

# SOME EFFECTS OF EXPORT RESTRAINTS ON JAPANESE TRADING BEHAVIOUR

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## INTRODUCTION

Trade problems between Japan and other industrialized countries in North America and Europe have increased over the last six to seven years. Japan's share of export markets has risen appreciably, while imports of finished manufactured goods, as a percentage of final expenditure, have remained very low. Accordingly Japan's current account surplus increased to \$21 billion by 1983 compared with a deficit of over \$10 billion in 1980; and bilateral imbalances with other OECD countries have generally grown. In addition, Japan has become a world leader in the development of high value-added, technology-intensive products. By 1983, for example, the output of total electrical engineering—which contains most of the “new” products—had risen about 50 per cent above its 1980 level, a development due very largely to strong export growth.

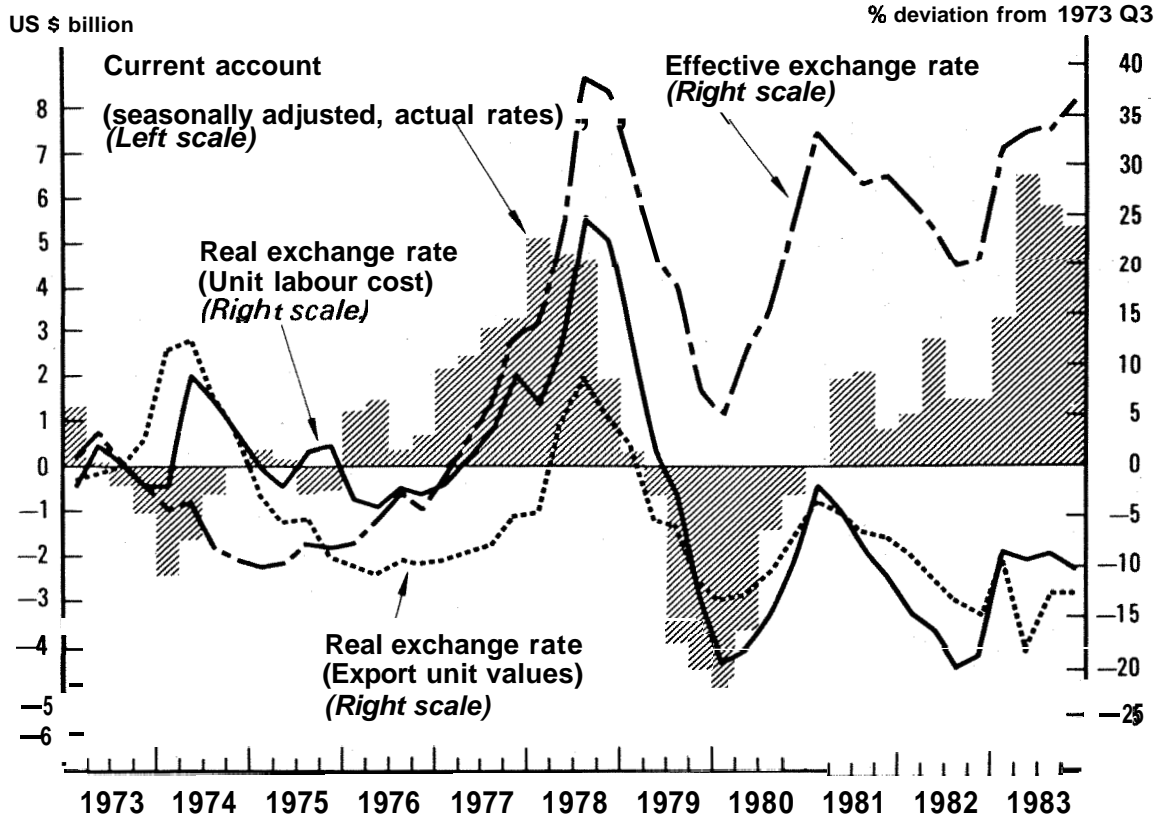
Unlike the experience of 1977/1978—when Japan's surpluses also grew sharply—these developments have not, until very recently, led to a substantial appreciation of the yen. Indeed, since the early 1980s the real exchange rate of the yen has generally been much lower than during the previous decade (Diagram 1)<sup>1</sup>. But export growth in volume terms has been limited by trade restraints; the nature of the measures taken is reviewed in Section I below. The possible implications of these measures provide the main focus of this article. In the short run, with quantities constrained, export prices could simply be adjusted to clear the market: in light of this, Section II examines the recent pricing behaviour of Japanese exporters. In the longer run, limits to direct exports can encourage Japanese corporations to expand their operations overseas: this is reviewed in Section III.

