

Causality Relationship among Foreign Direct Investments, Gross Domestic Product and Exports for Pakistan

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Abstract

The study of economic indicator is very vital for the assessment of overall performance of the economy in term of countrywide earnings. We are identifying the impact of some factors like FDI, GDP & export on economic growth and also recognize the relationship among GDP, FDI and exports in explaining the financial performance of the major nation like Pakistan and also identify the linkage on each other. With the help of time-series data from 1970 to 2012, this study investigates the causality relationship between FDI, GDP and exports in case of Pakistan economy. For this undertaking, statistical techniques like Unit root test of (ADF), Phillip Perron, Johansen's co integration analysis and Granger causality have been used. By apply the unit root test of Phillip all variables become stationery at first difference which leads to co integration test. Co integration test shows that there is existence of a long run relationship ship among the variables. Granger causality consequences suggest that there is bi directional causality relationship exist among FDI and Exports and uni-directional relationship exist between GDP-Exports and GDP-FDI running from GDP to Exports and FDI. No causal relationship found between Exports to GDP and FDI to GDP.

Keywords: Foreign Direct Investment (FDI), Gross Domestic Product (GDP), Exports, Pakistan.

INTRODUCTION

GDP, Export & FDI are most important economic indicator that shows the overall health of economy. The study of economic indicator is very vital for the assessment of overall performance of the economy in term of countrywide earnings. In our research work we are identifying the impact of some factors like FDI, GDP & export on economic growth and also recognize the relationship among GDP, FDI and exports to explain the financial performance of major nation like Pakistan. Official and academics needs to know which variable cause another, so that the exact strategies developed and implemented which have great effect on overall economic development. Like other under developed countries, Pakistan opens its door to foreign direct investment, with the expectation that it fetch huge profit for economy. Foreign direct investment consider as a most important factor which help to increase the economic growth. FDI rapidly grow over the last few decades, in 1980 the world GDP was 5% in 1995 it moved to 10% [world investment report (1997)]. Sum (1998) represent quarrel concerning nexus among economic development and inner FDI in that words: overseas capital inflows expand the delivery of funds for investment thus promotes funds creation in host state. Inner FDI motivate restricted investment by growing domestic outlay through relations in the manufacture series when overseas firms purchase nearby ended inputs or when overseas firms provide supplies of middle inputs to nearby firms. In addition, inner FDI can boost the host nation export ability causing the growing country to enlarge its overseas swap earnings. Pakistan faces the crisis of saving-investment crack and FDI filling this crack by rising productivity and employment creation. With the help of GDP economist calculate total amount of goods and services which are producing in an economy and shows the economic condition. GDP is one of the most important economic indicators used by economic decision-maker and government for planning and formulating polices. During 2008-2009 economy of Pakistan faces so many hurdles due to financial and some serious political actions. The performance of Pakistan economy is in good position during the era of 2004-2008 in this era the economy grow at an average rate of 7% and during 2003-2006 it was 16%. The major issue is that Pakistan exports are focus on a small number of items. During the era of 90's the composition of export change and move from primary and semi manufactured to manufactured export. Due to high contribution in economic growth export consider as an important indicator of economic growth.

Objectives of the Study

The aim of the study is to focus that which type of relationship exist between GDP, FDI and Exports, so that the policy maker can make polices which is more favorable for the country and pay positive role in economic development. The general objective of the study is to look at how GDP, Exports and FDI Interconnect with each other.

