FOREIGN DIRECT INVESTMENT, EXPORT AND ECONOMIC GROWTH IN PAKISTAN, IRAN, TURKEY, AND MALAYSIA: MULTIVARIATE VAR ANALYSIS

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Abstract

The main purpose of this paper is to study the dynamic relationship between FDI, GDP, and Export in Pakistan, Iran, Turkey, and Malaysia which are at different stages of growth and a study of the impact of FDI on GDP and export enable to compare the economic growth of these countries. To identify the causual relationship among these variables, Johansen co-integration test for the study of long run relationship and VECM estimates for short run relationships have been used during the present study . There exists a long run relationship among these variables for all the countries. The short run dynamics show error correction estimates for these countries as 62%, 59% ,72%, and 57% respectively for Pakistan, Iran, Turkey, and Malaysia.. VAR Granger Causuality results show, in Pakistan Export Granger cause FDI and GDP. In Iran FDI Granger cause export and in Turkey export Granger cause GDP.

Key Words: Foreign Direct Investment, Economic growth, Exports, VAR Granger causuality

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I.Introduction

The interaction between FDI, GDP, and export has a theoretical foundation to effect each other. So it is necessary to know mechanism among these variables and relationship between them for the formulation of economic policies. For this purpose it is important to investigate the long term and short term impact of FDI on economic growth. Duttaray,Dutt and Mukhopadyay(2008) observed a negative effect on growth in regression equations when FDI is measured as a ratio of FDI flow to output. According to Balasubramanyam et al.1996,1999;Borensztein et al.1998; and Stocker 1999, by the inclusion of exports in the regression equation, FDI co-efficient can become either positive or negative.

The paper focuses on Pakistan, Iran, Turkey, and Malaysia ,which are having different levels of economic growth. The study will be helpful to identify the impact of these variables on the economy of these countries . Pakistan with gdp per capita ,average(539.75 US$) and average fdi as (1013296146 US$)for the period under consideration ,the impact of fdi on economy of Pakistan will be different from those of Turkey having gdp per capita average of (3954 US$), and fdi average of (41017741935 US$) and Malaysia having gdp per capita average as (3840 US$) with fdi average of (3598290122 $US).

This paper discusses the dynamic relationship between FDI,GDP, and export in a time series framework from 1980 to 2012.This long time series will enable us to explore the long run and short run dynamics of these countries.The study includes checking the suitability of the model, stationarity of the variables and estimating VAR,VECM models using Johansen co-integration tests and Granger causuality tests.

It has been expressed by many authors that FDI leads to several economic benefits such as foreign exchange, capital, transfer of technology etc. Awan, et al.(2011) and Brooks, et al. (2003) described FDI to increase domestic investment. In the report of World Bank(2011) , FDI is described as a major source of economic growth and should be preferred over foreign aid.

The paper is divided into seven sections. Section I , is introduction of the study. Section II is literature review. Data and methodology is given in section III. Description of empirical results and discussion of results is given in section IV. Section V is about causuality between FDI,GDP,and Exports. Conclusions are described in section VI and references in section VII.

II.Literature Review

Foreign direct investment is one of the main source of finance and technological spillovers for developing countries from developed countries. With the import of technology ,it is possible for a developing country to achieve rapid economic growth(Khandker and Mettalab,2007). Quazi and Mahmmud(2004) observed economic freedom, openness, human capital and lagged fdi to be the main factors for inflow of fdi.. Naeem Ijaz and Azam(2005) observed that size of market, domestic investment, openness in trade, inflation and external debt are the main causes to effect fdi inflow.

The empirical evidences show, positive effects of fdi over weigh its negative effects(Lim 2001). Abdel Rahman (2002) while studying inflow of fdi in Saudi Arabia observed the flow of fdi to be positive towards gdp but less significant and negative towards exports and imports. According to Jafamejadet(2011) , openness and gdp have a positive impact,while inflation,oil extraction and production have a negative correlation with fdi in Iran. Syed Mohammad Alavinasab(2013) observed a positive significant effect of real gdp growth and infrastructure and insignificant effects of government consumption on fdi.

