity is located abroad. It includes the ratio of foreign to total sales, the ratio of foreign to total assets and the ratio of foreign to total employment.⁷ Japanese companies are not among the top ten. This group of TNCs is led by companies from smaller countries like Switzerland, Sweden, the Netherlands and Canada.

The average transnationalization index for the world has increased from 51.1% in 1990 to 54.0% in 1998. Japanese companies are on average less transnational. Nevertheless, their average (38.7%) is almost as high as that of the US companies (41.6%) in the sample. Japanese companies' index has increased by 3.2% points since 1990 (all data from UNCTAD, various issues). Certainly, the ranking is biased since it only includes very large com-

panies. But the average rise of transnationality and the differences among the countries included in the analysis point to general patterns. One of these is that large Japanese companies became global players in the 1980s and have stayed in this league throughout the 1990s.

Mergers and acquisitions are a common way of internationalizing the activities of companies. Although Japanese companies relied much more on greenfield investment than companies from other industrialized countries, M&A activities have increased strongly since the mid 1980s (Table 6). M&As reduce the time required to enter and allow to sidestep permits and licensing procedures. Japanese companies increasingly realized the advantages of this tying up with foreign companies, which provides them with new technologies, management know-how and business ideas (Muramatsu, 2000).

Table 6 gives the number of deals in which Japanese companies have been involved over a 16 year period. The number of domestic mergers is surprisingly low relative to other developed countries. M&As are not a traditional instrument of company restructuring in Japan. Developments in the late 1980s were driven by Japanese companies acquiring foreign companies especially in the United States. Backed by a strong yen and low costs of capital, Japanese companies in many industries became very active players in cross-border M&A markets. Foreign acquirers' activities in Japan remained very low due to the very high share prices of Japanese companies at this time and the industrial group structure with cross-shareholding of firms within their group.

⁷ The index ranges from 0% to 100%.