Other Key Objectives

- Find the long run Association ship among GDP, FDI and Exports

- Find the impact of FDI and GDP on Exports
- Find out the causal relationship among FDI and Exports
- Check the causal link among Exports and GDP
- To check the causal link among GDP and FDI

LITERATURE REVIEW

Chow (1987) examined the relationship among export enlargement & industrial expansion in eight recently industrializing nations. He originate that there is strapping bi-lateral causality association among the industrial development and export growth which props up the export lead development strategy in logic that by the sell overseas extension there will be the countrywide revenue expansion of the countrywide income growth of the state. Basu and Chakraborty (2002) examined the connection between GDP and FDI in India. They use two approaches co integration and ECM method to found that one-sided association with causation running from GDP to FDI. No connection was found in other variables. Athukorala (2003) checks the contact of relationship of FDI on financial development in Sri Lanka and this study base on time series data over 1959 to 2002.he use econometric structure of co integration & EC instrument to know the mutual linkages among variables. The study showed that foreign direct investment did not use as a sovereign pressure on financial development and the way of causation was from GDP to FDI relatively FDI to GDP. Dritsaki, Adamopoulos and Dritsaki (2004) investigate how export, economic development and FDI narrate to each other in Greece. During the 1960to 2002 and the consequences represent that there is survival of a long run balance association between the variables by means of co integration examination as Granger causality consequences represent fundamental association exist among variables. Dasgupta (2007) checks the effect of global trade & investment related macro-economic variables, on the out flow of FDI from India from 1970 to 2005.by using the time series figures study the empirical findings are unidirectional Granger causality from export and import to FDI outflow but the findings revealed that no causality exist from FDI inflow to the subsequent outflow from India. Miankhel, Kalirajan and Thangavelu (2009) examined the causality relation among FDI, GDP and export for Mexico, Thailand, Malaysia, India, Pakistan & Chile in both long and short run. In model fixed time series with structural breaks is also check. Their finding is dissimilar in all 6 countries. In long run, they discover that GDP growth as the frequent factor that drives growth in FDI and exports. In crate of India GDP (economic development) attracts FDI in long run while in crate of Pakistan GDP attracts export in Pakistan. The studies conducted in Latin American countries of Chile and Mexico shows dissimilar relationship in short run but in long run the exports have an effect on the growth of output and FDI. The studies of East Asian states, they found bi-directional long run association between FDI, GDP and exports in Malaysia, though they found that in case of Thailand a long run unidirectional association from GDP to exports exists. They used VECM to study the dynamic relation among variables. Shimul and Siddiqua (2009) look at the long run association among financial growth and FDI for Bangladesh using time series figure from 1973 to 2007. To check the relationship they use two modern time series economic approaches – bound testing autoregressive distributed lag (ARDL) Model and Engle granger two step actions and the learning found that there is no liaison exists among FDI & GDP. Karimi (2009) checks the relationship among GDP and FDI in Malaysia over 1970 -2005. He used the tactic of TODA-Yamamoto trial for causality liaison and the bounds testing (ARDL) by applying this methodology he found that there is no well-built verification of bi-directional causality and long run link among FDI and economic expansion. The study released that FDI has roundabout effect on economic development in Malaysia. Liu, Burridge & Sinclair (2010) they checks the causal relationship among trade, economic growth, and exports in china. The integration and Co integration properties of quarterly data are analyzed. They found long run relationships among these variables which are identified in a co integration frame work in which they found bi directional causality among these variables. Seilan and Jayachandran (2010) they check the connection among exports, FDI and economic development for India from 1970 to 2007. The Co integration examination recommended that there is a long-way equilibrium connection & the consequences of Granger causality trial suggest causal association among the investigated variables exists. Ahmadi and Ghanbarzadeh (2011) evaluate the granger causality relationship among FDI, exports, GDP and in Middle East and North Africa countries. They constructed three-variable panel VAR model to estimate the mutual relation among these variables. They found bidirectional causality relations between all three variables for this group. Meerza (2012) investigates the causal association among FDI, exports and GDP of Bangladesh over 1973 through 2008. He originates that co integration test present long run association among the variables. He also originate that financial growth have an effect on both FDI and exports. There was unidirectional causal link exist among FDI and exports which flow from export to FDI.

Shawa and Shen (2013) conduct an analysis on how FDI cooperate with the host state GDP and exports. They continually examine the causality link among GDP, Export, and FDI for Tanzania for about 33 year from 1980-2012.They use co integration technique to analyze long run liaison among variables. They also use granger causality test analysis and this analysis shows causality connection exist which is one-sided flow from FDI to export and nix causality was set up among FDI & GDP.

