Foreign Remittances and Economic Growth in Pakistan: An empirical investigation

Ahmad, Najid and Ahmad, Arslan and Hayat, Muhammad Farhat

Bahauddin Zakariya University Multan, Sub-Campus D.G.Khan, Pakistan, University of the Punjab, Lahore, Pakistan, Bahauddin Zakariya University Multan, Sub-Campus D.G.Khan, Pakistan

July 2013

Foreign Remittances and Economic Growth in Pakistan: An empirical investigation

Najid Ahmad[1], Arslan Ahmad[2], Muhammad Farhat Hayat[3]

[1,3]Bahauddin Zakariya University Multan, Sub-Campus D.G.Khan, Pakistan
[2]University of the Punjab, Lahore, Pakistan

ABSTRACT

This paper investigates the impact of foreign remittances on economic growth of Pakistan. We use secondary time series data for the period of 1978 to 2011. The multiple regression analysis is used to identify the relationship among the variables. GDP is taken as dependent variable while foreign remittances, FDI, inflation and exchange rate as independent variables. Augmented Dickey Fuller (ADF) test is used to check the stationary of variables and all variables found stationary at level. Ordinary Least Squares technique is applied to check the relation among these variables. Results indicate that foreign remittances have positive and significant relation with GDP of Pakistan while inflation and exchange rate has negative effect on economic growth. Foreign direct investment has positive but insignificant relation with GDP of Pakistan. One percent increase in foreign remittances will raise GDP by 0.25 percent. Our model is free from hetroskedasticity and autocorrelation with satisfactory functional form that suggests the stability of our model. The CUSUM and CUSUMSQ are showing that our model is structurally stable within the 5% of critical bounds. Pakistan needs stable and visionary government to enhance foreign capital inflow to boost investment and economic growth.
KEYWORDS: Foreign remittances, Economic Growth, OLS, Pakistan

1. INTRODUCTION

Remittance means the transfer of funds from international migrants to their family members in their home country. It is different from other external capital inflow like foreign direct investment, foreign loans and aids. It is the largest source of foreign exchange earnings for developing countries. Many developing countries have experienced tremendous surge in the inflow of remittances in past two decades. They export manpower to generate remittances. Foreign remittances are the source of poverty reduction, better health care and education. Remittances are the main source of increasing investment and consumption in recipient countries. The increase in investment and consumption is the sign of economic development. Remittances support in poverty reduction. These flow to neediest group of the population. In this way remittances directly contribute in poverty reduction. These draw positive effect even fully consumed as these are better for the welfare of the society. Remittances can contribute to higher investment in human and physical capital. But if remittances are use for consumption not for investment as is the nature of the developing countries then these can be harmful. As they fail to create enough savings that are necessary for economic growth.

The basic aim of this paper is to investigate the relationship between economic growth and foreign remittances in Pakistan. For our study we take GDP as dependent variable while FDI, foreign remittances, inflation and exchange rate as independent variables. Economic development is the dream of every country of the world as it plays important role in the poverty reduction and improving of quality of life. Foreign direct investment, foreign remittances, inflation and exchange rate are the most important variables that are affecting the economic growth of Pakistan. Pakistan is among top ten remittance receiving countries. Remittances are increasing day by day that Pakistani migrants send to their home country. This surge of flow provides support to balance of payments and poverty reduction. Foreign exchange reserves are playing important role in the stabilization of financial sector of Pakistan.

The rest of the paper is structured as follows: Section 2 presents the literature review related to our study. Section 3 represents data collection, methodology and model specification. Section 4 discusses the empirical results. Section 5 offers concluding remarks and policy implication.