Muharrem Afsar(2007) found a uni directional relationship of fdi to economic growth. Muhammad Arshad et al.(2011) observed unidirectional causuality in the long run from gdp to fdi, and bi directional causuality in the short run. Muhammad Sharif Karim(2009) observed neither bidirectional causuality nor long run relationship between fdi and gdp. Nair-Reichert ,et al.(2001) in their study developing countries observed no relationship between fdi and growth. . Ericsson, et al. (2001) failed to observe any causual relationship between fdi and economic growth in OECD countries. Liu et al.(2002) found a bidirectional relationship in the long run between economic growth, fdi and openness. Chakraborty, et al.(2002) found a unidirectional causuality of gdp to fdi in India. Liyan lu(2011) observed that in China,economic growth decreases with fdi and increases by domestic capital accumulation and employment growth. Arfan Shehzad et al.(2012) observed political instability to be one of the reasons to affect fdi inflow in Pakistan.

III Data and Methodology

The data on fdi, gdp, and export of about 32 observations is considered for the present study and is taken from world bank national accounts data for the period 1980 to 2012 .The variables are described in their log. values for their empirical studies.

Methodology

Four countries; Pakistan ,Iran, Turkey and Malaysia having different political and economic environments are choosen for the present study. Pakistan is faced with political instability due to Afghan war and terrorist activities within the country and low inflow of fdi. Iran is faced with international sanctions , whereas Turkey and Malaysia are free from such constraints and are having matured economic system as compared to Pakistan and Iran.. So a comparative analysis of these four countries will be useful to study the model and it will help to understand the economic growth of these countries. During the present study following econometric techniques have been used on the data of these countries.

1.Test equation to have a best regression model of dependent and independent variables.

2.Augmented Dicky Fuller test for a unit root to test the stochastic non-stationarity.

3.Johansen co-integration test for long run relationship between the variables.

4.VECM estimates for short run relationship between the variables.

5. Pair wise Granger causuality to know cause and effect relationship between two sets of variables.

6. Granger causuality under VAR environment to find causuality among models.

IV.Empirical results and discussion of results

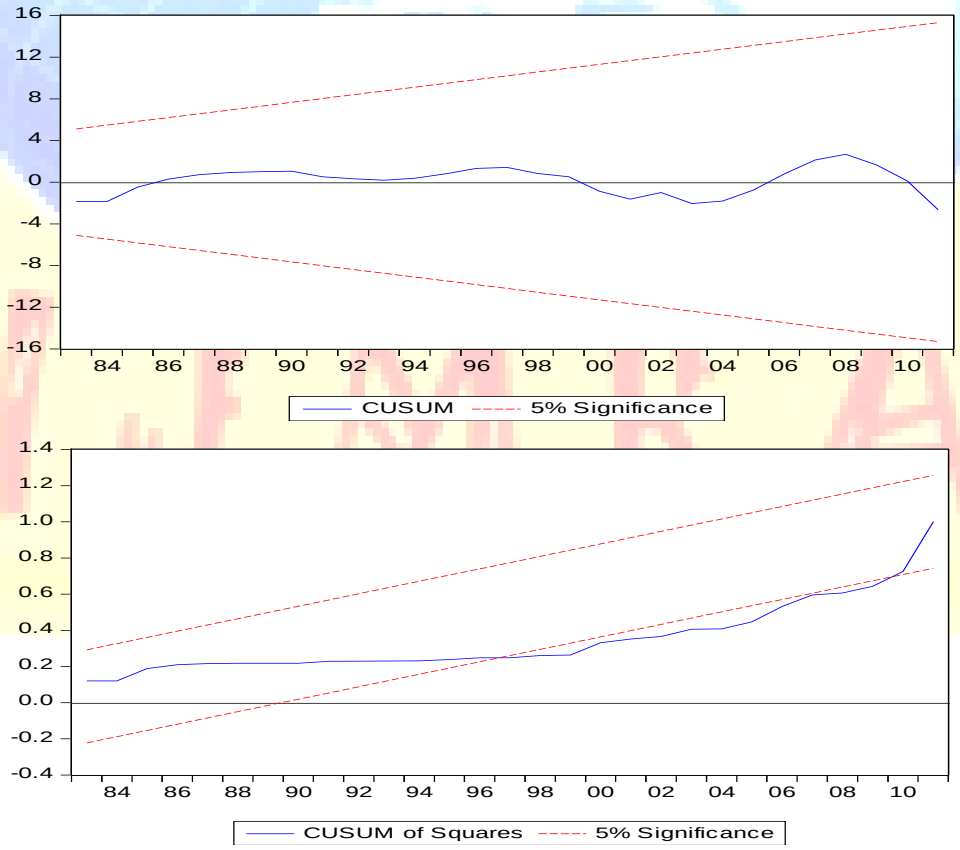
The suitability of the model is tested by the test equation method and the results obtained for all the countries are given in Table !.The table shows that the model FDI = GDP + EX meets the requirements of a good regression model ie;R^2 value for all the countries is greater than 60%, and less than DW. Also F-statistics are significant and normality not less than 5%. Also EC(-1) is significant with a negative sign. Its value for Pakistan, Iran, Turkey, and Malaysia are respectively as – 0.6219, -0.5936, -0.7818, and -0.5697. All these confirm the validity of the regression model .The plots of CUSUM and CUSUMSQ lie within 5% critical value line indicating a strong long run relationship between the variables. However plot of CUSUMSQ for Pakistan show some structural breaks at places which may due to some change in the politico,

