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Impact of Foreign Direct Investment on Economic Growth in Pakistan

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Foreign direct investment (FDI) is often seen as an important catalyst for economic growth in the developing countries. It affects the economic growth by stimulating domestic investment, increasing human capital formation and by facilitating the technology transfer in the host countries. The main purpose of the study is to investigate the impact of FDI on economic growth in Pakistan, for the period 1980-2006. The relationship between FDI and economic growth is analyzed by using the production function based on the endogenous growth theory; other variables that affect economic growth such as trade, domestic capital and, labour are also used. The results of the study show a negative and statistically insignificant relation between the GDP and FDI Inflows in Pakistan. Policy recommendations are suggested in the light of the results obtained, regarding the FDI in Pakistan.

Field of Research: International trade, International development

1. Introduction

Foreign Direct Investment (FDI) has emerged as the most important source of external resource flows to developing countries over the years and has become a significant part of capital formation in these countries, despite their share in global distribution of FDI continuing to remain small or even declining. The role of the foreign direct investment (FDI) has been widely recognized as a growth-enhancing factor in the developing countries (Khan, 2007). The effects of FDI in the host economy are normally believed to be; increase in the employment, augment in the productivity, boost in exports and amplified pace of transfer of technology. The potential advantages of the FDI on the host economy are; it facilitates the utilization and exploitation of local raw materials, introduces modern techniques of management and marketing, eases the access to new technologies, foreign inflows can be used for financing current account deficits, finance flows in form of FDI do not generate repayment of principal and interests (as opposed to external debt) and increases the stock of human capital via on the job training.

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The local enterprises are able to learn by watching, if the economic framework is appropriate (Bhagwati, 1994) it stimulates the investment in R&D (Bengoa and Robles, 2003).The amount of foreign direct investment increased significantly for developing economies during 1985 to 2000. The share of developing countries in world FDI inflows and outflows has risen from 17.4% in 1985-90 to 26.1% during 1995-2000. For Pakistan the amount of FDI inflows increased from $ 245 million in 1990 to $ 4,273 million in 2006 (WDI indicators 2008).The developing countries all over the world strive to draw foreign direct investment by introducing regulatory reforms, and provision of more incentives for foreign investors as compared to domestic investors. In this situation it becomes imperative to analyze the relation between FDI and economic growth of the host country, and to assess the effect of FDI on economic growth of the host economy. The present paper tries to analyze and empirically estimate the effect of FDI on economic growth in Pakistan, using the conventional neo-classical production function where FDI is considered to be an additional input. The paper is structured as follows; Section 2 describes the review of the relevant literature, Section 3 explains the research methodology and design, section 4 discusses the findings of the study and section 5 gives conclusions and recommendations.

2. Literature Review

A number of studies have analyzed the relationship between FDI inflows and economic growth, the issue is far from settled in view of the mixed findings reached. Most of these studies have typically adopted standard growth accounting framework for analyzing the effect of FDI inflows on growth of national income along with other factors of production. Within the framework of the neo-classical models (Solow, 1956) the impact of the FDI on the growth rate of output was constrained by the existence of diminishing returns in the physical capital. Therefore, FDI could only exert a level effect on the output per capita, but not a rate effect. In other words, it was unable to alter the growth rate of output in the long run. It is not surprising, thus, that FDI was not considered seriously as a drive engine of growth by mainstream economics.

In the contrast, the New Theory of Economic Growth, however, concludes that FDI may affect not only the level of output per capita but also its rate of growth. This literature has developed various arguments that explain why FDI may potentially enhance the growth rate of per capita income in the host country, the identified channels to boost economic growth include increased capital accumulation in the recipient economy, improved efficiency of locally owned host country firms via contract and demonstration effects, and their exposure to fierce competition, technological change, and human capital augmentation and increased exports. However, the extent to which FDI contributes to growth depends on the economic and social condition or in short, the quality of environment of the recipient country (Buckley, et al. 2002). This

quality of environment relates to the rate of savings in the host country, the degree of openness and the level of technological development. Host countries with high rate of savings, open trade regime and high technological product would benefit from increased FDI to their economies.

