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I. ARTICLES

FOREIGN DIRECT INVESTMENT AND ECONOMIC GROWTH IN DEVELOPING COUNTRIES: FURTHER EVIDENCE FROM PANEL DATA

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Recent theoretical and empirical advancement on growth accounting and endogenous growth front has emphasized that FDI can be a catalyst for the development of developing countries. The present study has attempted to empirically verify the role of FDI in the growth process of developing countries. Panel data evidence, however, does not find any significant role for FDI in the economic growth of all developing countries. The conclusion remained unchanged even if human development interaction with FDI was included in the model. Estimations for developing groupings, nevertheless, suggest that FDI significantly affects the growth of Latin American and the Caribbean countries but not in the case of Africa and Asia. One of the significant observations that this study derived, is that the growth effect of domestic investment is relatively more sensitive than FDI to the level of human development. The study also found that the role of international linkages has a major role in the growth process if the country is at a lower level of human development than a country with a higher level. Developing countries have to pursue a human-development-led-growth strategy supplemented by export-led growth if they want to improve their local productivity as well as that from FDI and maintain their competitive advantages in global markets.

INTRODUCTION

The experience of developing countries with FDI has been of critical interest to the literature on international production and development. This article focuses attention on how FDI and development are related and what mechanism developing countries can resort to, for minimizing the negative impact involved, if any, and to maximize positive influence on growth. Section-I reviews different theoretical approaches to the subject. Section-II sets out the model for analyzing the role of FDI in the economic growth of developing countries and the data source for the study has been mentioned in Section-III. Empirical results from the study have been discussed in Section-IV. Section-V concludes the paper with policy implications.

I. THE THEORETICAL BACKGROUND

What has FDI meant for economic development and growth? This can be conceptualized by a number of linkages that exist between FDI and development. The literature has identified following important linkages as shown in the flow diagram given below (Figure-1.1).

During sixties and seventies, the growth impact of FDI was presumed to be largely negative and growth retarding for host developing countries. In some sense these perceptions about MNCs-development linkage was more an ideological and historical one than based on any rational economic theory (Caves, 1982: Lall, 1993). The dominant structuralist perspectives combined with empirical evidences in the nature of cost-benefit analysis, reports net social benefits of MNCs to

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be either negligible or negative, this has strengthened the negative attitudes of many developing countries recently freed of colonial regime towards MNCs (Lall and Streeten, 1977: Hood and Young, 1979).

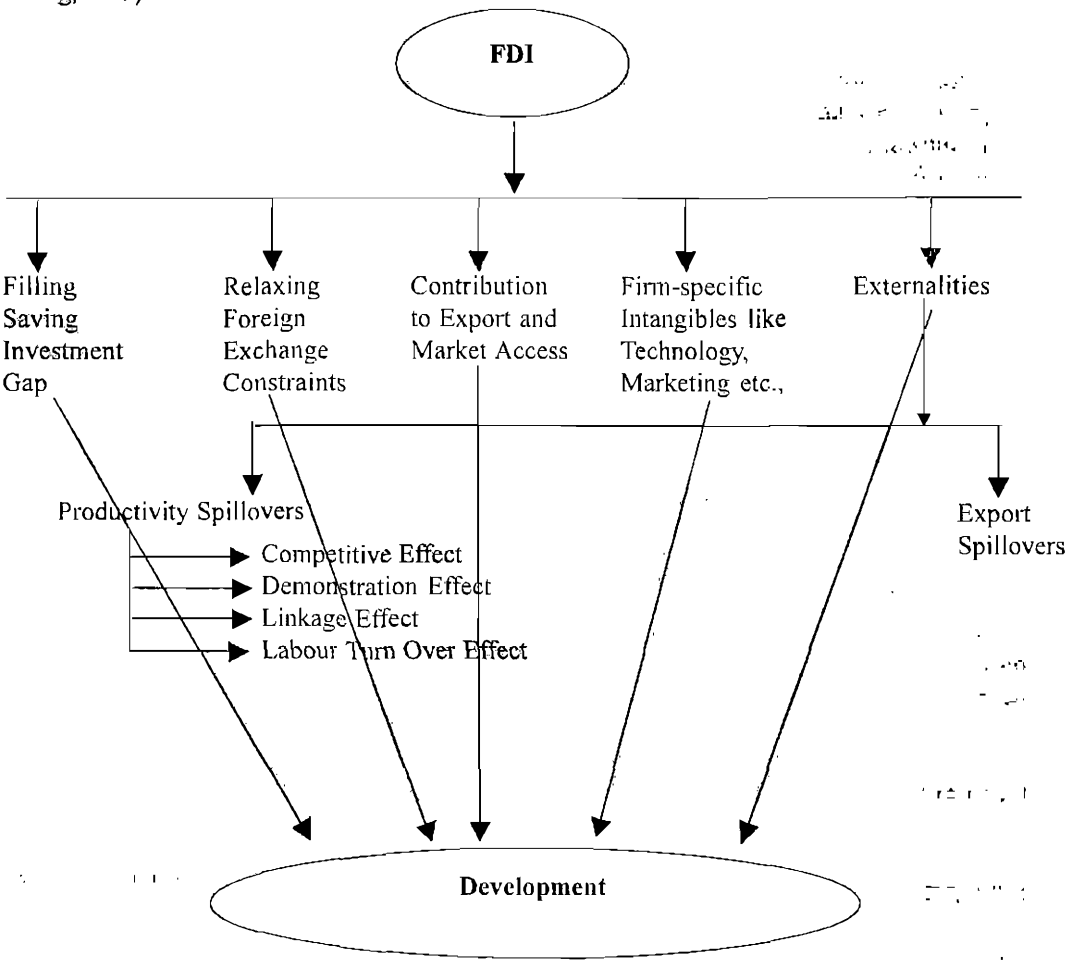

Figure-1.1: Linkage between FDI and Development

One of the important functions that FDI can perform in a poor country is to supplement the meager domestic savings and hence allow the host to achieve a higher level of capital formation. This raises the growth performance of the poor country by enabling utilization of resources that would have remained unutilized otherwise. However, the contemporary theoretical thoughts of sixties and seventies do not share this optimism from FDI.

Singer (1950) argued that the contribution of foreign investment towards the growth process of a poor country has been largely unfortunate. There are three specific reasons responsible for this. Firstly it removed most of the secondary and cumulative effects of investments like additions

to income, employment, capital, technical knowledge and growth of external economies from the country in which the investment took place to the investing country. Secondly, it promoted the specialization of underdeveloped countries along the lines of static comparative advantages offering less scope for technical progress, and without a significant impact on the general level of education, skill, way of life, inventiveness, habits, creation of new demands, etc. Thirdly, the factor that has significantly reduced the benefits of foreign trade-cum-investment to poor countries was the export specialization on food and raw materials. The hypothesis of secular deterioration of terms of trade has been advanced to show how developing countries was constrained in the long run.