### I. EXPORT RESTRAINTS

During the last few years formal import quotas or tariffs have not, in general, been imposed on Japanese goods<sup>2</sup>. Instead, there has been a proliferation of various forms of export restraint. Under the bilateral agreement concluded with the United States in May 1977, exports of colour television sets from Japan were limited for a three-year period<sup>3</sup>. In April 1978 measures were also introduced with a view to limiting export volume growth in Japan's Fiscal Year 1978 (April 1978-March 1979). Eight sensitive industries were subject to “intensified monitoring and guidance”<sup>4</sup>. A major element was the administrative guidance for motor vehicles, a

CHART 1

**Current account, external competitiveness and exchange rate**



Source: OECD Secretariat.

system replaced by looser monitoring procedures by MITI from April 1979. A programme of voluntary export restraint was announced in May 1981, when exports of passenger automobiles to the United States came under voluntary export restraint for a three-year period beginning in April. This agreement was renewed in November 1983 for a 12-month period ending in March 1985<sup>5</sup>. Shipments of cars to several European countries and Canada were also subject to “forecasts” made either by the Japanese government or by Japanese industries. In February 1983 a three-year agreement was signed between Japan and the European Economic Community involving “forecasts” of exports of video tape recorders<sup>6</sup>, motor cycles, machinetools (numerically-controlled lathes and machining centres), light commercial vehicles, quartz watches, fork-lift trucks and colour TV sets. These forecasts, which generally implied a moderate growth of exports, were to be taken into consideration by Japanese exporters when formulating their sales programmes.

An interesting feature of some measures of export restraint is that they have involved Japanese undertakings not to sell their products below certain price levels. This specific floor export price system is administered by MITI under the Export and Import Transaction Law. Exports of machine tools to the United States and Canada have been subject to this system since 1978, and those to Europe since 1981. This floor price was raised substantially at the beginning of 1983. The recent agreement with the EEC on VTRs has also led to some minimum floor-price system. In other cases, the importing countries have themselves imposed minimum price systems: in the case of steel, for example, both the EEC (the "basic price system" under the Davignon Plan) and the United States (the "trigger price system") have resorted to such measures.

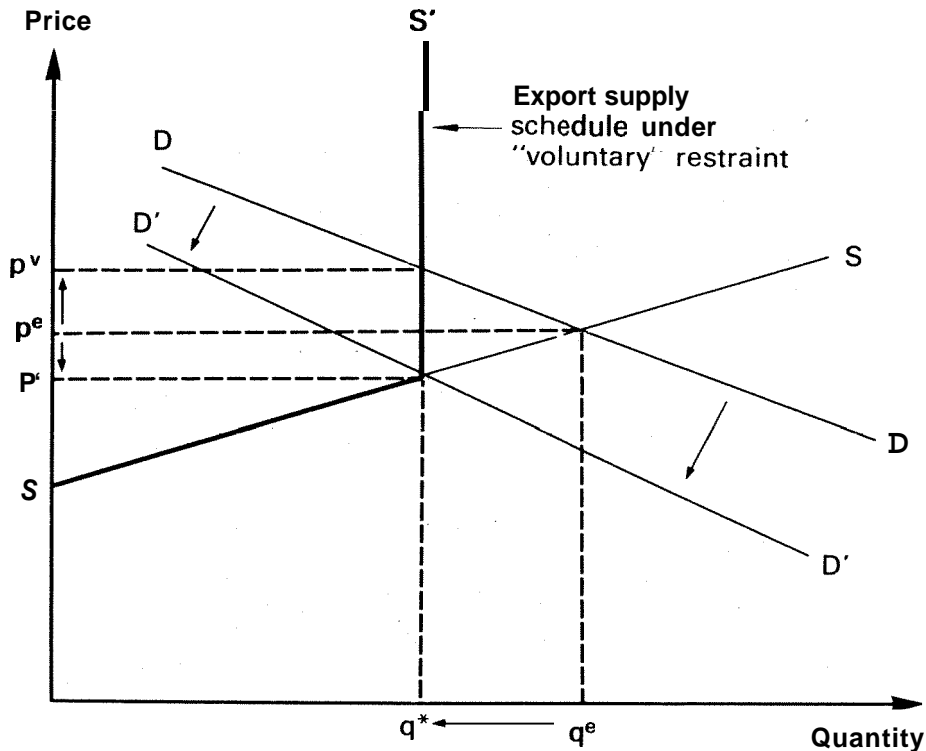
The effect on overall exports is probably greater than a catalogue of these restraints would indicate because the risk that inflexible restrictions will be imposed may have presented Japanese exporters from fully exploiting their competitive edge in all markets. While a precise estimate is not possible, there can be little doubt that a large part of Japanese exports face such constraints.