Table 6

M & A deals including Japanese companies, 1985–2000

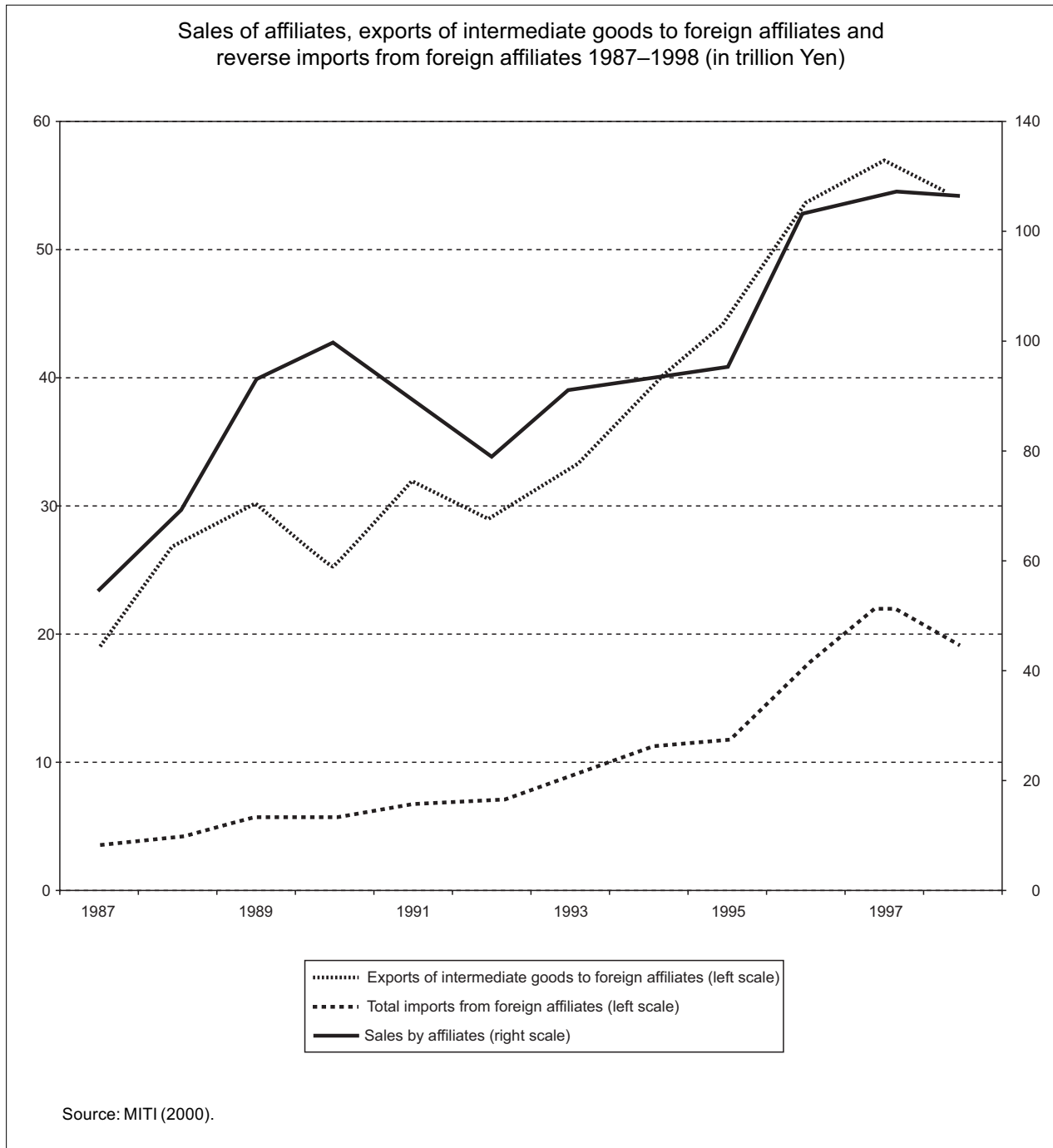
Number of deals

Year	Domestic	International Jap. acquirer	International Jap. target	International incl. foreign affairs of Jap. companies	Total
1985	160	77	22	1	260
1986	223	178	14	3	418
1987	207	156	17	2	382
1988	218	285	14	6	523
1989	247	384	11	8	650
1990	271	461	19	8	759
1991	312	293	18	18	641
1992	255	179	29	21	484
1993	236	108	23	29	396
1994	249	188	33	35	505
1995	255	206	33	35	529
1996	325	226	31	43	625
1997	455	216	51	33	755
1998	488	213	85	48	834
1999	718	248	129	74	1,169
2000	1,066	361	175	33	1,635
2001 ^{a)}	597	146	95	11	849

^{a)} First six months only.

Source: Recof (2001).

Figure 3



Since 1996, Japanese targets have shown the most dynamic development. The number of Japanese companies acquired by foreign companies has risen six-fold. Especially German firms have been very active, followed by firms from the United States, Switzerland, France, South Korea, and Taiwan. By industry, pharmaceuticals, chemicals, electrical machinery, transport equipment, and precision instruments have been most important. Often the deals aim at securing market access in Japan and Asia (Muramatsu, 2000).

MNE's affiliates in foreign countries are connected to the parent company and interconnected among each other through various links, most notably intra-firm trade. About a third of world trade takes place within, not between companies (UNCTAD, 1997). Thus, internationalization of production, by M&A activity or greenfield investment, raises economic integration directly and indirectly via intensified trade linkages. Figure 3 shows the growth of exports of intermediate goods and reverse imports from foreign affiliates of Japanese MNEs.

Intra-firm trade is not only growing in absolute terms but also relative to total trade. Intra-firm imports grew to 14.0% of Japanese total imports in 1998. This is an impressive increase from a meager 4.5% in 1986.⁸ Regarding intra-firm trade, Japanese companies have almost caught up with US MNEs. US intra-firm imports' share in total imports has been fairly stable at about 17% over the last two decades (Bureau of Economic Analysis, various issues). Intra-firm export levels are higher: about 27% of US total exports. Japanese companies' intra-firm export shares in Japan's total exports have risen from 12.8% in 1986 to 26.6% in 1998.

2.3 Portfolio investment

International capital markets have been liberalized increasingly since the 1970s. National capital markets have integrated into a world capital market where enormous amounts of capital are transferred daily across national borders. Japan started to integrate into the global market at the beginning of the 1980s. To evaluate Japan's integration into world capital markets, Feldstein-Horioka coefficients are employed. These are an often-used measure of capital market integration. Feldstein and Horioka regressed savings rates on domestic investment rates for a cross-section of countries. High values (coefficients close to one) point to a low level of integration. A coefficient of zero indicates perfect integration into world capital markets. For example, with worldwide-integrated capital markets there is no need to match savings and investments. External loans enable companies, consumers, or the government to meet their financial needs from any supplier; they do not need to look for domestic sources.

Feldstein-Horioka coefficients in Table 7 draw a picture of low economic integration of Japan into the global economy. According to them, Japan was less integrated into the world economy in the 1990s than in the 1980s, i.e. Japanese savings and investments were strongly cor-

related. The high coefficients, however, point to the tendency to meet financial needs by domestic suppliers. Japanese participants seem still to meet with obstacles on the global capital market.

