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# Multinational enterprises and employment-oriented "appropriate" technologies in developing countries

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This is one of the working papers prepared for an ILO pilot study on the development by multinational enterprises of appropriate technology for maximum employment creation in developing countries, undertaken by the ILO's Multinational enterprise programme. Responsibility for the opinions expressed in the working papers rests solely with their authors and the release of the working papers does not constitute an endorsement by the ILO of the opinions expressed in them. The working papers are intended to provide elements for further discussion of the subjects treated.

Other studies dealing with the subject of appropriate technology and employment creation are Working Papers Nos. 16, 17, 19 and 21 which are listed in the Appendix.

# MULTINATIONAL ENTERPRISES AND EMPLOYMENT-ORIENTED "APPROPRIATE" TECHNOLOGIES IN DEVELOPING COUNTRIES

## 1. Introduction

"Multinational enterprises, when investing in developing countries, should have regard to the importance of using technologies which generate employment, both directly and indirectly. To the extent permitted by the nature of the process and the conditions prevailing in the economic sector concerned, they should adapt technologies to the needs and characteristics of the host countries. They should also, where possible, take part in the development of appropriate technology in host countries."

The above passage is from the Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy adopted by the Governing Body of the International Labour Office in 1977.[1] Motivated by these principles, the ILO's multinational enterprise research programme envisages a series of case studies as part of its research project on the development of appropriate technology by multinational enterprises for maximum employment creation in developing countries. They are intended (1) to assess the direct and indirect employment effects of technologies adopted by such enterprises and (2) to examine main constraints on and incentives for their contribution to the development and diffusion of employment-oriented appropriate technologies. The purpose of the present paper is to provide a conceptual framework for these studies. References will be made here and there to findings of relevant field work for illustration, but neither a review of literature nor an assessment of the employment effects are intended. The objective of the paper is rather to define the areas to be covered by the case studies that will be commissioned for the project, and to identify a number of issues and factors to be borne in mind by the researchers who will carry them out.

With unemployment and underemployment continuing to grow rather than dwindle in most of the developing countries, studies

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[1] ILO: Tripartite Declaration of Principles concerning Multinational Enterprises and Social Policy (Geneva, 1977), para. 19.

on employment problems and strategies have proliferated in recent years, including those on the effects of multinational enterprises which are often major engines of industrialisation in these economies.[1] However, opinions still remain split as to whether these companies are making sufficient efforts to help the host countries in attaining their development and employment goals.[2] In many cases, results are inconclusive. Thus, the question of the appropriateness of technologies adopted by multinational enterprises seems to be particularly in need of further examination.

Certain methodological weaknesses are common in existing studies on the subject. Researchers often compare the technology used by a multinational in a host country with that in its home country, and proceed to argue about the existence and extent of technological adaptations. The feasibility of such adaptations naturally varies from industry to industry. In fact, they are quite limited in certain industries where many multinationals operate for economic and technological reasons, to be discussed shortly. The multinationals' performance is, also, constrained by many factors (both economic and technological) over which they have little control. It would be more fruitful then if one, therefore, started from an analysis of what could be realistically expected from a multinational enterprise when the product and certain local conditions are given, and then proceeded to examine how far its actual achievements have exceeded or fallen short of the expected results. The examination of the causes of the gap between the expected and the actual performance will provide important hints for both policy-makers and other enterprises. Sometimes multinationals and local enterprises are

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[1] The ILO has also recently undertaken a series of studies on employment effects of multinationals in different countries or regions, most of which have appeared in the working paper series listed at the end of the present paper.

[2] For a survey of literature on this subject, see Sanjaya Lall: "Transnationals, domestic enterprises, and industrial structure in host LDCs: a survey", in Oxford Economic Papers, July 1978, pp. 217-248, and various papers in James H. Street and Dilmus D. James (ed).: Technological progress in Latin America: the prospects for overcoming dependency (Boulder, Colorado, Westview Press, 1979), especially G. Richard Bath and Dilmus D. James, "The extent of technological dependence in Latin America", pp. 11-28.

compared with respect to the capital-output and/or capital-labour ratios. This approach is unsatisfactory because it is difficult to obtain comparable data and because capital equipment in foreign investments (including joint ventures) tends to be considerably overvalued. An example of the latter problem is offered by Enos who found foreign exchange allocations for capital goods imported by the salt industries in Indonesia, the Philippines and Thailand to have been exceeding the actual requirements by 50 per cent or more. The excess was sold on the black market.[1] His study did not relate especially to multinationals, but similar overvaluation is also likely in the case of these enterprises.

Another problem is that many of the existing studies cover only the direct employment effect, confining the scope of their analysis to the capital intensity at the enterprise or, at the most, the industrial level. It is, however, the total effect, i.e. the contribution to the aggregate employment in the economy, that matters. Even if steel mills, synthetic textile mills, or chemical fertilizer plants are very capital-intensive and have little scope for technological adaptations, their establishment may expand opportunities for employment and higher incomes in the user industries (i.e. metal engineering, garment manufacturing and agriculture).

