



Impact of Domestic Interest Rate on Foreign Direct Investment (A case study of Pakistan)

Rubab Khan

Department of Economics University of the Punjab, Lahore, Pakistan.

Hijaab Zahra

Department of Economics University of the Punjab, Lahore, Pakistan.

Abstract

This study analyzes the impact of domestic interest rate on FDI (in Pakistan). The present study is designed to estimate the impact of domestic interest rate, Gross domestic product per capita, merchandise exports and unemployment on foreign direct investment. For estimation purpose the study employs different econometric techniques i.e. Augmented Dickey Fuller test (ADF) and Autoregressive Distributed Lag Model (ARDL). Apart from these techniques different diagnostic tests have also been applied on the secondary data ranging from 1972-2013, collected from database of economic survey of Pakistan and World Bank. The results of the study reveal that domestic interest rate, Gross domestic product per capita and unemployment are positively and significantly related with foreign direct investment in Pakistan whereas the foreign direct investment and merchandise are significantly and negatively associated. The study concludes that in order to bag most from foreign direct investment government or policy makers should regulate interest rate at a level which is favorable to attract foreign investors and does not hurt domestic investors at the same time.

Key Words: FDI, Domestic Interest Rate, Merchandise Exports, Unemployment, Gross Domestic Product

JEL Codes: F30, G12, E24

I. Introduction

According to the detailed OECD (1996) benchmark definition “Foreign Direct Investment (FDI) is defined as an investment involving a long-term relationship and reflecting a lasting interest and control by a resident entity in one economy (foreign direct investor or parent enterprise) in an enterprise resident in an economy other than that of the foreign direct investor (FDI enterprise or affiliate enterprise or foreign affiliate)”. The recent trends of globalization are encouraging the developing countries to increasingly focus on how to attract more and more FDI. Number of countries like China, Korea, Malaysia, and Singapore has blossomed from investment abroad. Though this scene changed a bit during the financial crisis when in 2007 world FDI inflows deteriorated by 11.7% followed by a more sudden collapse of 3.2% in 2008 and 2009 subsequently. But in 2010 again FDI stabilized and reached the level of 4.9%. Despite the fact that FDI showed a dip between 2007 and 2009 it still is considered to be an important factor in enhancing economic growth (Al-Tarawneh, 2004). It is regarded to be the device that can trigger economic growth in developing countries. This is also the reason behind Economic theory prescribing Foreign Direct Investment (FDI) as a remedy for countries with low level of growth. FDI helps slow economies to break free from poverty trap as it enhances resource allocation, increases employment and promotes industrialization. Moreover, it polishes human capital, strengthens competition and encourages scale economies and imitation. Through FDI, countries also experience technological breakthrough which eventually strengthens domestic financial markets and lowers local capital costs. On top of all that FDI inflow galvanizes capital stock by augmenting domestic savings and eventually expanding efficiency of receiver country. (Gorg and Greenaway, 2004; De Mello, 1999; Botric and Skuflic, 2006).

Developing countries like Pakistan are in dire need of foreign investment for the stimulation of their economy. According to (Khan & Kim, 1999) Pakistan stands at 51st position out of 82 countries on the basis of 2007-2011 average FDI inflows of Pakistan contributed 0.19% to the world (Economist intelligence unit). Pakistan is world 7th most populated country with population of 140 million and has inept assets of natural recourses which render it to be the point of attraction for investors Froot & Stein (1991). Due to the above mentioned exceptional features of foreign direct investment FDI has been a hot topic of discussion for Economists and policy makers and they are keen to know the basic details of this variable and its working with other macro, micro economic social and political variables. This paper is also an attempt to explore this variable. This paper examines the effect of domestic interest rate, one of the major determinants of FDI, on foreign direct investment. Along with this the effect of FDI on three other variables namely gross domestic product per capita, unemployment and merchandise exports is also seen. According to (Anna, 2012; Chakrabarti, 2001; Singhania, 2011) FDI effects GDP in a positive way as FDI increases GDP increases. This increase in GDP consequently leads to increased investment opportunities which attract foreign investors.

FDI and international trade are like two sides of same coin as these two variables go side by side (Ruggiero 1996). FDI can bring about a breakthrough from exports of domestic sectors by the spill-over effects, (Harrison, 1993). This results in increased demand for domestic firms which helps in boosting exports. FDI may increase export based production that leads to betterment in export performance. Furthermore, export can enhance productivity that consequently attracts FDI. Customarily FDI is said to bear positive results for labor market of the host country as it helps in lowering unemployment. But the impact of FDI on employment can vary from one economy to other. The results may differ because of the type of investment pursued. If the FDI is of a green field one i.e. if parent company builds its operations in a foreign country from the ground up, then employment is positively related to FDI on the other hand, if investment is in shape of buyouts its effect is negative (Hisarcikilar et al, 2009, p. 9). According to a group of economists the rate of interest, social savings and investment are strongly associated. The interest rate does not only affect the investment activities and the current investment but also the future streams of investment. Real interest rate (Anna, 2012; Singhania, 2011) is return on investment; investor will channel their investments from low interest rates to higher interest rate, because it provides incentive to foreign investors looking for higher returns so higher interest rate brings more FDI.

