

Financial Management Appraisal of Technology Transfer to Developing Countries via Multinational Corporations

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ABSTRACT

By presenting a new measure of degree of monopoly power in Multinational Corporation – controlled developing countries in contrast with the A.P. Lerner Measure valid in the case of multinational corporation – parented industrialized countries, the author has analysed brilliantly, employing the minimum marginal cost pricing technique, the financial management implications of technology transfer from industrialized (developed) countries to developing countries.

JEL: D4,D42,D43,F2,FO2,F23,O3,O14,O19

Keywords: Punctured investment cycle tyre; Technology transfer; Developing countries; Monopoly power; Period analysis; Knowledge management; Multinational Corporations

I. INTRODUCTION

As an illustration, a 7 per cent growth rate of the U.S. economy is not the same thing as 7 per cent growth rate of the Nigerian economy as the U. S. is an adult and Nigeria is a child. Like a father has to look after his child, developed countries resort to technocapital transfer to developing countries through Multinational Corporations (MNCs) who, unlike a real mother, takes the role of a hypocritical parent. MNCs export capital to developing countries and the abnormal profit made, from their operations, is again repatriated to developed countries. Thus, developed countries become expatriates in developing countries. The MNCs, through transfer of sophisticated technology and manpower, venture into setting up assembly plants (without supporting local technical manpower) and would find profitable to operate at less than break-even capacity (say at 20 per cent) and show the host country (developing) that they are operating at break-even capacity (60 per cent) by taking advantage of non-disclosure of proper and accurate accounting information -- to this extent, MNCs may accumulate excess stock and when market conditions prevail to suit their convenience, the stocks are released and goods are overpriced. Thus, from a long-term perspective, setting up assembly plants poses a financial liability to the developing country.

Research studies have confirmed that MNCs parented in developed (industrialized) countries through their sub-subsidiaries (in developing countries with selfish interests like gamblers) begin the game with a small stake (initial investment) and by laying a carefully, meticulously and manipulatively laid down pipeline invest in "good political risk" developing countries continually plough back their winnings, into the game of gambling making the parent-MNCs grow richer and richer through abnormal profit earnings of anywhere between 400 per cent and 600 per cent on one hand; and on the other hand, the developing countries, acting as gambling den with MNC-supported management consultancy-cum-financed expensive loans (like Euro-dollar) and through transfer of sophisticated and inappropriate technology via subcontracting from the industrialized countries -- all in the name of so called economic development -- would continue to remain in a state of volatile and inorganic development path causing techno-economic overdependence and the MNCs, finding gambling a losing game in developing countries, would land them in lurch causing overcapitalization -- all leading to "punctured investment cycle tyre" and consequent stagflation.

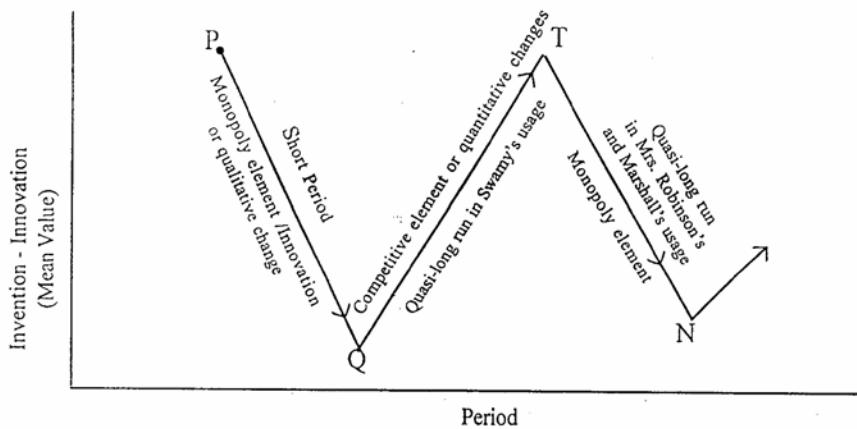
II. RELATIONSHIP BETWEEN INVENTION/INNOVATION AND FURTHERING OF PRODUCTIVE CAPACITY VS. PERIOD ANALYSIS

Seasoned economists have opined that the relation of monopoly and competition to innovation is a relatively unexplored area, and more serious is the fact that the literature abounds with simple and sweeping statements which are seldom supported by evidence, and with scattered and often casual remarks. There has been remarkably little thorough and systematic research on the subject and consequently, little advance in our scientifically-founded knowledge of the matter (Swamy, 1964, 1965, 1968, 1989).

