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# ECONOMIC EVALUATION OF FOREIGN DIRECT INVESTMENT IN PAKISTAN

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**Abstract**. Foreign Direct Investment (FDI) in Pakistan is one of the major external sources of funding to meet obligations of resources gap and goal achievement. FDI has played a vital role in the economic growth of Pakistan. FDI contributed significantly in the human resources development, capital formation, and organizational and managerial skills of the people in the country. Total foreign investment was $ 6.0 billion, of which FDI amounted to $ 4.16 billion in the year 2007. The present research study empirically analyzed the impact of FDI on Pakistani imports and exports through time series data. The study applied the Unit Roots test to check the stationarity of the data series used in the analysis. Cointegration technique was used to analyze the long run relationship among the variables. Error Correction Model was used for further analysis.

The results of the import model showed that FDI positively impacted real demand for imports in the short run and in the long run. In case of one percent increase in FDI; real demand for import would increase by 0.08 percent in the short-run and 0.52 in the long run. The results of export model showed that FDI has negative relation with real exports in the short-run and positive relation in the long run. The export model estimations indicated that with one percent increase in FDI, real export decreased by –0.08 percent in the short-run and increased by 1.62 percent in the long run.

## I. INTRODUCTION

In recent decades under the changing modes of international transactions and cross-border mobilization of production factors, foreign direct investment

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(FDI) attracted great attention not only in developing countries but also in developed countries. The open FDI regime forced the host countries to adopt greater deregulation policies and reliance on market forces in their economies. Most developing countries such as Pakistan now considered FDI as the major external source of funding to meet obligations of resources gap and economic growth, however it is difficult to measure economic effects with precision. Nevertheless, various empirical studies showed a significant role of inward FDI in economic growth of the developing countries, through its contribution in human resources, capital formation, enhancing of organizational and managerial skills, and transfer of technology, promoting exports and imports and the network effect of marketing. The other positive spillover effect was that the presence of foreign firm helps expand infrastructure facilities, which makes it easier and profitable for local firms to crowd-in (Lemi, 2004).

The negative impacts occur with competition over scarce resources and limited skilled manpower, due to strategic motives by the affiliates of Multinational Corporations (MNCs) or the high technological gap between local and foreign firms. There were also other costs associated with inflow of FDI such as restrictive business practices by foreign firms, profit repatriation and forgone tax in the case of tax holidays. The net welfare effects also differed by the nature of FDI, motives behind internal transactions, and host countries government policies.

Many factors made Pakistan an attractive place for foreign investments. Firstly, the Pakistanis economy showed responsiveness and potential capacity to meet exogenous shocks and minimize risks in response to various major regional and global events, for instance, the nuclear blast (1998), the bombing against French technicians in Karachi (2001); 9/11, 2001 which placed Pakistan in the frontline again and aid from Washington began to flow once again. The subsequent events included: Afghanistan war; the attack on India's Parliament (2001) that led to mobilization of Indian troops, the 2003 war in Iraq, Karachi Stock Exchange (KSE) crisis and severe earthquake (2005). Thus, foreign investors were assured that they could carry out business in a stable and certain environment.

Secondly, Pakistan has a population of more than 150 million (IFS, 2005) which provides a large market for consumer goods, a growing middle class with adequate purchasing power, and provision of low-cost labour, which reduces the cost of production and its strategic geographical location in Central and South East Asia.

Thirdly, Pakistan has a world-class physical infrastructure, which was necessary for investment. The country inherited strong institutions from the British, and provided adequate communication infrastructure for foreign investors.

Finally, there was also a strategic consideration for increasing FDI in Pakistan having implications for global security (Hussain, 2003).

Pakistan also undertook wide-ranging structural reforms in various sectors of the economy and pursued sound macroeconomic policies for the last seven years. Pakistan has now emerged as a favorite destination for foreign investors, both direct and portfolio investment. Total foreign investment during the (2006-2007) increased to $ 6.0 billion, which was almost 48 percent higher than last year in the same period. Within total foreign investment, foreign direct investment (FDI) amounted to $ 4.16 billion, which was 37 percent higher than last year (GOP, 2006-07). Important areas of FDI were: telecom, energy (oil and gas, power, petroleum refineries), banking and finance, and food and beverages. These four groups accounted for over 80 percent of FDI inflows (GOP, 2006-07). Other areas, for instance, textile, chemicals and petro-chemicals, automobiles, construction and trade, were also attracting FDI. Nearly 78 percent of FDI came from five countries. Pakistan's equity market was also attracting huge portfolio investment and has created brisk activity in stock markets (as Karachi Stock Exchange (KSE) of Pakistan). The magnitude of the foreign investment reflected the confidence of global investors on the current and future prospects of Pakistan's economy (GOP, 2006-07). The target of Exports in 2006-07 was at $ 18.6 billion or 12.9 percent higher than last year.