II. Literature Review

A lot of work has been done to explore the FDI interest rate association along with the other macroeconomic variables such as employment level, gross domestic product and merchandise exports in different contexts and regions. An overview of some of these studies is given here: Interest rate is cost of borrowing and return on savings. Interest rate when adjusted for inflation acts as a super fine mean of measuring FDI inflows (Singhania, 2011). Investors when investing go for the production process with the lower cost and higher interest rate (for higher returns). That is why (Chakrabarti, 2001) found the relationship between interest rate and FDI positive in Indian

economy. Comparably (Lanyi and saracoglu, 1983) employed discount factor method under uncertainty to evaluate the relationship between interest rate and investment for 21 developing nations and found that investment and interest rate are positively related. But Contrary to these results (Greene & Villanueva, 1990) when examined determinants of FDI in 23 low developed countries (the study was based on the time period 1975-1987) noticed that the real interest effected private investment negatively. Another such study conducted by (Aysan and others ,2005) In which the data were taken from 1980s to 1990s for Middle Eastern and North African countries to find out the determinants of poor private investment growth in the respective area revealed that the real interest rate have a negative effect on a firm investment projects.

The reason behind this contrasting view as given by (Greene & Villanueva, 1990) is that a higher interest rate increases the real cost of capital which subsequently decreases the private investment level so investment responds positively to higher real interest rates in poorly developed financial markets mostly present in less developing countries. Moving to the relationship between FDI and GDP (Qaiser et al Aug 2011) ran regression on sample of seven nations to know the stream of FDI regarding the GDP level the results showed significant and positive relation between GDP and FDI. Analogously (Thirunavukkarasu et al 2013) studying FDI and economic growth association on Srilankan economy used regression analysis and co-integration test and concluded that in short run FDI and economic growth has low reliance on each other and also variance between variables is small but in the long run the relationship between FDI and GDP is positive. FDI can bring about Economic growth in many ways; numerous studies have presented how FDI can enhance economic growth of the host countries. Zhang (2001) stated that FDI can elevate economic growth of a country by technological breakthrough. Approving this point of view (Buckley et al., 2002) also maintained that FDI results in technological spillover and also boosts growth by increasing productivity of human capital through training of labor by foreign-national corporations.

Similar findings were given by Althukorala (2003) that FDI gives developing countries an opportunity to augment their existing levels of technology, capital and skills which eventually help in decreasing poverty and generating new jobs thus helping a country in fastening the pace of industrialization process. The degree to which FDI effects the growth however depends upon social and economic conditions prevailing in a country. These conditions include country's existing technology level, its savings rate and trade openness. For a country to benefit from FDI they must go through high technological progress, should have high rate of savings and their trade system should be open (Akinlo, 2004). As FDI is a source of capital, an elevated level of economic growth in the developing countries will encourage international investors to invest in their countries. Besides this FDI, through capital accretion in the host economies increases economic growth as it enhances the blend of foreign and new technologies. Adams (2009) gave the point of dependency theory to explain the effect of FDI on developing countries. The dependency theorists argue that the foreign investment can have unfavorable effect on income distribution and economic growth. On the other hand (Khan .A 2007) found that FDI inflows show positive dependence on the economic growth in case of Pakistan on a condition that the domestic financial system had gained a specific level of development. (Ahmadet alAhmed, M.H.,S.Alam 2003) also explored the relationship between FDI, exports and output their study covered the time period of 1972 to 2001 and was based on Pakistan solely their work concluded that FDI effects output significantly and positively. Contrary to this (Falaki, N 2009) found the relationship between GDP and FDI inflows to be negative and statistically insignificant.

As far as FDI and exports are concerned, FDI can affect export from the export supply side of the recipient country. FDI improves productivity of exports based goods that in return enhances export performance. It can also be said that export increase productivity and then high level of productivity helps in attracting more foreign investors. Exports increase growth by helping in mobilization of labor and capital piling (Hailu .A.Z 2010). Trade and productivity have a causal relationship and those promoting growth through export argue that exports increase productivity. Economists claim that firms if want to exist need to adopt modern and new technologies so they can compete with others in the market. They can learn from the process of learning by doing, and surpass opponent firms through trying and working hard in the field of production and sale of exporting goods. Moreover, the increased production due to exports decreases production cost and gifts a country foreign exchange, which is usually low in developing nations. Revenue generated can then help a country to import capital and intermediate goods.