## II. TRADE RESTRICTIONS AND EXPORT PRICING

The impact of trade restrictions on export prices depends on the precise nature of the measures taken. According to standard textbook analysis, the imposition of a tariff will not generally increase export prices and may even actually reduce them depending on the elasticity of the export supply schedule. If the importing country possesses some degree of monopsonist power (less than infinitely elastic supply curve), its trading partners' export prices can be pushed down by imposing a tariff. On the other hand, measures of voluntary export restraint (agreed to by the exporting country) are likely to have exactly the opposite effect, and are likely to increase them. These points are illustrated by Diagram 2. The free trade level of exports,  $q^e$ , is reduced by some form of restriction to  $q^*$ . First, consider the impact of a voluntary agreement by the exporting country to restrict exports to  $q^*$ : essentially this makes the export supply schedule infinitely inelastic at this output level (curve  $SS'$  in the diagram) and prices rise to  $p^v$ . Second, consider the impact of a tariff. The demand curve (drawn on pre-tariff prices) shifts to the left (curve  $D'D'$  in the diagram): the same level of sales is attained but export prices are actually reduced to  $p^t$ . The following paragraphs assess to what extent Japanese export prices have indeed been affected by the particular type of restriction adopted.

First, it is instructive to review the performance of a standard export price equation over those periods when trade frictions have been most acute. The equation used was adapted from a similar equation used by the Economic Planning Agency in their *Economic Survey of Japan, 1981-1982*<sup>7</sup>. While this equation is not entirely satisfactory, it does accord reasonably well with *a priori* expectations, and

CHART 2  
Alternative Trade Restrictions



provides an acceptable benchmark from which to assess particular episodes. The dependent variable was export unit values in dollars (in logarithms), and the equation, estimated over 1970 Q1 to 1983 Q3 was:

$$\log PX = 0.84 \log P5 + 0.69 \log ER + 0.14 \log PF + \text{constant}$$

(10.3)                      (12.5)                      (2.1)

$\bar{R}^2 = 0.99$                        $DW = 0.44$                        $SE = 0.03$

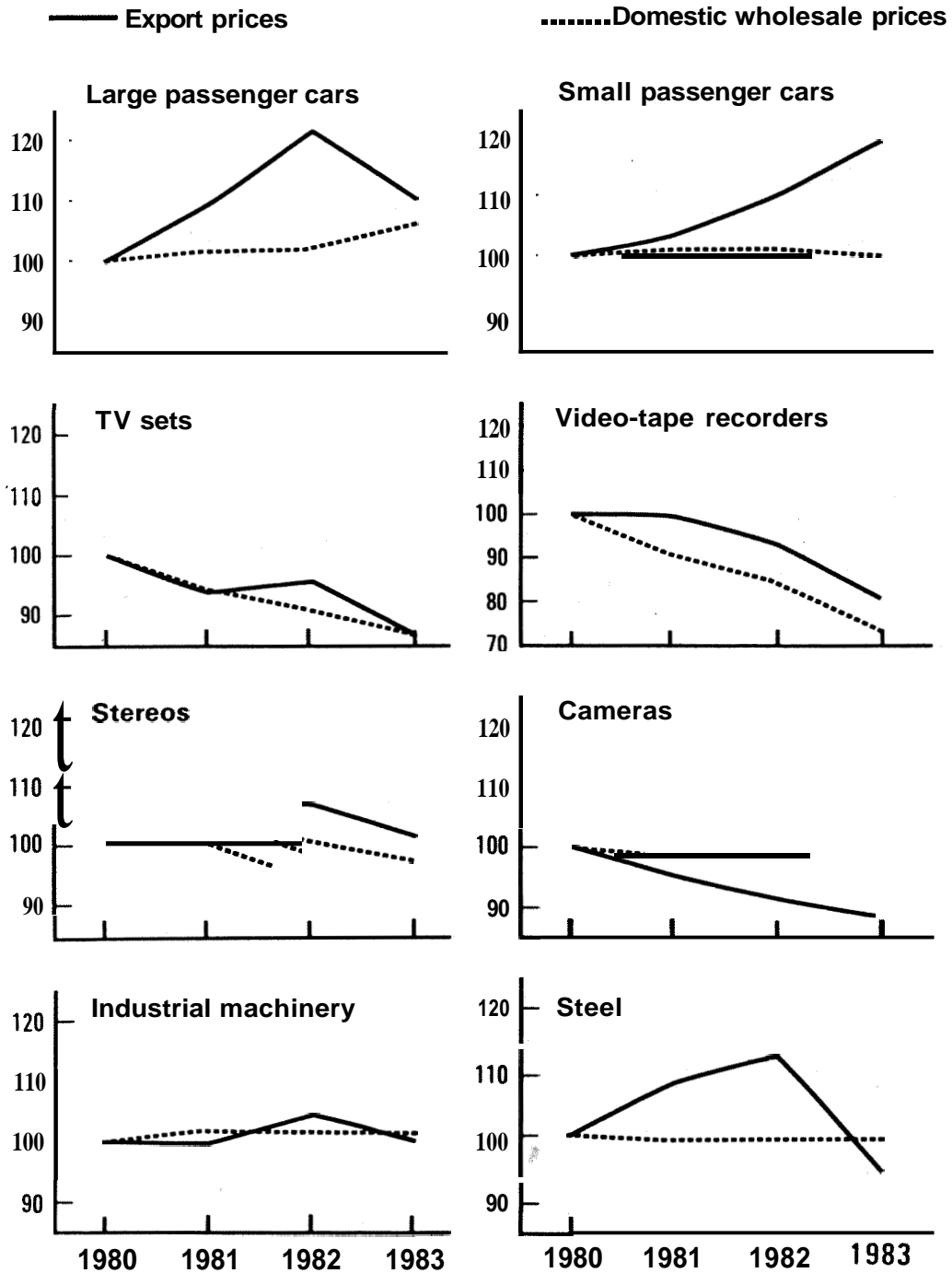
where:

- PD* = wholesale prices of manufactured goods
- ER* = average dollar per yen exchange rate
- PF* = competitors' export prices

An alternative specification of this equation in first differences produces virtually identical results although standard errors are somewhat larger<sup>8</sup>. Pricing behaviour in the 1977/1978 episode is a little hard to assess because of the very large appreciation of the yen that took place at that time. This by itself would have led to a large rise in dollar export prices. Nonetheless, while export prices appear to have

CHART 3

Export and domestic prices by commodity  
1980 = 100



Source: Bank of Japan. Price indexes Monthly.

risen slightly faster than predicted by the equation, the bulk of the price rise evidently reflected the large appreciation of the yen: out of a dollar rise of 23.5 per cent in 1978, about 19 percentage points are accounted for by the normal working of the equation. In the more recent episodes, however, export prices “should” have fallen by a cumulative 5½ per cent from 1980 to 1982 given the depreciation of the yen; in the event they remained virtually unchanged (in dollar terms). In 1983, however, despite an effective appreciation of just under 10 per cent, export prices actually fell whereas the equation cited above predicted a small increase<sup>9</sup>. Just as part of the depreciation of the yen in 1981 and 1982 was offset by higher export prices—partly because many Japanese exports were quantity-constrained—its subsequent appreciation was similarly offset so that Japanese price competitiveness did not deteriorate.