Let us examine the crucial issue of the relevance of the concept of innovation under conditions of monopolistic competition. According to the Chamberlinian Economic Structure, the real world is a blending of monopoly and competition. In the Schumpeterian Economic System mere quantitative changes, which refer to competition, do not bring about economic development. It is the qualitative change (innovation), referring to monopoly, which results in economic development. For Schumpeter, the qualitative change has to be continual in order for economic development to take place. It is like talking of only the monopoly element. Let us not forget that the real world encompasses an age of "periodical monopolistic competition".

Let us try to show the relation between monopoly and competition based on the period analysis formulated by M.R. Kumara Swamy(Swamy, 1964: 1965). In the short period, there is a strong monopoly element; in the quasi-long run in Swamy's usage, there is competition and hence a weakening of the monopoly element; in the quasi-long run in Mrs. Robinson's and Marshall's usage; there is a stronger monopoly element (than in the short period) and hence a weakening of the element of competition. The process goes on and on in subsequent periods. The entire process may be shown with the help of a Figure 1.

Figure 1
Monopoly - competition and period analysis



The entire economic system moves in a cyclical manner. Normal business fluctuations, occurring due to a normal or competitive lag between demand and supply and between savings and investment, are compatible not only with the Schumpeterian Economic System but also with the Chamberlinian Economic Structure. The cycle grows bigger and bigger because of the emergence of new and newer monopoly

elements, resulting in furthering of excessive productive capacity. The rate of economic growth may be computed by taking the mean value of the peaks (P and T) in our Figure and the mean value of the floors (Q & N). The elasticity of the mean values (floor and peak) will give us an idea of the rate of economic growth of the economy.

The element of monopoly in the quasi-long run in Mrs. Robinson's and Marshall's usage tends to be stronger and stronger in view of an increase in the scale of plant. At this point, automation becomes feasible and the utilization rate of machinery in automated plants tends to be higher than in conventional plants, and this may point towards possible reduction in capital cost or capital savings efforts of automation. It may be pointed out that the most disturbing cost aspect of automation is that it usually costs more than management had planned. The costs of installation are mostly very high and cumbersome. This is mostly true in the context of developing countries who have gone in for automated plants. The rise in cost is more effective in these countries because of the slow rate of technological progress.

III. RELATION BETWEEN INVENTION AND INNOVATION VS MEASURE OF DEGREE OF MONOPOLY POWER

There is a fundamental relation between invention and innovation or continual progress. Technological progress will be understood in the broadest possible sense to cover everything that increase the value of output obtainable from a given expenditure of effort. Whatever may be its effect on net investment, technical progress will normally raise gross investment. When we refer to technological advances resulting in a furthering of excessive productive capacity of plant, labour, autonomous investment (investment in response to inventions) becomes relevant. It may be noted that invention may be defined as current innovation put to practical use because the entrepreneur finds it profitable as he has moved from the minimum point of MC curve. When we talk of fixed excess capacity, induced investment becomes relevant as investment is induced by past changes in the level of output. It is conceivable to think that innovations might have taken place under a situation of fixed excess capacity but were not put to implementation as they were found uneconomical to operate referring to the minimum point of M.C. curve. Therefore, in the case of fixed excess capacity, due to the emergence of large induced investment, replacement plays a pivotal role. Therefore, the economy needs to take into account not only the impact of induced investment under a situation of fixed capacity of plant and labour, (like fixed knowledge of issues) but also of autonomous investment made possible under monopolistic situations where there is a furthering of capacity of plant, machine and of labour (referring to advanced/progressive knowledge) in determining the rate of economic growth, referring to stages 3 and 3² in Figure 2.