2. LITERATURE REVIEW

In this section we will discuss briefly the previous work related to our study. We find extensive literatures on the relationship of foreign remittances and economic growth as it is a global phenomenon and there have been

---

[*]**Corresponding Author:** Najid Ahmad, Bahauddin Zakariya University Multan, Sub-Campus D.G.Khan, Pakistan
Email Address: najid_2iqbal@yahoo.com

debate about the relation with economic growth of the country like Junaid Ahmed (2011) finds the impact of remittances, exports and money supply on economic growth in Pakistan. He uses time series data for the period of 1976-2009. The author finds positive and significant impact of remittances on economic growth of Pakistan in short and long run while Muhammad Javid (2012) documents the importance of remittances for the economic progress of the country. His analysis is based on district wise poverty alleviation. It is found that overseas migrants are positively contributing in poverty reduction of three provinces (Punjab, Sindh and Balochistan). He adds that in the long run remittance inflow leads to growth of the country and plays important role in poverty reduction.

Tehseen Jawaid (2012) sheds light on the importance of foreign remittances for the economic growth of Pakistan. He uses 113 countries data for the period of 2003-2009 for his analysis. His findings suggest positive and significant relation between foreign remittances and economic growth of these countries. His findings show that low and middle income countries are converging to each other fastly as compared to high income countries. Yaseer Abdih (2012) also talks about the remittances in his paper. Pablo Acosta (2007) explores the importance of remittances for economic progress of the country. The author finds impact of remittances on poverty, education and health in 11 Latin American countries. His findings show that remittances play important role in poverty reduction. It has positive and significant effect on education and health.

The relationship between inflation and economic growth has been source of contention among economists. There are different views of the economists about this relation. Najid Ahmad (2012) investigates the relationship between inflation and economic growth of Pakistan. He uses time series data for the period of 1971-2011. With the help of OLS technique he finds positive and significant relation between GDP and inflation in Pakistan. Further he adds that one percent increase in inflation will raise GDP by 0.45%. Inflation raises productivity and this increased productivity will reduce the prices of goods and services that are good sign for the economy. But inflation must be moderate for the betterment of the economy. Rapid growth is not possible without some inflation. Shazad Hussain (2011), Nasir Iqbal (2009), Naseer (2012) and Mubarik (2005) also find positive relation between inflation and economic growth.

Najid Ahmad (2012) finds negative relation of inflation and GDP of Pakistan. For his study he uses GDP as dependent variable while inflation, investment, exports and population as independent variables. He finds positive relation with GDP of all variables except inflation. He says that inflation is monetary phenomenon and State Bank of Pakistan should take serious steps to control it as it is necessary for the economic growth of the country. Bruno and Easterly (1998), Huybens (1999), Quartey (2010), Atish Gosh (1998) and Barro (1995) also finds negative and significant relation between inflation and economic growth in their studies. Farhan Ahmad (2012) investigates the relation between inflation and output growth in South Asian Countries for the period of 1960-2010. The author finds no relation between inflation and growth. Mohammad Ali (2012) also talks about the inflation.

If we talk about the relation between foreign direct investment and economic growth of the country. We find different views of the economists. Najid Ahmad (2012) invistigates the causal relation between foreign direct investment and GDP of Pakistan by using time series data for the period of 1971-2007. He uses co-integration and error correction model for his analysis. The author finds positive and significant relation between FDI and GDP of Pakistan in the short and long run. He says that if we want economic growth in Pakistan then we must encourage foreign investors. Najid Ahmad (2013) sheds light on the importance of foreign direct investment. He takes GDP as dependent variable while FDI and trade deficit as independent variables. For his analysis he uses Johansen cointegration and error correction model. He finds positive and significant relation between GDP and foreign direct investment. He says if we want to keep pace with the world then we must make such type of policies that attract foreign investors. Iqbal Mahmood (2011), Abdul Khaliq (2007) and Niazi (2011) is in a view that foreign direct investment is necessary for the economic growth of the country. Without sufficient amount of foreign direct investment it is impossible to make progress.

