SENSITIVITY ANALYSIS OF FOREIGN PRIVATE INVESTMENT IN NIGERIAN ECONOMY: A WALD TEST APPROACH

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ABSTRACT
The focus of this research work is to carry out an empirical study of the determinants of foreign private investment in Nigerian economy spanning from 1970-2008. Variables like Real Foreign Private Investment (RFPI), Interest Rate (INTR), Inflation Rate (INFR), Exchange Rate (EXR) and Real Gross Domestic Product (RGDP) were used for the study. The data employed in the study is secondary data from Central Bank statistical bulletin, golden jubilee 2010. In order to achieve the objectives of the study, the Vector Autogression (VAR) model approach was used. The study revealed that there is positive correlation between interest rate, inflation rate, exchange rate, real gross domestic product and foreign private investment in Nigerian economy. Based on the findings, the study recommended among others that: the macro-environment should be strengthened, socio-political instability should be addressed and policies towards enhancing the determinants of foreign investment should be pursued in the Nigerian economy.

INTRODUCTION

Foreign Private Investment (FPI) has now assumed an important role in the growth and development of various economies especially developing countries such as Nigeria. It is greatly important because it constitute an avenue by which less developed countries such as Nigeria can improve on the investment conditions and consequently their economic growth.

In order to seek the highest of return for capital, economists tend to favour the free flow of capital across national boarders. It is against this backdrop that multinational companies seek investment in foreign countries with reasonable risk. Nigeria is believed to be a high-risk market for investment because of factors such as bad governance, unstable macro economic policies, poor power supply to mention a few.

Foreign Private Investment (FPI), according to Thirwall (1994) as cited in World Bank Africa data base (2004), foreign private investment is described as multinational companies with headquarters in developed countries. The investment involves not only a transfer of funds (including the reinvested profits) but also a whole package of physical capital, techniques of production, managerial and marketing expertise, production, advertising and business practices for the maximisation of profits (CBN, 2003).

In order to avert the problem of capital shortage and inadequate capacity, international capital flows readily comes into mind. International Capital Flows (ICF) has now become an important means of helping developing countries such as Nigeria to overcome their capital shortage problem and also strengthening their quest for higher growth and development of their economy.

Foreign Private Investment (FPI) is composed of Foreign Direct Investment (FDI) and foreign portfolio investment. FDI is an investment in real assets where real assets consist of physical resources such as factories, land, capital goods, infrastructure and inventories. Foreign portfolio investment is an international investment in financial asset such as shares, debentures and cross-border investment in securities (World Bank, 2004).

Nigeria has high potential for attracting foreign investments, because of her inherited fundamental factors like: large market represented by a large population, endowed natural resources, mineral deposits especially oil and gas, vegetation and arable agricultural land. But inspite of all these, why has Nigeria being unable to attract as much foreign private investment like countries of Asia, Latin and Pacific America? What are those likely factors that determine the inflow of foreign private investment? Are those factors or determinants consistent with the level of FPI inflow in Nigeria?

The answers to the above questions constitute the focus of the study.

Since inception of the Nigeria independence in 1960, it is expected that Nigeria should have developed industrially via both foreign and local investors but that has always been a problem on the spines of the economy.

Based on unsatisfactory levels of foreign private investment inflow into Nigeria, especially when contrasted with trends such as global FPI inflows and flows into developing countries to which Nigeria belongs, it becomes important to situate the determinants of FPI flows, in order to make clear the reasons why the country has been receiving a small sum of FPI inflows.

Nigeria as a nation has enough resources to stand upright in foreign private investment (FPI) area considering her giant natural and human resources but leadership problem has been the greatest problem falling the country foreign private investment (FPI) and it has dragged the economy backward.

A lot of multinational companies has come and left the country as a result of environmental and unfavourable monetary policies. Nigeria as a nation lacks foresight as to generating materials for investors to use.

This study is therefore, carried out to examine multifaceted factors affecting foreign private investment in the Nigerian economy.

EMPIRICAL LITERATURE

Okojie (2006) in an empirical study of the determinants of foreign private investment in Nigeria, where secondary data were employed, adopted an aggregative econometric approach to analyse the determinants of foreign private investment in Nigeria. The variables employ are Real Foreign Private Investment (RFPI) as the dependent variable and inflation rate (INFL), Industrial Trade Dispute (ITD), Real Gross Domestic Product (RGDP), Interest Rate (INTR) and Trade Openness (OPEN) as the independent variables. The finding shows that parameters INTR and OPEN conformed to the apriori expectation and others like INFL and RGDP did not conform with the apriori expectation. The conclusion is that INFL and RGDP should be improve upon so that all can contribute to foreign private investment because it is believed that foreign private investment can lead to growth and development of a nation economy.

Meier (1995), in his work titled: "Private Foreign Investment in Developing Countries: Policy Perspective", employed both descriptive and empirical analysis for the study. The regression model of ordinary least square was applied in evaluating the relationship between foreign direct investment and major economic indicators such as gross domestic product (GDP), gross fixed capital formation (GFCF) and Index of Industrial Production (IIP). The model revealed a positive relationship between foreign direct investment and each of these variables, but that foreign direct investment has not contributed much to the growth and development of Nigerian economy.

Odozi (1995), in an empirical work titled: An overview of foreign investment in Nigeria, made use of time series data for the study. Ordinary least square (OLS) methodology which include tests for stationarity and cointegration was employed. The variables used are cumulative foreign private investment (CFPI), index of energy consumption (INDEXEC), total banking system credit to domestic economy (BSTCr), gross national saving (GNS), domestic inflation rate (INFR), maximum lending rate (MLR), foreign exchange rate (EXCHR) and debt service ratio (DSR) on capital formation. The finding shows that INDEXEC, CFPI and BSTCr has positive influence on capital formation while GNS, INFR, MLR, EXCHR and DSR has negative influence on capital formation. The study therefore concluded that foreign exchange rate leads to capital formation in Nigeria, and that index of energy consumption and debt service ratio must be built upon for better performance.

