# Measuring the indirect employment effects of multinational enterprises: Some suggestions for a research framework

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# THE INDIRECT EMPLOYMENT EFFECTS OF MULTINATIONAL ENTERPRISES

## INTRODUCTION

Multinational enterprises (MNEs) have contributed to creating large amounts of new manufacturing jobs in the developing countries, but the exact total is at best a rough guesstimate. According to one of the first ILO studies on the subject (ILO, 1981), these firms employed around 4 million workers in the developing countries (excluding the People's Republic of China) in 1980. A more recent study, published by the United Nations Centre on Transnational Corporations (UNCTC) but using updated ILO figures, puts the total at around 7 million in the mid-1980s (UNCTC, 1988). Both figures are rather conservative, and probably underestimate the true magnitude of the phenomenon. On a world-wide basis, the phenomenon, important as it may be in absolute terms, is nevertheless rather marginal in relative terms: the 7 million workers in MNE subsidiaries in the developing countries account for less than 1 per cent of the economically active population in these countries. To be fair, it should be noted that in the ten countries and territories which currently account for approximately half of the stock of foreign direct investment (FDI) — these are the so-called newly industrialised countries like Brasil, Mexico, Singapore or the Republic of Korea — the percentage of workers employed by MNE is considerably higher.

Alongside their direct employment effects, MNEs also contribute indirectly to the process of job creation, for instance through their local purchases of goods and services or through the sale of their products on the local market. The presence of MNE subsidiaries also contributes indirectly to the process of job displacement, or job destruction, notably as a result of the competition with smaller local enterprises. In order to get a comprehensive picture of the overall employment effects of MNEs in the developing countries, account would need to be taken not only of the direct employment-generating effects, but also of all the indirect effects, positive and negative, on the host countries.

Virtually all the authors who have been studying the employment effects of MNEs have drawn attention to this problem (ILO, 1981; Lim and Fong, 1981; Watanabe, 1980) and a few of them have tried to develop methodologies for measuring these indirect employment effects (Lall, 1979) or to make estimates as to the

number of jobs indirectly generated in specific industries in specific countries (Jo, 1976).

These ventures into the uncharted territory of indirect employment effects of MNEs have helped bring to light three important conceptual issues. The first concerns the very nature of these effects. Until fairly recently, it was generally assumed that these effects were essentially of two types: MNEs contributed indirectly to creating jobs through their local purchases of goods and services, and contributed at the same time to destroying local jobs as a result of the greater competitiveness of their products. Thanks to the work carried out by these pioneering authors, we now have a much clearer conceptual idea of the different types of indirect employment effects, and the two 'conventional' or 'traditional' effects (job creation through local purchases and job destruction through competition) can now be placed in a wider and much more sophisticated framework. This new framework, summarised and illustrated in Table 1 (page 3), distinguishes between vertical, horizontal and macroeconomic effects; within the vertical effects group, between backward and forward effects (or linkages, to use a somewhat analogous terminology); and within the horizontal effects group, between narrow and wide effects.

A second important issue brought to light by this research into the indirect employment effect of MNEs is that of limits between first-, second- and third-order effects. A multinational, or for that matter any other type of enterprise, contributes to the job generation process through its purchases from suppliers, who in turn purchase from other suppliers, who thereby also contribute to the job generating process. But at what point should the line be drawn between the immediate indirect effects, and the cascade of subsequent effects ? The problem is rather similar to that encountered in the cost-benefit analysis of development projects, where the chain of benefits (or for that matter costs) can be extended almost indefinitely, or at least as far as the analyst's imagination and perseverance will carry him.

The existence of these second-, third- or even fourth-order effects helped to show how complex and difficult it was to estimate even in a very rough way the indirect employment impact of MNEs, but pointed to a third important conceptual issue related to the nature of these effects. In its productive activities, a firm creates a visible and measurable number of productive jobs. Indirectly it also creates jobs, but these jobs are not as easily quantifiable as the number of employees on the firm's payroll. In fact  - and this is one of the implicit

Table 1: The direct and indirect employment-generating effects of MNE subsidiaries

| Types of effects | Illustrations |
|---|---|
| **VERTICAL EMPLOYMENT EFFECTS** | |
| Upward (or "backward") | Employment generated in the farming affects community which supplies sugarcane to a new sugar mill, or in the local firms supplying components or semi-finished goods |
| Downward (or "forward") effects | Employment generated among the traders who distribute the fertiliser of a new fertiliser plant or in the construction firms which purchase and use the cement of a new cement plant |
| **HORIZONTAL EMPLOYMENT EFFECTS** | |
| Narrow horizontal effects | Employment generated (or displaced) in the local agricultural tool and machinery industry by a new agricultural machinery firm, or in the local footwear industry by a new shoe factory. |
| Broad horizontal effects | Employment generated in the food processing industry and the transportation industry as a result of the increases in agricultural production resulting from a new fertiliser plant or a new agricultural machinery firm |
| **MACROECONOMIC EMPLOYMENT EFFECTS** | |
|  | Employment generated or saved as a result of the better health conditions made possible by rural health clinics or a better water supply and waste disposal system |

Source: (ILO, 1984)

conclusions of this research - the firm does not indirectly create new jobs; rather, it generates an additional economic activity which can eventually be translated into the equivalent of a certain number of jobs. This process of translation is however rather shaky from a methodological standpoint, and the degree of precision one can achieve in reaching such figures is not very high.

The fact that an economic phenomenon of this nature is extraordinarily complex to measure does not mean that it is unimportant, or that it should be dismissed altogether, quite the contrary. One result of the growing recognition of the importance of the phenomenon, coupled with the acknowledgement that it was extremely difficult and perhaps even impossible to measure, has led to a process of perpetual quotation of the very few studies (e.g. Jo, 1976) which, on the basis of rather heroic assumptions, attempted to quantify these indirect effects in a specific industry or country at a specific point in time. In the same way, statements on this issue by a public official (a minister of labour or the director of an export processing zone authority) tend to be eagerly quoted and even overquoted, and thereby tend to acquire a scientific credibility which is at best questionable. However, the fact that a figure gets quoted time and again adds nothing to its intrinsic quality (which may be very poor); at best, it is a testimony to the poorer quality, or even the absence, of other more quotable data.

## CONVENTIONAL WISDOM AND THE GENERAL PICTURE

Any country open to direct foreign investment and committed to creating new jobs would ideally need some sort of yardstick, or predictor, of the indirect employment effects of an MNE's investments. In reality, there are no such yardsticks. The research on this subject conducted over the last ten years has nevertheless brought to light a few rules-of-thumb, or at least some very rough indications, as to the relative importance of these indirect employment effects of MNEs. This conventional wisdom, or general picture, might be summarised in the form of a few simple statements.

(1) The size of these indirect employment effects tends to be linked with the MNE subsidiary's length of operation in the host country: the longer established the firm, the more it contributes to generating indirect employment opportunities, notably through its backward linkages with domestic enterprises (Lall, 1983; Halbach, 1985).

(2) In the same way, the older established foreign firm, because it has been operating in the host country for a long time, tends to have a less disruptive impact on local employment than a newcomer: local firms have had more time to adapt to the competitive pressures of the MNE. A newcomer, like a new disease, first meets with an environment that has a very poor immunity, and it takes several years before this local immunity gradually builds up.

(3) Firms in highly labour-intensive industries (e.g. garments) tend to generate less indirect employment than firms in more capital-intensive industries (e.g. automobiles). Their direct employment effects, however, are much higher.

