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**The Impact of Foreign Investment on Host Countries:
A Review of the Empirical Evidence**

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March 1997

ABSTRACT

This paper reviews the empirical evidence on host country effects of foreign direct investment. The focus of the paper lies on the transfer and diffusion of technology from foreign multinationals to their host countries, the impact of foreign MNCs for the trade performance of host countries, and the effects on competition and industry structure in host countries. We conclude that MNCs may play an important role for productivity and export growth in their host countries, but that the exact nature of the impact of FDI varies between industries and countries, depending on country characteristics and the policy environment.

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1. Introduction

Economic theory provides two approaches to studying the effects of foreign direct investment (FDI) on host countries. One is rooted in the standard theory of international trade and dates back to MacDougall (1960). This is a partial equilibrium comparative-static approach intended to examine how marginal increments in investment from abroad are distributed. The main prediction of the model is that inflows of foreign capital - whether in the form of FDI or portfolio capital - will raise the marginal product of labor and reduce the marginal product of capital in the host country. In addition, MacDougall suggests that FDI may be connected to other potentially important benefits:

The most important direct gains ... from more rather than less private investment from abroad seem likely to come through higher tax revenue from foreign profits (at least if the higher investment is not induced by lower tax rates), through economies of scale and through external economies generally, especially where (domestic) firms acquire "know-how" or are forced by foreign competition to adopt more efficient methods.

(MacDougall, 1960, p. 34)

There is no *a priori* argument, however, as to the relative importance of these various benefits in the MacDougall model.

The other approach departs from the theory of industrial organization, and was pioneered by Hymer (1960). Other important contributions have made by Buckley and Casson (1976), Caves (1971), Dunning (1973), Kindleberger (1969), and Vernon (1966), among others (for an overview, see Dunning, 1993 or Caves, 1996). The starting point here is the question why firms undertake investment abroad to produce the same goods as they produce at home. The answer has been formulated as follows: "For direct investment to thrive

there must be some imperfection in markets for goods or factors, including among the latter technology, or some interference in competition by government or by firms, which separates markets” (Kindleberger, 1969, p. 13). Thus, to be able to invest in production in foreign markets, a firm must possess some asset (for example, product and process technology or management and marketing skills) that can be used profitably in the foreign affiliate. Firms investing abroad therefore represent a distinctive kind of enterprise and the distinctive characteristics are pivotal when analyzing the impact of foreign direct investment on host countries. The entry of a multinational corporation (MNC) represents something more than a simple import of capital into a host country, which is generally how the matter is treated in models rooted in traditional trade theory.

This distinction is particularly important for developing countries, where domestic enterprises are likely to be relatively small, weak, and technologically backward. These countries also differ from the developed ones in such aspects as market size, degree of protection, and availability of skills. The entry of MNC subsidiaries into LDCs may therefore have effects, both positive and negative, which are substantially different from those that occur in developed host countries.

Although the traditional trade theory approach and the industrial organization approach are not mutually exclusive, they have so far generally emphasized different aspects of capital movements. Trade theorists have mainly been interested in the direct effects of foreign investment (*direct* as well as portfolio investment) on factor rewards, employment, and capital flows, while those following the industrial organization approach have put more emphasis on indirect effects or externalities. In this study, we will adopt an industrial organization approach, and focus on issues related to the transfer and diffusion of technology and knowledge, as well as the impact of FDI on market structure and competition in host countries. In the next two sections, we will discuss the role of MNCs in the international technology market, and review the empirical evidence on spillovers of technology from MNCs to local host country firms. In section 4, we go on to examine the impact of FDI on the host countries’ trade performance. Section 5 examines the effects of FDI on industry structure and competition, while section 6 summarizes and concludes the paper.

2. Voluntary and Involuntary Diffusion of MNC Technology

It is well known that MNCs undertake a major part of the world's private research and development (R&D) efforts and produce, own, and control most of the world's advanced technology. It is also known that the multinationals' R&D and technology is heavily concentrated to a few home countries, unlike MNC investment, production, and employment that are more widely spread across both industrialized and developing economies.

A few summary statistics can demonstrate this clustering of technology production. Over four fifths of the global stock of FDI originates from the half dozen home countries that dominate the world's research and technology: the US, the UK, Japan, Germany, Switzerland, and the Netherlands. On average, about a third of the total sales and the total employment of the MNCs based in these countries were accounted for by their foreign affiliates in the early 1990s (see Lipsey, Blomström and Ramstetter, 1995). However, less than 10 per cent of the R&D expenditures of e.g. US manufacturing MNCs were undertaken in their majority-owned foreign affiliates, and more than half of this was recorded by the affiliates located in the UK and Germany. Detailed data on the R&D expenditures of the MNCs based in the other main home countries are not available, but the pattern is likely to be similar and it is not very controversial to conclude that foreign MNCs are the most important sources of modern technology for most economies.

But although we know that MNCs produce and own the bulk of the world's modern technology, it is not obvious exactly how MNC technology spreads across international borders and what role MNCs play in the process. One reason, of course, is that "technology" is an inherently abstract concept, and therefore difficult to observe and evaluate. None of the available measures of technology and technology production - such as R&D expenditures, numbers of new patents, payments for licenses and royalties, stocks of capital equipment, and so forth - cover more than a part of this.

Another reason is that technology is diffused in many different ways. MNC technology can spread to new users through formal market transactions - transfers - or through informal, non-market mediated channels that may be voluntary or involuntary. For each alternative, the role of MNCs can be either active or passive. Table 1 shows some of the possible modes of international technology diffusion, grouped according to the type of transaction and role of the MNC. Foreign direct investment is another potential channel of technology transfer, but

we have not included it explicitly in the table: what distinguishes FDI from sales of equipment or licenses to outsiders (or even joint ventures) is that the MNC has chosen to retain the control and ownership of its proprietary technologies within the corporation.

*TABLE 1 International Diffusion of Technology:
Type of Transaction and Role of MNCs*

	<i>Role of MNCs</i>	
<i>Type of Transaction</i>	ACTIVE	PASSIVE
FORMAL	joint ventures, licensing	goods trade
INFORMAL	linkages	trade journals, scientific exchange

Source: Adapted from Fransman (1985).

It is an open question which of the transfer modes mentioned in the table is the most important, because it is difficult to compare the technology content of the different transactions, and because there are no comprehensive data available to measure the magnitude of the informal transfers. However, there are some old data provided by the UNCTC (1985) on formal transactions that are useful in outlining the quantitative dimensions, although the figures are neither complete nor extremely accurate. For instance, the industrialized countries imported USD 310 billion worth of machinery and transport equipment in 1980, whereas their yearly payments for technology and technical and management services in the early 1980s only amounted to approximately USD 10 billion. Concurrently, the developing countries' imports of machinery and transport equipment from developed countries reached USD 129 billion, and their payments of royalties, fees, and remuneration for technical services totaled about USD 2.5 billion. There are no data on the overall importance of joint ventures, but, for comparison, it can be noted that the industrialized countries' inward stock of foreign investment was estimated at approximately USD 401 billion in 1983, while the corresponding figure for developing countries was USD 138 billion (UNCTC, 1988, p. 25).¹

There are also some data available to describe the extent of MNC participation in licensing and goods trade. These data are interesting because they confirm that MNCs are the

main sources of these types of technology, but also because they indirectly introduce foreign direct investment into the picture. MNCs control technology supplies by virtue of their ownership of proprietary technologies, but they also account for a significant share of the demand, via their foreign affiliates. This is most apparent for the transfers of "disembodied" technology that are captured by data on trade in royalties, licenses, and patent rights. Over 80 per cent of the registered payments to the United States for technology sales during the 1970-1985 period were made by foreign affiliates of US firms (Grosse, 1989). More than 90 per cent of the technology payments from developing countries to Germany in the early 1980s, and over 60 percent of the payments to Japan, originated from their own foreign affiliates (UNCTC, 1988, p. 177).

