APPENDICES

APPENDIX A

Diagnostic check- Serial correlation LM test/ Normality test

The diagnostic test is to test the residual which employed from two tests: Serial correlation LM test and Jarque-Bera Normality test:

From the regression: $y_t = X_t\beta + \varepsilon_t$ where, β is estimated coefficient, ε is error term. So, The test statistic for lag order p is based on the residuals: $e = y - X\widehat{\beta}$:

$$e_t = X_t\gamma + \left(\sum_{s=1}^{p}\alpha_s e_{t-s}\right) + v_t$$

The LM statistic is computed by multiplying the number of observations with the squared R from the above regression. LM test statistic is asymptotically distributed as a $\chi^2(p)$ (p: lagged residuals up to order p).

Jarque_Bera: is a test statistic for testing whether the series is normally distributed. The test statistic calculates the different of the skewness (3rd moment) and kurtosis (4th moment). Under the null hypothesis of normal distribution, the Jarque-Bera statistic is distributed as χ^2 with 2 degree of freedom. The statistic computed as:

$$Jarque-Bera = \frac{N}{6}\left(S^2 + \frac{(K-3)^2}{4}\right)$$

Where; S is skewness, K is kurtosis

APPENDIX B

Granger Causality

Granger (1969) constructed a test with an approach to answer whether x causes us to see how much of the current y can be explained by past value of y and then to see whether adding lagged values of x can improve the explanation. y is said to be Granger-cased by x if x helps in the prediction of y, or equivalently if the coefficients on the lagged x's are statistically significant.

The system to test is:

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + ... + \alpha_l y_{t-l} + \beta_1 x_{t-l} + ... + \beta_l x_{-l} + \varepsilon_t$$
$$x_t = \alpha_0 + \alpha_1 x_{t-1} + ... + \alpha_l x_{t-l} + \beta_1 y_{t-l} + ... + \beta_l y_{-l} + u_t$$

for all possible pairs of (x,y) series in the group. The reported F-statistics are the Wald statistic for the joint hypothesis:

$$\beta_1 = \beta_2 = ... = \beta_l = 0$$

for each equation. The null hypothesis is that x does not Granger-cause y the first regression and that y does not Granger-cause x in the second regression.

APPENDIX C

Forecast Performance Criteria

The statistical tests applied to compare the forecast performance between models are:

+ Root Mean Square Error (RMSE):

$$RMSE = \sqrt{\frac{1}{h}\sum_{t=1}^{h}\left(X_t^f - X_t^a\right)^2}$$

+ Theil's U inequality index

$$U = \frac{\sqrt{\frac{1}{h}\sum_{t=1}^{h}\left(X_t^f - X_t^a\right)^2}}{\sqrt{\frac{1}{h}\sum_{t=1}^{h}\left(X_t^f\right)^2} + \sqrt{\frac{1}{h}\sum_{t=1}^{h}\left(X_t^a\right)^2}} = \frac{RMSE}{\sqrt{\frac{1}{h}\sum_{t=1}^{h}\left(X_t^f\right)^2} + \sqrt{\frac{1}{h}\sum_{t=1}^{h}\left(X_t^a\right)^2}}$$

where: X_t^f = forecast value of X_t^a

X_t^a = actual value of X_t^a

h= number of periods in the forecasting.

APPENDIX D

The relationship between basic interest rate (INT) and lending interest rate (INTE)

Cointergration test the long term relationship between INT and INTE

Sample: 2003M01 2009M04

Included observations: 74

Series: INT INTE

Lags interval: 1 to 1

Data Trend:	None	None	Linear	Linear	Quadratic
Test Type	No Intercept	Intercept	Intercept	Intercept	Intercept
	No Trend	No Trend	No Trend	Trend	Trend
Trace	1	1	2	1	2
Max-Eig	1	1	2	1	2

The test is performed by Eview.

The result shows that there is a relationship between basic interest rate and lending interest rate in linear without trend. So, to identify that the lending interest rate is decided based on basic interest rate, the study will employ the Granger causality to test whether the basic interest rate has Granger cause the lending interest or not (or whether the lending interest has employed the past information of basic interest rate to forecast or not).

