

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

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ABSTRACT

The study of economic indicators is 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 recognizing the relationship among GDP, FDI and exports in explaining the financial performance of the major nations like Pakistan and identify the linkage with 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 Cointegration analysis and Granger causality have been used. By applying the unit root test of Phillip all variables become stationery at first difference which leads to Cointegration test. Cointegration test shows that there is existence of a long run relationship among the variables. Granger causality consequences suggest that there is bi directional causality relationship exists among FDI and Exports and unidirectional relationship exists between GDP-Exports and GDP-FDI running from GDP to Exports and FDI. Our study results show that no causal relationship is found between Exports to GDP and FDI to GDP in case of Pakistan economy.

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

INTRODUCTION

GDP, Export and FDI are most important economic indicators that show the overall health of economy. The study of economic indicator is 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 recognizing the relationship among GDP, FDI and exports to explain the financial performance of major nations like Pakistan. Official and academic needs to know which variable cause another, so that the exact strategies developed and implemented which have great effect on overall economic development. Other under developed countries like Pakistan opens its door to foreign direct investment, with the expectation that it fetch huge profit for economy. Foreign direct investment considers as a most important factor which help to increase the economic growth. FDI has rapidly grown over the last few decades, in 1980 the world GDP was 5% and in 1995 it moved to 10% [world investment report (1997)]. Sum (1998) represented 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 motivates 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 is filling this crack by rising productivity and employment creation. With the help of GDP, economists 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 policies. During 2008-2009 economy of Pakistan faced so many hurdles due to financial and some serious political actions. The condition of Pakistan economy is in good position during the era of 2004-2008. In this era the economy grew at an average rate of 7% and during 2003-2006 it was 16%. The major issue is that Pakistan focus on export of less expensive items. During the era of 90's the composition of export change and move from primary and semi manufactured to export manufactured. Due to high contribution in economic growth, export considers as an important indicator of economic growth.

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Objectives of the Study

The aim of the study is to focus that which type of relationship exists between GDP, FDI and Exports, so that the policy maker can make policies which are more favorable for the country and play 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 Cointegration 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 Cointegration & 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 1960 to 2002 and the consequences represent that there is survival of a long run balance association between the variables by means of Cointegration 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, Burrridge & Sinclair (2010) they checks the causal relationship among trade, economic growth, and exports in china. The integration and Cointegration properties of quarterly data are analyzed. They found long run relationships among these variables which are identified in a Cointegration 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 Cointegration 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 Cointegration 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 Cointegration 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

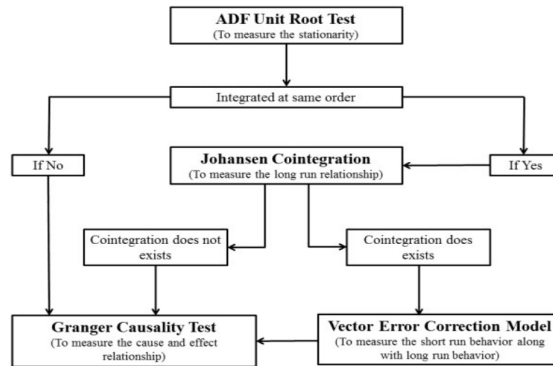
Data & Data Sources

We use data on annual basis from the period of 1970 to 2012. The Data of FDI inflow and GDP collected 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

We check the stationarity of data by applying unit root test of ADF and Phillips-Perron Test. The results of Phillips-Perron test show that data become stationary at same level 1(1). To find out the long run relationship among variables we apply Johansen Cointegration 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 value of all variables is positive. The value of LEXP, LFDI and LGDP is 17:59, 19:19 and 24.52 respectively. Leaning ID determines the asymmetry of the distribution of real-valued random variables. All variables are negatively skewed and 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. Table 1 shows 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

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 2 show that all variables (GDP, Export and FDI) are 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 2: 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 Cointegration test is applied. Outcomes are shown in table 3.

Table 3: 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 Cointegration Test

Max Eigen and Trace statistics are used to analyze the Cointegration 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 Cointegration among the variables. Table 4 and 5 shows the consequences of Cointegration.

**Table4: Johansen Cointegration Test
Cointegration 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 Cointegrationeqn (s) at the 0.05 level. *, denotes rejection of the hypothesis at the 0.05 level.

** Machkinnon-haug-Micheils (1999) p-value

Table5: Cointegration 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 Cointegration at the 0.05 level. *, denotes rejection of the hypothesis at the 0.05.

**, Macinnon-Haug-Michelis (1999) P-values.

Pair Wise Granger Causality Test

The Granger causality tests results in table 6 show that causal bi-directional relationship exists 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 bidirectional relationship among FDI and Exports exist in Malaysia. While GDP - Exports and GDP - FDI have causal unidirectional 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) execute in East & Southeast Asia states they found that china have unidirectional relation running from GDP & FDI and their study result support our results. According to Miankhel, Kalirajan and Thangavelu (2009) Pakistan, Malaysia, Thailand & Chile have unidirectional relation running from GDP to exports and unidirectional 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 unidirectional relationship exist among GDP and Exports running from GDP to Exports.

Table6: Pair Wise Granger Causality Test

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

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.

CONCLUSION AND POLICY IMPLICATIONS

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 findings suggest that there is positive and significant liaison exists between all variables. After that we apply regression technique to find out the relationship among dependent variable (exports) and independent variables (FDI and GDP) and results suggest that there is positive and significant relationship exist among dependent and independent variables. Apply the unit root test to verify the stationary of all variables by using (ADF) Test and Phillip-Perron test. In ADF test all variables 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 variables by applying Unit root test of PP then all variables become stationary at same level 1(1). On the basis of results of PP we conduct the Cointegration equation on both Trace statistics and Max-Eigen. The results of Trace statistics suggest that long run relationship exist while the Max-Eigen results suggest that there is no Cointegration exists among variable. In further step we use granger causality which shows the directions of relationship among variables.

Policy Implications

Evidence of our study provides practical suggestion to official policy makers. As the consequences show 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 economic growth. Moreover, policy makers should also focus to make those policies which supports long run relationship between FDI, GDP and exports, so they can get long run benefits for economic development.

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