economic environments within Pakistan during the period of structural breaks. Similar plots of CUSUM and CUSUM SQUARE are reported by Yelda Yücel(2005). He linked these structural breaks in CUSUM SQUARES due to shift in the Turkish economy in the early 1980 that resulted from ISI to trade and financial liberation.

Table 1 Characteristics of the Model FDI = GDP + EX

	Pakistan	Iran	Turkey	Malaysia
R^2	0.877	0.698	0.927	0.684
D W	0.970	1.617	1.2366	1.104
EC (- 1)	- 0.6219	- 0.5936	- 0.7818	- 0.5697
F-Statistics	103.4703	33.59703	184.4710	30.3205
Prob.(F.Stat)	0.0000	0.0000	0.0000	0.0000
Normality	Yes(.476122)	Yes(..304414)	Yes(.342059)	None(.006948)

Probability given in brackets.



Plot of CUSUM and CUSUM SQUARES for Pakistan

Augmented Dicky Fuller(ADF) is performed on level as well as on first difference. The results are presented in Table 2.

Table 2 Results for Unit Root Test (Augmented Dickey- Fuller Test)

Variable	Pakistan	Iran	Turkey	Malaysia
D(GDP(-1))				
Co-efficient	- 0.9698	- 0.795006	- 1.108115	- 0.908311
t.Statistics	- 5.1177	- 3.666966	- 5.996941	- 4.929821
D(FDI(-1))				
Co-efficient	- 0.8731	- 1.433072	- 1.147507	- 1.339378
t.Statistics	- 4.6204	- 8.660027	- 6.921168	- 7.449052
D(EX(-1))				
Co-efficient	- 0.9246	- 1.181642	- 0.990907	- 0.948589
t.Statistics	- 4.7600	- 6.488967	- 6.116714	- 5.207239
D(Residual(-1))				
Co-efficient	- 1.6608	- 1.424633	- 1.275305	- 1.365626
t.Statistics	- 5.2742	- .8.413679	- 7.465472	- 7.643312
Result	I (1)	I (1)	I (1)	I (1)

Results of Johansen (1988), co-integration test for long run relationship between the variables are given in Table 3 showing both maximum eigen values and trace test. The variables included during the present study have same order of integration. The table also shows number of cointegrating equations for all the countries at 5 percent level of significance. So it can be concluded that all the countries have cointegrating relationships among the selected variables of the model.

