Hidden Costs of Technology Transfer

Adverse impacts of package deals with restrictive clauses

Hasan Gürak

Homelink International

e-mail: gurak@turk.net

homelink@turk.net

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On anahtar kelime: teknoloji, teknoloji transferi, kalkınma, aksak piyasalar, doğrudan yabancı yatırımlar, teknoloji maliyetleri, gizli maliyetler, doğrudan maliyetler, "transfer-pricing, kısıtlayıcı uygulamalar.

Ten key words: technology, technology transfer, development, imperfect markets, foreign direct investments, cost of technology, hidden costs, direct costs, transfer-pricing, restrictive practices.

Abstract

Global operations of Giant Firms seem to restructure the division of production and income distribution on a global scale while increasing the interdependence of nations. In this process, the FDIs seem to be the principal mechanism linking national economies, in addition to trade. But, nevertheless, there is a disturbing gap in economic welfare between the few DCs and plenty LDCs. The rate of economic growth can, no doubt, be accelerated through the transfer of technology from the vast pool of technology accumulated in the developed countries. But, there is the belief that foreign investment "**if left to the prevailing market forces, would accentuate rather than alleviate some aspects of under-development: it would aggravate the inequality of social and economic relations and increase external dependence**." (UNCTAD,1972,p.1)

The purpose of this study is to shed some light on the “adverse” impacts of transfer of commercial technology through FDIs to LDCs. Analysis will focus more on the “hidden” costs arising from the use of restrictive clauses contained in package deals.

As will be seen, there are imperfect markets for technology transfer and the transactions in technology transfer often take the form of "**package deals**" accompanied by explicit written or implicit and unwritten contractual clauses.

Özet

Küresel üretim-dağıtım ilişkilerinin yönlendiricisi olan Dev Firmaların faaliyetleri sonucu dünya ekonomisi ve uluslararası gelir dağılımı yeniden şekillenmekte ve ülke ekonomilerinin birbirlerine bağımlılığı giderek artmaktadır. Bu süreçte ticaretin yanı sıra Doğrudan Yabancı Yatırımlar önemli bir rol oynamaktadırlar. Gelişmiş ülkelerden yapılacak "teknoloji transferinin" ülkeler arası refah farkını azaltması bekleniyordu. Oysa, gelişmelere bakılırsa mevcut düzenin refah farkı azalması bir yana sosyal ve ekonomik ilişkilerde eşitsizliği arttırdığı ve ekonomik bağımlılığı arttırdığı, sonuç olarak gelişmiş ve gelişmekte olan ülkeler arasındaki ekonomik refah farkının genel anlamda giderek büyüdüğü gözlemlenmektedir.

Bu yazının amacı işte bu olumsuz gelişmelere neden olan unsurlardan belki de en önemlisi olan Doğrudan Yabancı Yatırımlar aracılığıyla yapılan teknoloji transferinin "olumsuz" etkilerini incelemektir. Özellikle kısıtlayıcı maddeler içeren "paket anlaşmaları" sonucu ortaya çıkan "gizli" maliyetler üzerinde durulacaktır.

Yazıda da görüleceği gibi teknoloji piyasaları "kusurlu" (imperfect) piyasalardır ve teknoloji transferindeki paket anlaşmalar genellikle "açıkça" yazılı olan veya olmayan bir çok olumsuz etki yapan maddeler içermektedirler.

The institution that most changes our lives we least understand, or, more correctly, seek most elaborately to misunderstand.

That is the modern corporation.

K. Galbraith

The Age of Uncertainty (1977,p. 275)

Introduction

As empirical evidence on the global economic performance indicates, there is a widening gap in the economic welfare and technological advances between the few so called Developed Countries (DCs) and plenty Developing or Less Developed Countries (LDCs). Neither the popular import-biased economic growth strategies of 1950s and 1960s nor the highly praised export-biased growth models have been successful in transforming the LDCs from the cadres of less development into the levels of welfare state prevailing in Western industrialized countries. As a recent World Bank study indicates: "**The last decade of the 20th century saw great progress in parts of the world. But it also saw stagnation and setbacks, even in countries that had previously achieved the fastest rates of economic growth. These gaping differences and sharp reversals teach us much about what contributes to development. At the center is economic growth, not just its pace but—as important—also its quality**." (World Bank,2000;p.XXIII)

The World Bank claims that there is often inadequate attention to certain crucial aspects and recommends the broadening of policy framework to include some qualitative aspects. Accordingly, the World Bank focuses on four dimensions of quality going into the growth process;

1. Improving the distribution of opportunities;
2. Sustaining natural capital;
3. Dealing with global financial risks; and
4. Improving governance and controlling corruption.

The term "quality" is an ambiguous and subjective concept. While improved sanitation and health conditions might be considered as a qualitative change for citizens of Country-X, present family relations in DCs might be considered as reduced quality for the citizens of Country-Y. Yet in another community, the quality might imply egalitarian income distribution or better gender/racial equality while for the people in poverty it might imply more nutrition and improved shelter. Thus, given the disparities in social/cultural/institutional environment, the concept quality would have

different implications. Each nation will find its own subjective and specific qualitative patterns as economic growth takes place. Four dimensions of the Bank indicated above could serve only as normative sets of guidelines.