(4) Subsidiaries of firms which are already highly multinational tend, in the short and medium term at least, to generate somewhat fewer indirect employment opportunities than subsidiaries of less multinational, or more recently multinational firms (Halbach, 1985). The most likely reason for this is that the highly multinational enterprises already have a world-wide sourcing and distribution system, and need more time to adapt this organisational system to local purchasing opportunities than a smaller firm with a less sophisticated production system.

(5) The indirect employment generating effects of a firm are also to a large extent the result of corporate policy: some firms, as a matter of policy, deliberately seek to develop their backward and forward linkages with the host country's economy (for instance through technical assistance agreements with their suppliers), while others tend to rely on the normal interplay of market forces for the building-up of these linkages (Possas et al., 1983; Lall, 1983).

(6) The magnitude of these indirect employment generating effects is strongly influenced by the policies of the host country government (ILO, 1984): rules and regulations about local contents for instance play a major part in the development of purchases from local suppliers, and these purchases, in turn, indirectly generate large amounts of employment.

(7) Quite independently of their labour-intensity or capital-intensity, some types of industries tend to generate far more indirect employment opportunities than certain other types of industries. Food processing for instance (because of its large purchases of local fruit, vegetables or cereals) is a typical illustration of this; the electronics industry, by contrast, always takes a much longer time to build up its linkages with the host country's economy, and

therefore tends to generate much less indirect employment (Halbach, 1985; UNCTC, 1981; Moya, 1986).

(8) The indirect employment-generating effects of an MNE subsidiary are closely linked with export-intensity: the higher the export ratio, the larger these effects tend to be. The reason for this is relatively simple: the firm which exports has access to a market which is much larger than the domestic market, and this wider market will - all other things being equal, - induce the firm to purchase a larger amount of domestic components, services and raw materials than would be the case with a similar firm operating exclusively on that local market.

(9) The indirect employment effects of an MNE subsidiary appear to be rather closely linked with the firm's rate of growth: a fast growing enterprise will tend to generate indirectly more employment than a slow growing or stagnant enterprise. But if this growth is achieved at the expense of domestic enterprises, the employment-generating effects may be less than the employment-displacing effects.

(10) The marketing and distribution system of the MNE subsidiary can have major indirect employment effects. By deliberately choosing a 'traditional' distribution system (small shops and peddlers, rather than supermarkets for instance), a foreign subsidiary can have a noticeable impact on the number of new jobs created, or the number of existing jobs not displaced (Lall, 1983). In the same way, it can influence the volume of jobs indirectly created by choosing one type of sales and servicing organisation rather than another; in the case of the automobile industry for instance, the subsidiary can rely on exclusive dealerships, with relatively small indirect employment-generating effects, or in can on the contrary foster the development of smaller independent dealerships with a higher employment-generating potential (Bello and Iyanda, 1981).

(11) Fully-owned foreign subsidiaries generally tend - all other things being equal - to have somewhat fewer indirect employment-generating effects than subsidiaries with local equity participations. The main reason for this is that the local partner usually brings along an intimate knowledge of the local market, and notably of the opportunities to purchase local goods and services. It could also be that the presence of this local partner tends to discourage the subsidiary from the type of competitive or predatory pricing which puts local enterprises out of business (ILO, 1988).

(12) The technology choices made by MNE subsidiaries do not appear, in the short term, to have any noticeable impact on the process of indirect employment-generation or -displacement: a labour-intensive production process within the firm does not indirectly generate more jobs outside the firm than a highly capital-intensive process. In the long run, however, technology choices do have a great importance: the 'right' technology choices, i.e. the choices which allow a firm to grow rapidly, will indirectly condition the firm's indirect impact on the local employment scene (see point 9 above) (ILO, 1984).

(13) The indirect employment effects of an MNE subsidiary tend to be influenced to a certain extent by the nationality of the firm: Japanese firms for instance tend to have fewer backward and forward linkages with the host country's economy  - and hence fewer indirect employment-generating effects - than European firms. American firms generally fall somewhere between these two groups (Lim and Fong, 1981; Lee, 1984). Third World MNEs, and notably Indian MNEs, also tend, like the Europeans, to have relatively intensive linkages with the host country, and hence fairly high indirect employment-generating effects (Lall, 1983).

(14) MNEs from small countries seem to be more prone to develop vertical linkages with the local economy than MNEs from larger countries. All other things being equal, the subsidiaries of Dutch, Swedish or Swiss MNEs probably indirectly generate slightly more employment than subsidiaries of larger countries such as France, the United Kingdom or the Federal Republic of Germany. The reason for this could be the fact that  small country MNEs, precisely because their country of origin is small and less diversified economically, have a long practice of international sourcing. Another reason is that they are usually less constrained by the technical norms and standards which prevail in a much larger country.

The general pattern of things summarised in the above statements suggests that a lot more is known today about the indirect employment effects of MNE subsidiaries in the developing countries than was the case ten or even five years ago. This conventional wisdom is necessarily somewhat impressionistic, and the proofs which can be adduced to support it, in the form of hard data or clear-cut ratios, are for the time being still rather patchy.

Such conventional wisdom can serve as a useful if rough guideline for national policies in the field of employment or foreign investment. If a country's central priority is to promote employment for instance, it can target its efforts on attracting foreign firms in sectors which tend to have strong backward link-

ages or in sectors with a high export potential. If, on the contrary, the prio-
rity is to promote technological development and the building up of the coun-
try's endogenous capacity in the field of science and technology, its foreign
investment promotion effort will have to focus on completely different types of
enterprises. The conventional wisdom also suggests that a very liberal econo-
mic policy which allows foreign firms to operate freely on the local market is
in the long run less conducive    to the development of indirect employment
opportunities or of the country's technological capacity than a well conceived,
more 'dirigiste' type of policy.

In the long run, however, rough guidelines of this type are no substitute
for hard information on the exact scope of the indirect employment effects of
MNEs. These indirect effects may well be considerable. In fact, one of the impli-
cit assumptions underlying the present quest of many developing nations for
greater inflows of direct foreign investment seems to be that these indirect ef-
fects are not only considerable, but also essentially positive (i.e. the number
of new jobs indirectly generated by MNEs is much larger than the number of lo-
cal jobs displaced as a result of the competition from these firms).

This paper will therefore seek to explore some of the ways in which these
indirect employment effects could be calculated. Three assumptions underly our
quest. The first is that the present methods for evaluating these indirect em-
ployment effects of MNEs tend to give a very large, and possibly excessive, im-
portance to the firm's backward linkages with the local economy. Such a focus
on backward linkages, which results in large part from the greater availability
of data, had led to a certain neglect of the forward linkages and, perhaps more
important, of the firm's horizontal and macro-economic employment effects, which
could well be much more important. The second assumption is that the present
methods used for estimating these effects often fail to take into account the
time dimension, and that there therefore is a need for looking at things in a
much longer time perspective. One of the ideas here is that the major indirect
employment effects of MNEs are those resulting from the long-term structural
transformations of the host country's economy. The third assumption is that the
present methods tend to give much more importance to the indirect employment
generating effects than to the employment displacing effects. The latter may
be considerable  - and in this sense they represent an immediate cost, or dis-
benefit of foreign investment - but in the long run, these displacement effects
are part and parcel of the process of modernisation and structural change in the

host country's economy. Viewed in a long term perspective, they are thus not necessarily as negative as they might appear in a first analysis.

