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Foreign direct investment and patterns of industrialization and trade in developing countries: Notes with reference to the Brazilian experience

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Nº 206

FOREIGN DIRECT INVESTMENT AND PATTERNS
OF INDUSTRIALIZATION AND TRADE IN
DEVELOPING COUNTRIES: NOTES WITH
REFERENCE TO THE BRAZILIAN EXPERIENCE*

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&
Gustavo H.B. Franco

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The last two or three decades have witnessed marked changes in the global organization of industry with far reaching effects for the evolving patterns of integration of developing countries in the world economy. The long run process of worldwide industrial redeployment has been intensified and accompanied by an outstanding growth of manufactured exports from a small group of rapidly industrializing developing countries. In parallel, the post war period also witnessed the worldwide spread of MNCs: by the late 1970s shares of domestic industrial production held by MNCs affiliates in most Western countries - developed and developing - reached between a third and a quarter on average¹. These developments are by no means independent. The importance of MNCs participation in manufactured exports from NICs and of intra-firm trade have been observed by many authors², and seems to be on the increase under the the influence of the trading opportunities open by the processes of global vertical integration and worldwide sourcing, in which MNCs have been playing the leading role. In this context, it seems clear that strategic planning by globally minded MNCs operating on global oligopolistic structures is bound to be a crucial determinant of developing countries' trading patterns in manufactures.

The precise consequences of these developments have not yet been fully exploited³. In particular, it is not at all clear whether this influence on resource allocation and patterns of specialization would be equivalent to that which traditional comparative advantage would suggest. In this respect, according to an authority, "rather than thinking of the micro level problems of world trade in terms of international trade, i. e. a as trade between nations, it is time - in the global village - to begin to think of them in terms of global industrial organization"⁴.

To probe further into the relationship between inward FDI and trade orientation in developing countries may be a partial although important step in this direction as it may shed light on common aspects of two hitherto unconnected areas of international economics. On the one hand, given the importance of FDI in manufacturing in the NICs, it may add to a better understanding of the relationship between industrialization and trade orientation in developing countries. Indeed, current orthodoxy in the normative analysis of industrialization and trade patterns, by placing exclusive emphasis on the determinant influence of domestic policies⁵ has lost sight of the importance of exogenous developments affecting the behavior of international corporations in

¹ UNCTC (1983, pp. 136, 350-351).

² See for instance the pioneering contributions of G. K. Helleiner (1973) and D. Nayyar (1978).

³ Indeed, as noted in a recent survey on international investment, "current modes of thinking and analysis have not yet absorbed the full implications of the fact that a large proportion of various international economic transactions takes place within transnational corporations", cf. UNCTC (1983, p. 6).

⁴ G. K. Helleiner (1984, p. 4) emphasis in the original.

⁵ See, for instance, B. Balassa et al. (1987).

shaping observed manufactured export performance in developing countries. On the other, the discussion of a typology of inward FDI patterns in the relatively more industrialized areas of the South - stressing its relation with the different post-war "waves" or "vintages" of international direct investment flows with markedly changing characteristics as to trade orientation- may provide an interesting counterpoint to the large and growing literature on patterns of outward direct investment from developed countries.

The paper is organized in three sections. Section I addresses the possible relationships between the character of incoming FDI and host countries' tradeability; and it explores the exogenous influence of FDI upon host countries' trade orientation during the process of industrialization. It is observed that historically distinct FDI "waves" have had very different characteristics as regards trade propensities, which are relevant to explain well known differences in tradeability between NICs. Section II explores the Brazilian experience in some detail with the purpose of observing the importance of such exogenous influences to the growth and diversification of manufactured exports observed from the seventies on. Section III summarizes the main conclusions and draws attention to global developments affecting international firms as a crucial element in shaping host countries' industrial and trade policies.

1. MNCs and patterns of trade and industrialization in developing countries

To the extent that foreign direct investment represents an addition to a country's capital stock, it affects resource allocation in several ways¹. The presence of MNCs affiliates may affect capital accumulation², industrial structure and performance³ and, among many other structural characteristics of the host economy, her trade propensities. Thus, it is natural to assume that MNCs do influence, at least to some extent, the observed patterns of industrialization and trade orientation in host countries. This should be especially important, for example, in the larger Latin American economies in which the presence of foreign capital is very significant: in Brazil broadly defined MNCs accounted for 27.5% of total industrial production in 1980⁴. In Mexico this share was 27.2% for this same year⁵. These numbers are not far from OECD standards⁶.

Of course trade and industrialization patterns are affected by many influences, endogenous and exogenous to the host country. "Outward orientation" is certainly affected by the host country's trade policies and structural features, as extensively argued in the relevant literature. However, although such endogenous elements should in principle act on established affiliates in the same way as on domestic firms of equal attributes, the "outward orientation" of MNCs affiliates may differ from domestic firms' insofar as globally minded MNCs respond to a much broader environment than the one shaping the decisions of domestic firms.

1.1) MNCs, domestic firms and "outwardness"

The significance of such exogenous influences over a country's overall outward orientation, and the influence of foreign subsidiaries over the economy's *ex-ante* "outward orientation" could be gauged if MNC affiliates' trade orientation is different from that of its host countries' domestic firms. Several studies have searched for differences in trade orientation

¹ By and large the very large literature on the costs and benefits of FDI is addressed to assess the net effects of such changes in resource allocation. See for instance S. Lall & P. Streeten (1977).

² Positively or negatively depending, for example, on whether it displaces or supplements domestic savings, see K. Areskoug (1976)

³ As extensively discussed in S. Lall (1978)

⁴ Cf. L. Willmore (1987a, p. 163). Considering a sample of 55,730 firms responsible for about 95% of domestic industrial production. A "foreign" firm is defined as having a foreign share of at least 10% of total capital. For other samples, usually covering the largest 500 or 1000 firms, the foreign share is much larger, as for example in a 1981 study, in which this share for 1977 was estimated in 44%, cf. UNCTC (1983, p. 136).

⁵ According to figures from the Industrial Census for 1980, considering as foreign firms those with at least a 15% foreign share. Cf. W. P. Nunez (1988, p. 38).