FDI and international trade go side by side (Ruggiero 1996). FDI can bring about a breakthrough from exports of domestic sectors by the spill-over effects, (Harrison, 1993). This results in increased demand for domestic firms which helps in boosting exports. FDI may increase export based production that leads to betterment in export performance. Moreover export can enhance productivity that consequently attracts FDI. Moving to unemployment

(Rizvi and Nishat, 2009) found the effect of FDI on employment opportunities in three countries namely Pakistan, India and China. The study was based on time period 1985-2008. By applying various tests like for looking into long run relationship Pedroni (1999) test of panel Co-integration was employed and to study FDI effect on employment Seemingly Unrelated Regression (SUR) method was used. According to results of these tests FDI does not generate employment opportunities in India, China and Pakistan. Another similar study conducted by (Nayyira Zeb et al, 2014) utilized multiple regressions analysis to estimate the effect of some specific variables (FDI was one of the variable) on unemployment in Pakistan from 1995-2011. The results confirm that FDI play a significant role for the unemployment reduction in Pakistan. The results revealed that FDI has significant negative relationship with the unemployment. Which means If FDI goes up then unemployment goes down.

FDI affect on unemployment in developing countries was also investigated by (Aktar and Ozturk, 2009, pp. 203-211) he found the relationships among the variables namely FDI, exports, unemployment and gross domestic product in case of Turkey for the time period 2000-2007, employing VAR method he showed that in that time period FDI had no effect on reduction of the unemployment. Likewise (Hisarciklilar et al 2009) analyzed the effects of FDI on the employment generation for Turkey from between 2000 to 2007. A negative relationship between foreign investment and employment was found in this study too. They justified these results by stating that activities of foreign corporations were shifting from low-tech to medium-and high-tech industries in manufacturing (Hisarciklilar et al, 2009).

III. Economic Modeling

To analyze and predict, an economic model is constructed and economic model shows economic situation of different units under some assumptions and abstraction. This study investigates the impact of domestic interest rate on foreign direct investment in case of Pakistan. This study used the time series data within time period of 1972 to 2013. Data has been collected from the database of World Bank and economic surveys of Pakistan. The analysis of this study started from simple regression model with five variables from which four variables namely domestic interest rate, unemployment, merchandise exports and gross domestic product per capita are treated as regressors and foreign direct investment is treated as regressand. The functional form of the model is:

$$FDI_t = f(INT_t, UNEM_t, ME_t, GDPPC_t)$$

FDI= Foreign direct investment

INT= Domestic interest rate

UNEM= Unemployment

ME= Merchandise exports

GDPPC= Gross domestic product per capita

For finding the responsiveness of regressand to regressors, the equation can be written in the following form:

$$FDI_t = \beta_0 INT_t^{\beta_1} UNEM_t^{\beta_2} ME_t^{\beta_3} GDPPC_t^{\beta_4} \varepsilon_t^{\beta_5}$$

ε = represents for the base of log

Following the log linear form of the function the model becomes as:

To bring in line with the assumption of linear regression which states that the variables must be normally distributed the data is log transformed by taking log of all the variables in the data. Log linearization of the data also helps to decrease the chances of expected heteroscedasticity in the data and provides better estimation results. After converting data into log form the model of the study can be represented as:

$$LFDI_t = \beta_0 + \beta_1 LINT_t + \beta_2 LUNEM_t + \beta_3 LME_t + \beta_4 LGDPC_t + \varepsilon_t$$

In the above equation LFDI is the log of FDI, LUNEM is log of unemployment, LGDPPC is the log of gross domestic product per capita, LINT is log of interest rate and LME is log of merchandise exports.

IV. Econometric Methodology

The econometric tools are applied on macroeconomic model within quantitative economic analysis. As the time trend inclusion can make the time series data non-stationary and thus the regression may give spurious results and sometimes as Nelson and Plosser (1982) stated that time series data usually incurs unit root problem. Moreover, sometimes stationary time series can also face temporary shocks which vanish for the time being but in long run they move back to their mean values. To overcome such problems there are several tests that can be used to make the data stationary. This study uses Augmented Dickey Fuller unit root test to make the data stationary.

Dickey and Fuller (1981) propose the Augmented Dickey Fuller (ADF). The general form of ADF can be written as:

$$\Delta X_t = \delta X_{t-1} + \sum_{j=1}^q \phi_j \Delta X_{t-j} + \varepsilon_{1t}$$

$$\Delta X_t = \alpha + \delta X_{t-1} + \sum_{j=1}^q \phi_j \Delta X_{t-j} + \varepsilon_{2t}$$

$$\Delta X_t = \alpha + \beta t + \delta X_{t-1} + \sum_{j=1}^q \phi_j \Delta X_{t-j} + \varepsilon_{3t}$$

Xt is time series for testing unit roots, t is the time trend and et is the error term having white noise properties. If j=0, it represent the simple Dickey Fuller test. The lagged of regressand in the Augmented Dickey Fuller regression equation are included until the error term becomes white noise. For examining the serial correlation of error terms LM test is used. The null and alternative hypotheses of ADF unit roots are:

H0: $\delta = 0$ non-stationary time series; so there unit root problem exist.