DATA AND ECONOMETRIC METHODOLOGY

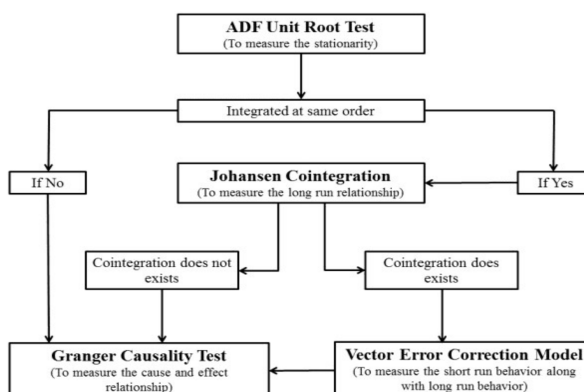
Data

We use data on annual basis from the period of 1970 to 2012. The Data of FDI inflow and GDP collect from the World Bank. While the data of exports taken from open doors for all. For the purpose of analyzing data we have used Eviews-7 and get the results.

Econometric Methodology

First we check the stationary of data by applying unit root test of ADF and Phillips-Perron Test the results of PP test shows that data become stationery at same level 1(1). To find out the long run relationship among variables we apply Johansen co integration test. Next we apply pair wise granger causality test to find out the directions of relationship among variables.

3.1 Flow Diagram of Research Methodology



EMPIRICAL RESULTS AND DISCUSSION

Descriptive Statistics

Descriptive statistics shows the quantitative summary form of variables. Mean show the average value of variables. The mean values of all variables the mean of the positive LEXP, LFDI and LGDP is 17:59, 19:19 and 24.52 are. Leaning ID determine the asymmetry of the distribution of a real-valued random variables. All variables are negatively skewed and were distorted in left direction. Further kurtosis is a measure of the peakedness of the probability distribution of real-valued random variables. Kurtosis of the normal distribution is 3 If the kurtosis = 3 means it mesokurtic when kurtosis value > 3 called leptokurtic and if kurtosis <3 means Platykurtic . The kurtosis value of foreign direct investment is mesokurtic, while the other two variables have platykurtic. This statistical analysis consists of 42 numbers of observations. Table1 show the descriptive statistics values of all the variables.

Table 1 Descriptive Statistics

	LEXP	LFDI	LGDP
Mean	17.5879	19.1999	24.5236
Median	17.6650	19.5898	24.5738
Maximum	19.3511	22.4443	26.1665
Minimum	15.1068	13.8155	22.8950
Std. Dev.	1.09664	1.96493	0.89479
Skewness	-0.39335	-0.58255	-0.08084
Kurtosis	2.48407	3.02944	2.24444
Jarque-Bera	1.54891	2.37707	1.04477
Probability	0.46095	0.30467	0.59310
Sum	738.693	806.398	1029.990
Sum Sq. Dev.	49.3075	158.2996	32.8267
Observations	42	42	42

Coefficient of Correlation matrix

Correlation matrix gives an idea of line association between the variables. For preliminary analysis of the integration variables, we initiate by examining the correlation coefficient between (GDP, exports and FDI). Results in Table 2 shows that all variable FDI, GDP and exports have strong positive relationship with each other.

Table 2 Correlation Matrix

	LEXP	LFDI	LGDP
LEXP	1		
LFDI	0.882425	1	
LGDP	0.955603	0.918542	1

Regression Results

The following linear regression model uses in this study.

$$(\text{Exports}) = \beta_0 + \beta_1 (\text{GDP}) + \beta_2 (\text{FDI}) + \epsilon$$

Where as

Exports is taken as independent variable.

β_1 (GDP) =The independent variable value which named (GDP) of the state which shows us the association and scale among the independent variable and dependent variable. Similarly the β_2 (FDI) relates to independent variable and shows the relationship between dependent variable. E time period appearance the relationship of other variable affect the dependent variable expects the independent variable defined in the model. Table 3 showing the statistical result to estimate the econometrics equation stated above showing the impact of FDI and GDP on exports. Here positive and significant relationship exist between dependent (exports) and independent (FDI, GDP) variable.