During the current fiscal year, exports increased only by 3.4 percent, rising from $ 13.46 billion to $ 13.9 billion. Pakistan's exports were mainly consisted of few items namely; cotton, leather, rice, synthetic textiles and sports goods. Imports target was set to decline by 2.1 percent in 2006-07 to $ 28.0 billion from last year's level of $ 28.6 billion (GOP, 2006-07).

The FDI *inter alia* was constrained by a number of factors namely, political instability, law and order, economic environment and no proper infrastructure, the instability in stock markets and regulatory regime. Nevertheless, FDI and foreign remittances provided a strong base to improve the economic situation of the country. The study envisaged a significant addition to the empirical estimation of the impact of foreign direct investment on Pakistan economy. The objective of this paper is to analyze the impact FDI on imports, exports and identify the constraints confronting

foreign investment. The results of the study provide the policy makers with a firm basis to formulate appropriate programs leading to the development of the Pakistan economy.

## II. DATA AND METHODOLOGY

Time series data is used to find the impacts of foreign direct investment on Pakistan's imports and exports for the period of 1973-2004 in this study. The data are taken from international finance statistics (IFS) Pakistan data (2005) and Handbook of Statistics on Pakistan Economy (2005) of State Bank of Pakistan (SBP). The included variables in this research analysis are: real Gross Domestic Product, GDP deflator, volume of exports, unit value of export, volume of imports, unit value of import, volume of foreign direct investment (FDI) as a percentage of GDP. The dummy variable $D_1$ is used for military rule and democracy. The $D_1$ is equal to one for military rule and zero for democracy. The variables are described in Table 1A in Appendix.

The time series data often show the property of non-stationarity in levels and the resulted estimates usually provide spurious results. Thus, the first step in any time series empirical analysis was to test for presence of unit roots to remove the problem of inaccurate estimates. The other important step was to check the order of integration of each variable in a data series in the model to establish whether the data under hand suffer unit root and how many times it needed to be differenced to gain stationarity.

Firstly, Augmented Dickey-Fuller (ADF) test is applied for unit roots to find out that the variables included are integrated of the same order. Then, Johansen-Juselius (1990) test for Cointegration is employed followed by error correction model (ECM). The variables are integrated of the same order. The unit root test showed that variables are integrated of order one or I (1). A few of the time series such as Lnpmpg and Lnrem showed ambiguity in stationarity, *i.e.* I (0) which implied that these series are unable to explain the long run relationships between I (1) variables, but are allowed to enter as un-restricted VAR as exogenous variables. The results of Augmented Dickey-Fuller (ADF) test are obtained in the Tables 2A and 3A. An ADF test indicated the existence of unit roots in levels of all variables ($p = 0.05$) with and without trend.

The functional equations specified to study the impact of FDI are based on Khan and Kim (1999) model. The linear formulation of import and export are given as under:

**Real Demand for Import Model**

$$\text{Ln } M = b_0 + b_1 \text{ Ln } y + b_2 \text{ Ln } (Pm / Pg) + b_3 \text{ Ln } FDI\ (-1) + b_4 \text{ Ln } rem + D1 + e_{mt} \quad (1)$$

**Real Export Model**

$$\text{Ln } X = b_0 + b_1 \text{ Ln } y + b_2 \text{ Ln } (Px / Pg) + b_3 \text{ Ln } FDI + b_4 \text{ Ln } rem + D1 + e_{xt} \quad (2)$$

Here $e_{mt}$ and $e_{xt}$ in equations (1) and (2) were the stochastic error terms encompassing the left over effects in real import model and real exports model respectively. These are considered as distributed independently and normally with zero mean and constant variance.

Shah and Ahmad (2003), Ahmad *et al.* (2003), Afzal (2004), Aqeel and Nishat (2004), and many other studies have applied Unit roots (ADF) test and Cointegration techniques to analyze the determinants of FDI, to watch the impact of FDI on growth and to observe the relation of Exports and imports with FDI. In this study, two techniques were used to test cointegration. These techniques were Augmented Dickey-Fuller (ADF) residual-based test technique suggested by Engle and Granger (1987) and the Johansen's Full Information Maximum Likelihood (FIML) approach proposed by Johansen (1988) and Johansen and Juselius (1990).

