

Inter-Linkage between FDI, Imports and Exchange Rate: An Empirical Evidence from Pakistan

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Abstract

Foreign Direct Investment (FDI) is a very important phenomenon of the millennium. It is considered a substitute and complementary for trade. Numerous researches regarding FDI and imports have been conducted, and contradictory results on complex relationship between FDI and Imports are found. The vector error correction model (VECM) and linear hypothesis testing have been applied by considering exchange rate as supplement for better and accurate modelling. The results of the study indicated short run as well as highly significant long run relationship among all variables under study. For imports causality runs from FDI to imports indicating FDI to be complementary variable for imports. Govt needs to implement policies which must boost up exports but curtail imports burden. In order to generate employment and reduce the balance of payments problems, it is therefore, suggested that government should opt and encourage FDI policies relevant to export oriented industries like manufacturing and production sectors along with the exploration of natural resources. Policies should aim to encourage FDI in industrial sector where the surge in import bill is compensated with export performance of the firms.

Keywords: Foreign Direct Investment, Imports, Exchange rate and VECM

1. Introduction

Foreign Direct Investment (FDI) is considered an essential catalyst for trade liberalization and economic growth in both developing as well as developed countries. For developing countries, FDI is considered as an engine of economic growth as it stimulates capital accumulation in host country, ultimately raises the economic efficiency and productivity. FDI is not only necessary to fill the technological and capital gaps, but also provides major financial cushion during debt crisis.

Theoretical and economical linkage between FDI and trade is well established in existing economic literature. (Rob and Vettas, 2003, Dunning, 1980) found substitution effect which exists between FDI and trade. (Iqbal et al., 2010, Qayyum and Mahmood, 2013) investigated empirically the complementarity between the variables and conclude evidences in its favour. It has also been explored that there is no long run relationship among FDI, imports, exports and GDP (Yasin and Ramzan 2013), while other has the view that high imports discourage FDI inflow and country might fall in scarcity of capital resource (Saeed, 2001).

As this study is concerned with FDI inflow to Pakistan so only imports will be considered for being substitute or complement of the FDI inflow. As a developing country, Pakistan with its wide customer base of over 180 million populations has been successfully attracting FDI. A glance at sector wise distribution of FDI inflow in Pakistan indicates that the telecommunication is on the top followed by business and finance and oil and gas sectors in the FY 2013-14. Whereas, education, food & cloths, energy and manufacturing industries are the catalyst for economic growth of countries like Pakistan however, unfortunately these sectors have attracted insufficient investment. There are indications that FDI from home countries is tied to imports of machinery, equipment, plants and other inputs. Consequently, such heavy tied imports put a heavy burden on country's financial position. Foreign firms are also reluctant to enter into export oriented economic activities. In addition to this, most of the work force of this emerging economy is either unskilled or semiskilled and can best be utilized in the manufacturing sector.

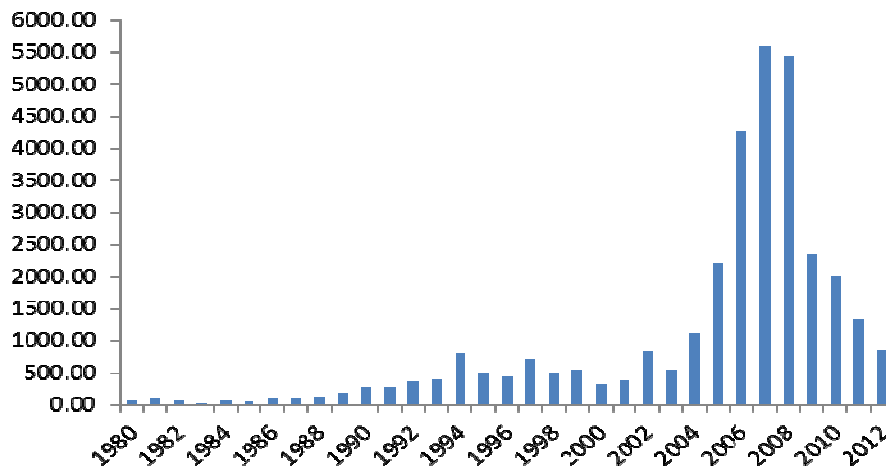
In view of the above limitations associated to FDI inflow to Pakistan, the study at hands has investigated the long run and short run relationship among FDI and imports under the assessment of exchange rate. The result of this empirical study provides sound policy recommendations for future policy adaptation. In order to generate employment and to reduce the balance of payments problems, it is therefore, suggested that government should opt and encourage FDI policies relevant to export oriented industries like manufacturing and production sectors. Policies should aim to encourage FDI in industries wherein the surge in import bill is compensated with better export performance of the firms. The rest of the study is organised as follow, section two and three constitutes the literature review and methodology respectively, while section four covers results and discussion and the last section offers conclusion and policy recommendations.