Asiedu (2006), in his work titled: the determinants of foreign direct investment in Nigeria, employed secondary data for the study. Ordinary least square (OLS) technique was employed to analyse the work. The variables used are inflation rate, efficiency legal system, corruption and political instability on foreign direct investment. The finding shows that low inflation rate and efficient legal system promote or has positive influence on foreign direct investment while corruption and political instability has negative influence on foreign direct investment. The work concluded that everything should be made possible to encourage low inflation rate so as to promote foreign direct investment in Nigeria.

Anyanwu (1998), in his empirical work titled: the determinants of FDI in Nigeria, used time series data and econometric technique on annual data of Nigeria. The variables employed are country's natural resources export, openness market size, inflation rate and exchange rate on FDI inflow in Nigeria. The finding shows that natural resource export complied with apriori expectation while inflation rate did not. The conclusion is that inflation rate should be improve upon so as to contribute to FDI inflow in Nigeria.

Chete (1998), in his research work titled: the determinants of foreign direct investment in Nigeria employed secondary data for the study and he made use of multiple regression technique to analysis the variables. The variables used are gross domestic product (GDP), inflation rate (INF) and saving rate (SAV) on foreign direct investment (FDI). The finding shows that GDP, EXR and INF has positive correlation with FDI while GCF and SAV has negative influence on FDI. In conclusion, GCF and SAV must be improve upon to contribute positively to FDI and to encourage the inflow of FDI in Nigeria.

With the findings, it is expedient that some major variables were exonerated from their research work. Considering also the methodology employed in their works which was the ordinary least square (OLS) approach. Odozi (1995) also used ordinary least square method which included test for stationarity and cointegration. All these caused limitation to their works. On this note, this research work considered major determinants of foreign private investment (FPI) which includes inflation rate (INFL), Exchange rate (EXR), Interest rate (INTR), Real Gross Domestic Product (RGDP) on foreign private investment was also employed as the methodology, this has not been used by any researcher on the subject under consideration.

THEORETICAL FRAMEWORK

In the words of Guido (2001), in the accelerator investment called Simple Accelerator Principle, postulated that current net investment is a function of growth in aggregate demand. In other words, the theory assumed investment to be an endogenous variable in the national income determination instead of the conventional assumption of investment being taken as exogenous variable. The two versions of the theory that can be distinguished are Fixed accelerators and Flexible accelerator

The fixed accelerator is characterised by two distinguishing features based on the underlying assumption. In the first case, there is an assumed fixity of the ratio of current desired capital stock to current output. This can be expressed as:

$K = \gamma t$ …… (i)

where k is the desired capital stock and γt is current level of output.

By expressing equation (i) we have

$Kt = K \gamma t$ …… (ii)

Where Kt = firm's desired capital stock

K = factor of proportionality (accelerator co-efficient)

Equation (ii) therefore express a firm desired capital stock as a proportion of the output in the current period where K is the factor of proportionality. The stability otherwise of equation (ii) depends on the value of K, the actual value of which is a function of time period within which the analysis is carried out. This longer time frame for the analysis makes the value of K approach zero.

The second version of the fixed accelerator model can be derived by assuming that investment equals the value of the discrepancy between the capital stock desired in the current period and the actual capital stock in the previous period.

Under this assumption we have:

$It = kt - kt - 1 = K$ ……... (iii)

A net investment rate that guarantees the optimally of capital stock would yield.

$Kt - 1 = Kt = K \gamma t - 1$ ……... (iv)

Substitution of (i) into (iii) gives

$It = K \gamma t - K \gamma t - 1 = 1 \gamma t$ ……. (v)

The equation (v) is the accelerator expression, which relates net investment to a change in the level of output. It specifies net investment as being proportional to the discrepancy between the actual level of income in the current period and the level of income in the immediate past period. The factor of proportionality being K, the assumed fixed capital output ratio. This constant is known as the accelerator and provided it is positive even a small change in output is expected to have an "accelerated" effect on net investment.

By re-expressing equation (v) in gross rather than net term would yield $1 \gamma t = K(\gamma_t - \gamma_{t-1}) + It$ …… (vi)

Equation (vi) shows that gross investment is proportional to the discrepancy between the correct level of income and the level of income in the previous period plus disposable investment, being the investment that is made to accommodate the depreciation suffered by capital goods in the course of usage.

METHODOLOGICAL FRAMEWORK

Model Specification

Based on the theoretical framework and literature review with a special reference to Guido (2001) in the acceleration investment called simple accelerator principle, the model for this study is stated as:

$\gamma_t = f(INFL, EXR, INTR, RGDP)$

$\gamma_t = \beta_0 + \beta_1 INFL_t + \beta_2 EXR_t + \beta_3 INTR_t \beta_4 RGDP_t + \mu_t$

Identification and Choice of Variables

γ_t = Net flow of foreign private investment at time t

INF_t = Inflation rate at time t

EXR_t = Exchange rate at time t

$INTR_t$ = Interest rate at time t

$RGDP_t$ = Real Gross Domestic Product representing the market size at time t

β_0 = Intercept of the relationship

$\beta_1, \beta_2, \beta_3$ and β_4 = Estimated coefficients or parameters

μ_t = Stochastic or error term

The choice of these four basic independent variables is due to the fact that, they are the major determinants of Foreign Private Investment that are commonly found in literature.

The wald test otherwise known as Vector autoregressive model approach (VAR) is adopted in this study. VAR according to Peasaran et al (2001), asserted that this technique allows a mixture of I(I) and I(O) variables as regressors. That is the order of integration of relevant variables may not necessarily be the same. Therefore the model can be specified as:

$$Z_t = \mu + \sum_{j=1}^{p} \beta_t Z_{t-1} + \Sigma_t$$

Where

Z_t = Vector of both X_t and γ_t

X_t = Independent variables which are f($INFL_t$, EXT_t, $INTR_t$, $RGDP_t$) which is the vector matrix that represents a set of explanatory variables.

γ_t = represent Net flow of foreign private investment ($RFPT_t$) time t which is the dependent variables.