## III. RESULTS AND DISCUSSION

The variables used in the research are found cointegrated, therefore, their long run relationship are estimated via ordinary least square method (OLS) and Vector Error Correction Model (VECM) is used for the estimation of short run adjustment. Shah and Ahmad (2003), Aqeel and Nishat (2004) and many other studies have applied Error-Correction techniques to observe the relationship between FDI and other variables.

Firstly, the cointegration among the variables used in the real demand for import model and real export model was assessed on residuals test basis. The equations (1) and (2) are tested by OLS method to apply the residual test. ADF-test was conducted upon the residual $e_{mt}$ and $e_{xt}$ obtained from equations (1) and (2). The residual/error term '$e_{mt}$' was generated from the estimated import model and it was found that error term was I (0) as $e_{mt}$ without trend was ($-3.42 < -2.97$), with trend it was ($-3.345 < -3.567$), It showed that the variables used in import model were cointegrated. The residual/error term '$e_{xt}$' was obtained from the estimated real export model and it was found that error term were I (0) as $e_{xt}$ without was trend ($-5.298 < -2.97$), with trend it was ($-5.203 < -3.567$). It showed that the variables used

in export model were cointegrated. The residual $e_{mt}$ and $e_{xt}$ were stationary. Therefore, residuals in these models were integrated of order zero, *i.e.* I (0) and all the other variables used in the models were integrated of order one, *i.e.* I (1). Therefore, cointegration or existence of a long-run relationship among the variables in equations (1) and (2) was found.

Secondly, the Johansen's technique, that permitted to check all possible cointegrating vectors existing among the variables, was also applied in both models. Thus, the order of Vector Auto Regression (VAR) model was determined before estimating the cointegration tests. It was important to specify the relevant order of lags (p) of VAR model. Given the time series nature of the data, p = 1 seemed a reasonable choice (Pesaran and Pesaran, 1997). To identify the order of lags of unrestricted (VAR) for VECM modeling Johansen (1992) procedure was used.

Schwarz Bayesian Criterion (SBC) and Akaike Information Criterion (AIC) were also described in the Table 4A where p = 4 was selected as the order of VAR on the basis of SBC to avoid over-parameterization of a time series. In order to test the presence of cointegration and find the number of cointegrating vectors among the series of real import model, the unrestricted intercept and no trend model was used in the Johansen Cointegration model. The results of the Cointegration with unrestricted intercepts and no trends in the VAR based on Maximal Eigen Value of the Stochastic were given in Table 5A. One cointegrating vector was selected on the basis of the Eigen Value Test. Therefore, it is concluded that the included variables in the real demand for import model were cointegrated.

Schwarz Bayesian Criterion (SBC) and Akaike Information Criterion (AIC) were also described in the Table 6A in which p = 3 was selected as the order of VAR on the basis of SBC to avoid over-parameterization of a time series.

The results of the Cointegration with unrestricted intercepts and no trends in the VAR based on Maximal Eigen Value of the Stochastic were given in Table 7A. One cointegrating vector was selected on the basis of the Eigen Value Test. Therefore, it is concluded that the variables in the real export model were cointegrated.

## ECM FOR REAL DEMAND FOR IMPORT

The Johansen normalized estimates for the Real Demand for Import were shown in Table 1. The coefficients showed estimates of long-run elasticities of Real Demand for Import with respect to FDI and GDP (*y*), relative prices of import and foreign remittances.

TABLE 1

Johansen Normalized Estimates for the Real Demand for Import

| Real Demand for Import equation |
|---|
| Lnm = –2.893 Lny + 3.109 Lnpm/pg + 0.522 LnFDI + 0.177 Lnrem + 8.468 |

The ECMs for the real demand for import in Table 1 were:

Ecm1 = 0.14087*LNM + 0.58271*LNY + 0.89384*LNPMPG – 0.52006*LNFDI – 0.071472*LNREM – 0.078103*D1 – 2.9005

Ecm2 = 0.73272*LNM – 2.0701*LNY + 3.0239* LNPMPG + 0.40736*LNFDI + 0.064464*LNREM + 0.31941*D1 + 5.9977

The results in Table 2 demonstrated that real demand for import was dependent on the GDP, relative prices of import, FDI and foreign remittances. The short-run elasticity of imports for FDI was significant ($p = 0.05$) and showed expected sign. The magnitude of the long-run import elasticity was high with expected sign but was not significant. The results showed that one percent increase in FDI, real demand for import would increase by 0.078 percent in the short-run and 0.52 percent in the long run. The elasticities of imports for real GDP, foreign remittances and dummy were significant ($p = 0.1$) in the short-run. The magnitude of elasticities of imports was 1.291 for real GDP, 0.087 for foreign remittances and 0.06 for dummy. The result of import model for relative import prices was not significant having elasticity (–0.166). The coefficients of lagged FDI were 0.078 in the short run and 0.52 in the long run in the import model. These results were comparable with Khan and Kim (1999) where the authors found that the coefficient of lagged FDI in the long run was 0.18 in the import model. The coefficients of real GDP were 1.291 and –2.893 in the short run and the long run respectively. Further these results theoretically indicated that a lion's share of FDI was import-oriented and short lived, *i.e.* FDI included telecom, energy, banking and finance, and food and beverages. These four groups accounted for over 80 percent of FDI inflows (GOP, 2006-07), as the projects were completed, the imports reduced and in the long run import-substitution strategy seems appropriate. GDP results also supported our arguments. Increased foreign remittances inspired people to spend lavishly on imported items but this trend reduced in the long run, also increased

Aggregate Demand caused more imports. The coefficient of the error correction term (EC) showed positive sign and indicated the adjustment toward long run equilibrium. The coefficient of 0.025 showed that the deviation of real demand for import from the long run equilibrium level was corrected by about 2.5 percent in the current period. The rationale for this slow rate adjustment was perhaps due to various constraints, *i.e.* political stability, law and order, economic environment and poor infrastructure and regulatory regime.

TABLE 2

The Error Correction Model Estimates for Real Demand for Import

| Regressors | Short-Run | Long-Run |
|---|---|---|
| Constant | | 8.468 (0.529) |
| ΔLNM1 | –0.075 (–0.408) | 1.000 |
| ΔLNY1 | 1.291 (1.54)* | –2.893 (0.851) |
| ΔLNPMPG1 | –0.166 (–0.94) | 3.109 (0.594) |
| ΔLNFDI1 | 0.078 (2.04)** | 0.522 (0.971) |
| ΔLNREM1 | 0.087 (1.81)* | 0.177 (0.364) |
| ΔD11 | 0.064 (1.50)* | 0.603 (0.529) |
| Ecm1 (–1) | 0.025 (0.38) | |
| Ecm2 (–1) | –0.047 (–0.71) | |
| R-Squared | 0.37965 | |
| SE of Regression | 0.066541 | |
| Residual Sum of Squares | 0.097409 | |
| DW-statistic | 2.2715 | |

NOTE: ** and * indicate significant at the 5 percent and 10 percent level of significance, respectively.

Δ indicates the first difference of the variable used.

The results of generalized Impulse Response Functions (IRF) for the real demand for import model were given in Table 3 and Figure 1. The results showed that one standard error shock to real demand for import caused initial response of 10 percent after second year till it returns to long run equilibrium but slightly increasing trend in horizon, gained again equilibrium. One standard error shock to the real demand for import showed an initial response of 1 percent in GDP (Y) that continued slightly rising to 0.02 percent. In the same way, one standard error shock to the real demand for imports regarding relative prices of import attained long run equilibrium after third year, Foreign Direct Investment (FDI) received long run equilibrium after first year, foreign remittances got equilibrium after third year but trend and furthermore binary variable sets long run equilibrium after third year.

TABLE 3

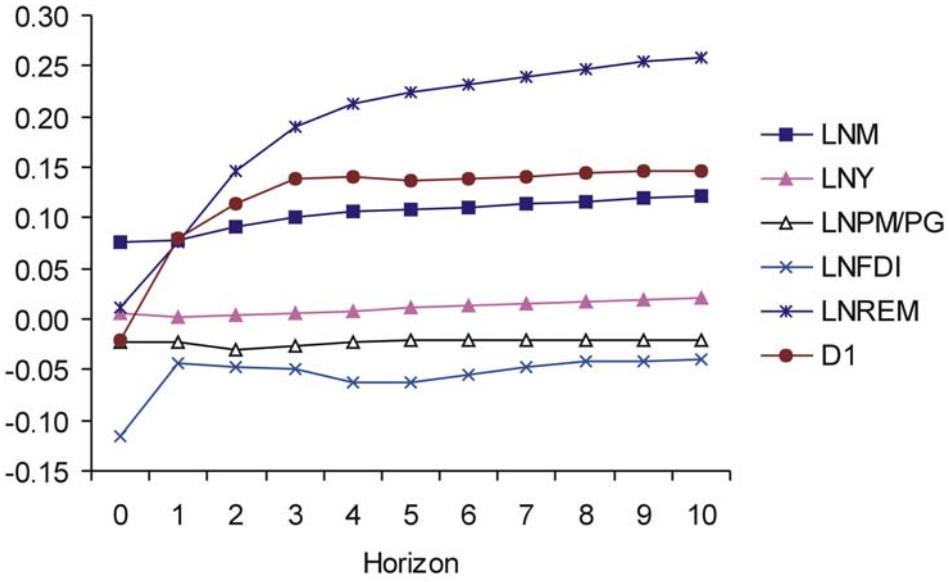
Generalized Impulse Response(s) to one SE shock in the equation for LNM