Table 3 Regression Result (Exports as Independent Variable)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LFDI	0.251501	0.045978	5.469988	0.0000
LGDP	0.520466	0.036157	14.39449	0.0000
R-squared	0.871935	Log likelihood	-19.80436	
Adjusted R-squared	0.868734	Schwarz criterion	1.121049	
Hannan-Quinn criteria	1.068633	Durbin-Watson stat	1.483689	

Unit Root Test (ADF Test)

Mostly used test the unit root in time-series are Dickey-Fuller (DF) test and the (ADF) test. Here we apply (ADF) unit root tests for each variable in a model for testing relevancy of independent variables. ADF results in table 4 shows that all variables (GDP, Export and FDI) were not stationary at level 1(0).FDI and GDP become stationary after first difference 1(1) but the Exports are still non stationary at first difference but become stationary at 2nd difference 1(2).

Table 4 ADF Unit Root Test at Level, First Difference & 2nd Difference

Variables	At level		First difference		2 nd difference	
	ADF statistics	Critical values	ADF statistics	Critical values	ADF statistics	Critical values
LEXP	-1.275529 (0.6298)	1% -3.632900 5% -2.948404 10% -2.612874	-2.108164 (0.2428)	1% -3.632900 5% -2.948404 10%-2.612874	-8.284243* (0.0000)	1% -3.632900 5% -2.948404 10% -2.612874
LFDI	-2.303381 (0.1759)	1% -3.605593 5% -2.936942 10% -2.606857	-11.27097* (0.0000)	1% -3.615588 5% -2.941145 10%-2.609066		
LGDP	0.175437 (0.9677)	1% -3.596616 5% -2.933158 10% -2.604867	-5.406614* (0.0001)	1% -3.600987 5% -2.935001 10% -2.605836		

Unit Root Test (Phillips-Perron Test)

A particular alternative test of Unit Root Tests i.e. Phillip Perron test is used to check the stationary of the data. This test allows the error variance to be heterogeneously distributed and less dependent. In PP test the variable find stationary at First difference so co integration test is applied. Outcomes are shown in table 5.

Table 5 (Phillips-Perron Test) at level & 1st difference

Variables	At level			First difference		
	Adj. t-Stat	level	Critical values	Adj. t-Stat	level	Critical values
LEXP	-1.664085 (0.4417)	1% 5% 10%	-3.596616 -2.933158 -2.604867	-13.03735* (0.0000)	1% 5% 10%	-3.600987 -2.935001 -2.605836
LFDI	-2.164078 (0.222)	1% 5% 10%	-3.605593 -2.936942 -2.606857	-10.9804* (0.0000)	1% 5% 10%	-3.615588 -2.941145 -2.609066
LGDP	0.190134 (0.9688)	1% 5% 10%	-3.596616 -2.933158 -2.604867	-8.261576* (0.0000)	1% 5% 10%	-3.600987 -2.935001 -2.605836

Johansen Co Integration Test

Max Eigen and Trace statistics are used to analyze the co integration among FDI, Exports and GDP. Trace statistics shows a long run association exists among FDI, exports and GDP. The study of BHATT, P.R. (2013) also supports our results. Maximum Eigen shows no co integration among the variables. Table 6 and 7 shows the consequences of co integration.

Table 6 Johansen Co Integration Test Co integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.384213	36.96342	35.19275	0.0319
At most 1	0.237338	18.53894	20.26184	0.0848
At most 2	0.19501	8.243184	9.164546	0.0746

Note: Trace test indicate 1 co integration eqn(s) at the 0.05 level. *denotes rejection of the hypothesis at the 0.05 level. ** Machinnon-haug-Micheils (1999) p-value

Table 7 Co integration Rank test (Maximum Eigen Value)

Hypothesized No. of CE(s)	Eigen value	Max Eigen Statistic	0.05 Critical Value	Prob.**
None	0.384213	18.42449	22.29962	0.1595
At most 1	0.237338	10.29575	15.8921	0.3082
At most 2	0.19501	8.243184	9.164546	0.0746

Note: max-Eigen value test indicate no co integration at the 0.05 level. *, denotes rejection of the hypothesis at the 0.05. **,Machinnon-Haug-Michelis (1999) P-values.