As the World Bank states: "**At the center is economic growth."** Therefore, at the expense of other "qualitative" aspects, the emphasis in this paper will be on the analysis of some inappropriate conditions for economic growth and incessant social change. To be more specific, the focus will be on global technological aspects, with the purpose to shed some light on the "adverse" impacts of technology transfer through foreign direct investments (FDIs) in LDCs. As technological changes take place, socio-economic changes follow accordinly and inevitably which also changes the qualitative aspects of life, both in developed as well as less developed nations. And the key to both, qualitative and quantitative progress, is the **knowledgeable human resources**, given the proper economic policies and institutional/cultural environment. (Gürak, 1999; 2000-a; 2000-b)

Analysis draws extensively from a previous thesis (Gürak; 1990) and will focus on the "hidden" costs arising from the use of restrictive clauses contained in package deals. But first, the concepts like development/growth, "new" technologies and channels of technology transfer will be reviewed briefly.

Economic Growth and Development

It is difficult to draw a distinct line between growth and development. For some researchers growth implies increased per capita value-added while the concept development implies more, i.e., economic growth plus institutional/social/cultural changes in the society. Regarding the circumstances in LDCs, this would imply, in addition to higher per capita income, improvements in areas ranging from educational opportunities, income distribution, housing conditions, infant mortality, life expectancy to political and judicial system. As the World Bank study indicates: **"Development is about improving the quality of people's lives, expanding their ability to shape their own futures. This generally calls for higher per capita income, but it involves much more. It involves more equitable education and job opportunities. Greater gender equality. Better health and nutrition. A cleaner, more sustainable natural environment. A more impartial judicial and legal system. Broader civil and political freedoms. A richer cultural life. As per capita incomes rise, several of these aspects improve in varying degrees—but others do not. "** (World Bank: XXIII)

There is a close correlation between technological change and economic growth - development. As firms introduce new technologies to control and to change the environment, they also, indirectly, induce socio-economic change. In other words, new technologies lead to inevitable modifications in the institutional setting and cultural values and incessant technological changes incessantly change our socio-economic life. One of the most recent and drastic example is the widespread application of computers and Internet. Developments in information technologies (IT) did not only make communication easier, generated new employment opportunities, opened up new markets but also raised social and political expectations. For instance, nowadays citizens of the DCs demand broader participation in decision-making concerning local and national issues. Since all economies, one way or another, incessantly undergo technological changes and technological changes lead to socio-economic changes, then all countries are, at the same time, growing and developing.

Technology

Technology is the knowledge that changes and controls our environment. In this study, as we focus on (commercial) technology transfer, the term technology will be used as the set of "**productive knowledge"** applied to produce commodities or to render services to meet the needs and wants of society. It is the "**key to the progress of mankind**" (UNCTAD,1983,p.41) and paves the way to economic development along with social-political change. (Gürak, 2000-a; 2000-b)

Invention-innovation process of a new technology is a rather costly and risky process which is predominantly undertaken and/or controlled by globally operating enterprises (GOFs). New technologies requires the engagement of highly skilled human labor as well as financial resources, given the appropriate technological, organizational, institutional and cultural infrastructure. The determinant objective of the firms to engage in such costly and risky process is to obtain the maximum compensation (return on investment) in the long-run. To achieve this goal, the new technology must be able to make the owner more competitive and profitable either in terms of lower unit costs by introducing a "new production method" for a "given" product or by introducing "new products and production methods" which usually facilitate the realization of above average profit rates, until the competitors catch up.

In a market economy, the patent rights system guarantees the reward for efforts in terms of returns on the investment. The owner of the new technology (productive knowledge) is thus granted the right by the authorities to enjoy the fruits of possessing a new productive knowledge until the

competitors develop similar products. The patent system does not only stimulate research for new productive knowledge but also eliminates unnecessary efforts in the same field as others would find out that their idea has already been developed. As the patent is disclosed in a public document, it is said to stimulate further improvements (development) of the patented technology by others.

GOFs possess an immense pool of productive knowledge, as well as widespread experience and managerial/organizational skills. Global inequality in wealth distribution is expected to narrow by transferring technology to LDCs mainly through the FDIs of GOFs. Empirical evidence indicates that most dynamic industries of the global economy are in research intensive sectors where technological change is an incessant process. Therefore, it is no surprise that the globally operating GOFs are, in general, found in those dynamic, research-intensive industries, which sometimes require funds greater than the total national income of some nation-states.

Is Technology Transfer Necessary?

To meet the desired development targets, the LDCs face with two alternatives:

1. encouraging indigenous technological efforts from R&D to product development; or
2. transferring the already existing and tried technologies from DCs.

Whatever the strategy of economic growth and development, LDCs, in general, seem to be in short supply of essential elements of development, especially of skilled labor force. On the other hand, in a rapidly and continuously advancing technological environment, consumers' preferences both in developed and developing countries are shifting towards more sophisticated and technologically complex products, especially in dynamic sectors like communication, biology, space industry, etc. Having access to an appropriate absorptive capacity in the recipient country in terms of qualified human resources and appropriate technological/institutional infrastructure is a prerequisite for the local production of new technologies which requires not only huge investments but also time and experience. Therefore, it would seem more rational for LDCs to rely on the technology transfer for development. The commonsense would find the argument for engaging the scarce resources of LDCs to produce something that already exists in DCs not only risky but also rather irrational.