The intra-firm character of the technology transfers that take place through trade in capital equipment and other products is less apparent, but still distinguishable. What we know about MNC involvement from statistics on goods trade is that between 70 and 80 per cent of the goods exports of both the US and the UK - the main suppliers of embodied technology together with Japan and Germany - are accounted for by MNCs (UNCTC, 1988, p. 90). Moreover, a significant share of the exports and imports of the major home countries (between one fifth and one third overall, and more for complex and technologically sophisticated goods that supposedly embody more technology) flow between MNC parents and affiliates (UNCTC, 1988, p. 91). A very important part of all formal technology transfers are, therefore, closely tied to FDI.

As already mentioned, there are no comprehensive data on the informal modes of technology diffusion, but it seems that FDI plays an important role also there. For instance, linkage effects can take place between firms in different countries, like when exporters learn from the feedback they receive from their multinational customers abroad (Fransman, 1985), but are perhaps stronger when they arise between local firms and MNC affiliates operating in the same country (as will be seen in the ensuing discussion of spillovers). Similarly, many informal transfers where MNCs have a passive role - those that come about as a result of any kind of personal contact with people who know about MNC technologies - are obviously facilitated by the presence of foreign affiliates. Of course, there are also transfer types that may be entirely independent from FDI. Exports from the MNC's home country may be sufficient to prompt reverse engineering - the practice of taking apart and analyzing products,

to learn about the technologies embodied in them - which is often recognized as one of the main sources of involuntary technology dissemination (Zander, 1991, Chapter 5).² Other informal transfers, through academic contacts, technical publications, and education abroad can also occur irrespective of the presence of foreign affiliates.

Thus, although FDI was not included explicitly in Table 1, it nevertheless seems that much of the international dissemination of technology is connected to foreign direct investment. A large share of both license sales and sales of technologically advanced products are directed to MNC affiliates, and FDI therefore seems to be more important for the geographical spread of technologies than sales of technology to unrelated parties. In addition, many informal contacts are easier and more important when MNC affiliates are present in the market than when contacts have to be made across international borders. Keeping this in mind, it is not surprising that FDI is probably the transfer mode that has received the most attention (see e.g. Enos, 1989).

However, there are important questions related to the role of FDI as a source of technology for host countries. From the point of view of the host, it is not clear what the actual technological benefits of FDI are and how they come about. A distinguishing characteristic of direct investment, as has already been noted, is that the control and ownership of the technologies used by the affiliates stay in the MNCs' possession. Is there any significant diffusion of technology to new users or is the affiliate able to protect its technology from spreading to outsiders? And if technology is diffused from the MNC affiliates, does it spread through the market or is it diffused informally, and are the multinationals active or passive in this process? Obviously, it is not trivial to pinpoint the correct position of foreign direct investment in Table 1.

Spillovers of MNC Technology

In the debate on the role of MNCs in international technology transfer, it has sometimes been suggested that the most significant channels for the dissemination of modern, advanced technology are external effects or "spillovers" from foreign direct investment, rather than formal technology transfer arrangements (Blomström, 1989). It is argued that when firms establish affiliates abroad and become multinational, they are distinguished from the already established firms in the host country for two reasons. One is that they bring with them some

amount of the proprietary technology that constitutes their firm-specific advantage and allows them to compete successfully with local firms who have superior knowledge of local markets, consumer preferences, and business practices. Another reason is that the entry of the MNC affiliate disturbs the existing equilibrium in the market and forces local firms to take action to protect their market shares and profits. Both these changes are likely to cause various types of spillovers that lead to productivity increases in local firms.

Generally, spillovers are said to take place when the MNCs cannot reap all the productivity or efficiency benefits that follow in the host country's local firms as a result of the entry or presence of MNC affiliates. The simplest example of a spillover is perhaps the case where a local firm improves its productivity by copying some technology used by MNC affiliates operating in the local market. Another kind of spillover occurs if the entry of an affiliate leads to more severe competition in the host economy, so that local firms are forced to use existing technology and resources more efficiently; a third type of spillover effect takes place if the competition forces local firms to search for new, more efficient technologies. These effects may take place either in the foreign affiliate's own industry or in other industries, among the affiliate's suppliers or customers.

A first reason to suspect that spillovers are important is that the technologies used by MNC affiliates are not always available in the market (see Blomström and Zejan, 1991). Abstracting from the fact that several means of extracting technology rents may occur simultaneously in reality, we can assume that the MNC has three alternative ways to exploit its technological advantages internationally. The MNC can produce for export in the home country, it can sell its technology to foreigners, or it can establish an affiliate abroad and control foreign production directly.³

However, markets for technology are typically imperfect, which makes the transactions costs for sales of technology to outsiders high (Buckley and Casson, 1976; Caves, 1996; Teece, 1981). For instance, it is difficult to judge the value of any specific technology and agree about prices and licensing costs that are acceptable to both parties. Consequently, MNCs often prefer direct investment before licensing, and the preference for FDI may be particularly strong when the newest and most profitable technologies (or those that are very close to the MNCs principal line of business) are exploited. A technology that is exploited through FDI will probably not be licensed to the local competitors in the host country - the

local firms' only chances to gain access to the technology may lie in reverse engineering or hiring of former MNC employees with special skills, or some other type of spillover. This reason for the importance of spillovers may be most valid for the more developed host countries and industries, because the technical skills required to imitate the newest and most profitable technologies are typically higher (see Blomström, 1991b).

Another reason why spillovers may be significant is that direct contact with users appears to be a principal factor explaining technology diffusion. Before a new process or product innovation is widely spread in the market, potential adopters have limited information about the costs and benefits of the innovation and may therefore associate it with a high degree of risk. As the potential adopters come in contact with existing users, e.g. MNC affiliates, information about the technology is diffused, the uncertainty regarding the pros and cons of the innovation is reduced, and the likelihood of imitation or adoption increases. In this way, the entry of foreign affiliates may demonstrate the existence and profitability of new products and processes, and encourage local firms to adopt some of them: these diffusion processes may even be repeated every time innovations are transferred from the MNC parent to the affiliate. This is an argument for spillovers even when access to new technology is not restricted by proprietary factors, because information about foreign technology is generally more expensive for local firms than for MNC affiliates. In addition, it can be assumed that "contagion" effects are more important for developing host countries, where indigenous skills and information are in shorter supply.⁴

A third reason to expect positive external effects from FDI is related to the typical features of MNCs - scale economies, high initial capital requirements, intensive advertising, and, not least, advanced technology. These are also industry characteristics that signal high barriers to entry, high concentration, and perhaps some inefficiency that follows from low levels of competition. Entry by new domestic firms into such industries in potential host countries is likely to be difficult; MNCs, on the other hand, are both likely to enter just those industries and be well equipped to overcome the entry barriers. They can coordinate their international operations and concentrate specific processes to few locations if scale economies are important entry barriers. If the barriers are made up of high capital costs, MNCs may have larger own funds than local firms, or access to cheaper financing on international markets. Barriers related to product differentiation and technology, finally, are

not likely to stop a multinational, since these features often characterize the MNCs themselves. The entry of MNCs into this kind of monopolistic industry is likely to increase the level of competition and force existing firms to become more efficient.

3. Empirical Evidence on Spillovers

The earliest discussions of spillovers in the literature on foreign direct investment date back to the early 1960s. The first author to systematically include spillovers (or external effects) among the possible consequences of FDI was MacDougall (1960), who analyzed the general welfare effects of foreign investment. Other early contributions were provided by Corden (1967), who looked at the effects of FDI on optimum tariff policy, and Caves (1971), who examined the industrial pattern and welfare effects of FDI.