| Horizon | LNM | LNY | LNPM/PG | LNFDI | LNREM | D1 |
|---|---|---|---|---|---|---|
| 0 | 0.0756 | 0.0065 | –0.0220 | –0.1167 | 0.0112 | –0.0201 |
| 1 | 0.0777 | 0.0027 | –0.0224 | –0.0440 | 0.0751 | 0.0790 |
| 2 | 0.0908 | 0.0036 | –0.0303 | –0.0478 | 0.1467 | 0.1135 |
| 3 | 0.1007 | 0.0057 | –0.0273 | –0.0496 | 0.1893 | 0.1391 |
| 4 | 0.1065 | 0.0081 | –0.0234 | –0.0634 | 0.2136 | 0.1406 |
| 5 | 0.1088 | 0.0105 | –0.0210 | –0.0621 | 0.2243 | 0.1369 |
| 6 | 0.1110 | 0.0126 | –0.0207 | –0.0544 | 0.2311 | 0.1377 |
| 7 | 0.1135 | 0.0148 | –0.0216 | –0.0470 | 0.2396 | 0.1414 |
| 8 | 0.1165 | 0.0171 | –0.0218 | –0.0427 | 0.2474 | 0.1451 |
| 9 | 0.1192 | 0.0194 | –0.0214 | –0.0412 | 0.2535 | 0.1462 |
| 10 | 0.1213 | 0.0217 | –0.0209 | –0.0394 | 0.2575 | 0.1456 |

The results of impulse response function for real demand for import model were given in the following Figure 1.

FIGURE 1

Generalized Impulse Response(s) to One SE Shock in the Equation for LNM




## ECM FOR REAL EXPORTS

The Johansen normalized results for the Real export were illustrated in Table 4. The coefficients represent estimates of long-run elasticities of Real export with respect to FDI and real GDP, relative prices of export and foreign remittances and dummy.

TABLE 4

Johansen Normalized Estimates for the Real Export

| Real Export equation |
|---|
| Lnx = –8.381 Lny – 12.247 Lnpx/pg + 1.623 LnFDI + 0.788 Lnrem + 36.027 |

Ecm1 = 0.24002*LNX + 0.70908*LNY – 1.2853*LNPXPG – 0.64272*LNFDI – 0.092138*LNREM – 0.16370*$D_1$ – 3.4633

Ecm2 = –0.77779*LNX + 1.8085*LNY + 1.2043*LNPXPG – 0.27287*LNFDI – 0.14263*LNREM – 0.066549*$D_1$ – 4.5531

The results in Table 5 showed that real export was dependent on the GDP, relative prices of export, FDI and foreign remittances. The short-run elasticity of export for FDI was not significant with negative sign. The magnitude of the long-run export elasticity was high with expected sign but was not significant. The results showed that one percent increase in FDI, real export decreased by –0.079 percent in the short run and increases by 1.623 percent in the long run. The elasticities of export for real GDP, foreign remittances and dummy were shown as 2.079 and –8.381 for real GDP, 0.013 and 0.788 for foreign remittances and 0.071 and 1.421 for dummy in the short-run and long run respectively.

TABLE 5

The Error Correction Model Estimates for Real Exports, Pakistan

| Regressors | Short-Run | Long-Run |
|---|---|---|
| Constant | | 36.027 (0.217) |
| ΔLNX1 | –0.463 (–2.36)* | 1.000 |
| ΔLNY1 | 2.079 (–0.23) | –8.381 (0.444) |
| ΔLNPX/PG1 | –0.105 (–0.94) | –12.247 (0.226) |
| ΔLNFDI1 | –0.079 (–0.82) | 1.623 (0.195) |
| ΔLNREM1 | 0.013 (0.09) | 0.788 (0.200) |
| ΔD11 | 0.071 (0.69) | 1.421 (0.208) |
| Ecm1 (–1) | –0.008 (–0.05) | |
| Ecm2 (–1) | 0.018 (0.11) | |
| R-Squared | 0.30 | |
| SE of Regression | 0.166 | |
| DW-statistic | 2.141 | |

NOTE: * and ** indicate significant at the 1 percent and 5 percent level of significance, respectively.