FDI increases technical progress in the host country by means of a contagion effect, (Findlay, 1978) which eases the adoption of advanced managerial procedures by the local firms. Similarly (De Gregorio, 1992) analyzed a panel of 12 Latin American countries in the period 150-1985. His results suggest a positive and significant impact of FDI on economic growth. In addition the study shows that the productivity of FDI is higher than the productivity of domestic investment. While, (Fry, 1992) examined the role of FDI in promoting growth by using the framework of a macro-model for a pooled time series cross section data of 16 developing countries for 1966-88 period. The countries included in the sample were Argentina, Brazil, Chile, Egypt, India, Mexico, Nigeria, Pakistan, Sri Lanka, Turkey, Venezuela, and 5 Pacific basin countries viz. Indonesia, Korea, Malaysia, Philippines and Thailand.

For his sample as a whole he did not find FDI to exert a significantly different effect from domestically financed investment on the rate of economic growth, as the coefficient of FDI after controlling for gross investment rate, was not significantly different from zero in statistical terms. FDI had a significant negative effect on domestic investment suggesting that it crowds-out domestic investment. Hence FDI appears to have been immiserizing. However, this effect varies across countries and in the Pacific basin countries FDI seems to have crowded-in domestic investment.

FDI inflows had a significant positive effect on the average growth rate of per capita income for a sample of 78 developing and 23 developed countries as found by (Blomström et.al, 1994). However, when the sample of developing countries was split between two groups based on level of per capita income, the effect of FDI on growth of lower income developing countries was not statistically significant although still with a positive sign. They argue that least developed countries learn very little from MNEs because domestic enterprises are too far behind in their technological levels to be either imitators or suppliers to MNEs. In this regard, another study was conducted by (Borensztein, et al., 1998) he included 69 developing countries in his sample. The study found that the effect of FDI on host country growth is dependent on stock of human capital. They infer from it that flow of advanced technology brought along by FDI can increase the growth rate only by interacting with country's absorptive capability. They also find FDI to be stimulating total fixed investment more than proportionately. In other words, FDI crowds-in domestic investment. However, the results are not robust across specifications. Export-oriented strategy and the effect of FDI on average growth rate for the period 1970-85 for the cross-section of 46 countries as well as the sub-sample of countries that are deemed to pursue export-oriented strategy was found to be positive (Balasubramanyam et al. 1996) and significant but not significant and some times negative for the sub-set of countries pursuing inward-oriented strategy.

Findings of (Xu, 2000) for US FDI in 40 countries for the period 1966-94 also support the findings of De Mello that technology transfer from FDI contributes to productivity growth in developed countries but not in developing countries, which he attributes to lack of adequate human capital. (Agosin and Mayer, 2000) analyzed the effect of lagged values of FDI inflows on investment rates in host countries to examine whether FDI crowds-in or crowds-out domestic investment over the 1970-95 period. They concluded that FDI crowds-in domestic investment in Asian countries crowds-out in Latin American countries, while in Africa their relationship is neutral (or one-to-one between FDI and total investment). Therefore, they concluded that effects of FDI have by no means always favourable and simplistic policies are unlikely to be optimal. These regional patterns tend to corroborate the findings of (Fry, 1992) who also reported East Asian countries to have a complementarity between FDI and total investment. In another study by (Pradhan, 2001) found a significant positive effect of lagged FDI inflows on growth rates only for Latin American countries. He used a panel data estimation covering 1975-95 period for 71 developing countries. The study sheds light that the effect of FDI was not significantly different from zero for the overall sample and for other regions.

A number of early studies have generally reported an insignificant effect of FDI on growth in developing host countries. FDI may have negative effect on the growth prospect of the recipient economy if they give rise to a substantial reverse flows in the form of remittances of profits, particularly if resources are remitted through transfer pricing and dividends and/or if the transnational corporations (TNCs) obtain substantial or other concessions from the host country. For instance, Singh, (1988) found FDI penetration variable to have a little or no consequences for economic or industrial growth in a sample of 73 developing countries. In the same way (Hien, 1992) reported an insignificant effect of FDI inflows on medium term economic growth of per capita income for a sample of 41 developing countries.

For studies conducted in Pakistan, a study by (Shabir and Mahmood, 1992) analyzed the relationship between foreign private investment FPI and economic growth in Pakistan. The study used the data for 1959-60 to 1987-88; the study concluded that net foreign private investment (FPI) and disbursements of grants and external loans (DISB) had a positive impact on the rate of growth of real GNP. However they did not treat FDI as a separate variable. Similarly (Ahmed, et.al, 2003) examined the causal relationship between FDI, exports and output by employing Granger non-causality procedure over the period 1972 to 2001 in Pakistan. They found significant effect from FDI to domestic output, in contrast to the above mentioned studies.