Also to be kept in mind is that over-emphasis on the use of labour-intensive technology may result in a loss of international competitiveness and eventually in a decline in the number of job opportunities or in the rate of their increase as has been demonstrated in the case of Indonesia's batik industry,[2] or India's garment industry.[3] An evaluation of the technology used by a multinational must take account not only of the direct effect, which is a combined result of its technological characteristics

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[1] J.L. Enos, "More (or less) on the choice of technique with a contemporary example", in Seoul National University Economic Review, Dec. 1977, pp. 177-99.

[2] Mohammad Sadli, "Application of technology and its employment effects: the experience in Indonesia", in Edgar O. Edwards (ed.): Employment in developing nations (New York, Columbia University Press, 1974), p. 370.

[3] S.K. Subramanian, "Subcontracting in India", in Susumu Watanabe (ed.): International subcontracting: a tool of technology transfer (Tokyo, Asian Productivity Organisation, 1978), p. 95.

(e.g. labour intensity) and the marketing capacity of the enterprise, and the indirect, long-term effects. This complicates the analysis considerably, since the extent of the market for the multinational's products (especially intermediate goods) and their indirect effects are largely determined by factors over which these enterprises have little control.

Once the researcher's concern shifts to the total employment effect, his task becomes difficult for another reason, too. Namely, he has to give thought to the opportunity cost of the multinational's operation: what would the employment situation have been without this enterprise? Would there have been at least equal employment opportunities? Here, the mode of financing the capital and foreign exchange will be a crucial factor: has the necessary capital and foreign exchange been brought in by the company, or have local resources been spent?

## 2. The extent of employment effects

The direct employment effect of an investment is the employment created in the investor's own plant, which can be easily assessed through a company study. Its indirect effects are naturally more complicated and difficult to quantify. Chart 1 depicts major conceivable indirect effects, excluding temporary employment created at the time of the construction of the investor's plant. The solid lines indicate the primary indirect effects that the multinational's operation will immediately generate outside its plant, while the dotted lines indicate the secondary indirect effects on the economy that accrue from the primary effects.

A multinational's impact on the tax revenue, the balance of payments, and the supply of financial resources in the country can be significant; but it is practically impossible to evaluate employment effects of changes in such variables. No less difficult is the assessment of the multiplier and accelerator effects of the enterprise. The researchers will have to neglect, therefore, the left-hand side of the chart. In a case study of one enterprise this seems justified since its scale is small compared with that of the manufacturing sector of the economy as a whole.

The direct employment effect of a multinational is determined by three factors: (1) the labour-intensity (labour-output ratio) of the product, (2) the size of existing market for the product, and (3) the ability of the enterprise or its marketing agents to expand the market. As already mentioned, the range of choice of technology open to the multinationals is, generally speaking, fairly limited (for the reasons to be discussed in the next section). In many industries where multinationals are common, moreover, all kinds of factors, internal and external to them, make the market imperfect and the demand for their products is rather inelastic with respect to the price. So long as the home market is concerned, therefore, one can tell the scale of direct employment expected of a multinational more or less precisely, once the product is given. In the case of its exports, the situation is different and the global distribution network of the multinationals can help to expand the market considerably.

Other conditions remaining constant, the relative importance of direct and indirect effects per unit of product is determined by the nature of the product.

At one extreme lie those multinationals which are engaged in export processing of imported materials or assembly of consumers' goods imported in the completely knocked down (CKD) form. In these cases, the indirect effects are almost negligible, being limited to those arising from their modest linkages with supporting activities (e.g. transport, banking and utilities). More or less the same can be said about the multinationals which are engaged in extraction of minerals and production of agricultural products for unprocessed export, although they can sometimes stimulate an important development of the communication system (e.g. railways). It must be remembered, however, that, even in these cases where the linkages effects are quite limited, the secondary effects can be enormous if masses of people are involved in such export processing and production, creating a sizeable effective demand for local industries. This is amply demonstrated by the experience of the Republic of Korea, where the growth of local durable consumers' goods industries like automobiles have been stimulated considerably in this way.