⁶ See UNCTC (1983, p. 350).

between MNCs affiliates and domestic firms, and their results show some consistent patterns. In general, studies focusing upon Latin American countries in the sixties and early seventies have found export propensity of MNCs affiliates to be very low: Vaitsos reports that majority owned US MNCs affiliates exported only 6.2% of their sales on average for Latin America in 1966¹ and an ECLA study, using a much larger sample for 1965 would find a similar ratio (7%)². It was also generally found that export propensities of foreign subsidiaries were lower or at most statistically no different than the ones for domestic firms, though by and large these early studies often did not control for other factors affecting trade orientation. A study for Mexico found MNCs affiliates sales abroad to be 2.8% of total sales in 1970, just slightly above the one for domestic firms, namely 2.6%³. R. Jenkins (1979, pp. 93-94) considered a sample of 658 exporting firms responsible for 77% of Mexican exports of manufactures in 1974, and found that locally owned firms exported 19.5% of their total sales on average, while foreign subsidiaries registered only 12.6%. Using a pooled sample of 500 Brazilian manufacturing firms for 1971-77 P. Naetke & R. S. Newfarmer (1985) found no significant differences in export propensities between foreign and domestic firms operating in Brazil when controlling for factors like capital intensity, size, and concentration⁴. In sum, it was generally found that MNCs affiliates were heavily oriented towards domestic markets in Latin America up to at least the sixties and early seventies.

In recent years this situation would be significantly changed. A recent study for Brazil, considering a sample of 20,107 firms for 1980, 3903 of which exporters, has established unambiguously that "foreign ownership has a strong, independent effect on both export performance and import propensities of individual firms" when controlling for factors like size, skill and advertising intensity, and vertical integration⁵. Another study would show that the probability of exporting is at least three times as big for foreign firms than for domestic ones⁶.

This growing outward orientation of MNCs affiliates in the leading Latin American economies can be illustrated with the help of table 1 below showing export propensities of majority owned US MNCs affiliates located in different regions:

¹ Which would have fallen to 5.4% in 1972. Apud R. Jenkins (1979, p. 90).

² CEPAL (1971, p. 335). Indications are that export propensity was even lower for Mexican MNCs affiliates: a study for 1966-67 found that sales abroad represented a proportion between 3% and 5% of total sales. B. Sepulveda & A. Chumacero (1973, p. 77).

³ F. Fajnzylber & M. Terrago, apud R. Jenkins (1979, p. 93).

⁴ Similar comparisons were performed by S. Lall & P. Streeten (1977, pp. 133-135) for a sample of six LDCs - Kenya, Jamaica, India, Iran, Colombia, and Malaysia - and it was found that transnationality had no impact on export propensities.

⁵ L. Willmore (1987b). Similar findings are reported by L. Willmore (1985).

⁶ CEPAL (1985).

Table 1: US MOFAs^a: propensities to export in manufacturing (%)

countries	1966	1977	1982	1986
all countries	18.6	30.8	33.9	38.3
developed	20.4	33.1	36.6	39.3
Canada	16.1	29.9	34.5	n.a.
Europe	25.8	37.7	41.2	n.a.
underdeveloped	8.4	18.1	22.0	32.6
Latin America	6.2	9.7	11.9	20.1
Brazil	3.0	8.7	12.4	17.4
Mexico	3.2	10.4	10.8	34.8
Asian NICs ^b	-	81.2	76.2	76.0

(a) Majority owned foreign affiliates. (b) Hong-Kong, Korea, Singapore and Taiwan. Adapted from M. Blomström (1987, p. 20 and 1988, tables A1, B1 and C1).

The table shows a very clear upward trend in export propensities by majority-owned US MNCs affiliates located in Latin America. At the same time a sharp contrast is readily observed in the export orientation of US MNCs affiliates established in Latin America, on one extreme, and in East Asia, on the other, where it appears that MNCs affiliates were "born" markedly outward oriented. To a significant extent these huge differences in export propensity between the two areas can be explained by aspects of trade policy - especially export targeting and the early creation of export processing zones - shaping the sectoral incidence of foreign investment in East Asia¹, while greater export orientation in Latin America in recent years would seem to explain their diverging pattern of change in the late seventies and eighties.

What is interesting to discuss, however, is whether MNCs export orientation reinforced overall inward orientation in the earlier stages of industrialization in Latin America and its growing "outwardness" in recent years. In order to perform a preliminary test to these proposition one should note first that an economy's openness is jointly determined by "openness", or export ratios, of foreign subsidiaries and of domestic firms. Next, it is possible to decompose an economy's (or the manufacturing sector's) openness into the foreign and the domestic component to see how each contribute to the overall trade orientation. One cannot compare, however, the most usual measure of openness - the exports to GDP ratio - with the ratios of table 1 because the former has value added in the denominator and the latter have gross sales. It is possible, however, to "correct" the ratios of table 1 to turn them into exports to value added ratios and to make comparisons possible. This correction is easily grasped from the following decomposition of an economy's export ratio for manufacturing:

$$(X/Y)_m = (X_{mn}/S_{mn}) \cdot B \cdot \Omega + (X_n/S_n) \cdot B \cdot (1-\Omega) \quad (1)$$

¹ While majority owned US investments in Latin America are quite diversified, in Asia are heavily concentrated on light electrical equipment. See M. Blomström (1987, p. 22).

where $(X/Y)_m$ stands for the overall export to value added ratio in manufacturing, which is written as a weighted average of "corrected" ratios of sales abroad to total sales ratio for domestic firms (X_n/S_n), and for foreign subsidiaries (X_{mn}/S_{mn}). The "correction" is made by multiplying the latter ratios by β , defined as the average value of production to value added ratio in manufacturing, or $(S/Y)_m$. The weights are given by Ω , the sales of foreign affiliates as proportion to total sales in manufacturing (S_{mn}/S).

