TRANSFER OF TECHNOLOGY AND THE DEVELOPING COUNTRIES

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The steady increase in the productive forces, the forging ahead of the scientific and technical revolution entail important consequences for the developing countries. In the colonial type of the division of labour certain extractive industries began to develop, but no general industrialization followed them. And even though in the neocolonial type of the international division of labour a certain development of the manufacturing industries has taken place this too cannot be regarded as a real, at best only as a "false" industrialization.

Only a few countries can afford to engage in a closed, overall reproduction process extending over all productive branches. Therefore, competition compels the transnational monopolies to get hold of the most important, decisive fields within the reproduction process and to monopolize them. This makes it possible for them to keep the decisive fields of the national industries, despite the political independence of the developing countries in dependence, indeed in an increasing dependence. The only choice left to the developing countries is to import the achievements of the scientific and technical centres - primarily of the USA and other developed capitalist countries. Then, the relations thus established gradually adapt the national economic endeavours initially aspiring to independence, to the requirements of the transnational monopolies, i.e. of the capitalist international division of labour.

The transnational monopoly is one of the channels through which the developing countries may acquire advanced technology from the developed capitalist countries. But it is also true that this channel is, in all probability, the most contradictory. These contradictions may be grouped around two main questions:

1. To what extent does the technology transferred correspond to the local circumstances in relation to other alternative sources.

2. What are its advantages and disadvantages for the recipient country, also compared to other possibilities.

The technology applied in the developing countries is very often extremely capital-intensive. This fact further agravates the problem of the anyway high unemployment and the dependence of the country on imports.

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If, owing to the composition of the market, the transnational company using capital-intensive technology acquires appropriate profits, then the possibility for it to cut down its costs, by applying a labour-intensive technology, to a minimum level and to gain thereby increasing profits, does not counterbalance the disadvantages experienced by the foreign firm when applying possibly a labour-intensive technology.

This, however, underlines again the fact that the transnational corporations' activity to transfer technology takes place in a "package" in at least two respects. One package consists of a set of services such as capital, management, marketing, etc., while the other is made up of the sum of tactical measures realizing the strategy of the corporation, that is, of the forms in which the technology is transferred.

Along with direct foreign investment, there also exists an important channel, that of international trade, through which the transfer of technology is transacted. Technology transferred through trade has three known forms:

1. Owing to the nature of their exports, the developing countries are inclined, often compelled, to accept a certain capital-intensive technology. This often stems from the character of the export product /e.g. oil, copper, etc./, but usually follows from the specifications of standardized, uniform-quality products. This can be found in an appropriate "package", in conformity with the requirements of the market, and usually brought about by transnational corporations and also exported by them to the developing countries. The export of investments made in the importing country belongs only geographically, and not in its economic content, to the developing countries.
2. The capital-intensive technology imported by the developing countries incorporates the technology of the developed capitalist countries. The equipment thus created induces in turn further investments and operations - again not corresponding, to the endowments of the developing country.
3. The transfer of technology through trade involves at the same time the export of taste, demand and types of income distribution, too.

Apart from trade, technology may also be transferred by aids and the associated financial facilities, e.g. by export credits. If the aid is tied - i.e.

if it must be spent in the donor country - , the effect is self-evident. The supply of equipment imported from abroad is made artificially cheaper for the recipient country, at least for reasons of accounting of private capital. Thus it is understandable that the stimulation of labour-intensive activity is not "profitable" for the recipient country as it often involves vast domestic expenses (not covered by aid), and it appears to be more favourable for it to select capital-intensive investment projects which ensure that the import requirements ("cheapness"!) are at a maximum. And as long as aid is extended for individual big investments, both parties are interested in tying up large capital in the developing country, and not in creating medium or small establishments.

The negative effect of technical assistance programmes often makes itself felt in an unconscious way. But this does not change its negative nature. The adviser of technical assistance always wants to pass on the experience gained in the possession of the knowledge he has acquired before, and is little concerned about the technical possibilities of modifications justified by the differing environment. The same applies to the education and training of the subjects of the developing country with the participation of foreign experts. Here again we find that the knowledge transferred is a mass of knowledge accumulated under the material and social conditions of the developed countries, and the divergent circumstances of the developing countries are seldom considered. These experts teach their students that the technology of the developed capitalist countries is the "developed", the "modern" and "progressive" technology, and that the simpler technologies are "primitive", "obsolete" and "backward".