H1: $\delta < 0$ stationary time series.

By Applying OLS and computing τ statistic of the estimated coefficient of X_{t-1} and comparing it with the Dickey Fuller (1979) critical τ values, if the calculated value of τ statistic is greater than the critical value then reject the H0. In this case the time series data is stationary. On the other hand, if we fail to reject H0, the series is non-stationary. Thus by applying this method on all the variables, we can easily find their respective orders of integration.

Autoregressive Distributive Lag Bound testing approach presented by Pesaran and shin (1997). This approach has many advantages and it is a better method of Cointegration than the traditional method. Due to the following reasons ARDL is regarded as a better method.

- a) ARDL gives ingenious and accurate comprehensive information regarding the structural break of data.
- b) ARDL can be applied no matter what the order of integration.
- c) ARDL bound testing approach can be employed even the sample size is small.
- d) In order to detain the data generating process in a general to specific modeling framework ARDL permit to take the adequate number of lag.

This method is based on unrestricted vector error correction model (UVECM) is superior to traditional method as it has better short run and long run equilibrium properties. After taking lag in ARDL process one can proceed to identification and estimation by using OLS test. Eventually inferences can be making through this long run coalition.

$$\Delta \ln Y_t = \beta_1 + \beta_2 t + \beta_3 \ln Y_{t-1} + \beta_4 \ln X_{t-1} + \beta_5 \ln Z_{t-1} + \dots + \sum_{h=1}^p \beta_h \Delta \ln Y_{t-h} + \sum_{j=0}^p \gamma_j \Delta \ln X_{t-j} + \sum_{k=0}^p \phi_k \Delta \ln Z_{t-k} + \dots + \mu_{it}$$

First of all by application of Bound test using Wald test the study will find the direction of relationship among the variables in case of Pakistan.

H0: $\beta_2 = \beta_3 = \beta_4 = 0 \rightarrow$ (Co integration does not exist among the variables)

H1: $\beta_2 \neq 0, \beta_3 \neq 0, \beta_4 \neq 0 \rightarrow$ (Co integration does exist among variables)

After the confirmation of long run Co integration among the variables. The study uses the VECM for finding short run relationship. The VECM can be defined as:

$$\Delta \ln Y_t = \beta_1 + \beta_2 t + \beta_3 \ln Y_{t-1} + \beta_4 \ln X_{t-1} + \beta_5 \ln Z_{t-1} + \sum_{h=1}^p \beta_h \Delta \ln Y_{t-h} + \sum_{j=0}^p \gamma_j \Delta \ln X_{t-j} + \sum_{k=0}^p \phi_k \Delta \ln Z_{t-k} + \omega ECM_{t-1} + \mu_{it}$$

V. Empirical Results and Discussion

According to the timely properties of data the descriptive statistics are given below in Table 1. The estimated result shows that Foreign Direct Investment (FDI), Gross Domestic Product per capita (GDPPC), Merchandise Export (ME) and Unemployment are negatively skewed whereas domestic Interest rate is positively skewed. According to the results all the variables display positive kurtosis. The estimated Skewness and Kurtosis are insignificant so we

reject null hypothesis that there is no normality. The value of Jarque-Bera reveals that variables of the model have zero mean value and finite covariance which supports the idea that this data set has normal distribution.

TABLE 1
Descriptive Statistics

	LFDI	LINT	LGDPCC	LM_EXPORT	LUNEM
Mean	19.37465	2.382897	10.55949	22.48169	0.942828
Median	19.63405	2.302585	10.62236	22.70684	1.654411
Maximum	22.44425	2.995732	10.93459	23.99984	2.112635
Minimum	15.20180	1.791759	10.06093	20.33640	-1.078810
Std. Dev.	1.779776	0.252259	0.261910	1.000217	1.072381
Skewness	-0.337347	0.425581	-0.344310	-0.326738	-0.513315
Kurtosis	2.509883	3.173935	2.009602	2.170159	1.663720
Jarque-Bera	1.188022	1.289328	2.485771	1.905933	4.851007
Probability	0.552108	0.524839	0.288550	0.385595	0.088434
Sum	794.3605	97.69879	432.9393	921.7494	38.65594
Sum Sq. Dev.	126.7041	2.545385	2.743881	40.01738	46.00003
Observations	41	41	41	41	41

Table 2 shows the correlation matrix of variables, the results show that Foreign Direct Investment has positive and significant correlation with interest rate, Gross domestic product per capita, merchandise exports and unemployment. Also interest rate has positive and significant correlation with Gross domestic product per capita, merchandise exports and unemployment. The results reveal that Gross domestic product per capita has positive and significant correlation with merchandise exports and unemployment. Merchandise exports also show positive and significant correlation with unemployment. The overall estimated result shows that all the variables in the model have positive and significant correlation when foreign direct investment is dependent variable. Thus the results of the correlation reveal that the problem of multicollinearity does not exist among the regressors.