In hindsight, the 1980s seemed to be the exceptional period. Certainly, this period exposed Japan to very different shocks. There was the second oil crisis at the beginning of the decade, the strong appreciation of the yen in the middle, and the deregulation-driven bubble economy at the end of this decade. In the 1990s, Japan has returned to high investment-savings correlation. This is high not only relative to 1980s levels but also compared to other developed countries.

As with trade, Japan seems to be integrated into international capital markets to a low degree, at least at first glance. But, as with trade, a more detailed analysis changes the story. Japanese integration in world capital markets has become more intense over the last two decades. Japanese institutional investors and households have come closer to those in the U.S. or European countries. This is certainly true with regard to portfolio investment. Its rise in the 1980s was even more impressive than the increase in FDI. That mainly was driven by the internationalization strategies of financial institutions after deregulation of foreign transactions since 1980 (removal of restrictions on euro-yen loans, abrogation of swap limitations on the conversion of foreign currency into yen, establishment of a Tokyo offshore market, deregulation of restrictions on foreign asset holdings of insurance companies). Especially institutional investors — above all insurance companies and investment trusts — increased their share of foreign securities in total assets. Starting at very low levels (average foreign securities asset ratio at 0.63% in 1980), the share of foreign securities increased remarkably (foreign asset ratio of banks at 2.0%, insurance companies at 9.2% and investment trusts at 23.7% in 1993). Net portfolio investment abroad contributed heavily to equalizing the soaring current account surpluses since the second half of the 1980s (Table 8).

The bursting of the bubble reduced portfolio investment activity in the first half of the 1990s, while FDI gained in relative importance. However, portfolio investment remained the most important means of international investment. By the end of 1999, 41% of the 2,996 billion US\$ worth of foreign assets held by Japanese investors were portfolio investments. US investors held 36% of their foreign assets as portfolio investment, German investors 37%. Regarding liabilities, the portfolio investment share was even larger (53%). This is little higher than in the United States (45%) and in Germany (47%).⁹ The structure of portfolio investment remained unchanged throughout the period of the bubble and the breakdown, with Japanese

Table 7

Feldstein-Horioka coefficients

	$\Delta(I/Y) = \alpha + \beta \Delta(S/Y)$	
	β	t-value
Japan 1980s	0.22	1.5
Japan 1990s	0.53	4.79
Germany 1980s	0.25	2.32
Germany 1990s	-0.41	-4.46
UK 1980s	-0.07	-0.46
UK 1990s	0.02	0.19
USA 1980s	0.16	2.25
USA 1990s	0.09	1.0

Source: IMF (2001); own calculations.

⁸ Author's calculations, based on MITI (2000).

⁹ All data are the author's own calculations based on IMF (2001).

Table 8

Trade, FDI and portfolio investment

Five-year average, in billion US\$

	1980–1984	1985–1989	1990–1994	1995–1999
CA exports	184.53	314.59	525.49	682.47
imports	-173.46	-242.79	-429.67	-584.68
PI ^{a)} outflows	-13.78	-94.88	-61.82	-96.68
inflows	11.87	25.42	48.40	77.76
FDI outflows	-4.28	-24.59	-26.29	-23.78
Inflows	0.26	0.1	1.37	3.84

^{a)} Portfolio investment.
Source: IMF (2001); own calculations.

companies predominantly investing in foreign bonds, whereas foreign portfolio investment in Japan was mainly in stocks. By the end of 1999, 72% of all assets were held in bonds, 22.9% in equities. On the liability side, the ratio was almost exactly the opposite: 71.4% were held in equities and 23.2% in bonds (Bank of Japan, 2000). Analyzing international diversification of investment portfolios, Eun and Resnick (1991) concluded that gains for Japanese investors accrue in lower risk, not so much in higher return. The opposite holds for US investors.

A breakdown by area shows that most portfolio investment of Japanese companies is undertaken in developed countries. The United States accounted for 34.3% of the stock of Japanese portfolio investments at the end of 1999, Europe for 43.1%. Asia's share was surprisingly low (2.6%), whereas that of Latin America was quite high (11.6%). Like FDI, inward portfolio investment came almost exclusively from developed countries. Europe held the largest share in 1999 with 53.5%, followed by investors from the United States (31.0%), Asian investors accounted for 7.0%, Latin Americans for 2.6% (all data from Bank of Japan 2000).