2. An overview of FDI, Imports and Exchange rate in Pakistan

2.1 Foreign direct investment (FDI)

In 1990s the restriction of authorization and government approval for each foreign investment was eliminated. Both domestic and foreign investors were permitted to negotiate the terms and conditions related to the investment and industry. Similarly the foreign exchange regime was also liberalize, both domestic and foreign investors were permitted to open account in foreign currency, keep foreign currency, can issue share of their companies to foreign investors without permission. The government also initiated easy visa process, rules & regulations to the investors. Legal protection is given to foreign investors in section 8 of the Economic Reforms Act 1992.

Figure 1: FDI inflow in Pakistan (million\$)



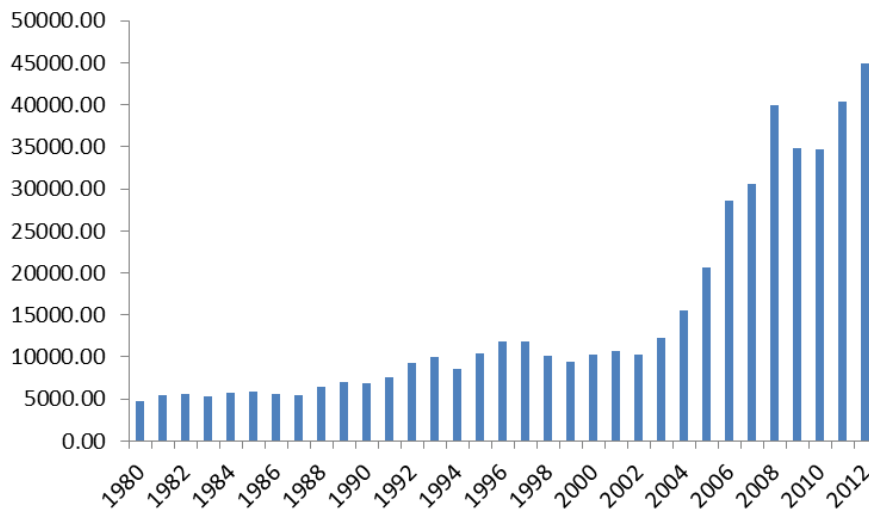
Source: State Bank of Pakistan

Like other developing countries in emerging Asia, Pakistan also liberalizes her policies to attract foreign capital to various sectors. In 2002-03, Pakistan received FDI worth of \$798 million, in 2005-06 the economy received \$3,521 million with 131% increase and in 2006-07 the figure reached to \$5,125 million with more than 200% increase (Figure1). The FDI received in 2006-07 (July- April) cross the figure of \$5,125 million, which is greater than the FDI inflow of the whole 1990-decade. The injection of such large foreign capital boost the potential of the economy, resultantly, economic growth reached to 7.6% in 2006-2007. FDI remained very low before 2005 and except the year 1996, it never exceeded \$1 billion. On the other hand, in FY 08-09, it rose to \$5.4 billion before dropping to \$3.7 billion in FY 2009-10. FDI in Pakistan was \$853.5 million during July-April 2012-13, against \$658.2 million previous year, showing an upsurge of 29.7 per cent.