The common aim of these studies was to identify the various costs and benefits of FDI, and spillovers were discussed together with several other indirect effects that influence the welfare assessment, such as those arising from the impact of FDI on government revenue, tax policies, terms of trade, and the balance of payments. The fact that spillovers were taken into account was generally motivated by empirical evidence from case studies rather than by comprehensive theoretical arguments - the detailed theoretical models analyzing spillovers did not appear until the late 1970s.⁵ Yet, the early analyses made clear that MNCs may improve allocative efficiency by entering into industries with high entry barriers and reducing monopolistic distortions, and induce higher technical efficiency if the increased competitive pressure or some demonstration effect spurs local firms to more efficient use of existing resources. They also proposed that the presence may lead to increases in the rate of technology transfer and diffusion. More specifically, case studies showed that foreign MNCs may:

- contribute to efficiency by breaking supply bottlenecks (but that the effect may become less important as the technology of the host country advances);
- introduce new know-how by demonstrating new technologies and training workers who later take employment in local firms;
- either break down monopolies and stimulate competition and efficiency or create a more monopolistic industry structure, depending on the strength and responses of the local firms;
- transfer techniques for inventory and quality control and standardization to their local suppliers and distribution channels; and,
- force local firms to increase their managerial efforts, or to adopt some of the marketing techniques used by MNCs, either on the local market or internationally.

Although this diverse list gives some clues about the broad range of various spillover effects, it says little about how common or how important they are in general. This brings up the question "How can we measure the significance and scope of spillovers?"

It is not difficult to picture an ideal study of productivity spillovers in host countries. To examine how the development of technology and productivity in individual local firms is related to the presence of foreign MNC in the local market, the study would require detailed micro data, both quantitative and qualitative. The study would have to cover several years, to take into account the fact that spillovers are not instantaneous. It should also include a large number of firms and industries, so that inter-industry spillovers could be observed, and so that it would be possible to draw statistically significant conclusions. With this kind of detailed information, it would also be possible to study productivity spillovers in the home countries of MNCs, and examine the presence of market access spillovers. However, to the best of our knowledge, no comprehensive analyses of this character have ever been made - one reason, of course, is the extreme data requirements. Additional empirical evidence on spillovers must therefore be drawn from two other sources.

Firstly, in addition to the few case studies focusing directly on spillovers, there is a large number of detailed case studies discussing other aspects of FDI in different countries and industries, and these studies often contain valuable "circumstantial evidence" of spillovers. For instance, many analyses of the linkages between MNCs and their local suppliers and subcontractors have documented learning and technology transfers that may make up a basis for productivity spillovers or market access spillovers. These studies seldom reveal whether the MNCs are able to extract all the benefits that the new technologies or information generate among their supplier firms, so there is no clear proof of spillovers, but it is reasonable to assume that spillovers are positively related to the extent of linkages. Similarly, there is much written on the relation between MNC entry and presence and market structure in host countries, and this is closely related to the possible effects of FDI on competition in the local markets. There are also studies of demonstration effects, technology diffusion, and labor training in foreign MNCs that are relevant for our purposes.

Secondly, there are a few statistical studies examining the relation between foreign presence in a host country industry and productivity (or productivity growth) in the locally-owned share of the industry or in individual locally-owned firms. These studies typically

estimate production functions for locally-owned firms, and include the foreign share of the industry as one of the explanatory variables. They then test whether foreign presence has a significant positive impact on local productivity (or productivity growth) once other firm and industry characteristics have been accounted for. There are no similar statistical studies of productivity spillovers in home countries, but there is one study employing statistical techniques to examine whether firms located near exporting MNCs are more likely than others to become exporters. Although the data used in these analyses is often limited to few variables, aggregated to industry level rather than plant level, and in several cases of a cross-section rather than time-series or panel character, they do provide some important evidence on the presence and pattern of spillover effects.

To provide an overview of the empirical evidence, we have structured the presentation as follows: we begin by distinguishing between spillover effects that are related to backward and forward linkages between MNCs and domestic firms, and go on to discuss MNC training of local employees and demonstration effects. In addition, we review the results of the available statistical studies of spillovers.

Linkages between MNCs and Local Firms

Some of the spillovers from FDI operate via the linkages between the MNC's foreign affiliate and its local suppliers and customers. The spillovers occur when local firms benefit from the MNC affiliate's superior knowledge of product or process technologies or markets, without incurring a cost that exhausts the whole gain from the improvement.⁶ Backward linkages arise from the MNC affiliate's relationships with suppliers, while forward linkages stem from contacts with customers.

Backward Linkages

Some of the "complementary activities" that may create spillovers through backward linkages are identified in Lall (1980). In summary, Lall notes that MNCs may contribute to raise the productivity and efficiency in other firms as they:

- help prospective suppliers (domestic as well as foreign) to set up production facilities;
- provide technical assistance or information to raise the quality of suppliers' products or to facilitate innovations;

- provide or assist in purchasing of raw materials and intermediaries;
- provide training and help in management and organization; and
- assist suppliers to diversify by finding additional customers.

In his empirical study, Lall (1980) examines two Indian truck manufacturers (one MNC and one joint venture) and finds significant backward linkages of all five types mentioned above. In particular, he notes that the truck manufacturers had been active in the establishment of supplier firms: of the 36 sampled supplier firms, 16 had been launched by the principals.⁷ Behrman and Wallender (1976), who examine the operations of General Motors, ITT, and Pfizer in several host countries, find similar linkages. They emphasize the ongoing character of the contacts and information flows between MNCs and their local suppliers. Evidence on the development of linkages is also provided by e.g. Watanabe (1983a, 1983b) and UNCTC (1981).⁸

Apart from demonstrating various types of linkages that create a potential for spillovers, these studies also suggest that the local content in MNC production is one of the determinants of the strength of linkages. Reuber et al. (1973), in a comprehensive survey of MNC affiliates in developing countries, note that over a third of the total value of goods and services purchased 1970 by all affiliates included in their survey were provided by local firms. However, there were systematic differences in local purchases depending on the affiliates' market orientation, the parent's nationality, and the host country. Local-market oriented affiliates purchased more from local firms than did export-oriented affiliates (perhaps because import licenses are easier to obtain for exporters); European MNCs relied more on local firms than US or Japanese firms (perhaps because they are generally older and have already built up local supplier networks); and affiliates in Latin America and India purchased more local inputs than affiliates in the Far East (probably because of differences in local content requirements). In addition to these factors, it seems that the technical capability of potential local suppliers must be important to take into account.

Moreover, there is a tendency for the share of local inputs to increase over time, also for export-oriented affiliates. McAleese and McDonald (1978), who study Irish manufacturing during the period 1952-1974, show that local purchases of inputs increase as the MNC affiliates mature. Several factors contribute to the gradual development of linkages: further production processing stages are added over time, the autonomous growth of the

manufacturing sector brings up new suppliers, and some MNC take deliberate action to attract and develop local suppliers.⁹ Hence, it is possible that spillovers also become more common over time, as more and more local firms establish various types of contacts with the foreign MNCs.

In addition to the linkages and spillovers that are result of cooperation between affiliates and local firms, it is also possible that there are effects that occur as suppliers are forced to meet the higher standards of quality, reliability, and speed of delivery of the MNCs. For instance, Brash (1966), in a study of the impact made by General Motors on its Australian local suppliers, emphasizes the importance of the MNC's stricter quality control, which also had an impact on the suppliers' other operations. Katz (1969, p. 154) reports that foreign MNCs operating in Argentina "forced their domestic suppliers to adopt productive processes and techniques used by the suppliers of their main firms in their country of origin". Similarly, Watanabe (1983a) notes complaints from small local producers in the Philippines about the large foreign firms' tough requirements on both product characteristics and prices: in developing countries, in particular, this alone may have an effect on what technologies are used, and perhaps also on the general competitive climate. However, there is very little additional evidence on such "forced linkage effects".

Some less optimistic conclusion on the effects of linkages are suggested by Aitken and Harrison (1991), who examine Venezuelan manufacturing between 1976 and 1989, and conclude that the effect of foreign investment on the productivity of upstream local firms is generally negative. They assert that foreign firms divert demand for domestic inputs to imported inputs, which means that the local supplier firms are not able to benefit from potential economies of scale. Their results differ from most other findings in this respect. One reason is that their study includes also local firms that have not been fortunate enough to establish linkages with foreign affiliates, and because they do not take into account the increase in local content that seems to take place over time. Yet, their conclusions highlight the need for more research where the connection between spillovers and linkages is examined explicitly.