Table 2 reports export to value added ratios for manufacturing, namely $(X/Y)_m$, and for majority owned US MNCs affiliates, which is given by $(X_{mn}/S_{mn}) \cdot \beta$, for 1970 and 1983:

Table 2: Exports of manufactures-Value added in manufacturing ratios: for MNCs affiliates and overall manufacturing

country	1970		1983	
	Manuf. Exp. M.V.A.	(Manuf. Exp.) β MN (M.V.A.) β MN	Manuf. Exp. M.V.A.	(Manuf. Exp.) β MN (M.V.A.) β MN
Hong Kong	2.520	2.310	3.200	2.337
Korea	0.358	2.014	0.747	1.928
Singapore	0.686	3.542	1.570	3.480
Taiwan	0.507	2.099	0.961	1.823
Brazil	0.037	0.065	0.148	0.290
Mexico	0.110	0.084	0.071	0.260

Sources and methodology: (X_m/Y_m) computed from the formula $(X_m/Y_m) = (X/Y) * (X_m/X)/(Y_m/Y)$, where X denotes exports, Y value added, and the subscript m denotes manufacturing. These ratios were obtained from CEPAL (1984), W. E. James et al. (1987) and IBGE (1987). "Correction" factors (see text) are gross value of manufacturing output to value added ratios, obtained from UNIDO (1987) for all countries (using 1970 and 1980) except Brazil, the figures for which were taken from IBGE (1987). Export to sales ratios were obtained from table 1.

The ratios in table 2 confirm the conjecture that foreign subsidiaries reinforce openness in Asia: except for Hong Kong, foreign subsidiaries are much more outward oriented than the average for the manufacturing sector, both in 1970 and in 1983¹. Note also that the ratios of exports to value added for foreign affiliates are very high for Asian countries listed, in contrast to Brazil and Mexico, reflecting well known differences in the degree of openness between the two areas due to a variety of reasons. The latter is clearly seen in table 3 below, which illustrates the contrasting

¹ Evidence related to the comparison between the trade orientation of affiliates and of domestic firms in larger East Asian economies tends to indicate that MNCs are more outward oriented than domestic firms, at least during the early seventies: B. J. Cohen (1975) has shown, for example, that foreign subsidiaries exported a higher proportion of sales than domestic firms in Korea, and the same proportion in Taiwan. These findings were confirmed by S. H. Jo (1976) for Korea, in which foreign subsidiaries were reported "substantially more export oriented than local firms". Apud R. Jenkins (1979, p. 91). This notion has been challenged by B. Y. Koo (1985), however.

patterns of industrialization and trade between the two regions: Brazil and Mexico alone are responsible for about a third of MVA generated in LDCs while the three Asian countries listed reach only a 7% share in 1980. In contrast, these three Asian countries are responsible for 42% of exports of manufactures from LDCs in 1980, while Brazil and Mexico together account for only 9.1%. This evidence is very much consistent with the high exports to value added ratios in Asia reported in table 2, although, of course, it does not explain why this ratio is higher for MNCs affiliates.

Table 3: Shares over LDCs manufacturing value added (MVA) and exports of manufactures from LDCs, selected countries.

country	% of MVA in LDCs		% of Mnf. Exps from LDCs	
	1970	1980	1970	1980
Brazil	17.5	22.7	3.8	7.4
Mexico	11.4	10.9	4.0	1.7
total	28.9	33.6	7.8	9.1
Singapore	0.7	1.0	4.4	9.0
Korea	2.0	4.5	6.6	15.6
Hong Kong	1.5	1.5	23.9	17.8
total	4.2	7.0	34.9	42.4

MVA data from national accounts and manufactured exports defined as SITC categories 5 to 8 less 68. Adapted from D. Nayyar (1983, p. 16).

It is also interesting to observe from table 2 that foreign subsidiaries become slightly less outward oriented from 1970 to 1983 in Korea and Taiwan, which coincides with a period of some FDI on import substituting activities, especially in Korea¹. Regarding Latin American countries it is very significant that foreign subsidiaries are very clearly inward oriented in 1970, and in the Mexican case even more inward oriented than the average for the economy. In 1983, MNCs affiliates become much more outward oriented than the national average both in Brazil and Mexico, suggesting that the influence of foreign subsidiaries was important to raise these economies' openness. In fact, as observed in table 1, the outward drive of US MOFAs in Latin America was extraordinary, especially after 1982. For Mexico the share of foreign firms on non-oil exports rose from 27% in 1981 to 55% in 1987². Higher openness is also very clear in overall manufacturing in Brazil, suggesting that domestic firms were also becoming more trade oriented. This was not the case of Mexico where a "dutch disease" phenomenon caused by the oil boom seems to have hit domestic firms, especially up to 1982, and thus distorted the influence of foreign subsidiaries over openness in manufacturing.

¹ See S. H. Jo (1988, p. 30 passim) and B. Y. Koo (1985, p. 293).

² W. P. Nunes (1988, p. 269).

1.2) FDI as an exogenous determinant of trade and industrialization patterns in LDCs¹

One should be careful at this point to jump to the conclusion that these countries' outward (or inward) orientation was, to some extent, determined by the character, or the trade orientation of MNC affiliates located thereof. One should have in mind first the limitations of the exercise built around table 2. It says nothing on the influence of foreign subsidiaries over the economy's export ratio in manufacturing which depends on the weights Ω , the share of MNCs affiliates' industrial production in total domestic output². Moreover, since trade orientation is affected by factors like firm size and the sectoral distribution of domestic value added, none of which unrelated to MNCs presence³, these influences should be controlled for before any firm conclusions are reached.

It is also important to observe that foreign subsidiaries are perhaps more sensitive to incentives than domestic firms, as MNCs possess a superior flexibility to respond to changes in the policy environment within which they operate in specific host countries. Besides, more often than not, export promotion policies are biased towards MNCs: targeting exports has become one of the more common performance requirements applied by host countries⁴. These factors could surely explain to some degree the "overreaction" to incentives (and disincentives) displayed in table 2.

Finally, we have been considering that foreign subsidiaries affect a country trade propensity directly, without "displacement effects" on domestic firms' investments and exports. The presence of these effects might be very important, as shown in Hufbauer & Adler (1968)

¹ Some of the main issues of this sub-section have been outlined in W. Fritsch & G. H. B. Franco (1988).

² There are cases of very high values for Ω , as for Singapore (83% in 1978), very low values as for example in Korea (11% in 1975), and intermediate values as in Brazil (27.5% in 1980) and Mexico (27.2% in 1980). These values are obtained from a variety of methods and samples, using different concepts of foreign firm, and for this same reason should not be used with the ratios of table 1, which refer to majority owned US MNCs affiliates. This inconsistency turns out to be important for purposes of calculation since there are sharp differences as regards, for example, trade orientation of foreign subsidiaries of different nationalities. In Singapore for example export propensity of Japanese firms was only 37.1% (in 1973), while for US firms would be of 93.2% (in 1977), cf. H. Hill & B. Johns (1985, p. 367). But if we perform, even in this precarious form, the computation of equation (1) to find the "openness" of domestic firms, considering all foreign firms to behave like US MOFAs and that Ω s have not changed over time, the result are hardly surprising: in 1970 we would have that domestically owned Korean firms would not be much more trade oriented than Mexican ones (15.4% against 12.0%). From 1970 to 1983 the aggressive export promotion policies in Korea would increase domestic firms trade orientation to 60.1%. A very significant "opening" would also be observed for Brazil (2.65% to 9.38%). In Mexico a significant "closure" would be observed.