TABLE 2 Pair wise Correlation

Correlation t-Statistic Probability	LFDI	LINT	LGDPCC	LM_EXPORT	LUNEM
LFDI	1.000000				
LINT	0.472983 3.352487 0.0018	1.000000 ----- -----			
LGDPCC	0.953604 19.78077 0.0000	0.440543 3.064601 0.0039	1.000000 ----- -----		
LM_EXPORT	0.945697 18.16914 0.0000	0.448299 3.131981 0.0033	0.991918 48.82119 0.0000	1.000000 ----- -----	
LUNEM	0.877568 11.43057 0.0000	0.392780 2.667274 0.0111	0.908906 13.61177 0.0000	0.909867 13.69515 0.0000	1.000000 ----- -----

The table given below displays the results of Unit Root Test of Foreign direct investment. The results of Augmented Dickey Fuller Test shows that domestic interest rate is stationary at level while Gross domestic product per capita,

unemployment, foreign direct investment and merchandise exports are non-stationary at level ,but at 1st difference these all variables are stationary. Therefore there is mixed order of integration which supports application of Auto-regressive Distributive lag (ARDL) Co integration Approach.

TABLE 3

Augmented Dickey-Fuller Unit root test		
At level		
Variables	T-Statistic	Prob.
LGDP	-1.195204	0.6672
LINT	-2.903294	0.0541
LUNEM	-1.738472	0.4048
LFDI	-2.445196	0.1365
LMEXPORT	-1.792830	0.3789
At first difference		
LGDP	-4.913764	0.0003
LINT	-5.343360	0.0001
LUNEM	-3.973818	0.0038
LFDI	-7.596520	0.0000
LMEXPORT	-6.825677	0.0000

ARDL bounds testing approach is applied below for investigating the Co integration among foreign direct investment, domestic interest rate, unemployment, merchandise exports and gross domestic product per capita. The results of ARDL Bounds testing approach are shown in given table. As shown, the calculated F-Statistics (6.666192) is greater than the upper bound (5.06). Therefore, the Null hypothesis that there is no Cointegration is rejected which tells that there is Cointegration among the variables in the model. Thus it is confirmed by the F-Statistics that Cointegration does exist among the variables of the model. After this confirmation the long run relationship among the foreign direct investment domestic interest rate, unemployment, merchandise exports and gross domestic product per capita can be examined.

TABLE 4

ARDL Bound Testing Approach		
Dependent Variable LFDI		
ARDL (1,2,0,2,2,0)		
Critical values	F-Statistics 6.666192	
	Lower Bound	Upper bound
90%	2.45	3.52
99%	3.74	5.06

The table given below displays the results of long run estimation of coefficients using ARDL Approach.

TABLE 5

Estimated Long Run Coefficient using the ADRL Approach			
ARDL (1,2,0,2,2,0) Dependent variable is LFDI			
Time Period 1972-2013			
Regressor	Coefficients	Standard-Error	T-Ratio (Prob)
LINT	0.849980	0.443842	1.915053(0.0654)
LGDP	13.977965	4.32362	3.233198(0.0030)
LUNEM	0.407514	0.238197	1.710825(0.0978)
LMEXPORT	-2.521001	1.222396	-2.062344(0.0482)
C	-74.453036	19.952594	-3.731497(0.0008)

The coefficient of interest rate shows positive and significant relationship with foreign direct investment. This shows that a percent increase in interest rate increases foreign direct investment by 0.849980 percent and this relationship is significant at 5 percent. There is also a positive and significant relationship between gross domestic product per

