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**THE ROLE OF
TECHNOLOGY TRANSFER IN THE DEVELOPMENT PROCESS
AND THE
RELATED BASIC ISSUES**

Introduction

Technology is a vital part of the development process. In the business and industrial world it is often understood that the meaning of "technology" encompasses a composite of techniques, knowledge and skills acquired by a company or an individual which can be used for some business purpose. ^{1/} "Technology" may be of a proprietary or non-proprietary character. If technology is not of a proprietary character, it is considered to be in public domain and everybody may make use of it. However, if a certain technology is of a proprietary character, it "belongs" to its proprietor who may, in turn, allow someone else to use it.

If technology is of a proprietary character, it constitutes a "right" which belongs to its owner. The owner of technology may agree that someone else uses it. The legal vehicle through which technology may be "transferred" to someone else for use, is the "contract" which, generally speaking, is the basis of all business life and business transactions. The specific contract which is most often used in the transfer of technology transactions, is also

^{1/} There are many definitions of "technology" in use. Webster's Third New International Dictionary, defines "technology" as "the science of the application of knowledge to practical purposes" or as "the application of scientific knowledge to practical purposes in a particular field" or as a "technical method of achieving a practical purpose". The unadopted International code of conduct on the transfer of technology (as of 16. November 1979) (hereinafter referred to as "the Code") defines transfer of technology as the "transfer of systematic knowledge for the manufacture of a product, for the application of a process or for the rendering of a service and does not extend to the transactions involving the mere sale or mere lease of goods" (Article 1.2). Some say that "technology" is commonly understood to mean "the stock of knowledge which permits the introduction of new or improved machinery and equipment, products, processes and services". UNCTC, TNCs in World Development, New York 1988, p. 176.

called a "license". There are also other forms which may be used in the transfer of technology transactions like simple sales, assignments, leases, turn key contracts, management contracts and a multitude of other contractual forms.

Since all industries are based on certain technologies, the industrial development process of nations is closely connected with the use of available technologies. As the result of the historical development, the fact is that most technologies are prevailingly concentrated in the countries with a longer industrial development tradition.^{2/} These countries are commonly known today as the "developed" countries. On the other hand, there are countries which are striving to achieve the industrial development and which do not possess the necessary technologies of their own. These countries, commonly known as "developing countries", are dependent on the acquisition of technologies from developed countries. There are also other countries, like for example former socialist countries, which do not possess modern technologies and are, therefore, at present also dependent on technologies from developed countries.

In modern times, transfer of technologies is a striving business. On the one hand, there is a tremendous exchange of technologies among developed countries themselves and, on the other hand, a lot of technologies are being transferred from developed countries to the developing countries. Among developed countries technologies are being transferred locally and internationally. These transactions present little fundamental controversies or problems since the basic concepts and issues on the technology transfer among the participants in these exchanges are common and non-controversial. Participants in these countries are well aware of the proprietary character of the technology and of the need to recognize the principle of a fair compensation or a fair return for the transferred technology. Furthermore, participants in these countries are capable of judging with great degree of accuracy the profitability and adequacy of a transfer of technology acquisition. Moreover, the legal systems of developed countries have evolved and erected a system of protective measures against various restrictions and restrictive practices so often related to transfer of technology transactions elsewhere.

In the area of transfer of technology between developed and developing countries, many misunderstandings and controversies have arisen in the last several decades. Developing countries have come to the conclusion that the terms under which they are acquiring foreign technologies are not as favorable as they thought they should be, while the efficiency and the effectiveness of the technology was lower than they have expected. At the same time, the

^{2/} It has been shown that during the past 200 years technological innovations have been dominated by a handful of countries. A study by O.E.C.D. (1970) identified 110 significant innovations in the 20th century. All emanated from developed countries with the U.S. responsible for 60%, the U.K. for 14% and Germany for 11%. Quoted according to "International Technology Transfer: Issues and Options", World Bank Staff Working Paper No. 344, July 1979.

costs of their acquisition was very high. Simultaneously, transfer of technologies was, as a rule, accompanied by a multitude of restrictive clauses which have further diminished their effectiveness and have tied the beneficiaries in a web of restrictions and tie-in clauses. Finally, many developing countries have realized that maybe even the adequacy of technologies they are acquiring is doubtful. As the result of all these misgivings and apprehensions, quite a few of them have lost confidence and faith in the very concept and in the usefulness of the transfer of technologies.