Jinzhao Chen (2012) studies the role of exchange rate on the economic growth in China. He takes data from 28 province for the period of 1992-2008. The author finds positive effect of exchange rate on economic growth. Abu Bakaar (2010) sheds light on the improtance of real exchange rate on economic grwoth of Sierra Leone. Granger Causality test is employed to check the relationship between exchange rate and economic growth. The author finds exchange rate is positively related with economic growth. He suggests that monetary policy is more better than fiscal policy for economic growth in the long run. Danson (2012) examines the impact of exchange rate on the economic growth of Kenyan and finds negative relation between exchange rate and economic growth. Qichun (2012) says exchange rate changes with economic growth of the country. China adopted fixed exchange rate and achieved high economic growth with stability. Zahoor Hussain (2009) explores the relationship between exchange rate and economic growth in Pakistan. He finds long run positive relationship between exchange rate and economic growth in Pakistan. He suggests stable exchange rate policy for the economic growth of the country. Ghulam Mujtaba (2012) investigates effects of exchange rate on FDI in Asian countries. Mehnaz (2012) talks about the

relation of real exchange rate instability on non petroleum exports in Iran. Yin-Wong Cheung (1998) also talks about economic growth and exchange rate.

3. DATA COLLECTION AND METHODOLOGY

We focused on secondary time series data for our study. It is collected for the period of 1978 to 2011 from official economic survey of Pakistan and world development indicator. Multiple regression analysis is used to find the relationship between the variables. Economic growth is treated as a dependent variable. Foreign remittances, FDI, inflation and exchange rate as independent variables.

The econometric model is given below:

$Ln(EG_t)=\beta_0+\beta_1 ln(REM_t)+\beta_2 ln(FDI_t)+\beta_3 ln(INF_t)+\beta_4 ln(EXC_t)+\mathcal{E}_t$

Where

EG=Economic Growth
REM=Remittances
FDI=Foreign Direct Investment
INF=Inflation
EXC=Exchange Rate
$\mathcal{E}_t$=Stochastic Error Term
$\beta 0$, $\beta 1$, $\beta 2$, $\beta 3$, $\beta 4$ are the respective parameters.

4. EMPIRICAL RESULTS

Table 1: Descriptive Statistics

Variable	Obs	Mean	Standard deviation	Min	Max
Ln(EG)	34	1.51225	0.5296506	0.0142934	2.323926
Ln(REM)	34	21.64247	0.6533497	20.71926	23.22757
Ln(FDI)	34	19.7238	1.424842	17.19844	22.42656
Ln(INF)	34	2.037369	0.4812322	1.069573	3.009937
Ln(EXC)	34	3.41387	0.7141263	2.292535	4.458332
Source: Author					

The table 1 represents the descriptive statistics of the model. The sample size comprises of 34 observations from the period of 1978 to 2011. The minimum and maximum value of ln (EG) is (0.014) & (2.32) respectively, whereas the mean value is (1.51) and standard deviation is (0.53). Ln (FDI) having minimum value (17.20), maximum value (22.43), mean value (19.72) and standard deviation (1.43). Ln (REM) having minimum value (20.72), maximum value (23.23), mean value (21.64) and standard deviation (0.65), mean (21.64) and standard deviation (0.65). The minimum and maximum value of Ln (INF) is (1.07) & (3.01), mean and standard deviation are (2.04) & (0.48) respectively. Moreover, minimum and maximum values of exchange rate are (2.29) & (4.46) and mean and standard deviation is (3.41) & (0.71) respectively.

Test of unit roots (ADF)

Table 2: Null Hypothesis: There is unit root; Alternative Hypothesis: There is no unit root

Variables	Trend	Drift	Conclusion
Ln(EG)	-3.627*	-2.804*	I(0)
Ln(FDI)	-3.630*	-1.751*	I(0)
Ln(REM)	-0.727	-1.629**	I(0)
Ln(INF)	-3.834 *	-2.183*	I(0)
Ln(EXC)	-1.706	-1.857*	I(0)
Source: Author			

Note: * denote significance at 5% and ** denote significance at 10%

Since all variables are integrated of order zero [I (0)], so we can use Ordinary Least Squares (OLS).

