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Document delivered to the U.S.- Mexican Studies Center of the U. of California, San Diego, at the end of our residence as visiting fellows. With many thanks to all the staff that made our stay a pleasant and productive one.

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Introduction.

Today, probably more than ever before, the industrializing countries are in need of a deeper understanding of the forces shaping international competition and about their prospects in the ongoing restructuring of the international economy. Not only for those countries heavily indebted but also for others aiming to sustain growth, the general prescription has become to succeed in promoting exports. However, even if one agrees to the imperative to compete internationally through exports, there still remains to be more realistically and pragmatically assessed the who, the why and the how. It is these three classical questions that lead us to the themes of the MNC, global competition and the role of technology.

We believe is most necessary a reflection on the changes and challenges posed by recent developments both in theory and in practice of three fields of study separately as well as in their relation to each other: the new theories of the firm, and especially their account of the expansion of MNC; the new theories of trade arising out of the concern with market imperfections; and the importance of technological innovations and technological diffusion in the expansion of MNCs and in the development of competitive advantages or competitive pressures. This essay is a first attempt to locate the major threads that may guide our analysis in the future.

We aim to accomplish two separate purposes in two sections. The first is to summarize the main issues involved within each of the fields separately. Thus we offer in the first section an interpretation on how the MNC has risen itself as a distinctive economic concept as a result of the debate that has involved many different lines of enquiry about the logic and results of their operations over the years. In that section their process of internalization while they continued to expand their operations globally, is introduced as one of the main forces leading to the new theories of trade that account for intrafirm transactions, and there we also highlight the role of new factors of competitive advantage such as the scale, the scope and the organizational changes that may give an advantage to that type of firms. The second section further ellaborates on the effect that technical

change introduces into the process of growth of the MNC and their competitive globalization.

A second purpose has been to develop a coherent argument on how the three separate fields of study are indeed interrelated, so that the policy implications that derive from their discussion are also interrelated. As a result, it is suggested the need for a more coherent and integrated design of industrial and foreign investment policy, trade policy, and technology policy, which takes into account the recent trends shaping them internationally.

1. The MNC as a concept.

Most recent theoretical work on the MNC (and more generally on FDI) and their role in development has proceeded in various directions whose result is both a more complex and also a more rich ground to analyze the uniqueness or distinctive features of those firms. We may find two separate levels at which the conflicting views are formalized in the literature: one is the macro level or macro conditions imposing on the environment in which the relation between the MNC and the domestic-host economies takes place; the other is the micro level or conditions at the level of the firms that determine the specific initiatives or the individual negotiations that take place between the MNC and the host states.

Each of these two levels involves currently an intense debate highly relevant for policy making at either side of the MNC-host country (HC) relation[1].

At the macro level, the discussion centers upon the structural conditions of the international economy where the MNCs make their decisions. The opposing schools may be grossly termed dependentist and interdependentist, although the writers of the first group now prefer the label of structuralists in order to avoid being connected with the dependency school that sprung mainly from Latin American radicalism in the 1960s and 1970s.

The "new" structuralists (Evans, Gereffi, Newfarmer and a few others reviewed in Borja, 1987), prefer now a more narrow -and somewhat closer to conventional- industrial organization analysis, which focuses on the market imperfections typical of the oligopolies where the MNC are most prominent. The structuralists accordingly argue that the bargaining between the MNC and HC will continue to favor the MNC over time, given its market power and the collusion opportunities that oligopolistic structures may provide.

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1 The debate has also attracted historians, who have been able to prove that most of the basic issues have already been there for quite a long time. See the excellent collection of case studies in Teichova, Lévy-Leboyer, and Nussbaum(eds.), 1986.

The interdependency school (Reynolds, Ozawa, Weintraub, Balassa-Bueno-et. al.) on the other hand, base their arguments mainly on the recent dynamics of the international economy, where increasing capital and trade flows among countries are taken to indicate a greater degree of mutual dependency among them. Inevitably, in their view, a basic pattern of convergence among countries occurs as they develop, though the increasing involvement of Japan and some of the NICs in the international economy may account for an exaggerated concern of certain proponents of this view[2]. Accordingly, the MNC becomes in this context one of the main mechanisms guiding this dynamic process of convergence and interdependence. And although the process is so far evidenced mostly for the industrialised countries, the fact that a few LDCs (particularly the well known Asian NICs) also emerge as participants in such flows, is taken to prescribe that, in principle, no country may be left out if it only tries hard and implements sound policy guidelines. These involve to search for

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2 In the U.S. particularly, a dramatic change of attitude can be observed at certain well established places of the economics profession. Their previous neglect of the deviations from conventional neo-classical explanations, suddenly is overturned in attempts to explain the market imperfections behind the rise of Japan and the fall of the U.S. internationally. Now, though the issue is still not settled, the terms of the discussion have certainly shifted towards a new political economy language based on market imperfections, power struggle and strategical choices regarding the degrees of interdependence of the international environments. See as an illustration Ozawa and Reynolds, 1988 ; Lipsey, Kravis & Bloomstrom, 1987.

efficient international vinculations through the promotion of outward looking MNCs[3].

The micro level debate has been led by theoretical works whose common ground is to reject the perfect mobility of production factors assumed by neo-classical theory, and instead attempt to determine the economic motivation for the firm when it decides to invest abroad. Most advanced in its theoretical formulation is the transaction costs approach to the DFI, which has focussed mainly on the MNCs engaged in expanding internationally through foreign investment.

The transaction costs analysis accounts for the factors that determine the firms' preference to integrate vertically (as to supply their own inputs internally) or to diversify horizontally (as in the multiproduct firm), rather than having to face the potential imperfections of the alternate external markets. The three most common sources of market imperfections for both inputs sourcing or products distribution are related to the transactions uncertainties, the frequency with which transactions occur, and the amount of sunk capital already committed to the transaction (Williamson, 1979). The extent to which the DFI operation is to take place anew may favor the direct investment option.

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3 See however the recent criticisms to trade related investment requirements (or performances -TRIP) by Moran and Pearson, 1988.

The analysis of the MNC has been further refined and enlarged by adopting the internalization theory, which extends the analysis of transactions costs and market failures to the international environment where the MNC operates (see the volume edited by Rugman, 1982). This approach allows the inclusion of factor markets (including R&D and technology transfer) as well as the goods and services markets, for cases where they lead to the development of a firm-specific advantage for the MNC. And it has been applied to assess among alternatives to the firm, including decisions regarding vertical integration and horizontal diversification both domestically and internationally through DFI (see for instance Teece, 1986 and Porter, 1986a). The major issue of relevance for us here probably is that these approaches center upon the market imperfections and associated economic returns that lead a MNC to prefer the DFI option to serve those domestic (and other) markets, instead of serving them through trade from other plants already operating, and/or instead of licensing independent local producers to that purpose.

Along the same perspective, but probably easier to relate to the interest of LDCs, there is another analysis at the micro level which includes more explicitly the objectives of the HC government agency evaluating the DFI proposal, and not only the firm's criteria for their decision making. This is what political economists have called the bargaining approach. This approach

estimates the MNC-HC bargaining outcomes as the result of three variables:

i) the resources controlled by one party and demanded by the other;

ii) the constraints that prevent potential power from being implemented; and

iii) the ability of either party to limit the behavior of the other directly (Kobrin 1987, p. 617).

In spite of still insufficient empirical evidence on the central bargaining hypotheses, and indeed coexisting with strong weaknesses as to how best to measure the empirical models[4], there are already propositions to dynamize over time the bargaining relationship on the basis of what is called obsolescence bargaining.