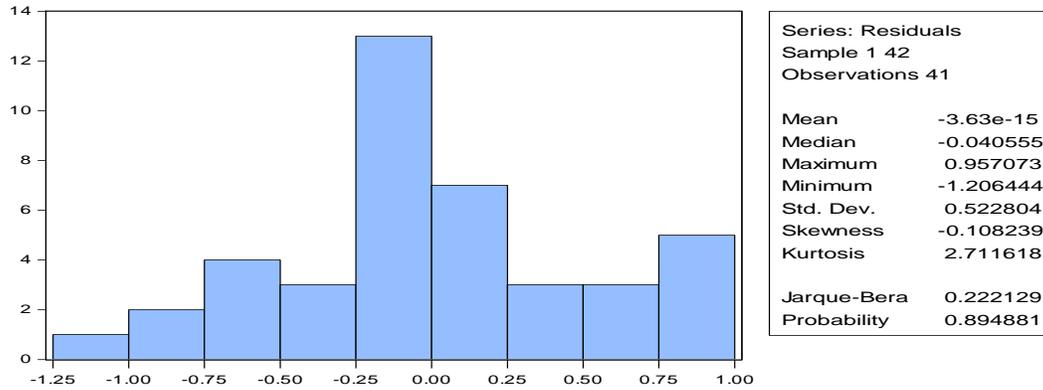
capita and foreign direct investment. According to the results if gross domestic product per capita goes up by 1 percent then the foreign direct investment goes up by 13.98 percent and this relationship stands significant at 1 percent. Moving on to unemployment its coefficients shows that there is positive and significant relationship between unemployment and foreign direct investment in the long run in case of Pakistan. The results reveal that if unemployment goes up by 1 percent foreign direct investment goes up by 0.41 percent and this relationship is significant at 10 percent. There is negative and significant relationship between merchandise exports and foreign direct investment. The result shows that if exports increase by 1 percent then foreign direct investment decreases by 2.52 percent.

The given table presents the results of short run dynamics. By using vector error correction model it investigated the short run dynamics among foreign direct investment, gross domestic product per capita, unemployment, merchandise exports and domestic interest rate in case of Pakistan. The estimates show that domestic interest rate has positive and significant impact on foreign direct investment as it showed in long run. In short run merchandise exports has positive and significant relationship with foreign direct investment. The estimated results reveal that there is negative and insignificant relationship between unemployment and foreign direct investment which differs from its positive and significant values in long run. The results exhibit that gross domestic product per capita has positive and significant relation with foreign direct investment which was also in the case of long run. The short run dynamics convey that domestic interest rate has positive relationship with foreign direct investment. On the basis of this it concludes that domestic interest rate is an effective variable in the determination of foreign direct investment, higher the domestic interest rate higher the FDI. The significant and negative coefficient (-0.691214) of ECM is theoretically correct. The value of ECM shows the speed of adjustment from short run to long run equilibrium. The results of ECM show that short run requires one year and five month for converging in the long run.

TABLE 6

Vector Error-Correction Model (VECM)			
ADRL (1,2,0,2,2,0)			
Dependent variable is LFDI			
Time Period 1972-2013			
Regressor	Coefficients	Standard-Error	T-Ratio (Prob)
D(LINT)	0.587518	0.333044	1.764087(0.083)
D(LM_EXPORT)	0.117783	0.638203	0.184554(0.8549)
D(LM_EXPORT(-1))	0.659072	0.737263	0.893945(0.3787)
D(LM_EXPORT(-2))	1.359055	0.548814	2.476350(0.0194)
D(LUNEM)	-0.309240	0.350346	-0.882671(0.3847)
D(LGDPC)	9.661769	2.804626	3.444940(0.0018)
ECM(-1)	-0.691214	0.138624	-4.986261(0.0000)
R-squared	0.952718	Mean dependent var	19.55154
Adjusted R-squared	0.938044	S.D. dependent var	1.627401
S.E. of regression	0.405075	Akaike info criterion	1.247063
Sum squared resid	4.758476	Schwarz criterion	1.673618
Log likelihood	-14.31774	Hannan-Quinn criter.	1.400107
F-statistic	64.92688	Durbin-Watson stat	1.956615
Prob(F-statistic)	0.000000		

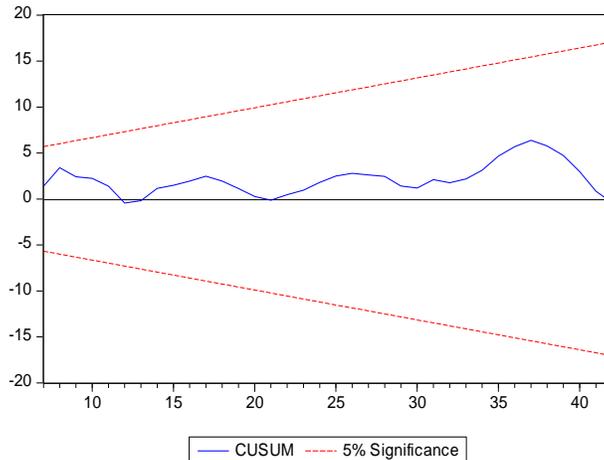
The evaluated results of diagnostic tests are shown in Table below. The estimated results of Lagrange multiplier test of residual serial correlation show that there is no serial correlation among the variables of the model. Skewness and Kurtosis based normality describes that the time series data of all variables is normally distributed. The results show that there is no problem of heteroscedasticity.