Technology does not confine itself exclusively to the productive sectors such as industry, agriculture, though very often it is these sectors that we have in mind. Also we can find in the same way differing opportunities for the application of technology in transport, trade, distribution, health, education, etc. The list might be lengthened at will, and it proves the eternal changeability of the "business culture" of the developed capitalist countries that the same attention is being paid today to these fields as was paid to the productive sectors a couple of years ago.

These forms of the transfer/acquisition of technology are just complementary to other best-known forms: the sale of patents for royalty, the transfer of managerial skills under the so-called management contracts, etc. The "traditional" forms are as follows:

(i) Capital investment including joint venture:

Here the supplier sells, in addition to the description of the product and to the production techniques, management, marketing and other centralized services, too. The name it has been given in economic literature is "package deal". Joint venture has recently come into the fore of interest in the developing countries, in all probability owing to the greater possibility of supervising and influencing it.

(ii) Licence agreements:

For the licence obtained the importing country pays a fee usually expressed in the percentage of the turnover achieved. It very seldom occurs that the licence agreement contains a complete set of technical knowledge and that it refers to the latest product or technique. Patents and licences provide the potential possibility to pursue a policy of "restrictive practices" against the buyer (export restriction, the prevention of further development, etc.).

(iii) Management contracts:

A management contract provides out of the "package" the desired technique and the management elements necessary for producing and marketing the product. A contract is successful if the foreign firm is interested in the flourishing of the company it is connected with, not merely in the satisfaction of its needs for machines and techniques. A management contract has a threefold aim: to ensure the continuity of management; to extend technical knowledge and advice; to train local partners.

(iv) The supply of equipment:

It is not a complete technological process, but merely a sales transaction containing only its part elements. The technology is therefore not "packaged", the buyer has to turn elsewhere for further parts.

(a) The nature of the transfer of technology. The world distribution of technological innovations is not subject to measurement, at least not by the means available to us now. If we cannot measure their distribution, then we usually the costs of technical innovations in general, the amount of sums allocated to experimentation. Research and development (R & D) expenditures have a very unequal distribution the world over: 98 per cent fall to the developed, 2 per cent to the developing countries. In other words, the technology of the developed countries is in a dominant position, and thus the transfer processess, too is

one-sided. The transfer of the research findings of the developing countries to the developed capitalist countries is a very uncommon case. It is, on the other hand, a rather frequent occurrence that an achievement of the research done in a subsidiary of the transnational corporation constitutes the property, together with the right of ownership, of the parent company and not of the developing country where the subsidiary is domiciled. Thus, even if the transfer of technology is a bilateral process, it is the developing country that has to bear the negative effect.

Earlier, economists often were of the opinion that a more rapid development of the developing countries will be much easier if the level of knowledge and the quantity of technology accessible to them are greater. This view, however, seems to ignore the vital fact that science and technology get not only accumulated but also change in the course of accumulation. Unfortunately, this change in the pattern is not beneficial to the developing countries, on the contrary, it is a source of serious troubles for them.

The technology of the developed capitalist countries is not only inadequate - one which leaves out of account the real interests of the developing countries - but it also applies inadequate methods. It stimulates/compels the developing countries to import a technology which originates in its own course of development. It is therefore not the technology itself that is inadequate - it meets, after all, the requirements of the developed capitalist countries at the best possible way - but the fact is that the developing world representing $\frac{2}{3}$ of mankind has not made available a technology suited to its own requirements. Capitalist economists suggest as a panacea a greater competition within the developing country and a greater price elasticity of demand. They hold the view that if the foreign firm has to face a sharper competition, if the demand for its products is more elastic, then the technology applied in the developing country will "substantially" differ from that of the developed capitalist country. What those who hold this view forget is that a local enterprise cannot, or can hardly compete with a foreign company, it is simply not able to. And the price elasticity of demand cannot change the quality of the technology concerned, it can at best make some modifications in it. The foreign company commands a greater dominance than to think in terms of one developing country only, it is always able to curb its production or transplant it to other countries, etc.[1] An important precondition of the elasticity of demand is the concentration of incomes in the hands of those strata which induce the demand for the foreign investor's "package". This is, from the point of view

of the developing country, an unambiguously false theory as it is not the needs of the great majority which determine the supply satisfying demand, but the transnational corporation itself.