Δ indicates the first difference of the variable used

The coefficient of FDI was 1.623 in the long run in the export model. This result is consistent with Khan and Kim (1999) where the authors found that the coefficient of FDI in the long run was 0.07 in the export model. Coefficients have same sign with different magnitudes due to different duration of data periods.

The big share of FDI came to Pakistan was not export-oriented (Important areas of FDI were: telecom, energy, banking and finance, and food (GOP, 2006-07), and most part of the investment was in private sector to capture the domestic market in Pakistan. Increased GDP and foreign remittances were used for unproductive expenditures, *i.e.* construction of bungalows, luxury automobiles, and conspicuous consumption. Therefore, results supported arguments taken in the analysis. The coefficient of –0.008 showed that the deviation of real export from the long run equilibrium level is corrected by about 0.08 percent in the current period. The rationale for this slow rate adjustment was perhaps due to various constraints, *i.e.* political instability, law and order situation, economic environment and poor infrastructure, regulatory regime and continuous inflationary pressure.

The results of generalized impulse response functions for the real export model were shown in Table 6 and Figure 2. The results showed that one standard error shock to real export caused initial response by decreasing 18 percent in the third year again rising to 19 percent One standard error shock to the real export revealed an initial response of GDP that continuously increasing trend (a minor increasing occurs). Similarly, one standard error shock to the real export regarding relative prices of export represented fluctuated long run equilibrium after second year. Foreign Direct Investment (FDI) showed slight increasing long run equilibrium after second year, foreign remittances also behave in same way as FDI while dummy showed long run equilibrium after third year.

TABLE 6

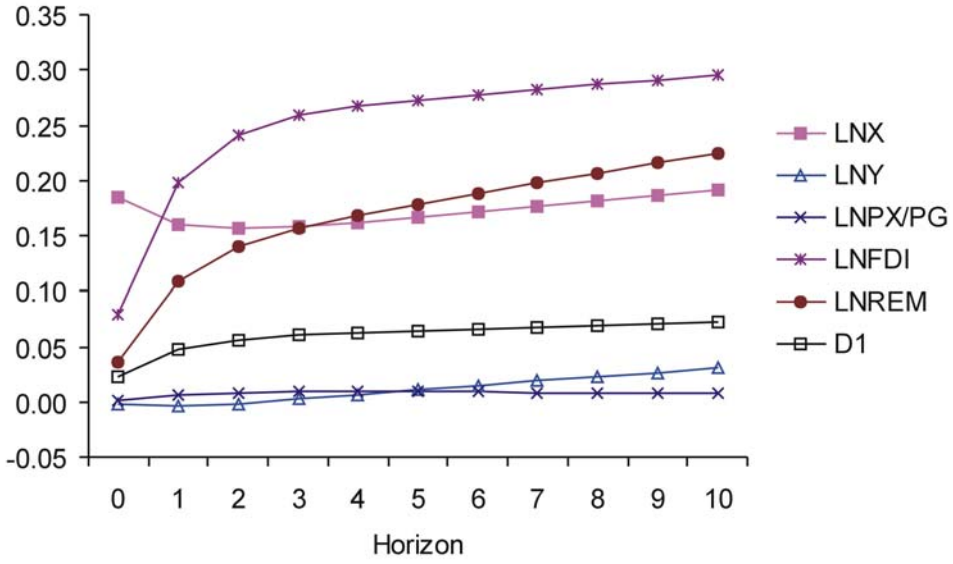
Generalized Impulse Response(s) to One SE shock in the Equation for LNX