2.4 International knowledge transfer

Japanese companies have been importing technology for a long time. In the 1980s, they emerged as major technology exporters as well. In the 1990s, the increase in the international transfer of knowledge, measured as royalties and license fee payments and receipts, continued. Royalties payments increased from 6,050 million US\$ in 1991, the first year for which IMF balance of payments data on royalties and license fees was available, to 9,620 million US\$ in 1997. This equals an annual growth rate of 8% over this period. Receipts rose from 2,870 million US\$ in 1991 to 7,300 million US\$¹⁰ at an impressive annual growth rate of 16.8%. Japanese companies account for 19% of worldwide technology imports and 12.7% of these exports. The deficit shrank in the 1990s, but Japanese companies are still net technology importers.

A large share of international transfer of knowledge takes place within MNEs. Using royalty and license fees data from the balance of payments of Germany and the US, UNCTAD (1997) calculated about 80% of worldwide technology transfer being intra-firm knowledge transfers. For Japan, no data on intra-firm royalties and license fees payments and receipts were available. But using information from different sources, a crude approximation might be possible. Table 9 gives some information about the Japanese technological service flows and combines them with data from benchmark surveys about foreign MNEs in the US (1992 data) and US MNEs' affiliates activities abroad (1994 data).

The balance of payments data discussed above show the rise of Japanese cross-border technology flows in the globalization era. New knowledge and technology is spread very fast to other developed countries. This phenomenon can also be observed from the patent applications given in Table 10. Increasingly, patents are applied for not only in the home country but in foreign countries, too. Japanese companies started from a much lower level of external patent applications and much later than their competitors from the US or from Germany. But the dramatic increase in the second half of the 1990s indicates an increasing speed in the spread of Japanese companies' know-how in the 1990s. However, patent applications are costly. Therefore, applications in foreign countries point to a reduction of other sources which used to protect knowledge. Alternatively, increasing external patent applications may point to a faster penetration of foreign markets not only by exports but also by production in foreign countries.

The importance of knowledge production, here proxied by the number of resident patent applications, has increased in all three economies, in the United States, in Germany and in Japan, over the last two decades. This fact and the internationalization in the use of this knowledge have led to a rising internationalization of knowledge

¹⁰ At current prices and exchange rates.

Table 9

Royalty and license fee flows

In million US\$

Year	Japanese payments		Japanese receipts		Payments of U.S. affiliates in Japan		Payments of Japanese affiliates in the US
	Total	To US ^{a)}	Total	From US ^{a)}	Total	Intra-firm	
1992	7,200	5,256	3,060	1,255	–	–	749
1994	8,310	6,066	5,180	2,124	2,432	2,242	–

^{a)} Bureau of Economic Analysis.
Source: IMF (1996); Bureau of Economic Analysis (1992, 1994); MoF (2000).

Table 10

Patent applications, 1980–1997

Year	Germany			Japan			United States		
	Resident applications	Foreign share ^{a)} (%)	External ratio ^{b)}	Resident applications	Foreign share ^{a)} (%)	External ratio ^{b)}	Resident applications	Foreign share ^{a)}	External ratio ^{b)}
1980	30,582	54.2	2.70	165,730	14.5	0.27	106,218	41.5	1.87
1985	32,708	56.8	2.87	274,348	10.2	0.27	120,589	47.2	2.35
1990	30,928	67.5	5.08	332,952	11.5	0.39	175,333	48.3	3.26
1994	37,199	64.5	5.36	319,344	13.6	0.44	207,255	48.1	5.97
1997	45,105	66.5	9.61	349,211	16.0	1.09	230,336	48.1	13.26

^{a)} (Non-resident patent applications / National patent applications) * 100.
National patent applications = Non-resident patent applications + Resident patent applications.
^{b)} External patent applications / Resident patent applications.
Source: OECD (2000a); own calculations.

protection. In 1997, a Japanese company applied (on average) for one patent in Japan and one in a foreign country. In 1980, only one in four companies applied for a patent in another country. In the same vein, the foreign share of national applications has grown in all three countries. Increasing international technology flows are protected by a rising number of patents which are given by foreign countries authorities. Like royalties and license fee flows, patent applications refer to the internationalization in the use of knowledge, and not to internationalization in knowledge production.

The internationalization of knowledge production has not kept pace with the globalization of trade and production. Even large companies in most cases perform most of their R&D at home (Pavitt and Patel, 1999). What holds for developed countries' companies in general is in particular true for Japanese companies. METI (2001) calculates R&D spending of foreign affiliates relative to R&D spending by domestic companies to account for 2.3%, whereas the overseas production ratio¹¹ was at 11.6% in 1996.