An important study undertaken by (Khan, 2007) examines the link between FDI and economic growth by including the role of domestic financial sector, Khan argues that introduction of financial sector indicator is expected to improve and reinforce the link between FDI and economic performance, as well as reflect the level of absorptive capability of a recipient country in enjoying the benefits embodied in FDI inflows. The study covers the time period from 1972-2005, and to examine the long run relationship between variables i.e. growth rate of real GDP, ratio of FDI to real GDP, financial

sector development, labour, and physical capital the study uses the Bound testing approach to co-integration within the framework of Autoregressive Distributes Lag(ARDL).

The findings of the study suggest that Pakistan will effectively transform benefits embodied in FDI inflows, if the evolution of the domestic financial sector has aimed at a certain development level. The interaction term between FDI and financial development indicator is positive, while the coefficient of FDI is negative in the case of Pakistan. This suggests that FDI will have a positive impact on growth performance only if the domestic financial sector is well developed and functioning efficiently, otherwise the effect of FDI on economic growth will be negative. The study also provides the evidence that the link between FDI and growth is causal, where FDI promotes growth through financial sector development.

3. Methodology and Research Design

The main purpose of the study is to assess/quantify the impact of FDI on economic growth in Pakistan. The Time period for study is 1980-2006, based on the grounds that Pakistan started receiving significant amount of FDI inflows after the 1980s.The data on the variables is from the *Handbook of Pakistan Economy-2005* published by the State Bank of Pakistan and the World Bank Development Indicators-2008 CD-ROM.

The theoretical model that is used, to investigate the interaction of FDI and Economic growth is based on the following production function.

$$Y_t = A_t K^{\alpha}_{dt} K^{\lambda}_{ft} L^{\beta}_{t}$$

Y is the flow of output, $\mathbf{K_d}$ represents domestic capital, $\mathbf{K_f}$ represents foreign owned capital respectively, **L** is labor force, **α** represent the output elasticity of domestic capital stock., **λ** represents the output elasticity of foreign capital stock, **β** represents the output elasticity of labor force and **A** is total factor productivity that explains the output growth that is not accounted for by the growth in factors of production specified.

The model is based on the endogenous growth theory, as developed by (Balasubramanyam, et.al, 1996) and (Borensztein, et.al, 1998). The model is based on the assumption that FDI contributes to economic growth directly through new technologies and other inputs as well as indirectly through improving human capital, infrastructure, and institutions, the level of a country's productivity depends on the FDI, trade and domestic investment. As the variable ***A*** captures the total factor productivity TFP) effect on growth in output and it is assumed that the effect of FDI on growth in output operates through Variable ***A***, and the effect of FDI on ***A*** also depends on the human capital. The main purpose of the study is to assess/quantify the impact

of FDI on economic growth, in order to achieve the desired objective, other independent variables which are assumed typically to influence the economic growth will be included in the model. It is expected that this inclusion will reduce or eliminate the specification error.

To test the hypothesis empirically, the effects of FDI on economic growth, the model used can be specified as follows:

$$g = a + b_1 \boldsymbol{L} + b_2 \boldsymbol{K} + b_3 \boldsymbol{FDI} + b_4 \boldsymbol{TRD} + e$$

Where Dependent Variable is *g* is the real *GDP*, And the Independent Variables are *FDI* is the foreign direct investment inflows, *TRD* the trade measured as exports of goods and services, *L* is economically active labour force, *K* is the domestic capital investment. For the purpose of estimation the equation to be tested was obtained by taking the log on both sides, equation that could be rewritten as follows.

$$\mathbf{lny_t = b_0 + b_1 lnk_d + b_2 lnl + b_3 lnk_f + b_4 lntrd + Ct}$$

Where variable on the left side is dependent variable and variables on the right side are the exogenous variables.