VEC Granger Causality/Block Exogeneity Wald Tests

Sample: 2003M01 2009M04

Included observations: 74

Dependent variable: D(INT)

Excluded	Chi-sq	Df	Prob.
D(INTE)	0.047282	1	0.8279
All	0.047282	1	0.8279

Dependent variable: D(INTE)

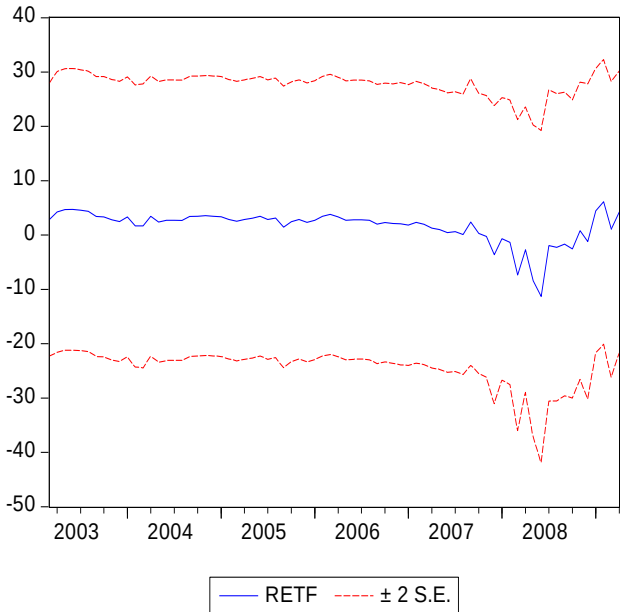
Excluded	Chi-sq	Df	Prob.
D(INT)	6.211102	1	0.0127
All	6.211102	1	0.0127

The test is performed by Eview.

The result shows that only lending interest employs the past information of basic interest rate to forecast; and the lending interest rate cannot be information for basic interest rate to forecast. This evidence proved that the commercial banks have applied the basic interest rate to decide their lending interest rates, so we could use the lending interest rate as other model to compare the impact of the basic interest rate and lending interest rate as a monetary variable of VAR analyses.

APPENDIX E

Forecast stock returns in Model A by using Box Jenkins method



Forecast: RETF
Actual: RET
Forecast sample: 2003M01 2010M04
Adjusted sample: 2003M03 2009M04
Included observations: 74

Root Mean Squared Error	12.14525
Mean Absolute Error	9.487853
Mean Abs. Percent Error	348.1242
Theil Inequality Coefficient	0.754847
Bias Proportion	0.000000
Variance Proportion	0.636623
Covariance Proportion	0.363377