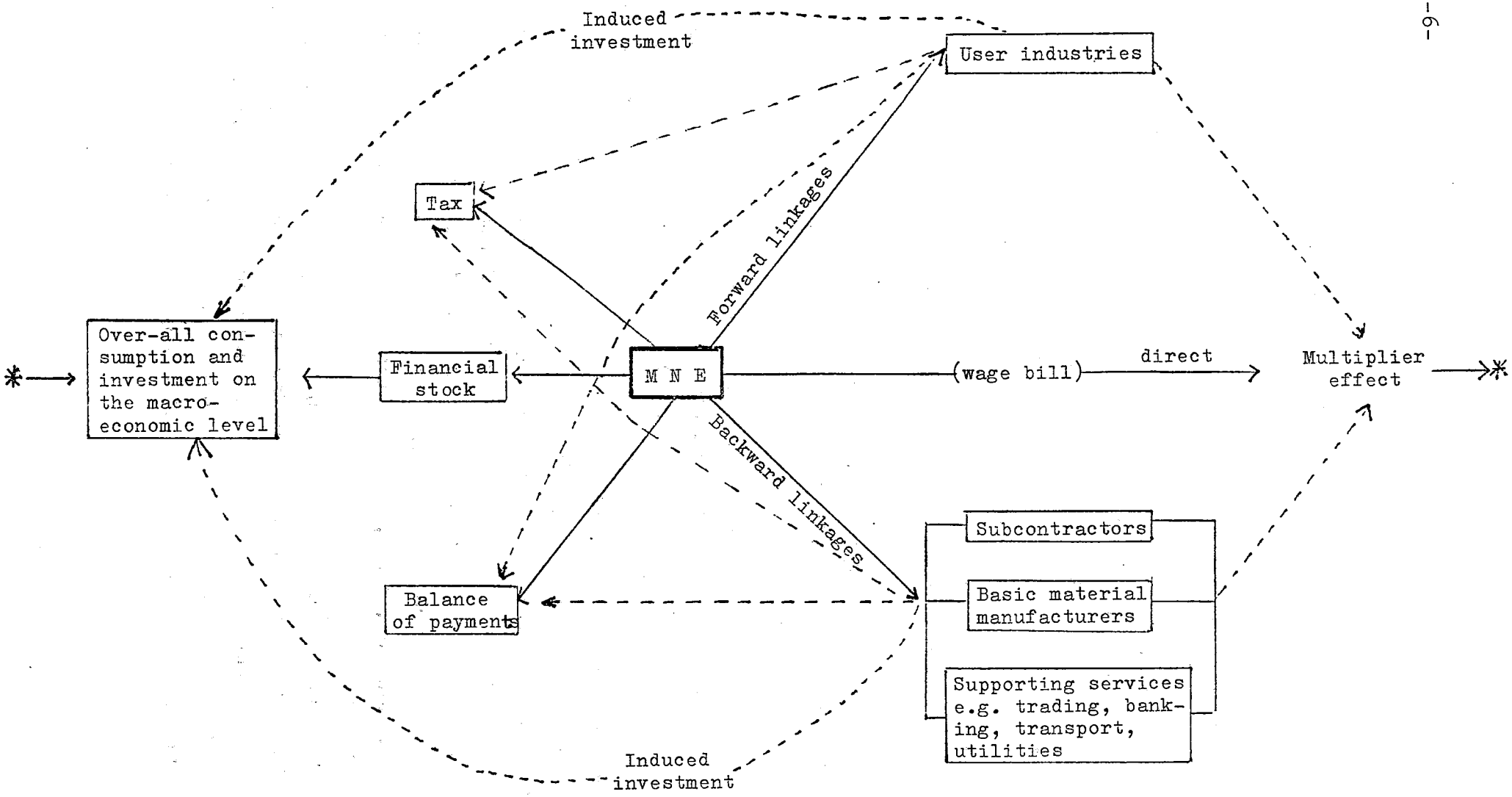


Chart 1: Multinationals' indirect effects

At the other extreme is the case of trading companies. Although they have been relatively neglected in the literature on the multinationals, the marginal direct employment created by their small purchasing offices can be accompanied by sizable indirect effects, resulting from international commercial subcontracting of labour-intensive products such as shibori (silk material for Japanese kimono) in the Rep. of Korea.[1] In 1974, the first five places in the overseas investment ranking of Japanese companies were occupied by trading companies, in terms of both total amount of investment and loans and the number of projects. Most of their investments were made in joint-ventures with other firms in agriculture, forestry and mining, as well as manufacturing, but about 10 per cent took the form of trading offices (12 to 24 offices per company). About half of these offices were set up in the developing world.[2] A good example is Daieh, the largest retailer in Japan, which has 13 small-sized purchasing offices abroad, eight of them in South-East Asia and China.[3]

Between these two extreme situations, the relative importance of the direct and indirect effects of multinationals varies considerably.

In countries at an intermediate stage of industrialisation, assembly industries like automobiles, electrical and electronic equipment, and industrial machinery manufacturing are growing. Multinational assemblers are under pressure from host country governments to subcontract manufacturing of parts and components to local enterprises, although many of the subcontractors are themselves multinationals (e.g. Spicer). To what extent this will involve the supply of basic materials from local industries depends on how far basic industries like the steel industry have already been developed.

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[1] Cf. Susumu Watanabe, "International subcontracting, employment and skill promotion", in International Labour Review, May 1972, pp. 425-449, and Susumu Watanabe (ed.): International subcontracting: a tool of technology transfer (Tokyo, Asian Productivity Organisation, 1978), Part 1.

[2] Kaigai Shinshutsu Kigyô Sôran (Japanese multinationals facts and figures) 1974 (Tokyo, Tôkô Keizai Shimpô-sha, 1974).

[3] Asahi Shimbun (Tokyo), 16 June 1980, p.1.

Indirect effects of the user industries can naturally be considerable in the case of basic, or intermediate, material manufacturers; e.g. chemical fertiliser manufacturing on agriculture and synthetic textile manufacturing on the export processing sector of the garment industry. Multinationals in certain industries and countries have also been making efforts to develop local primary commodities as their inputs. In such cases considerable employment can be created through backward linkages.