³ The importance of firm size as determinant of property patterns, or that larger size is positively related to the extent of foreign ownership, has been asserted recently by B. Levy (1988).

⁴ See A. E. Safarian (1983).

work, for example, which observes that the net balance of payments effect of the establishment of foreign subsidiaries might be drastically changed if displacement effects are allowed. The latter might not be especially important, however, in countries in the process of industrialization, where most often FDI comes to occupy new sectors.

With those caveats in mind it remains to explore the extent to which wholly exogenous elements in the character of FDI directed to different nations at different periods contributed to shape the regional differences in MNCs affiliates' trade propensities observed above. In this connection it is interesting to explore whether the differences in export propensities observed in table 1 could be explained by the fact that they refer to different "vintages" of foreign investment. In addressing the issue it is crucial to observe that the first major wave of international direct investment in the 1950s and 1960s, dominated by US and European firms ("the American Challenge" and the "European Response"¹), has had its determinants neatly described along Hymer-Kindleberger lines, or along the lines of the more recent "eclectic theory"²: firms in possession of an "unique asset", unexploitable by means of exporting from the parent country (thus the need to jump trade barriers in Latin America and in Europe), or by means of licensing (such markets were too thin), choose to establish affiliates in locations in which some attractiveness is provided by market size and growth prospects, labour costs, government incentives, and other possible locational advantages. This "Hymerian" wave of US FDI was predominantly geared at domestic markets, as the very low export propensities of foreign subsidiaries in Latin America up to the 1970s illustrates. The very same is true for US MNC affiliates established elsewhere in the 50s, including those in Canada and EEC countries. For US firms in the EEC in 1957, for example, the propensity to export to countries outside the Common Market was of only 15%³.

This "inward" orientation of US FDI in its "Hymerian" phase in the fifties and sixties can also be seen in the investment/trade sequences characteristic of the original product cycle model: in the first moment exports to host countries are reduced as local production are started and grow to the point it occupies the whole market in the host country. At this point, however, as the affiliate "matures", or it overcomes its initial competitive disadvantage related to production in a new location, it can even become an exporter⁴. Yet, as production move to the host country parent country's exports are actually displaced⁵. Foreign investment works as a substitute for

¹ European firms belong in this wave of foreign investment to the extent that they went multinational by means of a process described as "oligopolistic response" by F. T. Knickerbocker (1973). The "European Response" to the "American Challenge" bore, however, very much the same characteristics of the latter, cf. S. Hymer & R. Rowthorn (1970).

² J. H. Dunning (1979).

³ V. N. Bandera & J. T. White (1968, p.119).

⁴ R. Vernon (1966).

⁵ As forcefully argued for example by C. F. Bergsten et al. (1978, p. 97).

exports, and one very clear implication of this fact is that US FDI occurs in industries in which US comparative advantage is strong, i.e. industries with high R & D intensity, as shown in W. Gruber et al (1967) classic study.

This "US Model" of FDI geared at domestic markets, has been described as "anti trade oriented" by the authors describing the Japanese early pattern of multinationalization, which was basically a strategy for relocating exports made uncompetitive by real wage increases and natural resource shortages in Japan¹. The contrast as regards trade propensities in these two types or vintages of foreign direct investment have been extensively explored by the proponents of the Japanese model of foreign investment². Differently from the US pattern, early Japanese FDI was a strategy of adjustment to rising factor prices carried out essentially by marginal firms in relatively unsophisticated technologically and non-concentrated sectors. They chose to cross the country's rather than the industry frontier helped to a not inconsiderable extent by incentives granted by the government and large trading companies³, and the output of the migrating firms was basically aimed at the home country market, hence the crucial difference in trade propensities.

It would be natural, therefore, to infer that the specific trade orientation embodied in the different waves on incoming foreign investment would influence very significantly the outwardness of the industrialization drive in host developing countries. Surprisingly, however, these possible relations between the pace and character of structural transformation in the semi-industrialized areas in the South and this changing nature of industrial countries' outward FDI have never been explored. The fact that the the larger Latin American economies experienced an important industrialization drive during the "Hymerian" phase, while the Asian NICs had their "take-offs" in terms of production of relatively sophisticated goods a little later, in a moment when foreign investment was already more "outward oriented", may help to explain the differences in industrial sectors' tradeability - and, especially that of their internationalized segments - between the two areas observed in tables 1 and 2.

An interesting point to explore further is that there appears to be a "natural" increase in outward orientation for investments made during the "Hymerian" phase, as one easily grasps from Vernon(1979)'s revision of the original product cycle. It is pointed out that as subsidiaries networks are extended and the degree of internationalization is much advanced, established MNCs

¹ M. Y. Ioshino (1974) and S. Sekigushi (1979).

² The pioneer contribution is K. Kojima (1973). See, however, T. Osawa (1975 and 1979), and K. Kojima (1975) for an extended discussion.

³ The fact that these firms chose FDI instead of establishing themselves in the expanding sectors at home has also to do with more favourable factor endowments abroad and the "thin" technological gap between them and host countries industries and not with the existence of firm specific factors which usually explain FDI from oligopolistic structures. Cf. T. Osawa (1979, p. 80ff).

start to develop a different outlook; this leads to rationalization of activities and sourcing on a global scale with ample consequences as regards trade orientation of individual affiliates. It is natural to expect, in this connection, intra-firm trade to grow significantly, which is indeed observed in the sixties and seventies. Moreover, the growing internationalization of multinational groups is at the root of the intensification of the long run process of worldwide industrial redeployment. An important part of the transfer of industrial capacity to the South corresponds to the relocation of industrial (exporting) capacity within multinational groups¹. These transfers have implied important changes in patterns of trade and industrialization in NICs, among which the increasing share of MNCs in manufactured exports from some NICs, especially in Latin America².