In the last decades in the area of transfer of technologies certain basic issues have emerged as pivotal in the relations between developing and developed countries. Most of these controversies have come to fore in the negotiations on the Code which have started in the year 1975 under the auspices of UNCTAD. Without pretending to enumerate all the issues, here are some of the key issues which have occupied the attention of participants in this area of international economic development process.

To whom belongs the technology ?

In the early seventies, developing countries have rallied together in order to exert a pressure on developed countries and the proprietors of technologies to gain an easier access to technologies. With this aim in mind developing countries have initiated negotiations on elaboration of the Code. The General Assembly of the United Nations has in 1974 at its sixth special session inaugurated the "New Economic Order" and a "New International Legal Order". One of the basic postulates of the initial draft of the new Code was the principle which declared that technology is "the common heritage of mankind".^{3/} The very implication that the technology may belong to someone else and not to its "owner", was simply not acceptable to developed countries. Besides, technology in developing countries is seen as the result of individual ingenuity, hard work, considerable individual or corporate investments. Consequently, technology is "property", gained through personal and capital investments and should be protected against encroachment in the same way as other types of property.

The initial language in the draft code and the words "the common heritage of mankind", was later changed and the last draft

^{3/} For an extensive review of the negotiating process on the Code, see Thompson, Dennis, The UNCTAD Code on Transfer of Technology, Journal of World Trade Law, July August 1982, Vol 16, No 4, pp 311-337

provided only that the technology is "key to the progress of mankind" and that "all peoples have the right to benefit from the advances and developments of science and technology" (Preamble, para 2).

Developing countries have also proposed to revise the Paris Convention for the Protection of Industrial Property. This Convention makes the basis and the pillar for the international protection of patents. ^{1/} The intention was to change the definition and the scope of patent rights, particularly those of foreigners in developing countries. Developing countries wanted to restructure the whole patent protection system by lowering the levels of protection contained in the Paris Convention and by amending their national laws to reduce the protection of patent rights. The basic idea was to force the patent holders in developing countries to work their patents either on their own or through compulsory licensing to third parties. The expected result of such measures would be an improved access to foreign technology on more equitable terms. At the same time, a preferential status was to be accorded to developing countries in respect to industrial property. ^{2/} These efforts have also failed, since developed countries declined to make the requested concessions.

Self-reliance or transfer of technologies ?

There is a school of thought which proclaims that the transfer of technologies from developed to developing countries is detrimental to the development of these later countries. Therefore, developing countries should develop their own indigenous technologies. One of the arguments in favor of development of own technologies is the fact that imported technologies are either too advanced, too sophisticated, too capital intensive and generally speaking, not well adapted to the needs of developing countries. In short, the most of the acquired technologies through transfer from developed countries are not "adequate" for developing countries.

It is often argued, that technologies from developed countries are the product of the respective social and economic conditions of these countries and are consequently suited only to the prevailing

^{1/} The Paris Convention (1883) has been revised several times (1900, 1911, 1925, 1934 1958).

^{2/} For example, developing countries proposed that the time periods which must elapse before a compulsory license may be granted is shortened for developing countries, or that the granting of preferential treatment to applicants from developing countries be extended by all Paris Convention countries thus reducing by one-half the application fees and maintenance fees for patents and trademarks for nationals who are nationals of developing countries.

social order of these countries. They argue that if technologies are the product of skills, techniques, science and engineering created in one society, they are inherently inadequate for other, different societies. In favor of this view they point out that plants and other industrial establishments when they are transferred from an advanced social and economic environment have a much lower productivity than when they are used in their original social and economic environment. 6/

These and other arguments against importing foreign technologies do have certain weight. It is true that imported technologies often have considerably lower efficiency in developing countries. Therefore their price, based on their expected efficiency as known in developed countries, is much too high for a developing country. On the other hand, it is also reasonable to assume that developing countries will for some time to come not be able to develop technologies which are adequate for their needs. These countries do not have own research capabilities or their own indigenous capital or their own trained manpower.