Another line of concern that has been invoked in the late seventies is the problem of 'transfer pricing' by which MNCs transfer undisclosed remittances, and profits. A number of studies confirmed this problem, thus arguing that host economies do not gain significant financial benefit from foreign direct investment (Lall 1993). Further it has been noted that TNCs may, as many empirical evidences support, have captive access to local savings due to its large size, reputation etc. and which may crowd out domestic investments (Hood and Young, 1979).

The contribution of FDI towards foreign exchange may be positive in the short run by allowing developing countries to be able to import capital goods and other intermediate inputs so vital for their strategy of industrialization. However, in the end it may adversely affect the balance of payment position of the host countries. It is a known fact that the rate of profit of TNCs is significantly higher than the long-term rate of interest in international capital markets and once profits, remittances, technical fees, etc., starts flowing back to the home country, this results in a balance of payment problem. In addition, it has been suggested that MNCs are highly import-intensive and this slowly aggravates the problem.

As far as FDI as a bundle of intangibles is concerned, technology is the most important asset sought by the developing countries. In this context, it has been argued that it may be against the factor endowment of the developing countries. The problem of 'appropriate technology' however was backed by little empirical evidence. The critical aspect of the problem relates to the terms and conditions of technological agreement and cost of it. Firstly the royalties and the license fees charged by MNC are too high, secondly, that tie-in clauses in technology contracts require the licensee to purchase capital equipment and intermediate parts from the parent company, when such items could have been obtained more economically elsewhere, and thirdly, technology contracts that frequently incorporate export prohibition clauses, limited the sale of goods using this imported technology by the receiving country (Hood and Young, 1979). The experience of Latin American countries provides a certain amount of evidence concerning the last two costs of technology contracts.

It is also argued that as MNCs have little linkage with the local economy it will not generate the much-pursued Marshallian externalities. Whatever other assets of the package remain like managerial superiority, marketing, market access etc are argued to be critical for economic development but there exists little empirical evidence for this. About export performance, it was found that both local as well as foreign firms are more oriented towards domestic markets rather than exporting. The reason cited for these findings was the inward-looking policy of developing countries marked by inefficiency, high cost industrial structure, and market distortions.

As the developing countries are characterized by large-scale market failures, presence of

foreign firms only leads to a highly concentrated oligopolistic market structure. This is because MNCs by their very nature has been traced to market failures in the production, distribution and diffusion of ownership-specific assets.

Concisely the above discussion suggests that the literature of sixties and seventies in some sense was critical about the contribution of FDI towards development of underdeveloped countries. In the late seventies, however, the theoretical understanding has shown more maturity than that of the sixties and it suggests that the FDI factor can be growth enhancing, depending upon the level of development the host country has already achieved (Lall 1993).

In contrast to the views of earlier periods, 1980s and more explicitly 1990s saw a more liberal view about MNCs-development linkage. An era of structural adjustment and competitive outward orientation among developing countries marked by a liberalizing trade, FDI, and exchange rate regimes and acceleration of fiscal reforms, has put TNCs as the leading international market actors into the centre of economic development (WIR, 1992).

For host developing countries, the role of FDI is recently becoming critical. There are various reasons responsible for this. Firstly, with the decline in official financing and the instability of private financial flows FDI is increasingly seen as a solution to the problem of resource gap and external financing (TDR, 1999). Secondly, the source of economic growth is increasingly becoming less material-intensive and more skill, knowledge and technology-intensive. Given the low technological base of developing countries, they see FDI as a vehicle of international knowledge and technology and thus a main factor contributing towards their global competitiveness and growth. Moreover, the pattern of FDI inflows has shown a growth-oriented trend unlike the Singerian Growth-retarding pattern.[1]

With these changing contexts of development, theoretical advancement in analyzing the FDI-growth linkage was more significant during this period. Recent theoretical developments deriving strength from growth accounting framework and endogenous growth literature treats FDI as a package of tangible and intangible assets that are either scarce in supply or unavailable in the poor countries. These include capital, technology, marketing strategy, management practices and skills, market access, and a host of externalities generated by these factors in the development process of the host country.

Following the growth accounting approach, growth impact of FDI can be incorporated via an augmented production function which includes FDI as an additional input that along with traditional factors of production determine the maximum level of output attainable for the host country. In this context, stock-flow consistency among explanatory variables has to be maintained.

However, there are two problems associated with this growth accounting methodology. The first one is empirical in nature and is concerned with explaining higher estimates of the elasticity of output with respect to capital obtained in both cross-section and time series regressions. The second is theoretical in nature and is the absence of demand orientation of growth in the supply orientation of growth accounting (de Mello, 1997).

Emergence of theoretical modeling based on the endogenous growth literature seems to

[1] *In 1913 the primary sector (mainly mining and unprocessed agricultural raw materials) accounted for more than half of FDI flows to LDCs and the manufacturing sector received only 10% of total FDIs; in 1990s about 40% of FDI went to manufacturing, 50% to services and only 10% to primary sectors (Dutt, 1997, p. 1926).*

overcome these limitations of a growth accounting framework. Moreover, these developments have provided the real theoretical basis for the role of FDI in influencing the steady state growth rate of the recipient economy.

Before the emergence of the endogenous growth literature, the growth-enhancing role of FDI was severely limited in the Solowian growth framework in which the long run growth rate was entirely exogenously determined by the technological progress and the growth rate of the labour force. As the steady state growth rate is independent of the proportion of income saved and invested, the role of FDI in filling the resource gap would only affect the steady state per capita output level, leaving the long run growth rate unchanged. The only effect it can have is through permanent technological shocks (de Mello, 1997).

A group of growth economists, during the late eighties found this neoclassical-led exogenously driven explanations of the long run growth rates to be unsatisfactory and their contributions structured a class of growth models, which endogenises the determinants of growth. Contrary to the neoclassical assumption of diminishing returns, the essence of endogenous growth models is the absence of diminishing returns to capital. This absence of diminishing returns is usually explained by a broader concept of capital that encompassed physical and human components or learning by doing or the economy-wide knowledge and productivity spillovers (Barro and Sala-I-Martin, 1995).

This broader concept of capital and existence of knowledge spillovers in the economy has been advanced to provide the explanation for the higher output elasticity of capital than its share in total output. Further, the role of consumer behaviour is an integral part of the growth models, which are in essence a general equilibrium approach to the problem. Moreover, the endogenisation of growth determinants provides a significant space for policy variables to determine the dynamics of economic growth.

One simple way to introduce FDI as a determinant of long run growth is to view FDI as a factor contributing towards the overall knowledge stock of the economy (de Mello, 1997). FDI can contribute to this by both direct and indirect ways. First, introduction of new technology by MNCs has a higher skill content. This is reflected by new vintages of capital, quality control and precision in production and accompanying increased training and skill upgradation (World Bank 1997). Secondly, they brought with them a package of market knowledge and marketing skill accumulated from their long-standing experience and broader exposure to worldwide competitive markets (de la Torre, 1974). The indirect contributions of FDI in enriching the over all knowledge of the host economy is equally important as the above-mentioned direct contributions. Broadly these include productivity and exports spillovers.