Test of Ordinary Least Squares Method

Table 3: OLS Test, taking ln (EG) as Dependent Variable (1978-2011)

Variables	Coefficient	Std. Error	T-Statistics	P-Values	R^2	DW
Constant	-4.684895	3.196735	-1.465525	0.1535	0.381428	2.137569
Ln(REM)	0.250318	0.145019	1.726105**	0.0950		
Ln(FDI)	0.230849	0.153504	1.503865	0.1434		
Ln(INF)	-0.379384	0.206059	-1.841143**	0.0759		
Ln(EXC)	-0.878955	0.289241	-3.038836*	0.0050		
Source: Author						

Note: * denote significance at 5% and ** denote significance at 10%

Economic growth is a dependent variable and independent variables are foreign remittances, FDI, inflation and exchange rate. It is found that foreign remittances has positive and significant effect on economic growth of Pakistan, hence (β_1=0.25). It means 1 % increase in foreign remittances will raise GDP by to 0.25%. Foreign direct investment positively but insignificantly effect economic growth. Both inflation and exchange rate have negative and significant affect on economic growth of Pakistan. One percent increase in inflation will decrease GDP by 0.38 percent. And one percent increase in exchange rate leads to decrease GDP by 0.88 percent. The value of R^2 (i.e. the coefficient of determination) is 0.381428 that means 38.1% of the variations in the dependent variable (i.e. ln EG) are due to independent variables and others are due to error term. The model is free from the problem of autocorrelations (DW value =2.14). Stochastic Error Term (ε_t) is normally distributed (Appendix-A)

Table 4: Diagnostic Tests

| Item	Test Applied	CHSQ (χ^2)	Probability value
Serial correlation	Lagrange Multiplier Test	0.22639	0.634
Functional Form	Ramsey's reset test	1.0345	0.309
Normality	Test of skewness and Kurtosis	3.4690	0.176
Heteroscedasticity	White Test	2.8701	0.090
Source: Author			

Table 4 reports about the diagnostic tests. The results of diagnostic test demonstrate that our model is free from serial correlation and hetroscedasticity. Functional form is up to mark and normality assumption is also satisfied.

Figure 1: Plot of Cumulative Sum of Recursive Residuals
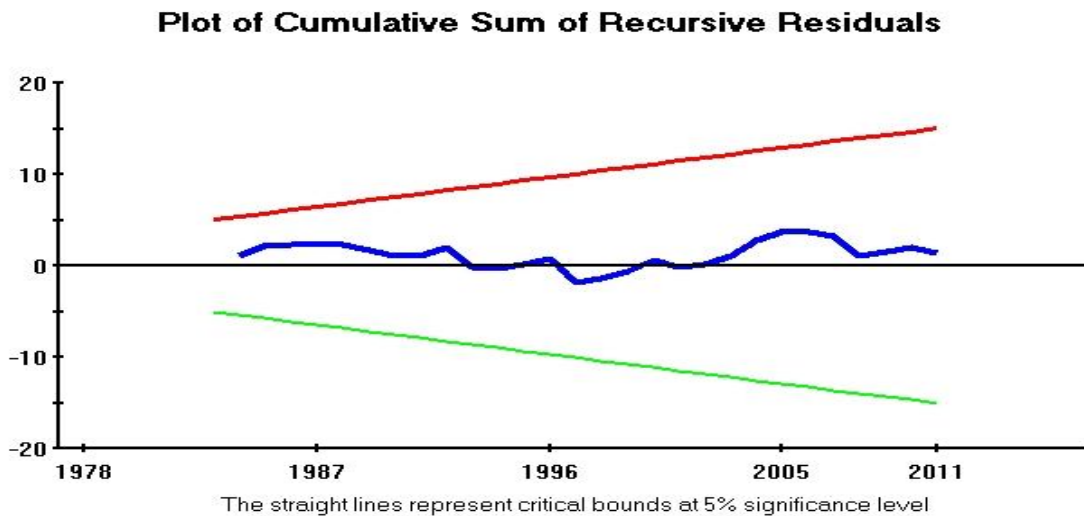
Source: Author