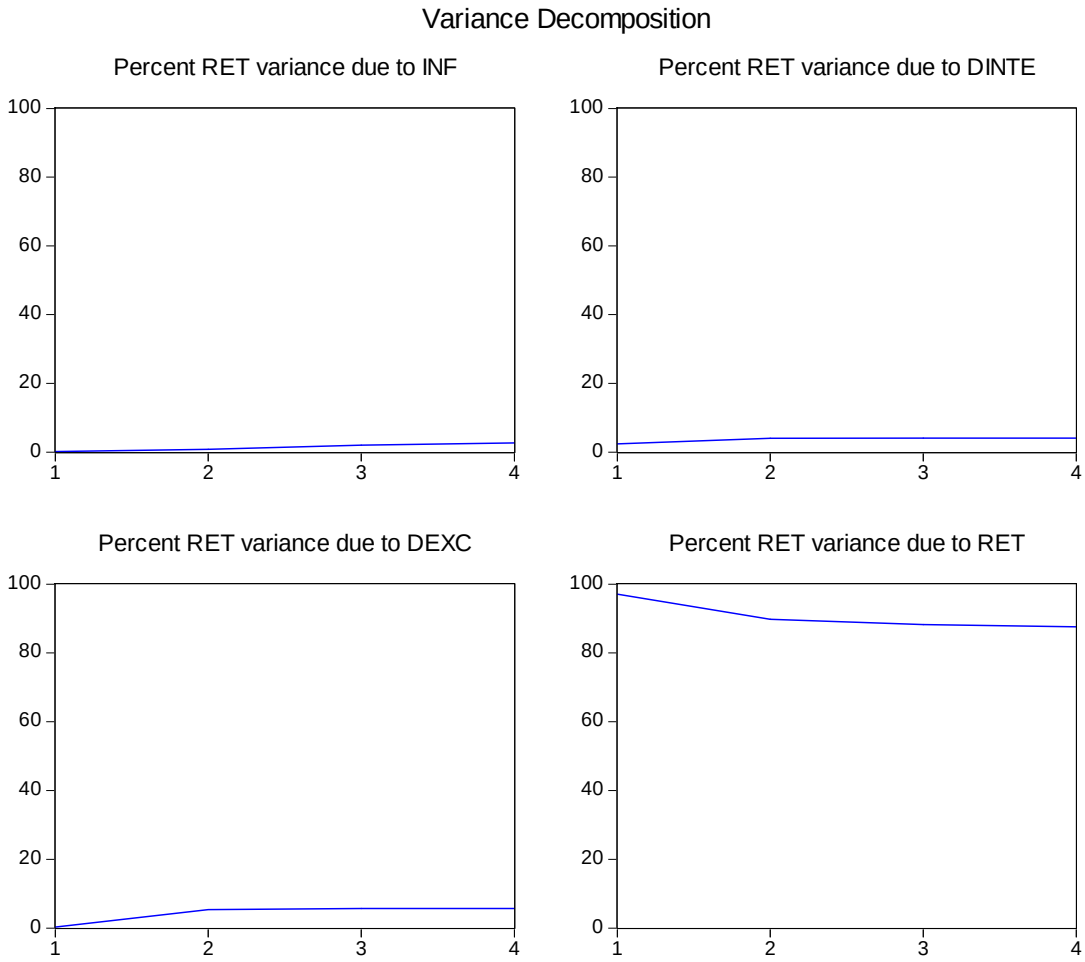
This result is improved the performance of model A in comparison to the analyses of VAR for model A (it provides lower root mean squared error and Theil's Inequality). This consequence leads to cancel the model A in analyses in this study since the study need to analyze the impulse and response of monetary policy variables instead of predicting the stock returns.