The presence of foreign firms affects the structure, conduct and performance of various markets of the developing economies. Local firms may improve their productivity by imitating the technology used by the MNCs operating in the local markets (demonstration effect) or by utilizing existing technology and resources more efficiently or opting for most up to date technology in response to MNC-increased competition (competitive effect). Productivity spillovers also occurred when trained labour migrates from foreign affiliates to domestic companies (labour turnover effect), and more importantly through existence of forward and backward linkages between foreign and local firms (linkages effect) (Caves, 1974; Blomstrom and Persson, P 1983; Markusen and Venables, 1997; World Bank, 1997; WIR, 1999)..

It is not essential that productivity spillover from FDI would always be beneficial. By definition foreign firms are characterized by a group of intangibles like new technology, efficient marketing strategy, thriving organizational skill, brand names and so on which provides them with an edge over their local competitors. Further, their entry size is large enough to realize scale economies that exist in any productive lines and consequently are producers with better quality at lowest costs. All these factors together contribute to their market power and consequent increase in market concentration. This in turn reduces market share of local firms forcing them to face negative scale-effect and resultant high cost of production in turn reinforces their compulsion to exit from the market in some subsequent round of cumulative effect. In sum, entry of multinational firms may substitute for final goods producers (Markusen and Venables, 1997).

Still there is another way by which FDI may be detrimental to growth of domestic firms as well as local entrepreneurial and technical development. Foreign firms, given their size and other advantages being a part of a global system of product have a preferential access to host country local savings through financial institutions. This will result in credit rationing for small sized local firms and consequent negative impact on their growth, and competitive strength through technical development. If this argument was true then, given the scarcity of domestic entrepreneurship and the need to nurture existing entrepreneurial talent, this would cast doubts on the favourable development effects of FDI (Agosin and Mayer, 2000).

Very recently, the literature has emphasized another important spillover impact that FDI may generate. This is the export spillover from multinational enterprises. It is argued that MNCs are a natural conduit for information about foreign markets, foreign consumers, and foreign technology, and they provide channels through which domestic firms can distribute their goods. To the extant that MNCs directly and indirectly provide information and distribution services, their activities enhance the export prospects of local firms (Aitken *et al,* 1997).

What the above arguments suggest is that FDI not only contributes towards knowledge capital stock of the host economy, it may also substitute already accumulated or potential local knowledge resources. It seems that the relative strength of positive and negative effects of FDI determine its growth enhancing capacity.

As mentioned earlier, one can introduce FDI as a contributing factor to the accumulation of knowledge input in the recipient country and thereby incorporate externalities generated by FDI in the country's production chains. Another line of approach proceeds along the technology diffusion models of open economy based on the endogenous growth literature. In these models inputs are differentiated horizontally or vertically in case of a quality ladder and when the FDI measured by the number of inputs produced by foreign firms increases or the improvements in the quality of production brought out by them, this results in the technological progress in the host economy and affect the steady state growth rate of the same (Borensztein *et al*, 1995).

II. MODEL SPECIFICATION

From the above discussion, it is clear that FDI can play a decisive role in the host economy, by adding to the capital formation and contributing to the total stock of knowledge. Nevertheless, the possibility that FDI related knowledge might substitute the domestic knowledge of the recipient economy also exists. Overwhelming empirical evidence supports the hypothesis that to get benefit from FDI, the economy must have a critical level of human development. In this section, we will

consider an endogenous growth model, which will take account of above findings. Our model specification largely follows that of de Mello (1997).

We begin with an aggregate production function for the recipient economy. The following relation gives the technology of economy.

$$Y = Ak_d^{\alpha} k_f^{\beta} H^{1-\alpha-\beta} \qquad \ldots(1.1)$$

All are expressed in per capita terms y, k_d and k_f are respectively output, domestic capital stock and foreign capital stock. H is the total knowledge stock of the host economy. α and β are respectively the shares of domestic and foreign capital stock in the total output. A is the efficiency parameter.

Obviously the above specification treats domestic and foreign capital as two separate inputs in the production process. This is a reasonable assumption as far as FDI associated with a new vintage of capital stock, new technology, and efficiency production structure is concerned.

The knowledge capital stock of the economy consists of two parts: domestic contribution to the knowledge stock and international knowledge spillovers to the economy. Learning-by-doing of Arrow (1962) is the basis for domestic knowledge accumulation. It is assumed that the process of learning-by-doing works through an aggregate domestic capital stock. Specifically, an increase in the economy's capital stock leads to a parallel increase in its stock of knowledge.

Our economy also learns from external sources. The literature regarding this emphasized three important channels of international learnings.

a) Imports of capital and intermediate goods as a conduit for R&D spillovers (Rivera-Batiz and Romer, 1991; Grossman and Helpman, 1991, Tybout, 1992).
b) Learning by exporting (Aw et al., 1997; Clerides et al., 1998; Bernard and Jensen, 1999).
c) FDI or other forms of non-equity co-operation involving transfer of tangible and intangible assets between local and foreign firms (de Mello, 1997; Blomstrom and Kokko, 1998; Branstetter, 2000)

We have assumed that the following relation gives the total knowledge stock of the host economy.

$$H = [k_d k_f^{\omega} x^{\Psi} m^{\rho}]^{\eta} \qquad \ldots(1.2)$$

Where x and m represent exports and imports of the economy in per capita term. One can visualize x and m in terms of a cumulative sense so that their incorporation is consistent with other determinants of knowledge stock. ω Ψ and ρ are respectively, the negative of the ratio of percentage change in domestic capital stock to percentage change in foreign capital stock, exports and imports successively, symbolically:

$$\omega = (-)\ \frac{\partial k_d / k_d}{\partial k_f / k_f} \Big| dH = 0$$

$$\Psi = (-)\ \frac{\partial k_d / k_d}{\partial x / x} \Big| dH = 0 \qquad \ldots(1.3)$$

$$\rho = (-)\frac{\partial k_d / k_d}{\partial m / m} dH = 0 \qquad \text{and}$$

$$\eta = \frac{dH / H}{d(k_d\, k_f\, x^{\Psi} m^{\rho}) / (k_d\, k_f\, x^{\Psi} m^{\rho})}$$

This specification of knowledge stock obviously allows for the possibility that foreign knowledge stock may substitute or complement domestic one. When $\omega > 0$, then foreign capital stock substitute domestic capital stock. When $\omega < 0$, then both are complementary.