Apriori Expectation

Based on the conventional theories, it is expected that parameter β_1 of inflation rate is expected to appear with negative sign, since inflation rate has negative or is inversely related to the FPI. Parameters β_2, β_3 and β_4 of exchange rate, interest rate and real gross domestic product are expected to appear with positive sign because they work together with foreign private investment in the economy. This can be symbolically represented as:

$$\frac{\partial\gamma_t}{\partial INFL_t} = \beta_1<0 \qquad \frac{\partial\gamma_t}{\partial EXT_t} = \beta_2>0$$

$$\frac{\partial\gamma_t}{\partial INTR_t} = \beta_3>0 \qquad \frac{\partial\gamma_t}{\partial RGDP_t} = \beta_4>0$$

Estimation Techniques

The estimation technique employed for the study is the wald test approach otherwise referred to as Vector Autoregressive (VAR) model which is discussed as follows:

Stationarity Test

In this study, unit root test is conducted on the variables in order to ascertain the stationarity status of the variables. The stochastic characteristics of each time series were tested at levels for stationarity by considering their order of integration. This helps to determine the subsequent long-run relationship among the variables. The study used Philip-Perron Unit Root Test for this purpose because Philip-Perron (PP) test statistic takes into account the less restrictive nature of the error process. Also, the use of Philip-Perron unit root test replaces the use of lag in the Augumented Dickey Fuller Unit Root Test (ADF) (Gujarati, 2009).

Co-Integration Regression and vector Error Correction Model.

After conducting the stationarity test, we test for co-integration among the series. Co-integration indicates the presence of a linear combination of non-stationary variables that are stationary. In a case where co-integration does not exist, it means that linear combination is not stationary and the variable does not have a mean to which it returns (Koutsoyiannis, 1997). The procedure adopted in this study is a representation of the approach of analysis of multivariate co-integrated system.

Impulse-Response Function

The wald test or Vector Autoregressive model is the best method for investigating shocks transmission among variables. A shock to the i-th variable not only directly affects the i-th variable but is also transmitted to all of the other endogenous variables through the dynamic (Lag) structure of the VAR (Ilesanmi, 2004). An impulse-response function of the VAR traces the effect of a one time shock to one of the innovation on current and future values of the endogenous variables.

Variance Decomposition

Gujarati (2009) opined that while impulse-response function traces the effects of a shock to one endogenous variable which to the other variable in the VAR, variance decomposition separates the variation in an endogenous variable into the component shocks to the VAR. Thus, the variance decomposition provides information about the relative importance of each random innovation in affecting the variables in the VAR.

Sources of Data

The study depends on secondary data. Therefore, secondary data were collected on net flow of foreign private investment, inflation rate, exchange rate, interest rate and real gross domestic product represents the market size. The data collected covers 1970 to 2008. The relevant data from this study were obtained from the Central Bank of Nigeria (CBN) statistical bulletin 2010 edition.

EMPIRICAL RESULTS ANALYSIS AND DISCUSSION

Correlation Matrix of Selected Variables

Table 1.1

	RFPI	INTR	INFR	EXR	RGDP
RFPI	1.0000	0.8639	0.0250	0.8271	0.9893
INTR	0.0864	1.0000	0.5555	-0.1990	0.0440
INFR	0.0250	0.5555	1.0000	-0.3433	0.0143
EXR	0.8271	-0.1990	0.3433	1.0000	0.8553
RGDP	0.9893	0.0440	0.0143	0.8553	1.0000

Source: Author's Computation

The result in Table 1.1 gives a preliminary idea of the relationship among foreign private investment, interest rate, inflation rate, exchange rate and gross domestic product. A critical look at the table shows that RFPI, RGDP have positive relationship with other variables in the model while INTR has negative relationship with EXR. In addition, INFR also has negative relationship with EXR while EXR has positive relationship with RGDP.

Unit Root Test

Table 1.2

VAR	PP Statistic	5% critical value	PP statistical	5% critical value	Level of Integration
RFPI	-1.090668	-2.941145	-6.787984	-2.943427	1 (1)
INTR	-1.447584	-2.941145	-6.339246	-2.943427	1 (1)
INFR	-3.029452	-2.941145	–	–	1 (0)
EXR	-0.070956	-2.941145	-5.169702	-2.943427	1 (1)
RGDP	0.066731	-2.941145	-5.019337	-2.943427	1 (1)

Source: Author's Computation.

From Table 1.2, INFR was stationary at its level while RFPI, INTR, EXR and RGDP were made stationary after taking the first difference. According to Peasaran et al (2001), since the series have different order of integration, this creates a necessary condition for Vector Autoregressive model approach to examine the short-run dynamism of the model.

Co-integration Test and Results

Co-integration tests are conducted by using the reduced rank procedure developed by Johansen (1988) and Johansen and Juselius (1990). Johansen procedure is used to determine the rank r and to identify a long-run relationship. The co-integration test includes foreign private investment, inflation rate, interest rate, exchange rate and gross domestic product variables at one lag in the VAR.

Table 1.3: The Estimate of Johansen Procedure and Standard Statistics

Table 1.3: Johansen Co-Integration Test

Eigen Value	Likelihood Ratio	5% Critical Value	1% Critical Value	Hypothesized No of CE (S)
0.499593	59.15934	68.52	76.07	None*
0.306620	32.85068	47.21	54.46	At most 1
0.288135	18.93597	29.68	35.65	At most 2
0.139063	6.021036	15.41	20.04	At most 3
0.008676	0.331124	3.76	6.65	At most 4

Source: Author's Computation.

Notes: The * indicates rejection of likelihood ratio test at 5% and 1% significance levels. Likelihood ratio is trace test statistics, adjusted for degree of freedom. The test statistics strongly accepts the null hypothesis of no co-integration at 5% and 1% levels of significances respectively. This confirms that there is no long-run relationship existing among RFPI, INTR. INFR, EXR and RGDP in Nigeria.

The Wald Test or Vector Autoregressive (VAR) Results

Table 1.4: Vector Auto-Regressive Estimates (Endogeneity Test)

	RFPI	**INTR**	**INFR**	**EXR**	**RGDP**
RFPI (-1)	0.7772	3.4555	-0.6159	9.0709	0.2118
INTR (-1)	0.0015	0.3785	-0.0058	-0.2084	0.0013
INFR (-1)	0.0087	1.4904	0.9582	-0.6153	0.0184
EXR (-1)	-5.54E-0.5	0.0807	0.0034	0.7695	0.0034
RGDP (-1)	0.1704	-4.3089	0.2125	-1.9488	0.7821
C	0.112-1	18.5288	3.6945	-44.7296	0.6058
R^2	0.9891	0.4163	0.8716	0.9617	0.9962
F-stat	580.3941	4.5640	43.4410	160.8602	1663.9160

Source: Author's Computation.

