

Achieving Goal Congruence Between the Objectives of Multinational Enterprises (MNEs) and Developing Countries (DCs)

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ABSTRACT

Technology is essential for national development and its dearth in LDCs contributes to the underdevelopment of these nations. MNEs are the main transferors of technology to the LDCs. However, MNEs' and LDCs' goals for technology transfers are incongruent. We reviewed factors that need addressing for goal congruence as: technology adaptation necessary for transfer, appropriateness of transfer technology, control over the technology, and the location of the technology-related assets. Specification of MNE performance requirements can also enhance transfer, as would elimination of restrictions on proprietary technology. We also discussed critical success factors for technology transfer to an LDC such as pro-investment policies, managerial skills, skilled labor, and a technology-friendly national culture.

INTRODUCTION

The last two centuries have witnessed the transformation of what were essentially agrarian societies into modern industrialized societies. This transformation was achieved through the application of technology or modern means of production to existing and new productive activities. Most of the affluent nations of the world built their economies on technology. Technology is seen by many as the most significant factor in improving productivity, quality and competitiveness. Porter (1990) posits that "a nation's ability to upgrade its existing advantages to the next level of technology and productivity is the key to international success". In fact, the uneven levels of development in the world today have been attributed to a "technology gap" (Spenser, 1970).

At one end of the economic spectrum, less developed countries (LDCs) have increasingly recognized the need for technology to improve their debilitating conditions. While the development of indigenous technology may be desirable or encouraged, technology transfer is still seen as a vital process for alleviating the poverty in these countries. On the contribution of foreign technology to the development of China, Mao Tse-Tung reportedly observed that "...without foreign aid, and imagining that we can count on our own resources, we will never make it" (Emmanuel, 1982). This observation recognizes that political pines of desirable autarky can compromise the reality of technological interdependency as key to development. It is unlikely that humanity would have made the technical progress which is now its heritage if each nation had merely followed the development path already travelled by others, from the invention of the wheel to interplanetary rockets. Technology transfer thus remains a dominant choice for the development of less developed countries (LDCs). It offers a platform and provides late-developer advantage to these countries to leap-frog generations of technology.

Several studies have examined technology transfer from different perspectives. Some examine the appropriateness of the technology multinational enterprises (MNEs) try to transfer (Hope, 1996; Mehaki, 1998; Emmanuel, 1982) while others detail the socio-economic preconditions necessary for a successful technology transfer (Rosen, 2007; Awany, 2005). Few studies have alluded to the necessity of congruence between MNEs and LDCs strategic goals for a successful technology transfer (Kuada, 2002; Hope, 1996). We believe such congruence holds the key in understanding and improving the rate of technology transfer, a belief that motivates this paper. We begin with a review of some relevant studies on technology transfer, followed by propositions and a typology for the achievement of congruence between MNE and LDC goals.

TECHNOLOGY TRANSFER

Like other concepts in economics and business, technology transfer has several definitions. In this paper, we limit ourselves to a few that lend themselves to the dynamism between MNEs and LDCs. One such definition is by Derakchshani (1983) as “the acquisition, development and utilization of technical knowledge by a country other than that in which the knowledge originated.” Most MNEs that operate in LDCs originate outside these countries. Thus, as reservoirs of technical knowledge, such MNEs fit Derakchshani’s definition so that we can say: “technology transfer is the acquisition, development and utilization of technical knowledge [within an MNE] by an LDC. Others like Gige (1978) view technology transfer as involving “acquisition of inventive activity by secondary users,” a view that fits the 21st Century more accurately as it evades territorial confines and origination dictates, and yet it is sufficiently inclusive of the transfer of hardware and software or bundle of technology. These definitions appropriately fit our objective in this study-- the acquisition of production technology consisting of hardware and software by developing countries for development purposes. We need such deliberate confinement in order to maintain focus and preclude other forms of technical assistance or knowledge transfer obtained through higher education or technical training. This approach also enables us to evade such issues as intellectual and other property rights that still boggle most LDCs. Similarly, the approach allows a quantitative focus since the values of hardware and software are easily determined, and “fair price” can be set to the MNEs.