As commonly acknowledged, technology transfer has many positive impacts on the economy of technology importing countries. Accesses to new and advanced know-how, addition to domestic productive capacity and employment generation are just a few. But the technology market also

contains many imperfections. Various factors seem to restrict the full-utilization of the transferred technology. In other words, FDIs do not only imply benefits but also some adverse impacts on important aspects such as income distribution, employment and foreign currency reserves. There are even claims that the overall costs by far outweigh the benefits generated by investment.

Channels of the Transfer of Technology

The channels of technology transfer can be classified in three groups:

(1) Transfer of Informative Knowledge;
(2) Transfer of Products; and
(3) Transfer of Production Method.

Transfer of Informative Knowledge

The scope of the transfer of informative knowledge ranges from the flow of publicly available knowledge like patent disclosure, professional books and journals to education/training of manpower. One has to distinguish, however, that what is to be transferred is **not** the productive knowledge on "how to produce", but rather the information on "product itself" like what it is, where it is used or how it is used. As such, informative knowledge is beyond the scope of this paper.

Transfer of Products

Also referred to as the "Direct Transfer" of technology, it takes place when a commodity containing the "features of a specific technology" is transferred (imported) to another country as a finished or semi-finished commodity. It is important to note that what is transferred is still **not** the productive knowledge "how to produce" a commodity but "a commodity" embodying the built-in features of a specific technology in "disguised" form. In other words, there is the mere transaction, e.g. sale/purchase, of a commodity. A great deal global trade consists of finished and semi-finished commodities. In this sense, a massive amount of technology transfer takes place every day, but the subject is not within the scope of this paper, either.

Transfer of Production Method

Transfer of technology should involve, as UNCTAD postulates, **"... 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."(1983,p.2) We refer to such technology transfer as the transfer of production method. The means for this kind of transfer range from the establishment of a wholly owned subsidiary in the host-country to patent / license arrangements, joint ventures, turnkey arrangements or to profit-sharing arrangements. Transferred method of production usually introduces new products that had no counterpart before in the importing countries by introducing:

1. a new production process for an existing product; or
2. new commodities/services; or
3. both.

The channels of the transfer of production method can be subdivided into two groups:

1. license/patent sale/purchase; or
2. foreign direct investment (FDI).

Given the appropriate conditions, the LDCs could save a lot of time, money and human resources by transferring technologies from DCs. There is of course a price for the technology to be transferred which ought to be lower than costs of local-development or re-invention of the desired technology. The focus, in this paper, will be on the "hidden" price (costs) arising from FDIs.

What Should Be the Price ?

If there were perfectly competitive markets as the Neoclassical theory predicts, the price of new technology would equal the marginal costs of distribution. Because, once a new technology (productive knowledge) is developed, its exploitation by others does not diminish its availability to others. Thus, to acquire **optimum** utility from the new technology, it's price ought to be set at marginal costs of distribution to other potential users. But, this represents a "utopian" case in contrast to common business practices in global economies. In real life, there is a price to be paid by technology buyer in excess of its diffusion costs.

Actual Cost

It is not an easy task to evaluate the actual costs of technology accruing to the technology importing country. Some costs are statistically measurable but some occur in a disguised form, such as transfer pricing of import/exports, or costs arising from restrictive practices on imports, exports, etc.

Such indirect costs involve both conceptual and verification problems. UNCTAD suggested to distinguish the direct costs from indirect ones in the manners described below.

"Direct costs:

(a) Charges for the right to use patents, licenses, know-how and trade-marks;

(b) Charges for technical knowledge and know-how needed both in the pre-investment and in the investment stages and in the operation stage.

Indirect costs:

(c) Charges through overpricing of imports of intermediate products and equipment ("hidden" costs or "price mark-ups"), some of which may not have market price;

(d) Charges arising through profits on capitalization of know-how (equity participation in place of, or in addition to, other means of payments for the transfer of technology); dividends on these equity holdings are, therefore, to be regarded as, in part, payments for the transfer of technology;

(e) Charges in the form of some portion of repatriated profits of wholly-owned subsidiaries or joint-ventures the establishment of which does not make specific provision for payments for the transfer of technology;

(f) Charges through imports of capital and other technical equipment, the price of which usually allows for the exporters' valuation of the cost of technology."(UNCTAD; 1972,p.24)

Hidden Costs Arising From Foreign Direct Investments

No doubt that there is sufficiently large quantity of literature and comments on the positive impacts of technology transfer through foreign direct investments on the host country economy such as contributions on;

1. domestic employment;
2. foreign currency inflow through investment and exports;
3. foreign currency saving through local production instead of importing;
4. increased production capacity;
5. increased productivity;
6. access to “new” superior productive knowledge;
7. tax revenues; etc., etc.

But, as mentioned before, there are also some serious demerits (hidden costs) of the system as such which cost rather dearly to the host countries which sometimes could be to the detriment of economic / technological development in contrast to the expectations. Costs like repatriation of profits, royalty payments, management salaries are measurable quantities and the cost to host country can be easily evaluated. But so called “hidden costs” which might sum up to huge amounts are difficult to reveal and to measure.

The following sub-chapters will focus on these hidden aspects of technology transfer accruing to host countries which are practically impossible to measure to full extent due to its inherent feature; that is being “hidden”, but. which ought to be dealt with if a better and fairer global economic, social and political order is desired.