(b) Transfer of foreign technology, or the development of own technology. The view that the import of an already developed technology - even though for a different purpose - is cheaper and more advantageous than the development of own technology in the developing country is so widespread in bourgeois (non-Marxian) economic literature that the arguments brought up against it are often not considered at all.

The cheapness and the advantage of imported technology are, first of all, a function of the price and the terms of transfer. Transnational corporations regard technological transfer as a suceessful process worth continuing in the future, too. For them it is definitely so. The surplus of USA technological balance of payments rose from an annual $356 million in 1956 to $2.200 million in 1970.[2] They maintain that "... the technology transferred is becoming increasingly expensive and difficult to develop".[3] The writer does not mention that this technology is developed for the purposes of their own companies operating in the advanced capitalist country and not with a view to meeting the requirements of the developing country. What comes after the realization of technology is nothing else but a new "life cycle" of that technology, that is, the lengthening of its applicability. It was Raymond Vernon who first pointed to the fact that it was by means of the so-called "product life cycle", the principle of economies of scale, that the American and other capitalist companies gained their profits first in their own domestic markets, then in other developed countries - by their subsidiaries - and only afterwards did they transfer it to the developing countries. This is nothing else but monopoly rent wrested by the monopoly of the already developed technology. The USA transacted in its transfer of technology to Latin America the export of the originial - about 5-10 year-old - technology at a price higher by 30-50 per cent than in 1974.[4] At the same time, the American subsidiaries, also in Latin America, sold their exports at a price lower by approximately 40-50 per cent than the actual price set by them elsewhere.[5] That is to say, they do damage to the developing countries in a double way. This is still further aggravated by the fact that 78 per cent of foreign investments are financed from local sources, and about 46 per cent of them are used for taking over local companies whose profits were to have increased the internal consumption or savings of the developing country. Thus, however,

about 52 per cent of the profits deriving from these companies leave the country, diminishing thereby the savings of the developing country in absolute terms and increasing at the same time, again in absolute terms, its anyway serious shortage of foreign means of payment.

Also unacceptable is the statement that "... the royalties paid by and repatriated from many developing countries have been considerably (My own emphasis) below the real costs incurred by the licensors for the transfer and services provided without allocating any development costs".[6] The royalties and licence fees are higher than realistic if they are not to be paid by the subsidiaries. The balance of the USA present this picture:

Million dollars	Subsidiaries		Non-subsidiaries	
	1966	1971	1966	1971
Fees received	1030	1874	353	695
Fees paid	64	91	76	125
Balance	966	1783	277	570

Source: United Nations: Multinational Corporations in World Development. New York, 1973, p. 188.

To the parent company accrues a twofold advantage: for the technology sold for a higher price it demands immediate transfer - direct income drain -, and also increases thereby the cost of the products it produces - which makes its profits appear to the official organs of the developing country to be seemingly lower - , and thus profit repatriation helps the company to gain additional profits again in an indirect way. By applying transfer prices within the company, it always manages to make the big profit gained in the given country "disappear" and to show it in a tax-haven country (Liechtenstein, Bermuda, Singapore, etc.). Justifiable is therefore the demand of certain groups of developing countries: the fee paid for technology should be included in the profit as a certain percentage of it, or that no payment should be made for it at all.

Without going into details, we only want to mention that such transfer of technology does not take into account those social costs either which arise in the wake of its application (pollution, urbanistic gigantomania, disruption of traditional family relations, unemployment, etc.). It does not use local

materials and component parts, by which it further increases the dependence of the country.