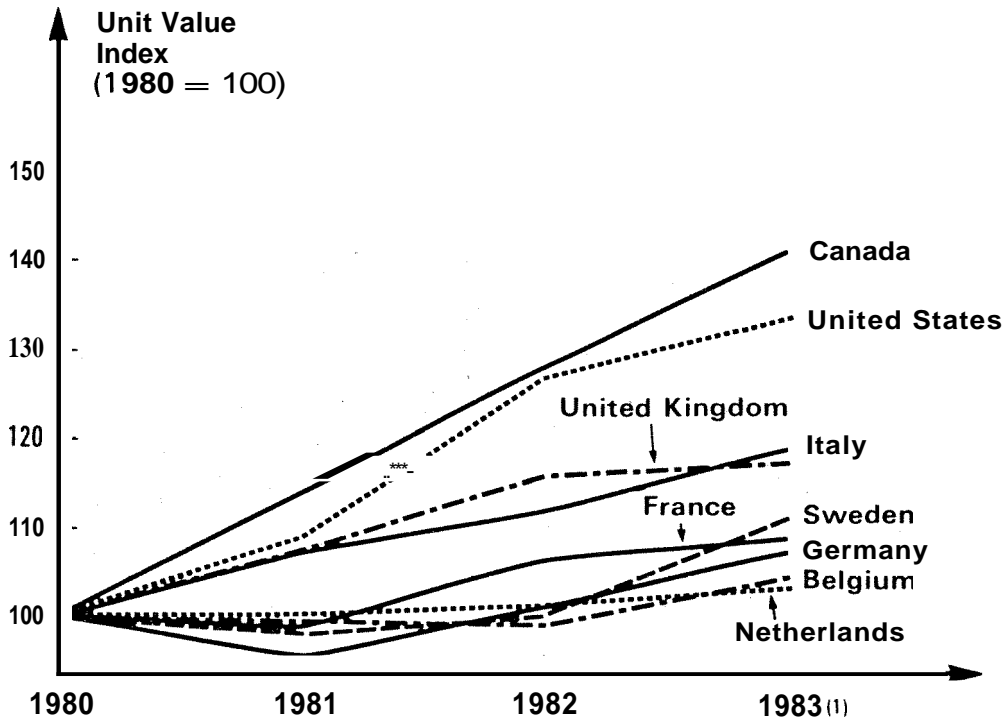
With quantities constrained, prices appear to have been increased to clear the market. Since restraint agreements have had their effect via increased export prices, export volumes have, since 1981, behaved much as predicted by a standard equation<sup>10</sup>. Furthermore because the elasticity of demand appears to be around unity (except possibly in the very long run), export revenues may not have been much depressed.

The conclusion that measures of export restraint have increased Japanese export prices is reinforced by cross-commodity pricing patterns. A comparison of exports and domestic prices for a range of commodities (see Diagram 3) suggests that pricing behaviour has been most affected for the more “sensitive” commodities such as cars, VTRs<sup>11</sup> and steel. In some cases (notably for VTRs and cars) the normally intense competition between domestic Japanese producers in international markets has inevitably been reduced by agreements to limit total exports. Such measures meant that the agreed level of exports had to be divided among rival Japanese firms, who then set prices accordingly. In addition, export unit values have risen faster than export prices as Japanese producers responded to quantity constraints by upgrading their product range<sup>12</sup>. This has been notably the case for exports of cars to the United States.

A comparison of export prices of certain commodities to different markets also yields interesting results. One reason for this approach is that the intensity of protectionist pressure against Japanese goods varies from one country to another. But also relevant is the fact that measures of Japan's *bilateral* competitiveness with major trading partners have diverged substantially, with competitiveness vis-a-vis the United States improving much more than that vis-a-vis Europe. Although comprehensive bilateral price indices do not exist, unit values of particular commodities are published. Diagram 4 shows the development of unit values of cars exported to particular markets since 1980. The largest increases were registered in the North American market, of around 30 per cent over less than two years. The main reason for this was probably that the improvement in competitiveness was most marked vis-a-vis the United States. With exports subject to a (binding) quantity constraint, it would have made little sense to reduce prices in line with exchange rate developments. By contrast, the increase in unit values of exports to the EEC was smaller, and the divergences between major EEC currencies reflected

CHART 4

Export Unit Values of Japanese Cars by Market



1. January-October only.

similar differences in competitiveness. The average levels of Japanese unit values for cars exported to specific markets also reveal an interesting ranking (in million yen; 1980-1982 average):

United States	1.015
Canada	0.812
United Kingdom	0.783
France	0.720
Germany	0.699
Sweden	0.679
Belgium	0.666
Netherlands	0.651

This ranking partly reflects quality differences in the cars exported. The differences may be intrinsic (American preferences for larger cars, stricter safety and pollution standards and so on); but they may also reflect a deliberate upgrading of the product mix presented by Japanese producers anxious to maximize profits given



import volume ceilings. It is also interesting that prices of exports to the major European countries—which have their own car industries—have generally exceeded those of exports to the smaller European countries which do not have their own car industries or whose industry is geared to a different segment of the market (for example, Volvo in Sweden)<sup>13</sup>.

The result is that, in the context of a weak yen, restraint measures have had the effect of raising export prices has important macroeconomic implications. Under normal circumstances, a subsequent appreciation of the exchange rate would reduce net exports and thereby lower GNP. But when export prices have already been raised because of restraint measures, an appreciation may be “absorbed” by reducing previously-inflated profit margins, leaving export volumes more or less unaffected<sup>14</sup>. Since an appreciation may tend to strengthen domestic demand via an improvement in the terms of trade, GNP may not necessarily be reduced.