The General Circumstances

In general, the LDCs offer a variety of generous financial and non-financial incentives and concessions with the hope to attract more FDI, hence to accelerate the domestic economic growth, increase employment, and solve other related problems. But, these incentives and concessions are not always compatible with the development plans and aspirations of the developing countries. Not infrequently, there are even conflicts of interest between the GOF and host country. It has often been observed that the foreign investors enjoy monopolistic/oligopolistic advantages in the host country over the quantity/quality of production, distribution, source of inputs and finance, prices, quantity/type of exports, and the method of production. These monopolistic/oligopolistic advantages may cause serious adverse effects on the economy of recipient countries, such as imbalance-of-payments, "non-transfer" of technology, deterioration of income distribution or the introduction of inappropriate (luxury) products. It is a great concern to many that globally operating corporations might take too much and leave too little, thus costs to the host country might far exceed the initial financial benefits and expectations as technology markets are characterized by imperfections to the detriment of LDCs.

At first sight, the sources of advanced technology might seem to be manifold and this fact seems to place the technology importing firms in an advantageous position against the technology sellers. But there is a serious problem; a country with low technological absorptive capacity would not know what alternative technologies are available, what the most suitable ones for local production, what the best channels of transfer are and how to bargain effectively about the terms transfer.

If the developing countries could agree on certain basic principals to act collectively against the GOFs, their bargaining power and the ensuing benefits would have been improved significantly. In practice, however, it is the GOFs that have the upper hand, especially when technologically more complex projects are involved. The more complex the imported technology for the buyer, the weaker the bargaining strength of the recipient tend to be and the more costs tend to accrue. The GOFs are normally in a rather strong bargaining position and usually dictate the terms of conditions of technology transfer in conjunction with their own global interests. Thus, complexity of the technology and the relative bargaining powers of related parties appear to be the major initial causes of technology market imperfections.

What are the specific circumstances leading to undesired hidden costs ?

"Package Deals" with Restrictive Clauses

The GOFs do not only respond to local market imperfections such as inefficient economic policies, but often generate these imperfections themselves and the package deals containing various kinds of restrictive practices is a common way of doing it. Package deals can contribute to the acceleration of economic development in developing areas by providing the secure flow of vital inputs of production. But they can also become the impediments of economic and technological progress. It seems like that many FDIs would not have taken place in developing countries in the absence of restrictive practices which tend to redistribute income in favor of the industrialized countries, thus adversely affecting the global income distribution patterns.

There are three major reasons for packaging the technology;

1- packaging enables the GOF to exercise considerable degree of control over key issues such as price, source of inputs, exports, quantity, etc.;
2- packaging minimizes the risks of technical/organizational inefficiency in the operation of subsidiary and guarantees a certain degree of quality to protect the image of a "trade-mark"; and
3- the GOF would be reluctant to see an unchecked diffusion of its technological and managerial skills that might lead to the creation of local competitors.

In contrast to direct foreign exchange costs and tax-concessions, costs arising from package deals are rather cumbersome to measure, if not impossible. In case of joint-operation, it is an expected behavior by the GOF to make an explicit written agreement specifying the nature and extent of transactions. But, if the subsidiary is a wholly-owned or controlled subsidiary, such an explicitly

written contractual agreement would be superfluous, since the subsidiary would receive all instructions directly from the head-quarters. There would be no need for formal documents for the GOF is in complete control of all operations anyway. As a result, there would be no "visible" restrictions to be criticized and estimating "hidden costs" would become more complex.

Developing country institutions urgently have to find and impose counter-acting measures to minimize the hidden costs which implies;

1. loss of tax revenues to the state;
2. higher consumer prices (when imports are over-priced);
3. less dividends for the local share-holders (if there is a local partner);
4. deteriorated foreign exchange reserves (over-priced imports / under-priced exports); and;
5. loss of export earnings (if exports are restricted).

Classification of Hidden Costs

The "hidden" costs can be analyzed in the following major groups:

1- Transfer Pricing ("Under-pricing" exports / "Over-pricing" imports).
2- Export Clauses.
3- Import Clauses.
4- Production Clauses.
5- Management Clauses.
6- Intra-firm Loan Clauses (Excessive interest-rate on intra-firm loans).
7- Grant-back Clauses (Reverting product improvements to parent-firm).
8- Technological Dependence for Uninterrupted Production.

1- Transfer Pricing (Over-pricing Imports– Under-pricing Exports)

A significant share of global trade takes place intra-firm, that is between the subsidiary and the parent firm which provides an appropriate climate for **transfer-pricing** mechanism in transactions with the Parent Firm. Probably the most efficient means of clandestine transfer of company revenues (e.g. **invisible profits**) from the subsidiary to parent firm is through the transfer-pricing mechanism. GOFs possess the necessary facilities, experience and expertise to manipulate the intra-firm prices in accordance with their global strategies, especially vis a vis the developing countries. Unfortunately, making a sound estimate of such costs is rather difficult due to commercial secrecy and reluctance to publish such data, but they are assumed to be of significant amount.

Transfer-pricing mechanism, accompanied by restrictive clauses, obliges the subsidiary;

1. to buy the necessary capital goods and other inputs of production from the sources, and at the prices, determined by the technology supplier (**over-pricing**); and/or
2. to sell the subsidiary's output to customers, and at prices, determined by the technology supplier (**under-pricing**).