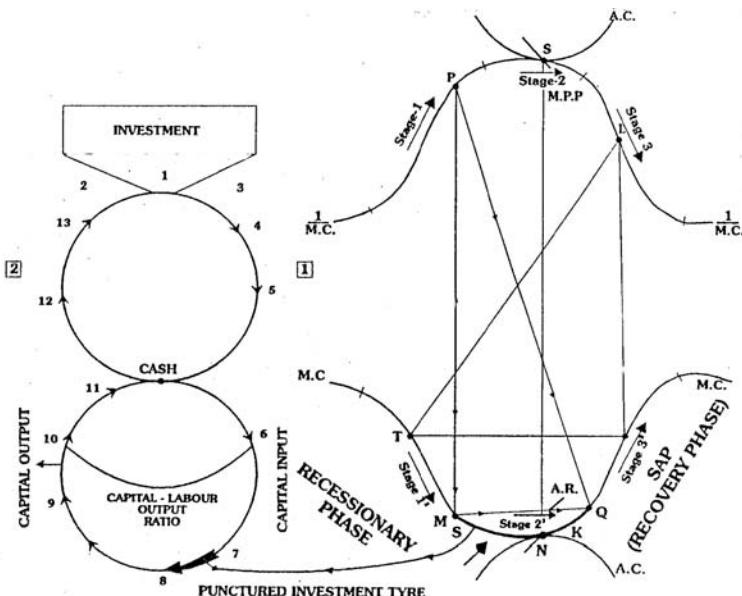
Thus the A. P. Lerner Index of Monopoly Power in an advanced (industrialized) economy, where multinational corporations are parented and who have sole control over technology and know-how combined with continuous technological progress and furthering of productive capacity, is determined by

$$\frac{(P - M.C.)}{P} \quad (1)$$

or monopoly element dominates.

Figure 2

Significance of minimum marginal cost pricing and "punctured investment cycles tyre"
(M.R. Kumara Swamy research findings)



Key : (1) Money = (2) Deposits + (3) Loans (4) Consultancy : Award of contracts (5) dumping/purchase of sophisticated machinery, equipment, etc. (fixed assets) (6) Locked-up capital (causes overcapitalization) (7) Procurement of spare parts, raw materials, etc. (8) Punctured Investment Tyre : (9) Creation of customers (buyers and sellers) (10) Income generation, (11) Unlocked capital (causes fair capitalization), (12) Returns on capital employed (dividend payments), (13) Plough-back of profits.

Stage (Right Portion)

Acquisition of fixed assets, etc., Represent
Locked-up capital (including stock) Means
Investment sector involves Expenditure
M.C. stands for marginal cost
A.C. stands for average total cost
(fixed and variable)
A.R. stands for average revenue
M.P.P. stand for marginal physical product
The sine curve shows stages 1,2,3 of economic growth
The inverse of sine curve shows stages : 1¹,2²,3³ of economic growth
Stage 1 : deficiency of capital
Stage 2 : saturation point
(technical bottlenecks appear)
Stage 3 : deficiency of demand

Stage 2 (Left Portion)

Use of Fixed Assets, etc, Referring to
Unlocking of locked-up capital, Represents
Production of goods & services, Generates
Effective demand (consumption),
Leads to Income Generation
Stage 1¹ : Low productivity; W being diverted to (R+P);
uneconomic layout : stagflationary tendencies set in.
Stage 2²: minimum point of marginal cost : pecuniary
bottlenecks appear and structural adjustment programmes
(S.A.P) have to be implemented/applied
Stage 3³ : high productivity
Region S-N is characterised by deep recessionary pressures
combined with widening poverty gap
Point N is a point where Structural Adjustment Programme
(S.A.P) is employed : The lowest minimum point of M.C.
schedule.
Region N-K is characterised by upswing – the result of S.A.P.

On the other hand, in a developing (multinational corporation-controlled) economy which lacks capital and technology and operates under conditions of fixed capacity (referring to stagnant (fixed) know-how, the M. R. Kumara Swamy Index of Monopoly Power (Swamy, 1994) is determined by

$$\frac{(P - A.V.C.)}{P} \quad (2)$$

or the Corporation faces competition from among various operating MNCs drawn from different countries and engaged in a particular product manufacture and marketing like tyres, cars, etc. (and producing different brands of cars, tyres by different MNCs.)