The actual extent of the indirect effects depends, obviously, on (1) the scale of production, (2) the market (export or local), and (3) the availability of local inputs (i.e. basic materials, parts and components, and various services). It is important to note that the performance of a multinational is considerably constrained by the capacity of its subcontractors, material suppliers, and user industries: without adequate supplies of parts, components, and basic materials, it cannot operate properly, and without growth of user industries its local market and therefore forward linkage effects cannot expand. Of course, the opposite is also true: growth of multinationals will provide market for subcontractors and basic material suppliers and facilitate the development of user industries. The main constraints to the over-all industrial expansion have to be determined carefully case by case. In the metal engineering industry in Mexico, for example, skills are in short supply, equipment is poor and the supplies of basic materials like steel and copper are unreliable in quantity, quality and delivery. Consequently, the development of local subcontractors has been slow, although the government introduced programmes for the localisation of the automobile industry almost two decades ago.

The indirect effect need not be positive. For example, the entry of a multinational plastic shoe manufacturer may not only destroy considerable job opportunities in the leather footwear industry but also in the industries related with it through backward-linkages (tannery and cattle raising).[1] As a matter of fact, even the direct employment effect can be negative, if the multinational's entry takes the form of a take-over of existing local firms which may reduce job opportunities.

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[1] To some extent this negative effect is offset, e.g. because the multinational may create jobs for retailers, while the small local shoe-makers sell directly to the end consumers.

## 3. Technological adaptation

In light industries producing unsophisticated conventional goods (e.g. non-synthetic textiles, footwear, food) as well as crude metal products, a fair range of technological choice exists.[1] In any country, people know these products well, and, having been manufacturing them for generations as a matter of necessity, they are also familiar with the traditional production processor. Imported technologies often find local counterparts with which they can be "married" to produce "intermediate technologies". The variety of imported technologies itself tends to be large, because different countries of origin have different technologies based on their own tradition. The customers' tolerance with respect to the quality of products is large, partly due to the difference in their taste and income level. This provides the producers with a wide range of technological choice.

In modern high-technology industries like machinery manufacturing, however, the tolerance regarding the quality of the product including parts and components is quite limited (except in the cases of repair shops). The developing countries have no local technological base with which they can be matched. Re-designing of the equipment and plant requires a considerable amount of time and money. Moreover, the labour cost tends to be only a minor cost item.[2] Thus, technological adaptations are largely confined to the scaling down of imported technologies to suit the small local market and replacement of machinery with manpower in the peripheral processes of in-plant transport, packing, etc.[3] The scaling down of the imported technologies can be achieved, for instance, by application of older vintages of technologies which the multinationals used in their home countries some time ago,[4] but developing countries tend to resist the transfer of such old technologies. In the case of process industries (e.g. chemicals), the scope for technological adaptation is even more limited.

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[1] Cf. A.S. Bhalla (ed): Technology and employment in industry (Geneva, ILO, 1975).

[2] On this subject, see Samuel A. Morely and Gordon W. Smith, "Adaptation by foreign firms to labour abundance in Brazil", in Street and James (ed.). op.cit pp. 199-225.

[3] ibid. See also Lall, op.cit., for a survey of evidence on related subjects.

[4] For the case of Toyota, see Susumu Watanabe, Technical co-operation between large and small firms in the Filipino automobile industry, World Employment Programme Research Working Paper WEP 2-22/WP 47, (Geneva, ILO, March 1979), p. 7.

Multinationals are naturally concentrated in these modern industries, where competition with local enterprises is frequently non-existent and where they enjoy an oligopolistic position thanks to their technology.[1] Where the technology is very common, and where the production in developing countries is attractive because of the lower labour cost, multinational enterprises have a tendency to resort to international commercial subcontracting rather than to direct investment.

In the modern high-technology industries, technological adaptations by multinationals usually involve some simplification of the product and/or use of local substitutes for imported materials. One important example is the Asian utility vehicles, which have been introduced by major car-assemblers (Ford, Chrysler, General Motors, Toyota and Volkswagen), in the ASEAN regions since the early 1970s. Although the main components are the same as those of these assemblers' passenger cars, the designs of the vehicles have been simplified for the local market and they look like large jeeps. These vehicles are over 30 per cent cheaper than the smallest passenger cars, and they are used as mini-trucks and mini-buses. By 1977, they accounted for 30 per cent of the total automobile sales in the Philippines. In the case of Toyota, the model has been designed listening carefully to the opinions of its distributors in the Philippines and Indonesia, and benefiting from active participation of those distributors' R and D staff.[2] It may not be wrong to suggest that these multinationals' efforts for the development of such "utility vehicles" in this region have been stimulated originally by the need for competing with Japanese exports in this relatively promising regional market. The Filipinos' two decades' experience with jeepneys[3] must have been of some use in these attempts.

In the manufacture of certain "new" daily consumption goods and agricultural inputs (including machinery), R and D efforts for

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[1] Sanjaya Lall and Paul Streeten: Foreign investment, transnationals and developing countries (London, Macmillan, 1977), Ch. 2.