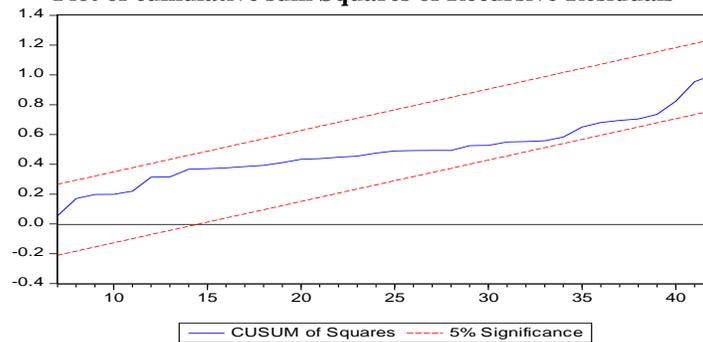
Breusch-Godfrey Serial correlation:

F statistics	1.565202	Prob F(2,34)	0.2237
Obs R squared	3.456644	Prob Chi Square (2)	0.1776
Heteroskedasticity:			
F-statistics	2.58724	Prob F(1,37)	0.11162
Obs R-squared	2.549398	Prob Chi-Square (1)	0.1103

Plot of cumulative sum of Recursive Residuals



Plot of cumulative sum Squares of Recursive Residuals



The stability of the model provides information about the estimated model of foreign direct investment has changed or not over time. The estimates of Cumulative Sum and the Cumulative Sum of Squares tests are given below (refer to figures). These graphs show that Cumulative Sum and the Cumulative Sum of Squares lie between two critical lines which reveal that the estimated model is stable. The straight line in the figures shows that critical bound significant at five percent.

VI. Conclusions

This paper investigates the impact of domestic interest rate on Foreign Direct Investment in case of Pakistan. This study uses the data from the period 1972 to 2013. The data is collected from the database of World Bank and economic survey of Pakistan and then employs different econometric methods to analyze the selected data. Firstly, it uses the Augmented Dickey Fuller test to make data stationary. After that ARDL Co-integration approach has been applied to check the long run and short run dynamics. Then to make sure that that data is normally distributed and is free from the problem of serial correlation and heteroscedasticity it utilizes different Diagnostic tests. The estimates of Lagrange multiplier test of residual of serial correlation reveal that serial correlation does not exist among the variables. Normality based on Skewness and Kurtosis explores that the time series data of all the variables has normal distribution. Moreover, the estimates display no problem of heteroscedasticity. The estimates of ARDL bound testing approach reveal that Co-integration exists among the variables and explain that there is positive and significant relationship between foreign direct investment and domestic interest rate in case of Pakistan. The results show that there is positive and significant relationship between gross domestic product per capita and foreign direct investment. This study found that foreign direct investment and unemployment are positively and significantly related in Pakistan in extended duration of time. The results also reveal that there is negative and significant relationship between merchandise exports and foreign direct investment in Pakistan. The value of ECM (co-integrating vector) reveals that there is convergence from short run to long run as the value of ECM is negative and highly significant and is also less than one. This means that it will take one year and five months for short run to converge into long run. The estimates of ARDL Co-integration show that there is positive and significant relationship between foreign direct investment and domestic interest rate in case of Pakistan. These estimates confirm that if interest rate is high in host country then Foreign direct investment will also increase in host country this is the phenomena found in Pakistan. The study concludes that in order to secure maximum gains from foreign direct investment government or policy makers should direct interest rate at a level favorable to attract foreign investors and not to hurt domestic investors at same time. Such trade liberalization policies that are beneficial for domestic producers and consumers and are also effective in attracting FDI should be pursued. By formulating such policies attention of foreign investors can be captivated and the benefits of FDI like higher GDP, increased productivity and technological advancement can be enjoyed by a nation. In all FDI can help developing nations like Pakistan to break free from poverty trap and galvanize the process of industrialization.

References

- Adams, S. (2009). *Foreign Direct investment, domestic investment, and economic growth in Sub-Saharan Africa*.
- Ahmad, M. H. Alam, S. (2003). *Foreign Direct Investment, Exports and Domestic Output in Pakistan with Comments*. *The Pakistan Development Review*, 42(4), 715-723.
- Akinlo, A. E. (2004). *Foreign direct investment and growth in Nigeria: An empirical investigation*. *Journal of Policy Modeling*, 26(5), 627-639.
- Aktar, I. and L. Ozturk, (2009). Can Unemployment be Cured by Economic Growth Can and Foreign Direct Investment in TURKEY? *International Research Journal of Finance and Economics*
- Al-Tarawneh, S. (2004). The Policy of Pricing of Lending Interest Rate by Commercial Banks in Jordan: An Econometrical Study. Al-Manarah, Al al-Bayt University, Jordan, 10(2). University of Nottingham, 10 May 2010)
- Athukorala, P. P. A. (2003). *The impact of foreign direct investment for economic growth: a case study in Sri Lanka*. In 9th International Conference on Sri Lanka Studies, Full Paper (No. 092).
- Aysan, A., Gaobo, P. and Marie-Ange Veganzones-Varoudakis (2005). *How to Boost Private Investment in the MENA Countries: The Role of Economic Reforms*”, *Topics in Middle Eastern and North African Economics, MEEA, Journal*, (VII), 1-15.
- Beccarini A. (2007). *Investment Sensitivity to Interest Rates in an Uncertain Context: is a Positive Relationship Possible?* *Economic Change and Restructuring*, 40, 223-234.
- Botric, V. and L. Skufflic (2006). Main Determinants of Foreign Direct Investment in the Southeast European Countries. *Transition Studies Review*, 13(2), 359-77.