The result in Table 1.4 shows that there is a strong relationship among the variables. The result portrays the level of exogeneity. Comparing the critical F-values and the R^2, the following deduction could be made:

1. RFRI, INTR, EXR and RGDP are more endogenous than exogenous having R^2 from 87% to 99.6% each. Less endogenous having R^2 of 41.6%.

Pairwise Granger Causality Test Results

Table 1.5: Pairwise Granger Causality Test Result

Null Hypothesis	**Obs**	**F-statistic**	**Probability**
INFR does not Granger cause RFPI	38	0.65379	0.42422
RFPI does not Granger cause INFR		0.09187	0.76360
INTR does not Granger cause RFPI	38	2.10787	0.15545
RFPI does not G ranger cause INTR		3.15051	0.08460
EXR does not Granger cause RFPI	38	0.08538	0.77186
RFPI does not Granger cause EXR		5.48546	0.02499
RGDP does not Granger cause RFPI	38	2.39221	0.13094
RFPI does not Granger cause RGDP		3.10984	0.08655
INTR does not Granger cause INF	38	4.69521	0.03714
INF does not Granger cause INTR		0.29379	0.59123
EXR does not Granger cause INF	38	0.40103	0.53067
INF does not Granger cause EXR		0.46798	0.49842
RGDP does not Granger cause INF	38	0.09540	0.75925
INF does not Granger cause RGDP		2.50741	0.12231
RGDP does not Granger cause INF	38	1.76281	0.19287
INTR does not Granger cause RGDP		0.01935	0.89016
RGDP does not Granger cause INTR	38	2.79311	0.10359
INTR does not Granger cause RGDP		2.03715	0.1636
RGDP does not Granger cause EXR	38	4.31871	0.04509
EXR does not Granger cause RGDP		0.02303	0.88026

Source: Author's Computation.

Pairwise Granger Causality test between foreign private investment and its determinants were examined in Table 1.4. The Pairwise Granger Causality test were inconclusive at 5% level of significance. The results alternated between bi-directional, no causality and uni-directional depending on the lag length allowed. The table reveals that exchange rate did not Granger cause Foreign Private Investment while Foreign Private Investment Granger caused Exchange Rate. That is, Exchange Rate determines foreign private investment in Nigeria.

Moreover, exchange rate did not Granger caused inflation rate in Nigeria. In the same vein, inflation rate did not Granger caused exchange rate. In addition, the table reveals that gross domestic product did not Granger caused inflation rate in Nigeria but inflation rate Granger caused gross domestic product confirming uni-directional causality running from inflation rate to gross domestic product. On the other hand, the table reveals that interest rate did not Granger cause gross domestic product while Gross Domestic Product Granger caused Interest Rate which signifies that Gross Domestic Product determines Interest Rate in Nigeria. In addition, Gross Domestic Product Granger caused Exchange Rate while Exchange Rate did not Granger caused Gross Domestic Product which implies that Gross Domestic Product determines Exchange Rate in Nigeria confirming that there is uni-directional causality running from gross domestic product to exchange rate. Table 1.4 also revealed that Inflation Rate Granger caused Foreign Private Investment while Foreign Private Investment did not Granger Cause Inflation Rate which signifies that Inflation Rate determines Foreign Private Investment in Nigeria.

Impulse – Response Function Result

Impulse – Response to One S.D. Innovations

The impulse –response analysis of VAR traces the effects of a one standard deviation shock to one of the innovation on current and future values of the endogenous variables. It is used to predict or forecast the response of each variable in the model to a standard deviation change on all other variables.

Visual observations of the impulse–response graph in appendix iv shows the following:

i). A standard deviation change in foreign private investment produces unstable effect on other variables in the model but drifted towards equilibrium at the 10^{th} period.

ii). A standard deviation change in INFR produced an initially unstable effect on other variables at initial stage but converged towards equilibrium and become stable at 6^{th} period upward.

iii). A standard deviation change in INTR diverged away from equilibrium without drifting towards equilibrium up to the 10^{th} period.

iv). A standard deviation change in EXR produced initially an unstable effect on other variables up to the 6^{th} period but it drifted towards the equilibrium position at 7^{th} period and later became stable at the 10^{th} period.

v). A standard deviation change in RGDP produced initially unstable effect on other variables but drifted towards equilibrium at 5^{th} period but did not coverage at equilibrium up till the 10^{th} period.

The summary of the impulse-response analysis is clear in sense that it confirms that RFPI, INTR, EXR, INF, RGDP are sensitive to one another in Nigeria. Each of the variables responds to shocks in others in a dynamic sense.

Variance Decomposition Results

This analytical method gives information about the relative importance of each random innovation or shock to the variables in the VAR. It decomposes the variation in each variable into the components shocks to other variables. The variance decomposition graph in appendix v shows the following:

i). 100 percent of the total variations in RFPI at the 1st period were from its own lag and it gradually reduced to about 57 percent at the 10th period.

ii). The total variations in INFR between 1st and 3rd period ranged from 83 percent to 72 percent from its own lag and it reduced to about percent at the 5th period which was sustained up to the 10th period.

iii). The total variations in INTR was about 95 percent between 1st and 2nd periods which sharply reduced to 60 percent at 4th period and slightly sustained up to the 10th period.

iv). The total variations received by EXR between 1st and 2nd period was about 98 percent from its own lags which sharply reduced to 40 percent at the 10th period.

v). The total variations in RGDP at 1st period was 85 percent from its own lags and it reduced to 38 percent at 6th period and sustained up to the 10th period.

Conclusion

Determinants of foreign private investment have since been seen as very vital in attracting foreign private investment (FPI) in Nigeria. Though there is no consensus about the impact of foreign private investment, but it is however believed that it can lead to growth and development. If this is true, then foreign private investment is desirable and important.

To enhance the flow of foreign private investment into Nigeria, policies relating to its determinants should be well addressed and assessed so as to improve on their positive impact.