Empirical data indicates that the provisions of contractual clauses are used mainly for over-pricing purposes, rather than under-pricing. (Gürak; 1990) While over-pricing of inputs and capital goods in intra-firm trade contributes to the maximization of global earnings of the GOFs, it represents loss of already scarce foreign currency for host country. For instance, for some specific inputs, say the engine for Fiat automobiles, there is no international market and the source of supply is determined by the headquarters along with the pre-determined price to be paid by the subsidiary. There is no way to estimate the rate of over-pricing and the ensuing clandestine revenue transfer correctly.

According to a recent but rather naive approach by UNCTAD, transfer pricing methods are introduced as a response to tax policy imperfections, such as double taxation. (UNCTAD; 1999-c,E.99.II.D.8) The recommended remedy to overcome this problem is to restructure the international tax laws and other arrangements **including mutually acceptable transfer pricing methods**. New global tax arrangements might indeed serve to eliminate double taxation but would hardly be sufficient to eliminate the transfer pricing mechanism and the evils caused by it.

Given the global strategies of GOFs, the motives for the technology supplying Parent Firm to prefer transfer-pricing mechanism could be summarized as follows;

1. to avoid double taxation or host country taxation;
2. to maintain a pattern of "image" in the host country by keeping declared profits / royalties low;
3. to maximize the profits in predetermined "profit-centers"; and
4. to overcome the host country controls and regulations on remittances.

The firms are reluctant, by their nature, to pay taxes (item-1) and this factor may induce the Parent Firm to search for means to avoid or minimize the payments. Instead of paying full amount taxes, the parent firm may transfer earnings to a preferred center, through the over-pricing mechanism.

For some people, especially in the developing countries, FDIs represent a new form of (economic) imperialism and exploitation of indigenous endowments. To avoid further antagonism in the host country or in international opinion, the Parent Firm may pursue a policy of keeping profits low in

the developing host countries. Thus, while preserving its image as a good "corporate citizen" (item-2) it can continue its operations, including transfer-pricing, in a smooth atmosphere.

In case of joint-ventures, the Parent Firm can increase its share of the profits by reducing the profit rate at subsidiary level through transfer-pricing (item-3). And finally, the stringent host country foreign exchange controls and regulations (item-4) may induce the Parent Firm to resort to other means than royalty payments or profit remittances from the subsidiary.

Transfer pricing is not entirely a developing country dilemma. It has also been used in the intra-firm trade among developed countries. The most striking example of over-pricing, to our knowledge, is the case of Hoffmann-La Roche. The U.K. subsidiary of the firm had declared profits at around 5 percent while The Monopolies Commission in UK claimed that the return on capital earned over the period 1966-1972 was, in fact, over 70 percent. (Franco,1976,p.227) Similar cases occur throughout the world, but, not infrequently, the developing host countries are unable, certainly not unfamiliar, to cope with the problem efficiently.

2- Export (Non-competition) Clauses

The main purpose of such clauses is to preempt the possibility of competition of the subsidiary by entering global markets for the same products as competitors to the Parent Firm. Although a rather rational behavior from the point of view of Parent Firm, export clauses imply a "potential" loss of foreign exchange earnings for developing country. Export clauses may appear in various forms ranging from direct prohibition of exports to limiting the exportable quantity, restricting the number of export zones to quality control of products. Prohibition of the use of trade mark in third countries and export of "similar" products are other serious obstacles to the detriment of exports from LDCs.

Nowadays, there is a widely acknowledged and highly praised tendency for globalization of production and distribution, shaped by the GOFs. At first glance, one might get the impression that products are being produced at sites of least cost plants flowing freely in international markets and global competition is growing. Thus, the subsidiaries may appear as globally competing production centers. Unfortunately, not quite so. Subsidiaries are no "independent" profit centers, but fortresses of oligopolistic combats to maximize the profits in pre-determined profit centers in conjunction with global strategies of GOFs. Implicit or explicit export clauses are to serve the global interests

of GOFs. For instance, no matter how cost effective, given the quality, Fiat vehicles made in Turkey cannot be exported without the prior approval of Parent Firm in Italy.

3- Import Clauses (Tied-inputs)

Distribution of tie-in clauses on inputs ranges from country to country and demonstrates various levels of tendencies for tying the purchase of "certain" inputs from the Parent Firm and/or from the sources determined by it, depending on the global strategies. In the case of wholly owned subsidiaries, there is no need to specify such restrictions because of the fact that the Parent Firm determines the guidelines of operations of a wholly owned subsidiary. But in case of local partnership, implicit and/or explicit restrictions appear like mushrooms. Quality control clauses can reinforce the position of Parent Firm by determining "additional" tied-in items to purchase from the pre-determined sources or by restricting the purchase of inputs from "other" sources

4- Production Clause

The restrictive clauses on production would aim to predetermine the quality as well as the minimum and/or maximum quantities to be produced by the subsidiary which might serve to maintain the quality and (domestic/global) prices at a desired level. Quality controls, as mentioned before, can easily be used to tie-in imports while quantitative controls are, not infrequently, designed to preempt the possibility of exports.

In addition, the Parent Firm may prohibit the subsidiary to import competing products or production processes or cooperation of any kind with third parties. Restrictions on the production of "similar" products with the imported technology is a different but not a less significant matter. Production clauses are definitely not in contrast with the global interests of Parent Firm. But, depending on the nature and extent, production clauses may become serious obstacles to increased global competition and efficiency, to the detriment of LDCs.

5- Management Clauses

Technology selling firms are always anxious to maintain and consolidate control on the local firm by applying clauses on the key decision-making processes like planning and strategy, by appointing personnel trained and loyal to the parent firm. The key word is loyalty to the Parent Firm and its global strategic targets.