Forward Linkages.

There is much less evidence of forward than backward linkages. Only a minority of the firms studied by Reuber et al. (1973) claimed to have contributed significantly to the development of local distributors and sales organizations. However, McAleese and McDonald (1978) report that forward linkages in the Irish economy grew in much the same way as backward linkages. In particular, they assert that many MNCs commenced operations with heavy export-orientation, but that the importance of the home market has increased over time.

Blomström (1991a) discusses forward linkages in closer detail, and emphasizes the growing technical complexity in many industries. On the one hand, this could mean that only MNCs can afford the necessary R&D to develop and manufacture modern products; on the other hand, industrial application of e.g. computer-based automation and information technologies might require expertise from the manufacturers. This, he argues, would contribute to increasing the role of MNC-customer contacts, especially in the smaller countries. One of the few empirical works touching upon the issue is the study by Aitken and Harrison (1991) noted above. They conclude that spillovers from forward linkages seem to be important in most industries - in fact, they argue that the downstream effects of foreign investment are generally more beneficial than the upstream effects.

Summarizing, there is much evidence of the existence and potential of backward linkages, and a suspicion about the growing importance of forward linkages as well. Some of the host country characteristics that may influence the extent of linkages - and thereby the extent of spillovers - are market size, local content regulations, and the size and technological capability of local firms. Moreover, linkages are likely to increase over time, as the skill level of local entrepreneurs grows, new suppliers are identified, and local content increases. This constitutes circumstantial evidence for spillovers, but it must also be mentioned that there are hardly any studies where the connection between linkages and spillovers is explicit.

Training of Local Employees in MNC Affiliates

The transfer of technology from MNC parents to affiliates is not only embodied in machinery, equipment, patent rights, and expatriate managers and technicians, but is also realized through the training of the affiliates' local employees. This training affects most levels of employees, from simple manufacturing operatives through supervisors to technically advanced professionals and top-level managers. Types of training range from on-the-job training to

seminars and more formal schooling to overseas education, perhaps at the parent company, depending on the skills needed. Although higher positions are often initially reserved for expatriates, the local share typically increases over time. The various skills gained while working for an affiliate may spill over as the employees move to other firms, or set up their own businesses.

The evidence on spillovers from the MNC affiliates' training of local employees is far from complete, and comes mainly from developing country studies. Considering that the public education systems in developing countries are relatively weaker, it is also possible that spillovers from training are relatively more important there. However, there is scattered evidence of effects in the industrialized countries, and then perhaps mainly regarding management skills. It is possible, for instance, that the inter-firm mobility of managers has contributed to spread specific management practices from Japan to the United States and Europe, and, in earlier times, from the US to Europe (Caves, 1996). Moreover, casual observation suggests that the mobility of employees from MNCs in the computer and software industries contributes to spillovers, both within the industry and elsewhere.

Studies in developing countries have recorded spillovers of both technical and management skills. For instance, Gerschenberg (1987) examines MNCs and the training and spread of managerial skills in Kenya. From detailed career data for 72 top and middle level managers in 41 manufacturing firms, he concludes that MNCs offer more training of various sorts to their managers than private local firms do, although not more than joint ventures or public firms. Managers also move from MNCs to other firms and contribute to the diffusion of know-how. Of the managers in private local and public firms who had training from elsewhere, the majority had received it while working for MNCs - joint ventures, on the other hand, seemed to recruit mainly from public firms. Yet, mobility seemed to be lower for managers employed by MNCs than for managers in local firms. This is not surprising remembering the common finding that MNCs pay more for their labor than what local firms do, even taking skill levels into account: in fact, it is not unreasonable to hypothesize that the fear of a "brain-drain" to local firms is one of the reasons behind the higher wages in MNCs. Katz (1987) points out that managers of locally owned firms in Latin America often started their careers and were trained in MNC affiliates.¹⁰

Chen (1983), in a study of technology transfer to Hong Kong, chooses to emphasize training of operatives. In three out of four sampled industries, the MNCs' incidence of undertaking training and their training expenditures were significantly (several times) higher than those for local firms. Consequently, he concludes that "the major contribution of foreign firms in Hong Kong manufacturing is not so much the production of new techniques and products, but the training of workers at various levels" (p. 61).

Another factor in the dissemination of technology and human capital skills is related to the R&D efforts undertaken by the MNC affiliates. Here, we will only hint at some of the results in a very extensive research field. Firstly, MNCs do undertake R&D in their host countries, although it is strongly concentrated to the home countries. The affiliates' research efforts could be important, and should be compared with the R&D efforts of local firms, rather than with the parents' total R&D. Doing so, Fairchild and Sosin (1986) conclude that foreign firms in Latin America exhibit more internal local R&D activity than is generally presumed, and that their total expenditures on research are very similar to those of domestic firms. In addition, they have access to the aggregate know-how base of the parent and related affiliates, and sometimes also to the parent's R&D facilities. The affiliates' R&D may therefore be more efficient than that of local firms. Not much is known, however, about what type of R&D is done in affiliates - traditionally, much has been adaptation of products and processes - and even less is known about the mobility of R&D personnel or the effects on the host country's technological capability.¹¹

Judging from the aggregate evidence on spillovers from the training of MNC personnel, there seems to be a definite accumulation of human capital skills in the MNCs' employee stock. Some of these skills can be appropriated by local firms when employees move to new jobs, but how much is an open question. The fact that most studies deal with the spread of management skills suggests that they are less firm-specific than technical skills, and can more easily be used in other contexts: the empirical evidence, however, is too limited for any more definite conclusions.

Demonstration Effects

There are a few case studies where pure demonstration effects of FDI on local firms in the host countries of MNCs have been discussed. Riedel (1975) claim that horizontal

demonstration effects from the operations of MNCs were an important force behind the development of the manufacturing export sector in Hong Kong in the 1960s. Swan (1973) suggests that multinationals are important not only for the diffusion of the specific technologies they use, but more generally because they strengthen international communications channels, which makes demonstration across international borders possible. Tilton (1971), in a study of the semiconductor industry, points to the importance of new MNCs in introducing US innovations to the European countries. Lake (1979), also examining the semiconductor industry, argues that affiliates of US MNCs have been more active than local firms in the diffusion of new technology in Great Britain. Mansfield and Romeo (1980) show that the technologies transferred to affiliates are younger than those sold to outsiders, and that there are cases where the affiliates' technology imports have induced local competitors to imitate their behavior.

These case studies suggest that demonstration may be an important channel for spillovers. However, there are too few studies to reveal how important the simple demonstration effects are, nor do we know whether they are more important in some countries or industries than in others. One reason is that pure demonstration effects often take place unconsciously: it is seldom documented how and where a firm first learns about a new technology or product that is subsequently adopted. Another reason is that demonstration effects are often intimately related to competition. Summarizing a comparison of MNC and local technologies, Jenkins (1990, p. 213) notes that “over time, where foreign and local firms are in competition with each other, producing similar products, on the same scale and for the same market, there is a tendency for local firms to adopt similar production techniques to those of the MNCs. Indeed this is part of a general survival strategy, whereby in order to compete successfully with the MNCs local capital attempts to imitate the behavior of the MNCs.”

Some case studies at the firm and industry level are also available to describe the combined effects of demonstration and competition from MNCs on local firms. For instance, Langdon (1981), in a study of FDI in the Kenyan soap industry, reports that the entry of foreign MNCs also introduced mechanized production, and local firms found themselves unable to sell handmade soap in the urban markets. Instead, they were forced to introduce mechanized techniques to stay in business. Similarly, foreign entry into the Kenyan footwear

industry led to increased competition and changes in the production techniques of local firms (Jenkins, 1990). In the Brazilian textile industry, the establishment of an affiliate by a foreign firm brought in synthetic fibers: the consequent stagnation of demand for cotton textiles led to the disappearance of some local firms, and forced others to seek joint ventures with foreign firms in order to get access to competitive technology (Evans, 1979).