If one considers that this "maturing" of the product cycle oriented investments occurs more or less simultaneously with the multinationalization of Japanese firms along lines suggested by the Kojima model, one is able to understand the marked increased trade orientation of foreign subsidiaries in Latin America suggested by table 1: not only newcomers, especially Japanese, are export oriented, but also previously established affiliates are now involved in parent firms' worldwide sourcing and, consequently, become more trade oriented. Of course, these exogenous influences should not be the only reason why Latin American countries become more export oriented in the seventies; many other domestic influences are relevant, as the analysis of the Brazilian experience in the next section will reveal. Yet the notion that trade orientation is also determined by exogenous factors relating to the nature of FDI is very much consistent with observed patterns.

Finally, one further caveat should be made before ending this section, namely that such broad characterizations of FDI vintages - "Japanese", "Hymerian" - should be seen as no more than caricatures or approximations; actual patterns are much more complex. There are, for instance, US investments in Mexico and in Asia that follow a "Japanese" pattern, while Japanese investments in the US that are *quid pro quo*s for trade restraints are pretty much "Hymerian". Besides, there are other nationalities of FDI, some with very specific characteristics, and other stereotypes³. A recent study focusing German, British and Swedish FDI, as well as American and Japanese, would actually conclude that "country specific factors dominate in the determination of international production"⁴.

¹ See for example R. E. Lipsey & I. B. Kravis (1987).

² M. Blomström et al. (1988, p. 11).

³ See for example Vernon's "global scanners", cf. R. Vernon (1979).

⁴ J. Clegg (1987, p. 8)

2. FDI and the patterns of industrialization and trade in Brazil

After three decades of rapid industrialization based on import substitution, Brazilian industrialization turned outwards in the late sixties: manufactured exports grew at very high rates from then on, and especially so after the first oil shock. High export growth rates were not circumscribed to natural resource based or labour intensive industries; export performance was also exceptionally good in sectors receiving newer "vintages" of more "outward oriented" FDI, and also in several of the more technology or capital intensive sectors set up through import substitution and intensive FDI penetration during the formative years of the Brazilian heavy industry¹.

Given Brazil's resource endowments it would not be difficult to explain the high export growth rates in resource based or labor intensive industries on traditional comparative advantage grounds, once excessively export repressing trade and exchange rate policies adopted since the late forties were put to an end. To reconcile the exceptional performance of the latter sectors with conventional trade theory is more difficult. It seems interesting, in this connection, to discuss to what extent export diversification towards these sectors is the result of the combination of the greater outward orientation of the more recent waves of direct investment, as suggested in the previous section, with the operation of learning processes accompanying the maturation of already established foreign firms, and also a result of domestic policies.

2.1) The changing character of FDI in Brazilian industrialization: an overview

The building of a modern and vertically integrated industrial sector was the main feature of the process of rapid growth and structural transformation experienced by the Brazilian economy in the post war years. Two distinct phases, distinguished by the implied outward orientation, can easily be identified in this process: the first, was mostly a response to incentives to domestic production created by foreign exchange shortages from the late forties, and corresponds to the classic import substitution industrialization pattern². During this period FDI sought protected sectors with a view at exploring a large and rapidly growing domestic market³, having thus made a decisive contribution to import substitution and growth especially in modern

¹ As shown by S. A. Morley & G. W. Smith (1971).

² Rigorously, classic ISI started from the collapse of the international economy in the early 1930s. Except for a brief exceptional period in the immediate aftermath of the war, it is fair to say that foreign exchange shortages had been endemic since. An account can be found, for example, in the classic study of J. Bergsman (1970) and also in A. Fishlow (1972).

³ This emerges from surveys such as L. Gordon & E. L. Grommers (1962) on US investments and also from T. Osawa et al. (1976) on Japanese investments.

segments of consumer durables, mechanical and electrical equipment and a number of relevant branches of basic inputs and capital goods industries. This first wave of FDI in Brazil in the post-war period was very characteristically hymerian: typically US firms, and sometime later their European competitors, in view of trade barriers and the unwillingness, or impossibility, to license, choose to exploit their "unique assets" by the establishment of subsidiaries in Brazil. This kind of "inward oriented" internalization of oligopolistic structures geared to domestic markets of host countries corresponds to the heyday of the import substituting industrialization in Brazil in the fifties, after many decades of "espontaneous" substitution in non-durable consumer goods¹.

Two later investment spurts followed a sharp recession in the early 1960s and the reorientation of the economy towards greater integration into the world economy: the so-called Brazilian Economic Miracle of 1967-73 - and the investment projects under the PND II (the Second National Development Plan) launched in 1974. In the former, emphasis was given by large government projects in basic chemicals and capital goods, and in the latter, the need to adjust to the oil crisis added energy and intermediate goods to these priorities. Regarding the role of FDI in each of these moments, the period of the Economic Miracle would witness significant modifications in the relative weights of state, domestic and foreign firms in Brazilian manufacturing. Large state enterprises strengthened and consolidated their dominance in steel, oil refining and some segments of petrochemicals. Foreign firms advanced in all non-traditional sectors, with the exception of mechanical equipment and those occupied by state-owned conglomerates, and thus maintained more or less stable around 50%, their share in the total capital in manufacturing. Again, a significant correlation was found between best growth performances across sectors and the presence of MNC affiliates².

It is significant, though, that the presence of US firms was substantially reduced relative to firms of European and Japanese origin during the seventies; the rapid development of chemicals, mechanical equipment and of branches of precision mechanics and instruments, opened a number of niches occupied predominantly by smaller firms of a non-US origin. This change in the geographical origin of foreign capital in Brazil had important implications for the overall outward orientation of foreign firms in Brazil since European and Japanese "latecomers", according to Newfarmer & Marsh (1981), were much more outward oriented than American firms even considering that US firms had also become significantly more export oriented during the seventies.

¹ This pattern of direct investment can actually be traced, albeit in a far less important scale, to the inter-war years. On this see D. M. Phelps (1936).

² C. Von Doellinger & L. Cavalcanti (1975, pp. 56-57) report a Spearman rank correlation of 0.60 between sectoral growth rates in manufacturing for 1967-1973 and the share of foreign capital in each sector.