The obsolescence bargaining idea owes a great deal to economists paying attention to the evolution of technology. Originally conceived to analyze the evolution of bargaining for FDI in the natural resource activities, lately has been extended towards the analysis of technological maturity, such as with the

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4 The very key dependent variable, i.e. the measure of the bargaining outcome, for example, may be highly questionable. One such estimate, the percentage of foreign ownnership authorized (as in Kobrin's exercise, p. 616, for example), may be of little relevance for cases where foreign majority above 51% is attained. That level is, in many cases, the real target to negotiate from what concerns to the firm.

product cycle approach to FDI and international trade. Starting with Hirsch (1965) and Vernon (1966), and followed by many other proponents of the product life-cycle theory of trade, the analysis illustrates how the relative importance of certain production factors would change over the different phases of the product cycle, and how such changes could shift the comparative advantage in favor of LDCs as products reached the maturity phase[5]. Consequently, MNC-HC negotiations should evolve in accordance to the technological maturity of the products of the MNC. More precisely, this perspective would claim that the bargaining capacity of the HC state increases over time and may be used to the HC benefit, provided there is kept a fair assessment by the state of the technological and product cycles.

Such a view needs qualifications to adjust its mechanistic implications. Obviously, HC negotiations vis-a-vis the MNC that is searching for location of a new plant could only be more to the advantage of the LDC if this is well informed about the technological maturity conditions imposing on the MNC to set up the plant in a less costly country. And by the same token, it is only after the FDI has taken place and the new plant has been built

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5 Perez and Soete (1988) offer an interesting suggestion that attributes to Rostow's stages of economic growth similar assumptions to those of the product cycle theory, whereby there is a distinct S-shaped pattern of growth (as in the diffusion cycle of the product) that characterises the phases of take-off, the drive to maturity, mass-consumption and standardisation (p. 460-461).

into one such country, that the bargaining position should more typically move over time in favor of the HC government as some degree of technological diffusion occurs within the LDC[6]. In both those more dynamic instances, we may also find that some states have acted more efficiently than others to increase their technological prowess over time, pushing themselves up along a learning curve that may provide them with new additional negotiating powers[7]. Nevertheless, one needs to be cautious in accepting without serious reservations these arguments, given the complex variety of patterns observed for the processes of innovation, diffusion and maturity of technical changes, which may explain the enlarged role at present, and yet to be played, by MNC in LDC and elsewhere.

Among the main elements that limit the process which ought to give way to obsolescence bargaining are the pace at which technological innovations may proceed along time, and also the complexity that may accompany the oligopolistic restructuring and reorganization of industry internationally. Industries where international competition develops into more concentrated global oligopolies with MNCs adopting a global strategical organization

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6 This is the case of obsolescence bargaining originally foreseen by Vernon (1977), who atributted it to the diffusion of technology and to the amount of capital investment already sunk into that country's affiliate.

7 As in the targeted policy instrumented by the Japanese government with respect to the computer industry. See Anchordoguy (1988).

may suggest some new elements in action[8]. If this oligopolistic pattern occurs in spite of substantial technological maturity and diffusion, it may be due to the importance of new dymensions of the competitive process, of which the economies of scale and the economies of scope of large TNC conglomerates have been suggested as of higher relevance in the new shape of old barriers to new entrants (Krugman 1987 and Teece 1988).

In both such cases, where the pace of technological innovations remains high and where oligopolies are able to take a global hard shape, the HC bargaining power of LDCs will advance very little as time progresses, and may in fact actually deteriorate[9]. The case of obsolescence bargaining then may be reversed when the analysis of the new trends affecting technical change, scale and scope is conducted more carefully. These variables, traditionally relevant within the domestic domain of

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8 One such model of highly coordinated global strategy is IBM's approach of performing R&D, manufacturing, and marketing in many countries, but reaping economies of scale through operating large facilities in a number of countries while balancing imports and exports in each country (Porter 1986b, p.6). Similar patterns are emerging for many of the large TNC in the auto and chemical industries in Mexico (Unger 1989).

9 That could in fact be argued about the computer industry in both Mexico and Brasil during the late 1980s. In Mexico, both IBM and Hewlett Packard were recently able to regain some of the ground temporarily lost in previous years. In Brazil, IBM and Unisys have ended among the most favored firms of the brazilian 'market reserve' policy. See Evans and Tigre, 1989, pp.9-10, and Unger and Saldaña, 1989, pp.23-26.

conventional industrial organization theory, now need to be enlarged to capture their effect on the new trends of international competition and the international strategic behavior of the MNC[10].

Furthermore, certain other properties of technical change besides the rate of innovation, most particularly its cumulativeness on certain actors and firms and the spillovers effect, seem to suggest the desirability of enforcing international strategies, both at the level of countries and firms, to capture and retain for themselves the advantages associated to such effects. The cumulative effect applies mostly at the micro specific level where one observes both the undertaking of R&D and other innovation efforts as well as the actual innovative results (in the form of patents, new products and the like), both accruing to the same industrial sectors and firms over time, and actually increasing the relative weight of a handful large MNC over time (Pavitt, 1984 and 1985). The countereffect of technological diffusion is also at work, but the premium to innovation in the form of economic rents still remains most attractive over the long run for both firms and governments concerned (Freeman, et.al., 1982 and Krugman, 1986, p.12-13). The spillovers effect of technological innovations is a most important externality of

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10 For a summary account of the forces that have led to the growing of international competition and to the globalization of industry, emphasising the importance of technological restructuring and cross-cutting technological changes, see Porter, 1986b.

concern for the governments industrial and trade policy, which will be further analysed in our next section.

2. Global competition and the role of technology.

The reading of the most recent literature seems to imply a new agenda for international firms, urging them to adopt an aggresive strategic behavior to incorporate the new technological and organizational changes, in order to convert worldwide production, marketing, R&D, and financial prescence into a long term competitive advantage[11].

The growing international competition and the globalization of industry scope have certainly to do with the changes in the international markets for goods, inputs and financial resources. The new conditions improve the profitability of new projects if a global perspective is adopted. However, the most important changes leading the way for trade and financial adjustments to follow, may be the cross-cutting technological advances in microelectronics, information systems and the like that dictate the new terms to international competition.

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11 Such would be the basic message in a wide variety of references. See for instance Porter 1986b (the introduction, pp.1-7); Sewell, et. al. 1988 (the overview, pp.1-21); Branson and Klevorick 1986 (especially pp.245-6); Borrus, Tyson and Zysman 1986.

The role of technology as a crucial variable in the analysis of the globalization of industrial competition has recently been revived in the U.S., mainly in the attempts to explain the Japanese challenge of the U.S. industrial and technological leadership. Even though Japan is commonly singled out as the main contender of U.S. industrial supremacy, and is so illustrated through its largest share in the worsening of the U.S. trade deficit, the very crucial process of technological innovation and diffusion at work has involved many other countries that have also increased their exports to the U.S. as well, and it should be more systematically attended[12].

Following the Schumpeterian tradition, the diffusion of technological innovations is at the center of the process of catching-up to the American leadership. This process has led to a convergence of technological levels, industrial structures and forms of corporate organization mainly, though not exclusively, within the group of OECD countries. And this convergence in turn, tends to erode the initial U.S. leadership[13]. Perhaps more

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12 In 1987 Japan still accounted for 34.9% of the total U.S. trade deficit, though its share has decreased substantially from the 52.1% that it represented in 1981 because of the growing prescence of other exporting countries. Western Europe, Canada and the East Asian NICs accounted for 55% of total U.S. imports in 1987 (estimates from U.S. Dept. of Commerce/I.T.A., 1988, shown in Annex, tables 3 and 5).