Some authors have actually hypothesized that the most important influences of MNCs on local firms operate through the interaction of demonstration and competition (Blomström, 1986a), and several reasons to expect important effects from competition were noted in the conceptual discussion: most importantly, MNCs are likely to enter into industries where potential local challengers are discouraged by high barriers to entry and where competition between existing local firms may therefore be limited.

In practice, it is difficult to distinguish between effects of demonstration and competition when it comes to imitation or adoption of new technologies, and the most valuable information from case studies may therefore be related to how local firms respond to increased competition in the short run, before imitation takes place. The immediate local reaction may be to merely enforce stricter or more cost-conscious management and motivate employees to work harder, in order to reduce slack or improve X-efficiency. It is possible that this seemingly simple response may make a more substantial contribution to productivity than improvements in resource allocation (see Leibenstein, 1966, 1980). Bergsman (1974), on the basis of a study of industry in six developing countries, argues that X-efficiency is several times as important as allocative efficiency in increasing incomes in these countries. Also Pack (1974), in a study of LDC manufacturing industries, and Page (1980), referring to evidence for three manufacturing industries in Ghana, suggest that factors related to X-efficiency - mainly management and capacity utilization - are more important than changes in resource allocation (via changes in relative factor prices) to improve performance (see also White, 1976).

The potential productivity improvements from these types of reactions are probably larger in the less developed countries than elsewhere, simply because the initial inefficiencies are often larger. On the other hand, local firms in the less developed countries may be too weak to mount a competitive response to foreign entry, whereas the locals in industrialized host countries can often be expected to reply competitively. Various defensive corporate

agreements, such as amalgamations among local firms or cooperative ventures with other foreign firms, may improve the local firms' competitiveness, even in developing countries (Blomström, 1986b; Lall, 1979; Evans, 1977), but there are no direct cross-country comparisons available, and there are not enough case studies for more comprehensive conclusions. Exactly what the reaction is - and how important the spillover benefits are - is likely to depend on the initial conditions in the market, and how much of an impact MNC entry makes on concentration and competition. However, the evidence seems to suggest that there is a larger risk that foreign MNCs crowd out local firms in developing countries. We will return to this question in section 4 below.

Statistical Testing of Spillovers

Although there is plenty of empirical evidence of spillovers from the studies reviewed above, there are only few direct analyses and tests of the existence and significance of spillovers in a more general setting, presumably because of measurement problems and lack of suitable data.¹² In addition, most of the studies that are available focus on intra-industry effects. An early exception is Katz (1969), who notes that the inflow of foreign capital into the Argentine manufacturing sector in the 1950s had a significant impact on the technologies used by local firms. He asserts that the technical progress did not only take place in the MNCs' own industries, but also in other sectors, because the foreign affiliates forced domestic firms to modernize "by imposing on them minimum standards of quality, delivery dates, prices, etc. in their supplies of parts and raw materials" (Katz, 1969, p. 154).

The earliest statistical analyses of intra-industry spillovers include studies for Australia by Caves (1974), for Canada by Globerman (1979a), and for Mexico by Blomström and Persson (1983).¹³ These authors examine the existence of spillovers by testing whether foreign presence - expressed in terms of the foreign share of each industry's employment or value added - has any impact on labor productivity in local firms in a production function framework. Foreign presence is simply included among other firm and industry characteristics as an explanatory variable in a multiple regression. All three studies conclude that spillovers are significant at this aggregate level, although they cannot say anything about how spillovers take place.

Some more recent studies also present results that are consistent with these early analyses. Blomström and Wolff (1994) ask whether the spillovers in the Mexican manufacturing sector were large enough to help Mexican firms converge toward US productivity levels during the period 1965-1982. Their answer is affirmative: foreign presence seems to have a significant positive impact on the rates of growth of local productivity. Nadiri (1991b), in a study of the impact of US direct investment in plant and equipment on the manufacturing sectors in France, Germany, Japan, and the UK between 1968 and 1988, comes to similar conclusions. Increases in the capital stock owned by US multinationals seem to stimulate new domestic investment in plant and equipment, and it appears that there is also a positive impact of FDI on the growth of total factor productivity in the host countries' manufacturing sectors.

There are also some studies suggesting that the effects of foreign presence are not always beneficial for local firms. For instance, Haddad and Harrison (1991, 1993), in a test of the spillover hypothesis for Moroccan manufacturing during the period 1985-1989, conclude that spillovers do not take place in all industrial sectors. Like Blomström (1986a), they find that foreign presence lowers the average dispersion of a sector's productivity, but they also observe that the effect is more significant in sectors with simpler technology. This is interpreted to mean that foreign presence forces local firms to become more productive in sectors where best practice technology lies within their capability, but that there are no significant transfers of modern technology. Furthermore, they find no significant effects of foreign presence on the rate of productivity growth of local firms, and interpret this as additional support to the conclusion that technology spillovers do not occur.

Aitken and Harrison (1991) use plant-level data for Venezuelan manufacturing between 1976 and 1989 to test the impact of foreign presence on total factor productivity growth. They conclude that domestic firms exhibited higher productivity in sectors with a larger foreign share, but argue that it may be wrong to conclude that spillovers have taken place if MNC affiliates systematically locate in the more productive sectors. In addition, they are also able to perform some more detailed tests of regional differences in spillovers. Examining the geographical dispersion of foreign investment, they suggest that the positive impact of FDI accrued mainly to the domestic firms located close to the MNC affiliates. However, effects seem to vary between industries. Aitken and Harrison (1991) is also one of the few studies,

apart from Katz (1969), where inter-industry spillovers from foreign investment are discussed explicitly. As noted earlier, they assert that forward linkages generally brought positive spillover effects, but that backward linkages appeared to be less beneficial because of the foreign firms' high import propensities (although there were differences between industrial sectors).

Cantwell (1989), who investigates the responses of local firms to the increase in competition caused by the entry of US multinationals into European markets between 1955 and 1975, also argues that positive technology spillovers did not occur in all industries. His analysis differs notably from the other studies discussed in this section - he does not focus on productivity, but rather on changes in the market shares of foreign and local firms - but his conclusions are interesting. He asserts that "the technological capacity of indigenous firms ... was the major factor in determining the success of the European corporate response" (p. 86) to the US challenge, and that the size of the national market was an additional determinant. More specifically, Cantwell suggests that the entry of US affiliates provided a highly beneficial competitive spur in the industries where local firms had some traditional technological strength, whereas local firms in other industries - especially in countries where markets were too small to allow both kinds of firms to operate at efficient scale - were forced out of business or pushed to market segments that were ignored by the foreign MNCs.

Recently, some authors have also explicitly discussed the apparent contradictions between the earlier statistical spillover studies. In line with Cantwell (1989), Kokko (1994) argues that spillovers should perhaps not be expected in all kinds of industries. In particular, foreign MNCs may sometimes operate in "enclaves", where neither products nor technologies have much in common with those of local firms. In such circumstances, there may be little scope for learning, and spillovers may not materialize. Conversely, when foreign affiliates and local firms are in more direct competition with each other, spillovers are more likely. Examining data for Mexican manufacturing, he finds no signs of spillovers in industries where the foreign affiliates have much higher productivity and larger market shares than local firms; in industries without these enclave characteristics, on the other hand, there appears to be a positive relation between foreign presence and local productivity. Kokko, Tansini and Zejan (1996a) present similar findings for the Uruguayan manufacturing sector.

Another possible explanation for the divergent findings from the existing statistical tests is proposed by Kokko (1996), who focuses on effects of competition in Mexican manufacturing. The earlier studies have tested the hypothesis that productivity spillovers are strictly proportional to foreign presence, but Kokko (1996) argues that this is not always the case. Spillovers from competition, in particular, are not determined by foreign presence alone, but rather by the simultaneous interactions between foreign and local firms. Hence, it is possible that the spillovers are larger in case where a few foreign MNC stir up a previously protected market than in a situation where foreign affiliates hold large market shares, but refrain from competing hard with local firms. In fact, sometimes large foreign presence may even be a sign of a weak local industry, where local firms have not been able to absorb any productivity spillovers at all and have therefore been forced to yield market shares to the foreign MNCs.