## THE CONSUMER SURPLUS APPROACH

One of the most understudied aspects of an MNE's indirect employment effects is the macro-economic effect. The MNE spends large amounts of money on wages and salaries, and this money in turn is used by local workers and managers to buy goods and services. This expenditure stimulates the development, and hence the employment-generating potential of the local industries (farming, housing, energy, transportation, etc.) which supply these goods and services. In most cases, it will also stimulate the import of consumer goods, and thus indirectly generate employment in other countries, and possibly even in the country of origin of the MNE, as clearly shown by the story of the export processing industries, or 'maquiladoras', in Mexico (Nieto and Saavedra, 1987).

This conception of the MNE's indirect employment generating effects is rather narrow, in that it looks only at the firm's expenditures, and the flow of these expenditures within the host country's economy. Macro-economic effects could also be viewed in a wider perspective: in addition to its local expenditures, the firm also produces goods and services which are sold on the local market, and these goods and services in turn indirectly contribute to generating new employment. This indirect employment effect is generally described as a forward employment effect (See Table 1), but could perhaps more appropriately be viewed as one of the important dimensions of the firm's macro-economic employment effects.

The way in which the firm indirectly generates these macro-economic employment effects can perhaps best be understood in terms of a consumer surplus. When selling its products - let's say a sewing machine or a car - to a customer, the subsidiary of an MNE, or for that matter any industrial firm, whether foreign-owned or domestically-owned, acquires a certain revenue, and the purchaser makes a certain expenditure. The price which the purchaser is willing to pay, or prepared to invest, depends on a number of factors, the most important usually being his perception that the price paid is lower than the benefit he expects to derive from the use of that product (or service). The difference between the price and the anticipated benefit is the consumer's surplus. In some cases, this surplus is to a large extent an intangible psychological satisfaction (as with the ownership of the latest model luxury car), but in most cases, it is a measurable

economic benefit. Take for instance the case of the housewife who purchases
her first sewing machine. This will allow her to do her usual needlework much
faster and more efficiently, start making clothes for her children and perhaps
even set up a little cottage industry that brings in an additional monetary
income. In the same way, the purchase of a car will reduce its owner's transpor-
tation costs (measured in monetary terms, and especially in terms of time sa-
ved) and most probably expand his range of job opportunities.

The purchaser's perception of the economic surplus accruing from the usage
of a particular product may of course be at fault. By and large, however, a
firm's ability to sell its products is conditioned by the existence of a very
real surplus, and even the most unsophisticated customer has a rough idea as to
why a product is 'worth buying'. This surplus may be fairly small, but when mul-
tiplied by the thousands or even millions of customers for a particular product,
it amounts to a very significant total. It is difficult to measure but can be mea-
sured. Such measurements have in fact been carried out in a number of instances,
one of the most important being the telecommunications industry. What several
researchers have tried to do in this industry is compare the cost of telephone
calls with the surplus accruing to the customer in the form of reduced trans-
portation costs, immediate availability of information and time saved (Kaul,1983;
Kamal, 1983; Saunders et al., 1983; ITU, 1986; Cañas, 1987).

In the case of telecommunications, the surplus invariably tends to be ex-
traordinarily high (i.e. between 5 and 50 times the cost of the service), and
this accounts in large part for the very long waiting lists for telephones in
all developing countries, or the equally long waiting lists for new types of
telecommunications services (facsimile transmission, mobile radio, etc.) in the
highly industrialised countries. In other industries, it may be much lower, but
it most probably exists everywhere. In fact, it could be argued that no indus-
trial firm could survive in the long run if the consumer surplus offered by its
products or services were consistently negative, or even simply equivalent to
zero.

Telecommunications is probably the sector where the most detailed and pain-
staking calculations of this surplus have been carried out, although it could
be argued that the cost-benefit analysis techniques developed by the big inter-
national development banks are at least as sophisticated on this score (Squire
and van der Tak, 1980; Baum, 1985; Jéquier and Hu, 1988). The research done in
the field of telecommunications shows that this consumer surplus can be calculated

with a relatively high degree of precision, and that the non-monetary compo-
nents of this surplus (e.g. the amount of time saved, the convenience of the
product or service, and even its reliability) can be translated into a reason-
ably satisfactory monetary equivalent.

The centrally important point to our line of reasoning here is that this
consumer surplus, which can be found in all types of industries, is not simply
an economic benefit, or the equivalent of an additional monetary income, for
the user or the customer: this additional income will either be saved or spent,
but in both cases it will reenter the economic circuit, and create a certain
amount of jobs, or an additional economic activity which stimulates the process
of employment generation. The farmer who is now earning more money because of
the availability of a telephone in the village may use this money to improve
his house, pay for the education of his children or purchase new equipment for
his farm.  The housewife who does her sewing faster because she now owns a sew-
ing machine, and who starts up a small cottage industry, will use this money
for her family and her house, and this expenditure will generate a measurable,
if small, increase in the country's overall economic activity. The same type of
observation can be made for virtually any other type of product, be it a car,
a washing machine, a dishwasher, a bulldozer, a power tiller or a numerically
controlled machine tool.

All these products are manufactured by industrial enterprises, and many of
them are multinational corporations. Our suggestion here is that the measurement
of the indirect employment effects of MNEs could perhaps most effectively be
tackled via the consumer surplus approach. This could in fact be a much more
rewarding line of analysis than the very complex input-output analyses carried
out - or rather proposed - by a number of researchers, and which often turn out
to be virtually inapplicable because of the poor quality of the available data.

This approach to measuring the indirect employment effects of MNEs raises
a number of technical problems which should not be dismissed offhand. The first
is the intrinsic difficulty of measuring this surplus. Intuitively, one can sense
that a sewing machine for instance, or for that matter a car or a small power
tiller, provides its user with a certain economic surplus. But translating the
intuition into hard data (or at least relatively hard data) is a complex and very
time-consuming process. To come back to the case of telecommunications, the
knowledge we now have on the size and nature of this surplus took over five years

to assemble, and involved dozens of research teams throughout the world (Saunders et al., 1983; Pierce and Jéquier, 1983). This experience gathered in the field of telecommunications could undoubtedly be applied to other industries or services, but experience from the telecommunications field shows that there is no real substitute for the detailed micro-level case studies. In the case of telecommunications, this involved for instance detailed interviews with farmers, businessmen and industrial firms about the frequency and purpose of their telephone calls, their willingness to use other means of communication (mail, transportation, etc.), the amount of time lost as a result of poor communications and their willingness to pay for better service.

Measuring the economic surplus provided by the sewing machine industry, the car industry or the agricultural machinery industry for instance would necessarily involve the same type of micro-level analyses. This brings us to the second important technical issue, namely that of representativity. Given the fact that such studies are expensive and time-consuming to carry out, and given also the extraordinary diversity of the universe we are proposing to study (MNEs in general, which are a far wider subject than just telecommunications), which are the sectors, the firms or even the specific products which should be studied in detail so as to provide some rough estimates of this surplus ? There probably is no satisfactory answer to this question, but it must in any case be raised.

A third and somewhat more complex technical issue is that of translating this surplus into jobs, or job equivalents. With the two first issues raised here - building up the basic data from micro-level case studies, and ensuring that these case studies are at least reasonably representative - a lot can be derived from the experience developed in the field of telecommunications, or for that matter from the experience of the big international development banks in the field of cost-benefit analysis. But when it comes to translating the surplus into jobs, the methodology which needs to be developed would have to be almost entirely original, since the work carried out in the field of telecommunications did not, apart for a few exceptions (Blanc, 1983; Jéquier, 1984), focus specifically on employment issues. Such a methodology can most probably be developed, and would in all likelyhood not be insuperably complex. The problem nevertheless deserves to be mentioned here.