The costs of installation of automated equipment (average variable cost) are mostly high and cumbersome, especially in the context of developing countries, attributed to the slow rate of technological progress. Automation is said to be economically feasible in the context of industrially developed countries where there is a continuous technical progress. Therefore, automation in the context of advanced economies results in labour saving or, other words, marginal cost (M.C.) tends to dominate; whereas, in the case of developing or newly - emerging countries automation results in labour-intensive pure economic system or, in other words, average variable cost (A.V.C.) tends to dominate in the total cost structure.

The optimum levels of growth are reached at points S (where A.C. is lowest and M. P. is O) and N (M.C. is lowest and A. T. C. curve cuts M. C. curve at its lowest point), and economies of scale are reaped due to high productivity by making the best (justifiable) use of plough-back profits or past savings.

Figure 2 depicts the economic growth of a country under situations of:

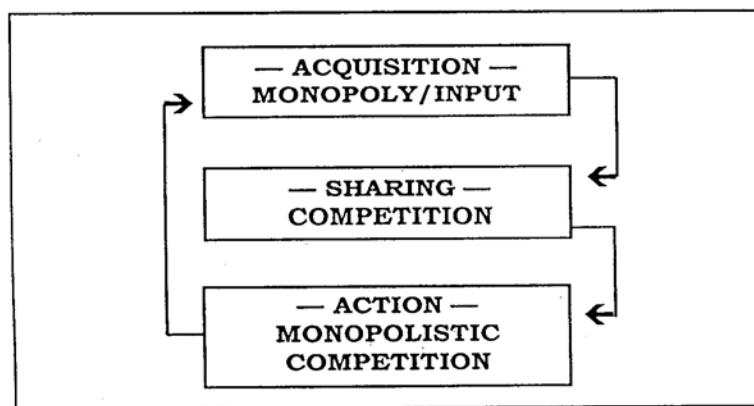
1. Continual progress in technology leading to the furthering of excessive productive capacity of plant, machine and labour via autonomous investment; and
2. Continuous progress in technology leading to fixed excess capacity of plant, machinery and labour via induced investment.

It is evident that the element of monopoly is stronger in the case of the furthering of excessive productive capacity, and that the element of competition is stronger in the case of fixed excess capacity.

Thus, the minimum point of A.V.C. becomes an important analytical tool in determining the rate of economic growth of developing economies whose technological development is not continual, combined with widening of knowledge gap and where the competitive element is pretty strong; whereas, the minimum point of M.C. becomes an important analytical kit, although unexplored by financial economists and economic theorists, for determining the rate of economic growth of an advanced economy where technological advancement is continual and that there is a furthering of excessive productive capacity of plant, machinery and of labour and that the element of monopoly is pretty strong.

In the beginning of the range of stages 2 & 2², technical and pecuniary bottlenecks are introduced into the system owing to the reason that productivity has gone down so low that capital - labour output ratio tends to get higher and higher and the economy has reached the lowest ebb of the cycle indicated along the range 7-8 in the Figure. In the last range of stages 2 & 2², capital labour output ratio tends to get shorter, and innovations take place based on inventions, which had taken place in the earlier period owing to continual investment in knowledge and material capital. The range PMQ represents rational investment and the range LTS irrational investment. It is in this context, the role of intellectual property rights¹ becomes highly relevant and crucial.

Figure 3
Cycle of knowledge acquisition, sharing & application: monopoly vs. competition



Key: Knowledge Acquisition - input (Monopoly) → By sharing (Competition) through publications/experiments → turns to output (Monopolistic Competition) is put into Action (implementation) - for human progress through techno-economic development.

IV. INTELLECTUAL PROPERTY RIGHTS: KNOWLEDGE MANAGEMENT

Secret Know-how and Other Data: Patents provide exclusive rights to inventions that are new, non-obvious and industrially applicable. Still, only a small fraction of the technology currently in use is patented, even in high technology industries. A major part of working technologies belongs to the category of secret know-how and sophisticated technical knowhow is not transferred by developed countries. In cases like the computers industry, there is much greater reluctance to make technology available outside of foreign direct investment in majority-owned affiliates. This is attributable to the strong technological lead of the dominant firms, and the perceived costs of losing

control over extremely valuable production technology. US data show that about 90 per cent of the R&D expenditures of MNCs based in the USA take place within the USA itself, slightly 9 per cent within other developed countries and under one per cent within the developing countries. Thus, technology is not shared but is monopolised: retained (see Figure 3) (Swamy, 1978).