The answer to this plight of developing countries, in our opinion, is not in the rejection of foreign technologies but in the creation of such national policies and strategies which will screen and select such technologies from developed countries which will be more suitable to the social and economic development capabilities of particular countries than some other technologies. Developing countries should, as a matter of national policy, identify the particular stage of their industrial and economic development, their needs for processing and extracting raw materials and other natural resources with which they dispose, and according to that development stage ascertain which technologies would be best suited for their needs.7/

Legislative regulation of technology transfer

In order to improve the conditions and terms under which technology was being transferred, many developing countries have

6/ Abdul Rehman Yousef, *The Role of Transfer of Technology in the Pursuance of Technical Progress, Technology Policies for Development and Selected Issues for Action, Proceedings of a Seminar organized by Islamic Development Bank and UNCTAD, UN Publication, New York, 1988, p. 10 et seq.*

7/ This point is granted even by developed countries as shown by the results of a program conducted by the Management and Development Institute for the U.S. Department of State where one of the conclusions of the report was that "developing countries need to improve their choice of technologies and to set clear and realistic development plans and priorities". (IMDI, Final Report, Science, Technology, and Development, January 1979, p. 14)

enacted special legislation containing terms and conditions for such transfer. This practice is in sharp contrast with otherwise almost universally acceptable freedom of international merchants to conclude and make contracts under the terms and conditions as they deem fit. However, this practice was in accordance with the tendencies of many developing countries to regulate through special legislation those areas of international contracting where their own enterprises needed additional protection due to their weaker and unfavorable negotiating position. Such areas were primarily the areas of joint ventures and transfer of technology agreements. These contracts were new to the negotiators of many developing countries and they did not have sufficient experience in negotiating them, while the other side, namely transnational corporations and other foreign investors, were very experienced in negotiating them. Many governments of developing countries have, therefore, through special legislation, prescribed terms and conditions which such contracts should contain and have reserved for themselves the right to approve all such contracts before they could enter into force or become valid and enforceable.

Conditions which developing countries imposed through the special legislation were varied. Some countries, for example, have forbidden the capitalization of technologies as equity investments into joint ventures. ^{*/} Some have imposed special guarantees and warranties which the licensor must take over for the licensed technology or in relation to the intended output or in relation to the environment or for the possible damage from technology to third persons. Some have imposed special obligations on the licensor relating to the supply of improvements in the technology during the validity of the license, or special restrictions for the supply of similar technologies from third parties, or special obligations relating to the training of licensees personnel. Most legislation have tried to curtail the restrictive clauses in relations to marketing, production, improvements or in relation to the so called "tie-in" or "tie-out" clauses, which either tie the licensee to specific sources of supplies for raw-materials, spare parts or exclude them from certain sources of supplies. Such clauses can often be found in transfer of technology agreements. Many of the provisions of special legislation were aimed at curbing the "transfer pricing" practices of developed countries through which they have often succeeded to diminish their profits in host countries and increase their profits in countries of tax haven or in their home countries.

^{*/} Such a provision was contained in the Andean Foreign Investment Code (Decision No. 24 adopted December 31, 1970 by the Commission of the Cartagena Agreement, as amended. Article 21 of the said Code states that "intangible technological contributions ... may not be computed as capital contributions".

Although there is nothing wrong in the practice of states to regulate areas where their national interests are at stake, it is submitted, that contractual relations should, in principle, be left to the parties themselves to regulate. Freedom to contract gives to the parties the necessary flexibility to structure their contractual relations in the way best suited for the particular relationship, while all legislative restrictions have exactly the opposite effect. National states are aware of this and they do not try to regulate those contractual relations for which they know that their nationals are well equipped to deal with, like simple sales or various engineering contracts or similar, where national legislation of contractual relations is marginal or non-existent. Therefore, national legislation of the transfer of technology area is acceptable as long as the inequality of contracting parties between developing and developed countries in the field of technology is not diminished and as long as the negotiators from developing countries do not gain sufficient experience in negotiating this type of contracts.

As pointed out, developing countries are genuinely caught in a dilemma. Strict regulations of technology contracts may actually improve the contractual conditions of technology transfer but, at the same time may prevent access of domestic firms to foreign technology. The cure is, therefore, in structuring regulations in a flexible manner and by paying due attention to the changing circumstances of the country's economy. */

Restrictive practices

One of the crucial areas of misunderstanding and disagreement between developed and developing countries was the area of "restrictive business practices". As such are understood contractual clauses which restrict the freedom of the licensees to act in their best interest and oblige them to act as provided in the contract. In negotiating the draft code on transfer of technology, there were 20 restrictive practices identified in the Draft code.^{10/}

*/ UNCTC, Third World Report, op. cit. p. 185.