2.2 Imports

Pakistan's economy dwindling when imports are surging mainly because large amount of paper money flooded into the system. If government is not able to take it back as a part of tax, such persistent inflow of imports create large trade deficit as the production process become costly. In such case, economy has to rely on imported products to fulfil the demand gap. FDI is considered to be substitute of trade, fills the capital, skill and technological gap. As most of the developing countries lack the basic requirements and facilities to initiate a business, therefore, investors need to import the technology and equipment in form of both skilled, expert labour and high quality infrastructural material. While in some cases even the raw material is imported frequently due to unavailability of the resource or high cost of extraction at host country. In general FDI and imports have bi-directional cause and effect relationship in developing countries, so it is indispensable to avoid one of these in a study of trade related research. The latest value for Imports of goods and services (current US\$) in Pakistan was \$44,919 million in 2012. Over the past 34 years, the value for this indicator has fluctuated between \$44,919 million in 2012 and \$4,740 million in 1980 (see figure 2).

Figure 2: Imports of Pakistan (1980-2012)

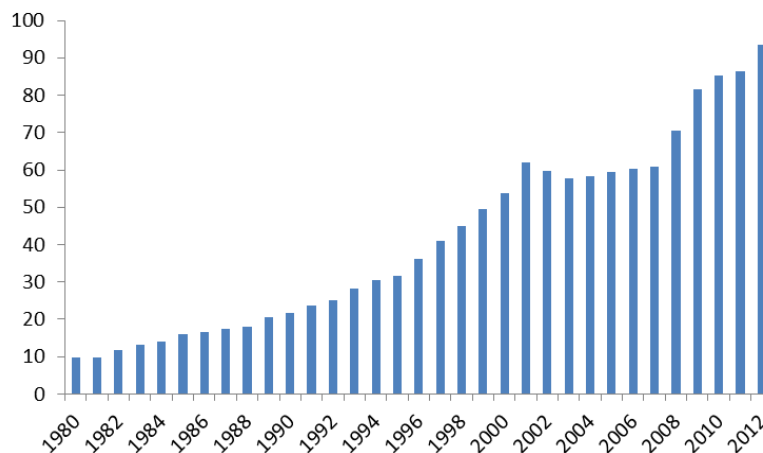


Source: Pakistan bureau of statistics. www.pbs.gov.pk/

2.3 Exchange Rate

In open economies, one of the most significant policy variable is exchange rate as it has influence over the macroeconomic factors like, FDI, trade, inflation, capital flows, remittances, international reserve and GDP, etc.. In literature as well as by conducting so many empirical investigations, it has been revealed that the exchange rate has brought competitive advantage to foreign trade. Fluctuations in exchange rate not only affect the volume of exports and imports within a country but indirectly also alter the trade pattern of trading allies. It also affects the flow of FDI and remittances. Both exchange rate and FDI has bi-direction causal relationship and greatly influence each other rate and volume (Rehman et al., 2010, Khan et al., 2012). Figure 3 represents the fluctuations in real effective exchange rate with index base year 2000 for period 1980-2012.

Figure 3: Real effective exchange Rate of Pakistan (1980-2012)



Source: UNCTAD stat.

3. Literature Review

Yasin and Ramzan (2013) aimed at reconnoitre GDP growth, exports and imports under FDI effect in Pakistan from 1976-2010. The hypothesis mainly concentrates about FDI led trade surplus and economic growth. An Autoregressive Distributed Lag (ARDL) approach was used to find out long run relationship among FDI, exports, imports and GDP. The outcome showed no long run association among FDI with exports, imports and GDP. Qayyum and Mahmood (2013) investigated the causality between FDI and foreign trade for Pakistan and with it eight major trading partners by using annual data from 1985 to 2010. They used VECM and Johansen Fisher Panel co-integration and conclude that in case of Pakistan, FDI encourages trade with its major trading partners. Atique et al. (2004) examined the trade policy regime of Pakistan during 1971-2001 and derived that it had greatly affected the level of inward FDI and economic growth on the other hand promotion policy and inward

FDI to be subsisted for the sustained economic growth. Further the study concluded that liberalization of the foreign trade is an essential part of the growth of FDI in developing countries.