There is a vast difference between trained manpower in general and manpower trained to solve the problems of the country. Education for the sake of education is absurd. Education is meaningful only if it enables man to be of greater service to his society. Thus, secondary know-how transferred to less developed countries, in the name of technological assistance, amounts to brain waste and is a financial liability to the less-developed developing countries. On the other hand, invention by advanced developing countries refers to brain gain, while intermediate know-how acquired by trainees (sent on deputation to developed countries and who prefer to stay on in developed countries) refers to brain drain from advanced developing countries. Brain Waste + Brain Drain leads to Brain Wash.

A. Sophisticated Technical - Know-How Is Not Transferred By Developed Countries

Industry studies conducted by the erstwhile U.N. Centre on Transnational Corporations suggest that there are several sectors in which foreign direct investment appears to be the preferred mode of foreign involvement by MNCs (UNCTC: 1985, 1990).

1. In computers, manmade fibres, electrical power equipment, agricultural machinery and automobile production (through not assembling) industries requiring more complex technology, there is evidence that MNCs will sell or lease technology to domestic enterprisers in host (developing) countries which restrict foreign direct investment. A case in point is electrical power equipment, an industry in which both India and Republic of Korea have made much use of licensing and technical collaboration agreements. Another example is pharmaceutical where a country like Egypt made substantial use of licensing agreements between MNCs and its state enterprises.
2. For many firms which lack the capabilities to undertake world-wide production directly, or the will or inclination to engage in equity investment in developing countries, subcontracting is preferable to foreign direct investment. In the automobile industry, licensing for the assembling of vehicles from completely knocked-down (CKD) kits by domestic firms in developing countries is also widespread, possibly a strategy used by West European and Japanese MNCs to win export markets away from firms based in the U.S.A.
3. In the fertiliser, pharmaceutical, and electrical power industries, MNCs often capitalize on their technology through one-off contracts for the design and construction of plants, and the provision of specialised services associated with this, and through joint ventures where the domestic markets are sufficiently large to be attractive and the association with a local enterprise (frequently public

corporation/enterprise) provides an outlet for the sale of technology and components.

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B. Economic Development-Unrelated Exchange Rate vis-a-vis Irrational Wage Differentials in Less Developed Developing Countries

On a parallel basis, it may be pointed out that countries like Libya, Kuwait, Bahrain, Oman, etc. have been operating on very high purchasing power rates for their currencies for the obvious reasons that these countries are over dependent on foreign technology, foreign manpower through MNCs parented in western countries, and the high purchasing power of currencies provides an inducement to attract MNCs as these countries are considered as difficult to live-in areas. For instance, a foreign technician in Oman earns about Omani Rials 500 per month while on Omani living standards in Oman, the economic status of a foreign technician, say from India or Pakistan or Bangladesh or Korea or Philippines comes in the category of a middle level or lower-middle level worker; on a contrasting basis, he, on transfer of funds to countries like India, U.S.A., U. K. comes in the category of surpassing the salaries of two to three 'high-paid' executives (high - level technical manpower) in India/Bangladesh/Pakistan/Korea/Philippines.

Also, it is a sad, but a true commentary, that the MNC-controlled developing countries have been resorting to baseless, unwarranted and unjustified for the same job wage (salary) differentials based on nationality considerations - for instance, a technician or a mechanic, say in the U.S.A. or U. K., wears the robe of a specialist engineer in developing countries in the name of technological development of developing countries and earns non-productivity (due to professional incompetence) - based abnormal salaries and help perpetuate technological over dependence on advanced countries; on the other hand, a highly competent and professionally qualified technical personnel (say from India) in a less-advanced developing country (who can very well supervise the work of the "so-called specialist engineer" from an advanced country like the U.S.A. (for reasons explained above) earns not only lower salaries -- not commensurate with his qualifications and experience -- but also are placed in subordinate (lower) positions. It is high time that such less advanced -- cum - MNC - dependent developing countries stopped practising this technique of non-productivity - based wage differentials (at MNCs - behest) based on nationality or other considerations as it does not augur well for techno-economic self-reliance from a long-run point of view.²