It is important to emphasize that our characterization of technology transfer involves two agents: the transferor and the recipient. We can have an MNE, the transferor with a clearly defined objective [for the transfer] while the recipient may be a private enterprise with no or very little governmental intervention, or a government or governmental agency. Within these limits, several variations may be found. However, since the transfer involves a transaction across national borders, customs, tax and other regulations are relevant. National governments subsequently become involved.

There are also clearly defined vehicles for the transfer. One type of transfer is the establishment of a production unit in the country under consideration, using technology perfected in the home country. This can be done in two ways. The direct way (Emmanuel, 1982): the LDC’s own economic agents may go to the source of the technology and purchase the goods and services, making its application possible, and if necessary the patents which give rise to the technology. Alternatively, the MNE may establish the production unit in the country under consideration. This is the indirect way. Invariably, the indirect way is the predominant form of transfer, and since most writers refer to it as foreign direct investment, we shall use that nomenclature in this paper. The dominant form of transfer is between an MNE and an LDC government or private enterprise mediated by an LDC government through regulatory agencies. Mallampaly (1997) estimates that in 1996 MNEs invested \$3.4 trillion in 449,000 foreign affiliates throughout the world, out of which about 37% went to companies in LDCs. MNEs and LDCs may have divergent objectives for the transfer so let’s discuss objectives next.

Objectives of MNEs in FDI

To an MNE, the prime objective of a foreign investment may be to exploit a technologically based organization-specific advantage (Dunning, 1993). Caves (1982) and Teece (1985) have also both asserted that an MNE may pursue efficiency-enhancing investment. This may be done by promoting a more efficient international division of labor and by exploiting the economics of common governance of cross-border activities. MNEs also invest abroad to acquire particular and specific resources at a lower real cost than could be obtained in the home country. The motivation for the investment is thus to make the investing enterprise more profitable and competitive. Fig. 1 is a summary of the general objectives of MNEs.

Furthermore, MNEs invest abroad to take advantage of cheap and well-motivated labor. This particularly pertains to manufacturing firms from countries with high real labor costs. Another objective for a foreign investment is to sustain or protect existing markets or to exploit or promote new markets. An MNE may also invest in another country to be able to adopt products to local tastes, or have a physical presence in an important market.

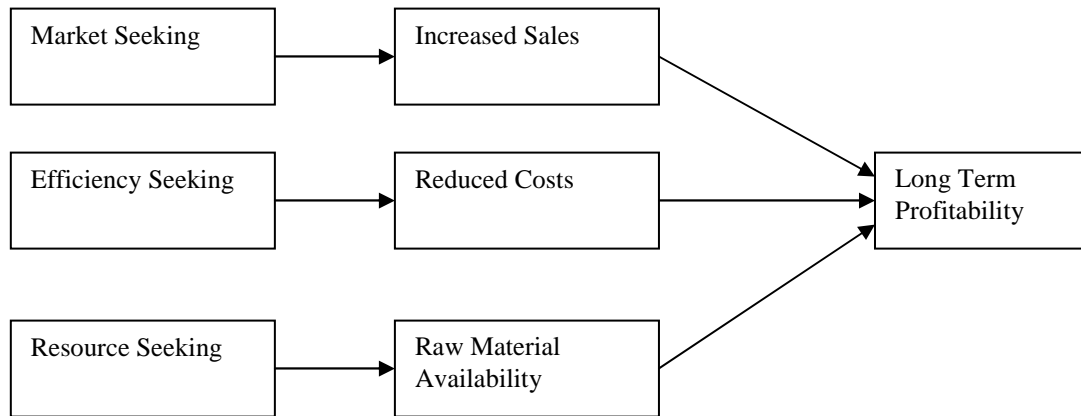


Figure 1: Objectives of multinational enterprises.

The objective of efficiency seeking foreign investor is to rationalize the structure of established resource base or to be able to gain from the common governance of geographically dispersed activities (Dunning, 1993). The intention is to take advantage of factor endowments, cultures, institutional arrangements, economic systems and policies, and market structures. Similarly, the technology transfer can provide an investor access to foreign markets (Dunning, 1993). In short, the objective of private enterprises in engaging in foreign investment is to advance their long-term profitability.