Table 3 Johansen Co-integration Test

Pakistan					
Hypothesized No. of CE(s)	Trace Statistic	0.05 Critical Value	Hypothesized No. of CE(s)	Max-Eigen Statistic	0.05 Critical Value
None *	182.6563	29.79707	None *	98.34882	21.13162

At most 1 *	84.30746	15.49471	At most 1 *	66.58299	14.26460
At most 2 *	17.72447	3.841466	At most 2 *	17.72447	3.841466
Iran					
None *	91.13280	29.79707	None *	21.13162	0.0000
At most 1 *	28.79264	15.49471	At most 1 *	14.26460	0.0018
At most 2 *	6.067730	3.841466	At most 2 *	3.841466	0.0138
Turkey					
None *	227.2713	29.79707	None *	199.2665	21.13162
At most 1 *	28.00476	15.49471	At most 1 *	27.81045	14.26460
At most 2	0.194315	3.841466	At most 2	0.194315	3.841466
Malaysia					
None *	56.59268	29.79707	None *	42.48591	21.13162
At most 1	14.10677	15.49471	At most 1	11.52354	14.26460
At most 2	2.583237	3.841466	At most 2	2.583237	3.841466

*denotes cointegrating eqn(s) at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Normalized cointegrating coefficients for all the countries given in table 4 shows GDP for Pakistan and Malaysia have positive sign ,while for Turkey and Iran it has negative sign. EX for Pakistan and Malaysia have negative signs and EX for Iran and Turkey it is positive. This shows that in case of Pakistan and Malaysia GDP has positive effect on FDI ,while this effect is negative in case of Iran and Turkey. As for effect of EX is concerned it is positive for Iran and Turkey and negative for Pakistan and Malaysia. The elasticities of GDP for Pakistan, Iran, Turkey, and Malaysia are 1.84, - 5.58, -2.15,and 0.79 respectively. The elasticities of Ex for Pakistan, Iran, Turkey, and Malaysia are -2.71, 1.46, 0.15, and -1.29 respectively. It shows in the long run, Pakistan and Malaysia have similar effects of GDP and Ex on FDI while Iran and Turkey have similar effects of GDP and EX on FDI in the long run.

Table 4 Normalized cointegrating coefficients (standard error in parentheses) on FDI

	Pakistan	Iran	Turkey	Malaysia
GDP	1.842722	-5.580128	-2.148970	0.792294
	(0.15985)	(0.35482)	(0.02365)	(1.37856)
EX	-2.705967	1.459849	0.154042	-1.286836
	(0.09956)	(0.34151)	(0.01773)	(0.91062)

The results of ECM estimation are given in table 5. The error correction coefficient for all the countries have expected negative signs. This shows that all the variables considered for the model(FDI, GDP ,and EX are cointegrated. The values of EC(-1) for all the countries show that disequilibrium of;62.19% for Pakistan,59.36% for Iran, 78.18% for Turkey, and 56.97 for Malaysia are corrected immediately ,ie in the next year.

Table 5 ECM Estimates (Dependent variable DFDI)

Pakiistan	Iran	Turkey	Malaysia
EC(-1)			
-0.621866 (0.28869) [-2.15412]	-0.593630 (0.39636) [-1.49771]	-0.781796 (0.27444) [-2.84866]	-0.569691 (0.27831) [-2.04693]
D(GDP)			
0.083002 (1.54027) [0.05389]	1.037043 (1.62895) [0.63663]	0.004257 (0.73282) [0.00581]	-1.431608 (2.27181) [-0.63016]
D(EX)			
2.273824 (0.92043) [2.47038]	-0.359687 (1.42003) [-0.25330]	0.405429 (0.97149) [0.41733]	1.342183 (2.48114) [0.54095]
Constant			
-0.073510 (0.92043) [2.47038]	0.141314 (0.13102) [1.07855]	0.071872 (0.06965) [1.03185]	-0.041438 (0.09748) [-0.42508]

R-squared			
0.541873	0.541873	0.397871	0.306060

Standard errors in ( ) & t- statistics in [ ]

V. **Causuality** between FDI, GDP, and Exports

Short term and long term effects of FDI ,GDP, and exports are presented in Table 6 . The table shows that for Pakistan, in the long run, there is bidirectional causation EX and GDP. Similar is the case for FDI-GDP and FDI-EX. All these variables show bidirectional causation. In the short run only GDP shows causation towards export. In Iran there is no causation ,of unidirection or bidirection. Same is the case for Malaysia. However for Turkey in the short run, there is FDI led growth attracting export adopting a channel of FDI-GDP-EX. In the long run FDI led growth is attracting export and export led growth is attracting FDI ie,in the long run there is bidirection causation between FDI and export.