Also, this high exchange rate (Omani rial versus Indian rupee or U.S. dollar, etc.) is not functionally related to the state of economic development of a country like Oman -- rather it is imposed on such developing countries by MNCs to serve their selfish interests by making imports of men., materials, capital, technology cheaper and exports

costlier, thus rendering such developing countries consumer oriented for the above reasons. The Mexican economy has now landed into deep recessionary problems resulting in mounting external debt burden, rapid depreciation of peso value and creditors running away from the economy causing massive decline in foreign investment flow, etc. Similarly the Nigerian economy, in the wake of oil boom, rode on the crest of wave and became a heavily-dependent economy on MNCs relying on imports of practically every item to satisfy social and merit wants and the exchange rate of the naira to the U.S. dollar etc. was fixed at a very high level, not related to the economic development of the country (at one naira equal to around US\$ 1.50 during late seventies), which proved a boon for profit repatriators and a doom to the economy. With crude oil shock -- oil price and production cut --, the Nigerian economy has been suffering from hardships caused by, among other factors, MNCs massive withdrawal from the economy as their 'gambling' has proved to be highly risky and unprofitable.

V. CONCLUSIONS

To hold continuity of MNCs stronghold in G-15 countries as expatriates through trade, know-how protection and techno-capital monopoly, some G-7 countries have ventured into destructive, unethical/selfish - oriented actions against developing countries, which do not augur well for rational economic interdependence and global peaceful coexistence. For strategic foreign investment purposes, country risk and political risk will have to be managed through the installation of early warning systems.

It is an established fact that G-15 (developing) countries experiencing intra-country widening poverty gap and growing technological unevenness with G-7 (developed) countries and faced with overtime problems of overcapitalization causing external indebtedness have, by necessity, to resort to (politically-motivated or real economic development - oriented and or both) tied/ linked up international capital transfer from G-7 countries through the technique of transfer pricing which is a major source of earning abnormal profits through multinational corporations (MNCs).

On a parallel basis, economist Ozay Mehmet (1995) has opined that the developing world is not better off today than 30 years ago. The income gap between those living in the developed world and those in the developing world is greater than at any other time. Where analysts differ is in their reasons and explanations for this inequality, and that the lack of economic development in the Third World is the result of Western bias against Third World cultural norms. Specifically, Western knowledge capitalist economic theories have reflected what he calls 'Eurocentrism' that is: "The interest or benefit of Europeans and their descendants is pursued at the expense of others while justifying this worldview by paradigms or ethical norms that proclaim universal benefits for all."(Mehmet, 1995)

This important and crucial view is shared by the UNESCO-sponsored World Commission on Cultural and Development when it concludes: "Development divorced from its human or cultural context is development without a soul."

NOTES

1. The US Patent and Trade Mark Office, Washington, D.C., it is reliably understood (without proper and full scientific study and verification of the origin of Turmeric -- a yellow dye substance obtained from an East Indian plant of the ginger class and a term/word which finds an entry in every English language dictionary and scientific encyclopedia - and its use for several hundred years now by Indians (Ayurvedic doctors and elders) as medicine possessing healing properties, etc.) had recently granted patent on the healing properties of turmeric to a US University Medical Centre. After this unethical act was challenged, based on scientific evidence, by the Council of Scientific and Industrial Research (Government of India apex techno-industrial-scientific autonomous research institution), the US Patent and Trade Mark Office cancelled the 'turmeric' patent earlier granted to the US University Medical Centre.(C.S.I.R. & U.S. Patent and Trade Mark Office, 1997)
2. Many times one finds that consultants retained for the design of a project -- and especially those from trained in the western world -- have an in-built bias towards the establishment of capital-intensive facilities. This may be so because they hope that eventually they will be involved in the actual construction of the plant; often, it is so, because they believe that only large-scale plants will help to modernise the developing economies. As a result, many feasibility studies do not analyse what alternative technological possibilities exist, and it is often overlooked that less capital-intensive facilities may well have higher financial as well as economic and social rates of return than the recommended large scale plants. If consultants are aware that the eventual financier insists on a comparative analysis of possible technologies, then the likelihood of biases towards the capital-intensive end of the spectrum of processing will be considerably reduced. (Timmer, 1975; Helmers-Leslie, 1979).

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