Again, data is available for the R&D performed by affiliates in the United States. Among foreign affiliates, the Japanese-owned have been among the most active regarding the absolute amount of R&D abroad. In 1992, Japanese affiliates performed R&D for themselves for 1,510 million US\$. This has made them fifth behind companies from the UK, Canada, Switzerland and Germany, and accounts for 11.6% of the total R&D activities of foreign affiliates. Relative to the FDI stock, however, R&D performance is less impressive. Japanese MNEs' FDI share in the United States stood at 23.1% in 1992 (Bureau of Current Business, 1994). A sectoral breakdown of FDI reveals an exceptionally high share of wholesale trade (21.6% compared to 6.6% for all countries) in total FDI. The less impressive relative R&D performance of Japanese affiliates can partly be explained by the different sectoral composition of Japanese FDI, with a larger share of FDI stock in the less R&D intensive wholesale sector.

¹¹ Sales of foreign affiliates of Japanese companies over domestic sales.

3. Conclusion

Various indicators of foreign trade, internationalization of production, portfolio investment, and international transfer of knowledge have been employed for an analysis of Japan's integration into the world economy in the 1990s. Using these measures, the situation in Japan in the 1990s has been compared to the situation in the 1980s. Where necessary, other OECD countries have been taken as a benchmark.

The analysis of the globalization process of Japanese companies reveals strong progress in the late 1980s, which was consolidated in the 1990s. Foreign trade changes were not so much quantitative but rather qualitative in nature. Although trade levels have increased throughout the period, trade did not keep pace with Japanese production or even world trade expansion. Thus, Japan's openness (trade over GDP) has decreased, and Japanese companies have lost world export market shares. However, remarkable qualitative changes have occurred. A breakdown of trade by region shows a change in Japanese companies' internationalization strategy from regionalization in Asia to globalization. Developed countries have accounted for increasing export and import shares in Japanese foreign trade. This tendency has been accompanied by changing sectoral patterns, most drastically in Japanese imports. The share of Japan's intra-industry trade has increased strongly. Japan's sectoral trade composition resembles that of other developed countries today to a much greater degree than two decades ago. Export and import structures have diversified. Internationalization of production shows a similar regional and sectoral pattern, but a much more dynamic rise than trade. Its growth has gone hand in hand with rapidly growing intermediate goods trade in general and intra-firm trade

in particular. Japanese companies started to internationalize their production later than their competitors in other OECD countries. Today, they employ labor and capital in foreign countries to a similar degree. Measured by transnationality, as defined by UNCTAD, Japanese companies have become global players similar to their US competitors.

In summary, globalization of Japanese companies in the 1990s fell short of the high expectations at the beginning of the decade. The progress of the 1980s has been consolidated, some changes on the import/inward FDI side have occurred. Much more progress on the inward side must be achieved to reach truly global competition that benefits all, especially Japanese, companies and consumers. Continuing efforts to open up Japan to foreign trade and to attract FDI are the challenges of the new decade.

So far the analysis has been descriptive. It reveals the main changes in the last period and differences from and similarities to development in other OECD countries. However, explaining reasons for the changes and the special Japanese development in the 1990s, which has led to the globalization pattern described, is beyond the scope of this paper. Further work should examine the changes which occurred when Japan caught up to the leading economies in the mid 1980s. The descriptive analysis of this paper can provide a starting point and an orientation for theoretical explanations.

Acknowledgements

Financial support from the Thyssen Foundation is gratefully acknowledged. I am grateful to Philipp Schröder for discussions and comments. The author thanks Marco Oestmann for research assistance.

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Zusammenfassung

Japans Integration in die Weltwirtschaft in den 90er Jahren

In dieser Untersuchung werden Indikatoren wie Offenheit, die Intensität des Intra-industriellen Handels, Feldstein-Horioka-Koeffizienten, grenzüberschreitende Flüsse von Lizenzzahlungen und Anteile der Produktion der Unternehmen eines Landes im Ausland herangezogen, um die Integration Japans in die Weltwirtschaft zu bewerten. Verglichen mit anderen OECD Ländern zeigte sich für Japan eine relativ geringe Integration in den 90er Jahren. Fortschritte, die in den 80er Jahren gemacht worden waren, wurden im letzten Jahrzehnt nicht weiter ausgebaut. Jedoch unterschieden sich Struktur und Niveau von Japans internationalen Wirtschaftsbeziehungen in den 90er Jahren nicht mehr entscheidend von denen anderer OECD-Staaten. Das gilt für Handel- gleichermaßen wie für Kapital- oder Technologief Flüsse und ist auf jeder Stufe der Datenaggregation beobachtbar: mittels Mikrodaten, auf der Sektorebene und mittels aggregierter gesamtwirtschaftlicher Zahlen.