Table 6 Long run Short run Causuality in FDI, GDP, and EX

Country		EX→GDP	GDP→EX	FDI→GDP	GDP→FDI	FDI→EX	EX→FDI
Pakistan	LR	Yes	Yes	Yes	Yes	Yes	Yes
	SR	None	Yes	None	None	None	None
Iran	LR	None	None	None	None	None	None
	SR	None	None	None	None	None	None
Turkey	LR	None	None	None	None	Yes	Yes
	SR	None	Yes	Yes	None	None	None
Malaysia	LR	None	None	None	None	None	None
	SR	None	None	None	None	None	None

Pairwise Granger Causuality. Results for pairwise Granger causality are given in Table 7. The lag one shows causation of EX to FDI in case of Pakistan. The causation effect for Iran is GDP to FDI and EX to FDI and GDP. For Turkey, there is bidirection causation of GDP and FDI. There is also causation of EX to FDI, GDP. There is no causation in case of Malaysia. The table shows a change in causation effects in lag.2. In Pakistan it is EX to FDI, GDP, for Iran and Malaysia there is no causation, and for Turkey there is causation of EX to FDI, GDP. During lag

3,4 for Pakistan there is causation of Ex to FDI and Turkey shows causation of EX to GDP. The table shows no causation in case of Iran and Malaysia.

Table 7 Pairwise Granger Causuality

Country	Lag 1	Lag 2	Lag 3	Lag 4
Pakistan	EX→FDI	EX→FDI,GDP	EX→FDI	EX→FDI
Iran	GDP→FDI EX→FDI,GDP	None	None	None
Turkey	GDP↔FDI EX→FDI,GDP	EX→FDI,GDP	EX→GDP	GDP →FDI
Malaysia	None	None	None	None

VAR Granger Causality is expressed in table 8. In Pakistan FDI is being caused by export, while GDP does not Granger cause FDI. GDP is being Granger caused by export while FDI does not Granger cause GDP. As for export is concerned both FDI and GDP are not causing it.

In case of Iran both GDP, Ex are not causing FDI, similarly FDI and EX do not cause GDP. However EX is being caused by FDI and GDP is not causing EX. In case of Turkey both GDP and EX are not causing FDI. GDP is not being caused by FDI, however GDP is being caused by EX. Both FDI and GDP do not cause EX.. In Malaysia both GDP and EX do not cause FDI; FDI and Ex do not cause GDP and FDI,GDP do not cause EX.

Fig. 8 VAR Granger Causuality

Variables	Pakistan	Iran	Turkey	Malaysia
FDI				
GDP	(0.8036)	(0.3601)	(0.4068)	(0.9899)
EX	(0.0030)	(0.4818)	(0.3321)	(0.8645)
GDP				
FDI	(0.3050)	(0.4997)	(0.1653)	(0.9682)
EX	(0.0136)	(0.2112)	(0.0192)	(0.4364)
EX				
FDI	(0.7082)	(0.0467)	(0.6777)	(0.9512)
GDP	(0.1164)	(0.0666)	(0.9799)	(0.5540)

( ) Prob.values

VI.Conclusions

We can conclude from the present study that the model FDI = GDP + EX is the best regression model that satisfies the characteristics of a good regression model. All the countries have long run relationship among the variables. EC(-1) of the countries are significantly high in the sequence of 72%,62%,59%,and 57% for Turkey, Pakistan, Iran, and Malaysia.FDI has behaved in a different manner between all the countries, which may be due to different politico, economic conditions of these countries. The VAR Granger causation results show that in Pakistan, export Granger cause FDI and GDP. In Iran FDI Granger cause export and in Turkey export Granger cause GDP. So export is the main factor which should be given due importance for economic betterment of these countries.

VII.References

Abdel-Rahman, A-M.M (2002), The Determinants of FDI in the Kingdom of Saudi Arabia, Department of Economics, King Saudi University.

Arfan Shahzad Dawood Ali Mithani Abdullah Kaid Al-Swidi Faudziah Hanim Bt Fadzil (2012), Political Stability and the Foreign Direct InvestmentInflows in Pakistan *British Journal of Arts and Social Sciences Vol.9 No.II (2012)*

Awan, M. Z., Khan, B., & Uz Zaman, K. (2011). Economic determinants of Foreign Direct Investment (FDI) in commodity producing sector: A case study of Pakistan. *African Journal of Business Management*, 5(2), 537-545.