13 Accordingly, it may be of interest to note that it took more than a decade since the Europeans began to show their concern on the role of technology for international competitiveness, for these topics to become fashionable

precisely, we have recently had a dominant pattern where the rates of technological diffusion to other countries were significantly higher than the American rates of innovation (Fagerberg 1988).

The diffusion of technology and the international convergence that promotes, in turn increase the struggle for international competition, whereby a double effect of cost-based competition results in the growing U.S. trade deficit. The first effect is seen rather straightforward through the increasing participation of industrial imports in the U.S. economy. Imports of manufactures as a proportion of manufactures GNP doubled from 19.8% to 40.3% in the decade between 1977- 1987 (estimates from U.S. Dept. of Commerce/B.E.A., 1988, shown in Annex, table 1).

And a second more complex effect has been due to the more dynamic growth of U.S. intrafirm imports in comparison to intrafirm exports, especially during the 1980s. On the whole, intrafirm imports grew at 14.4% a year during the 1982-1985 period, two times faster than the exports growth of 7.0%. Both the parent firms of U.S. based TNCs and U.S. affiliates of TNCs of other origins, though significantly more the latter, have been actively engaged

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in the U.S. See for instance the works edited by Porter (1986b) and Scott and Lodge (1985). The British had experienced themselves the erosion of their industrial competitiveness much earlier, and were then naturally brought into accepting Schumpeter's ideas earlier. See for instance Freeman (1974) on the economics of industrial innovation.

in importing into the U.S. and by 1985 the two groups together account for 40.2% of total U.S. imports in the form of intrafirm imports.

The intrafirm trade of U.S. parent firms with their affiliates in foreign countries has been largely concentrated in a few industries, such as transportation equipment, non-electrical machinery and electric-electronic equipment. These sectors may explain as much as 63.3% of total U.S. parent companies intrafirm imports in 1985. And with chemicals and allied products in that year they amount to 78.0% of the U.S. parents intrafirm exports which have also grown substantially (see Annex, tables 12 and 19). In these sectors seems clear a response to the loss of competitiveness of their U.S. domestic plants by implementing some of the new technological advances that allow to shift the production of parts, components or lines of product to lower cost plants in other countries, while retaining in the U.S. other plants still capable to compete through exports[14].

The other type of intrafirm imports shipped to the U.S. affiliates of TNCs of other origins are mostly finished goods entering the U.S. for wholesale trade, such as motor vehicles and

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14 In this respect, Sneddon Little (1988) argues that in spite of the greater increase in imports than in exports, intrafirm trade of the U.S. firms has actually mitigated the effect of the dollar appreciation on the balance of trade because the activity outside the U.S. helped to sustain some of the firms' internal production (p.52).

equipment, durable goods, and metals and minerals (Annex, table 13). These products reveal the size and the dynamism of the U.S. market in recent years which has overtaken to most other markets.

For whichever specific combination of reasons the loss of the U.S. industrial competitiveness may be accounted for, and indeed the topic is still highly controversial[15], our concern here is the analysis of technical change influencing the pattern of international competition. There are three main arguments relating technology and changes in competitiveness: first, the direct relationship between technology intensity and the industry's trade performance; second, the impact of the technological trajectory or evolution followed by the innovations as they mature in time upon the basis of competitiveness of the product or industry directly involved in the innovation; and thirdly is the indirect impact or spillovers gains of innovating in certain products or industries that create external economies that turn more competitive other products or industries. Each of them has received some attention in later years, but much more, especially on the empirical side of

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15 For an introduction to such debate see Fajnzylber (1984), Scott (1985) and Brooks (1985). Within the American scene, most distinguished in the debate are microeconomists and business schools professionals grass-rooted into the economic realities of the firms, who have been recently advocating the connection between technological innovation, diffusion and competitiveness. See for instance Chandler (1986) and Porter (1986b) at the Harvard Business School; and the case study based works of Borrus, Zysman and Tyson (1986) at Berkeley.

relevance for industrialising countries, still needs to be done. Here we attempt to summarize the main contributions so far, and at the end we suggest some of the main policy implications for the industrialising countries.

The most straightforward indication relating an extended process of international technological diffusion and the loss of U.S. industrial competitiveness is given by the deterioration of the U.S. trade performance in a majority of the most technology intensive manufacture sectors. Industrial chemicals, electrical and non-electrical machinery, and motor vehicles have shown imports growth during the 1980s at very high rates, while their exports increased at rates equivalent to one half or less of the imports rates (see Unger 1989, table I.2, p.46). By 1987, only chemicals among those remained with a net trade surplus (although reduced to half the level it had in 1980), while the others have turned the U.S. economy into a net importer (ibid, p.47).

A more sophisticated analysis may belong to what has been termed technological trajectory. The analysis of technological trajectories and industrial competitiveness can be traced back to the product life cycle theory and its application to international trade, as indicated in the first section, but has been recently refined to account for the dominant technological patterns -also called technological paradigms- that condition different evolutionary routes for innovations of different nature and

affecting different industrial activities or type of firms[16] (Dosi 1982). This is the focus of one of the most comprehensive empirical works on innovations so far, conducted at the Science Policy Research Unit of the University of Sussex, G.B. (see Pavitt, 1984). That work deserves a brief review here given its direct implications to some of the new issues of concern about technical change and international competitiveness.

Pavitt's analysis of the thousands of major industrial innovations taking place in Great Britain during the post-war period leads to a taxonomy of sectoral patterns of innovation with distinctive characteristics for three groups of industries: supplier-dominated sectors; production-intensive sectors (sudivided into scale-intensive and specialised equipment suppliers); and science-based sectors. The extent to which technical change is product -or process-centred, internally or externally generated, radical or incremental, varies between these types of sectors; and by implication, the variety of technical changes affecting to different sectors carries a different influence on the sectors' sources of competitiveness.

The supplier-dominated industries are typically most of the traditional consumer goods industries that tend to be developed

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16 On a more general interpretation of the evolution of firms that takes into account also their strategical and organizational contexts, are recommended the works of Nelson and Winter (1982) and Teece (1988).

within each country as a result of import substitution. They comprise most of the low technology intensity activities where entry barriers to new competitors are relatively low and where international competitiveness rests mainly on conventional costs savings based on low wages or resources abundance. Their process of innovation consists primarily of the diffusion of best-practice capital goods and of newer intermediate inputs (e.g. synthetic fibers), innovations originated outside the sectors themselves.

The production-intensive industries, and more particularly the scale-intensive ones (such as automotives and iron-steel), tend to show a larger role for process innovations that allow competition to take place on a more global perspective, especially when they combine those innovations with the scale advantages that can be derived from the international specialization on components or stages of the process within large oligopolistic conglomerates.

Finally, the science-based sectors such as the electronics industries and most of the chemicals, rest very heavily on high entry barriers to new competitors of a technological nature, which then allows very high rents to the few producing the most innovative lines. Such high returns, plus the benefits they provide to the other sectors in the form of externalities since a high proportion of their product innovations enters a wide number of sectors in the form of capital goods or intermediate inputs,

has made them a logical target for state support in most of the industrialised countries.

It is the latter group which relates more directly to the argument that attaches to technological innovation important external economies in the form of technological spillovers, as noted earlier. This is, for Krugman, the reason why external economies have become more of a trade issue since the reassessment of trade gives technological innovation an enlarged role. Innovation, because it involves the generation of knowledge, is particularly likely also to generate valuable spillovers (1986, p.13).

Obviously enough, the technological spillovers of innovating science-based industries are likely to be greater than those from more mature or passive ones. The innovating industries are assumed to be most active in the development and implementation of new products and new forms of producing them. The supplier dominated industries on the other hand, are rather passive recipients of technological innovations developed elsewhere (but mainly in the equipment producing industries), and they may well line at the very end in the externalities creating score. In this respect, the evidence gathered by Scherer (1982) on inter-industry technology flows is rather conclusive: high-tech industries invest five times more in R&D to produce their own innovations than what they obtain for their use in the form of innovations produced with R&D

invested in the other less technology intensive industries; and altogether, the latter obtain more innovations from outside sources than what they provide for themselves as innovations from their own R&D (Kushida 1987, table 1, p.37).