Lin (1995) estimated demand equation for imports of Taiwan amplified with inward FDI from four countries Malaysia, Indonesia, Thailand and Philippines for period from 1972 to 1992. The existing FDI revealed no effect on imports of Taiwan from the country of origin for the reason that the sign of the FDI variable input was rather positive but statistically insignificant. The exemption was the influence of FDI inflows on imports from Thailand. The significant negative sign was detected in this case, which reflect a level of transposition of imports by FDI. Shah et al. (2003) investigated the determining factor of FDI in Pakistan for the period 1960-2000. They used error correction model and co-integration to find the long-term and short execution determinants of FDI. GNP per capita, change in real GDP, the cost of capital of a foreign company, the actual expenditure on transport tariff rates, communication in the public sector and the model of democratic governments, all were considered to be important FDI determinants in the long term. Although they evidenced GNP per capita, dummy for the drastic increase in FDI flows and price in 1995-96 had substantial short-term influence. Saeed (2001) examined the relationship of FDI with economic growth and international trade, analyzed the annual data from 1984 to 1997 for Pakistan using two economic models. One model was based on simultaneous equation without considering long term validity of the estimates while the other was based on potentially co-integrated variables concerned with long run relationship and associated short term dynamics. He found no significant effect and long run sustainability of FDI on output level (GDP) on Pakistan economy.

Aqeel et al. (2004) acknowledged the usefulness of government policies to invite FDI between 1961 and 2003 using the error correction model and co-integration. They found that GDP, corporate taxes, average wage, credit to the private sector, tariffs, the average annual exchange rate and the price index and two dummy variables the most influential variables for FDI and recommended that policymakers must concentrate on these factors to attract FDI towards Pakistan. Ahmad et al. (2003) observed the effect of the openness of the economy of Pakistan considering trade and FDI associations for the period from 1972 to 2001. They argued that FDI is also an important indicator of the openness of economy besides increase in international trade (imports and exports). Their results indicated that there is a long-term relationship among FDI, exports and domestic production. Sahoo (2006) investigated that FDI in South Asia with GDP, domestic investment, and export. He applied general panel regression and carried Granger Causality analysis to find the relationship between FDI and GDP. The results indicated that FDI had positive effect on economic development of south Asian countries. The overall result revealed that FDI has positive impact on economic growth. However, FDI is more beneficial for export-led growth economies. Herzer et al. (2008) investigated the effect of FDI on economic growth for 28 developing countries by using co-integration and causality techniques. Their findings showed no long run relationship among FDI and GDP in 21 countries, while positive effect was found in only four countries.

Khan (2007) empirically investigated the relationship among FDI, economic growth and the domestic financial sector of Pakistan for the period 1972 to 2005 by using the bound testing method of co-integration. The results supported positive influence of FDI inflows on economic growth in the short term and long term in case where the domestic financial system had reached a specific least level of development. Yousaf et al. (2008) examined the effect of FDI on imports and exports for Pakistan since 1973 to 2004. Outcome of the error correction model showed that FDI had a positive influence on real imports and negative effect on the real short-term exports. The results of co-integration suggested that FDI had positive effect on real exports and real imports in longer term. Gudaro et al. (2010) analyzed the impact of FDI in Pakistan over the period 1981 to 2010. The paper evaluated the performance of GDP and historical trends in FDI and CPI using multiple regression models. With respect to the outcome of the study, the model suggested positive and significant relationship between GDP and FDI, whereas, in a negative and significant relationship among GDP and inflation. Iqbal et al. (2010) analyzed the causation among FDI, economic growth and trade in Pakistan for 1998-2009 quarterly data. By using VAR model and co-intergration analysis, the results showed that there was a long run co-integration exists between the observed variables. While from VECM bidirectional analysis, causality can be seen among FDI, export and economic growth which supported that FDI had encouraging effect on the trade development in Pakistan.