Developing Countries' Objectives

Of the factors of production (land, labor, capital and entrepreneurial resources), the dearth of capital, broadly defined to include technology, is perhaps the most deficient in developing countries. Aiming to address this need, several developing countries have undertaken reform programs for attracting foreign investment. The prime objective of the LDCs in attracting foreign investment is to acquire technology for economic development. Development or progress occurs with improvement in productivity that emanates from the efficient combination of factors of production. The economic-technological development relationship is such that economists have long attributed the differences in development between advanced and developing countries to a "technological gap" (Raz, et al, 1983). Rostow (1967) and Solow (1988) were among the pioneers who have attributed a nation's economic prosperity to its level of technological development.

For developing countries that may have abundance of land and natural resources as well as high unemployment, productivity in agriculture, that is, tool-aided labor applied to the land, tends to be low. Primitive methods of mining preclude the exploitation of mineral deposits on a large scale. Lack of technology and the means for its acquisition make manufacturing an unrealizable dream. Thus, acquisition of technology through technology transfer would result in the availability of capital to make possible farming on a large scale where underutilized land, under-employed or unemployed labor can be efficiently utilized. Introduction of appropriate technology can also mean the absorption of labor into the mining and manufacturing sectors. A key caveat is that the transferred technology must utilize the available workforce and not subject the nation to the use of expatriate labor. These relationships are depicted in Figure 2 below.

Technology transfer may also lead to increased business activity and to the development of related and supporting activities (Keller, 2004; Porter, 1990). Related and supporting industries may in turn offer employment to the locals and lead to the development of skills that may be utilized elsewhere in the economy (Porter, 1990). Some suggest that foreign investment can lead to the acquisition of managerial skills (Keller, 2004). The process being: the foreign investor may employ local management personnel thereby, developing and assimilating managerial skills that can be transferred elsewhere in the economy.