[2] Cf. Masaharu Tanaka, "Transportation and an affluent society: the Toyota basic utility vehicle", in The Wheel Extended, A Toyota Quarterly Review (Tokyo, Toyota Motor Sales Co.), Special Issue, 1976, pp. 31-36.

[3] On jeepneys and utility vehicles in the Philippines, see S. Watanabe, Technical co-operation between large and small firms in the Filipino automobile industry, op. cit., pp. 8, 66-67 and 73-78.

the adaptation of the product to the local conditions and for the discovery of cheap local substitutes for imported materials are almost indispensable for the operations of multinationals. A good example is Unilever, which spends considerable resources for these purposes, both at its headquarters and at its local plants. The optimum formulation of washing products (e.g. soap) depends on such factors as the kind of clothes, the kind of soil, the hardness and temperature of the water and the incidence of washing machines, while the properties of edible fats such as margarine have to vary from country to country, depending on local people's taste, the product's texture, colour, and stability at the ambient temperature, the locally available raw materials, and the mode of its application (i.e. whether it is used as a spread or for cooking). Unilever has succeeded in extracting oil from sal, neem, mowrah and rice bran for hard soap in India. It has also developed technologies to produce edible oil from previously neglected materials (babassu palm oil in Brazil and coconut parings oil in Sri Lanka), and research is going on to develop rice bran oil in Japan and passion fruit seed oil in Kenya.[1] In Malaysia where it has its own palm plantations, its R and D staff, in collaboration with its laboratory in Britain, has recently devised a technology to grow a practically unlimited number of palm trees from a single bit of tissue from a parent plant by cloning.[2]

The production processes and equipment often need to be altered, as the product changes and as a new material is introduced. To what extent the necessary machinery is locally made appears to depend, largely, on the stage of development of local capital goods industry: all the necessary equipment for manufacturing of detergents is supplied locally in India, while a certain percentage has to be imported in the case of Colombia.[3]

The intensity of multinationals' enthusiasm for the development of new products and inputs naturally depends on the expected gain.

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[1] K.H. Veldhuis, "Transfer and adaptation of technology: Unilever as a case study", in Austin Robinson (ed.): Appropriate technologies for Third World development (London, Macmillan, 1979), pp. 219-238, and discussion on this paper, pp. 246-249.

[2] International Herald Tribune (Paris), 26 June 1980.

[3] Veldhuis, op.cit., pp. 224-225.

This, in turn, will be governed by a number of factors: (1) the size of the existing and potential market for the product or input which may extend beyond the national borders, (2) the savings in the material cost expected from the introduction of the new input, and (3) the required R and D cost, which will vary according to the amount of knowledge and technologies in the company's possession that can be utilised in the development of new product or input.

Multinationals are often criticised that their behaviour in individual developing countries is controlled on the basis of the group's global calculations, and that they do not pay sufficient attention to local needs. Without doubt there is some truth in this view. A typical example would be the manipulation of the "deletion allowances": when a certain component of the hitherto imported CKD package (e.g. automobiles) is proposed for localisation, the supplying principal factory sometimes cuts the price of the CKD package by an amount appropriate to the group's over-all benefit which can be unduly small and endanger the localisation project.[1]

As often argued, a multinational group frequently applies a standard technology or a limited range of "recommended" technologies all over the world. This may, or may not be, in the interest of the host developing countries as there may be more labour-intensive optimal technologies available.

The use of standard equipment is not necessarily disadvantageous to the host economy. In his study on a multinational plastic shoe manufacturer, Boon[2] discovered that uniform quality standards were applied everywhere in the group, and the group's member companies in different countries were effectively obliged to use machines produced by three makers belonging to the group. All the machines produced by them were automatic and as universal as possible, so that they could produce all kinds of shoes, sandals and boots. By producing a limited variety of universal machines, their production costs were reduced through economies of scale. Use of common machines in the group permitted inter-plant transfer of managers and machines, and training, management of spare parts, inventories,

[1] Cf. S. Watanabe, Technical co-operation between large and small firms in the Filipino automobile industry, op.cit., pp. 56-57.

[2] Gerard K. Boon: Technology and employment in footwear manufacturing (Alphen aan den Rijn, Sijthoff and Noordhoff, 1980), Ch. 6.

printing of instructions, etc., became easier. Even with respect to machines which were not produced by the member companies, the headquarters recommended the use of certain machines. In these cases, its strong negotiating power with some outside machine producers seemed to enable the group to secure considerable discounts.

As Boon notes, universal injection machines seem to be appropriate technology for developing countries. They are capital-saving, and almost certainly relatively labour-intensive compared with specialised machinery. In the footwear industry, where products are sensitive to fashion, product diversity is high, and the use of universal machines is recommended, especially for a relatively small market. It also gives rise to economies in training, maintenance, stock of spare parts and the like within each firm.