Rehman et al. (2010) evaluated the effect of FDI one real exchange rate of Pakistan for monthly figures of 1993-2009. By using co-integration technique they concluded that FDI appreciated real exchange rate equilibrium in Pakistan. Falki (2009) inspected the impact of FDI on economic growth in Pakistan (1990-2006) using production function on the basis of the theory of internal growth with supplementing variables such as trade, domestic capital, capital and human labor. Estimated outcomes showed positive and statistically significant relationship between GDP per capita and real FDI. Ahmadi and Ghanbarzadeh (2011) examined the Granger causality between GDP, exports and FDI in the Middle East and North Africa (MENA) countries for the period of 1970-2008 by designing three variable panel VAR model. Hausman test was used to estimate the model. Panel VAR techniques were used for testing Granger causality indicating that there was bidirectional causality among the three variables. Khan and Khan (2011) established an experimental relationship between

FDI and some specific output growth for Pakistan over the period 1981-2008, by applying the Granger causality and panel co-integration. The outcome approved that FDI has an encouraging impact on long-term production as well there exist long-term causality from GDP to FDI, whereas in short term, the indication of bi-directional causality between FDI and GDP can be seen. The most striking result is that at sector level FDI leads to progression in the primary commodities and services sectors, whereas production growth causes FDI in the manufacturing sector. Anwar and Nguyen (2011) applied gravity model to inspect the effect of FDI on exports, net exports and imports of Vietnam for panel dataset of its 19 main trading partners from 1990-2007. Complementary association amongst FDI and exports was revealed and also between FDI and imports, correspondingly in the post-Asian financial crisis period, a significant positive correlation occurs between net-exports and FDI.

Jawaid and Raza (2012) scrutinized the relationship between FDI and economic growth for 129 countries using annual data from 2003 to 2009. The results indicate significant relationship among FDI and economic growth in all countries with high, medium and low income. They found that relative to middle and high income countries FDI contributes more in low-income countries. Khan et al. (2012) examined the influence of FDI on economic growth in emerging countries, with specific reference to Pakistan (2001 to 2010). The study attempted to determine whether there has been economic development or deterioration in the midst of a downward trend in FDI, but the study suggests that there is a negligible effect on the economy, as it goes through a descending tendency in FDI. The outcome shows a frail positive relationship between FDI and economic growth. Khan et al. (2012) studied the effect of real exchange rate on GDP, inflation, trade and FDI in Pakistan for the period of 1980-2009. They used Johansen's co-integration and Granger causality to test the causal relationship among these variables. The outcome showed long run relationship and bi-directional causality amongst exchange rate and FDI. Saqib et al. (2013) tested the impact of FDI and on Pakistan economy the results of the study indicated that Pakistan's economic growth was adversely affected by foreign investment, whereas national investment had benefited the economy. Furthermore, inflation, debt and trade of the country showed negative impact on GDP.

4. Methodology

To develop a functional form for our study, we recall the objective of our study that we are interested in finding out the relationship between FDI, imports and exchange rate. Thus the specification of our model is as under:

$$FDI = F(M, ER) \quad (1)$$

Where M is imports and ER is exchange rate. The following model is constructed for econometric analysis:

$$FDI = \beta_0 + \beta_1 M + \beta_2 ER + \mu_t \quad (2)$$

Where β s are parameters of the model while μ_t is the random error. Before estimation of co-integration among variables, it is important to check the order of the integration of the variables. If all of the variables in the model are integrated of same order then we will apply the Johansen co-integration test to find the long run association among variables and will be estimating the VECM model to derive the short run parameters of the model. The expected VECM model for FDI will be of the following form.