These recent analyses point to the significance of local conditions in host countries as determinants of the magnitude and scope of spillovers. A high level of local competence and a competitive environment, both contribute to raise the absorptive capacity of the host country. In addition to explaining some of the differences between countries and industries when it comes to productivity benefits from FDI, they also highlight a possible role for economic policy in host countries. So far, foreign MNCs have typically been controlled through various types of performance and technology transfer requirements, but it appears that policies supporting a more competitive environment are useful alternatives for countries aiming to maximize the productivity benefits from FDI.¹⁴

4. Trade Effects

To enter a foreign market and to become a successful exporter, a company must not only be a competent manufacturer, but it will also need to manage the international marketing, distribution, and servicing of its products - tasks that are typically connected with high fixed costs. Few local firms, particularly those in developing countries, have the skills and resources to take on all these challenges on their own (see further Keesing and Lall, 1992). A MNC parent or affiliate is likely to be in a better position to establish export operations, since it can benefit from the existing international network of the entire corporation. The contacts with other parts of the corporation provide both knowledge of international market conditions

and access to foreign marketing and distribution networks. Moreover, MNCs are often larger than local firms and may be able to afford the high fixed costs for the development of transport, communications, and financial services that are needed to support export activities.

Examining the impact of FDI on the host countries' trade performance, it is useful to distinguish between direct and indirect effects. Regarding the direct effects on host country exports, we follow Helleiner (1973), and divide the exports and MNC activities into four different categories according to production characteristics:

- local raw material processing,
- conversion of import-substituting industry to exporting,
- new labor-intensive final product exports, and
- labor-intensive processes and component specialization within vertically integrated international industries.

In the first category, i.e. processing of locally produced raw materials, MNCs may have better export potential than indigenous firms in developing countries, because of their business contacts abroad, their marketing skills, superior technology both in product and processes, and their greater know-how in general. Particularly for the poorest developing countries, where most of these assets are lacking, foreign firms may be one of the few available alternatives, at least for the time being, if they want to increase their exports.

The same MNC advantages should also be important when countries try to convert import-substituting industries to exporting (for empirical evidence, see Blomström and Lipsey, 1993). If this avenue for the expansion of manufactured exports is chosen, one should also consider the suggestion that multinational corporations may be a significant factor in speeding up free trade, not least among the developing countries. For instance, it has been noted that MNCs have been firm supporters of common markets, customs unions, and free trade areas in the developing countries, since these enable them to rationalize small-scale facilities and develop exports (see e.g. Helleiner, 1973 and Dunning, 1993). On the other hand, there are reasons to believe that the MNCs are eager to support protection in host developing countries if the reason for the investment from the very beginning was the profits provided by protected market. However, with the decreasing appeal of import-substituting strategies in general in developing countries, the anti-trade influence of MNCs is expected to be weak.

Multinational corporations are also believed to have more general interests in trade liberalization in their home countries, particularly in their own products, and it is often said that these firms have become a significant source of political pressure for freer trade. Given the currently widespread perception that there is a hardening of commercial policies in the developed countries, it is important to analyze what role the MNCs may play here. Are these firms in a position to facilitate exports from the developing to the developed countries, for instance, in labor-intensive final products, and, if so, will they do it on a general basis or will they lobby only for their own exports?

Some efforts have been made to test the hypothesis that protection is lower on products that are of special interest to the MNCs. For instance, Laverne (1983) and Helleiner (1977) tested whether United States MNCs acted as a free-trade force in support of imports of their majority-owned foreign affiliates, but no conclusive evidence was found. In this context, it can be noted that Bhagwati (1988) argues that it is not meaningful to look for pro-trade influences of multinational corporations in cases of successful opposition to particular protectionist pressures. He asserts that MNCs are in opposition to protectionism in general in their home countries to avoid possible outbreaks of protectionism elsewhere, so that they act as an important free-trade force, not in specific sectors, but at higher levels.

When it comes to exports of new labor-intensive final products, such as textiles and other consumer goods, history seems to tell that there are many opportunities for developing countries to become significant exporters even without the help from foreign firms. Such a conclusion would, however, understate the importance and contribution of multinational corporations in these exports. Firms in developing countries seeking to expand their exports to developed countries face immense difficulties in setting up a distribution network, keeping in close touch with the rapid change in consumer tastes, mastering the technicalities of industrial norms and safety standards, and building up a new product image. In many cases, the design, packaging, distribution, and servicing of the products are as important as being able to produce them at (or below) ruling prices in world markets, and the lack of such skills constitutes a key entry barrier to markets for developing country exporters.

The story behind the success of many developing country firms entering world markets in light consumer goods is that foreign firms help them by providing the links to the final buyers (Blomström, 1990). Usually, firms in developed countries seek out manufacturers in

developing countries and bring them under contract as suppliers. The former may be import-wholesalers in narrow product lines, large department store chains or, as in East Asia, Japanese trading companies dealing in a wide variety of products. Many of these firms are true MNCs with outlets in several countries, and by not taking their activities into account, we significantly overstate the opportunities for developing countries to enter markets for labor-intensive final products.

Hence, although the local suppliers of MNCs do not always export under their own name, they benefit from access to foreign markets. This may allow them to expand output and achieve economies of scale. It is also likely that the linkages with export oriented MNCs provide knowledge about product and process technologies and foreign market conditions - for instance, foreign preferences regarding design, packaging, and product quality - and if this information can be used profitably in the supplier companies' other operations, there may be important external effects from contacts with foreign MNCs (see Keesing and Lall, 1992).

Exports of labor-intensive components within vertically integrated industries are almost by definition dependent on the participation of MNCs. Generally, we think of these exports as intra-firm trade, but a great part of them are arm's-length transactions between MNCs and indigenous LDC firms (although the MNCs usually take responsibility for the marketing and distribution of the products). However, since this type of production is often dependent on imports of raw materials and intermediate goods, it is not obvious that the net earnings of foreign exchange will be significant. The main benefits from export processing are instead related to increased employment, skills, wages, and taxes, at least in the short run (see Kobba, 1986, for an analysis of the effects of such foreign direct investment in Tunisia).

Countries that choose to specialize in labor-intensive processes and components production for MNCs also have to take into account that these affiliates are relatively "footloose", with little physical capital nailed down to hinder movement to the most favorable environment (see e.g. Flamm, 1984). Decisions taken by the parents may lead to sudden changes in the production of their affiliates in different countries, without necessarily taking into account the interest of host countries. This may happen as a result of changes in the costs of production, the perception of risks, or the policy environment in different host countries (UNCTC, 1985).

In addition to the export influences that require some type of linkage between MNCs and local firms, there may also be several indirect effects that benefit local export performance. In the simplest case, local firms may learn how to succeed in foreign markets simply by copying MNCs, although more tangible externalities are usually needed. For instance, MNCs may have affiliated firms in the prospective export market who can lobby for trade liberalization, and local firms may benefit from any reductions of trade barriers that are achieved. There may be spare capacity in the distribution or marketing facilities created by MNCs, which local firms may use at or slightly above marginal cost. The MNCs may also train their local staff in export management, and these skills may spill over to local firms if the MNCs employees change jobs. Other channels for the diffusion of information on foreign market conditions are trade associations and other industry organizations, of which MNCs are often prominent members. This kind of "market access spillovers" may be most important where the indigenous resources are weakest, i.e. in developing countries.