| Horizon | LNX | LNY | LNPX/PG | LNFDI | LNREM | $D_1$ |
|---|---|---|---|---|---|---|
| 0 | 0.1850 | –0.0014 | 0.0014 | 0.0783 | 0.0358 | 0.0223 |
| 1 | 0.1606 | –0.0030 | 0.0069 | 0.1987 | 0.1094 | 0.0469 |
| 2 | 0.1561 | –0.6683E-3 | 0.0086 | 0.2414 | 0.1402 | 0.0560 |
| 3 | 0.1582 | 0.0029 | 0.0090 | 0.2585 | 0.1568 | 0.0601 |
| 4 | 0.1623 | 0.0069 | 0.0090 | 0.2671 | 0.1686 | 0.0625 |
| 5 | 0.1670 | 0.0109 | 0.0088 | 0.2729 | 0.1788 | 0.0643 |
| 6 | 0.1720 | 0.0149 | 0.0087 | 0.2777 | 0.1883 | 0.0659 |
| 7 | 0.1769 | 0.0189 | 0.0085 | 0.2822 | 0.1976 | 0.0674 |
| 8 | 0.1817 | 0.0229 | 0.0083 | 0.2865 | 0.2066 | 0.0689 |
| 9 | 0.1865 | 0.0267 | 0.0081 | 0.2908 | 0.2155 | 0.0703 |
| 10 | 0.1912 | 0.0305 | 0.0079 | 0.2949 | 0.2243 | 0.0718 |

The results of impulse response function for real export model are given in the following Figure 2.

FIGURE 2

Generalized Impulse Response(s) to One SE Shock in the Equation for LNX




## IV. CONCLUSION AND RECOMMENDATIONS

Foreign Direct Investment (FDI) has become an important growth factor in the globalization of the world economy. The countries that experienced faster growth rate of GDP were considered successful and have been attracting larger amount of FDI. In developing countries FDI was helpful to narrow down the Saving-Investment gap. A Multinational company's decision to expand its business to another country was mostly based on high efficiency, low production cost, availability of strategic raw material and emerging market. The economic benefits of FDI were wide-ranging; it opened new avenues of knowledge, transfer of technology, training of manpower, market networking and many other spillover effects and externalities in the host countries. Numbers of the developing countries including Pakistan have taken effective policies and aggressively pushing economic reforms to attract foreign investments including FDI. However, the local conditions can restrict the potential benefits produced by FDI despite of instrumental policies.

Many theoretical and empirical research studies were conducted at national and international level related to FDI and most of them were reviewed in the literature. This research study empirically analyzed impacts of FDI on Pakistani imports and exports. The analysis relied on annual time series data over the period of 1973 to 2004. This study applied the Unit roots (ADF test) to check the stationarity of the data used in the analysis. Cointegration was used to analyze the long run relationship among the variables and Error-Correction (EC) techniques to estimates the FDI and other explanatory variables that affect the dependent variables. The results of the import model showed that FDI has positive relation with real demand for imports in the short run and in the long run. The results of export model expressed that FDI has negative relation with real exports in the short-run and positive relation in the long run. The results of import model expressed that one percent increase in FDI; real demand for import would increase by 0.078 percent in the short-run and 0.522 percent in the long run. The export model estimations indicated that one percent increase in FDI, real export would decrease by –0.079 percent in the short-run and increase by 1.623 percent in the long run.

On the basis of this study's results, the following recommendations are suggested for the long-run economic benefits of FDI in Pakistan:

- Policy makers should provide conducive and friendly environment to foreign investors to attract more FDI.
- Foreign investor should be given more incentives for the transfer of technology to host country. This would lubricate the local enterprises.
- For Pakistan import-substitution policy related FDI may prove good.

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## APPENDIX

TABLE 1A

Description of Variables

| | |
|---|---|
| Y | Real Gross Domestic Product (GDP) |
| Pg | GDP deflator |
| X | Volume of exports |
| Px | Unit price of exports |
| Px / Pg | Relative prices of exports |
| M | Volume of imports |
| Pm | Unit price of imports |
| Pm / Pg | Relative prices of imports |
| FDI | Foreign Direct Investment |
| FDI (–1) | Lagged Foreign Direct Investment |
| Rem | Foreign Remittances |
| Ln | Natural log |
| Lny | Natural log y |
| Lnx | Natural log X |
| Ln (Px / Pg) | Natural log (Px / pg) |
| Lnm | Natural log M |
| Ln (Pm / Pg) | Natural log (Pm / Pg) |
| Ln FDI | Natural log FDI |
| Ln FDI (–1) | Natural log FDI (–1) |
| Lnrem | Natural log rem |
| D1 | Dummy variable |

*The year 2000 was taken as base year.

TABLE 2A

ADF Unit Root Test for Stationarity

| Variables | Without Trend | With Trend |
|---|---|---|
| Lnx | –1.620 | –1.573 |
| Lnpx/pg | –2.950 | –2.895 |
| Lnpm/pg | –1.563 | –3.649* |
| Lnfdi | –1.572 | –2.990 |
| LnTD | –0.555 | 0.029 |
| Lnrem | –3.718* | –3.412 |
| Lnm | –1.420 | –2.494 |
| Lny | –1.650 | –0.882 |
| Critical values (0.05 %) | –2.962 | –3.567 |

ADF tests were performed using Microfit 4.1.

