Foreign Direct Investment and Export Performance of Pakistan: The Cointegration and Causality approach

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ABSTRACT

Purpose: FDI is a bridge between the world markets and local market and works asa way to increase the capabilities of the host country through investmentsthat help in transfer of technology and creation of employment opportunities. The aim of this paper was to investigate the nexus of Foreign Direct Investment and the Export performance in the economic settings of Pakistan along in the presence of explanatory variables, based on well-established economic theory and long standing relationships.

Methodology/Sampling: Supplementing the variables into a linear regression model, tested under the OLS and checked for the assumptions of normally and identically distributed errors.

Findings: It was found that exports are positively affected by FDI and CPI whereas negatively affected by the interest rates in the case of Pakistan. Furthermore the long run relationship between the variables has been tested under the Johensen Cointegration test, which suggests that a long run relationship exist between the variables. Finally the direction of causality has been investigated with the help of Granger Causality test, indicating bidirectional causality between CPI and interest rate, exports and interest rate, unidirectional causality from exports to CPI, CPI to GDP growth rate, interest rate to GDP growth rate, exports to FDI and exports to GDP growth rate.

Practical Implications: This study is helpful both for policy makers and practitioners to understand the dynamics and intertemporal linkages underlying the FDI and Exports Nexus; hence will help in formulating strategies to further enhance the export performance of the country.

Keywords : FDI, Exports, Causality, Cointegration, Pakistan.

Jel Classification: F23, M13

1. Introduction

FDI is a bridge between the world markets and local market and works as away to increase the capabilities of the host country through investments thathelp in transfer of technology and creation of employment opportunities. The role of FDI in today's global environment cannot be neglected as FDI is also beneficial for economic growth, building foreign reserves and helping local producers to enhance their capabilities that ultimately leadthem to explore export opportunities and establish trade linkages with the world. In this paper the role of FDI is investigated in enhancing the exports of Pakistan.

Pakistan being a developing country needs and is catering for both a strong and continuous flow of inward FDI and vigorous exports for sustainable development and economic growth. This study will shed light that what effect FDI has on Pakistan's exports in recent years as recently a slight decline has been witnessed in the FDI to Pakistan that might have affected the exports performance of the country in particular. Most of the literature on the nexus of FDI and exports mainly covers the macroeconomic domains like international trade, international funds flows and firm level studies like Kojima (1973), Abdel-Malek (1974), Aggarwal (2002), Rasiah (2003), Mai (2001) among others. Regarding Pakistan, many researchers have tried to investigate the said nexus, however in the most recent of the scenarios; there is a strong need to re-investigate the said nexus as to find out the reasons and the effects of the declining FDI lately. Hence this study is designed to bridge that gap.

Furthermore Most of the previous studies on the subject matter are mainly cross country studiesandvery little evidence is available on the causality between the variables for individual countries. This study has the potential to bridge this gap in the literature by assessing the cointegration and the causality between the determinants under study.

2. Literature review

Both the theoretical and empirical literature suggests that there is a strong and positive link between FDI and exports like Kuntluru, Mupaniand Khan, (2012) among others, however some studies are of the opinion that FDI poses relatively less effects on the exports (Buckley et al. 2007). However in any way for a developing country like Pakistan FDI is a major external funding source that is viewed as necessary to fill resource gap for and meet obligations for sustainable growth (Yousaf, Zakir and Ahmad, 2008). The study further investigated while evaluating the economic effects of FDI on the imports and exports for Pakistan that FDI comprised for almost 69 percent of the foreign investment in Pakistan during the year 2007 and played most important role in economic growth, human resource development, and capital formation, organizational and managerial skills of the people in the country. The study concluded that FDI has positive long run effects on the exports of Pakistan, while inthe short run the same was found to be negative.

Similarly Sarumi (2006), studying the impact of FDI on economic development of

Africa found that in some African economies FDI shows negative but insignificant effects while in others it wielded positive and significant effects.

On the industry level and firm level, Haq (2013) studied the effects of FDI on the export performance of the Textile sector of Pakistan that is a major player in the exports of the country. Haq argues that there is a positive impact of FDI on the exports in terms of exchange of modern technology, new innovative skills and market links. Similarly Akmal and Saleem (2012), comparatively studies the effects of FDI on the exports of the Textile sectors of India and Pakistan over the period 2001-2007. The study further took into account the role of exports from the textile sector in the economic development of both countries and found that India relatively achieved its targets as compared to Pakistan.