Pairwise Granger Causality Test

The Granger causality tests results in table 8 show that causal bi-directional relationship exist between FDI and Exports which imply that both FDI and Exports have reinforcing effect on each other. According to Miankhel, Kalirajan and Thangavelu (2009) study results bi-directional relationship among FDI and Exports exist Malaysia. While GDP - Exports and GDP - FDI have causal uni directional relationship running from GDP to Exports and FDI respectively which imply that GDP is a precondition for attracting and gripping of exports and FDI inflow in Pakistan. According to study results of (F.S.T. Hsiao, M.-C.W. Hsiao / Journal of Asian Economics 17 (2006) 1082–1106) that they execute in East & Southeast Asia states they found that china have uni directional relation running from GDP & FDI and their study result support our results. According to Miankhel, Kalirajan and Thangavelu (2009) Pakistan, Malaysia, Thailand & Chile have uni directional relation running from GDP to exports and uni directional relation among GDP to FDI is also exist in India, Pakistan, Mexico and Malaysia. According to the research study of Bhatt, P.R. (2013) there is uni directional relationship exist among GDP and Exports running from GDP to Exports.

No causality link exist among Exports-GDP and FDI-GDP. According to our results we reject H_0 (null hypothesis) and accept the H_1 . The alternative hypothesis H_1 is that GDP can cause exports and FDI. In case of FDI and Exports we also reject H_0 and accept H_1 because both variables cause each other.

Table 8 Pair Wise Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.	Conclusion
LFDI does not Granger Cause LEXP LEXP does not Granger Cause LFDI	40	8.13026 17.5336	0.0071 0.0002	LFDI ↔ LEXP
LGDP does not Granger Cause LEXP LEXP does not Granger Cause LGDP	42	18.6883 2.66732	0.0001 0.1105	LGDP → LEXP
LGDP does not Granger Cause LFDI LFDI does not Granger Cause LGDP	40	18.5719 0.12689	0.0001 0.7237	LGDP → LFDI

CONCLUSION AND RECOMMENDATIONS

Conclusion

The objective of this study is to examine the causality association among Exports, FDI and GDP in case of Pakistan. Paper analyzes the annual time series data from 1970 to 2012. First find out the value of descriptive statics which shows the quantitative summarized form of variables. Than we apply correlation matrix to find out the overall relationship among variables and correlation matrix finding suggests that there is positive and significant liaison exists between all variable. After that we apply regression technique to find out the relationship among dependent variable (exports) and independent variable (FDI and GDP) and results suggest that there is positive and significant relationship exist among dependent and independent variable. Apply the unit root test to verify the stationary of all variables by using (ADF) Test and Phillip perron test. In ADF test all variable are not stationary at same level i.e. export become stationary at 2nd difference and FDI and GDP become stationary at 1st difference but when we check the stationary of variable by applying Unit root test of PP than all variable become stationary at same level 1(1). On the basis of results of PP we conduct the co integration equation on both Trace statistics and Max-Eigen. The results of Trace statistics suggest that long run relationship exist while the Max-Eigen result suggests that there are no co integration exists among variable. In further step we use granger causality which shows the directions of relationship among variables.

Practical Implications

Evidence of our study provides practical suggestion to official policy makers. As the consequence shows that there is positive association between FDI and Exports as well as positive relationship exist between GDP and exports. So the policy makers should pay more attention on FDI and GDP because the increment in both will automatically increase the exports which are more beneficial for the economy growth. Moreover, policy makers should also focus to make those policies which supports long run relationship between FDI, GDP and exports and gets long run benefits for economy development.

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