Thus, given the difference between industries in their related external economies advantages, it seems obvious that the choice of one country to specialize in one type of industry or the other, all the rest being equal, is not of little relevance. In fact, foreign promotion of these high-tech spillovers maximizers sectors might be depriving other countries of valuable spillovers and should be countered, contrary to the conventional argument that free trade is appropriate whatever other countries do (Krugman 1986, p.14).

However tempting it may be to group activities according to their technological virtues, the dynamics of technical change may make this exercise permanently incomplete. That takes Nelson and Soete to conclude that from a truly evolutionary perspective "..the long-term implications of technical change, the 'externalities' of orthodox economics, will not be susceptible to definitive once and for all categorisation and are intimately related to particular historical and institutional contexts.." (1988, p.633-4). These limitations urge upon us some creative thinking if one were to

suggest the need for state intervention in industrialising countries, as argued below[17].

The policy implications for industrialising countries such as Mexico are probably more acute as well as more challenging. In such a country, official policy should not only be guided for what has just been said in relation to trade and industrial policy, but altogether the foreign investment policy must play a very determinant and related role. The internationalization or global spreading of production undertaken by the TNCs in some of the scale-intensive (e.g. automobiles) and science-based industries (e.g. computers) may not necessarily imply a new wave towards generalized convergence between countries (as argued earlier in reference to Fagerberg), but rather may involve a certain pattern of specialization guided and directed from the TNC headquarters which may deprive each recipient country of most of the technological spillovers associated with the industry as a whole.

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17 The paradoxical conflict of governments everywhere is well expressed in the following quotation: "..Confronted with rapid scientific and technological change, governments are today faced with a major challenge. How to assume the State's function as social 'regulator' of technical change in a period of deregulation 'destruction tout-court',aimed itself at stimulating further innovation...In a period in urgent need of new regulatory framework, it will be tempting to equate the need for 'less State', with the notion of 'technological laissez-faire'." (Nelson and Soete 1988, p.634).

If the specialization now applies at the level of components or product lines within the TNC, then the selection of components or products to promote officially for local production becomes more complex because it now demands a higher degree of specificity. It is now at the level of components or product lines that the government needs to discriminate, and not in reference to the industrial sectors as whole units[18]. It should then be the aim of industrial and FDI policy to attract domestic production of components and product lines with a greater potential for competitiveness over the medium and long run, which requires an assessment that ought to consider both the nature of their technological trajectory and also their virtues as creators of external economies of technological nature[19].

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18 We may be differing from Krugman's recommendation only at the level of activity at which policy should apply. For the industrialising country the choice to negotiate with the TNC is at the level of specific products or components. Otherwise, we fully agree with him: "If we could conclude that certain high-technology sectors generate large technological spillovers to the rest of the economy, we could then conclude that promoting these sectors, through protection, export subsidies, and so on, might raise national income" (1986, p.14).

19 From this perspective, the longer term prospects for many of the leading products of the recent export drive of Mexican manufactures seem rather dark. Considering some of the best known man-made 'advanced' materials already applied in industrial production, one may soon expect an impact of the development of high-temperature ceramics over auto engines, of lightmeight plastics to replace other steel based autoparts, of optical fibers made from silicon that have virtually replaced copper in telephone cables, and of industrial glucose produced through genetically engineered microorganisms to compete with sugar, etc. (others listed in Sewell 1988, p.20). The production in low wage areas of other mechanical auto components, such as transmissions and stampings, may also

And yet another related case though further complicated by the new internationalization pattern is that of the sub-contracting assembly industries (maquiladoras) which have been growing significantly in certain industrialising countries. The new character of more sophisticated assembly operations taking place, for instance, in northern Mexico[20], suggests a new case for the interphase between industrial, trade and technology policies. However, we may caution to interpret the increased sophistication of technology in use in the operations of assembly as something different in nature that can not be equated to the technological character of the industry's products or components. For sure, the external economies or technological spillovers in these cases will be mostly confined to the labor training effect of such assembly operations, and less to other linkages towards inputs and services as it may be in other manufacture activities.

Conclusions

The dependency (structuralist)-interdependency debate conveys the identification of a continuous bargaining process taking place

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be adversely affected because their production is best suited to automation (Castells and Tyson 1988, p.70).

20 For a recent account of the increased sophistication of new assembly industries in Mexico that involves the use of microelectronics equipment, see Brown and Dominguez (1989).

between the MNC and the HC in search of mutual or exclusive benefits. Such process may be better analysed by considering market imperfections, modes of competition, technological changes and trajectories, and the evolutionary and strategical determinants of the firms in their global scope. This complex analysis requires to distinguish between industrial sectors, rather than to attempt general prescriptions and overall industrial strategies through the use of macro policy instruments.

The distinction between sectors and firms within each sector implies a somewhat sophisticated design of industrial and trade policy anticipating the evolutionary trends expected for each major sector and, possibly, for each of the largest firms. The new drive towards export promotion and the industrial modernisation of LDCs makes this effort all the more challenging while indispensable. There are some new elements of modern industrial organisation, such as the scale and the scope of the firm determined by the international strategy of its global production, that need to be addressed more explicitly when assessing the export prospects of each large MNC.

Finally, the technological spillovers of certain high-tech industries justify also a more targeted and down-to-earth evaluation. This should include the assessment of the technological virtues of the specific operations installed in each plant, and also of the nature of R&D undertaken by the MNC in each specific

location. In other words, the global leadership of a particular firm in a certain high-tech industry does not necessarily guarantee the technological supremacy for each individual plant, nor avails the maximum generation of externalities for the benefit of the industrial and technological development of the country.

A N N E X

TABLE 1. U.S. IMPORTS AND EXPORTS TO GROSS NATIONAL PRODUCT
(Percentages)

	TOTAL		MANUFACTURING	
YEAR	M/GNP	X/GNP	M/GNP	X/GNP
1974	9.7	10.2	18.7	22.4
1975	8.4	9.8	17.7	24.1
1976	9.1	9.9	18.9	22.0
1977	9.8	9.6	19.8	20.3
1978	10.2	10.2	22.7	21.5
1979	11.1	11.7	23.6	25.5
1980	12.0	12.9	25.7	30.1
1981	11.6	12.5	26.2	28.8
1982	10.7	11.4	26.8	27.0
1983	10.4	10.2	27.6	23.3
1984	11.7	10.2	32.4	22.6
1985	11.2	9.2	34.9	22.5
1986	11.4	8.9	38.4	23.2
1987	12.2	9.5	40.3	25.2
1988	12.6	10.7		

SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS.

TABLE 2. U.S. GROSS NATIONAL PRODUCT AND FOREIGN TRADE
(Billions of dollars)

	TOTAL			MANUFACTURING		
YEAR	GNP	IMPORTS	EXPORTS	GNP	IMPORTS*	EXPORTS
1974	1413.2	136.9	144.4	334.6	62.5	75.1
1975	1516.3	127.6	148.1	350.1	61.9	84.3
1976	1718.0	157.1	170.9	410.4	77.7	90.3
1977	1918.0	187.5	183.3	464.8	91.8	94.3
1978	2156.1	220.4	219.8	518.7	117.9	111.7
1979	2413.9	267.9	281.3	563.2	133.0	143.8
1980	2631.7	314.8	338.8	581.5	149.7	175.3
1981	2957.8	341.9	369.9	643.6	168.7	185.6
1982	3069.3	329.4	348.4	630.6	169.1	170.5
1983	3304.8	344.4	336.2	685.2	189.2	159.8
1984	3772.2	442.4	383.5	771.9	250.0	174.2
1985	4014.9	448.9	370.9	789.5	275.7	177.6
1986	4240.3	482.8	378.4	820.1	314.5	190.4
1987	4526.7	551.1	428.0	853.6	343.7	215.2
1988	4863.1	614.5	520.2			

SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS.