Substitution of relation (1.2) into (1.1) leads to the following relation for the host economy:

$$Y = Ak_d^{\alpha+\eta(1-\alpha-\beta)}\, k_f^{\beta+\omega\eta(1-\alpha-\beta)}\, X^{\Psi\eta(1-\alpha-\beta)}\, m^{\rho\eta(1-\alpha-\beta)} \qquad \ldots(1.4)$$

Corresponding to (1.4), a standard growth accounting equation can be derived as:

$$g_y = g_A + [\alpha+\eta(1-\alpha-\beta)]g_d + [\beta+\eta\omega(1-\alpha-\beta)]g_f + [\Psi\eta(1-\alpha-\beta)]g_x + [\rho\eta(1-\alpha-\beta)]\, g_m \qquad \ldots(1.5)$$

where g_i, i = A, d, f, x, m are respectively growth rate of total factor productivity, domestic capital stocks, foreign capital stocks, exports and imports.

Relation (1.5) suggests that the output elasticity of domestic capital stock, in the presence of foreign capital stock and international trade, also depends on 'η' – the nature of relationship between total knowledge stock and its determinants through assumed functional form as shown in (1.3). Obviously, a positive η will inflate the output elasticity of domestic capital stocks. This may explain higher estimates of the elasticity with respect to capital obtained in previous estimated long run growth relations. The above growth accounting specification of the model can be supplemented by demand related factors by explicitly introducing the saving behaviour. It can be shown that along with domestic capital stock, foreign capital stock, exports and imports determine the steady-state growth rate of the host economy.

For empirical implementation of the model, we have adopted one-way error component approach of the panel data literature. It well known that this approach is superior to pure cross-sections or time-series approach. Panel data controls country heterogeneity and produces more reliable parameter estimates by providing more variability, less collinearity, more degrees of freedom and more efficiency (Hasio, 1985, Baltagi, 1996). Measurements of different variables are as set by the previous studies, Following precedents from previous studies, the growth rate of domestic capital stock, foreign capital stock, exports and imports will be measured respectively by the domestic capital formation (DINV), FDI inflows (FDI), merchandise exports (EXP), and merchandise imports (IMP), all expressed as a percent of GDP of the host economy. The growth rate of output is the growth rate of real GNP per capita (g_y).

As the literature on FDI and growth emphasized the role of human development for a host country to reap benefit from FDI, we have introduced this variable into our model specification. The measurement of the variable differs across studies, as proxies used are literacy rate, the secondary school enrollment, mean years of schooling and real government expenditure on education. For the purpose of the study the variable was constructed following UNDP methodology taking only two indicators namely the combined primary and secondary enrollment ratio (ENR), and life expectancy at birth (LEB). ENR is the average of the combined ratio for 1970 and 1980. LEB is the average of the figures for 1970 and 1985.

Most of the empirics on growth relations suffered from the problem of endogeneity, ie., the cause-and effect relationship is now simultaneous. Ignoring this problem produces inconsistent estimators and consequently misleading conclusions from OLS application. To minimize this bias the study, like WIR 1999, introduced independent variables in one period lagged form.

The empirical specification of the model is thus following:

$$g_{yit}=V_i+\beta_1 LogGNP_{0i}+\beta_2 HD_{0i}+\beta_3(HD_{0i}*FDI_{i,t-1})+\beta_4 DINV_{i,t-1}+\beta_5 FDI_{i,t-1}+\beta_6 EXP_{i,t-1}+\beta_7 IMP_{i,t-1}+\varepsilon_{it} \quad ...(1.6)$$

For i = 1...n and, for each i, t = 1...T, of which T_i periods are actually observed. V_i is the individual effect and assumed to be time (t) invariant and cross-sectional specific (i). ε_{it} is the classical disturbance term. GNP_0 and HD_0 are the initial per capita gross national product and human development respectively.

III. DATA SOURCE

Data on net FDI inflows up to the year 1988 have been obtained from World tables, 1995, and World Investment Directory, Volume-I (1992), Volume-II (1994) and Volume-V (1996) and thereafter from World Investment Reports various issues. Whenever the former two sources differ significantly from each other, average of both has been used instead. The poor quality of FDI data as reported in the national account statistics of different developing countries is a well-observed point in the empirical investigation. The real GNP per capita (Atlas methodology), nominal GDP, share of domestic capital formation in GDP, merchandise exports and imports, were obtained from World Tables, 1995 and thereafter from World Development Reports (1995, 1996, 1997). Data on LEB and ENR for male and female are collected from United Nations (1989), Compendium of Statistics and Indicators on the situation of women. The life expectancy of person has been obtained by averaging that of male and female. The same has been done with respect to the combined enrollment ratio. In the construction of the HDI (Human Development Index), we have used the range-based-equally weighted procedure as proposed by the UNDP. The method is a two-step procedure. In the first step, we have derived the achievement levels of the chosen indictors by subtracting normative minimum values from respective actual level and next divide the same by the normative range level of the concerned indicator. Finally, the index is a simple average of the range scaled achievement series.

IV. EMPIRICAL RESULTS

There exist two estimation procedures for the model (1.6) depending on the assumption made about V_i to be either estimable fixed parameters or they are independent random variables, accordingly, the estimation technique is fixed effects or random effects. To decide between these two techniques, we depend on the Hauseman Specification Test (1978) (HST) which is in turn essentially a test of the equality of the coefficient estimated by these two effects.

Table-1 furnishes the random-effects estimation of the cross-country growth relation for all sample developing countries (71 in total). Results from regression 1.1 (tabulated in Table-1) indicate that the initial per capita GNP and human development both multiplied by time t have statistically strongest impact on the growth. The negative sign of the former indicates neoclassical conditional convergence among developing countries. The next important sources of growth are domestic capital formation and exports. Over the study period, a one per cent increase in the investment-to-GDP ratio previous

year was, on the average, followed by an increase in the growth rate of about 20 per cent in the following year. Considering the arguments of export-led growth, each one-percentage increase in the previous year's merchandise exports-to-GDP ratio was observed to have a 13-percentage impact on current period growth. With a statistically insignificant coefficient, one period lagged imports seem to be not contributing to the growth. The argument that imports add to the knowledge stock of the economy was not true at least for the total imports figure. Instead, it would have been better to include only a part of it, namely the value of capital goods and intermediaries. Alternatively, one can resort to construction of a foreign R&D figure weighted by imports figure as suggested by Coe and Helpman (1995). But as many studies have pointed out that since eighties the trade of capital goods among developed countries have risen at a faster rate than that between developed and developing countries, it does suggest that knowledge spillovers from technological leaders to technological laggards were an exaggeration. Rather, knowledge spillovers have been a phenomena more significantly confined to developed world only. Further, the trade in new technology is confined to developed world and except for a hand full of developing countries, the developing regions more or less remain left out of international markets for new technology. On the contrary, consumption goods, which form a major chunk of total imports, combined with international demonstration effect do not contribute to the growth of local enterprises due to shrinking demand for their products.