We may state, therefore, that the cost of the diffusion, the transfer, of technology already developed is nil, or of a level covering merely the costs of adaptation to the differing climatic and economic conditions. Yet the monopoly owners of technology expect their buyers to pay a "reasonable" - often not cost-proportionate - price for R & D expenditure, or - which is a more realistic assumption - for the costs of new R & D inputs ensuring the future of the business activity of the transnational corporation in question.

Since the firm supplying the technology enjoys at the very outset a more favourable bargaining position, the information available to it is richer, the terms of transfer include a monopoly rent, which is further strengthened by the lack of a competitive price system. If the developing country has not got a R & D basis of its own, it is in fact unable to decide if the given technology really complies with its own conditions, if it is efficient; it has no basis of comparison to analyse other alternative sources; it is not in a position to ascertain if the terms of transfer are just; it uses a different technical terminology for appraisal, etc.

Therefore, the dilemma of import or own development is a false one. Without a national technical basis, no advantageous technological import is conceivable. The import of technology can be advantageous only if it is selective, and selectivity is based on national technical capacities. Inequality also exists in the case of technical assistance, let alone the practice of technical assistance which impedes and even paralyses local development.

(c) The impact of technology transferred on development. Mention has already been made of the primary negative impact: the creation of the dualistic structure. Capital-intensive technology is directed towards the critical points of development, absorbs skilled labour and further enhances, unemployment. A survey made in Nigeria in 1968 and extending over 625 engineering companies revealed that their total capital was 179.8 million dollars, of which 126 million, or 70 per cent, was owned by foreigners. Out of 88.000 blue - and white-collar workers employed 2.040-2.3 per cent - were foreigners, but they received 25.1 per cent of the total of wages and salaries and 63.4 per cent of all benefits in money![7] An average foreign blue - and white-collar worker earned eight times as much money as his Nigerian opposite number.

A many-sided reaction may also be experienced between unequal income

distribution and capital-intensive technology. Owing to the demand created unequal income distribution leads to capital-intensive technology: effective, solvent demand is concentrated in strata enjoying high-bracket incomes and demanding capital-intensive products.

A reaction may also be witnessed in a dynamic sense. If the developing country imports a capital-intensive technology, it will continue to depend on the development of this technology, i.e. on the transnational corporation. This will mean labour-substitution in the future, too.

The developing countries pursuing the so-called policy of "open doors" identify the import of capital-intensive technology with "modernization", and the latter with development, and to achieve this they take further steps to strengthen the modern sector (tax allowances, preferential customs clearance, free building sites, supply of raw materials and energy, budgetary government support, etc.). Not only foreign firms are accorded preferential treatment, but simultaneously the "non-modern" sectors, i.e. the overwhelming majority of all economic branches, are often discriminated by various regulations concerning building, health, licence, labour management, etc., by which not only their "modernization" is not promoted, but also the tensions of economic structure are driven to extremes.

The transnational monopolies undoubtedly take part in a structural transformation of the developing economy. This process, however, makes it possible for them to exercise an ever increasing control over technology and finance in most developing countries. Osvaldo Sunkel correctly sums up the opinion of the developing countries: "It is true that the developing country may obtain, through skilful negotiation and policies, a larger share of profits. But as far as transfer of technology is concerned, what we get are strictly end products, not the ability to combine lasting knowledge into commercially viable product and processes.[8] We get new products and processes, but not the capacity to develop new products and processes".[9]

(d) "Technological imperialism" and the Andean Common Market. The experience gained from the activity of the Andean Common Market may help us to form an opinion about the practical "results" of transfer of technology. Thus the negative features shown theoretically may be corroborated by practical experience.

The transnational monopolies of the USA account for 12 per cent of the industrial output and 30 per cent of the exports of the Latin American cou-

ntries. According to computations, they control 50-75 per cent of the dynamic branches. It is commonly known that the extractive sector is almost exclusively owned e.g. by Standard Oil in Venezuela (before the nationalizations), United Fruit in Equador, Cerro Corporation in Peru and, until July 1971, Anaconda and Kennecot in Chile. Between 1920 and 1970, American direct capital invested in the countries of the Andean Common Market rose from 978 million dollars to 4.826 million dollars (without Bolivia and Equador), i.e. showed a five-fold increase.[10]

This, however, does not mean that new industries have come into being, it is rather the existing local enterprises that have been taken over. Foreign capital spends about 46 per cent of its investments on such take-overs.