NOTE: * NONAGRICULTURAL IMPORTS LESS PETROLEUM AND PRODUCTS

TABLE 3. TOP 10 DEFICIT COUNTRIES IN TOTAL U.S. TRADE
(Millions of Dollars and Percentages)

C O U N T R I E S	1981	1982	1983	1984	1985	1986	1987
TOTAL U.S. TRADE DEFICIT	34,666	38,443	64,240	122,366	133,635	156,144	171,216
TOTAL OF COUNTRIES SHOWN	26,167	45,220	58,643	92,026	113,609	128,246	135,301
JAPAN	18,081	18,965	21,665	36,796	49,749	58,575	59,825
TAIWAN	4,327	5,220	7,443	11,085	13,061	15,727	18,994
WEST GERMANY	1,641	3,211	4,492	8,726	12,182	15,568	16,281
CANADA	2,224	8,905	9,201	15,134	16,140	13,151	11,696
SOUTH KOREA	358	483	1,732	4,045	4,756	7,142	9,892
HONG KONG	3,122	3,443	4,261	5,836	6,208	6,443	6,507
ITALY	189	1,040	1,912	4,129	5,756	6,473	6,168
MEXICO	(3,775)	3,953	7,937	6,275	5,757	5,167	5,938
BRAZIL	1,053	1,220	2,824	5,633	5,007	3,455	4,393
UNITED KINGDOM	876	2,896	2,279	2,835	4,300	4,614	3,884
TOTAL U.S. TRADE	100.0	100.0	100.0	100.0	100.0	100.0	100.0
JAPAN	52.2	49.3	33.7	30.1	37.2	37.5	34.9
TAIWAN	12.5	13.6	11.6	9.1	9.8	10.1	11.1
WEST GERMANY	4.7	8.4	7.0	7.1	9.1	10.0	9.5
CANADA	6.4	23.2	14.3	12.4	12.1	8.4	6.8
SOUTH KOREA	1.0	1.3	2.7	3.3	3.6	4.6	5.8
HONG KONG	9.0	9.0	6.6	4.8	4.6	4.1	3.8
ITALY	0.5	2.7	3.0	3.4	4.3	4.1	3.6
MEXICO		10.3	12.4	5.1	4.3	3.3	3.5
BRAZIL	3.0	3.2	4.4	4.6	3.7	2.2	2.6
UNITED KINGDOM	2.5	7.5	3.5	2.3	3.2	3.0	2.3

SOURCE: U.S. DEPARTMENT OF COMMERCE, INTERNATIONAL TRADE ADMINISTRATION, 1988 U.S. FOREIGN TRADE HIGHLIGHTS

NOTE: PARENTHESES INDICATE A TRADE SURPLUS.

TABLE 4. TOP 6 DEFICIT COUNTRIES IN U.S. MANUFACTURES TRADE
(Millions of Dollars)

C O U N T R I E S	1981	1982	1983	1984	1985	1986	1987
U.S. MANUFACTURES TRADE DEFICIT	(15,365)	2,777	29,982	78,230	101,553	128,928	137,699
TOTAL OF COUNTRIES SHOWN	47,018	49,799	58,851	87,521	106,024	124,438	135,535
JAPAN	29,421	29,536	32,249	47,627	59,312	67,860	71,035
TAIWAN	5,670	6,407	8,932	12,772	14,353	17,126	20,612
WEST GERMANY	3,750	4,872	6,072	9,720	12,896	16,471	17,491
SOUTH KOREA	2,884	2,774	4,180	6,394	6,892	9,209	12,646
HONG KONG	3,608	3,930	4,751	6,421	6,750	6,986	7,183
ITALY	1,685	2,280	2,667	4,587	5,821	6,786	6,568

SOURCE: U.S. DEPARTMENT OF COMMERCE, INTERNATIONAL TRADE ADMINISTRATION,
1988 U.S. FOREIGN TRADE HIGHLIGHTS

TABLE 5. TOTAL TRADE WITH INDIVIDUAL COUNTRIES (Percentages)

	1981		1987	
	EXPORTS	IMPORTS	EXPORTS	IMPORTS
TOTAL	100.0	100.0	100.0	100.0
CANADA	18.7	17.1	23.7	16.9
JAPAN	9.1	14.6	11.2	20.8
WESTERN EUROPE	27.5	19.9	27.6	23.6
EAST ASIAN NICs	6.3	8.1	9.3	14.5
MEXICO	7.5	5.1	5.8	4.8
BRAZIL	1.6	1.8	1.6	2.0
VENEZUELA	2.3	2.1	1.4	1.4
CHINA	1.5	0.8	1.4	1.6
TOTAL OF COUNTRIES SHOWN	74.4	69.5	81.9	85.5
MANUFACTURES	100.0	100.0	100.0	100.0
CANADA	22.6	20.2	27.4	16.1
JAPAN	5.9	25.3	8.2	25.9
WESTERN EUROPE	26.3	26.2	27.8	25.8
EAST ASIAN NICs	5.7	13.6	8.5	17.7
MEXICO	8.4	3.4	6.1	4.1
BRAZIL	1.6	1.3	1.7	1.5
VENEZUELA	2.5	0.1	1.4	0.1
CHINA	0.7	0.8	1.4	1.7
TOTAL OF COUNTRIES SHOWN	73.7	90.8	82.4	93.0

SOURCE: U.S. DEPARTMENT OF COMMERCE, INTERNATIONAL TRADE ADMINISTRATION, 1988 U.S. FOREIGN TRADE HIGHLIGHTS

TABLE 6. U.S. TOTAL TRADE WITH INDIVIDUAL COUNTRIES (Millions of Dollars)

	1981			1987		
	EXPORTS	IMPORTS	BALANCE	EXPORTS	IMPORTS	BALANCE
TOTAL	238,686	273,352	(34,666)	252,866	424,082	(171,216)
CANADA	44,602	46,827	(2,225)	59,814	71,510	(11,696)
JAPAN	21,823	39,904	(18,081)	28,249	88,074	(59,825)
WESTERN EUROPE	65,544	54,381	11,163	69,718	99,934	(30,216)
EAST ASIAN NICs	15,059	22,057	(6,998)	23,547	61,283	(37,736)
MEXICO	17,789	14,013	3,776	14,582	20,520	(5,938)
BRAZIL	3,798	4,852	(1,054)	4,040	8,433	(4,393)
VENEZUELA	5,445	5,800	(355)	3,586	5,881	(2,295)
CHINA	3,603	2,062	1,541	3,497	6,911	(3,414)
TOTAL OF COUNTRIES SHOWN	177,663	189,896	(12,233)	207,033	362,546	(155,513)
MANUFACTURES	171,749	156,385	15,364	200,047	337,746	(137,699)
CANADA	38,759	31,543	7,216	54,738	54,538	200
JAPAN	10,080	39,501	(29,421)	16,319	87,354	(71,035)
WESTERN EUROPE	45,195	40,954	4,241	55,601	86,979	(31,378)
EAST ASIAN NICs	9,789	21,293	(11,504)	17,020	59,768	(42,748)
MEXICO	14,421	5,259	9,162	12,245	13,861	(1,616)
BRAZIL	2,816	1,982	834	3,324	5,220	(1,896)
VENEZUELA	4,320	205	4,115	2,835	424	2,411
CHINA	1,141	1,262	(121)	2,788	5,898	(3,110)
TOTAL OF COUNTRIES SHOWN	126,521	141,999	(15,478)	164,870	314,042	(149,172)

SOURCE: U.S. DEPARTMENT OF COMMERCE, INTERNATIONAL TRADE ADMINISTRATION, 1988 U.S. FOREIGN TRADE HIGHLIGHTS

TABLE 7. U.S. TOTAL INTRAFIRM TRADE AS PERCENTAGE OF TOTAL TRADE (Percentages)

	1977	1982	1983	1984	1985
IMPORTS	44.2	36.8	36.6	37.1	40.2
EXPORTS	35.6	34.2	35.7	38.1	40.6

SOURCES: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLES 57 AND 58, SEVERAL YEARS.