The case of the utility vehicles in the ASEAN region mentioned earlier also suggests that multinationals' activities based on a global, or regional calculation, can sometimes help to achieve what is desirable but unfeasible for local governments. The ASEAN nations have been talking about their "regional industrial complementation" programme for over a decade, in the hope of developing a closer industrial co-operation based on the specialisation and division of labour among themselves. While some progress has been made in the fields of air-transport and tele-communication as well as some tariff concessions, this programme still remains on paper because of conflicting national interests. Meanwhile, multinationals in this region, especially automobile assemblers, have been moving forward with their own programmes of regional procurement of components in this and wider region based on their idea of "Asian cars".[1] How much their programmes can contribute to the development of the local economies depends largely on how far and how quickly the governments can reduce institutional barriers (e.g. import restrictions) to the intra-regional exchange of parts and components which may facilitate larger-scale production and cost reductions.

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[1] Cf. S. Watanabe, "International sub-contracting and regional economic integration of the ASEAN member countries: the role of the multinationals", in Dimitri Germidis (ed.): New forms for investment in developing countries: international sub-contracting (Paris, OECD Development Centre, 1980).

The importance of the indirect employment effects have been stressed in the previous section. A similar argument holds good with regard to technological effects: even if a multinational does not contribute to local technological development and adaptations directly, it can generate a considerable impact on the technological and skill levels of local industries through the training of workers, and through backward and forward linkages.

Such training effects of multinationals may be illustrated by the experience of the electronics industries of Hong Kong and Rep. of Korea. Assembly of imported components is usually believed to have little technological merit to the host country. A Korean author, for example, argues that although the development of the electronics industry has made a significant contribution to the over-all growth of the economy and of employment, it is not likely to accomplish a full-scale diffusion of modern technology, because foreign firms bring semi-finished products for assembly in the labour-intensive segment of the production process and maintain a minimum relationship with local firms.[1] With respect to the same industry, however, a report from Hong Kong has drawn a totally different conclusion. Here it is argued that while local engineers were working in American subsidiaries which assembled parts and components imported from the United States, they learned techniques of assembly line arrangements, batch and flow production systems, quality control and supervisory methods, etc. Many of them started their own small firms, which now supply parts and components to big enterprises, replacing imports. For mutual co-operation and benefits, the latter assist them to overcome problems related to production techniques, supply of materials, and installation of machinery and equipment.[2] There is little doubt that, in the longer run the picture of the Rep. of Korea will be much the same as in Hong Kong.

Technological linkage effects can be inferred from the experience of Korean shibori processing. Starting with simple work of tying

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[1] Sang Chul Shu, "Development of a new industry through exports: the electronics industry in Korea", in Wontack Hong and Anne O. Krueger (ed.): Trade and development in Korea (Seoul, Korea Development Institute, 1975), pp. 118-122.

[2] Fai-Tai Wong, "Country paper, Hong Kong", in Asian Productivity Organisation (ed.): Intra-national transfer of technology (Tokyo, 1976), pp. 2-3.

the silk material imported from Japan, it has encouraged the development of local seri-culture (backward linkage) and dyeing industry (forward linkage), as the amount of the business expanded.

These cases illustrate the crucial importance of the time factor and the volume of work. In the short run, and without large-scale operations, one could not expect sizable indirect effects from a multinational's activity.

4. Incentives and constraints

An awkward thing about evaluating the result of a programme or an enterprise's performance is that the government in launching the programme or receiving the foreign investor often had no or little intention to achieve the objective the evaluator has in mind, or considered it only as a secondary objective. This is very often the case with the objectives of employment creation and choice of appropriate technologies. Rightly or wrongly, foreign investments are often encouraged by host governments for the purpose of substituting imports and saving and earning foreign exchange. The localisation programmes of the automobile and other industries in Mexico and the Philippines are good examples.

It is also fairly well established that many governments welcome the entry of foreign firms with up-to-date technologies for the sake of national prestige and are offended if the firms propose to use old-fashioned but more economical labour-intensive technologies.[1]

Needless to say, the multinationals are private companies which behave according to their own cost/benefit calculations. It would be unrealistic to expect them to sacrifice their own benefits, in the long run, for the sake of economic development of the host countries (where these two do not go together). Whether and to what extent developing countries resort to multinational enterprises for the attainment of their development and employment objectives is naturally for them to decide. The question is controversial to say the least. At the heart of the matter lies the question of "economic and technological dependency".

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[1] Sadli, op.cit., p.366.

The experience of countries like the Republic of Korea, however, suggests that, paradoxically, a heavy dependency on multinationals and foreign investment can be a short cut in certain cases to attain economic independence. The key to the success of this strategy lies, in the present writer's view, in whether the government can create incomes and employment en masse, while depending on foreign multinationals for industrialisation. If the government can do so, then, sooner or later, the growing purchasing power of the masses will stimulate various local industries and a local technological base. Growth in the scale of an economy is bound to change its industrial structure and technological level. It is equally necessary, of course, for the nation to steadily continue efforts for reducing dependency. In many cases, it seems that current government policies are too much concerned about reducing the immediate cost of investment and technology transfer, and lack such long-term perspective.