6- Intra-firm Loan Clauses

High interest payments on **intra-firm loans** represent another form of clandestine transfer of resources (foreign exchange) flowing from the subsidiary to the parent firm. Data available indicated that at occasions the volume of foreign private loans coming from the home countries exceeded the volume of total foreign direct investment originating from the same countries in a given period. (Gürak,1990)

7- Grant-back clauses

Such clauses require that any technological improvement made locally by the subsidiary to be reverted back to the owner of technology, the GOF. Such clauses deprive the host country of the potential benefits of technological improvements made in the host country, while consolidating the position of Parent Firm in global markets.

8- Technological Dependence

Large scale of technology transfer may become an impediment to the development of local technological capabilities and infrastructure, thus perpetuating the technological dependence on GOFs. In addition, Parent Firms are always keen on the further use of its productive knowledge after the expiration of contractual agreements and usually attempt to prohibit the further use of imported technology after the expiration. To extend the further use of technology, a new agreement has to be designed which enables the Parent Firm to continue widespread control over the subsidiary. Such restrictions along with "grant-back" clauses of locally made improvements which perpetuate technological dependence, are definitely not in the interest of LDCs, nor in the interest of global competitiveness and efficiency.

Duration of contracts is another problem area. The longest duration period possible would be the most desirable solution from the point of view of GOF. But the interests of the host country point to the opposite direction, e.g. the shortest possible duration.

Summary of the Findings

The growing dominance of global business transactions by the GOFs has led to different responses. The proponents of the new international division of labor discovered many highly merited benefits

in it for the entire world. FDI, they claim, brings not only foreign exchange, superior managerial and/or organizational ability but also new technologies unknown before the FDI. Thus, GOFs with its enormous facilities and global opportunities are seen as units of real international integration of the global economy.

The critics often draw attention to aspects such as economic and technological dependence, inappropriateness of the technology imported, misallocation of resources as well as adverse income distribution effects. It is true that the adverse affects of foreign investment are, to some extent, due to prevailing economic policies in LDCs. But it is also true that the functioning of technology markets, especially restrictive (abusive) practices, is the cause of many evils in the market.

Global operations of the GOFs is restructuring the division of production and income distribution on a global scale while increasing the interdependence of nations. In this process, the FDIs seem to be the principal mechanism linking national economies, in addition to trade. Global prosperity is increasing, but there is a disturbing and widening gap in economic welfare between the few DCs and plenty LDCs. The rate of economic growth can, no doubt, be accelerated through the transfer of technology from the vast pool of technology accumulated. But, the global strategies of GOFs and imperfect technology markets do not seem to be a proper cure to the problems. In fact, the present globalization process seems to aggravate global inequality and external dependence tends to be perpetuated. The GOFs seem to be "... **able to manipulate prices and profits, to collude with other firms in determining areas of control, and generally to restrict the entry of potential competition**...." (Todaro; 1977,p.342) And the prevailing conditions seem to prevent the extensive utilization of available technologies by developing countries.

The major findings can be summarized as follows.

1- FDI improves the foreign exchange reserves of host country at the initial stage. But what is taken out of the country after some years in terms of royalties and profits (official and clandestine) tend to exceed the initial inflows by a good margin. Transfer-pricing mechanism seems to be the principal source of clandestine profits (foreign exchange costs).
2- If the subsidiary is established to benefit from cheap labor to service the foreign markets only, there is the risk of "non-transfer" of technology.

3- Tax-concessions deprive the developing host countries of vital revenues for the state that could be utilized to promote the indigenous capabilities. Unfortunately, developing nations seem to compete with each other to provide more generous tax-concessions.

4- Restrictive (abusive) practices, whether implicit or explicit, constitute serious impediments to global competition and development. Such practices range from the prohibition of exports to tying the imports to a source or qualitative/quantitative restrictions, pre-determined by GOFs.

Developing nations owe the acquisition of many new technologies to FDIs. Nevertheless, one should not make the fallacy of assuming that the GOFs undertake FDIs to comply with the national objectives of a nation. GOFs only pursue their own global interests with the ultimate responsibility to their shareholders.

Some Policy Proposals

Developing countries still have a lot to learn from the experiences and expertise of GOFs in terms of technological know-how, marketing skills, managerial efficiency, etc. If right steps are taken in the right direction, there is a great potential contribution to be made from technology transfer. For the sake of global prosperity and stability, such improvements are imperative. Otherwise, the global income disparity would continue to deteriorate and many people in LDCs will continue to flow to DCs as economic refugees through illegal means in order to receive a share of the globally produced wealth. This illegal, undesired but inevitable international mobility of labor force, also referred to as "the voyage to hope", perpetuates many social problems in DCs while practically solving none in the developing world.

Here are some proposals to relief the problems in the short and longer period to come.