Furthermore Khan and Shujjat (2011),studies the demand and supply for Pakistani exports for the period of 1990-2010, using two stage least square, they conclude that the demand for Pakistani exports decreased due to the increase in the real effective exchange rate. But at the same time they found positive and significant effect on the gross capital formation. Similarly Le and Ataullah (2006) found that FDI to Pakistan is decreasing whereas foreign aid is increasing and that the effects of FDI are becoming insignificant in Pakistan due to inappropriate interaction with the international firms. They further suggest that the government needs to promote new technical skills among the industrial sector to fill this gap. Another voice comes from Khan and Kim (1999) that for the instant economic boost, Pakistan needs to organize more foreign resources asin the past the impact of FDI was not enough in Pakistan. The main reason for this is the energy and power sector that caused increase in per unit cost and lowered the government's revenue.

For the developed economies, Katerina, Papanastasiou and Athanasios, (2004) studies that where does FDI impact the most in the case of developed and transition countries? They argue that FDI can play beneficial role for economic growth when the host country designs framework, and policies to attract foreign investors and take advantage of globalization through transfer of technology and trainings. On the contrary if any host country think that FDI can damage local sector they make defensive step to prevent such effect. They further conclude that there is no significant relation between FDI and economic growth in the case of developed countries. Similarly Alfaro (2003) argues that Foreign Direct Investment has naturally many advantages for the host country for the primary, manufacturing and service sectors. They found negative effect on the growth but in manufacturing the impact is positive an on the service sector the effect is unclear.

Raza, et al (2012), argues that FDI is only the basic tool to the economic growth during the past two decades. This study shows significant relationship of Pakistan's inwards cash flow and the economic growth. The government should keep a track for the improvement of cash inflows to sustain growth. They further argue that Pakistan still not getting fullbenefits of FDI but during the past decade it is helpful for the economic

development as we adopted international market trading policies. The data is taken from the year 1970 to 2001 and its supporting the "BHAGWATI" hypothesis. However FDI is the essential tool to the economic development as because of it the country's human capital is utilized.

Ayaz,Yousuf and Asghar(2013) studies that in developing countries Foreign Direct investment isa large share of inflow of capital, in this paper through different technique and methods try to study the relationship of FDI with other variable like GDP, related price and export in long run / short run for Pakistan. They suggest that the government should take solid measures to encourage overseas investors to push export sector directly through Textile sector or indirectly through power sector. In conclusion the show the relationship between FDI and export in long/short run during 1970 till 2011 that some other factors also affect FDI inflow into the country like law and order situation. FurthermoreFDI can accelerate the economy by investment in manufacturing sector and can increase export and economic stability, it also generate foreign reserve / foreign exchange and on the other hand results in increase in exports.

As an aggregate study on the South Asian economies, Sahoo(2006) suggest the South Asia is one of the fastest growing regions in the world, and Pakistanshows promising growth in macroeconomic indicators both domestic and international. They further suggest that all South Asian countries India, Pakistan, Bangladesh, Sri Lanka and Nepal target to compete in the same market with the rest of the world and needs reforms and better policies to attract more foreign investments to fill the gap between investment and savings. Furthermore Sahoocharacterize the whole region to be one of the fastest growing and a playground for foreign investors. However on the contrary lack or infrastructure facilities and governance is a major hindrance in this regard

On a novel tone, Amna and Babar (2011), discussesthe darker and brighter sides FDI in relation to the economic performance of a country. The study try to explain the relationship of FDI with GDP, Export performance, domestic output, employment and overall growth and finds positive relationship between the variables. However they find negative relationship with that of imports. The question is why negative impact on import?The answer is that those goods were imported in country before and now due to FDI the local producersare now able to produce the same goods within the country and save foreign exchange.It was also found that FDI positively impact employment or per capita income that shows rise in living standard. Policies to attract overseas investor in host country should be revised and give free market to transfer technologies to local producer and train as per modern requirement of world market. Many similar and recent studies who took care of the subject matter include Abbas and Raza (2013), Saqib, Masnoon and Rafique (2013), Atique, Ahmad and Azhar (2004) andBedi, and Cieslik(2000)among others.

3. Research Methods

3.1 Data and specifications

The data used in this study is annual time series for the period of 1973-2008, gathered from the State Bank of Pakistan's Handbook on Statistics 2010. The following variables are supplemented into the model that are based on long standing relationships and underlying economic theory. All the data series are in natural logarithmic form.

FDI =   Foreign Direct Investments
EXP =   Exports
GDPGR =   Real GDP growth rate
CPI =   Consumer Price Index
INT =   Interest Rate/Discount Rate

As for as the testing methodology is concerned, first the unit root test has been applied and then the variables are then supplemented into the following regression model and tested under OLS;

$$\ln Exp = \beta_0 + \beta_1 \ln FDI + \beta_2 \ln GDPGR + \beta_4 \ln CPI + \beta_5 \ln INT + \varepsilon_t \qquad \dots (1)$$

After establishing the slope coefficients for the parameters in our model, Johansen Cointegrationtest has been applied to assess the long run equilibrium relationship between the variables in the model. And finally the direction of causality has been established with the help of Granger Causality Test.