Figure 2: Plot of Cumulative Sum of Squares of Recursive Residuals

Plot of Cumulative Sum of Squares of Recursive Residuals

The straight lines represent critical bounds at 5% significance level
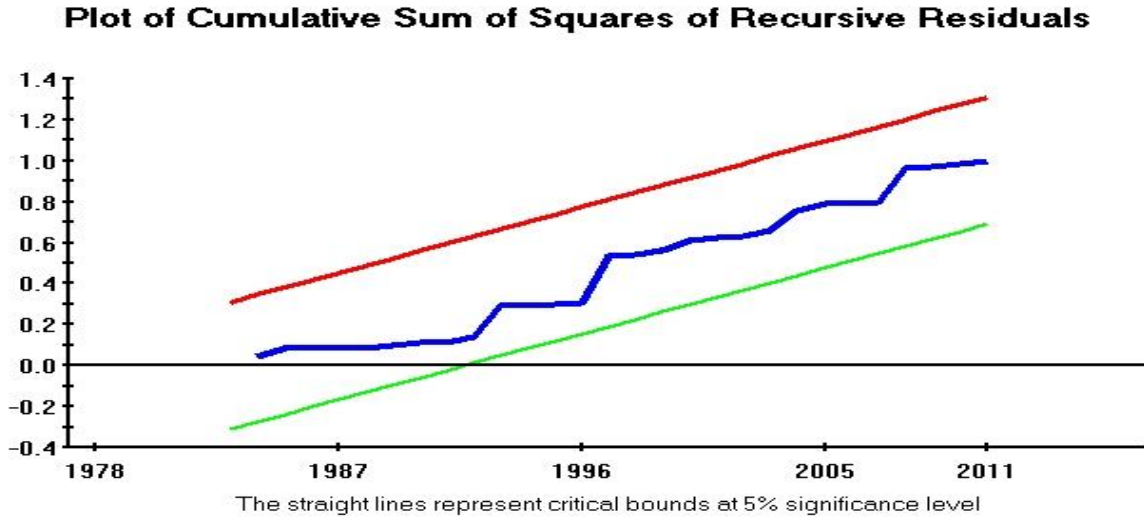
Source: Author

The above graphs show that both CUSUM and CUSUMQ are lying within the critical bounds so our model is structurally stable.

5. CONCLUSION AND POLICY IMPLICATION

The study examines the impact of foreign remittances on the economic growth of Pakistan by using the yearly data for the period of 1978–2011. Multiple regression technique is used to check the relationship between dependent variable (Economic Growth) and independent variables (FDI, Remittances, inflation and exchange rate). Augmented Dickey Fuller test shows that all variables are stationary at level. So OLS technique is used to check the relation between the dependent variable and independent variables. The results of OLS show that foreign remittances have positive and significant affect on economic growth of Pakistan. One percent increase in foreign remittances will raise GDP by 0.25%. Inflation and exchange rate have negative and significant effect on economic growth of Pakistan. FDI have positive but insignificant relation with economic growth (GDP) of Pakistan. These findings are consistent with the theoretical literature. Diagnostic tests confirm that our model is free from hetroskedasticity and autocorrelation while error term is normally distributed that show the stability of our model.

Pakistan is developing country so increase in foreign capital inflows will positively affect the level of investment; the consumption level and economic growth. Many families living in Pakistan depend on foreign remittances receiving from their family members who are working in different countries across the globe. It has great impact on their health, education and livelihood. In this way efficiency of the Pakistani people increase and they can earn more and more. The educational improvement is linked to remittances inflow. As when growth rate of working population is higher a qualified labor force becomes ambassador in foreign countries. They contribute to foreign exchange reserves. But for this Pakistan needs stable and visionary government to enhance foreign flow of money in the economy to boost investment and economic growth.

REFERENCES

Junaid Ahmed, K. Z. (2011). An empirical analysis of remittances-growth nexus in Pakistan using bounds testing approach. *Journal of Economics and International Finance* , 176-186.

Muhammad Javid, U. A. (2012). Impact of remittances on economic growth and poverty. *Academic Research Journal* , 433-447.