After the first oil shock, the government would strongly favour the formation of joint ventures, often with state participation, to undertake the investment projects defined in the PND-II. Brazilian experience with joint ventures with state participation had been positive - in steel and in the petrochemical industry¹ - and it was presumed that their use had the advantage of preventing full foreign control, increasing market access and facilitating technology transfer. As it turned out, these years would witness an important rise in "espontaneous" partnerships between private domestic and foreign firms. Although the diffusion of joint ventures would not be expressive in the early years of the PND-II², it would accelerate by the late seventies and early eighties, and a recent study has related over 1500 joint ventures in operation in the Brazilian economy in 1984³.

The maturation of investments associated to the import substitution projects implemented up to the early sixties not only consolidated a reasonably integrated industry, with well defined "leaders" in several industries, but also generated a system of interindustrial links with great complementarities between firms with differentes patterns of ownership. Thus, once market leadership patterns were not altered in a meaningful extent during the boom of the early seventies, neither did ownership patterns in different branches of manufacturing⁴.

Table 4: Brazil, 1980
Shares of domestic, foreign and state-owned firms in domestic and foreign markets
(in % of total sales in each market)

type of firm	number of firms	domestic sales	exports	total sales
domestic private	48,615	59.5	54.2	59.0
foreign ^a	1,089	27.5	38.3	28.5
state-owned	65	13.0	7.5	12.5
total	49,769	100.0	100.0	100.0

(a) foreign firms are defined as those in which non-residents hold more than 10% of voting capital and state presence is insignificant. Source: L. Willmore (1987a, p. 163).

Table 4 provide an overall picture of the present weight of foreign firms in Brazilian industry. Although foreign firms do not control an abnormally high share of industrial output in

¹ The outstanding early example is the Usiminas steel plant organized as a joint venture of the Brazilian government, with Japanese associates founded in 1957. For the more extensive experience in petrochemicals see M. A. Suarez (1983) and E. A. Guimarães et al. (1982)

² For a general discussion of the extent to which the incentives to joint ventures were applied see E. A. Guimarães et al. (1982, p. 75).

³ J. Zoninsein (1986, p. 17).

⁴ On patterns of competition in Brazilian industry during this period see Finep (1977) and S. A. Morley & G. W. Smith (1973).

Brazil¹, they are dominant in some sectors - as transport equipment (68% of sales), rubber products (tyres) (63%), pharmaceuticals (71%) and tobacco (73%) - they share leadership positions in several others, and in 67 of the 174 sectors there is not a single foreign firm - defined as those with over 10% of non-residents' participation² - among the leading four. Foreign firms participation in exports is significant, and even more so if one considers only the larger firms: for the largest 100 foreign firms - defined as in table 4 - foreign firms are responsible to 49.2% of exports³.

2.2) FDI and changing comparative advantage in Brazilian industry

An outstanding feature of Brazilian industrialization has been its impact on the country's volume and commodity pattern of trade in manufactures. After a long period of contracting imports as proportion of GDP and export stagnation, manufactured imports and exports began to grow by the late sixties, as mentioned above. With the first oil shock, however, the situation changed significantly. On the one hand, investments geared to the PND-II - considered by many authors as the key to the structural transformation experienced by the Brazilian economy that allowed the adjustment effected in 1982-84, when a current account deficit of nearly 8% of GDP was turned into a small surplus - had an important impact on industrial sector tradeability, producing an uncommon combination of a further deepening of import substitution, but accompanied this time by a sound export performance in the same sectors in which import substitution was taking place⁴. On the other hand, there were important improvements in competitiveness and outward orientation of several old-established sectors not benefitting from government priorities under the Plan. Indeed, overall export performance was exceptional, and the more so as one notes that the economy has not been entirely freed from anti-export biases⁵. Even so, as can be seen in table 5, from the early 1970s to the early 1980s Brazil substantially increased her share in world markets for manufactures in all SITC groupings and average yearly growth rates of exports neared 30%.

¹ The sample of table 4 is responsible for nearly 95% of Brazilian industrial production, cf. L. Willmore (1987a, p. 162).

² Note that the share of production accounted for by foreign firms would fall to only 23.2% in case just those with over 50% non-resident's participation were considered.

³ Ibid. p. 167.

⁴ See J. C. Batista (1986) and G. H. B. Franco (1988).

⁵ W. Tyler (1983, pp. 97-108) would observe anti export biases in 51 out of 58 industrial sectors in 1977.

Table 5: Brazilian manufactured exports indicators, 1970-1983

product grouping ¹	world market share		average growth rate
	1970-72	1981-83	1970-72 to 1981-83
SITC 5	0.22	0.80	31.4
SITC 6 (less 68)	0.46	1.26	24.7
SITC 7	0.15	0.74	33.5
SITC 8	0.24	0.69	28.4
total	0.26	0.86	29.0

¹ SITC groups defined as: chemicals (group 5), manufactures classified according to materials less non-ferrous metals (group 6 less 68), machinery and transport material (group 7) and miscellaneous manufactures (group 8). Source: R. Gonçalves (1987, table 1, elaborated from UNCTAD trade data base).

This exceptional performance reflected to a large extent increased competitiveness, as opposed to external demand: recent calculations using constant market share analysis¹, show that competitiveness - i. e., the unexplained residual - responds for two thirds of the total observed growth of manufactured exports, the other third being accounted for by world trade growth; changes in composition and on the direction of trade have had negligible impact². The relative importance of the competitiveness component compares very favourably to estimates made for other developing countries exporters of manufactures, and shows no significant difference to that estimated for South Korea³ - the best performer among Asian NICs - and is a reflection of the increased diversification, and to some extent, the upgrading of Brazilian manufactured exports. However, to what extent can this changing pattern of comparative advantage be primarily attributed to the behavior of the subset of foreign firms in the manufacturing sector ?

The available evidence regarding the influence of foreign ownership and export orientation in the Brazilian manufacturing sector can be seen on table 4 above, in which it is shown that foreign firms were responsible for no less than 38.3% of total sales abroad in 1980. Moreover, two in each three of these firms are exporters, against less than half of the national firms in the sample. As already mentioned in section 1.1, foreign ownership was recently found to be a strong and independent influence on export propensity - when controlling for concentration, size, and other firm and market characteristics - a result that studies for earlier periods in Brazil have failed to produce.