Policy Recommendations

From the findings and conclusion of this study, the following recommendations are made:

Since both domestic and foreign private investment as indicated in this study, make a nation's economically thick and buoyant, it is therefore strongly recommended here that government must thoroughly set up high powered policy on foreign private investment to fashion out policies that will favour domestic and foreign private investment in Nigeria. Other recommendations are:

i). The macro-environment should be strengthened: that is the aggregate economic environment should be made favourable to encourage foreign private investment. The macro-environment include infrastructural facilities should be developed to enhance the inflow of foreign private investment in Nigeria.

ii). Policies towards enhancing the determinants of foreign private investment should be pursued as most policies in our society do not encourage the inflow of foreign private investment. Government and individuals and the society at large should create and pursue policy that will enhance and promote foreign private investment and its inflow in Nigeria.

iii). Moreso, government should assess its FPI policy regime so as to identify constraints and address them. The government should try all it could to always review its policies concerning foreign private investment and it inflow in order to amend or create new ones to encourage the flow of foreign private investment.

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Appendix I

OBS	RFPI	INFR	INTR	EXR	RGDP
1970	6.011000	13.80000	3.000000	0.714300	8.557400
1971	7.187500	16.00000	3.000000	0.695500	8.790300
1972	7.359500	3.200000	3.000000	0.657900	8.883000
1973	7.475200	5.400000	3.000000	0.657900	9.304800
1974	7.502200	13.40000	3.000000	0.629900	9.814600
1975	7.735200	33.90000	4.000000	0.615900	9.950200
1976	7.757500	21.20000	4.000000	0.626500	10.19080
1977	7.836400	15.40000	4.000000	0.646600	10.35840
1978	7.959700	16.60000	5.000000	0.606600	10.44990
1979	8.056100	11.80000	5.000000	0.595700	10.64420
1980	8.194300	9.900000	6.000000	0.546400	10.81240
1981	8.231600	20.90000	6.000000	0.610000	10.82980
1982	8.591000	7.700000	7.500000	0.672900	10.85230
1983	8.691100	23.20000	7.500000	0.724100	10.93870
1984	8.766900	39.60000	9.500000	0.764900	11.04250
1985	8.825300	5.500000	9.500000	0.893800	11.16530
1986	9.139200	5.400000	9.500000	2.023600	11.18250
1987	9.209700	14.00000	14.00000	4.017900	11.59160
1988	9.336000	14.50000	14.50000	4.536700	11.86790

1989	9.296500	16.40000	16.40000	7.391600	12.30230
1990	9.253000	18.80000	18.80000	8.037800	12.51320
1991	9.412800	14.29000	14.29000	9.905000	12.66560
1992	9.928800	16.10000	16.10000	17.29840	13.19250
1993	11.10930	16.66000	16.66000	22.05110	13.44170
1994	11.16640	57.00000	13.50000	21.88610	13.71460
1995	11.69020	72.80000	12.61000	21.88610	14.47550
1996	11.71670	29.30000	11.69000	21.88610	14.81020
1997	11.76240	8.500000	4.800000	21.88610	14.84580
1998	11.93430	10.00000	5.490000	21.88610	14.81660
1999	11.94590	6.600000	5.330000	92.69340	15.01350
2000	11.96740	6.900000	5.290000	102.1052	15.36890
2001	11.99750	18.90000	5.490000	111.9433	15.49710
2002	12.02350	12.90000	4.150000	120.9702	15.64520
2003	12.09220	14.00000	4.110000	129.3565	15.61750
2004	12.42610	15.00000	4.190000	133.5004	16.25010
2005	50560	17.90000	3.830000	132.1470	16.56350
2006	12.62100	8.200000	3.140000	128.6516	16.73680
2007	12.80490	5.380000	3.545000	125.8331	16.84360
2008	13.12000	11.60000	3.210000	118.5669	16.98700

Source: Central Bank of Nigeria (CBN) Statistical Bulletin 2010 Edition

Appendix II

Regression Results

Johansen Cointegration Test

Date: 09/08/10 Time: 13:59
Sample: 1970 2008
Included observations: 38
Test assumption: Linear determinants trend in the data
Series: RFPI INF INTR EXR RGDP
Lags interval: No lags

Eigen Value	**Likelihood Ratio**	**5% Critical Value**	**1% Critical Value**	**Hypothesized No of CE(s)**
0.499593	59.15934	68.52	76.07	None*
0.306620	32.85068	47.21	54.46	At most 1
0.288135	18.93597	29.68	35.65	At most 2
0.139063	6.021036	15.41	20.04	At most 3
0.008676	0.331124	3.76	6.65	At most 4

*(**) denotes rejection of the hypothesis at 5% (1%) significance level
L.R. rejects any cointegration at 5% significance level

Unnormalized Cointegrating Coefficients:

RFPI	INFR	INTR	EXR	RGDP
0.022022	-0.010915	-0.002089	-0.002923	0.32689
0.412736	-0.001891	-0.001214	-0.002532	-0.233904
0.389354	-0.004535	0.038641	-0.007246	-0.428964
-0.219066	-0.003183	0.033967	0.000529	0.180516
-0.071500	0.000894	0.008098	-0.003190	0.048319

Normalized Cointegrating Coefficients: 1 Cointegrating Equation(s)					
RFPI	INFR	INTR	EXR	RGDP	C
1.000000	-0.495611	-0.094876	-0.132717	1.484344	-13.39994
	(2.21488)	(0.64048)	(0.61924)	(10.4520)	
Log likelihood -347.1451					
Normalized Cointegrating Coefficients: 2 Cointegrating Equation(s)					
RFPI	INFR	INTR	EXR	RGDP	C
1.000000	0.000000	-0.002083	-0.004954	-0.585855	-2.256369
		(0.03211)	(0.00541)	(0.13418)	
0.000000	1.000000	0.187229	0.257789	-4.177067	22.48453
		(0.80525)	(0.16071)	(3.36550)	
Log likelihood -340.1877					
Normalized Cointegrating Coefficients: 3 Cointegrating Equation(s)					
RFPI	INFR	INTR	EXR	RGDP	C
1.000000	0.000000	0.000000	-0.004419	-0.597217	-2.147406
			(0.00574)	(0.13418)	
0.000000	1.000000	0.000000	0.209736	-3.155941	12.69232
			(0.14641)	(3.42469)	
0.000000	0.000000	1.000000	0.256655	-5.453894	52.30078
			(0.08303)	(1.94228)	