In one of the few available statistical analyses of export externalities, Aitken, Hanson and Harrison (1994) hypothesize that one firm's export activities may reduce the costs for foreign market access of other potential exporters that are located nearby. Testing a logit-specification for over 2,000 Mexican manufacturing plants during the period 1986-1990, they find that locating near an exporting MNC raises the probability of exporting for an individual firm, but that there is no corresponding effect from locating near locally-owned exporters. Hence, Aitken, Hanson and Harrison (1994, p. 25) conclude that "Foreign-owned enterprises are a natural conduit for information about foreign markets and technology, and a natural channel through which domestic firms can distribute their goods. To the extent that foreign investors directly or indirectly provide information and distribution services, their activities enhance the export prospects of local firms." Although their study cannot say anything about what the channels for market access spillovers are, they are able to demonstrate that the effects are significant at the national level.

Similarly, Kokko, Tansini and Zejan (1996b) find that the presence of foreign MNCs raises the likelihood that local Uruguayan firms are involved in exporting. However, this effect only applies for exports to the world market, while exports to the neighboring countries Argentina and Brazil appear not to be influenced by foreign presence. Moreover, only foreign MNCs established in Uruguay during the relatively outward-oriented period since 1973 - but

not MNCs established during the preceding import-substituting period - seem to have any influence on the probability that local firms are engaged in exporting.

5. Competitive and Anti-Competitive Effects

It was argued earlier that MNCs may improve industrial efficiency and resource allocation in their host countries by entering into industries where high entry barriers reduce the degree of domestic competition. The entry of MNCs into these monopolistic industries is likely to raise the level of competition and force existing firms to become more efficient. Foreign entry may, of course, also lead to a fall in the number of firms in the industry if the least efficient local companies are forced out of business. This raises the fear that foreign MNCs may outcompete all local firms and establish monopolies that are even worse than the domestic oligopolies they replace: in addition to restricting competition, there is a risk that MNC monopolies may also repatriate profits and avoid taxation through transfer pricing.

However, it is likely that competition generally becomes more fierce, because the MNC affiliates' strategies typically stir up the established patterns of "gentlemanly competition". Hence, it has been said that "whatever the market structure that results from the influence of direct investment, it can be argued that entry by a foreign subsidiary is likely to produce more active rivalrous behavior and improvement in market performance than would a domestic entry at the same initial scale" (Caves, 1971, p. 15). Another point to note is that the increase in competition is often more effective in inducing technological change and productivity improvements than profit incentives, since "threats of deterioration or actual deterioration from some previous state are more powerful attention-focusing devices than are vague possibilities for improvements" (Rosenberg, 1976, p. 124).

Yet, the uncertainty regarding the generality of competition effects motivates an examination of some studies of FDI and industry structure in host countries. One central problem here is the question whether MNC entry and presence explain industry structure, or whether industry structure determines if MNCs will enter or not. This is an important question, since we have argued that one of the reasons to expect significant effects of foreign presence is the improvement in efficiency and resource allocation that may follow from MNC entry into monopolistic host country industries. Another problem is that there is some confusion regarding effects that are endemic to MNCs and those that are only speeded up by

MNC presence. Few authors have been able to make a proper distinction between these two effects, but it may not be a crucial issue in the present context. What matters is the impact made by MNCs, and not the question of whether it is caused by foreign ownership or some other of the MNCs' characteristics. Yet another (perhaps more important) complication is that there is no simple relationship between competition and efficiency, on the one hand, and concentration, on the other hand. This will warrant some further comments later.

Moving to the empirical findings, it is clear that the overwhelming majority of studies are able to establish a positive correlation between foreign entry and presence and seller concentration in host country industries (see e.g. Dunning, 1993 and Caves, 1996, for surveys). However, the causal links are more difficult to establish. One finding is that the correlation disappears once other determinants of concentration are taken into account, and that MNCs do not cause concentration but are drawn to concentrated industries (Fishwick, 1981; Globerman, 1979b). Knickerbocker (1976) shows that entries by MNCs into the US market in the 1960s led to lower concentration, and that the same pattern was evident also for Canada, Italy, France, and West Germany. Commenting on these and other studies, Caves (1996, p. 89) concludes that the "correlations do not themselves prove that any direct causal relationships exist between foreign investment and concentration". It should, however, be noted that most of the studies look at effects of MNC entry, and it is possible that the concentration-reducing impact does not hold for already established affiliates, who may instead be interested in building barriers to entry.

Regarding the studies of developing countries, most authors have not been able to - or have not even tried to - determine whether the high degrees of concentration in the industries where foreign affiliates are present have been caused by MNCs or whether MNCs have just been attracted to these industries by good profit opportunities. Two (seemingly contradictory) exceptions are Evans (1977), who claims that MNCs tended to reduce concentration in the oligopolistic Brazilian pharmaceutical industry, and Newfarmer (1979), who argues for the opposite effect - caused by interlocking directorates, collusion, cross-subsidization, and other "oligopolistic tactics" - in the Brazilian electrical equipment industry.

Lall (1978) hypothesizes that it is plausible that MNCs speed up the natural concentration process in LDCs, or that the weakness of local competitors allows MNCs to achieve a higher degree of market dominance than in developed countries. Lall (1979)

proceeds to argue that the level of concentration probably falls in the short run following MNC entry, as the affiliate adds to the number of firms in the industry, but that this may be reversed in the long run. The MNCs may buy out local firms or force them out of business, their success may force local firms to fusions and amalgamations, or they may be more skilled as lobbyists than others, thus adding to entry barriers and protection. Looking at the effects of MNCs on concentration in 46 Malaysian industries, he asserts that the presence of foreign firms on balance increased concentration. This was brought about both by the MNCs' impact on general industry characteristics - such as higher initial capital requirements, capital intensity, and advertising intensity - and by some apparently independent effect of foreign presence, perhaps related to "predatory" conduct, changes in technology and marketing practices, or gains of policy concessions from the government. Similar results were reported for Mexico in Blomström (1986b). Thus, the evidence seems to suggest that there is a larger risk that MNCs crowd out local firms in LDCs than in developed countries.

The assumption implicit in much of the discussion above is that competition improves efficiency and welfare, but there are cases where it must not necessarily be that way. Firstly, economies of scale are important determinants of industrial productivity. To the extent that foreign entry increases concentration in relatively small national industries, resource allocation and efficiency may well improve from the increase in average firm size. Whether this effect is stronger than that from the presumably reduced competition depends on market characteristics and trade policy. For instance, a fall in the number of competitors from thirty to twenty must not necessarily harm the competitive environment, but a reduction from three to two certainly will. Similarly, increased concentration is likely to have more harmful effects in protected industries than in import-competing or export-oriented industries.¹⁵

In fact, free trade and imports may well be good substitutes for large numbers of domestic competitors: Scandinavian, and particularly Swedish, industrial policies have for a long time built on this assertion (Hjalmarsson, 1991), although the competition between the few remaining large firms has also been important (Porter, 1990; Sölvell, Zander, and Porter, 1991). The conclusion by Chen (1983, p. 90) from his study of Hong Kong manufacturing, where all industries are either export-oriented or import-competing, is consistent with these arguments: "There are indications that the presence of foreign investment in an industry may

have the effect of eliminating wasteful competition ... [without introducing] damaging monopolistic elements into the industry”.

Secondly, focusing more closely on technology, there is the classic ”Schumpeterian Dilemma” of weighing the static allocative efficiency of competitive markets against the supposed dynamic efficiency of monopolistic and oligopolistic firms. The rate of technical progress can perhaps be higher in concentrated markets, since firms there have internally generated profits to use for R&D, and are generally larger and more able to enjoy economies of scale in R&D. It is also possible that market structure has some impact on what the R&D efforts aim to achieve.

In fact, empirical studies seem to show that market structure affects both the rate and type of technical progress. Looking at the overall rate of technical change, Kamien and Schwartz (1982) summarize a survey of research in industrialized countries by concluding that neither perfect competition nor perfect monopoly, but rather mildly oligopolistic markets, are most conducive to technical progress. Moreover, Katz (1984) and Teitel (1984) in studies of Latin America, and Lall (1980) for India, show that technical change in industries with limited competition largely aims to overcome supply bottlenecks, e.g. by substituting imported raw materials and components, while change in more competitive industries is characterized by cost-reducing and quality-improving innovations. In these cases, however, limited competition is intimately tied to import-substitution rather than concentration, although there is a certain overlap.