Developing Indigenous Capabilities

1. Education/Training

New technologies are the product of creative mind, e.g., the mental labor, the genesis and incessant source of long-run growth. (Gürak; 2000-a) But, given the prevailing conditions of human development and technological gap, a large number of the LDCs can achieve growth without having to engage in the costly and time-consuming new technology producing process. Because, there is already an immense pool of productive knowledge existing in relatively more developed countries. A large number of the "known" technologies are, in fact, "new" technologies for the LDC

firms. Assuming the absence of technology market imperfections, this situation presents a great economic growth potential for the LDC firms. What is required is the creation of appropriate premises for technology transfer. But, an indispensable prerequisite of a successful technology transfer is (preferably, up-to-date) **qualified (educated / trained) human resources**, first to find out **what** and **where** is the best suitable technology, **to adapt** and eventually **to further develop** it. The key word is "**qualified labor force**", i.e., increased quality and quantity of human resources. Initial costs of investments in human resources may be rather high and takes long time to pay off. But the country's potential benefits in the long run would be tremendous. If technology is the key to development, skilled manpower, given the appropriate infrastructure and economic policies, is the key to successful application, adaptation and further development in LDCs.(Gürak, 2000-a; 2000-b)

2. Economic Policies

It would be hardly proper to claim that LDCs, in general, pursue appropriate and efficient economic policies. There are many social, historical, cultural and political reasons for that. But the decision-makers have to find out and apply appropriate economic measures most suitable to their country's specific conditions. There is no universal prescription to overcome the problems. But, at least four universal areas could be pointed;

1- reallocation of resources to high-productivity (value-adding) sectors;
2- promoting the competitive conditions;
3- preserving the environment; and
4- preventing corruption, increasing economic-political transparency.

In order to reach the development targets, the decision-makers should prepare the premises for replacement of low-productivity firms and sectors, including Public Enterprises (PEs), by more productive firms and sectors in a fair competitive environment. For instance, it is a common knowledge that PEs are usually run rather inefficiently, and not infrequently used as means to provide "illicit" profits for certain privileged persons or firms close to decision-making circles. State owned banks are another striking example to observe how resources are being misallocated, as in the case of Turkey. Yet, the governments are rather reluctant, for several reasons, to change the status quo.

Many LDCs encourage the output in labor-intensive sectors like ready-wear and textiles. This could be a fruitful policy in the early stages of development. But, as development reaches higher stages, it would be in the best interest of working people and the country as a whole to reallocate resources

to higher productivity sectors. Policies protecting labor-intensive sectors in the long-run are bound to be counter-productive. After all, there are plenty of LDCs with low(er) wages looking for an opportunity to get a market share. Turkey is a good sample for this case; the ready-wear and textile sectors earn about 5-6 billion $ foreign currency a year. But in order to be competitive, the wages have to depressed and kept low permanently. There is a significant gap between the wages in low- and high-productivity sectors. A smooth and gradual transfer of human and financial resources to higher productivity sectors would benefit not only the workers but the country as a whole as well. An irreplaceable and indispensable prerequisite to reach the universal targets is the presence of **qualified human resources**.

3. Other issues

Cultural values, institutional setting, fertility rates, political pluralism, social mobility, etc. all are critical aspects of economic growth and development in the long-run. All these factors would change in time best suitable to the country-specific conditions as human and economic development increases. Therefore, once again, human resources appear to be as the best long-run remedy.

Supervising Agencies

Given the specific nature of transactions in technology transfer and the urgent need for accelerated economic growth, one of the objectives of developing countries should be to set up competent International and National Agencies with authority, responsible for the guidance of technology transfer. There ought to be an "International Code of Conduct" (ICC) to which all countries as well as GOFs are subordinated. ICC could eliminate/relief many problems and market imperfections such as tax-incentives and clandestine foreign exchange transfers. Whilst the ICC define the general framework of technology related matters, the National Agency could see to it that globally accepted guidelines are not violated in the national market. In addition, the National Agency should assist the local firms in search of the appropriate technologies and in negotiations with technology seller. A further objective should be the encouragement of efficient use of imported technology.

In 1983, the U.N. introduced a such a “Draft International Code of Conduct on the International Transfer of Technology”, (UNCTAD,1983) which was given the final shape in 1985 at the close of sixth session of the conference (TD/CODE TOT/47) Unfortunately there has been no new initiative in this respect in spite of radical changes in the political, economic and technological areas since

then. Given the present nature and structure of global interests and technology markets, the efficient operation of International Authorities seems highly utopian, at least for now.

Encouraging Joint-investments Without Abusive Practices

Complete control of the subsidiary's business transactions and related decisions constitute various disadvantages for the firms and national economy of host countries. After all, a wholly foreign owned subsidiary would be subordinated entirely to the global interests of Parent Firm in conjunction with global strategies of profit maximization. Without resorting to any explicitly written arrangements, the Parent Firm can exercise complete control on key decisions concerning price, quality, quantity, exports, imports, as well as the very existence of plant itself, all of which could be to the disadvantage of host country interests. In order to increase the benefits from technology transfer, joint-venture investments (preferably with at least 50 percent ownership) ought to be encouraged. After all, joint ventures do not only imply cost sharing but also technical/managerial skill sharing between partners, and as such reduce, if not eliminate, the risk of foreign control and transfer pricing.

In addition, measures like encouraging the foreign investors to buy locally produced components through subcontracting and promoting the forward- and backward-linkage effects would increase the contribution of imported technology significantly.