### III. FOREIGN DIRECT INVESTMENT

A second, though longer-run, response to restraints on exports is increased foreign direct investment. The transfer of Japanese production—and the associated technology—to other advanced OECD countries is becoming increasingly important, and represents a significant change from the traditional pattern of Japanese foreign direct investment. Until the mid-1970s, Japanese foreign direct investment had a number of particular characteristics:<sup>15</sup>

- a high proportion of investment went to various mining ventures to secure raw material supplies;
- within manufacturing, the concentration was on labour-intensive or standardized products such as textiles, metals, simple electrical goods and basic chemicals;
- direct investment was consequently mainly directed to Asia and Latin America, rather than OECD countries;
- considerable investment in North America and Europe took place in financial and commercial enterprises, motivated in part by the need to support direct Japanese exports.

However, the emergence of trade restraint has started to change this pattern of direct investment. The total stock of investment in North America grew from only **\$2.4** billion in 1973 (23.9 per cent of the total) to \$15.2 billion by 1982 (28.7 per cent of the total). A similar shift has taken place in direct investment to Europe. Furthermore, these aggregate figures understate the importance of the change because investment has been concentrated in certain key industries. In 1973, only **4.1** per cent of accumulated investment in North America was in the machinery

Table 1. Development of direct investment (Accumulation since 1951)  
Percentage distribution

	North America			Europe		
	1973	1978	1982	1973	1978	1982
Manufacturing	24.1	23.4	27.9	7.9	15.3	19.2
Foods	1.1	1.5	2.4	1.2	1.1	0.7
Textiles	1.5	2.1	1.4	0.3	3.2	2.5
Timber and pulp	9.0	3.9	2.8	0.0	0.0	0.0
Chemicals	1.2	2.5	2.5	1.8	2.4	2.6
Metals	6.3	3.4	2.9	1.4	2.5	2.8
General machinery	1.4	2.0	2.7	1.9	2.4	2.4
Electrical machinery	2.5	6.0	7.5	0.3	1.5	3.7
Transport machinery	0.2	0.7	4.0	0.2	0.3	1.9
Others	0.9	1.3	1.6	0.6	1.9	2.7
Agriculture and fisheries	1.4	2.1	2.1	0.0	0.0	0.0
Mining	10.5	6.7	5.1	42.2	25.3	14.0
Construction	0.5	1.5	1.1	0.0	0.3	0.6
Commercial	33.9	37.7	35.6	7.2	15.2	23.7
Finance and insurance	10.3	10.3	10.2	21.1	16.7	21.0
Other services	19.2	18.3	18.7	30.4	27.2	21.4
Total (million dollars)	2 428	6 765	15 225	1 959	3 398	6 146

Source: *Monthly Financial Statistics*, Ministry of Finance.

sectors (general, electrical and transport); by 1982, this proportion had risen to 14.2 per cent (Table 1). The first wave (1973/1978) mainly reflected increased investment to produce colour TV sets; the second wave (1978/1982) reflected increased production of automobiles. The manufacturing sector whose foreign direct investment has been most significant has been the electrical equipment industry<sup>16</sup>. Up to the mid-1970s, the bulk of foreign direct investment in this sector was concentrated in Asia (mainly Taiwan) mainly to take advantage of cheap local labour. By 1983 this had changed radically, with investments in North America becoming dominant (Table 2). Such investment has, to an important extent, been motivated by the need to avoid trade frictions. The cycle is a familiar one. First, Japanese exports of particular products grow very rapidly (often because of a major technological advance) and large gains in market share occur. This gives rise to trade frictions, and restraint measures are agreed upon. In the final stage, Japanese producers find that further market gains (or consolidation of earlier gains) can be achieved only by increased local production, a process generally encouraged by the host country.

The transformation evident in direct investment flows is mirrored by the rapid increase in foreign employment by Japanese corporations. By 1980, three quarters of a million people were so employed, compared with only a quarter of a million at

Table 2. Balance of foreign investment in Japanese electric equipment industry

	March 1976		March 1983	
	\$ million	%	\$ million	%
North America	129	24.7	1 141	49.1
Central and South America	103	19.7	273	11.8
Asia	250	47.9	643	27.7
Middle East	4	0.8	12	0.5
Europe	25	4.8	226	9.7
Africa	2	0.4	5	0.2
Oceania	9	1.7	21	0.9
Total	522	100.0	2 322	100.0

Source: Monthly Financial Statistics, Ministry of Finance.

the start of the decade. Moreover, employment in North America and Europe has grown much more rapidly than elsewhere (Table 3).