Pablo Acosta, P. F. (2007). The impact of remittances on poverty and human capital: Evidence from Latin American household surveys. *World Bank Policy Research Working Paper 4247* , 01-36.

Raza, S. T. (2012). Remittances, Growth and Convergence:Evidence from Developed and Developing Countries. *MPRA working paper No. 39002* , 01-20.

Yaseer Abdih, A. B. (2012). Remittances Channel and Fiscal Impact in Middle East, North Africa, and Central Asia. *IMF Working Paper WP/12/104* , 01-39.

Najid Ahmad, M. L. (2012). A dynamic analysis of the relationship among inflation, investment, population growth, export and economic growth in Pakistan. *Asian Journal of Research in Business Economics and Management* , 175-182.

Shahzad Hussain, S. M. (2011). Inflation and Economic Growth: Evidence from Pakistan. *International Journal of Economics and Finance* , 262-276.

Mubarik, Y. A. (2005). Inflation and Growth: An Estimate of the. *SBP-Research Bulletin* , 35-44.

Nawaz, N. I. (2009). Investment,Inflation and Economic Growth Nexus. *The Pakistan Development Review* , 863-874.

Michael Bruno, W. E. (1998). Inflation crises and long-run growth. *Journal of Monetary Economics* , 03-26.

Huybens, E. and B.D Smith. (1999) Inflation , Financial markets and long run real activity. *Journal of Monetary Economics.*

Quartey, P. (2010). Price Stability and the Growth Maximizing Rate of Inflation for Ghana. *Scientific Research Journal* , 180-194.

Atish Ghosh, S. P. (1998). Warning: Inflation May Be Harmful. *International Monetary Fund* , 662-710.

Barro, R.J. (1995). Inflation and Economic Growth. *National Bureau of Economic Research (NBER) Working Paper* No. 5326.

Joyia, N. A.-t. (2012). The relationship between inflation and economic growth in Pakistan: An econometric approach. *Asian Journal of research in business economics and management* , 38-48.

Abdul Khaliq, I. N. (2007). Foreign Direct Investment and Economic Growth: Empirical Evidence from Sectoral Data in Indonesia. *Indonesia Journal and Review* , 01-27.

Niazi, G, S, K (2011). Does an Inflation and Growth of a country affect its Foreign Direct Investment? *Journal of Management, Economics & Finance* , 84-90.

Iqbal Mahmood, M. E. (2011). Macroeconomic variables and FDI in Pakistan . *European Journal of Scientific Research* , 388-393.

Najid Ahmad, M. F. (2012). The causal links between foreign direct investment and economic growth in Pakistan. *European Journal of Business and Economics* , 20-21.

Najid Ahmad, U. A. (2013). Relationship between trade deficit and economic growth in Pakistan: An econometric investigation. *Australian journal of basic and applied sciences* .

Chen, J. (2012). Real exchange rate and economic growth: evidence from Chinese Provicial data (1992-2008). *Paris School of Economics Working paper No: 2012-05* , 01-27.

Danson Musyoki, G. P. (2012). The impact of real exchange rate volatility on economic growth: Kenyan evidence. *Business and Economic Horizons* , 59-75.

Farooq, Z. H. (2009). Economic growth and exchange rate volatility in case of Pakistan. *Pakistan Journal of life and social sciences* , 112-118.

He, Q. (2010). Expanding varieties in the nontraded goods sector and the real exchange rate depreciation. *Journal of international and global economic studies* , 19-38.

S.Lai, Y.-W. C. (1998). Economic growth and stationarity of real exchange rates: Evidence from some fast-growing Asian Countries. *Pacific Basin Finanace Journal* , 61-76.

Tarawalie, A. B. (2010). Real exchange behaviour and economic growth: evidence from Sierra Leone. *SAJEMS NS 13 (2010) NO 1* , 08-23.

Aboutorabi, M. A. (2012). The Effect of Inflation on Financial Development: The Case of Iran. *Journal of Basic and Applied Scientific Research* , 8394-8400.