Appendix III

Pairwise Granger Causality Tests
Date: 09/08/10 Time: 13:54
Sample: 1970 2008
Lags: 1

Null Hypothesis:	Obs	F-Statistic	Probability
INF does not Granger cause RFPI	38	0.65379	0.42422
RFPI does not Granger cause INF		0.09187	0.76360
INTR does not Granger cause RFPI	38	2.10787	0.15545
RFPI does not Granger cause INTR		3.15051	0.08460
EXR does not Granger cause RFPI	38	0.08538	0.77186
RFPI does not Granger cause EXR		5.48546	0.02499
RGDP does not Granger cause RFPI	38	2.39221	0.13094
RFPI does not Granger cause RGDP		3.10984	0.08655
INTR does not Granger cause INF	38	4.69521	0.03714
INF does not Granger cause INTR		0.29379	0.59123
EXR does not Granger cause INF	38	1.40103	0.53067
INF does not Granger cause EXR		1.46798	0.49842
RGDP does not Granger cause INF	38	0.09540	0.75925
INF does not Granger cause RGDP		2.50741	0.12231
EXR does not Granger cause INTR	38	1.76281	0.19287
INTR does not Granger cause EXR		0.01935	0.89016
RGDP does not Granger cause INTR	38	2.79311	0.10359
INTR does not Granger cause RGDP		2.03715	0.16236
RGDP does not Granger cause EXR	38	4.31871	0.04509
EXR does not Granger cause RGDP		0.02303	0.88126

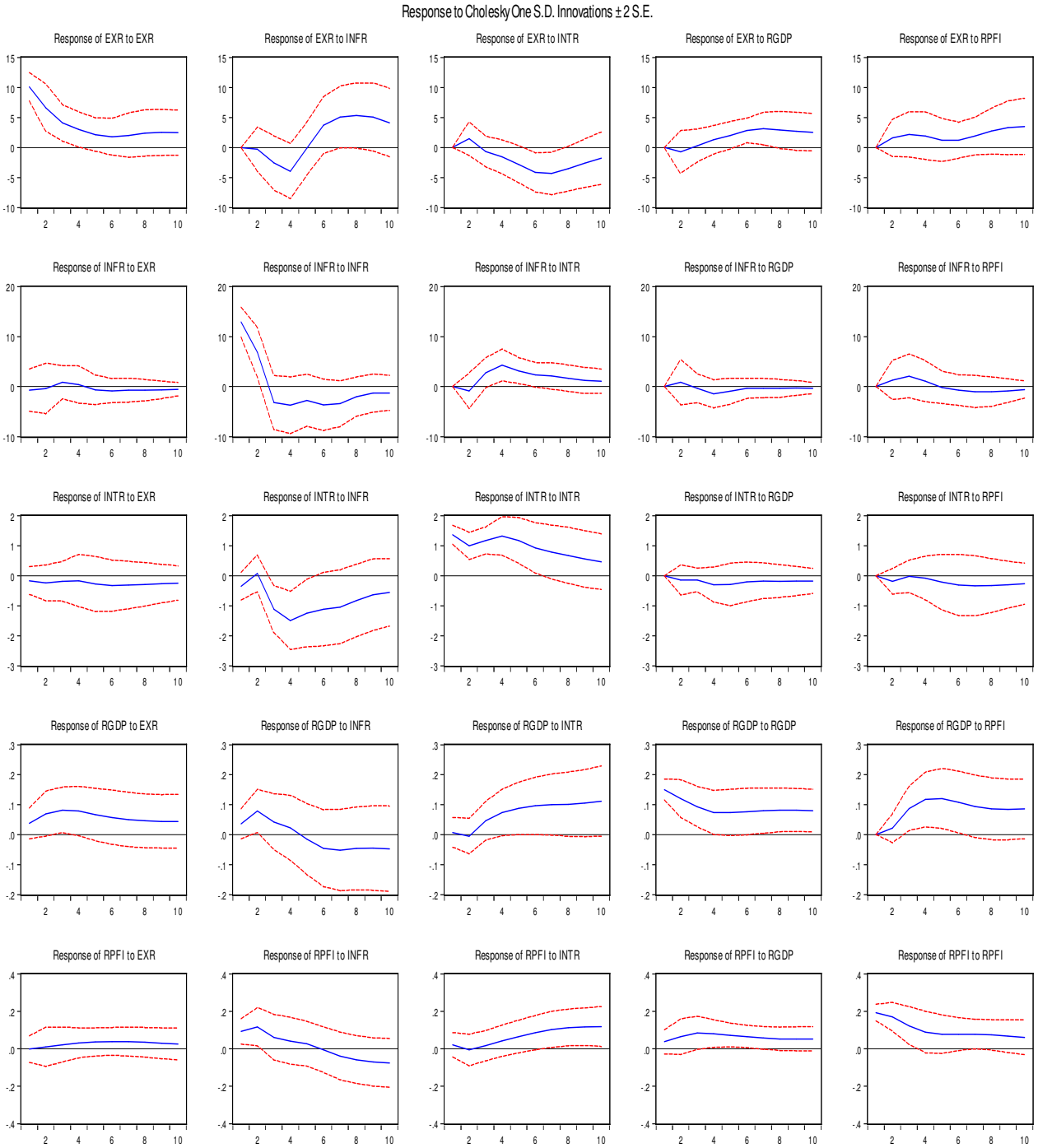
Appendix IV

Vector Autoregression Estimates
Date: 07/18/12 Time: 11:00
Sample (adjusted): 1972 2008
Included observations: 37 after adjustments
Standard errors in ( ) & t-statistics in [ ]