The evolution of Japanese exports of colour TV sets provides an interesting case study of a complete “export boom/trade frictions/direct investment” cycle<sup>17</sup>. In the wake of the first oil crisis, Japanese producers of colour TV sets enormously improved their international competitiveness by a major mechanisation programme—the labour force was reduced to one-twelfth of its earlier size—and by the introduction of integrated circuits. As a result, exports of colour TV sets to the United States jumped from 1.2 million in 1975 to 2.96 million units in 1976. Such a rapid expansion of exports heightened trade frictions and led as noted to the 1977 Orderly Marketing Agreement which limited the export of Japanese colour TV sets to the United States to 1.75 million annually from 1977 to 1980. Thereafter

Table 3. Foreign employment by Japanese corporations  
Percentage

	FY 1971		FY 1980		Growth rate (1971-1980)	
	Total	Mfg.	Total	Mfg.	Total	Mfg.
North America	16 335 (6.8)	3 238 (1.7)	78 612 (11.2)	52 473 (8.8)	19.1	36.3
Europe	7 550 (3.1)	3 332 (1.7)	31 588 (4.5)	17 535 (2.9)	17.2	20.3
World	241 579 (100.0)	193 401 (100.0)	700 854 (100.0)	599 207 (100.0)	12.4	13.4

Source: MITI's Annual Survey 1983.

operations in the United States were greatly expanded: by 1980, Japanese manufacturing plants in the United States were producing more than 3 million colour TV sets annually, Direct exports fell to little over half a million sets.

There seems to be little doubt that this process will be repeated with other products if trade frictions persist. Preliminary indications are that a number of Japanese manufacturers plan to increase VTR production in the EEC after the recent limit to direct exports. Surveys of the automobile industry reveal a similar picture<sup>8</sup>. The international advantages of spreading Japanese technology overseas are clear. But increased direct investment may limit domestic employment in Japan, especially in the small, subcontracting enterprises which cannot easily diversify overseas. Domestic employment by the major electrical producers fell by about 10 per cent from 1973 to 1978, while employment in Japanese firms abroad more than doubled<sup>9</sup>. While the traditional dynamism of Japanese industry and the flexibility of the labour market has done much to mitigate this problem (for example, jobs lost as TV set output fell were made up by increased VTR production), foreign direct investment could create problems of domestic adjustment in Japan.

## NOTES

1. For a discussion of the reasons for the undervaluation see Yoshitomi (1983). The latest report of the United States Council of Economic Advisers (February 1984) also discusses the reasons for the misalignment between the yen and the dollar. The recent performance of a standard exchange rate equation for the yen was reviewed in the latest OECD Economic Survey of Japan (1983).
2. However, unilateral measures have been taken by some of Japan's trading partners. One notable example is that France and Italy have both unilaterally restricted imports of automobiles from Japan. Also, the United States increased the tariff on motorbikes (over 700 cc) in April 1983.
3. The limit was fixed at 1.75 million complete sets per annum.
4. Automobiles, motorcycles, steel, television sets, ships, copying machines, watches and cameras.
5. Exports were initially limited to 1.68 million units a year, and to 1.85 million units from April 1984.
6. The "forecast" or "target" level of EEC imports was 4.55 million sets in 1983, compared with 4.35 million (final destination imports) in 1982. This included an estimated 0.6 million knock-down kits exported for final assembly at a number of newly-established Japanese VTR factories in the United Kingdom and West Germany. The annual "forecast" for 1984 is 5.05 million units, an increase of only 11 per cent over the previous year's level. For finished VTRs the ceiling remained unchanged at 3.95 million units, but for kits it was raised from 0.6 to 1.1 million units.
7. MITI's equation (in their Annual Survey 1983) is similar (1971 Q1 - 1982 Q2):

$$\log PX = 0.77 \log PD + 0.65 \log ER + 0.23 \log PF + 0.06 D + \text{constant}$$

$$\begin{array}{ccccccc} & (9.0) & (11.9) & (3.2) & (4.1) & & \\ & & & & & & \\ & & & \bar{R}^2=0.997; & & DW=0.79 & \end{array}$$

where  $D$  is a dummy variable for immediate impact of the first oil shock and other mnemonics are as indicated in the equation shown in the text.