As noted earlier, the consumer surplus generated by a particular product or service is not related, in principle at least, to the ownership structure of the firm offering that product or service on the market. The surplus comes from

the use of the product or the availability of the service, rather than from the firm itself, be it foreign-owned or domestically-owned. In this perspective, we are simply proposing to use this approach as a means of calculating the indirect employment of one particular type of firm, namely the MNE, operating in a particular type of environment, namely the developing countries.

Finally, it should perhaps also be noted here that we have been focusing until now on the indirect employment generating effects, and not on the indirect employment displacing effects. The latter are important, and should not be neglected. They could perhaps also be studied via the consumer surplus approach, but this line of research might prove to be rather more difficult to pursue. One reason for this difficulty is that most of the research carried out until now on this consumer surplus has been concentrating, as with the telecommunications studies mentioned above, on the surplus, and not on the 'minus'. As a result, there are few if any good methodological models to follow. A second and more fundamental reason is that the concept of a consumer surplus is perhaps the very negation of the 'minus' one might want to use in order to assess the employment displacing effects. In fact, as we shall try to argue later, the indirect employment displacing effects could probably better be taken care of through an analysis of the competitive effects of MNEs on the local economy of their host countries.

## THE TECHNOLOGY SURPLUS APPROACH

The recourse to the consumer surplus method might well prove to be one of the most effective methods for assessing some of the main indirect employment-generating effects of MNEs. One criticism which might be raised against this approach is that it fails to take into account one of the major aspects of an MNE's operations, namely its ability to foster technological change. MNEs today are the main driving force in the process of technological innovation, and are continually developing new products and improving the performance, quality and reliability of their existing product lines.

If we assume that the purchase of a particular product provides its customer with a measurable economic surplus, it stands to reason that this process of innovation in turn generates another type of surplus which might be described as the 'technology surplus'. Technically speaking, this surplus is very similar to the consumer surplus discussed above, but there is one rather subtle difference between the two: the consumer surplus is essentially an individual benefit accruing to the individual purchaser of a particular good or service, and the total

benefit to the country, in the form of an additional economic activity or an additional number of job opportunities, can be calculated simply by multiplying the individual benefit by the total number of beneficiaries (or customers). The technology surplus, by contrast, is of a more collective, or macro-economic nature, and involves a time dimension which cannot really be captured by the consumer surplus concept.

This can perhaps best be explained with the help of a simple example. Take for instance the case of washing machines. The consumer who purchased such a machine ten years ago got a good machine which provided him with a certain economic surplus. The consumer who buys a similar type of machine today (this may be the same customer of ten years ago who is replacing his old machine, or a much younger customer making his first buy) is getting something much better for a price which is probably even lower in nominal terms than it was ten years ago: the energy consumption of this new type of machine which be much lower, the number of programmes will be a multiple of that of the older machine, and its reliability will be much higher. In other terms, the consumer surplus of this newer machine will be a lot higher.

The technology surplus concept could be viewed as the means of capturing this difference, due to technological innovation, between the consumer surplus of yesterday and the consumer surplus of today. In a sense, it might be viewed simply as an extension of the consumer surplus concept, with the major difference that it takes into account both the technology factor and the time factor. The consumer surplus is essentially a benefit to the individual. The technology surplus, by contrast, is a more collective concept, in the sense that it usually involves different beneficiaries at different points in time. Each of these beneficiaries is of course an individual (or for that matter an individual enterprise), but the calculation of this technology surplus most probably needs to be calculated in the form of a macro-economic, or societal benefit, rather than in the form of a sum of individual benefits.

The more collective, or macro-economic nature of the technology surplus probably means that it should be calculated in a rather different way from the more conventional consumer surplus. The idea here - and it is still very much a tentative idea - is that the approach should be to look not an individual consumers (as with the consumer surplus calculations), but rather at the evolution of particular products over a long period of time, taking into account their performance, their reliability and their 'price per unit of service' (e.g. wash-

ing 4 kilos of dirty clothes in a washing machine, driving 1,000 kilometers with a car, making 100 telephone calls, keeping one ton of apples in a cold storeroom for six months, etc.).

Data are in fact available on this cost or price per unit of service in a number of industries. The most notable case in this respect is that of the electronics industry, and in particular computers and semiconductors (Zysman and Tyson, 1981; Braun and MacDonald, 1978; Jelinek, 1979; Klein, 1977). Another notable case is the telecommunications industry, where there are many studies on the compararative evolution of the cost of telephone services over relatively long periods of time, with very interesting cross-country comparisons (Berry, 1983; Maddox, 1972: ITU, 1988; ITU, 1986; Jussavalla and Lamberton, 1982; Jonscher, 1981 ; Porat, 1976). Electronics and telecommunications are probably the two most widely surveyed industries in this respect, and could probably serve as a very good starting point for measuring this technology surplus.

Data are also available for several other industries, but are generally less comprehensive. This is the case for instance of the automobile industry or the iron and steel industry. In addition to being much less comprehensive, these data, contrary to those which are available in the electronic or telecommunications industries, tend to focus on a particular aspect of the cost equation (such as the number of man-hours needed to produce a ton of steel) rather on the final cost to the consumer of the service provided by the product, and seldom if ever manage to capture the time dimension.

This can perhaps best be understood by looking at a specific case like that of the automobile industry. The cars of today are still basically similar to the cars of 50 years ago in their general conception (unlike today's computers compared to the computers of the 1950s): they still have four wheels, an internal combustion engine running on the same fuels, a steel body, and four to five seats. But every single component today is completely different from the components of 50 or 15 years ago, and the overall performance of the vehicle has improved beyond recognition. Witness for instance the much lower fuel consumption, the immensely higher degree of active and passive safety, the much lower maintenance costs (as illustrated by the fact that servicing intervals have gone from 5,000 to 20,000 km in the last 25 years), the much higher speed (which, given the speed limitations, helps to reduce wear and tear) or the innumerable accessories which were non existent or extraordinarily expensive 25 years ago (cassette decks, air con-

ditioning, on-board computer, four-wheel drive, four-wheel steering, ABS braking, etc.).

One can of course try to compare the cost of today's car with the cost of a similar car manufactured 25 or 40 years ago, and take into account the differences in the value of the currency used as a basis of comparison. The point however is that the two products are not similar at all, even if the basic configuration appears to be the same. How does one take into account the increased value to the car owner or to society at large (this is the technology surplus) of the fact that the durability of cars has increased considerably (today's 2-litre car can be driven for some 800,000 kilometers: in the early 1950s, the great maximum which could be expected was around 100,000 kilometers, and Mercedes had in fact designed a special certificate for the few duly registered cars of its make which had reached the unheard-of total of 200,000 kilometers !). Or take the case of the much higher safety of today's cars, due to better construction, more powerful brakes, better steering and a host of other features. This has resulted in a much lower statistical chance of being killed or wounded in a crash. This lower risk is another economic surplus for society as a whole, and actuarial techniques make it possible to calculate this benefit in a relatively precise way.

In fact, the automobile industry would probably be one of the best cases to serve as a basis for measuring this technology surplus and, from this technology surplus, for arriving at some estimates of the indirect employment generating effects. Since the near totality of the world's car output is accounted for by MNEs (UNCTC, 1983), this type of research would serve as a fitting illustration of our main concern here, namely the indirect employment impact of MNEs, as opposed to indirect effects in general. This industry also a a few other advantages. One of them is the availability of large amounts of raw data. Another is the high degree of homogeneity of the industry in general, and of the main firms in the industry. Finally, it is a very large industry: total annual output is in the region of $ 300 billion, which suggests that the indirect employment effects are quite staggering.