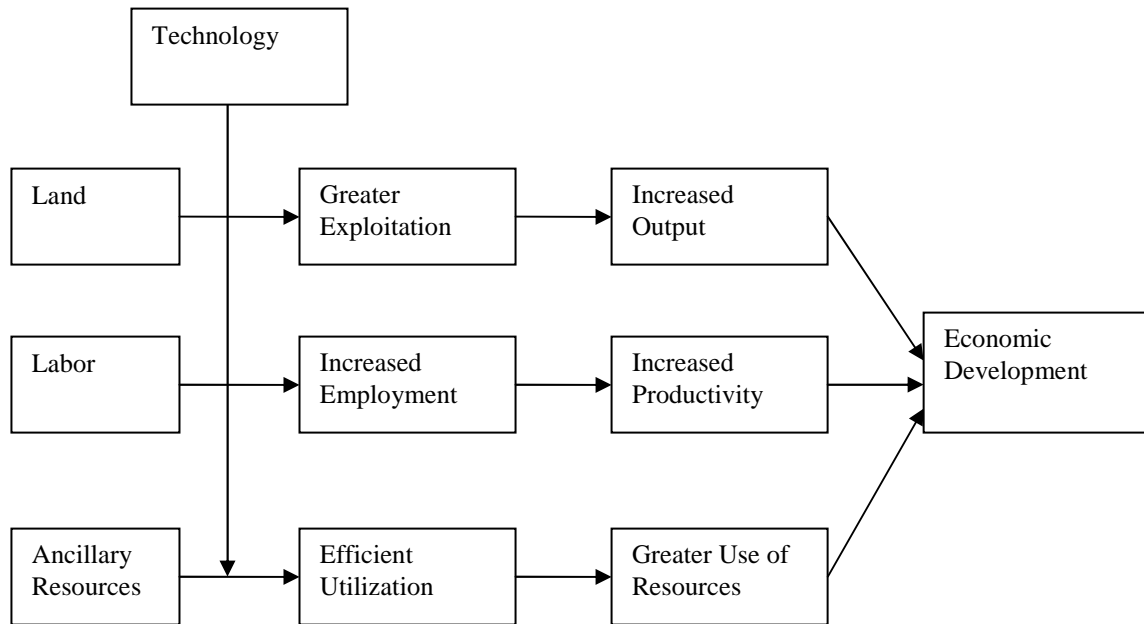


Figure 2: Objectives of developing countries

Goal Congruence or Divergence

As stated earlier, there are two ways for a developing country to acquire foreign technology. The economic agents of the country can directly purchase the technology where the country has the wherewithal. For most developing countries with balance of payments problems and shortage of hard currencies, this approach is infeasible. This leaves MNEs as the main agents of technology transfer to developing countries. However, a comparison of Fig.1 and Fig. 2 shows potential areas of divergence between the objectives of MNEs and those of developing countries. The prime objective of MNEs is to make profits, the investment location being secondary while developing countries want to acquire technology through foreign investment in furtherance of their efforts at economic development. Specifically, developing countries want foreign investment to increase the growth rates (i.e., GNPs), increase employment, control inflation, and develop a technological base.

Goal congruence occurs when the goals of MNEs and LDCs are perceived to be compatible (Fig. 3). Dunning (1993) has suggested that for MNEs and LDCs to mutually benefit from foreign investments, certain conditions must be satisfied. One of the issues to be addressed is the extent to which MNEs are prepared to adapt their technologies to meet the requirements of host countries and that depends upon (1) the size and characteristics of the market, (2) differences in factor costs, (3) differences in the availability of factor inputs and materials and differences in organizational cultures and inter-firm relationships.

Such an adaptation may be effected through the modification of process or product technology. So long as the MNE perceives the realization of mutual benefits through such adaptation, it would effect the adaptation. Thus, we propose:

Proposition 1: The willingness of an MNE to adapt its technology will depend on the size of the LDC market, the differences in factor costs and the availability of factor inputs.

Technology transfer may also be influenced by the scope of operation and strategic orientation of the MNE. An important issue to address is whether the transfer will lead to the production of standardized products or products that meet the local preferences and tastes of its LDC customers (Prahalad and Doz, 1987). Lado and Vosikis (1996) argue that a company that seeks global integration of its operations may choose to internalize its technology transfer through wholly owned subsidiaries. On the other hand, a company that focuses on local responsiveness and pursues multi-domestic strategy might seek strategic partnership with local firms in order to jointly develop local initiatives to exploit opportunities offered by the alliance. The MNE gains entry and expansion into a new market while the local partner acquires the desired competencies. Our next proposition is thus:

Proposition 2: An MNE's choice of the mode of technology transfer will depend on the scope of the operation and its strategic orientation