- Buckley, P. J., Clegg, J., Wang, C., & Cross, A. R. (2002). FDI, regional differences and economic growth: panel data evidence from China. *Transnational Corporations*, 11(1), 1–28.
- Chakrabarti, A. (2001). The determinants of foreign direct investments: Sensitivity analyses of cross- country regressions. *Kyklos*, 54(1), 89-114.
- Chingarande, Anna, Roseline T. Karambakuwa, Denhere Webster, Felix Tafirei, Zivanai Onias, Lovemore Muchingami, and Victoria Mudavanhu, (2012). The impact of interest rates on foreign direct investment: A case study of the Zimbabwean economy (February 2009-June 2011).
- De Mello, J. L. R. (1999). Foreign Direct Investment-led Growth: Evidence from Time Series and Panel Data”, *Oxford Economic Papers*, 51(1), 133-51.
- Falki, N., (2009). *Impact of Foreign Direct Investment on Economic Growth in Pakistan*. *International Review of Business Research Papers*, 5(5), 110-120.
- Froot, K. A. and Jeremy C. Stein, (1991). Exchange rates and foreign direct investment: An imperfect capital markets approach. *The Quarterly Journal of Economics*, 196(4), 1191-1218.
- Gorg, H. and D. Greenaway (2004). Much Ado about Nothing? Do Domestic Firms Really Benefit from Foreign Direct Investment? *World Bank Economic Observer*, 19(2), 171-97.
- Greene, J. and Villanueva, D. (1990). *Determinants of Private Investment in LDCs*, *Finance and Development*, December.
- Haddad, M., & Harrison, A. (1993). Are there positive spillovers from direct foreign investment? *Journal of Development Economics*, 42(1), 51-74.
- Hisarciklilar M. and D. Gültekin-Karakaş, A. Aşici, (2009). Can FDI Be a Panacea For *Impact of Foreign Direct Investment on Trade of African Countries* Zenegnaw Abiy Hailu *Journal of Policy Modeling*, 31(6), 939–949.
- Khan, A. H. and Yun-Hwan Kim (1999). Foreign direct investment in Pakistan: Policy issues and operational implications. Asian Development Bank, EDRC Report Series No. 66.
- Lanyi, A. and Saracoglu, R. (1983) *Interest Rate Policies in Developing Countries*. Occasional Paper 22, Washington DC, International Monetary Fund.
- Nayyira Zeb, Fu Qiang, and Muhammad Suhail Sharif, *Int.J.Eco. Res.*, (2014). v5i2, 10-17 ISSN: 2229-6158
- OECD, Detailed Benchmark Definition of Foreign Direct Investment, third edition (OECD, 1996), and International Monetary Fund, Balance of Payments Manual, fifth edition (IMF,1993).
- Qaiser, A. A.Salman, N.S Ali, AU. Hafiz, N. A. Muhammad 2011). *Impact of foreign Direct Investment on Gross Domestic Product* . Vol. 11, Issue8, Version 1.0. Lahore, Pakistan.
- Rizvi, S. Z. A. and Nishat, M., (2009). *The Impact of Foreign Direct Investment on Employment Opportunities: Panel Data Analysis*.
- Ruggiero, R. (1996). Foreign Direct Investment and the Multinational Trade System. *Transnational Corporation* 5, 1-18.
- Singhania, Monica, and Akshay Gupta. (2011). Determinants of foreign direct investment in India. *Journal of International Trade Law and Policy* 10(1), 64-82.
- Thirunavukkarasu, V. A. Sivapalan and K. Rajendra (2013). *Foreign Direct Investment and Economic Growth*. Vol. 9, NO. 1; 2014. Sir Lanka.
- Zhang, K. H. (2001). *Does foreign direct investment promote economic growth?* Evidence from East Asia and Latin America. *Contemporary Economic Policy*, 19(2), 175–185.
- Zhao, C., & Du, J. (2007). *Causality between FDI and economic growth in China*. *Chinese Economy*, 40(6), 68–78.