The technology surplus we are suggesting here as a means of assessing the indirect employment effects of MNEs would thus consist in trying to put an economic value to the advantages offered by better technology, and then translating this additional value into jobs, or employment opportunities. This would undoubtedly be a long and complex undertaking, but should probably not be more difficult than measuring the consumer surplus in the telecommunications sector.

Research into this technology surplus could benefit from the fact that a few economists have already tried to integrate the technology change factor in economic statistics. Authors such as George Gilder, Paul Hawken or Joel Popkin have observed that GNP statistics, or for matter statistics on industrial production, invariably fail to take into account the increasing quality and performance of goods and services produced by enterprises, and notably MNEs (in the U.S. statistics for instance, the price of computers is estimated to have been raising on the average at 1 per cent per year; given the tremendous increase in performance, this assumption is quite clearly unrealistic); this leads to gross overestimates of the rate of inflation, and to even larger under-estimates of the real size of a country's GNP (Gilder, 1984; Hawken, 1977; Popkin, 1983).

This line of research, or rather of critical thinking, is still in its early stages, and puts into question a number of very fundamental assumptions in the field of statistics and macroeconomic policy. Its importance however is considerable. What is more, it could be as useful a source of inspiration in building up our understanding of this technology surplus as the earlier research on telecommunications could be in developing our understanding of the consumer surplus and its relationship with the process of indirect employment creation by MNEs.

## THE TIME SURPLUS APPROACH

Durable consumer products such as cars, washing machines, dishwashers or television sets provide their users with a certain economic surplus. And their increasing technological sophistication provides both their users and society as whole with what we called a technology surplus. This technology surplus could be viewed as one of the major dimensions, or components, of the consumer surplus, but should probably be analysed separately since it is of a more collective or macroeconomic nature and since, unlike the consumer surplus, it tries to take into account the longer term technological perspective.

Another important component of the consumer surplus is what might be called the time surplus. This is perhaps most conspicuous in the telecommunications sector: the availability of a telephone provides its user with a measurable economic benefit, but also with a saving in time (a phone call is a faster way of transmitting and receiving information than a letter, and may save hours or even days if it can replace a face-to-face conversation). This saving in time can be

translated into an economic benefit by simply multiplying the amount of time saved by the average unit cost, or price, of this time (i.e. average wage per hour or per day).

Intuitively, one can sense that this time dimension of the consumer surplus probably has more to it than an individual, short term benefit and that there are much longer term benefits of a more macroeconomic nature which are not satisfactorily captured by the consumer surplus approach developed in the field of telecommunications for instance. This can perhaps best be understood by looking and the evolution of domestic working conditions in the last 50 years and the structural evolution of the labour force in the highly industrialised countries. These countries have been characterised by a high increase in the participation rate of women in the labour force. This structural change is the result of a number of complex economic, sociological and educational factors. But what has contributed perhaps most directly to making this evolution possible is the development of an extraordinarily wide range of durable consumer goods, virtually all produced by MNEs, which have relieved the housewife of a vast amount of time-consuming (and often back-breaking) chores, and thus provided her with the possibility of taking on a salaried job outside the house.

Every one of these modern durable consumer goods provides its user, day-in and day-out, week after week, with a small but measurable saving in time. Think for instance of the refrigerator, which allows not only for a much more sanitary storage of food, but also for savings in transportation time (going to the supermarket once a week, instead of going every day to the local store). The dishwasher saves an average of between 30 and 60 minutes per day at the least, which at the end of year makes a total of perhaps 300-400 hours. The benefit in time saved offered by a washing machine is at least as big, if not bigger, and the same line of reasoning could be taken for the innumerable types of machinery and services now available in any standard modern household (water supply, hot water, electricity, gas, central heating, etc.), or even for the products consumed by an average household (semi-processed foods for instance).

All these products and machines are the result of technological innovations developed by industrial firms which happen to be, or to have become as a result of their success on the market, multinational enterprises. This tidal wave of technological change in the household has been at the origin of profound social and economic changes. As a small illustration, one could recall here the fact that in 1935, the most important job category in Great Britain after farming was

that of domestic servants, which have since then almost all been replaced by the different types of machines and services now available to the average house-wife.

This economic and social impact of MNEs could be approached in a number of different ways. The one suggested here might be look into the time surplus factor: by looking at the amount of time gained, or saved, over a long period of time as a result of the availability of these new products and services, it should in principle be possible to arrive at some rough figures of the work possibilities, or indirect employment opportunities, thus created. One could object that all this time saved is not necessarily devoted to salaried productive work outside the home. The fact is, however, that the amount of time which is devoted to supposedly 'unproductive' activities (e.g. reading, sports, education, movie-going, etc.) indirectly also contributes to generating jobs, for instance in book publishing, the manufacturing of sports goods or the production of musical instruments.
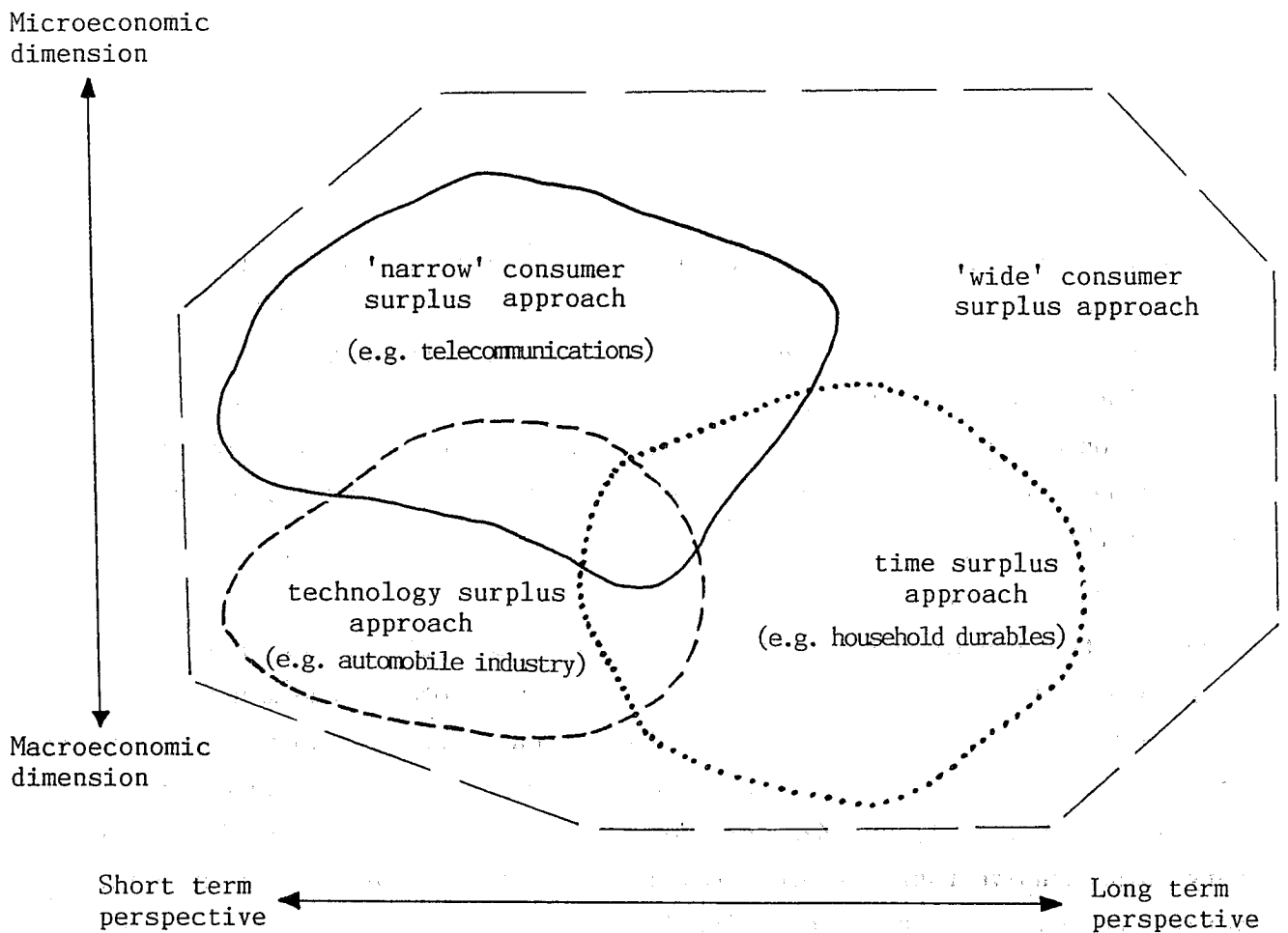
The time surplus suggested here may be a rather narrow approach to what is in fact a much wider issue, namely the creation of wealth through technological change. In has, however, one fundamental advantage to our central concern here about employment effects: time, unlike money, is an unchanging yardstick, and it can be converted fairly easily into the equivalent of employment opportunities quite independently of the level of income of different countries, or of the changes in this level of income over a long period in a particular country.