From the analysis in the earlier sections, it is clear that a host government needs to screen a multinational's entry proposal carefully, taking due account of its direct and indirect effects. For this purpose, the host country needs an adequate capacity to appraise the quality of the technologies to be brought in and the prices to be paid for them, which in turn depends largely on its ability to "shop around". For the development of such local capacity and abilities, constant local R and D efforts are essential.[1] If the responsible government officials are well-informed about the technological alternatives available, they should also be able to negotiate with the incoming multinationals in order to make their production methods more suitable to the local development goals. After all, case-by-case negotiations are known to be an effective means of attaining this objective.[2]

Multinationals' choice of a country for their investment and of production techniques is considerably influenced by the availability

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[1] Cf. Dilmus D. James, "The economic case for more indigenous scientific and technological research and development in less developed countries", in Street and James, (ed.), op.cit., p. 94.

[2] Alejandro Nadal, "Multinational corporations and transfer of technology: the case of Mexico", in Dimitri Germidis (ed.): Transfer of technology by multinational corporations (Paris, OECD Development Centre, 1977), Vol. 1, p. 250.

of inputs (employable workers and basic materials), especially in the case of export-oriented investments. The problem of the supplies of basic and intermediate materials has been solved in many cases by means of the "bonded" industry arrangement, i.e. duty free importation of such materials with special administrative arrangements for quick import and export procedure. The adequate supply of labour has to be secured by training programmes. In this connection, it has always to be remembered that the existence of masses of jobless people does not mean the existence of an abundant supply of labour. Shortage of labour can and does often exist in the ocean of unemployment and underemployment: large numbers of people are unemployable in the modern industries due to the lack of discipline, education and skills.

This problem is closely related to the over-pricing of unskilled labour. In Mexico, for example, entrepreneurs (especially local medium and small enterprises) do not take in unskilled workers nor try to train them, substituting machines for labour to "cope with the problem of labour shortage". The apprentice system was abolished in 1970, and the employers have been obliged to pay the fairly high minimum wages even to the trainees.[1] While the statutory minimum wage system is far more effective and also ambitious in Mexico than in almost any other developing countries, unfavourable technological impacts of labour unrest and tight restriction on the dismissal of workers have been well publicised in the context of various countries: management of machinery is easier than that of workers.[2] The governments need to have a sound sense of balance between the short-term welfare of workers and the long-term welfare of the whole nation.

Once a multinational has invested in a country, the host government can increase its total positive effect by encouraging forward and backward linkages through appropriate policies. In the Philippines, for instance, government-controlled vocational training centres offer plating and other services for small enterprises,

[1] Cf. S. Watanabe, Medium and small enterprises and subcontracting in Mexican industries: a policy consideration, a report to the Government of Mexico prepared under an ILO/UNDP technical co-operation project, April 1980, pp. 29-30.

[2] For example, see Sadli, op.cit.

which enable the latter to work as subcontractors for multinational automobile assemblers. The Philippines Coconut Authority provided financial assistence for a medium-sized local company which developed coco fibres into seat pad material with encouragement from these assemblers. The local governments' and other local institutes' active co-operation for the multinationals' operation in this manner seems to be more conducive to the latter's adaptations to the local conditions and needs than mere regulations demanding such efforts.

The multinationals do not operate in a vacuum any more than the local firms. Their pattern of behaviour is influenced by all kinds of socio-political factors including the host governments' policies. Impacts of labour legislation have been already mentioned. There is no doubt that multinationals' contribution to the fast absorption of surplus labour in the Rep. of Korea and Singapore (as well as Hong Kong) has much to do with the liberal policy of these countries in this domain, and the low incidence of industrial disputes. No less important are the industrial and trade policies, which influence the market and industrial structures and the degrees and pattern of industrial competition both inside and outside the countries. Too much intervention by the government kills entrepreneurs' initiative and prevents industrial progress and expansion of employment opportunities, as the experience of various developing countries indicates.[1]

The main role of the government in encouraging multinationals' adoption of employment-generating (directly and indirectly) technologies seems to be related to the screening of the incoming multinationals and to the promotion of direct and indirect effects of the established multinationals through the promotion of forward and backward linkages in every possible way.

## 5. Summary

Quantification of employment effects and identification of concrete examples of technological innovation and adaptation are interesting but only part of the contribution expected from the case studies. What is more important is that the analysis as to

[1] On this subject, see Ian Little, Tibor Scitovsky and Maurice Scott: Industry and trade in some developing countries: a comparative study (London, Oxford University Press, for the OECD, 1970).

why and how the enterprise under investigation has achieved the observed results, and how far its experience can be transferred elsewhere. From this, one may be able to know what other enterprises (and governments) can do in order to increase the scope for the multinationals' direct and indirect contribution to employment creation and development of the local technological base.

Much of the inconclusiveness of findings of past studies and the controversy about the multinationals' performance in the Third World arise not so much from the difference in the multinationals' intrinsic characteristics as from the lack of comparability of the objects of study and from differences in assumptions and definitions adopted by the various researchers. The following are among the major sources of confusion:

(1) Difference in the concept of the product group or industry: the implications of difference in this respect is clear from the earlier sections.

(2) Difference in the definition of "multinationals": whether they are totally owned by the principal firms, or joint-ventures with local firms.

(3) Difference in the definition of "technology": whether the author is concerned with "core technology" only or also with "peripheral technologies" and even managerial, marketing and production skills.

(4) Difference in the time horizon: how long the multinational has been operating in the country. (This will naturally influence its degree of integration with the local industries and indirect effects).