Balasubramanyam V.N, . Salisu M, and David Sapsford (1999), Foreign direct investment as an engine of growth Journal of International Trade & Economic Development - , vol. 8, no. 1, pp. 27-40,

Borensztein, E. and De Gregoro, J and Lee.J.W., (1998), How does foreign direct investment affect economic growth', *Journal of International Economics*, 45(1998):115-135.

Brooks, D. H., Fan, E. X., Sumulong, L. R., & Bank, A. D. (2003), Foreign direct investment in developing Asia: trends, effects, and likely issues for the forthcoming WTO negotiations. *Asian Development Bank.*

Chakraborty, C, and Basu, P. (2002), "Foreign direct investment and growth in India: A cointegration approach," *Applied Economics*, 34(9), 1061–1073.

Duttary,M ;Dutt,A.K, and Mukhopadhyay K.(2008),Foreign direct investment and economic growth in less developed countries: an empirical study of causality and mechanisms', *Applied Economics*, 40:1927-1939.

Ericsson, J. and Irandoust, M. (2001), "On the Causality between Foreign Direct Investment and Output: a Comparative Study," *The International Trade Journal*, Vol. 15, pp. 122-132.

Granger, C. W. J. (1969). "Investigating Causal Relations by Econometric Models and Cross-spectral Methods". *Econometrica* **37** (3): 424–438.

Jafarnejad, Ahmad; ArashGolman and Nader Ale Ebrahim, (2009), "Determinants of foreign direct Investment in IRAN: An Empirical Study Using Structural Equation Modeling", *Middle East FORUM*, Issue 9, December, pp.71-83

Javed, K., Falak, S., Awan, R., & Ashfaq, M. (2012). Foreign Direct Investment, Trade and Economic Growth: A Comparison of Selected South Asian Countries. *International Journal of Humanities and Social Science*, 2(5).

Johansen,S. (1988), Statistical analysis of co-integrating vectors.*Journal of Economic Dynamics and Control .volume 12,pp.231-254.*

Khondoker and A. Mottaleb (2007), "Determinants of Foreign Direct Investment and Its Impact on Economic Growth in Developing Countries, MPRA Paper No. 9457

Lim,Ewe-Ghee (2001), "Determinants of, and the Relation Between, Foreign Direct Investment and Growth: A Summary of the Recent Literature", IMF Working Paper 175,.

Liyan Liu 2011 FDI and Economic Development: Evidence from Mainland China Journal of Service Science and Management, 2011, 4, 419-427

Muharrem Afsar (2007), The causuality relationship between economic growth and foreign direct investment in Turkey.. *Business &Economics Society International*

Muhammad Arshad Khan and Shujaat Ali Khan (2011)Foreign Direct Investment and Economic Growth in Pakistan: A Sectoral Analysis *Pakistan Institute of Development Economics, Islamabad*

Muhammad Sharif Karimi (2009), FDI and Economic Growth in Malaysia MPRA Munich Personal REPEC Archive

Naeem, K. Ijaz, and M. Azam. (2005),Determinants of Foreign Direct Investment in Pakistan (1970- 2000): An Econometrics Approach, *Sarhad Journal of Agriculture*, vol 21 No 4, pp. 761-764

Nair-Reichert, U., Weinhold, D. (2001), Causality Tests for Cross-Country Panels: A New Look at FDI and Economic Growth in Developing Countries., *Oxford Bulletin of Economics and Statistics*, 63(2), 153–171.

Quazi R., M., and M. Mahmud (2004), "Determinants of Foreign Direct Investment in South Asia" *College of Business prairie View A &M University Prairie View*, Texas.

Salman, A., & Feng, H. X. (2010). FDI in Pakistan: Impact on GNP and capital financial account. Paper presented at the Financial Theory and Engineering (ICFTE).

Seyed Mohammad Alavinasab (2013),Determinants of Foreign Direct Investment in Iran *International Journal of Academic Research in Business and Social Sciences February 2013, Vol. 3, No. 2)*

Yelda Yücel(2005) Empirical examination of Turkish foreign trade 1950-2003

World Bank Report. (2011). United Nations, New York

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