*Stationarity at 1(0)

TABLE 3A

ADF Unit Root Test for Stationarity at First Difference

| Variables | Without Trend | With Trend |
|---|---|---|
| Δ Lnx | –5.261 | –5.590 |
| Δ Lnpx/pg | –5.050 | –5.244 |
| Δ Lnpm/pg | –4.391 | –4.315 |
| Δ Lnfdi | –6.656 | –6.846 |
| Δ LnTD | –2.579 | –3.681 |
| Δ Lnrem | –2.683 | –2.739 |
| Δ Lnm | –3.041 | –3.094 |
| Δ Lny | –2.453 | –2.878 |
| Critical values (0.05%) | –2.962 | –3.567 |

*ADF tests were performed using Microfit 4.1.

Δ indicates the first difference of the variable used.

TABLE 4A

Order of the VAR for the Real Demand for Import Model

| List of variables included in the unrestricted VAR | | | |
|---|---|---|---|
| Lnm lny lnpmpg lnFDI1 lnrem D1 | | | |
| List of deterministic and/or exogenous variables | | | |
| Constant | | | |
| Order | AIC | SBC | Adjusted LR test |
| 8 | 38.287 | 30.041 | ---------- |
| 7 | 39.128 | 31.471 | 0.132 [0.716] |
| 6 | 39.333 | 32.264 | 0.795 [0.672] |
| 5 | 34.340 | 27.861 | 5.789 [0.122] |
| 4 | 33.225 | 27.364* | 7.527 [0.111] |
| 3 | 33.178 | 27.877 | 8.424 [0.134] |
| 2 | 34.095 | 29.383 | 8.493 [0.204] |
| 1 | 35.092 | 30.969 | 8.496 [0.291] |
| 0 | 34.501 | 30.967 | 9.822 [0.278] |

NOTE: p – values in the parentheses**.**

AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion

*Minimum value of SBC

TABLE 5A

Johansen Cointegration Results for Real Demand for Import Model

| Relationship | Hypotheses | | Eigen values | Critical values |
|---|---|---|---|---|
| | $H_0$: r | $H_a$: r | | |
| Lnm | 0 | 1 | 84.704* | 40.530 |
| Lny | 1 | 2 | 35.481* | 34.400 |
| Lnpm/pg | 2 | 3 | 29.221* | 28.270 |
| Lnfdi1 | 3 | 4 | 21.645 | 22.040 |
| Lnrem | 4 | 5 | 14.821 | 15.870 |
| D1 | 5 | 6 | 10.72* | 9.160 |
| The critical values were given (p = 0.05 percent) levels for Cointegration. | | | | |

*Indicates support for Cointegration

TABLE 6A

Selecting the Order of the VAR for the Real Export Model

| List of variables included in the unrestricted VAR | | | |
|---|---|---|---|
| Lnx Lny Lnpx/pg LnFDI Lnrem D1 | | | |
| List of deterministic and/or exogenous variables | | | |
| Constant | | | |
| Order | AIC | SBC | Adjusted LR test |
| 4 | 12.3928 | 7.4141 | 0.821 [1.00] |
| 3 | 11.2380 | 6.7572* | 1.252 [0.999] |
| 2 | 11.0334 | 7.0505 | 1.252 [0.999] |
| 1 | 11.4818 | 7.9967 | 1.604 [1.00] |
| 0 | 12.4112 | 9.4240 | 1.618 [1.00] |

NOTE: p – values in the parentheses.

AIC = Akaike Information Criterion

SBC = Schwarz Bayesian Criterion

*Minimum value of SBC

TABLE 7A

Johansen Cointegration Results for Real Export Model

| Relationship | Hypotheses | | Eigen values | Critical values |
|---|---|---|---|---|
| | $H_0$: r | $H_a$: r | | |
| Lnx | 0 | 1 | 92.119* | 40.530 |
| Lny | 1 | 2 | 35.554* | 34.400 |
| Lnpx/pg | 2 | 3 | 28.338* | 28.270 |
| Lnfdi | 3 | 4 | 21.976 | 22.040 |
| Lnrem | 4 | 5 | 12.628 | 15.870 |
| D1 | 5 | 6 | 4.905 | 9.160 |
| The critical values were given (p = 0.05 percent) levels for Cointegration. | | | | |

*Indicates support for Cointegration.