Encouraging License Arrangements

A license arrangement permits the recipient to have access to certain productive knowledge developed by the technology supplier. It saves the costs of producing similar technology, thus freeing the scarce resources for alternative uses. Therefore, license arrangements could be an efficient alternative to the technology transfer through FDI. Japan has been quite successful in acquisition and adaptation of imported technology through license arrangements and developing countries could learn a lot from the Japanese experience. The key factors of Japanese success was the availability of highly skilled manpower. Another important factor was the relatively narrower technological gap between Japan and industrialized countries.(see Appendix-A)

Restructuring the International Intellectual Property Rights System (IPRS)

Technology, or alternatively, "Knowledge on Production", is the key to progress of all nations, in terms of both economic growth and development. For technological advances change our economic life which, in its turn, changes our social-political life. As UNCTAD quite rightly points out, the "Global Entitlement to Knowledge" (1999-c), i.e., its transfer and diffusion, is rather essential for global economic growth and development. But, what UNCTAD infers from "Global Entitlement" seems to be all aspects of informative knowledge, except for the proprietary knowledge, that is "knowledge on production".

Yet, the sensitive and critical issue, the core of the matter, is the diffusion of proprietary knowledge, that is the knowledge protected by intellectual property rights. Most of the evils and imperfections in technology markets are due to prevailing IPRS conditions which definitely favor the GOF's interests. As UNCTAD suggests: "**A scheme for the global mobilization of non-proprietary technology"** (1999-c) would certainly make a significant contribution but is bound to have limited impacts unless complemented with **a new scheme for the global utilization of proprietary knowledge.**

Final words; A number of measures were outlined above to reach the standards of DCs which is not and easy target. There is no miracle prescription to overcome the obstacles of development. **Increasing the quantity of qualified human resources** is, no doubt, the core of the matter and the best remedy to all problems, in the long-run. Thus, the design and application of **appropriate education/training policies** along with all **other related economic, social and political policies** is an imperative condition. In the short run, most LDC firms are in need of more expertise and experience **TO USE** rather than "to produce" technologies.

On the path of development, the **quality of governance**[1] is of vital importance, to reach the determined targets.

[1] To set an example, just compare the economic indicators of Turkey with those of South Korea since WW-2. The gap is a clear indication of the "**quality**" of governance in Turkey. Another striking example is the difference in development between the ex-DDR (German Democratic Republic) and Federal Republic of Germany.

APPENDIX (A)

Japanese government's guidelines for the foreign investors. *

1-Seek co-existence and prosperity with Japanese enterprises through joint ventures on an equal partnership basis.

2- Avoid concentration of investment in specific industries.

3-Avoid suppressing small enterprises when entering into industries characterized by small firms.

4- Co-operate voluntarily with the Japanese effort to maintain proper industrial order.

5- Avoid entering into unduly restrictive arrangements with parent companies abroad, and do not resort to unreasonable restrictions concerning transactions or to unfair competition.

6- Take positive steps toward developing Japanese technology, and do not hamper the efforts of Japanese industries to develop their own technology.

7-Contribute to the improvement of the nation's balance-of-payments through exports and other means.

8-Appoint Japanese to the board of directors and top-management positions and makes shares of company stock available to the public.

9-Avoid closures of plants, or mass dismissal, and unnecessary confusion in employment and wage practices by paying due regard to the prevailing Japanese practices.

10- Conform to the government economic policy.

* Foreign Investment Council's recommendations to the Finance Minister on June 2, 1967, approved on June 6, 1967.

Appendix-B

UNCTAD

E/CN.16/1999/4 and Corr.1

26 March 1999

A COMMON VISION ON SCIENCE AND TECHNOLOGY FOR DEVELOPMENT

5- We believe that one of the central issues of the coming millennium will be the need to build capacity in developing countries so that they can adapt to the challenges of continuous change. In pursuing this goal**,** the United Nations Commission on Science and Technology for Development (CSTD) is committed to the common vision of a **global entitlement to knowledge** and to the benefits of **science and technology** for development in the twenty-first century.

6- To achieve this, it will be necessary to formulate national policies and establish international arrangements that safeguard and protect the interests of all people on the planet as well as those of future generations.

12- The world of the twenty-first century will be one in which **knowledge generation** increasingly takes place within the networks of **large transnational corporations**. In such a world, there will be opportunities for the **monopolization of scientific and technological knowledge** and the potential to restrict the free flow of information. It will be necessary to provide greater support for research in the public sector particularly in the areas of health and agriculture, in order to make sure that local interests and needs are acted upon, to encourage the further development of indigenous knowledge systems, and to **increase capacities for the assimilation of transferred technology**. Research institutions, however, cannot be expected to play both a long term public research function and an entrepreneurial role aimed at short-term objectives. It will be necessary to **create and support intermediary institutions, in order to build linkages between the users and producers of knowledge in developing countries**, where enterprises are small, their capacity to seek and evaluate information weak, and their in-house development capabilities limited. National and local Governments all have a role to play in this process, as do international educational and research networks.

13-In the world of the twenty-first century, nations and their economies will be more than ever embedded in a vast array of **international institutional arrangements** and economic, scientific, technological and social interactions. **These, we believe, are critical vehicles for acquiring the knowledge and information required for development**. As only a small minority of developing countries have succeeded in attracting significant inflows of foreign investment, more attention will need to be given to **alternative channels** for acquiring know-how from external sources, such as supplier-customer linkages, licensing, alliances, partnership arrangements and networks for joint research and development, production and distribution. Thanks to these linkages, exporting has proved a highly effective means of acquiring technological capabilities. The international community has a role to play in creating new mechanisms to support the flow of technology and in assisting developing countries to become more attractive both to foreign investors and to potential trade and technology partners.

14- To build local technological and productive capabilities, **greater flexibility** will be needed in international trade, investment and **intellectual property agreements.**

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