TABLE 8. TOTAL U.S. INTRAFIRM IMPORTS (Millions of Dollars)

	1977	1982	1983	1984	1985
All industries	67,144	91,203	98,434	123,244	135,767
Petroleum	18,772	13,624	11,799	11,487	10,554
Manufacturing	21,318	32,638	39,957	50,938	54,063
Food & Kindred Products	1,018	1,265	1,109	1,459	1,596
Chemicals and allied products	1,772	3,387	3,714	4,932	4,676
Primary & fabricated metals	1,891	2,328	2,511	2,983	3,258
Machinery except electrical	2,020	3,887	4,474	6,617	6,964
Electric & electronic equipment	3,048	5,165	6,971	8,047	8,483
Transportation equipment	9,065	13,030	17,101	21,920	24,372
Other manufacturing	2,503	3,576	4,077	4,980	4,714
Wholesale Trade	25,305	41,911	44,002	57,876	67,949
Other industries	1,749	3,030	2,676	2,943	3,201

SOURCES: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLE 58, SEVERAL YEARS.

TABLE 9. TOTAL U.S. INTRAFIRM IMPORTS (Percentages)

	1977	1982	1983	1984	1985
All industries	100.0	100.0	100.0	100.0	100.0
Petroleum	28.0	14.9	12.0	9.3	7.8
Manufacturing	31.7	35.8	40.6	41.3	39.8
Food & Kindred Products	1.5	1.4	1.1	1.2	1.2
Chemicals and allied products	2.6	3.7	3.8	4.0	3.4
Primary & fabricated metals	2.8	2.6	2.6	2.4	2.4
Machinery except electrical	3.0	4.3	4.5	5.4	5.1
Electric & electronic equipment	4.5	5.7	7.1	6.5	6.2
Transportation equipment	13.5	14.3	17.4	17.8	18.0
Other manufacturing	3.7	3.9	4.1	4.0	3.5
Wholesale Trade	37.7	46.0	44.7	47.0	50.0
Other industries	2.6	3.3	2.7	2.4	2.4

SOURCES: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLE 58, SEVERAL YEARS.

TABLE 10. U.S. TOTAL INTRAFIRM IMPORTS (RATES OF GROWTH)

	1977-1982	1982-1985
All industries	6.3	14.4
Petroleum	-6.2	-8.1
Manufacturing	8.9	18.7
Food & Kindred Products	4.4	9.5
Chemicals and allied products	13.8	12.4
Primary & fabricated metals	4.2	12.0
Machinery except electrical	14.0	22.7
Electric & electronic equipment	11.1	18.6
Transportation equipment	7.5	23.5
Other manufacturing	7.4	10.3
Wholesale Trade	10.6	18.0
Other industries	11.6	2.4

SOURCES: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLES 57 AND 58, SEVERAL YEARS.

TABLE 11. U.S. IMPORTS ASSOCIATED WITH U.S. PARENT AND THEIR FOREIGN AFFILIATES, BY INDUSTRY OF U.S. PARENT (Millions of dollars)

	1977	1982	1983	1984	1985	1986
All industries	36,266	39,288	43,632	52,793	54,027	54,349
Petroleum	16,496	11,027	10,100	10,425	9,329	5,312
Manufacturing	16,807	24,959	30,755	39,539	41,632	45,757
Food & Kindred Products	563	651	347	613	781	718
Chemicals and allied products	978	1,848	1,904	2,553	2,184	2,162
Primary & fabricated metals	1,141	1,373	1,296	1,273	1,249	1,300
Machinery except electrical	1,260	2,786	3,235	5,021	5,203	6,214
Electric & electronic equipment	2,139	3,842	4,881	5,329	5,371	5,664
Transportation equipment	8,949	12,038	16,261	21,119	23,555	26,525
Other manufacturing	1,776	2,421	2,831	3,631	3,289	3,174
Wholesale trade	1,513	828	794	805	1,051	1,210
Other industries	1,450	2,474	1,983	2,024	2,015	2,070

SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLE 58, SEVERAL YEARS.

TABLE 12. U.S. IMPORTS ASSOCIATED WITH U.S. PARENT AND THEIR FOREIGN AFFILIATES, BY INDUSTRY OF U.S. PARENT (Percentages)

	1977	1982	1983	1984	1985	1986
All industries	100.0	100.0	100.0	100.0	100.0	100.0
Petroleum	45.5	28.1	23.1	19.7	17.3	9.8
Manufacturing	46.3	63.5	70.5	74.9	77.1	84.2
Food & Kindred Products	1.6	1.7	0.8	1.2	1.4	1.3
Chemicals and allied products	2.7	4.7	4.4	4.8	4.0	4.0
Primary & fabricated metals	3.1	3.5	3.0	2.4	2.3	2.4
Machinery except electrical	3.5	7.1	7.4	9.5	9.6	11.4
Electric & electronic equipment	5.9	9.8	11.2	10.1	9.9	10.4
Transportation equipment	24.7	30.6	37.3	40.0	43.6	48.8
Other manufacturing	4.9	6.2	6.5	6.9	6.1	5.8
Wholesale trade	4.2	2.1	1.8	1.5	1.9	2.2
Other industries	4.0	6.3	4.5	3.8	3.7	3.8

SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLE 58, SEVERAL YEARS.

TABLE 13. U.S. IMPORTS SHIPPED TO AFFILIATES, BY THE FOREIGN PARENT GROUP, BY INDUSTRY OF AFFILIATE (Millions of dollars)

	1977	1982	1983	1984	1985
All industries	30,878	51,915	54,802	70,451	81,740
Petroleum	2,276	2,597	1,699	1,062	1,225
Manufacturing	4,511	7,679	9,202	11,399	12,431
Food & Kindred Products	455	614	762	846	815
Chemicals and allied products	794	1,539	1,810	2,379	2,492
Primary & fabricated metals	750	955	1,215	1,710	2,009
Machinery except electrical	760	1,101	1,239	1,596	1,761
Electric & electronic equipment	909	1,323	2,090	2,718	3,112
Transportation equipment	116	992	840	801	817
Other manufacturing	727	1,155	1,246	1,349	1,425
Wholesale trade	23,792	41,083	43,208	57,071	66,898
Motor vehicles & equipment	9,486	(D)	18,616	24,927	28,415
Metals & minerals	4,658	7,645	6,230	7,696	7,811
Other durable goods	5,215	11,606	12,900	18,524	21,872
Farm products raw materials	1,713	2,509	2,246	2,221	4,921
Other nondurable goods	2,720	(D)	3,216	3,703	3,879
Other industries	299	556	693	919	1,186

SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.

NOTE: A "(D)" INDICATES THAT THE DATA IN THE CELL HAVE BEEN SUPRESSED TO AVOID DISCLOSURE OF DATA OF INDIVIDUAL COMPANIES.