American subsidiaries transfer thousands of millions of dollars to their parent companies. This is - after local taxes have been paid - a legal and open practice. This transfer is based on tax returns prepared for the local organs and the tax authorities of the USA. Besides, there are still great many hidden possibilities to repatriate additional profits in other legal and illegal ways. But even the amount of official profit repatriation is extremely high. Between 1950 and 1970, 1.700 million net capital flowed from the USA to the four largest Andean countries (Chile, Peru, Colombia, Venezuela). At the same time, the official sum total of repatriations amounted to 11.200 millions dollars, which meant a net profit of 9.500 million dollars for the parent company.[11] The greater part of this profit stemmed from the oil fields of Venezuela and the copper mines of Chile and Peru. The governments promoted this by such means as accelerated depreciation, duty-free import of intermediate products, satisfaction of claims on foreign-exchange for amortization, interest payments, transaction of repatriation, etc. An additional device was the so-called "extraction compensation", which may be as high as 15 per cent of gross profit: the companies are "indemnified" as the oil wells and copper mines will one day be exhausted.[12] A similar demonstration of the activities of the manufacturing subsidiaries is, on the basis of the source quoted, not possible. Thus the sum total of profits is comparatively modest. The companies conceal the hidden forms of transfer by a twofold double-entry book keeping - first the one prepared for official tax return and the other, for the purpose of a <u>real</u> accounting within the parent company.

C. Vaitsos explored, by analysing 395 contracts, the actual profit rate of 15, completely foreign-owned pharmaceutical companies in respect

to their net investment value. The figures obtained ranged between values of 44.2 per cent to 962.1 per cent, so that the majority of companies enjoyed a profit of over 100 per cent related to annual investment. Their actual rate of profit was 136.3 per cent, while the rate declared for the tax authorities of the recipient country was 6.7 per cent.[13] These figures bear evidence that about 82 per cent of actual profits stem from the price rise of imports alone. But even these figures underestimate the size of actual profits accruing to these companies since they do not take into account the possibility of an arbitrary decrease in export value - affected by means of the transfer price -, nor the overestimation of the actual investment value of subsidiaries. The unreliability of the official profit figures of American subsidiaries is also admitted by the Rand Corporation.[14]

The money transferred for licences, patents, industrial property rights will be increasingly important complements to profit repatriation as also admitted by the US Department of Commerce.[15] In Latin America alone, the sum total of repatriations from "technological" transfer amounted to 2.500 million dollars in 1951-1970.

Million dollars	Repatriation for "technological transfer"	Official profit repatriation	Total repatriation	Percentage of hidden repatriation related to total repatriation
	1	2	3=1+2	1:3
1951-55	250	3.089	3.359	7.4 per cent
1956-60	334	3.562	3.896	8.6 per cent
1961-65	672	4.667	5.349	12.5 per cent
1966-70	1.217	5.879	7.096	17.2 per cent
1951-70	2.473	17.207	19.680	12.6 per cent

Source: Various issues (1964-71) of Survey of Current Business and US Business Investments in Foreign Countries (US Department of Commerce), Washington, 1960.

Hidden income drain is increasing, therefore, more rapidly than what is officially declared. But the additional income drawn out of the country by means of technological transfer is not the whole story. According to Vaitsos' research findings, the declared income of foreign-controlled pharmaceutical subsidiaries amounted in 1969 to 3.4 per cent (!) of the sum actually transferred to the parent company.[16]

In Peru, also in a pharmaceutical company, the ratio of officially repatriated profit to invested capital was 11.5 per cent, the corresponding

ratio of licence fees 20 per cent, the size of overpricing imported products 37.6 per cent. Thus income drain amounted to 69.3 per cent of capital invested compared to the official 11.5 per cent.[17]

A close interrelationship can be found between the controlling activity of the monopolies, on the one hand, and payments made for "technological transfer" and imported intermediate products, on the other. Transfer has already been made mention of. As regards imports, it is extremely important that on average one-third of imports to Latin America comes from the parent company. It is obvious that the steady rise in the price of imports by monopolizing the import markets causes no trouble to the giant companies, while it constantly deteriorates the trade relations of the developing countries

At the same time, the parent companies restrict or completely prohibit the exports of their subsidiaries. 78 per cent of the 409 agreements examined in the Andean Common Market, contained export restrictions. This may have different causes:

(i) In this way, the parent company does not create a competitor for its subsidiaries - operating elsewhere in the same branch -, but can always apply retaliatory measures against steps that may be taken against it (stopping by the parent company of the operation of the subsidiary within the company "concerned").