Farhan Ahmed Mughal, N. A. (2012). Inflation, Inflation Uncertainty and Output Growth, Are they related? A study on South East Asian Economies, 1960-2010. *Journal of Basic and Applied Scientific Research* , 6108-6114.

Ghulam Mujtaba Chaudhary, S. Z. (2012). Do Exchange Rate Volatility Effects Foreign Direct Investment? Evidence from Selected Asian Economies. *Journal of Basic and Applied Scientific Research* , 3670-3681.

Mahnaz Dolatti, B. E. (2012). The Effect of Real Exchange Rate instability on Non-Petroleum Exports in Iran. *Journal of Basic and Applied Scientific Research* , 6954-6961.

Naseer Seifollahi, F. A. (2012). Any Relation between Nominal Interest Rate and Inflation Rate upon Fisher Effect. *Journal of Basic and Applied Scientific Research* , 4000-4007.

APPENDIX-A

A1: The Error Term (ε_t) of the model is normally distributed
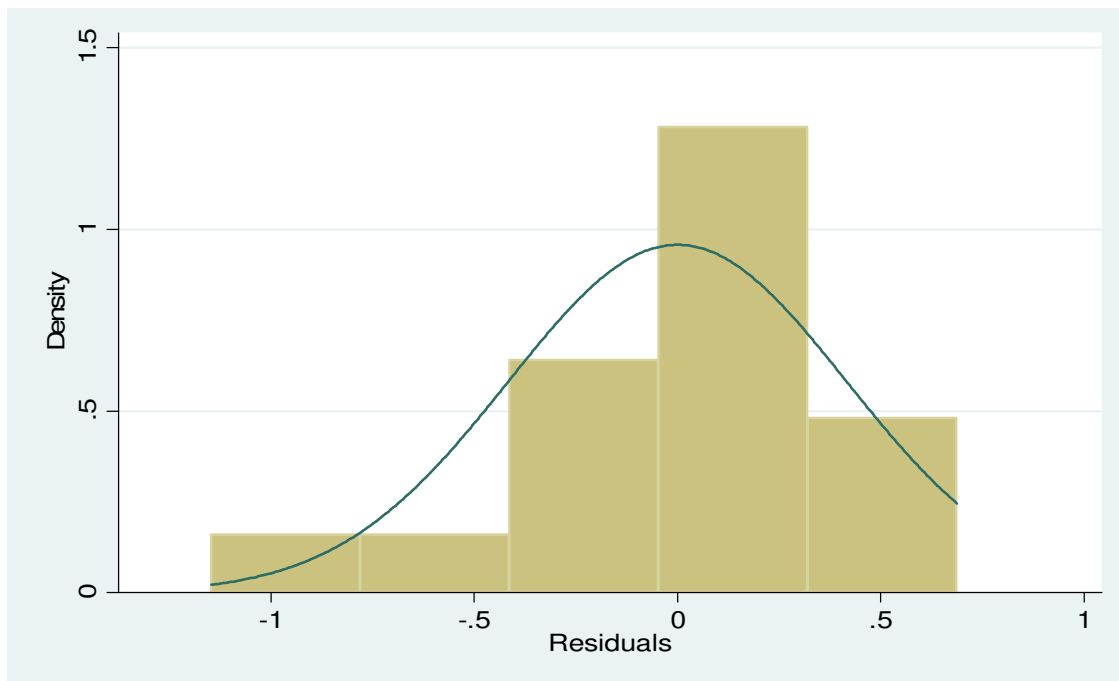
Source: Author

A2: Correlation Matrix

Variables	Ln(EG)	Ln(REM)	Ln(FDI)	Ln(INF)	Ln(EXC)
Ln(EG)	1				
Ln(REM)	-0.0400	1			
Ln(FDI)	-0.3759	0.5601	1		
Ln(INF)	-0.1210	0.2877	0.3238	1	
Ln(EXC)	-0.4941	0.5042	0.8930	0.0559	1
Source: Author					