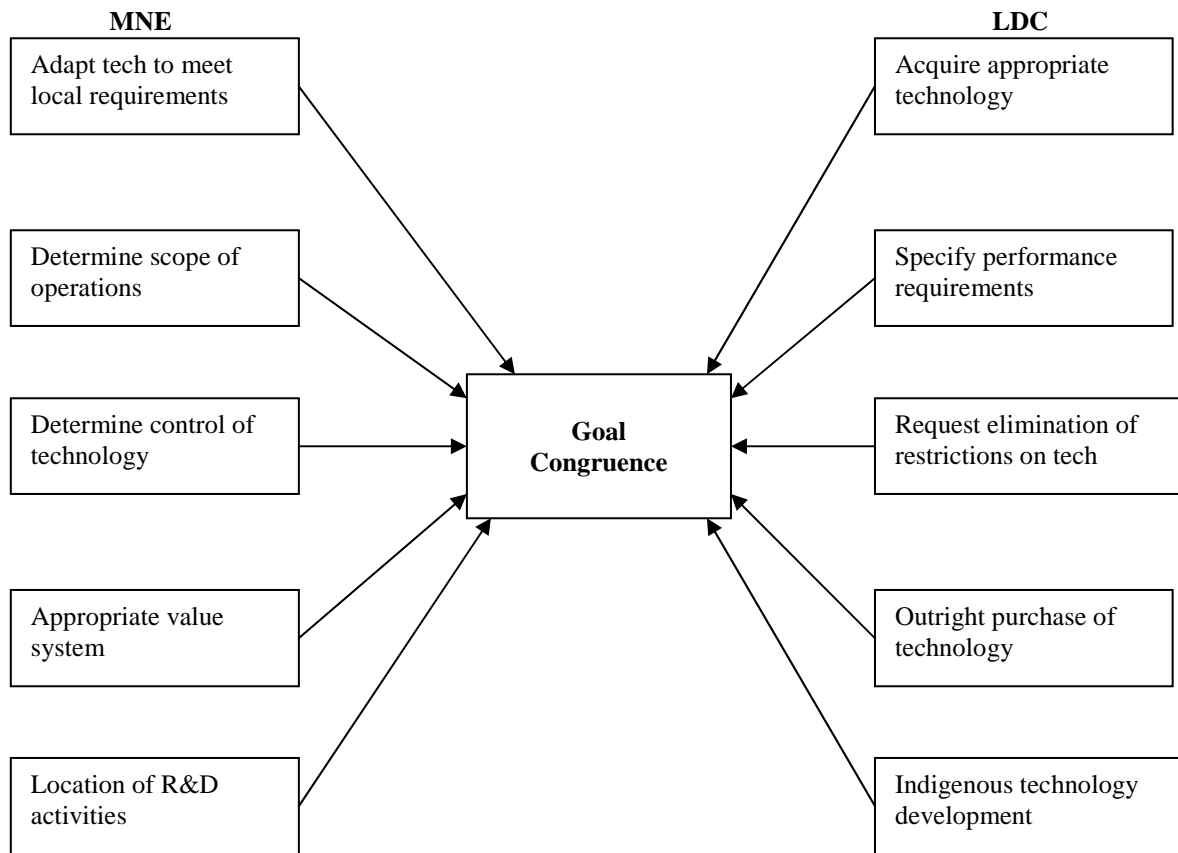


Figure 3: Achieving goal congruence: convergence of MNE and LDC strategies

For congruence to be achieved, it is imperative that the appropriateness of technology transferred by the MNE to the needs of and aspirations of host countries must be addressed. As stated earlier, a country can satisfy its technological requirements through technology imports via MNEs or through direct purchases by the country's economic agents. Resource-rich countries like Kuwait and Saudi Arabia have chosen this route. On the other hand, large or resource-poor countries like China and India have chosen to develop their own technological needs. In between these extremes, are countries pursuing varying strategies of self-reliance and technology imports, each country's strategy determined by its resource endowments and socio-political philosophical confines.

Some writers (e.g., Madu, 1992 and Raz et al, 2005) suggest that developing countries need to pay closer attention to the appropriateness of technology earmarked for transfer. Others like Emmanuel (1982) opine that a technology considered "appropriate" to developing countries would be an underdeveloped technology. Such a technology, Emmanuel contends, would be one that "freezes and perpetuates underdevelopment" and such is the technology that should be avoided if developing countries are to make any headway. We are inclined to side with the advocates of appropriate technology such as Madu (1992). Although it maybe ideal to transfer the most modern technology without major modifications to suit the local environment, it is doubtful that wholesale adaptation could achieve desired objectives. For one, most of the LDCs are in or near the pre-industrial stage of economic development. Perhaps it would constitute too much of a leap from a pre-industrial society to high-tech society. It may be questionable whether most LDCs would have the requisite absorptive capacity to productively utilize 'top of the line' technology from high-tech society. "Appropriate" does not mean "under-developed" but that the technology in question is readily suited to the LDC context and environment at modest cost. It means setting in place a "vital nexus" among options, development strategies and policies that engenders successful acquisition and assimilation of a technology (Goulet,

1997) that makes effective use of LDC's resources and capabilities and sensitive to its environment (Madu, 1992). The successful transfer of appropriate technology will thus ultimately depend on the ability of the MNE and LDC to develop a mutually acceptable definition of appropriateness in relation to their goals. In other words, to achieve a successful transfer of technology, LDCs need to define their technological needs accurately in alignment to MNE objectives of markets, efficiency, or access. This leads us to our next proposition:

Proposition 3: The quality and quantity of benefits that an LDC may derive from technology transfer will depend on the LDC's ability to identify and acquire the right level of technology.