It is well established that (macro) time series data such as the ones used in the present study tend to exhibit either a deterministic and/or stochastic time trend and are therefore not stationary: that is the variables in question have means, variances and covariances that are not time invariant. According to Engle and Granger (1987) the direct application of Ordinary Least Square (OLS) or Generalized Least Square (GLS) to nonstationary data produces regressions that are misspecified or spurious in nature. These regressions tend to produce performance statistics that are inflated in nature, such as high R2 and t-statistics, which often lead investigators to commit a high frequency of Type I errors as shown by Granger and Newbold (1974).

The concept of the Cointegration as introduced by Engle and Granger(1987) states that for two variables that are nonstationary or integrated of order I(1), if there exists a linear combination of these non stationary variables that is stationary then such variables are said to be Cointegrated and the system is said to be in long run or equilibrium. The Engle Granger Testing for Cointegration proceeds with first testing the stationarity of the variables, and then applying the Ordinary Least Squares (OLS) Method to estimate the coefficients of the Regression equation and then checking the residuals of the regression for stationarity, if the residuals are stationary then the variables are cointegrated or in a long run equilibrium, and the coefficients are regarded as the long term elasticities. The stationarity of the series has been tested by employing Augmented Dickey Fuller (ADF) test on level first. The results show indicates that none of the series is stationary at levels. ADF is applied again at first difference of the variables and the results show Domestic capital, inflation and Exports are stationary at 1st difference on 5% level of significance, while other variables are also stationary at 1st difference on 1% level of significance. After establishing that all

the variables are stationary at 1st difference according to Engle – Granger (1987) method, OLS was used to estimate the equation no 3. The residuals of the regression were checked for the stationarity.

Applying the OLS on equation

$$LNG = 5.440 + 0.398*LNK + 0.674*LNL - 0.161*LNF + 0.049*LNX$$

(16.58) (2.40) (2.39) (-1.01) (1.89)

Adjusted R^2=0.98 F Statistics=34.1

The estimated value for R^2 and F statistic is 0.98 and 34.1 respectively. Which shows that the regression is overall good fitted on 1% level of significance (as the $F > F_{.01}$: n-l, n-k), which means that we can reject the null hypothesis that the regressors have no impact on the economic growth. Significance of the regressions parameters is tested by the usual t statistic. The t statistics are given in parentheses, which show that all the parameters, domestic capital, and labour are significant at 5% level of significance as well as the intercept. The other two variables namely FDI has a negative sign and is insignificant as well, for the export the coefficient though is positive but is not significant at 5% level of significance. According to the Engle Granger method the residuals were checked for stationarity, and the test shows the stationarity of residuals of OLS at level. As the ADF statistic is less than the critical value at % level of significance, so we can reject the null hypothesis of unit root and accept the alternate hypothesis of stationarity of the series. Now the result obtained for regression parameters has validity of long run trend which gives us the elasticity's of the variables. It shows the responsiveness of economic growth (GDP) for a unit change in exogenous variables.

The study tested the cointegration of variables by applying another test i.e. Cointegrating Regression Durbin-Watson test (CRDW) whose critical values were first provided by (Sargan and Bhargava 1983). For the CRDW test the value of Durbin-Watson obtained from the Cointegrating regression is used .On the basis of 10,000 simulations formed from 100 observations each, the 1, 5, 10 % critical values to test the hypothesis that the true d=0 are 0.511, 0.386, 0.322, respectively. This if the computed value of d is less than, say 0.511, the null hypothesis of cointegration at 1% is rejected. For this study the value of d=1.42 which is above the critical value suggesting that the variables are cointegrated, thus reinforcing findings on the basis of Engle Granger test.

4. Discussion of Results

The results of the study are very interesting and in line with the results obtained by other researchers on the relationship between economic growth and the Foreign Direct Investment Inflows for Pakistan. Since the system is in long run equilibrium the estimated coefficients of the parameters can be interpret as the elasticities of the respective variables. The following section discuses the results of the test individually

for the exogenous variables of the study. The coefficient of Domestic capital is positive and significant and the value 0.398 can be treated as long run elasticity of Domestic Capital. For one unit change in Domestic Capital the Economic growth (GDP) increases by almost 40%. This shows the positive contribution of Domestic Capital formation on economic growth in Pakistan has been positive, for 1980-2006.These results are in line with the results obtained by (Atique et al.2004), their results for the Pakistan economy for 1970-2001 show that the coefficient of Domestic Capital is positive and significant with value of 0.51(near the value obtained by this study). The result for domestic capital is also in line with the results of (Balasubramanyam et.al 1999). The coefficient of labour force is positive and significant, with value 0.67 that can be treated as long run elasticity. For one unit change in labour the economic growth (GDP) increases by 67%. This positive contribution of labour towards the economic growth is also in accordance with the results of other studies.