$$\Delta \ln fdi_t = \alpha_0 + \alpha_1 \sum_{i=1}^n \Delta \ln fdi_{t-1} + \alpha_2 \sum_{i=1}^n \Delta \ln m_{t-1} + \alpha_3 \sum_{i=1}^n \Delta \ln exc_{t-1} + \phi ECT_{t-1} + \varepsilon_t \quad (3)$$

Where ε_t is a pure white noise error term and is stationary, ECT is the error correction term, ϕ is the coefficient measuring speed of adjustment, $\alpha_i (i=1,2,3)$ are the short run coefficients.

Annual data of the foreign direct investment, imports and exchange rate from 1980 to 2013 are extracted from International Financial Statistics (IFS) and State Bank of Pakistan different issue and expressed in logarithmic form for empirical analysis.

5. Results and Discussion

As all of the variables should be integrated of the same order, therefore, before applying the Johansen's co-integration test, first we will check the stationarity of the variables under study. For this purpose Augmented Dickey Fuller (ADF) test is applied on the data and the results are provided in Table 1. The results of the ADF showed that all of the variables in the model are stationary at first difference, now we are able to run Johansen's co-integration.

Table 1: ADF stationarity test at level and first difference

Variables	ADF statistics at level	Critical values (5%)	ADF statistics at first difference
Lnfdi	-1.373	-2.980	-5.353
Ln timer	-1.272	-3.572	-4.600
Lnexc	-1.359	-2.983	-4.749

The first step to estimate the VECM model is the lag selection and then run Johansen's co-integration. Thus, we applied different criteria, for optimal lag selection i.e. Likelihood Ratio test (LR), Final Prediction Error criteria (FPE), Akaike Information criterion (AIC) and Hannan-Quinn Information Criteria (HQIC). Most of the Criteria suggesting four lags so we select four lags for the estimation of proposed VECM model.

Table 2: Information criteria regarding selection of lag length

LAG	DF	LL	LR	P-VALUE	FPE	AIC	HQIC	SBIC
0	9	-58.279	-	-	0.0137	4.226	4.270	4.368
1	9	54.924	226.41	0.000	0.00001	-2.960	2.783	-2.395
2	9	76.008	42.168	0.000	4.7e-06	-3.794	3.484	-2.804
3	9	98.391	44.765	0.000	2.0e-06	-4.7167	4.274	-3.302*
4	9	109.86	22.929*	0.000	1.9e-06*	-4.887*	4.311	-3.048

As all of the variables in the model are integrated of order one, now we are able to apply the Johansen co-integration test to find the co-integration among variables under study. Table 3 offers the results of the Johansen co-integration. The results rejected the hypothesis of no co-integration. However both of the methods, trace statistics and maximum eigenvalue suggested the existence of two co-integrating equations. The next step is the estimation of the VECM model.

Table -3: Results of Johansen co-integration test

Maximum Rank	LL	Eigen Values	Trace Statistics	5% Critical Value	Max Statistic	5% Critical Value
0	73.519	-	72.672	29.68	45.214	20.97
1	96.127	0.789	27.457	15.41	26.365	14.07
2	109.309	0.597	1.092*	3.76	1.092*	3.76
3	109.855	0.037	-	-	-	-

Table 4 presents the results of VECM. The value of ECM is negative and significant at one and five percent respectively which shows the existing of long run relationship running from imports and exchange rate to FDI. The estimated values of ECM are negative and statistically significant showing the conversion for disequilibrium to equilibrium in next period.