Table-1: Random-Effects Estimation of the Real Per Capita Growth Relation for All Developing Countries, an Unbalanced Panel Data Over 1974-1995

Independent Variables	GLS Regression 1.1		GLS Regression 1.2	
	Coefficients (Standard Errors)	P-Values	Coefficients (Standard Errors)	P-Values
Log GNP_0 *t	-0.2729	0.000	-0.2720	0.000
	(0.0511)		(0.0519)	
HD_0*t	1.9647	0.000	1.9521	0.000
	(0.4750)		(0.4864)	
HD_0 *FDI(t-1)			0.3611	0.831
			(1.6891)	
DINV(t-1)	0.1979	0.046	0.1959	0.049
	(0.0991)		(0.0995)	
FDI(t-1)	0.3667	0.137	0.1552	0.880
	(0.2469)		(1.0243)	
EXP(t-1)	0.1304	0.022	0.1315	0.022
	(0.0569)		(0.0573)	
IMP(t-1)	-0.0886	0.074	-0.0876	0.080
	(0.0496)		(0.0500)	
Constant	7.6352	0.005	7.6577	0.005
	(2.6887)		(2.6990)	
R^2 (Overall)	0.0320	—	0.0321	—
Wald χ^2_{df}	49.64	0.0000	49.51	0.0000
HST χ^2_{df}	7.70	0.2606	7.92	0.3399
Observations	1513			
Number of Groups	71			

Note: HST – Houseman Specification Test

Foreign direct investment as a channel of international knowledge spillovers is not vindicated by the empirical findings. Although it was found to have a positive impact on growth, we do not have statistical strength with in this claim. Even though performing not very well in terms of R^2, which is merely 0.32 per cent, the model is highly significant as suggested by Wald Chi-square value. That means, taken together, our statistical results are significant.

To test the role of FDI interacting with the initial level of human development, we have extended our 1.1 regression model to include one more regressor in the form of an interaction term. Results have been shown by regression 1.2. The findings for all other variables remain unchanged. FDI and its interaction with human development seem to have positive impact on growth. Statistically both these coefficients are insignificant.

However, estimation of 1.1 and 1.2 relations for three developing grouping, namely, Latin America and the Caribbean, Africa and Asia, reveals contrasting implications. For the first developing group, it has been found that along with initial GNP per capita and initial human development, FDI contributes significantly to growth (see Table-2). Last year's FDI-to-GDP ratio, on an average, had a more than one-to-one impact on the current period growth rate. Although exports and domestic investment ratio of last year had a positive impact on growth, the coefficients are not significant. These results are in contrast to the results for the sample of developing countries taken together. Imports-to-GDP ratio was found to have a negative impact but is not statistically significant. The estimated model is highly significant and in terms of R^2 (0.12) performs better in comparison to that for all developing countries sample (0.03). When the FDI-HD interaction term was added to the model in 1.2 regression, it was observed that the coefficient of the term has a negative sign. This result is in contrast to many other studies supporting that domestic knowledge will be more productive in interacting with foreign knowledge. Perhaps it might be true that for developing countries to reap benefits from foreign knowledge they must achieve a critical level of human development. It seems that developing countries of Latin America and Caribbean do not meet this criterion.

Estimations for African countries suggest that domestic investment, FDI and exports, although they had a positive impact on growth, their contribution was not significant (Table-3). The initial GNP per capita and human development continued to be significant determinants of growth. Previous findings pertaining to imports remain intact. According to goodness of fit, the model was worse than the estimated relation for Latin American countries. Extension of the model to include interaction term seems to reveal similar findings as obtained for the developing group of Latin America.

Table-2: Random-Effects Estimation of the Real Per Capita Growth Relation for Developing Countries of Latin America and the Caribbean, An Unbalanced Panel Data Over 1974-1995

Independent Variables	GLS Regression 1.1		GLS Regression 1.2	
	Coefficients Standard Errors)	P-Values	Coefficients (Standard Errors)	P-Values
Log GNP_{0i} *t	-0.2139	0.0030	-0.2302	0.0050
	(0.0727)		(0.0817)	
HD_0*t	1.3620	0.0420	1.5166	0.0450
	0.6689		(0.7572)	
HD_0* FDI(t-1)			-1.9217	0.6620
			4.4007	
DINV(t-1)	0.1272	0.1900	(0.1286)	0.1860
	(0.0970)		0.0972	
FDI(t-1)	1.0491	0.0000	(2.5276)	0.4560
	(0.2181)		3.3927	
EXP(t-1)	0.0354	0.5330	0.0353	0.5350
	(0.0568)		(0.0568)	
IMP(t-1)	-0.0784	0.0800	-0.0793	0.0770
	(0.0448)		(0.0448)	
Constant	9.3875	0.0000	9.2276	0.000
	(2.5986)		(2.6264)	
R^2(Overall)	0.1198	—	0.1201	—
Wald χ^2_{df}	66.80	0.0000	66.88	0.0000
HST χ^2_{df}	11.9	0.0643	13.08	0.0701
Observations	498			
Number of Groups	23			

Note: See Table-1.

Table-3: Random-Effects Estimation of the Real Per Capita Growth Relation for Developing Countries of Africa, an Unbalanced Panel Data Over 1974-1995

Independent Variables	GLS Regression 1.1		GLS Regression 1.2	
	Coefficients (Standard Errors)	P-Values	Coefficients (Standard Errors)	P-Values
Log GNP_0*t	-0.3857	0.000	-0.3940	0.000
	(0.0973)		(0.0977)	
HD_0*t	3.6045	0.000	3.7199	0.000
	(0.9990)		(1.0073)	
HD_0*FDI(t-1)			-3.1109	0.370
			(3.4679)	
DINV(t-1)	0.1630	0.334	0.1683	0.319
	(0.1686)		(0.1688)	
FDI(t-1)	0.1251	0.756	1.7704	0.346
	(0.4028)		(1.8778)	
EXP(t-1)	0.1122	0.304	0.1110	0.309
	(0.1091)		(0.1091)	
IMP(t-1)	-0.0531	0.539	-0.0555	0.522
	(0.0866)		(0.0867)	
Constant	7.2112	0.1380	6.9622	0.1530
	(4.8674)		(4.8760)	
R^2 (Overall)	0.0292	—	0.0303	—
Wald χ^2_{df}	21.86	0.0013	22.66	0.0020
HST χ^2_{df}	7.64	0.2654	7.81	0.3498
Observations	734			
Number of Groups	35			

Note: See Table-1

Results from Asian countries have been presented in Table-4. Domestic capital formation was found to have a negative impact on growth. The same was true for FDI. Imports consistently have negative sign. Nevertheless, none of these are statistically significant. Export was the most dominating factor in the growth process contributing more than 35 per cent to the current growth for a one per cent increase in it last year. Overall R^2 was observed to be highest for this developing group at 20 per cent. Inclusion of interaction effect as before evidence a positive impact but was found to be significant.