8. The equation (estimated over 1971 Q1 to 1983 Q3) is:

$$\log \left[ \frac{PX}{PX(-1)} \right] = 0.82 \log \left[ \frac{PD}{PD(-1)} \right] + 0.62 \log \left[ \frac{ER}{ER(-1)} \right] + 0.19 \log \left[ \frac{PF}{PF(-1)} \right]$$

(7.4)                      (9.5)                      (2.0)

$\bar{R}^2=0.75;$        $DW=1.61;$        $SE=0.019$

It is also noteworthy that the coefficient of PD exceeds that of ER, suggesting a rather greater response to changes in domestic prices than to changes in the exchange rate, at least in the short-run. There are two possible explanations for this asymmetry. First, the denomination of a significant proportion of Japanese exports in dollars may reduce the impact of exchange rate changes. Secondly, Japanese producers typically adopt a medium-term export strategy: because a change in domestic prices is more likely to be permanent than a change in the exchange rate, adjustment will probably be more rapid. In any event, the difference between the coefficients is significant at the 5 per cent level. Constraining the coefficients on PD and ER to be the same—probably desirable for simulation work—yields the following equation:

$$\log \left[ \frac{PX}{PX(-1)} \right] = 0.64 \log \left[ \frac{PD \cdot ER}{PD(-1) \cdot ER(-1)} \right] + 0.23 \log \left[ \frac{PF}{PF(-1)} \right]$$

(9.8)                      (2.4)

$\bar{R}^2=0.73;$        $DW=1.60;$        $SE=0.020$

These coefficients are very close to the ones currently used in the OECD's INTERLINK model.

9. The detailed figures are:

(% changes)	Actual	Estimated
1981	6.2	1.8
1982	-6.4	-7.3
1983 Q1-Q3 (Preliminary)	-4.0	1.2

10. For details of the export volume equation used see the Annex. It is interesting to note that experience in 1978 was quite different: export volumes fell, "defying" the pattern of earlier experience embodied in the standard equation.

11. For VTRs, this is also confirmed by surveys conducted by consumers' associations. For example, following the February 1983 agreement between Japan and the EEC the average price of a Japanese video cassette recorder sold in the United Kingdom has increased by around £100 in 1983.

12. The annual rises in export prices and unit values are (in yen terms):

	Prices	Unit Values
1980	8.6	11.4
1981	1.2	3.0
1982	3.9	5.2

13. The case of Italy is somewhat anomalous because virtually no Japanese cars are exported to Italy. The average unit value for exports to Italy was 0.887, the highest in Europe,

14. Japan's experience in 1983—when the appreciation of the yen was offset by lower export prices so that competitiveness was maintained and exports grew rapidly—seems to confirm this pattern.

15. See Kojima (1982) and Ozawa (1979) for an analysis of "Japanese-type" direct foreign investment.

16. From 1951 to 1981 cumulative investment in the electrical machinery industry amounted to \$2.1 billion, compared with \$1.1 billion in general machinery and \$1.4 billion in transport equipment.

17. This account is taken from Oshima (1982).

18. A recent *Nihon Keizai Shimbun* survey shows that overseas production of cars will more than double in the next five years (from 1.6 million in 1983 to 3.7 million in 1988) while direct exports are expected to increase only slightly (from 5 million in 1983 to 5.4 million in 1988).

19. The figures are (000s)

	Employment in Japan	Employment in Japanese firms abroad
1973	390	50
1978	354	111

Source: Oshima (1982). It should be noted that foreign direct investment by the declining industries (steel, aluminium, oil refining, etc.) has also been important—though not related to trade frictions generally—and the employment consequences have been significant.

### ANNEX

The export volume equation was estimated over the period 1970Q1 to 1983Q3:

$$\log X = 1.09 \log MG + 0.29 \log Z - 0.94 \sum_{i=0}^6 w_i \log P_{-i} + \text{constant}$$

(49.3)                      (5.6)

$\bar{R}^2 = 0.98; \quad DW = 0.70; \quad SE = 0.04$

lag pattern (3rd order Almon lag; far and near points constrained to zero):

$i$	0	1	2	3	4	5	6
$w_i$	.14	.20	.22	.19	.14	.08	.03

Where  $X$ =export volumes  
 $MG$ =export market growth  
 $Z$ =inventory/shipment ratio  
 $P$ =relative export prices

During the earlier major episode of trade frictions, in 1978, export volumes fell by 4.5 per cent, compared with a “predicted” rise of around 2.9 per cent. In this case, protectionism appears to have had a direct effect on export volumes independent of price movements. But experience in 1981 and 1982 was quite different as export volumes did not appear to have been below the level predicted by past relationships (given export market growth and relative prices):

(% Changes)	Actual	Predicted
1981	10.9	8.6
1982	-2.1	-3.4

Nevertheless, protectionist pressures do appear to have inflated export prices, suggesting it was primarily through this mechanism that the constraint on export volumes was satisfied.

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