Another issue of relevance to MNEs is the extent of control over the technology. According to Dunning (1993), about 80-90% of technology sales occur within the advanced industrialized economies through private firms. The UN (1994) also reports the MNE as the most important source of technology to LDCs. If technology is controlled by MNEs from the advanced industrialized countries, how then can their goals be congruent with those of LDCs? Available evidence indicates that LDCs are entering into collaborative agreements with MNEs to achieve common objectives (Ito, 1986). Areas of cooperation include R&D activities. Thus, through such agreements, the interests of MNEs and LDCs can converge.

As a corollary, a firm's realization of the benefits emanating from its desire to control the technology transferred depends on the firm's value orientation (Chakravarthy and Perlmutter, 1985). These values may range from ethnocentric to polycentric orientations. Since a given technology may be associated with a particular firm's value system, one can expect that an ethnocentric firm will effect technology transfer through a wholly-owned subsidiary in order to achieve a benefit-value system fit. On the other hand, a polycentric or to some extent, a geocentric firm is more likely to realize a benefit-value system fit through an alliance mode of technology transfer. Our next proposition is thus:

Proposition 4: An MNE's choice of technology transfer to a host country will be contingent upon the MNE's value system.

Proposition 4A: The greater the alignment between an MNE's value-system and ethnocentrism, the more likely the firm will transfer its technology through a wholly-owned subsidiary.

Proposition 4B: The more polycentric or geocentric a firm appears, the more likely the firm will transfer its technology through an alliance mode.

It has been pointed out by Lado and Kedia (1992) that the greater the degree of complementarities between the resources and the capabilities of two organizations, the greater the desire to cooperate between the two firms. In other words, the greater the extent to which a company's resources and capabilities require another company's resources and capabilities in order to produce a given product or exploit a particular technology, the stronger the willingness to cooperate between the two organizations. This implies that the greater reliance of one firm's assets on another firm's technology, the greater will be the commitment to cooperation to realize mutual benefits (Teece, 1987). We extend this argument to propose of MNEs and LDCs thus:

Proposition 5: The degree of commitment to cooperate between two an MNE and an LDC will depend on the degree of complementarities between their resources and capabilities

Also of importance to LDCs and MNEs is the location of technology-related assets or research facilities. The location of these assets is important because they enhance a country's ability to improve or sustain its human and physical capabilities to innovate or produce technology. Obviously, the greatest concentration of research facilities is in the advanced countries. In fact Dunning (1993) emphasized that only 4.3% of worldwide research expenditure is incurred in developing countries. The question then is whether MNEs would locate research in developing countries, and since technology is proprietary knowledge, would MNEs eliminate any restrictions on the use of their transferred technologies? The answers to such questions indicate that to benefit from technology transfer by an MNE to a developing country, the latter must pursue certain strategies. Since developing countries are at various stages of development, different strategies would have to be pursued by the various countries. These discussion leads to the following proposition:

Proposition 6: The willingness of an MNE to locate its research facilities in a developing country may depend on identifiable MNEs benefits from such a location.

LDC Strategies to Achieve Congruence

Potential strategies that LDCs can pursue in order to benefit from technology are varied and depend on the individual LDC's resource endowment and stage of economic development. For example, strategies that India may pursue vary from those that Angola or Nigeria may pursue. Whereas Brazil may adopt strategies to strengthen its quest for technological self-reliance, Ivory Coast or Kenya may pursue policies which may ultimately lead to their technological dependence on MNEs. The strategies discussed below may be appropriate for mid-level developing countries. This is because low-income LDCs such as Burundi and Bangladesh may lack the factors which attract FDI (World Bank, 2005). On the other hand, high-income LDCs such as Saudi Arabia and Kuwait may have the means to purchase their technological requirements. This leaves the mid-level LDCs subject to decision-theoretic analysis by MNEs in their investment decisions.