Table-4: Random-Effects Estimation of the Real Per Capita Growth Relation for Developing Countries of Asia, An Unbalanced Panel Data Over 1974-95

Independent Variables	GLS Regression 1.1		GLS Regression 1.2	
	Coefficients (Standard Errors)	P-Values	Coefficients (Standard Errors)	P-Values
Log GNP_0*t	-0.2792	0.0000	-0.2734	0.0000
	(0.0539)		(0.0604)	
HD_0*t	1.4621	0.0060	1.3988	0.0210
	(0.5299)		(0.6057)	
HD_0*FDI(t-1)			0.9762	0.7890
			(3.6461)	
DINV(t-1)	-0.0798	0.5730	-0.0795	0.5790
	(0.1415)		(0.1434)	
FDI(t-1)	-0.4989	0.4840	-1.0126	0.6240
	(0.7133)		(2.0676)	
EXP(t-1)	0.3541	0.0000	0.3554	0.0000
	(0.0673)		(0.0676)	
IMP(t-1)	-0.1484	0.1840	-0.1579	0.1830
	(0.1117)		(0.1185)	
Constant	14.7049	0.0000	14.8779	0.0000
(3.4246)		(3.4978)		
R^2 (Overall)	0.2000	—	0.2002	—
Wald χ^2_{df}	68.50	0.0000	68.35	0.0000
HST χ^2_{df}	10.34	0.1109	10.57	0.1586
Observations	281			
Number of Groups	13			

Note: See Table-1

One important question here is about the impact of domestic investment on growth. As we have seen, for all developing countries take together, the investment ratio was found to significantly impinge on growth. However, for Latin America and Africa, although the impact was again positive, it was statistically insignificant. In addition, in case of Asian countries it was observed to have a negative sign but not a significant one. Explaining this finding was a real puzzle. We have consulted the empirical literature on cross-country growth estimation and found this puzzle existing there also. Recent studies including those of Delong and Summers (1991) and Mankiw, Romer, and Weil (1992) and Borensztein *et. al* (1995) reported a significant impact of investment ratio on growth. In contrast to their findings, another study suggests that GDP growth in a period is more closely related to subsequent capital formation than to current or past capital formation (Blomstrom *et al* 1996). Barro (1997) also reported that the impact of investment ratio even though positive was not significant. The results from Blomstrom *et al* and WIR, 1999, indicate that the past domestic capital formation had a negative impact on growth (see, Table-II and III, pp. 274-75 for Blomstrom *et al*, 1996 and pp 334-335 of WIR, 1999).

It has been emphasized that the reserve causation may explain these findings. Studies reporting a significant positive coefficient on the contemporaneous investment ratio may only be reflecting a positive relation between growth opportunities and investment rather than the positive effect

of an exogenously higher investment ratio on the growth rate (Barro, 1997). Further, bi-way causation is most common among supposed causes of growth themselves. For example, exports might affect investment opportunities by widening market size and in turn might be affected by the size of domestic investment making it possible to achieve economies of scale. This study tries to minimize the role of such reverse causation between the dependent and independent variables by incorporating one period lagged series of all the independent variables. The result of all developing countries set suggests that gross domestic investment is the key to economic growth of developing countries in general. However, evidence from regional groupings, suggests that for growth it is not the level of investment alone that matters. It is the efficiency and productivity of investment that is more important for growth.

The impact of FDI on growth can also be examined in the above perspective. Many empirical studies provided evidence to the effect that the absolute size of market as well the rate at which that market is expanding are significant determinants of FDI inflows to host countries. This implies that there exists reverse causation between these two also. It is hoped that inclusion of lagged FDI series minimizes the severity of this problem so as not to bias our results. Findings suggest that although FDI has a positive coefficient in a majority of cases, its impact is not statistically significant, exception being Latin American countries. It seems that the last mentioned regional groups have experienced an effective role of FDI in their economic growth.

The Role of Human Development

It has been argued in a number of studies that human development was a key to the finding that FDI contributed to the productivity/growth of developed countries but not in LDCs. Threshold hypothesis has been advanced in this context and many researchers were found to be busy in identifying the threshold to have a positive impact from FDI and another threshold after which FDI impact was not only positive but statistically significant. (see, Borensztein et al. 1995, Xu, 2000). This study adds one more finding, which indicates that a critical level of human development is not only essential for FDI to be productive but that the criterion is exactly same for domestic investment as well. In essence, any investment without the requisite knowledge and skill cannot be productive or efficient. The absence of this, results in an investment structure marked by inefficiency, poor quality, high cost of production and technological obsolescence.

For the purpose of our analysis, the total sample of developing countries was divided into two groups based on a cut-off point of human development equal to point five. It was observed that there were 43 developing countries that had a human development greater than 0.5. The sample of less than or equal to 0.5 criterion includes rest of 28 developing countries.

Table-5 has shown the estimation for developing countries having lower human development. In terms of our coefficients, we find that the initial GNP per capita for one-year increase in time decreases growth rate by 24 per cent in the current year and that one per cent increase in the last year's exports-to-GDP ratio increases current year growth by 22 per cent. The variable human development, although has a positive sign, is not significant. This was a priori expectation given the fact that the developing countries of this group were at the lower end of human development. Imports ratio also has a positive impact but was not significant.

The domestic investment ratio turns out to have a negative sign. This result was understandable in the context of lower human development and consequently inefficiency and lower productivity. Mis-match between the level of human development and physical capital

accumulation, results in economic inefficiency and mis-utilization of economy's scare resources. Inclusion of FDI-HD interaction term does not reveal major change in the findings except that the coefficient of FDI now has a negative sign and the interaction term has a positive sign. Both coefficients were statistically insignificant.

Table-5: Random-Effects Estimation of the Real Per Capita Growth Relation for Developing Countries Having Human Development Less Than Point Five (HD ≤ 0.5), An Unbalanced Panel Data Over 1974-1995

Independent Variables	GLS Regression 1.1		GLS Regression 1.2	
	Coefficients (Standard Errors)	P-Values	Coefficients (Standard Errors)	P-Values
Log GNP_0*t	-0.2356	0.0000	-0.2303	0.0000
	(0.0441)		(0.0446)	
HD_0*t	0.7720	0.1650	0.7097	0.2060
	(0.5554)		(0.5616)	
HD_0*FDI(t-1)			1.8467	0.4450
			(2.4186)	
DINV(t-1)	-0.1026	0.1880	-0.1073	0.1700
	(0.0779)		(0.0782)	
FDI(t-1)	0.4472	0.0840	-0.2819	0.7760
Log GNP_0*t	-0.3857	0.000	-0.3940	0.000
	(0.2585)		(0.9892)	
EXP(t-1)	0.2231	0.0000	0.2178	0.0000
	(0.0407)		(0.0413)	
IMP(t-1)	0.0404	0.3150	0.0395	0.3250
	(0.0401)		(0.0402)	
Constant	12.7788	0.0000	12.9191	0.0000
	(1.8263)		(1.8361)	
R^2 (Overall)	0.1824	—	0.1832	—
Wald χ^2_{df}	130.95	0.0000	131.44	0.0000
HST χ^2_{df}	2.89	0.8220	3.98	0.782
Observations	594			
Number of Groups	28			

Note: See Table-1

Contrasting above findings with that for developing countries with a high level of human development, reveals some interesting implications. As shows in Table-6, for latter group, initial GNP per capita, initial human development, and domestic investment ratio are the significant determinants of growth. Exports and FDI ratios have positive impact but are not significant. Imports ratio has its as usual insignificant negative impact on growth.