4. Empirical Results

As a stylized fact while dealing with time series data we need to consider to investigate for the unit root test firsthand. For that purpose the ADF or the Augmented Dickey Fuller and PP or Phillips Perron tests have been applied to find the unit root in the series with the results presented in table 2, suggest that over all the process is stationary both at level and at 1st differences, which means that a linear regression model like OLS could be suitably adopted.

Group Unit Root Test Summary		
Series: Exp, FDI, GDPGR, CPI, INT		
	At Level	**1st Difference**
ADF - Fisher Chi-square	28.6079 (0.0014)	86.1433 (0.0000)
PP - Fisher Chi-square	16.3899 (0.0890)	142.615 (0.0000)

Table 2: Group Unit Root Test.

	CPI	INT	EXP	FDI	GDPGR
Mean	150.2806	11.25714	7556.346	867.2286	5.174286
Median	141.8700	10.00000	6819.300	322.5000	4.800000
Maximum	233.2400	20.00000	19290.00	5410.200	9.000000
Minimum	100.0000	7.500000	1136.700	10.70000	1.700000
Std. Dev.	38.16146	3.025313	5414.096	1413.258	1.971166
Skewness	0.663830	1.315997	0.805979	2.197359	0.043812
Kurtosis	2.283278	3.950391	2.623424	6.712411	2.109097
Jarque-Bera	3.319706	11.41967	3.995677	48.29683	1.168688
Probability	0.190167	0.003313	0.135628	0.000000	0.557471
Sum	5259.820	394.0000	264479.1	30353.00	181.1000
Sum Sq. Dev.	49514.10	311.1857	9.97E−08	67908173	132.1069
Observations	35	35	35	35	35

Table 3: Descriptive Statistics

Dependent Variable − lnExports			
Variable	**Coefficient**	**t-Statistic**	**Prob.**
C	4.784793	6.224015	0.0000
ln FDI	0.477562	20.68025	0.0000
ln CPI	0.433733	2.378542	0.0239
ln GDPGR	-0.071941	-0.872501	0.3899
ln INT	-0.366656	-1.999420	0.0547
R²	0.945457	**Adj. R²**	0.938161
F-statistic	129.9547	Durbin-Watson stat	1.413594

Table-4: Regression Results

The results for the estimated regression model show that all of the estimated parameters are statistically significant with the expected signs except for the GDPGR or Real GDP Growth Rate, that is insignificant at any given level, hence losing any further significance in this study. However the negative association of Real GDP growth rate with that of exports can be characterized by the export led growth or growth driven exports paradox (Konya, 2004).

The estimated coefficient for FDI shows that with one percent increase in FDI will result in a positive and significant increase in Exports on average for about 0.47 %. Similarly CPI is also positively affecting the exports with 0.433 % on average. Finally interest rate is affecting the exports with a negative 0.366 %, indicating that with increasing interest rate the cost of doing business is also increased which may lead to a reduction in the total exports.

The R2 and the Adj. R2 tells the story of a perfect fit that almost 93% of the variation

has been explained by the given model. Similarly the F-Statistic is also favorable in this context. Finally some diagnostic tests were also conducted to test the robustness and stability of our model. These include the Jarque-Bera for normality, the White heteroscedasticity and the LM test for Serial correlation. The results are presented in table 5. All of the three diagnostics indicate that the residuals in our model are serially uncorrelated, normally distributed and homoscedastic.

Breusch-Godfrey Serial Correlation LM Test			
F-statistic	1.041988	Prob. F(2,28)	0.3660
Obs*R-squared	2.424519	Prob. Chi-Square(2)	0.2975
Heteroskedasticity Test: White			
F-statistic	0.538751	Prob. F(14)	0.8803
Obs*R-squared	9.584744	Prob. Chi-Square(14)	0.7919
Normality Test: Jarque-Bera			
Jarque-Bera	1.435278	Probability	0.4879

Table 5: Diagnostic Tests

Finally the stability are tested under the CUSUM (Cumulative Sum of Recursive Residuals) and CUSUMSQ (Cumulative Sum of Recursive Residuals Squared), which tells us that the final estimated model is dynamically stable.
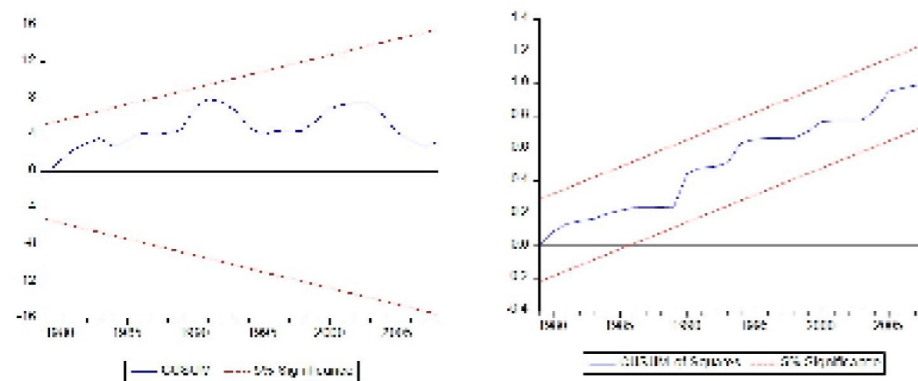