To mutually benefit from technology transfer, an LDC may specify the performance requirements of the MNE. Such requirements may include for instance, the discouragement or outright prohibition of assembly plants only set-ups. In some cases, LDCs may specify the local content or the percentage of local resources that may be used. Some LDCs may even specify the percentage of management personnel to be recruited locally. Because of the competition to attract foreign investors, most LDCs are reluctant to insist on stringent performance requirements.

Another approach is to eliminate restrictions on the use of proprietary technology from MNEs. Some technology agreements may have restrictive clauses, which can impede the advancement of the welfare of the nationals of LDCs. For example, a technology transfer agreement may restrict R&D activities of the subsidiary in that country or may restrict the output or market it may serve. Such restrictions may limit the benefits an LDC may derive from technology transfer. In other words, no goal congruence will emerge with an MNE transferor when restrictions are imposed on the use of the technology.

LDCs can also benefit from technology if they can purchase the technology outright or on contractual basis. When technology is purchased outright, provided the necessary conditions for its adaptation are favorable, MNEs may not be able to impose any restrictions on the use of the technology. Under such circumstances, the LDC can utilize the technology in any way it deems. And since the technology was purchased in an open market, there will be goal congruence in that the market determines the perceived benefits the MNE and LDC derive from the transaction.

Finally, some LDCs opt to acquire technology through indigenous technological development. This may be done by the LDC government investing in higher education, and increasing expenditure on R&D. The government may also assist by enacting appropriate policies to encourage local companies to merge or form alliances with MNEs. This is the route countries such as India, South Korea and Brazil have travelled. Dunning (1993) argues that this may be a costlier route in the short run because increased expenditure on higher education takes a long time to yield any dividends. Moreover, without providing added R&D facilities, increased expenditure on higher education may be a waste.

Requirements for Technology Transfer

Technology transfer may not achieve its intended objectives in the absence of certain requirements. One of the most important requirements for a successful transfer of technology relates to host government policies. If a government is perceived to pursue hostile policies, home governments may restrict the export of technology to such countries. For example, most western countries prohibit the export of technology to Libya, Iran, and Cuba. Apart from such renegade regimes, policies such as foreign exchange limitations, trade barriers, high taxes, indigenization policies and legislation on foreign investments may limit the extent of technology transfers (Madu, 1992). Such policies in effect create undesirable business environments for the suppliers of technology (hinders their goal realization).

Similarly, technology transfer is constrained by the availability of an educated labor force. Generally, education and training in science and technology are important to achieve long-term technological progress, The absence of educated labor force leaves an LDC dependent on the transferor to supply requisite labor force. According to Ito (1986), unless technology recipients become sufficiently capable of maintaining an introduced production system, they are unlikely to enhance the capability to modify or improve technology. In other words, a LDC must possess some amount of absorptive capacity to facilitate technology transfer (Madu, 1992).

Related to education and training is the availability of managerial skills. Technology has to be effectively managed in order to achieve the desired societal objectives. Efficient management will lead to the efficient utilization of the LDC's resources, making it possible for the LDC to plan the use of its resources. Finally, the cultural and value system of a country may also impact technology transfer. National culture and value system need to be captive to new technology. According to Kogut and Singh (1988), investment decisions by MNEs as well as the level of R&D activity performed by US MNEs in a particular country are influenced by the cultural distance relative to American culture. Perhaps, the closer the national culture of a LDC to the MNE's home culture, the more probable the success of technology transfer by the MNE to the LDC in question. Our discussion has not covered every possible factor that could influence strategic goal congruence between MNE and LDC that can impede technology transfer. Neither have we delved exhaustively in the technology transfer phenomenon.