(5) Differences in the researchers' expectations: what contributions are "significant" or "insignificant" in his view.

It must be stressed that the most important explanation for the varied performance of the multinationals often lies in differences in the local conditions and the host governments' policies. The prime factors in this respect may be:

(a) the degrees of development of related industries (subcontractors, material and capital goods suppliers, and user industries);

(b) trade and industrial policies, which influence the market and industrial structures and the degree and pattern of inter-firm competition;

(c) the supply of labour (its discipline, literacy and training, wage and salary levels);

(d) the industrial relations (employment) system or practices, frequency of industrial disputes etc. ; and

(e) the local R and D capacity and the government's policy in related fields (including education in engineering and sciences).[1]

Joan Robinson has recently written:[2] "The interaction between the long-run and the short-run consequences of technical innovations is a complicated subject which requires more study." A similar statement can certainly be made with respect to the employment effects of such innovations.

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[1]Most of the studies in Street and James' volume quoted above stress this as an essential means of overcoming technological dependency of Latin American countries.

[2]Joan Robinson, "Time in economic theory", in Kyklos, Vol. 33, 1980, Fasc. 2, p. 228.

## Annex I

## Research Objectives and Factors to be Considered in the Case Studies

### Research objectives

The case studies envisaged under the present project will examine the scale and pattern of selected multinational enterprises' efforts to promote technologies, which help create sizable employment in developing countries, directly and indirectly, in the short-run as well as in the long-run. Inclusion of long-term, indirect effects in the analysis implies that the concept of "technology" should be wide enough to cover not only core production technologies (e.g. machinery and assembly) but also peripheral technologies (e.g. in-plant transport and packing). It should also cover managerial and marketing techniques and workers' skills.

The ultimate objectives of the research are:

(1) to know why and how the enterprises selected for the study have created such extensive employment effects;
(2) how far their positive experience can be transferred elsewhere; and finally,
(3) what other enterprises and governments can do to increase the scope for the multinationals' direct and indirect contributions along these lines.

### Some criteria in selecting the sample enterprises for the case studies

The enterprises should be selected for each case study according to the following criteria:

(1) In principle, the enterprise should be operating in the manufacturing sector but trading houses and primary sector firms may also be selected where their direct or indirect contributions to employment appear to have been significant (i.e. considerably above the average);
(2) Reasonable grounds for assuming that the employment performance of the enterprise selected is related to the active development or adaptation of technologies relevant to employment creation in developing countries;

(3) The company should have been operating in the country for a sufficiently long period of time (about 5 to 10 years) to permit an evaluation of its impact.

(4) The enterprise should be in conformity with the definition of a multinational enterprise as found in para. 6 of the ILO Tripartite Declaration concerning Multinational Enterprises and Social Policy.[1]

Determinants of the multinational's employment effects

The following list of factors should be examined, inter alia, in the case studies as having a possible influence on the selected MNE subsidiaries behaviour with respect to the choice or adaptation of technologies, and the extent of their direct and indirect employment effects in both the short and long terms:

(1) the available types of technologies in the industry concerned;

(2) the enterprise's over-all economic policy, and its criteria in choosing a technology;

(3) the enterprise's R and D efforts and system;

(4) the nature of the enterprise's product(s);

(5) the scope for import substitution with respect to inputs ("backward linkages");

(6) the local supply of complementary inputs (e.g. skills, raw materials, intermediate goods (e.g. parts and components), capital equipment);

[1] "..Multinational enterprises include enterprises, whether they are of public, mixed or private ownership, which own or control production, distribution, services or other facilities outside the country in which they are based. The degree of autonomy of entities within multinational enterprises in relation to each other varies widely from one such enterprise to another, depending on the nature of the links between such entities and their fields of activity and having regard to the great diversity in the form of ownership, in the size, in the nature and location of the operations of the enterprises concerned. Unless otherwise specified, the term "multinational enterprise" is used in this Declaration to designate the various entities (parent companies or local entities or both or the organisation as a whole) according to the distribution of responsibilities among them, in the expectation that they will co-operate and provide assistance to one another as necessary to facilitate observance of the principles laid down in the Declaration".

(7) the development stage of user industries ("forward linkages");

(8) governmental policies affecting technological choice (e.g. those relating to manpower, foreign investment, industrial competition and labour legislation);

(9) the local R and D capacity, and the government's science and technology policy;

(10) the marketing efforts undertaken by the enterprise, the government or any other local organisation (including for export market);

(11) other factors considered important in the local context.

Possibilities of and limitations to the application of the enterprise's experience elsewhere

In order to determine what lessons can be learnt from the case studies, either by other multinationals or by governments in other developing countries, one needs to know to what extent the enterprises studied have been influenced by factors specific to them or the country. This factor may be examined in the case studies, for example, with respect to the following aspects:

(1) the stage of industrialisation of the country;

(2) the availability of complementary inputs (raw materials etc.);

(3) the geographical location;

(4) the size of market, local or export;

(5) the local government's industrial and trade policies;

(6) the local labour and social legislation;

(7) other factors considered important in the context.