For the variable FDI, the variable of prime interest in this study the coefficient of FDI is 0.16 with a negative sign that is also not statistically significant. This low value of FDI long run elasticity with a negative sign is also somehow in line with the previous research that had been conducted on the said topic. The results of study by (Atique et al.) obtained the coefficient of FDI as -0.03 that seems to be in line with this study. However this particular study found the growth impact of FDI to be greater under an export promotion (EP) trade regime compared to an import-substitution (IS) regime by using data from Pakistan over the period 1970-2001, by obtaining the coefficient of interaction term of FDI and OP(openness of an economy) as 0.12. Similarly a study by Khan (2007) also reported the long run coefficient of FDI to be -0.27 that is again in line with the results obtained by the this study. Similarly another study by Agrawal (2004) for five South Asian countries including Pakistan also document the coefficient of FDI as negative value,-0.288 for the whole sample. Another study by Kumar and Pradhan (2002) also shows the coefficient of FDI for Pakistan to be negative i.e. -1.128.

Other studies conducted outside Pakistan also confirm the results of this study as De Mello (1999) also conducted time series as well as panel data estimation. He included a sample of 15 developed and 17 developing countries for the period 1970-90. The study found strong relationship between FDI, capital accumulation, output and productivity growth. The time series estimations suggest that effect of FDI on growth or on capital accumulation and total factor (TFP) varies greatly across the countries. The panel data estimation indicates a positive impact of FDI on output growth for developed and developing country sub-samples. The study infers from these findings that the extent to which FDI is growth-enhancing depends on the degree of complementarity between FDI and domestic investment, in line with the eclectic approach given by (Dunning 1981). The degree of substitutability between foreign and domestic capital stocks appears to be greater in technologically advanced countries than in developing countries. Developing countries may have difficulty in using and diffusing new technologies of MNEs. Findings of the study regarding the role of FDI in economic growth in developing countries have been widely supported by other researchers such as (Xu 2000).

The justification for the negative value can be explained as pointed out by (Nunnenkamp 2004).According to the study, for FDI to help increase the economic growth and to achieve the international development goals of reducing absolute poverty and raising average income levels, two conditions have to be met. First, the developing countries need to be attractive to foreign investors. Second, the most important is the host country environment in which foreign investors operate must be conducive to favourable FDI effects with regard to overall investment, economic spillovers and income growth. The effects of FDI on economic growth can not be materialized without the development of local markets and institutions, an investment-friendly policy and administrative framework, as well as the availability of complementary factors of production. The host country conditions prevailing in most of the developing countries include weak institutions, and an insufficient endowment of complementary factors of production, that may seriously constrain growth-enhancing effects of FDI. The result for the last variable of the study Exports is positive but not significant with value .04 treated as the long run elasticity. The results could be justified on the ground that since Pakistan export performance has not been very impressive over the last two decades so that it has not played a significant role in economic growth. A the same time larger part of FDI inflows in Pakistan have been in services sector rather than being in Industrial sector or large scale manufacturing sector, thus the role of FDI in enhancing the exports has not been effective.

5. Conclusions

FDI as the results show has not contributed much to the economic growth in Pakistan for the time period 1980-2006, as compared to domestic capital and labour, therefore it is imperative for the government to make a policy for attracting FDI in such a way that it should be more growth enhancing than growth retarding. More Greenfield investment should be encouraged along with investment in large scale manufacturing that can improve the exports of the Pakistan as well as the strongest argument for FDI is that it stimulates exports for the host country. FDI is believed to transfer technology, promote learning by doing, train labour and in general, results in spill-overs of human skills and technology. For all this to hold in a given economy several prerequisites are required. The preconditions include presence of a liberal trade regime, a threshold level of endowments of human capital, an adequate domestic market for the goods produced, and effective competition from locally owned firms through both investments in R&D and domestic production. For FDI to be a significant contributor to economic growth, Pakistan would do better by focusing on improving infrastructure, human resources, developing local entrepreneurship, creating a stable macroeconomic framework and conditions conducive for productive investments to speed up the process of development.