*/ The Draft code has identified the following restrictive trade practices:

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| - Grant back provisions | - Patent pools & cross licensing |
| - Challenges to validity | - Restrictions on publicity |
| - Exclusive dealing | - Payments after expiration of i.p.r. |
| - Restrictions on research | - Restrictions after expiration of arrangement |
| - Restrictions on the use of personnel | - Limitations on volume, scope, etc. |

Developing countries have argued that restrictive practices impose an undue burden on the recipients of technologies, lower their returns on the invested capital, while they increase the returns of the proprietors. Furthermore, they have argued that most of the restrictive practices are possible because their own domestic legislation and court practices in this area are not as developed as those of developed countries, which prohibit such practices. On the other hand, developed countries have argued that the restrictive practices should be viewed within the principle of "reasonableness". This would mean that almost every restrictive practice could, under certain circumstances, be allowed, provided that its application is "reasonable" and that their own legislation and court practices are adjusted and follow that principle. ^{11/}

Many of the arguments of both sides in these discussions are well founded. While a flexibility is essential in all commercial dealings and therefore also in transfer of technology arrangements, the widespread restrictive practices threaten to deprive the developing countries of considerable benefits they could derive from these transactions. Since no agreement was reached on a wider international scale and since the Code was never agreed upon, developing countries are left with the option to regulate this field through their own domestic legislation. It is submitted that a balanced legislation and measured court practices in these countries could considerably decrease the negative sides of restrictive trade practices through elimination and prevention of the worst cases of such practices.

Forms of technology transfers

Basically, there are two essentially different forms through which technology could be transferred from one country to another.

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| - Price fixing | - Quality controls and standards |
| - Restrictions on adaptations | - Obligation to use a trademark |
| - Exclusive sales or representation agreements | - Obligation of licensee to provide equity agreements or licor to participate in management |
| - Tying arrangements | - Unlimited or unduly long duration of |
| - Export restrictions | - Limitations upon the use of technology already imported |

For detailed discussion of these issues, see Fikentscher, W. The Draft International Code of Conduct on the Transfer of Technology, IIC Studies, Volume 4, Max Planck Institute for Foreign and International Patent, Copyright, and Competition, Munich, 1980, pp. 80 - 121.

^{11/} In assessing if a certain practice is acceptable or not, there are two fundamental tests applied by the courts. These two tests are the "rule of reason" and the so called "per se" standards. If a practice is "per se" illegal there are no conceivable circumstances which may justify a person in engaging in it. If, for example, price fixing is illegal "per se", even if the members of the group were in no position to control the market, they would be directly interfering with free play of the market. On the other hand, if the "rule of reason" can be applied to a practice, it means that an inquiry is necessary and that the illegality depends on circumstances which will show whether the practice was reasonable or illegal. Nature, purpose, and effect of restraints are examined and judgment passed on the individual features of each case.

These two basic forms are: equity or non-equity.

The equity form means that the technology is being transferred through or coupled with an equity investment. This implies that the foreign technology supplier retains a certain degree of control and management rights connected with his equity and that he can influence the operation and application of the technology through the retained equity rights. Controls and management rights connected with an equity may be such that the foreign technology supplier retains the sole and exclusive rights to control and management (as would be the case in a fully or majority foreign owned subsidiary) or that he retains a certain degree of control and management depending on the proportion of his equity participation or on the contractual clauses regulating his role in control and management.

The non-equity form of technology transfer consists in licensing a certain technology through a contractual, licensing arrangement. Practice has shown that many up-to-date or sophisticated technologies are simply not available through licensing because its proprietors are not willing to cede their use to parties over which they do not exert certain control. On the other hand, if the technology is used through equity forms, and particularly through fully foreign owned subsidiaries, it is sometimes difficult or almost impossible to force the foreign owners and local subsidiaries to deal with their subsidiaries on "arms length principles". That opens the possibilities for transfer pricing practices and for ultimate increases in the prices of technology.

Conclusion

The foregoing discussion has attempted to outline some of the crucial dilemmas connected with transfer of technologies as an essential element in the development policies of nations. While developing countries need foreign technologies and are unable to develop their economies only on the basis of indigenous technologies, their desire to win more favorable terms is legitimate and understandable. Developing countries have had bitter experience with inadequate technologies and with the often high costs of its acquisition. They clearly need, what is sometimes referred to as "an active technology transfer strategy".^{12/} Such strategy would encompass the conscious search and selection of technologies, as well as measures aimed at facilitating technology

^{12/} UNCTC, Third World Report, p. 188 - 191.

absorption, assimilation, diffusion and innovation. It implies deliberate control over and management of the transfer process. And increasingly requires greater efforts to foster indigenous technological capabilities. ^{13/}

^{13/} Ibid, p. 185.