TABLE 14. U.S. IMPORTS SHIPPED TO AFFILIATES, BY THE FOREIGN PARENT GROUP, BY INDUSTRY OF AFFILIATE (Percentages)

	1977	1982	1983	1984	1985
All industries	100.0	100.0	100.0	100.0	100.0
Petroleum	7.4	5.0	3.1	1.5	1.5
Manufacturing	14.6	14.8	16.8	16.2	15.2
Food & Kindred Products	1.5	1.2	1.4	1.2	1.0
Chemicals and allied products	2.6	3.0	3.3	3.4	3.0
Primary & fabricated metals	2.4	1.8	2.2	2.4	2.5
Machinery except electrical	2.5	2.1	2.3	2.3	2.2
Electric & electronic equipment	2.9	2.5	3.8	3.9	3.8
Transportation equipment	0.4	1.9	1.5	1.1	1.0
Other manufacturing	2.4	2.2	2.3	1.9	1.7
Wholesale trade	77.1	79.1	78.8	81.0	81.8
Motor vehicles & equipment	30.7	(D)	34.0	35.4	34.8
Metals & minerals	15.1	14.7	11.4	10.9	9.6
Other durable goods	16.9	22.4	23.5	26.3	26.8
Farm products raw materials	5.5	4.8	4.1	3.2	6.0
Other nondurable goods	8.8	(D)	5.9	5.3	4.7
Other industries	1.0	1.1	1.3	1.3	1.5

SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.

NOTE: A "(D)" INDICATES THAT THE DATA IN THE CELL HAVE BEEN SUPRESSED TO AVOID DISCLOSURE OF DATA OF INDIVIDUAL COMPANIES.

TABLE 15. U.S. TOTAL INTRAFIRM EXPORTS (Millions of Dollars)

	1977	1982	1983	1984	1985
All industries	43,010	72,150	71,974	83,778	87,752
Petroleum	2,196	3,545	3,104	2,432	3,295
Manufacturing	28,048	43,970	47,186	55,748	60,004
Food & Kindred Products	648	858	1,103	1,140	1,367
Chemicals and allied products	4,462	7,061	7,381	7,863	8,589
Primary & fabricated metals	1,202	1,468	1,389	1,381	1,798
Machinery except electrical	5,503	10,263	10,487	12,821	14,076
Electric & electronic equipment	2,783	6,139	6,326	7,465	7,083
Transportation equipment	9,168	12,161	14,805	18,668	21,515
Other manufacturing	4,282	6,020	5,695	6,410	5,576
Wholesale Trade	11,596	22,587	20,025	23,834	22,838
Other industries	1,170	2,048	1,659	1,764	1,615

SOURCES: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLE 57, SEVERAL YEARS.

TABLE 16. U.S. TOTAL INTRAFIRM EXPORTS (Percentages)

	1977	1982	1983	1984	1985
All industries	100.0	100.0	100.0	100.0	100.0
Petroleum	5.1	4.9	4.3	2.9	3.8
Manufacturing	65.2	60.9	65.6	66.5	68.4
Food & Kindred Products	1.5	1.2	1.5	1.4	1.6
Chemicals and allied products	10.4	9.8	10.3	9.4	9.8
Primary & fabricated metals	2.8	2.0	1.9	1.6	2.0
Machinery except electrical	12.8	14.2	14.6	15.3	16.0
Electric & electronic equipment	6.5	8.5	8.8	8.9	8.1
Transportation equipment	21.3	16.9	20.6	22.3	24.5
Other manufacturing	10.0	8.3	7.9	7.7	6.4
Wholesale Trade	27.0	31.3	27.8	28.4	26.0
Other industries	2.7	2.8	2.3	2.1	1.8

SOURCES: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLE 57, SEVERAL YEARS.

TABLE 17. U.S. TOTAL INTRAFIRM EXPORTS (RATES OF GROWTH)

	1977-1982	1982-1985
All industries	10.9	7.0
Petroleum	10.1	0.5
Manufacturing	9.4	11.0
Food & Kindred Products	5.8	17.3
Chemicals and allied products	9.6	6.8
Primary & fabricated metals	4.1	8.1
Machinery except electrical	13.3	11.4
Electric & electronic equipment	17.1	5.3
Transportation equipment	5.8	21.0
Other manufacturing	7.1	-2.0
Wholesale Trade	14.3	1.2
Other industries	11.8	-7.0

SOURCES: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLE 57, SEVERAL YEARS.

TABLE 18. U.S. EXPORTS ASSOCIATED WITH U.S. PARENT AND THEIR FOREIGN AFFILIATES, BY INDUSTRY OF U.S. PARENT (Millions of dollars)

	1977	1982	1983	1984	1985	1986
All industries	31,319	47,126	49,397	56,706	61,852	61,607
Petroleum	1,798	2,875	2,507	1,951	2,657	2,250
Manufacturing	26,683	40,857	44,078	52,035	56,333	57,190
Food & Kindred Products	528	756	1,013	1,017	1,257	1,022
Chemicals and allied products	4,067	6,079	6,305	6,621	7,249	7,832
Primary & fabricated metals	1,070	1,279	1,179	1,145	1,540	1,034
Machinery except electrical	5,268	9,863	10,114	12,395	13,631	13,404
Electric & electronic equipment	2,625	5,208	5,445	6,350	6,095	6,616
Transportation equipment	9,166	12,105	14,775	18,597	21,416	22,169
Other manufacturing	3,959	5,567	5,247	5,910	5,145	5,113
Wholesale Trade	2,008	2,246	1,992	1,717	2,069	1,278
Other industries	830	1,148	820	1,003	793	889

SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLE 57, SEVERAL YEARS.

TABLE 19. U.S. EXPORTS ASSOCIATED WITH U.S. PARENT AND THEIR FOREIGN AFFILIATES, BY INDUSTRY OF U.S. PARENT (Percentages)

	1977	1982	1983	1984	1985	1986
All industries	100.0	100.0	100.0	100.0	100.0	100.0
Petroleum	5.7	6.1	5.1	3.4	4.3	3.7
Manufacturing	85.2	86.7	89.2	91.8	91.1	92.8
Food & Kindred Products	1.7	1.6	2.1	1.8	2.0	1.7
Chemicals and allied products	13.0	12.9	12.8	11.7	11.7	12.7
Primary & fabricated metals	3.4	2.7	2.4	2.0	2.5	1.7
Machinery except electrical	16.8	20.9	20.5	21.9	22.0	21.8
Electric & electronic equipment	8.4	11.1	11.0	11.2	9.9	10.7
Transportation equipment	29.3	25.7	29.9	32.8	34.6	36.0
Other manufacturing	12.6	11.8	10.6	10.4	8.3	8.3
Wholesale Trade	6.4	4.8	4.0	3.0	3.3	2.1
Other industries	2.7	2.4	1.7	1.8	1.3	1.4

SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLE 57, SEVERAL YEARS.

TABLE 20. U.S. EXPORTS SHIPPED BY AFFILIATES, TO THE FOREIGN PARENT GROUP, BY INDUSTRY OF AFFILIATE (Millions of dollars)

	1977	1982	1983	1984	1985
All industries	11,691	25,024	22,577	27,072	25,900
Petroleum	398	670	597	481	638
Manufacturing	1,365	3,113	3,108	3,713	3,671
Food & Kindred Products	120	102	90	123	110
Chemicals and allied products	395	982	1,076	1,242	1,340
Primary & fabricated metals	132	189	210	236	258
Machinery except electrical	235	400	373	426	445
Electric & electronic equipment	158	931	881	1,115	988
Transportation equipment	2	56	30	71	99
Other manufacturing	323	453	448	500	431
Wholesale trade	9,588	20,341	18,033	22,117	20,769
Motor vehicles & equipment	(D)	1,844	1,800	2,115	2,053
Metals & minerals	3,083	6,564	5,826	7,334	7,277
Other durable goods	566	1,526	1,137	1,130	1,232
Farm products raw materials	4,626	9,776	8,564	10,750	9,428
Other nondurable goods	(D)	631	706	788	779
Other industries	340	900	839	761	822

SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.