	EXR	INFR	INTR	RGDP	RPFI
EXR(-1)	0.696075	-0.031855	-0.006991	0.004115	0.000179
	(0.17253)	(0.22032)	(0.02415)	(0.00272)	(0.00372)
	[4.03447]	[-0.14458]	[-0.28943]	[1.51486]	[0.04798]
EXR(-2)	-0.073559	0.133685	0.009362	0.000667	-0.000545
	(0.16126)	(0.20593)	(0.02258)	(0.00254)	(0.00348)
	[-0.45615]	[0.64917]	[0.41466]	[0.26290]	[-0.15674]
INFR(-1)	-0.035816	0.450590	0.035593	0.002923	0.001611
	(0.15190)	(0.19398)	(0.02127)	(0.00239)	(0.00328)
	[-0.23579]	[2.32291]	[1.67367]	[1.22222]	[0.49163]
INFR(-2)	-0.284736	-0.460397	-0.098282	-0.003957	-0.003006
	(0.13938)	(0.17799)	(0.01951)	(0.00219)	(0.00301)
	[-2.04282]	[-2.58658]	[-5.03645]	[-1.80346]	[-0.99955]
INTR(-1)	0.982769	-0.746792	0.746943	-0.009825	-0.019618
	(1.00181)	(1.27932)	(0.14026)	(0.01577)	(0.02162)
	[0.98099]	[-0.58374]	[5.32557]	[-0.62293]	[-0.90758]
INTR(-2)	-2.033551	2.990102	0.312146	0.039298	0.034791
	(1.09140)	(1.39372)	(0.15280)	(0.01718)	(0.02355)
	[-1.86326]	[2.14541]	[2.04287]	[2.28722]	[1.47740]
RGDP(-1)	-7.024467	4.071790	-0.741538	0.771494	0.209270
	(11.8896)	(15.1831)	(1.66457)	(0.18718)	(0.25654)
	[-0.59081]	[0.26818]	[-0.44548]	[4.12176]	[0.81574]
RGDP(-2)	8.731615	-12.20003	0.200640	-0.101712	0.033847
	(10.9258)	(13.9524)	(1.52964)	(0.17200)	(0.23574)
	[0.79917]	[-0.87441]	[0.13117]	[-0.59134]	[0.14358]
RPFI(-1)	8.210757	6.737743	-0.987022	0.108458	0.878767
	(7.93852)	(10.1376)	(1.11141)	(0.12498)	(0.17129)
	[1.03429]	[0.66463]	[-0.88808]	[0.86784]	[5.13034]
RPFI(-2)	0.269065	1.043496	1.364638	0.207677	-0.188548
	(7.47983)	(9.55181)	(1.04720)	(0.11775)	(0.16139)
	[0.03597]	[0.10925]	[1.30314]	[1.76365]	[-1.16827]
C	-72.84626	23.48190	4.205685	0.930717	0.034086
	(20.2199)	(25.8210)	(2.83084)	(0.31832)	(0.43628)
	[-3.60270]	[0.90941]	[1.48567]	[2.92385]	[0.07813]
R-squared	0.972252	0.579951	0.937216	0.997004	0.990508
Adj. R-squared	0.961580	0.418394	0.913068	0.995851	0.986857
Sum sq. resids	2660.773	4339.056	52.15313	0.659441	1.238750
S.E. equation	10.11620	12.91847	1.416294	0.159258	0.218276
F-statistic	91.10181	3.589761	38.81183	865.1471	271.3125
Log likelihood	-131.5966	-140.6439	-58.85115	22.00397	10.34035

Akaike AIC	7.707926	8.196966	3.775738	-0.594809	0.035657
Schwarz SC	8.186847	8.675887	4.254660	-0.115888	0.514578
Mean dependent	37.55971	19.99135	7.773649	12.89676	10.03896
S.D. dependent	51.61073	16.93935	4.803574	2.472558	1.903969

Determinant reside covariance (dof adj.)	26.64076
Determinant reside covariance	4.564622
Log likelihood	-290.5928
Akaike information criterion	18.68069
Schwarz criterion	21.07530



Appendix V

Variance Decomposition of EXR:

Period	S.E.	EXR	INFR	INTR	RGDP	RPFI
1	10.11620	100.0000	0.000000	0.000000	0.000000	0.000000
2	12.30906	96.50782	0.060004	1.398096	0.374741	1.659334
3	13.42681	90.40532	3.780096	1.446642	0.366252	4.001688
4	14.57661	80.83451	10.53085	2.375718	1.096156	5.162767
5	15.18084	76.51226	9.718199	5.618539	2.749961	5.401039
6	16.54552	65.54913	13.16999	11.00378	5.211657	5.065445
7	18.32362	54.67784	18.40404	14.54515	7.166592	5.206386
8	19.96187	47.51165	22.62327	15.43023	8.183417	6.251432
9	21.33645	42.96548	25.44125	15.03083	8.728655	7.833789
10	22.36389	40.31482	26.55392	14.30813	9.235755	9.587371

Variance Decomposition of INFR:

Period	S.E.	EXR	INFR	INTR	RGDP	RPFI
1	12.91847	0.310176	99.68982	0.000000	0.000000	0.000000
2	14.73225	0.307881	98.24016	0.330174	0.341761	0.780024
3	15.49926	0.600615	93.00222	3.481031	0.361094	2.555040
4	16.61520	0.573522	86.00066	9.720453	1.083181	2.622182
5	17.16999	0.687522	83.06346	12.48963	1.296492	2.462893
6	17.75487	0.868395	81.98881	13.41603	1.249295	2.477469
7	18.25568	0.975673	81.11416	14.04731	1.219325	2.643533
8	18.48831	1.109156	80.26403	14.51095	1.230216	2.885647
9	18.60705	1.231114	79.73239	14.75072	1.240390	3.045377
10	18.70120	1.302833	79.39128	14.93194	1.258984	3.114959

Variance Decomposition of INTR:

Period	S.E.	EXR	INFR	INTR	RGDP	RPFI
1	1.416294	1.341441	6.214827	92.44373	0.000000	0.000000
2	1.764081	2.780538	4.198795	91.14950	0.703728	1.167438
3	2.401819	2.094369	23.79084	72.72270	0.750007	0.642091
4	3.142272	1.503616	36.56362	60.12748	1.360708	0.444578
5	3.607303	1.747744	39.69352	56.14255	1.701524	0.714657
6	3.920269	2.214181	41.72210	53.10412	1.722155	1.237446
7	4.160359	2.535221	43.30577	50.68694	1.711324	1.760744
8	4.321194	2.801648	43.81540	49.38514	1.768049	2.229755

9	4.425455	3.053531	43.84257	48.64572	1.854981	2.603197
10	4.503309	3.252761	43.86108	48.05906	1.955165	2.871927