6. References

Atique Zeshan, Ahmad H.Mohsin, and Azhar Usman 2004 “The impact of FDI on economic growth under foreign trade regimes: A case study of Pakistan” The Pakistan Development Review, Vol 43, no 4, pp. 707-718

Agrawal, P. 2000, “Economic impact of foreign direct investment in south Asia”, Working Paper, Indira Gandhi Institute of Development Research, Mumbai, India

Ahmad M.H., Alam S. And Butt M.S. 2003 “Foreign Direct Investment, Exports, and Domestic Output in Pakistan” The Pakistan Development Review, Vol 42, no.4, pp. 715-723

Agosin M.R. and Ricardo Mayer. 2000. “Foreign Investment in Developing Countries: Does it Crowd in Domestic Investment?” UNCTAD Discussion Paper No 146, Geneva: UNCTAD.

Balasubramanyam, V.N., Salisu, M. And Sapsford, D., 1996. “Foreign direct investment and growth in EP and IS countries”, The Economic Journal, Vol, 106, No 1, pp.92-105.

Borensztein, E., De Gregorio, J. & Lee W. 1998,”How does foreign direct investment affects economic growth?” Journal of International Economics, Vol.45, No 1, pp.115-135.

Bhagwati, J.N. 1994, “Free trade: Old and new challenges”, Economic Journal, vol.104, pp. 231-246

Blomstrom, Magnus, Robert E. Lipsey, and Mrio Zejan 1994, What Explains the Growth of Developing Countries? In Baumol, William J.Nelson, Richard R. and Wolff, Edward N. (eds.), Convergence of productivity, Oxford University Press, New York; 243-256

Buckley P., Clegg J., Wang C. 2002, “The impacts of FDI on the performance of Chinese Manufacturing Firms”, Journal of International Business Studies, Vol.19. no. 2, pp 55-67.

Bengoa Calvo and Sanchez-Robles 2004. “Does Foreign Direct Investment Foster Economic Growth? Some Theoretical and Empirical Arguments”. Available at http://ssrn.com/abstract=525882

Dunning, J.H. 1993, Multinational Enterprises and Global Economy, Wokingham, Addison-Wesley

De Gregario, J. 1992, “Economic growth in Latin America”. Journal of Development Economics, vol 39, pp. 59-83

De Mello Jr Luiz R. 1999 “Foreign Direct Investment-led growth: evidence from time series and panel data”, Oxford Economic Papers, vol 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

Engle F.R. and Granger W.C 1987 “Cointegration and Error Correction: Representation, Estimation and Testing”, Econometrica, vol 55, pp. 251-276.

Findlay, R. 1978. “Relative backwardness, Direct Foreign Investment, and the transfer of technology: a simple dynamic model’, Quarterly Journal of Economics, vol. 92, pp.1-16

Fry, Maxwell J. 1992 “Foreign Direct Investment in a Macroeconomic Framework: Finance, Efficiency, Incentives and Distortions”, PRE Working Paper, Washington DC: The World Bank.

Khan Arshad, 2007, “Foreign Direct Investment and Economic Growth: The role of Domestic Financial sector”, PIDE Working Paper

Nunnekamp Peter, 2004 “To what extent can Foreign Direct Investment help achieve international development goals” Kiel Institute for World Economics.

Pradhan, Jaya Prakash.2003. Foreign Direct Investment and Economic Growth: The Case of Developing Countries, Unpublished M.Phil Dissertation submitted to Jawarhlal Nehru University, New Delhi

Singh, R.D. 1998. “The Multinational’s 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.

Shabbir T., And Mahmood A. 1992. “The Effects of Foreign Private Investment on Economic Growth in Pakistan”, The Pakistan Development Review, vol 31, no. 4, pp.831-841

Xu, B. 2001. “Multinational enterprises, technology diffusion and host Country productivity growth”, Journal of Development Economics, vol 62, pp.477-494.

Solow, R. 1956. ”A contribution to the theory of economic growth”, Quarterly Journal of Economics, vol. 70, no1, pp., 65-94

Sargan J.D and Bhargava A.S.1983. “Testing Residuals from Least Square Regression for being generated by the Gaussian Random Walk”, Econometrica, vol 51, pp.153-174