Table-6: Random-Effects Estimation of the Real Per Capita Growth Relation for Developing Countries Having Human Development Less Than Point Five (HD > 0.5), An Unbalanced Panel Data Over 1974-1995

Independent Variables	GLS Regression 1.1		GLS Regression 1.2	
	Coefficients (Standard Errors)	P-Values	Coefficients (Standard Errors)	P-Values
Log GNP_0*t	-0.5339	0.0000	-0.5103	0.0010
	(0.1500)		(0.1523)	
HD_0*t	4.7852	0.0010	4.5556	0.0010
	(1.3826)		(1.4062)	
HD_0*FDI(t-1)			3.5457	0.3690
			(3.9474)	
DINV(t-1)	0.4947	0.0050	0.4944	0.0050
		(0.1765)		(0.1765)
FDI(t-1)	0.2724	0.4310	-2.0480	0.4320
	(0.3456)		(2.6062)	
EXP(t-1)	0.0849	0.4580	0.0930	0.4180
	(0.1143)		(0.1147)	
IMP(t-1)	-0.1380	0.1350	-0.1303	0.1600
	(0.0923)		(0.0927)	
Constant	-0.5052	0.9220	-0.8146	0.8740
	(5.1433)		(5.1554)	
R^2 (Overall)	0.0269	—	0.0.277	—
Wald c^2_{df}	25.18	0.0003	25.98	0.0005
HST c^2_{df}	4.68	0.5861	5.39	0.6126
Observations	919			
Number of Groups	43			

Note: *See Table-1*

This result reveals that the productivity of domestic investment is more sensitive to the level of human development than that in the case of FDI. For the developing countries with low human development, the coefficient of last year's domestic investment ratio is both negative and statistically insignificant as compared to the highly significant positive impact of the same on growth of developing countries with high human development. Interestingly the contribution of international knowledge stock towards growth is more important for the sample of developing countries with a lower human development level. For these countries, specifically exports-to-GDP ratio is positive and highly significant indicating that exports have more potential to contribute to the growth and knowledge stock of the economy. In contrast, the same is positive but insignificant for developing countries with a high level of human development. Moreover, the coefficient of FDI and imports-to-GDP ratio are positive for developing countries with low human development as compared to the positive (insignificant) and negative coefficients respectively for human development achieved developing countries. This fact of inverse relationship between the growth impact of international linkages and the level of human development can be interpreted in terms of the scope of learning from these linkages. For a country with a lower human development, the scope of learning or knowledge transfer is relatively more than for a country with a higher human development level.

CONCLUSIONS

Recent theoretical and empirical advancement on growth accounting and endogenous growth front has emphasized that FDI can be a catalyst for the development of developing countries. FDI can contribute to the domestic stock of knowledge and its very presence generates a host of externalities enhancing productivity and competitiveness of the host country. This optimism from FDI is conditional, however, and consequently the literature on FDI-empirics has been cautious on more than one point. It has been consistently argued that developing countries can maximize benefits from FDI only when they achieve a critical level of human development. Further, many studies have pointed out that there exist cases where FDI can crowd out domestic investment and puts impediments in the way of building up of local capabilities.

The above empirical exercise, however, does not find any significant role for FDI in the growth of all developing countries. The conclusion remained unchanged even if human development interaction with FDI was included in the model. Estimations for developing countries groupings, however, suggest that FDI significantly affects the growth of Latin American and the Caribbean countries but not in the case of Africa and Asia. The interaction effect was observed to be positive only in the case of Asia and negative in case of other two developing countries groupings. In none of the cases, the interaction was found to be statistically significant. If we hold on to human development argument, it can be argued, as already suggested by many, that the developing countries do not have the required level of human development. This conclusion was reached by Xu (2000) who also finds that the technology transfers by US MNEs contribute to productivity growth in DCs but not in LDCs.

One of the significant observations that this study derived is that the growth effect of domestic investment is relatively more sensitive than FDI to the level of human development. For developing countries with higher human development, the impact of domestic investment on growth is not only positive but also statistically significant, whereas, it has no significant impact in the case of developing countries with lower human development. It is true that the interaction effect is more in case of countries at higher level of human development than in the case of countries at the lower level; the effect nonetheless is not significant. Lastly, the study found that the role of international linkages has a major role in the growth process if the country is a lower human development one than a country with a higher level of human development.

The policy implication is obvious. It is a human-development-led-growth strategy supplemented by export-led growth. Developing countries have to pursue a strategic human development policy, by not only investing more in expanding basic human capability but more importantly the knowledge space of the country. This is the key strategy if they want to improve their local productivity as well as that from FDI and maintain their competitive advantages in global markets. This conclusion was also reached by the Human Development Report-1996, which explored in detail the complex relationship between economic growth and human development and found bi-way linkages. More importantly, this strategy is essential in the context of restrictive functioning of global markets where developing countries enter as unequal partners and leave with unequal rewards. In addition, for developing countries, learning from exports is important for their endowments of knowledge resources.

APPENDIX

Name of the countries included in the study: China, Fiji, India, Indonesia, Malaysia, Oman, Pakistan, Papua New Guinea, Philippines, Sri Lanka, Thailand, Turkey, Korea Rep. Of Algeria, Benin, Botswana, Burnika Faso, Burundi, Cameroon, Cen. African Rep, Chad, Congo, Cote D'Ivoire, Egypt, Gabon, Ghana, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, Swaiziland, Togo, Tunisia, United Rep.of Tanzania, Zaire, Zambia, Zimbabwe, Argentina, Barbados, Bolivia, Brazil, Chile, Colombia, Costa Rica, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Suriname, Trinidad & Tobago, Uruguay and Venezuela.

REFERENCES

Agosin, MR. and Richardo Mayer (2000): "Foreign Investment in Development Countries: Does it Crowd in Domestic Investment?" UNCTAD Discussion Paper, No. 146.

Aitken, B, Gordon H. Hanson, Ann E. Harrison (1997): "Spillovers, Foreign Investment, and Export Behaviour," *Journal of International Economics,* 43, pp. 103-132.

Athukorala, P., Sisira Jayasuriya, and Edward Oczkowski (1995): "Multinational Firms and Export Performance in Developing Countries: Some Analytical Issues and New Empirical Evidence," *Journal of Development Economics*, Vol. 46, pp. 109-122.