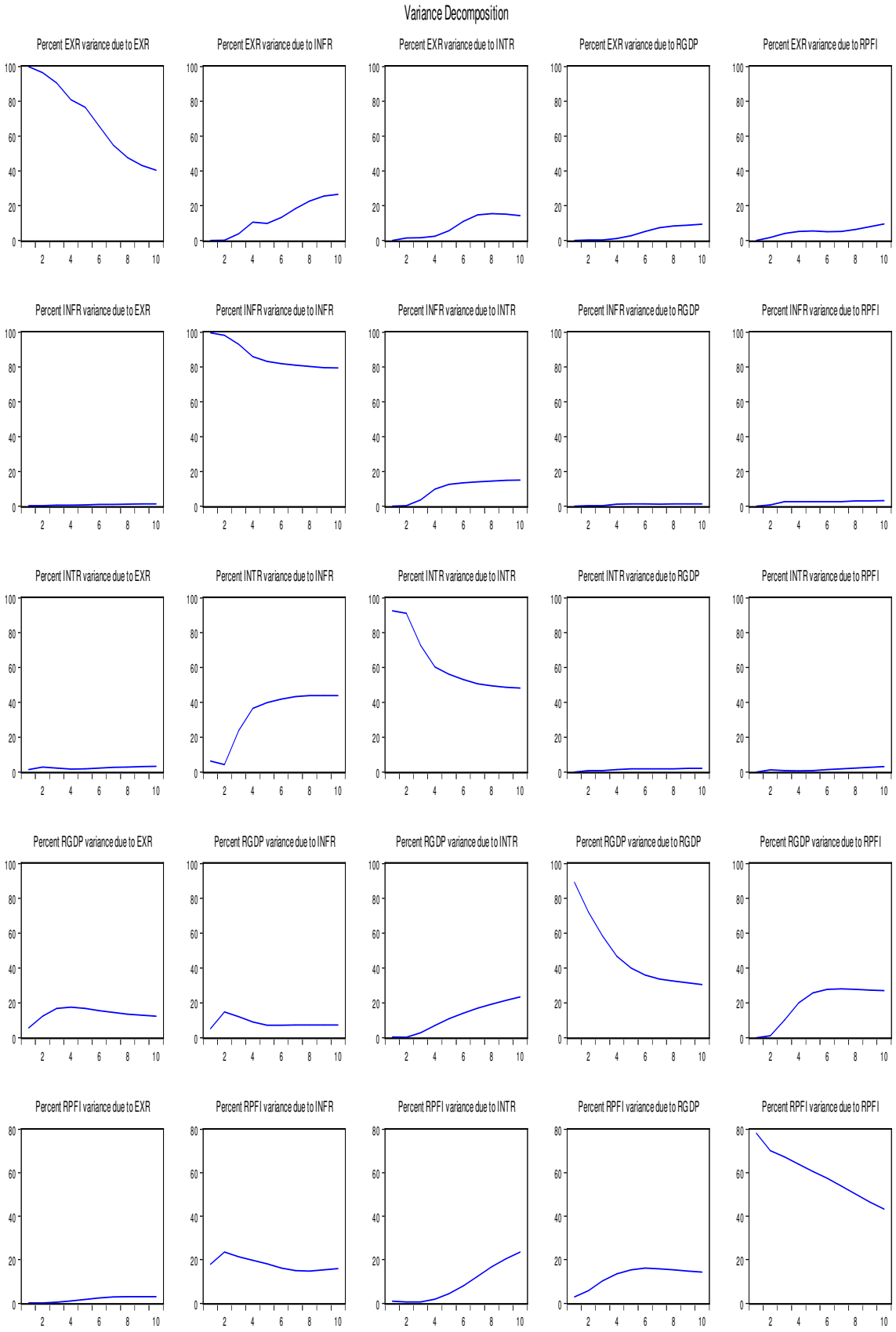
Variance Decomposition of RGDP:

Period	S.E.	EXR	INFR	INTR	RGDP	RPFI
1	0.159258	5.489306	5.071603	0.224715	89.21438	0.000000
2	0.226531	12.16955	14.62793	0.165925	72.18176	0.854840
3	0.279488	16.63795	11.88141	2.816062	58.44259	10.22199
4	0.330543	17.48813	8.937189	6.935400	46.74689	19.89238
5	0.376166	16.63481	7.069961	10.75259	39.89068	25.65196
6	0.416760	15.44092	6.958455	14.04227	35.89044	27.66792
7	0.451789	14.36730	7.234349	16.84237	33.66233	27.89364
8	0.482386	13.49247	7.277988	19.18039	32.41492	27.63424
9	0.511274	12.74905	7.248875	21.27523	31.42280	27.30404
10	0.539991	12.07637	7.277237	23.32915	30.34347	26.97377

Variance Decomposition of RPFI:

Period	S.E.	EXR	INFR	INTR	RGDP	RPFI
1	0.218276	0.011899	17.95321	0.901852	2.860925	78.27212
2	0.306982	0.103441	23.47608	0.506751	5.782425	70.13130
3	0.347606	0.445550	21.39356	0.606717	10.29181	67.26236
4	0.373469	1.076686	19.77991	1.820053	13.49335	63.83000
5	0.395947	1.763172	18.02975	4.281652	15.36947	60.55595
6	0.419098	2.406396	16.11402	7.936882	16.08243	57.46027
7	0.445486	2.847958	15.02027	12.38583	15.86474	53.88120
8	0.473408	3.026587	14.87180	16.71501	15.29595	50.09065
9	0.500785	3.033619	15.29961	20.39174	14.76005	46.51498
10	0.526781	2.969327	15.93873	23.41190	14.33642	43.34362

Cholesky Ordering: EXR INFR INTR RGDP RPFI


Variance Decomposition
Percent EXR variance due to EXR
Percent EXR variance due to INFR
Percent EXR variance due to INTR
Percent EXR variance due to RGDP
Percent EXR variance due to RPFI
Percent INFR variance due to EXR
Percent INFR variance due to INFR
Percent INFR variance due to INTR
Percent INFR variance due to RGDP
Percent INFR variance due to RPFI
Percent INTR variance due to EXR
Percent INTR variance due to INFR
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Percent RPFI variance due to EXR
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Percent RPFI variance due to RGDP
Percent RPFI variance due to RPFI