CONCLUSION

Technology is essential for the development of any nation, and the uneven levels of development in the world today can be attributed to the differences in the levels of technology between nations. Developing countries recognize that to develop, they must have access to technology which is mostly supplied by multinational corporations. Unfortunately, the goals of developing countries in acquiring technology do not converge with those of the multinationals which transfer the technology. Factors that need addressing for goal congruence include: the extent to which multinationals are prepared to adapt their technology to meet the requirements of developing countries, the determination of the appropriate level of technology to transfer, control over the technology, and the location of the technology-related assets. LDCs can also benefit from technology transfer if they specify performance requirements of the MNEs, are able to eliminate restrictions on the use of proprietary technology from MNEs, purchase the technology outright from MNEs or encourage the development of indigenous technology. To achieve successful technology transfer, critical success factors such as pro-investment public policies, required managerial skills, skilled labor, and a technology-friendly value-system need to be in place in LDCs.

REFERENCES

- Awmy Mohamed Mamdouh, (2005), Technology Transfer and Implementation Processes in Developing Countries, *International Journal of Technology Management* Volume 32, Number 1-2: 213 - 220
- Caves, R. E., (1982) *Multinational Enterprises and Economic Analysis*, Cambridge. Cambridge University Press.
- Derakhshani, S., (1983) Factors Affecting Success in International Transfer of Technology: A Synthesis and a Test of a New Contingency Model, *Developing Economics*. Vol. 21: 27-45
- Dunning, John H., (1993). *Multinational Enterprises and the Global Economy*. Harlow, Addison-Wesley Publishers Ltd. 287-347
- Emmanuel, Arghiri, (1982). *Appropriate or Underdeveloped Technology*. New York, John Wiley and Sons
- Goulet, D., (1977). *The Uncertain Promise*, New York, IDOC (North America)
- Hope, R. Kempe, (1996) Promoting Sustainable Community Development in Developing Countries: The Role of Technology Transfer, *Community Development Journal* 31:193-200
- Keller, Wolfgang (2004). International Technology Diffusion, *Journal of Economic Literature*. Vol. 42, Issue 3: 752-782
- Kogut, Bruce, Habir Singh (1988). The Effect of National Culture on the Choice of Entry Mode, *Journal of International Business*, Vol. 19, Issue 3: 411-432
- Kuada, John (2002) Collaboration Between Developed and Developing Country-based Firms: Danish-Ghanaian Experience, *Journal of Business and Industrial Marketing*. Vol. 17, Issue 6: 538-557
- Lado A. Augustine, G. S. Vozikis (1996). Transfer of Technology to Promote Entrepreneurship in Developing Countries: An Integration and Proposed Framework, *Entrepreneurship: Theory & Practice*, 21 (1-Winter): 55-72
- Madu, Christian (1992). *Strategic Planning in Technology Transfer to Less developed Countries*, New York, Quorum Books. 1-35
- Mallampally Routledge., P , K. Sauvart. (1999). Foreign Direct Investment in Developing Countries. *Finance and Development* 36, no.1 March

- Najmedin Meshkati (1998) Technology Transfer to Developing Countries: A Tripartite Micro- and Macroergonomic Analysis of Human-organization-technology Interfaces, *International Journal of Industrial Ergonomics*. Vol. 4, Issue 2: 101-115 ,
- Porter, M. E., (1990). Competitive Advantage of Nations, *Harvard Business Review*, March-April: 73-93
- Prahalad C. K, Yves Doz (1987). *The Multinational Mission: Balancing Global Integration and Local Responsiveness*, FreePress, McMillan
- Rosen H. Herbert (2007). Technology transfer to developing nations, *The Journal of Technology Transfer* , (1) 2: 93-104
- Rostow, W. W., (1967). *The Stages of Economic Growth: A Non-Communist Manifesto*. New York, Cambridge University Press.
- Solow, R. M., (1988). *Growth Theory: An Expedition*, New York, Oxford University Press.
- Teece, David, (1985). The Market for Know-how and Efficient International Transfer of Technology, *Annals of American Academy of Political and Social Science*. 458: 81-86
- United Nations, Department of Economic and Social Affairs. (1992; 2005). *The Acquisition of Technology from MNCs*. ST/ESA/12 (Sept. 1974) New York: Greenwood Publishing Group.
- Van Gige, J. P., (1978). A Comparison of Educational Processes at Similar UK and US Institutions of Higher Learning, *Journal of Technology Transfer*, Vol. 3, No. 1: 15-19.