Baltagi, B.H. (1995): Econometric Analysis of Panel Data, John Wiley & Song Ltd., Chichester, West Sussex, England.

Barba Navaretti, Giorgio, and David G. Tarr (2000): "International Knowledge Flows and Economic Performance: A Review of the Evidence," *The World Bank Economic Review,* Vol. 14. No. 1 pp. 1-15.

Barro, Robert J., and Xavier Sala-I-Martin (1995): Economic Growth, New York: McGraw-Hill.

Barro, Robert, J, (1997): Determinants of Economic Growth: A Cross-Country Empirical Study, The MIT press, Cambridge, Massachusetts.

Blomstrom, M, and Hakan Persson (1983): "Foreign Investment and Spillovers Efficiency in an Underdeveloped Economy: Evidence from the Mexican Manufacturing Industry," *World Development, Vol. 11, No. 6,* pp. 493-501.

Blomstrom, M, Robert E. Lipsey and Mario Zejan (1996): "Is Fixed Investment the Key to Economic Growth," *Quarterly Journal of Economics, 444,* 1, 269-276.

Borensztein, Eduardo, Jose' De Gregorio and Jong-Wha Lee (1995): "How Does Foreign Direct Investment Affect Economic Growth?" *NBER Working Paper No. 5057,* NBER, 1050, Massachusetts Avenue, Cambridge, MA 02138.

Branstetter, L (2000): "Is Foreign Directive Investment a Channel of Knowledge Spillovers? Evidence from Japan's FDI in the United States," *NBER Working Paper 8015,* NBER, 1050 Massachusetts Avenue, Cambridge, MA 02138.

Caves, R.E. (1974): "Multinational Corporations, Competition and Productivity in Host-Country Markets," *Economica*, 41, pp. 176-193.

de la Torre, J (1974): "Foreign Investment and Export Dependency," *Economic Development and Cultural Change*, vol. 23, No. 1, pp. 133-151.

de Mello Jr Luiz R., (1999): "Foreign Direct Investment-led Growth: Evidence from Time Series and Panel Data," *Oxford Economic Papers, 51,* pp. 133-154.

De Mello, Jr Luiz R., (1997): "Foreign Direct Investment in Developing Countries and Growth: A Selective Survey," *The Journal of Development Studies,* Vol. 34, No. 1, pp. 1-34.
DeLong, J. Bradford and Lawrence H Summers (1991): "Equipment Investment and Economic Growth," *Quarterly Journal of Economics,* 106, 2, pp. 445-502.
Djankov, Simeon and Bernard Hoekman (2000): "Foreign Investment and Productivity Growth in Czech Enterprises," *The World Bank Economic Review,* Vol. 14, No. 1, pp. 49-64.
Dua, P and Aneesa I. Rashid (1998): "Foreign Direct Investment and Economic Activity in India," *Indian Economic Review,* Vol. xxxiii, No. 2, pp. 153-168.
Dunning, J.H (1988): Explaining International Production, London, Unwin Hyman.
Dutt, A.K., (1997): "The Pattern of Foreign Direct Investment and Economic Growth," *World Development.* Vol. 25, No. 11, pp. 1925-1936.
Fan, Xiaoqin, and Paul M Dickie, (2000): "The Contribution of Foreign Direct Investment to Growth and Stability," *Asean Economic Bulletin,* Vol. 17, No. 3, p. 313-323.
Globerman, S (1979): "Foreign Direct Investment and 'spillover' efficiency benefits in Canadian Manufacturing Industries," *Canadian Journal of Economics,* 12, pp. 42-56.
Green, W. (1997): *Econometric Analysis,* New Jersey Prentice-Hall International, Inc.
Haddad, M, and A Harrison (1993): "Are these positive spillovers from direct foreign investment? Evidence from Panel Data for Morocco," *Journal of Development Economics,* 42, pp. 51-74.
Hood N and S. Young (1979): The Economics of Multinational Enterprise, London, Longman.
Kathuria, V (2000): "Productivity Spillovers from Technology Transfer to Indian Manufacturing Firms," *Journal of International Development,* 12, pp. 343-369.
Kokko, A., Ruben Tansini and Mario C. Zejan (1996): "Local Technological Capability and Productivity Spillovers from FDI in the Uruguayan Manufacturing Sector," *The Journal of Development Studies,* Vol. 32, No. 4, pp 602-611.
Kumar N and N.S. Siddharthan (1997): Technology, Market Structure and Internationalization: Issues and Policies for Developing Countries, *Routledge and UNU Press,* London and New York.
Lall, S and P. Streeten (1997): Foreign Investment, Transnational and Developing Countries, London, Macmillan.
Mankiw, N, Greogory, David Romer and David N. Weil (1992): "A Contribution to the Empirics of Economic Growth," *Quarterly Journal of Economics,* 107, 2, 407-437.
Marksun, JR, and Anthony J. Venables (1997): "Foreign Direct Investment as a Catalyst for Industrial Development," *NBER Working Paper No. 6241,* NBER 1050, Massachusetts Avenue, Cambridge, MA 02138.
Ramirez, M.D (2000): "Foreign Direct Investment in Mexico: A Co-Integration Analysis," *The Journal of Development Studies,* Vol. 37, No. 1, pp. 138-162.
Rogers, M (1995): "International Knowledge Spillovers: A Cross Country Study," in *Steve Dowrick eds. Economic Approaches to Innovation,* Edward Elgar.
Singer H., (1950): "The Distribution of Grains Between Investing and Borrowing Countries," *American Economic Review,* 2, 473-485.
Singh, R.D (1998): "The Multinationals' Economic Penetration, Growth, Industrial Output, and Domestic Savings in Developing Countries: Another Look," *The Journal of Development*

Studies, Vol. 25, No. 1, pp. 55-82.
Sjoholm, Fredrik (1999): "Technology Gap, Competition and Spillovers from Direct Foreign Investment: Evidence from Establishment Data," *The Journal of Development Studies,* Vol. 36, No. 1, pp. 53-73.
Solow, R.M. (1957): "Technical Change and the Aggregate Production Function," *Review of Economics and Statistics,* Vol. 39, pp. 312-320.
Stoneman, C, (1975): "Foreign Capital and Economic Growth," *World Development,* Vol. 3, No. 1, pp. 11-26.
UNDP (1996): Human Development Report, *Oxford*, Oxford University Press.
United Nations (1999): World Investment Report: Foreign Direct Investment and the Challenge of Development, New York.
World Bank (1997): A World Bank Country Study, Malaysia: Enterprise Training Technology and Productivity, *Washington, D.C.,*
Xu, B (2000): "Multinational Enterprises, Technology Diffusion, and Host Country Productivity Growth," *Journal of Development Economics,* Vol. 62, pp. 477-493.
Xu, B, and Jianmao Wang (1999): "Capital Goods Trade and R&D Spillovers in the OECD," *Canadian Journal of Economics,* Vol. 32, No. 5, pp. 1259-1274.