(ii) Thus the developing country is unable to meet its export plans since there is a "legal" - contract-like basis for impeding it.

(iii) The local firm knows immediately how to behave.

There are compulsory regulations for the technology, the source and price of import products, etc. Most of the patents are owned by foreigners. In Colombia, 10 per cent of all patent owners possess 60 per cent of all patent rights (in the pharmaceutical, man-made fibre and chemicals industries, and this 10 per cent represent exclusively foreign transnational monopolies).[18] Their utilization serves the purpose of outpricing all local and foreign rivals. In Peru, out of the 4.872 patents registered in 1960-1970 - patents in electronics, textiles, engineering, chemistry, pharmaceuticals, fishery, metal-working, transport - altogether 54, i.e. 1.1 per cent, were actually utilized. In Colombia, of 3.513 patents only 10, or 0.3 per cent, were made use of.

As we have seen, the storehouse of monopoly potentialities concerning technological transfer only, and of additional monopoly rents that can be achieved by them is extremely large. An adequate protection of a country

against them is possible only if a well thought-out and concerted policy concept is formulated as also evidenced by the case of the Andean Common Market. According to its common order No. 24, the member countries revised their external agreements on technology, and in this way, e.g. Colombia saved 8 million dollars in 1972, which equals a whole year's import of technology by Peru. The related regulations of the Andean Common Market allow profits to the extent of 14 per cent of the basic investment, including of course hidden profit withdrawals. Chile - following Pinochet's order - left the Common Market. By his latest regulation Pinochet gave free hand to transnational corporations. Foreign investors enjoy conditions completely equal to those granted to domestic investors, may "... transfer abroad their capitals and the liquid profits with no limitations whatever."[19]

The result does not fail to show up: foreign capital subjugates Chile again, and the construction of an independent national economy can materialize only at the cost of a long and hard struggle.

FOOTNOTES:

1. For more details see Tamás Szentes: Az elmaradottság és fejlettség dialektikája a tőkés világgazdaságban. (The dialectics of underdevelopment in the world capitalist economy). Budapest, "Kossuth" Publishing House, 1976.
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4. The New sovereign. op cit., p. 80.
5. Ronald Muller & Richard Morgenstern; MNCs and Balance of Payments Impacts in LDCs. - Kyklos, April, 1974.
6. Jose de Cubas, op. cit., p. 14.
7. Karl Sauvant (ed.): Control of Multinational Companies. New York, 1976, p. 146.
8. Quoted by O. Sunkel in the U.N. study referred to in the footnote below.
9. United Nations; Hearings of the Group of Eminent Persons on the Multinational Corporations in World Development. New York, 1974, p. 132.
10. Various issues (1964-1971) of Survey of Current Business.
11. Various issues (1964-1971) of Survey of Current Business.
12. Claes Brundenius: "The Anatomy of Imperialism"- The Case of the Multinational Mining Corporations in Peru. Journal of Peace Research, 1973.
13. Constantine Vaitsos; Inter-Country Income Distribution and Multinational Enterprise. Oxford University Press, Oxford. 1974. Appendix.

14. Rand Corporation: Latin America in the 70s. Prepared for the US State Department, R-1067-Dos, December 1972.

15. Survey of Current Business, 1966, p. 38.

16. C. Vaitsos: "The Process of Commercialization of Technology... Lima", ECLA, 1971. p. 20.

17. H. Espinoza, 1971. p. 56.

18. C. Vaitsos: "Patents Revised: Their Functions in Developing Countries". The Journal of Development Studies. 1973.

19. Financial Times, March 21. 1977. p. 4.