¹ W. Tyler (1976) and M. H. Horta (1985)

² This analysis is carried out at a three digit level of the SITC classification and considers 11 trading regions.

³ See R. Gonçalves (1987, p. 418-420).

The recent change in foreign firms' trade orientation in Brazil was not restricted to export performance. The last decade also witnessed an important reduction in multinationals' import propensities¹, which was an important contributory factor to the impressive swing in their trade balance to a sizeable surplus in the eighties, as seen in table 6.

Table 6: Trade balance of foreign firms[†] in Brazil, 1978-1985

year	exports	imports	trade balance
1978	2,918	2,949	-31
1979	3,773	3,482	291
1980	5,719	3,921	1,978
1981	7,141	3,567	3,574
1982	5,670	2,874	2,796
1983	5,824	2,342	3,481
1984	7,197	2,414	4,783
1985	7,123	2,305	4,818

[†] defined as majority foreign owned. Source BNDES (1988, table B, p. 8).

This amazing improvement in the trade performance of foreign firms can certainly be credited to the reduction in the anti-trade bias of Brazilian trade and exchange rate policies from the late sixties, given the generally held view that large international firms possessing inherent competitive advantages in international markets (e. g. marketing channels) and superior managerial flexibility tend to react strongly to changes in the trade policy environment². Moreover, there is circumstantial evidence that, following the first oil shock, the usual export requirements associated with access to subsidies were complemented by informal but effective import targets imposed with special zeal on international firms by the import licensing authorities.

The main concern of this section is, however, to probe further into the determinants of the growing comparative advantage of Brazil in technologically sophisticated and/or capital intensive sectors, some of which were typical horror stories of highly protected "infants" during the classic import substitution phase. In the voluminous literature addressing the issue of determinants of the growth of manufacturing exports in Brazil one is not to find strong evidence of the influence of the change in crucial elements of the policy regime - such as exchange rates and export subsidies - on the performance of these sectors³. A suggestive explanation for this high growth rates on the lines of "import protection as export promotion"⁴ has been provided by Teitel & Toumi who argued that

¹ See Cepel (1983).

² Changes in both exports and imports in more recent years should also be attributed to the collapse of domestic demand, especially for capital goods following the debt crisis.

³ See, for instance, World Bank (1983), S. Teitel & F. E. Toumi (1986), W. Tyler (1983), R. Baumann Neves (1985), and also M. B. P. Pinto (1984).

⁴ A phrase coined in P. Krugman (1984).

given Brazil's large markets, ISI was "a preamble to the export phase" and that the "new manufactured exports of the 1970s were not in fact, an exclusive consequence of export incentives but a 'natural' result of the maturation of the process of industrial growth, helped by the substantial expansion of world trade verified during the period"¹. This general interpretation brings important considerations about dynamic efficiency gains which are to have a central place in any explanation of this phenomenon. However, it underemphasizes one of its crucial features namely the substantial concentration of foreign firms among exporters in more technologically sophisticated branches of manufacturing, as can be seen by inspection of table 7 below. Thus, in explaining the changing trade orientation of technologically sophisticated sectors in Brazil one should have not only to move away from traditional trade theories based on simple notions of comparative advantage determined by relative factor endowments, but also to deal with the fact that the improving export performance came from a subset of predominantly foreign firms.

Table 7
Foreign firms* shares in exports of selected commodity groups[†] in Brazil, 1974-1985
(in % of total exports of each group)

	1974	1977	1980	1983	1984	1985
Basic products	11	14	16	15	15	15
Manufactures						
Equipment & Instruments	67	64	62	62	67	63
Other	17	23	22	17	18	18
Total	17	22	25	22	23	23

* foreign firms defined as those with over 25% foreign direct control [†] Groups defined according to the Brazilian Commodity Nomenclature: Basic products (sections I to V), manufactures (sections VI to XXI), Equipment and instruments (sections XVI, XVII and XVIII). Source: Cacex, processed by the authors.

That the comparative advantage of foreign firms may diverge from that of the host country has been noted in the FDI literature². Indeed this seems to be the case in Brazil where no significant serial correlation was found between the revealed comparative advantage (RCA) indices³ for all 28 sectors at the two digit level of the ISIC classification and the RCA indices for just the foreign firms operating in those sectors: while for aggregate (all firms) data RCA is generally higher in less technology intensive sectors, it tends to be otherwise when only foreign firms' RCA indices are calculated⁴. Table 8 confirms these results by showing mean difference

¹ S. Teitel & F. E. Toumi (1986, p. 163)

² As shown, for instance in R. Lipsey & I. Kravis (1985).

³ Defined for each industrial sector as the ratio between the share of that sector in the country's total manufactured exports to that sector's share in world manufactured exports.

⁴ See R. Gonçalves (1987, p. 422ff). Technology intensive sectors are mechanical equipment, transport material, rubber, chemicals, pharmaceuticals, cosmetics and plastics. Non technology intensive sectors are non-metallic minerals, metallurgy, iron and steel, wood products, furniture, paper leather, textiles, clothing and footwear. The RCA index for foreign firms is

tests for export performance indicators for national and foreign owned firms according to the technological intensity of the goods exported. It shows that Brazil has a high RCA in traditional sectors but that the foreign firms operating in the country have, relative to domestic firms, a higher RCA in technologically sophisticated goods, where they also hold a larger share of domestic production.

Table 8: Mean values of sectoral indicators of manufactured export performance

product grouping ¹	tech.intensive sectors	non-tech intensive sectors	t statistic ¹
overall RCA index	0.52	1.21	-1.77
RCA index for foreign firms	1.28	0.52	2.71
share of foreign firms in output (%)	52.2	16.5	4.19

¹ t statistics significant at least at a 5% level. RCA indexes as defined in footnotes
Source: adapted from R. Gonçalves (1987, table 4).

What seems to have occurred in Brazil is that, as the ISI crystallized a stable ownership structure in which foreign firms became leaders in several technologically sophisticated domestic oligopolies, Brazil's changing comparative advantage in these sectors reflect the changing "outwardness" of the Brazilian parties of these firms. Thus, the roots of the growing comparative advantage which accompanied the "maturation" of these now dynamic foreign owned exporters in Brazil could lie in the global developments affecting the trade orientation of multinational firms as a worldwide phenomenon, outlined in section 2. Indeed the extent of intra-firm trade in this technologically intensive sectors is disproportionately high as compared to that of traditional sectors¹. However, when specific characteristics of the process of FDI penetration in Brazilian industry are taken into account, there are grounds to believe that the influence of these general trends upon the export propensity of foreign firms might have been strongly reinforced by the usual processes of learning and dynamic efficiency gains operating in already established subsidiaries.