The industries which might serve as the best basis for this time surplus approach to the measurement of the indirect employment effects of MNEs should most probably the durable consumer goods sector, and notably the manufacturing of the various types of durable household equipment mentioned above. Most of the firms in this field are multinational enterprises, and the great majority of them (Philips, Siemens, Moulinex, Zanussi, General Electric, Hoover, etc.) produce a very comprehensive range of products, and have been active in this area for several decades. Case studies of individual enterprises would thus be rather revealing, in the sense that they would make it possible to take into account both the long term time perspective and the product diversity perspective.

This time surplus approach could be viewed as an extension of the more traditional consumer approach and perhaps as a deepening of the technology surplus approach. These three approaches, taken together, would succeed in covering both

the microeconomic and the macroeconomic dimensions of the MNE's indirect em-
ployment effects, as well as the short-term and the long-term perspective. There
is of course a certain amount of overlapping between these three approaches, as
illustrated in Figure 1, and they should be seen essentially as three components
or aspects of a much wider and more comprehensive surplus approach which has yet
to be carried out.

Figure 1: The different surplus approaches to the indirect employment effects
of multinational enterprises

Microeconomic
dimension

'narrow' consumer
surplus    approach

(e.g. telecommunications)

'wide' consumer
surplus approach

technology surplus
approach
(e.g. automobile industry)

time surplus
approach

(e.g. household durables)

Macroeconomic
dimension

Short term
perspective

Long term
perspective

## THE SURPLUS CONVERSION ISSUE

The research work done in the field of telecommunications shows that it
is possible (although neither cheap nor quick) to make fairly good estimates
of the economic surplus accruing to individuals as a result of the availability
of a particular good or service. In the same way, judging from what we already
know about an industry such as automobiles, it seems possible to make some sort
of evaluation of the technology surplus and measure it in dollars and cents.
In the case of the time surplus, it can be measured either in monetary terms, or
more simply in man-hours or man-years of work, of potential work.

This however does not solve the apparently rather complex issue of con-
verting these figures in numbers of jobs, or volume of employment opportunities.
Assume for a moment that the surplus accruing to a family from a particular ser-
vice or from the availability of certain types of goods is estimated to be in
the region of lets say $ 1,000 in a certain year. This figure for one household
could be multiplied by the number of households in the country to get an idea
of the total benefit, or surplus, to the national economy, with the appropriate
allowances made for the penetration of this particular type of product or ser-
vice in the country.

With a penetration rate of 50 per cent (half of all households have access
to this product or service) and a total number of households of 1 million (this
would be a relatively small country - perhaps 4 million people - with a medium
level of per capita income), this corresponds to a total surplus in the region
of $ 500 million.  This surplus will generate an additional economic activity
in the country, either through immediate expenditures or through savings (i.e.
a deferred expenditure). But to how many new jobs does this additional economic
activity effectively correspond ?

The simplest approach would probably be to divide this surplus by the aver-
age wages, or average output per worker, in this country. This may give a first
indication of the approximate number of jobs indirectly generated by this sur-
plus. A simple ratio of this type however fails to account of the fact that a
large part of the surplus thus generated may in fact be spent on imported goods,
rather than on locally-produced goods and services. In other terms, the indirect
employment-generating effects may be taking place, at least in part, abroad
rather than in the country where the surplus is generated. Allowance can be made
for this phenomenon (and should in fact imperatively be made), for instance by
reducing the size of the surplus in line with the economy's overall propensity

to import. Thus if imports represent 20 per cent of GDP, one could automatically reduce the surplus by the same amount. This approach however probably does not sufficiently take into the fact that the additional income accruing to the average consumer from this surplus may be spent on a much higher proportion of imported goods than anticipated. In other terms, the import propensity may not be 20 per cent, as it is for the economy as a whole, but maybe 50 per cent or even 80 per cent.

The indirect employment generating effects of this surplus will not of course disappear. They will simply be taking place in another country. But since the income of the country where these imported goods and services are produced may be much higher, the overall employment-generating effects may be considerably lower. Take for instance the hypothetical surplus of $ 500 million generated in a country of 5 million people with an average per capita income of $ 2,000 (or a household income of $ 10,000). This might indirectly generate a total number of jobs in the region of 100,000, if we assume an average wage or output per worker of the order of $ 5,000. If, however, 80 per cent of this surplus is spent on imported consumer goods coming from a highly industrialised country with a per capita income of $ 15,000, the total number of jobs indirectly generated by this surplus will be of the order of 30,000, i.e. more than three times lower (the basis of calculation is the following: 20 per cent of $ 500 million spent locally will indirectly generate 20,000 jobs; the 80 per cent spent abroad will generate around 10,700 jobs in the country from which these goods are imported, on the assumption that the output per worker bears the same relationship with per capita income  - 2.5 to 1 - as in the country where the surplus is generated).

This very rough  rather theoretical   example suggests that these indirect employment effects are very sensitive to the patterns of expenditure. One cannot assume simply that the surplus will generate all the jobs locally, or even that the share of the surplus spent on foreign goods will correspond roughly to the country's overall import propensity.

This issue clearly brings to light the need for two types of research. One concerns the typical patterns of consumer spending, and notably the patterns of surplus spending. In most countries, there are good statistics on household incomes and the amount of money spend for food, housing or services. These statistics, however, tell us very little, if anything, about the ways in which consumers

spend their additional income from year to year. What in fact would be needed is interview-based research, where a carefully chosen sample of consumers would be asked how they would spend an additional income of X per cent over their present revenues, and try to find how much of this expenditure would go to imported goods. One could also look at past expenditures, and ask the same sample of people what were their major non-recurrent expenditures in the the preceding two or three years, and assess how much of that was spent on imported goods.