Figure 1: Stability Tests; CUSUM and CUSUMSQ.

4.1 Cointegration and Causality Analysis

Likelihood Ratio	5 % Critical Value	Prob.**	Hypothesized No. of CE(s)
0.659357	0.659357	0.0001	None *
0.541152	0.541152	0.0014	At most 1 †
0.436147	0.436147	0.0077	At most 2 †
0.362252	0.362252	0.0254	At most 3 *
0.074986	0.074986	0.1088	At most 4

Table 6: Joheneon Cointegration.* denotes rejection of the hypothesis at the 0.05 level

The likelihood ratio for Johensen Cointegration presented in table 6, indicate a total of four cointegrating vectors at 5 % level of significance, strongly supporting the evidence that there is a long run relationship among the variables in the model and they drift to each other in the long run.

Now that we have established the existence of long run relationship among the variables, the final step is to determine the direction of causality, for that purpose a pairwise granger causality test has been conducted with the results presented in table 7 below;

Null Hypothesis:	F-Statistic	Prob.
INT does not Granger Cause CPI	5.01672	0.0137
CPI does not Granger Cause INT	2.87606	0.0731
EXP does not Granger Cause CPI	2.52890	0.0978
CPI does not Granger Cause EXP	1.74255	0.1935
FDI does not Granger Cause CPI	1.69787	0.2014
CPI does not Granger Cause FDI	0.15895	0.8538
GDPGR does not Granger Cause CPI	0.10933	0.8968
CPI does not Granger Cause GDPGR	3.01777	0.0650
EXP does not Granger Cause INT	3.72363	0.0368
INT does not Granger Cause EXP	5.39333	0.0104
FDI does not Granger Cause INT	0.49545	0.6145
INT does not Granger Cause FDI	1.76594	0.1895
GDPGR does not Granger Cause INT	0.70593	0.5022
INT does not Granger Cause GDPGR	4.94873	0.0144
FDI does not Granger Cause EXP	2.05987	0.1464
EXP does not Granger Cause FDI	6.28472	0.0056
GDPGR does not Granger Cause EXP	0.15580	0.8565
EXP does not Granger Cause GDPGR	4.81641	0.0159
GDPGR does not Granger Cause FDI	1.47055	0.2470
FDI does not Granger Cause GDPGR	1.88918	0.1700

Table 7: Pairwise Granger Causality Test.

The null hypothesis of no causality has been rejected in case of interest rate and CPI in both ways as the P value is less than 0.1 and the F-Statistic does not fall in the acceptance region, hence there is a two way causality between CPI and interest rate. Similarly unidirectional causality has been observed running from exports towards CPI, no causality between CPI and FDI, however a unidirectional causality can be observed from CPI towards GDP growth rate. Furthermore bidirectional causality between exports and interest rate, no causality between FDI and interest rate and a unidirectional causality from interest rate towards GDP growth rate can be observed. Finally unidirectional causality from exports to FDI, GDP growth rate and no causality between FDI and

GDP growth can also be observed.

5. Conclusion

The aim of this paper was to investigate the nexus of Foreign Direct Investment and the Export performance in the economic settings of Pakistan along in the presence of explanatory variables, based on well-established economic theory and long standing relationships. Supplementing the variables into a linear regression model, tested under the OLS and checked for the assumptions of normally and identically distributed errors, it was found that exports are positively affected by FDI and CPI whereas negatively affected by the interest rates in the case of Pakistan.

Furthermore the long run relationship between the variables has been tested under the Johansen Cointegration test, which suggest that there is a long run relationship exist between the variables. Finally the direction of causality has been investigated with the help of Granger Causality test, indicating a bidirectional causality between CPI and interest rate, exports and interest rate, unidirectional causality from exports to CPI, CPI to GDP growth rate, interest rate to GDP growth rate, exports to FDI and exports to GDP growth rate.

Most of the previous studies on the subject matter are mostly cross country studies, however very little evidence is available on the causality between the variables for individual countries. This study has the potential to bridge this gap in the literature and can be extended in the future in many ways by including other economic indicators into the model.

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