Learning and efficiency gains in already established foreign-owned firms could a priori be explained on the lines suggested by the now vast literature on technical progress in semi-industrialized economies, according to which a crucial role is played by minor innovations implicit in the process of adaptation of exogenously developed technologies to smaller market

calculated for each sector as the ratio between manufactured exports from that sector as a proportion of total manufactured exports by foreign firms and the share of that sector in total world exports of manufactures.

¹ The proportion of US imports coming from American subsidiaries in Brazil in 1979 were 9.2% for textiles, 0.5% for footwear, 95.3% for electrical and 59.9% for non-electrical equipment, cf. G. K. Helleiner & R. Lavergne(1979).

sizes, different input (including skills) specifications and demand characteristics¹. Although in the study of these learning and adaptation phenomena special emphasis has been given to the experience of indigenous firms, a strong case could clearly be made that it should also be observed in the case of foreign firms whose entry in the country had its origins - as in the vast majority of the cases in the Brazilian and Latin American industrialization experiences, as discussed in the previous section - in import substitution projects along Hymer-Kindleberger lines.

Indeed, recall that, according to this view of the determinants of FDI, the competitive advantage of foreign firms stems from the possession of some firm specific "unique asset" - the market for which is thin or non-existing - which more than offsets the inherent informational disadvantages of doing business in a strange environment². Thus, the very existence of these learning and communication costs must give rise to substantial X-efficiency gains as the subsidiary survives and matures. This is to say that, implicit in this explanation of the FDI process - and specially so for those investments geared at domestic markets - there is the notion that survivors should face a downward sloping learning curve. Indeed, based on existing evidence on the very limited extent of technological search by multinational corporations before investment in developing countries³ a case could be made that there was ample room for efficiency-improving technological adaptation by their foreign subsidiaries. In the Brazilian case, this potential for improvement could be even greater than that available to local firms as existing evidence suggests substantially greater technological search by the latter⁴.

The influence of changing trade policy should not, however, be dismissed in explaining these "distortions" of Brazil's patterns of comparative advantage through dynamic efficiency gains, as made above. On the one hand, low technological search before entry is not, of course, unrelated to the degree of protection from foreign competition - among other temporary favours - granted to import substituting investors in countries such as Brazil. Consequently, subsequent reductions in the "inwardness" of the host country's trade orientation - together with the natural phasing out of the other *ad hoc* locational incentives - could play an important role in inducing efficiency-enhancing adaptations over time. If that is accepted, the greater neutrality of incentives in Brazilian trade and exchange rate policies from the late sixties, following a wave of low-search

¹ On this see, for instance, S. Teitel (1984) and J. Katz (1984).

² Cf. S. Hymer (1976) and C. P. Kindleberger (1969). It should be noticed that the existence of these disadvantages is by no means a hypothesis peculiar to this particular strain of theory but a widely recognized fact in the so called "industrial organization" approach to the theory of FDI. See for example R. Caves (1982) for example.

³ Of the sample of seventy seven foreign investment projects in developing countries surveyed in G. Reuber et al. (1973) not less than fifty claimed not to have made any initial adaptation to local conditions.

⁴ On this see S. A. Morley & G. W. Smith (1977). For similar evidence for Mexico and the Philippines see R. H. Mason (1973).

import-substituting projects undertaken by foreign firms, should also have contributed to spur these firms to move faster down their learning curves¹.

3. Summary and some policy conclusions

This paper stressed the importance of exogenous influences - related to strategic reactions of international firms in industrial countries to global developments and their impact upon the trade orientation of international direct investment flows - in explaining the export propensity of the manufacturing sector in semi-industrialized developing countries, and put forth two main conclusions. First, that such exogenous elements can to a large extent explain the wide divergence in export propensities existing between foreign firms located in the semi-industrialized economies of Latin America and East Asia as well as its observed change over time. Second, that exogenous influences accounting for differences in "outwardness" between foreign entrants of old and new vintages in Brazilian industry, should be taken into consideration - together with the operation of learning processes in old-established subsidiaries and a more trade oriented policy environment - in explaining the country's manufactured export diversification towards technologically sophisticated goods, where foreign firms played a leading role.

Recognising that global trends have a central influence on the organization of cross-border transactions of international firms has important implications for the design of effective trade and industrial policies in open developing economies. Although the analysis of the complex interdependence of domestic measures and the motivations of multinational firms in determining observed outcomes goes beyond the scope of this study, it should be clear that policies are not likely to be effective if they go against the strategic decisions of these firms, that is, if they do not conform with prevailing global trends shaping those decisions. This seems increasingly true as the latter have adapted to the economic and technological shocks of the 1970s and early 1980s by learning to respond faster to environmental volatility, so that, as suggested by Dunning "in the formation and development of their industrial, technological and trading strategies, governments must explicitly recognise the role of MNEs in fashioning cross-border trade"².

The corollary of this assertion is that the quality of active trade and industrial policies in the semi-industrialized periphery depends upon the policy authority's ability to predict global

¹ Whether this has in fact induced greater adaptation efforts by foreign firms is an empirical question and not very relevant for the present discussion. The weak evidence there is available, based on the estimation of CES production functions for ten Brazilian manufacturing sectors, concluded, however, that foreign firms displayed greater capacity of technological adaptation to changing factor prices than domestic firms in the seventies. See J. L. Máscolo & H. Braga (1985).

² J. H. Dunning (1988, p. 100) emphasis in the original.

trends affecting the strategic behavior of internationally oriented firms and thus the nature of future North-South FDI flows¹. This is by no means reassuring, as complex and far reaching structural trends - such as the process of industrial restructuring in OECD countries, the intensification of industrial redeployment in the NICs and the acceleration in the rate of innovation in industrial applications of electronics and biotechnology - persist, while the potential for global macroeconomic imbalances has, if anything, increased.

¹ For an illustrative discussion of how a persisting dollar depreciation against the currencies of the leading surplus countries would increase the locational advantages of the semi-industrialized Latin American countries, see W. Fritsch & G. H. B. Franco (1988).

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