The other type of research which is needed here concerns the conversion of the surplus: data are needed on average wages, average output per worker and productivity, so as to arrive as reasonably accurate ratios for calculating the effective employment effects of such surpluses.

Two other types of complementary information would also be needed to make this surplus approach fully operational. One concerns the distribution of the surplus within the country. Intuitively, one can sense that a surplus accruing to a rural region might have much larger employment effects than the same surplus accruing to an urban region. The reason for this is that the rural dweller, because of his much lower income, will probably spend most of the additional income on very basic goods such as housing, food or clothes which are locally produced. And when it comes to durable consumer goods, or even investment goods, he may be more prepared than the sophisticated city dweller to buy the lower quality and less well designed domestic product.

Another type of information concerns the availability of opportunities to spend the money resulting from this surplus: in countries with a tightly controlled foreign exchange and trade system, and a local industry with a limited production capacity, any additional income, and notably that accruing from one or the other types of types of surpluses we have been discussing, cannot find an outlet – be it a spending opportunity or an investment opportunity – and the additional income from the surplus will do little more than fuel domestic inflation. In other terms, the structure of the local economy most probably plays an important but largely unknown part in determining the indirect employment effects of these different types of surpluses.

## THE COMPETITION-LINKED EMPLOYMENT EFFECTS

As we observed earlier on in this paper, our knowledge about the indirect employment effects of MNEs is rather unbalanced. A considerable amount of research has been done in recent years on the vertical effects (or linkages), and

notably on the backward effects of MNEs (UNCTC, 1981; Germidis, 1980; Watanabe, 1978; Edelberg, 1976), and from this research, one can derive some estimates of the order of magnitude of some of the MNE's indirect employment effects (ILO, 1984). The employment effects resulting from the firm's macro-economic linkages with the host economy or from its forward linkages are far less well known, although several authors have made valiant efforts to put specific numbers on the amount of jobs indirectly generated through these linkages (Gershenberg, 1983; Lall, 1983; Bello and Iyanda, 1981). The three approaches suggested above, namely the consumer surplus, the technology surplus and the time surplus, could be one promising way of tackling both the forward employment effects and the macro-economic employment effects.

This still leaves us with a vast unexplored territory, namely the MNE's horizontal employment effects, i.e. its effects upon local industries in the same sector (these are the narrow horizontal effects) or in other sectors in the host country (broad horizontal effects). These horizontal effects are in essence those stemming from the competition between MNEs and local enterprises. Some of these effects are undoubtedly negative: a typical instance might be that of the modern shoe factory of foreign origin which displaces thousands of small workshops producing hand-made shoes, or the metal kitchenware firm whose products will gradually push the local potters out of their job. Cases of this nature are often adduced as an illustration of the negative effects of competition, and notably of competition from MNEs, but a closer look suggests that the phenomenon is usually much more complex.

For one thing, the market which a newly-established MNE is entering is seldom a static market. To take the case of footwear, in most countries, the local market is probably growing relatively rapidly as a result of population growth and the overall increase in income. The foreign firm may be contributing to the disappearance of many traditional shoemaking jobs, but it will more probably be simply capturing the greatest share of this additional demand caused by rising incomes and demographic increase. In this sense, the job displacement effects may be far lower than they are thought to be. By providing the market with products which are cheaper, longer lasting or simply more attractive from an aesthetic point of view, it is generating a modest consumer surplus which contributes to employment generation in a whole range of other industrial activities. This indirect employment-generating effect must be balanced against the job losses in the traditional shoemaking sector.

In other cases, the market which the foreign subsidiary is attempting to penetrate may in fact not yet exist, and what the firm will be doing is to create an entirely new market within the host country for a particular group of products or services. This market-generating aspect of foreign investment is extremely important, both in terms of new jobs thus generated and in terms of structural change within the host country's economy. Take for instance the case of a foreign firm which starts to manufacture telephone equipment for the first time in a particular country. In the long run, its products, installed and operated by the national telecommunications administration, will contribute to displacing a sizeable number of jobs in the urban messenger community, but the possibility now given to local businesses to exchange messages by phone rather than by human carriers will bring about an enormous increase in the efficiency of these local businesses (Tyler, 1983), and this increased efficiency will probably in the long run indirectly generate far more jobs than might have been lost in the local messenger services.

When looking at the indirect employment effects of an MNE, account should be taken of the type of market in which the firm is operating: is it a static market, a growing market, or an entirely new market ? And whatever the type of market, what are the longer term structural changes brought about by the presence of this foreign firm ? For the moment, we are largely reduced to rather tentative speculations as to the exact nature of these indirect employment effects. What is needed is some rather detailed case studies of individual firms or even individual products to assess in a precise way what are the overall employment effects. This would mean looking in detail at the development of a particular firm in a particular country, at the evolution of local enterprises in the same sector, and at the subsidiary's indirect influence on the technological modernisation of these local enterprises.

The difficulty here is of course to pick out case studies which can be considered as fairly representative, rather than case studies where these indirect employment effects are so obvious (in a positive or negative sense) as to be of little general interest. The purpose of such cases is not to illustrate a particular thesis, but rather to try to get a general idea of what is likely to be happening in the host country's economy as a result of the activities of foreign subsidiaries: are the indirect employment effects linked to competition with domestic enterprises positive or negative ? And be they positive or negative, what is the approximate size of this effect, measured in number of jobs or employment opportunities ?

It may also be revealing to take into account here the alternative situation hypothesis, namely what might have happened in the absence of the MNE which is being studied. One should not forget that if the presence of an MNE may well have some negative effects as far as employment is concerned, the absence of such a firm may have equally or even more negative effects: a local enterprise using foreign technology to acquire a dominant share of the local market may be much more aggressive, and successful, than a less experienced foreign firm, and the negative employment effects of its activities may well be greater. One way of tackling this alternative situation problem might be to pick out pairs of case studies, by taking for instance the same industry in two countries at a reasonably similar level of development, but very different in terms of receptivity to direct foreign investment. This might mean choosing for instance the footwear industry in Kenya and Tanzania, or a particular sub-sector of the durable consumer goods industry in Morocco and Algeria.

Such an approach would probably provide some interesting answers about the competition-linked indirect employment effects (or narrow horizontal effects, to use the familiar term). It could perhaps also provide some answers about a somewhat more complex issue, namely the indirect employment of MNEs on domestic firms in entirely different industrial sectors (the broad horizontal effects). Intuitively, one can sense that a foreign firm's activities must have some sort of indirect employment effects far beyond the narrow confines of the industry in which this firm is operating. The subsidiary manufacturing agricultural machinery for instance will clearly, through its innovations, its marketing practices or its pricing structure, have a significant impact on domestic machinery manufacturers. But ultimately, the most important indirect employment effects are those taking place within the farming sector as a whole. In the same way, a newly-established foreign computer firm will modify the structure of the local market, but the big employment effects are to found in the industries and service enterprises which will be using the computers manufactured by that foreign firm.

These broad horizontal employment effects are rather more complex to analyze than those which can be observed within a given industry. Through the sale of its products or services, the subsidiary is contributing to structural transformations downstream, i.e. to a modification of the nature of competition in the sectors which are using the products manufactured by that foreign firm. In order to understand this phenomenon, the case studies should focus in priority

on firms producing capital goods, rather than consumer goods (e.g. agricultural machinery, computers, electrical machinery, etc.). Alternatively, it might be interesting to pick one or two firms producing basic goods which serve as inputs to a wide number of industries (like steel for instance, or cement) or which undergo a long chain of transformations in a more limited sector of the economy (this might be the case of certain types of basic chemicals).