Summarizing the evidence on the relation between MNC entry and presence and industry structure, it seems that MNCs enter mainly into industries where barriers to entry and concentration are relatively high, and initially add to the number of firms in the market. In the long run, MNCs may contribute to some increase in concentration, but efficiency may still benefit, particularly if protection does not guarantee an easy life also for the MNC affiliate. Most of the evidence, however, is related to MNC entry rather than to MNC presence - the dynamic aspects of MNCs and competition in host country markets are not well researched. Moreover, much of the evidence refers to effects in developed countries, and it is not possible to disregard the risk that MNC entry into developing countries replaces local production and forces local firms out of business, rather than forcing them to become more efficient.

5. Concluding Remarks

This paper has reviewed the evidence on host country effects of foreign direct investment. The focus of the discussion has been on the transfer and diffusion of technology from foreign multinationals to the host country, since MNCs own and control the bulk of the world's commercial technology. In addition, we have examined the impact of foreign MNCs for the trade performance of their host countries, and the effects on competition and industry structure in the host countries.

A tentative conclusion of the review is that foreign direct investment may promote economic development by contributing to productivity growth and exports in their host countries. However, the exact nature of the relation between foreign MNCs and their host economies seems to vary between industries and countries. It is reasonable to assume that the characteristics of the host country's industry and policy environment are important determinants of the net benefits of FDI. This paper has not explicitly dealt with questions related to host country policies vis-à-vis foreign MNCs, but the findings of the paper highlight the need for future research in this area.

Notes

¹ Some authors argue, in spite of the lack of more comprehensive evidence, that goods trade is the main channel of technology transfer for most countries. See e.g. Gomulka (1990), p. 161 and Kaplinsky (1990), p. 21.

² One of the few comprehensive quantitative assessments of the importance of imitation and reverse engineering is de Melto et al. (1980). They report that half of a sample of 280 significant innovations commercialized in Canada between 1960 and 1979 could be characterized as "imitations", and that more than half of these resulted from reverse engineering. Mansfield, Schwartz, and Wagner (1981) find that 60 per cent of the patented innovations in their sample were imitated within 4 years. Kim and Kim (1985) also present evidence of imitation and informal technology transfers in 42 South Korean firms. We will not examine these studies in detail because they do not focus on foreign investment, but it should be remembered that MNC presence in the host country probably facilitates imitation of MNC technology.

³ The determinants of the MNCs' choice between exports, licensing, and foreign direct investment are not discussed in this study, but treated in detail by e.g. Blomström and Zejan (1991), Contractor (1984), Davidson (1980, 1983), Davidson and McFetridge (1985), Stobaugh (1988), Telesio (1979), Vernon and Davidson (1979), and Zander (1991).

⁴ Mansfield and Romeo (1980) present indirect evidence also for this argument. They claim that the export of technologies from parents to U.S. affiliates abroad speeded up the emergence of competing products or processes in the host countries by an average of 2.5 years in about a third of their cases. In addition, they report that more than half of the managers of a sample of British firms believed that they had introduced some products and processes earlier as a consequence of transfers of technology to U.S. affiliates operating in the United Kingdom. More evidence will be presented later, in the survey of empirical studies of spillovers.

⁵ For theoretical studies, see e.g. Findlay, (1978), Koizumi and Kopecky (1977), Das (1987), and Wang and Blomström (1992). Some other early empirical studies are Balasubramanyam (1973), Brash (1966), Deane (1970), Dunning (1958), Forsyth (1972), Gabriel (1967), Rosenbluth (1970), and Safarian (1966).

⁶ However, the existence of linkages does not prove that there are spillovers, but the two are probably closely related. Even if the MNC affiliate charges for the support it provides to their local suppliers and distributors, it is not always able to extract the full value of the resulting productivity increases.

⁷ The domestic content in Lall's two cases was extremely high - probably over 90 per cent - and both firms had extensive supplier networks, with 500 and 339 independent suppliers, respectively. It should be noted that these characteristics already distinguish the Indian experience from others, since an extreme import substitution policy made India a virtually closed economy until the mid-1980s. Hill (1982), who examines the Philippine appliance and motor cycle industries, argues that inter-firm linkages are often significantly weaker than in the Indian case. More liberal import policies reduce local content, the smaller size of most markets makes much production economically unviable, and the assembler character of many principal firms makes them incapable of offering technical assistance to suppliers. Similarly, Lindsey (1989) argues that the positive impact of MNCs on the Philippine economy has been very limited.

⁸ Lall (1978) reviews numerous other studies of linkages between MNCs and local firms, and Halbach (1989) summarizes a detailed study of subcontracting and linkages in several South-East Asian industries.

⁹ This last point is noted in numerous other studies. Dunning (1958), one of the earliest contributions, maintains that foreign firms are generally engaged in the training of local suppliers. In addition to the comprehensive evidence on local content, Reuber *et al.* (1973) argue that MNCs actively support the establishment of independent local suppliers. Lim and Pang (1982) also underscore this in their study of the Singapore electronics industry: they point specifically at the role of MNCs in suggesting entrepreneurial possibilities and assisting in the establishment of supplier firms, and their "willingness to bear the initial costs of encouraging and patronizing local suppliers, who in the long run would be cost-competitive" (p. 591). What distinguishes their study is, firstly, that it is concerned with export-oriented TNCs whereas most others look at import-competing industries, and secondly, that they show how the development of linkages in Singapore was relatively rapid during the late 1970s while most other studies seem to suggest a much slower process.

¹⁰ Wasow and Hill (1986) provide similar evidence for the dissemination of management skills in the Philippine insurance industry. Likewise, Yoshihara (1988) underlines the importance of training in foreign companies (and overseas education) for Chinese-owned firms in South-East Asia. Behrman and Wallender (1976) recognize spillovers of both managerial and technical skills. In particular, they note that several of the MNC affiliates' subcontractors had been established by former employees. Hill (1982) also identifies similar cases in the Philippine appliance and motor cycle industries, but argues that they were insignificant. Nevertheless, 12 out of 20 assembler firms had some subcontractors that were established by former employees.

¹¹ For some recent studies touching on these issues, see Cantwell (1995), Patel and Pavitt (1994), and Zander (1994).

¹² It should also be noted in this context that both intra-industry and inter-industry R&D spillovers have been identified and estimated, mainly for developed countries, but generally without explicit reference to MNCs and FDI. See e.g. Bernstein (1988, 1989) and Nadiri (1991a). The fact that this kind of spillover seems to take place offers some indirect support to the hypothesis that there are technology spillovers between MNC affiliates and local firms. The conclusion that technological innovations (proxied by R&D measures) in some domestic firms

have positive effects on the productivity of other domestic firms is analogous to the situation where technological innovations (proxied by the size of the technology gap or the amount of technology imports) in foreign affiliates have positive effects on the productivity of local firms.

¹³ See also Blomström (1989). Moreover, Chen (1983) presents a detailed discussion and some statistical evidence of spillovers in the major manufacturing industries in Hong Kong, although he does not examine the whole manufacturing sector. More specifically, he shows that foreign firms have been more active than local firms in importing new technologies to Hong Kong, and that the rates of technology diffusion have been higher in the industries where foreign firms hold larger market shares.

¹⁴ For instance, Blomström, Kokko and Zejan (1994) and Kokko and Blomström (1995) show that the technology imports of foreign affiliates are partly determined by the competition in the host country market.

¹⁵ The Peruvian automotive industry in the late 1960s and early 1970s (like many other industries in countries with extreme import-substitution policies) provides a striking example of the fact that low concentration does not necessarily equal high efficiency. At that time, "13 firms, each with some foreign ownership, were assembling 18 brands and over 25 models of automotive vehicles, mostly passenger cars. Facing a limited local market, none of these firms was able to use more than 30 per cent of its installed capacity" (UNCTC, 1981, p. 19).

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