NOTE: A "(D)" INDICATES THAT THE DATA IN THE CELL HAVE BEEN SUPRESSED TO AVOID DISCLOSURE OF DATA OF INDIVIDUAL COMPANIES.

TABLE 21. U.S. EXPORTS SHIPPED BY AFFILIATES, TO THE FOREIGN PARENT GROUP, BY INDUSTRY OF AFFILIATE (Percentages)

	1977	1982	1983	1984	1985
All industries	100.0	100.0	100.0	100.0	100.0
Petroleum	3.4	2.7	2.6	1.8	2.5
Manufacturing	11.7	12.4	13.8	13.7	14.2
Food & Kindred Products	1.0	0.4	0.4	0.5	0.4
Chemicals and allied products	3.4	3.9	4.8	4.6	5.2
Primary & fabricated metals	1.1	0.8	0.9	0.9	1.0
Machinery except electrical	2.0	1.6	1.7	1.6	1.7
Electric & electronic equipment	1.4	3.7	3.9	4.1	3.8
Transportation equipment	0.0	0.2	0.1	0.3	0.4
Other manufacturing	2.8	1.8	2.0	1.8	1.7
Wholesale trade	82.0	81.3	79.9	81.7	80.2
Motor vehicles & equipment	(D)	7.4	8.0	7.8	7.9
Metals & minerals	26.4	26.2	25.8	27.1	28.1
Other durable goods	4.8	6.1	5.0	4.2	4.8
Farm products raw materials	39.6	39.1	37.9	39.7	36.4
Other nondurable goods	(D)	2.5	3.1	2.9	3.0
Other industries	2.9	3.6	3.7	2.8	3.2

SOURCE: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.

NOTE: A "(D)" INDICATES THAT THE DATA IN THE CELL HAVE BEEN SUPRESSED TO AVOID DISCLOSURE OF DATA OF INDIVIDUAL COMPANIES.

TABLE 22. GROWTH OF INTRAFIRM IMPORTS AND EXPORTS, 1977-1985 (annual rates)

	U.S. AFFILIATES				U.S. PARENTS			
	IMPORTS		EXPORTS		IMPORTS		EXPORTS	
	77-82	82-85	77-82	82-85	77-82	82-85	77-82	82-85
All industries	11.0	16.7	1.5	1.9	1.6	11.5	8.5	9.6
Petroleum	2.7	-18.9	1.0	0.8	-7.7	-5.2	9.8	0.4
Manufacturing	11.2	17.6	1.6	6.1	8.2	19.0	8.9	11.4
Food & Kindred Products	6.2	10.5	-0.3	4.8	2.9	19.1	7.4	19.3
Chemicals and allied products	14.2	17.9	1.8	11.0	13.6	7.6	8.4	6.1
Primary & fabricated metals	5.0	28.5	0.7	10.9	3.8	-3.1	3.6	7.9
Machinery except electrical	7.7	17.2	1.0	4.0	17.2	25.0	13.4	11.7
Electric & electronic equipment	7.8	34.2	3.5	3.3	12.4	12.3	14.7	5.7
Transportation equipment	53.6	-6.0	6.8	43.2	6.1	25.5	5.7	21.0
Other manufacturing	9.7	7.3	0.7	-1.1	6.4	11.9	7.1	-2.0
Wholesale trade	11.5	18.2	1.5	1.7	-11.4	9.3	2.3	-1.5
Motor vehicles & equipment	(D)	23.9	(D)	4.1				
Metals & minerals	10.4	2.2	1.5	4.6				
Other durable goods	17.4	24.3	2.0	-5.7				
Farm products raw materials	7.9	36.7	1.5	0.3				
Other nondurable goods	(D)	9.9	(D)	7.5				
Other industries	13.2	28.8	1.9	-2.7	11.3	-6.1	6.7	-9.1

SOURCES: U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, FOREIGN DIRECT INVESTMENT IN THE UNITED STATES: OPERATIONS OF U.S. AFFILIATES OF FOREIGN COMPANIES, TABLE G.3, SEVERAL YEARS.
U.S. DEPARTMENT OF COMMERCE, BUREAU OF ECONOMIC ANALYSIS, U.S. DIRECT INVESTMENT ABROAD: OPERATIONS OF U.S. PARENT COMPANIES AND THEIR FOREIGN AFFILIATES, TABLES 57 AND 58, SEVERAL YEARS.

TABLE 23. ASSETS AND DIRECT INVESTMENT ABROAD AND IN THE UNITED STATES
(Millions of dollars and percentage changes)

	U.S. ASSETS ABROAD	%	FOREIGN ASSETS IN U.S.	%	DIRECT INVESTMENT ABROAD	%	FOREIGN DIRECT INVESTMENT	%
1970	165,385		106,912		75,480		13,270	
1971	179,004	8.2	133,493	24.9	82,760	9.6	13,914	4.9
1972	198,694	11.0	161,658	21.1	89,878	8.6	14,868	6.9
1973	222,430	11.9	174,536	8.0	101,313	12.7	20,556	38.3
1974	255,719	15.0	196,988	12.9	110,078	8.7	25,144	22.3
1975	295,100	15.4	220,860	12.1	124,050	12.7	27,662	10.0
1976	347,160	17.6	263,582	19.3	136,809	10.3	30,770	11.2
1977	379,105	9.2	306,364	16.2	145,990	6.7	34,595	12.4
1978	447,847	18.1	371,730	21.3	162,727	11.5	42,471	22.8
1979	510,563	14.0	416,106	11.9	187,858	15.4	54,462	28.2
1980	606,865	18.9	500,830	20.4	215,375	14.6	83,046	52.5
1981	719,683	18.6	578,983	15.6	228,348	6.0	108,714	30.9
1982	838,962	16.6	691,975	19.5	221,843	-2.8	124,677	14.7
1983	893,826	6.5	787,611	13.8	226,962	2.3	137,061	9.9
1984	898,187	0.5	893,803	13.5	212,994	-6.2	164,583	20.1
1985	949,371	5.7	1,061,253	18.7	229,748	7.9	184,615	12.2
1986	1,071,432	12.9	1,340,670	26.3	259,562	13.0	220,414	19.4
1987 *	1,167,807	9.0	1,536,040	14.6	308,793	19.0	261,927	18.8

SOURCE: SURVEY OF CURRENT BUSINESS, JUNE 1986 & JUNE 1987.

NOTE: * PRELIMINARY

TABLE 24. ASSETS AND DIRECT INVESTMENT IN JAPAN AND IN THE UNITED STATES
(Millions of dollars and percentage changes)

	U.S. ASSETS IN JAPAN	%	JAPANESE ASSETS IN U.S.	%	U.S.DIRECT INVESTMENT IN JAPAN	%	JAPANESE DIRECT INVESTMENT IN U.S.	%
1983	48,943		50,046		8,063		11,336	
1984	48,362	-1.2	67,631	35.1	7,920	-1.8	16,044	41.5
1985	56,744	17.3	102,817	52.0	9,246	16.7	19,313	20.4
1986	92,481	63.0	156,176	51.9	11,332	22.6	26,824	38.9
1987	113,324	22.5	194,031	24.2	14,270	25.9	33,361	24.4

SOURCE: SURVEY OF CURRENT BUSINESS, JUNE 1986 & JUNE 1987.

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