Table -4: Fitted VECM (FDI as dependent variable)

Variable	Coefficients	Std. Error	P-Value
CE1(-1)	-0.58799	0.18497	0.001**
CE2(-1)	-0.41502	0.19236	0.031*
Δ lnfdi(-1)	-0.22916	0.19402	0.238
Δ lnfdi(-2)	0.06033	0.19082	0.752
Δ lnfdi(-3)	0.17174	0.15826	0.278
Δ lnm(-1)	1.27056	0.57900	0.028*
Δ lnm(-2)	2.97511	0.60914	0.000**
Δ lnm(-3)	1.10172	0.58282	0.059
Δ lnexc(-1)	-1.08593	1.13229	0.338
Δ lnexc(-2)	-2.21188	1.61411	0.171
Δ lnexc(-3)	0.850093	1.32441	0.521
Intercept	-0.00352	0.40258	0.993

Note: * denote significance at 5% and ** denote significance at 1%

Table -5: Normalized Beta Vector

Variables	Vector 1	Vector 2
Lnfdi	1.00000	Omitted
LnM	-2.78e-17	1.00000
Lnexc	-1.642626	-0.17873
Intercept	0.882160	-10.2109

Johansson's maximum likelihood estimation methods require some normalization restrictions; therefore we set the coefficients of the FDI and of the imports equal to unity in CE1 and in CE2, respectively. Thus, the first and second equilibrium relationships are:

$$ECT_1 \quad LFDI = -0.8822 + 2.78e-17LM + 1.6423LER \quad (4)$$

$$ECT_2 \quad LM = 0.1787LER + 10.21099 \quad (5)$$

According to ECT_1 in the long run there is positive relationship among the FDI and imports and FDI and real effective exchange rate and ECT_2 suggests that in the long run imports and exchange rate is also positively related. The short run relationships of FDI with imports are significant and non-significant with real effective exchange rate. The estimated VECM for FDI is given in equation 6.

$$\begin{aligned} \Delta LFDI_t = & -0.0035 - 0.2292\Delta LFDI_{t-1} + 0.0603\Delta LFDI_{t-2} + 0.1717\Delta LFDI_{t-3} + \\ & 1.2706\Delta LM_{t-1} + 2.9751\Delta LM_{t-2} + 1.1017\Delta LM_{t-3} - 1.0850\Delta LER_{t-1} - 2.2119\Delta LER_{t-2} + \\ & 0.850\Delta LER_{t-3} - 0.588ECT1_{t-1} - 0.415ECT2_{t-1} \end{aligned} \quad (6)$$

It is visible from equation 6 and table 4 that there exist positive and significant short run relationship among FDI and imports and its lags. However the relationship among FDI and real effective exchange rate is non-significant at 5% significance level.

By applying post estimation test and testing linear hypothesis, it has been observed with $\chi^2=87.42$ and p-value of 0.000 that there is highly significant short run relationship among the variables under investigation. The model qualify all of the standard diagnostic tests i.e. autocorrelation, normality and heteroskedasticity

Table-6: Diagnostic tests

Test	χ^2	P- Value
Lagrange-Multiplier test for Autocorrelation	8.2401	0.510
Jarque-Bera Test for Normality	0.259	0.879
White's test for heteroskedasticity	11.26	0.057

6. Conclusion and Policy recommendations

This paper has examined empirically the relationship between FDI and import in Pakistan using annual data for the period from 1980 to 2012. In this study, co-integration and error-correction techniques were used to find whether there was substitutability or complementarity between FDI and imports in Pakistan. Our results favors complementarity hypothesis as FDI causes rise in foreign imports. Further, we also conclude that FDI is not directed towards export oriented production activates or FDI is contributing meagerly to the exports of Pakistan. It is also discovered that most of the foreign capital comes to three sectors that is telecommunication, power and business and financial sector; unfortunately it cannot accommodate the surplus unskilled or semi-skilled labor of the country.

The result of this empirical study provides some policy recommendations. The Government needs to implement those FDI policies which stimulate exports but reduce the imports burden. In order to generate employment and to reduce the balance of payments problems, it is therefore, suggested that government should opt and encourage FDI policies relevant to export oriented industries like manufacturing and production sectors along with the exploration of natural resources. Policies should aim to encourage FDI in industries wherein the surge in import bill is compensated with better exports performance of the firms.

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