Another approach might be to look at the long term 'efficiency effects' – and the employment consequences of such effects – resulting from the diffusion of the MNE's products or services. One industry which could serve as a good starting point for analysing these effects is the truck industry: the number of firms is relatively small, a relatively good amount of information on this industry is available from earlier case studies or company studies, its products are very homogeneous, and a lot of data could probably be found on costs, prices and employment from the local trucking industry. The idea here would be to look simultaneously into the indirect downward employment effects (i.e. in the trucking industry itself) and the broader horizontal employment effects, which could be approached from this efficiency standpoint. One can assume that the diffusion of more modern higher performing trucks contributes to increasing the overall efficiency of a national economy – for instance in the form of lower transportation costs, faster transportation and, perhaps most important of all, new business opportunities resulting from this availability of better transportation. This increased efficiency results in some sort of economic surplus, which can be translated into a certain number of new jobs.

Another industry which might also be worth analysing on this score is the air transportation industry, and notably the air cargo sector. It is known from the experience of many developing countries that the availability of inexpensive air cargo has indirectly led to the development of entirely new types of industries (e.g. flower exports in the case of Kenya for instance) or to the rapid expansion of more traditional industries (e.g. meat exports from Mali or the Central African Republic, vegetable exports from Burkina Faso). Quite clearly, the increases in exports made possible by air transportation are not attributable to this industry alone, but its presence is one of the key conditions for the development of such exports, and hence for the expansion of new employment opportunities. The research we are suggesting here could perhaps also be tied into another important industrial phenomenon, namely the export processing zone (EPZ), and it is interesting to observe here that in the vast literature on EPZs, there are practically no studies on this transportation dimension (ILO, 1988).

## THE EXPORT-LINKED EMPLOYMENT EFFECTS

The indirect employment effects of MNEs, just like the direct employment effects, are closely linked with the firm's export performance: the higher the export ratio, the greater the volume of employment directly and indirectly generated by the firm. Export performance is also closely linked with the employment displacing effects: a firm which is exporting the totality of its output will have far fewer, if any, displacing effects on local industries than a firm which is actively competing against domestic enterprises on the local market. This in fact is one of implicit attractions of EPZ industries to a growing number of developing countries.

This linkage between export performance and indirect employment effects could serve as a basis for exploring what might be called the world-wide dimension of the employment creation and destruction process. In effect, the direct and indirect employment effects resulting from exports are a zero sum game: what is gained by one country is lost by another. This can be illustrated with the case of the automobile industry. There are today some 100 countries with an automobile industry which, in the most elementary cases, may consist simply in a small assembly plant which does no more than put together a few thousand cars per year imported in CKD form (completely knocked down). Virtually all these local industries are subsidiaries of, or joint ventures with, the big MNEs that account for the near-totality of the world's car output (UNCTC, 1983).

A significant number of these domestic automobile industries in the developing have started to export cars (e.g. Malaysia, the Republic of Korea, the Philippines, Argentina, Brazil, Mexico, etc.), and these exports, although they are generally still relatively modest, contribute directly and indirectly to the local employment generating process. One can thus assume that the export ratio of these domestic automobile industries are a good indication of their direct and indirect employment-generating potential: the higher the export ratio, the greater the number of jobs created in the host country.

However, if one looks at the problem in a more global perspective, the picture appears rather different. A country may be exporting quite a large number of cars, and thus generate many jobs both directly and indirectly, but from the viewpoint of the national economy, the critical variable is not exports per se, but rather the net export performance: if a country exports let's say 10,000 cars per year, but at the same time imports a 100,000 foreign manufactured cars, it is in fact 'loosing' the direct and indirect employment generating potential

offered by the total net domestic market of 90,000 cars. Or, to put things dif-
ferently, its net imports  of 90,000 cars are generating employment opportuni-
ties elsewhere, i.e. in the exporting countries.

This suggests that the direct and indirect employment effects cannot be
analysed in a purely national perspective. As a result of international trade,
the creation, displacement and non-creation of jobs has become a truly world-
wide phenomenon, and the performance of any country in this respect must be put
in relation with what is happening elsewhere in the world. The automobile in-
dustry might serve as a good basis for analysing both the export-linked employ-
ment effects of MNEs and the world-wide dimension of this phenomenon, and could
help to correct the conclusions which might come out of purely national case
studies.

Globally, international trade is always a zero-sum game: what is exported
by one country must be imported by another, and the net global employment effects
from trade as such might in a first analysis be viewed as neutral. This may well
be true in a purely static perspective. However in a more dynamic long term
perspective, international trade indirectly contributes to creating entirely
new markets, and a new market demand, which in turn generate many direct and in-
direct employment opportunities. To come back to our case of a developing coun-
try which exports 10,000 cars but also imports 100,000 cars: it may indeed be
loosing the employment potential offered by a net domestic market of 90,000
cars, but had it not been for these imports, and notably for the imports in the
previous years, a small domestic car industry would most probably never have
emerged, and it is the availability of imported cars in the first place which
created and stimulated demand. The function of MNEs in this perspective is not
simply to meet a demand, but to some extent to create this demand, and in doing
so, it generates, directly or indirectly, first in its country of origin and
later in other countries, a large number of employment opportunities.

Our suggestion here would therfore be to take the automobile industry
as a case for illustrating these world-dimensions of the employment generating
process, and for exploring the complex linkage between employment generation
and the creation of this market demand which directly or indirectly gives rise
to new employment opportunities. Contrary to the other types of studies alluded
to in this paper, this one would necessarily have to be very global and very
macro-economic. Conceptually, it may be rather difficult to plan and carry out,

but it could probably provide many new insights into the MNE's direct and
indirect employment effects.

## CONCLUSION

The various approaches outlined here for analysing the indirect employment
effects of MNEs are still very tentative and it is difficult to foresee how oper-
ational they might turn out to be. The main problem lies not in the methods of
analysis themselves as in the very complexity of the issue. Philosophically,
these indirect effects probably have the same degree of complexity as particle
physics: the more one learns about the structure of the system and the nature
of its components, the more complex the whole thing  appears to be, with the
result that more knowledge contributes to extending the boundaries of one's
ignorance.

The lines of research suggested here therefore cannot hope to 'solve the
problem' or to provide entirely satisfactory answers to all the questions one
may be asking about these indirect employment effects of MNEs. They could never-
theless help to provide a much better picture than the one we have today, and
to give some indications as to the nature and scale of these effects.

From a practical point of view, two broad lines of analysis could be en-
visaged. The first would focus on entirely new types of case studies or country
studies. The second would try to build on the research which has already been
carried out in specific sectors, or on specific firms and countries, and try
to build up upon the data and insights gathered in the course of these studies.
This would would be a way of building upon the experience curve. In practice,
the two lines would probably have to be followed simultaneously.

The complexity of the issues and the rather inconclusive nature of the res-
earch carried out until now in this field does not mean that the problem is in
itself unsolvable. In this respect, the story of the research conducted on
the economic benefits of telecommunications is rather revealing: ten years ago,
practically nothing was known about the subject, and the intuitions of a few
visionaries were at best rough insights without any immediate operational va-
lue. Today, by contrast, we know quite a lot about the subject, and although
this knowledge is still very incomplete, it has nevertheless proven sufficient
to bring about an entirely new perspective in the financing of telecommunica-
tions projects in the developing countries. The same could happen in the field

of direct foreign investment, and the lines of research outlined here might serve in the long run as a basis for much more effective national policies with regard to MNEs.

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