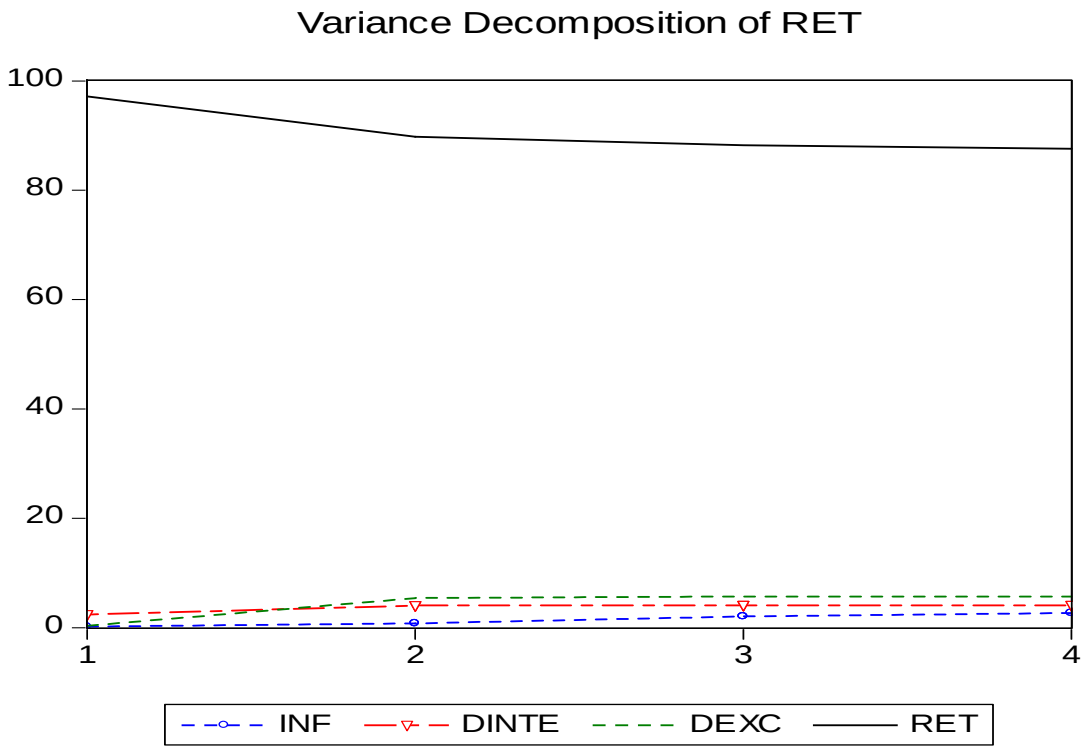
APPENDIX F

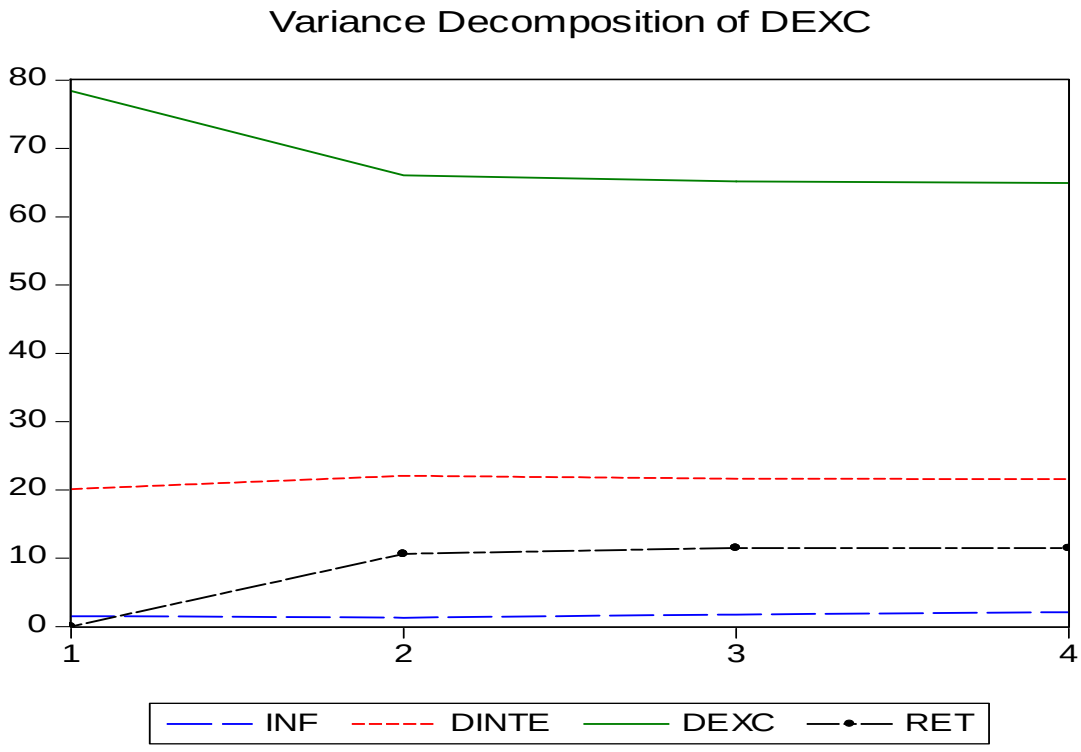
Some graphs for analyses

Figure 5.6

Variance decomposition

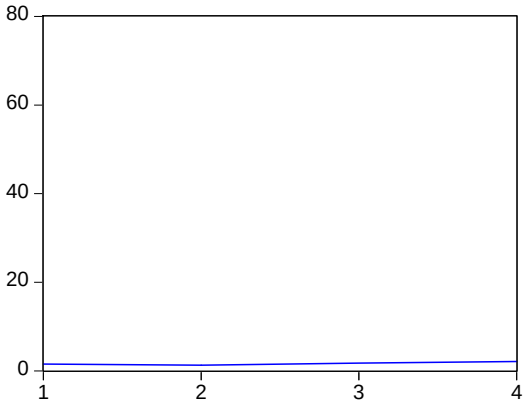



Variance Decomposition of RET
100
80
60
40
20
0
1
2
3
4
INF
DINTE
DEXC
RET

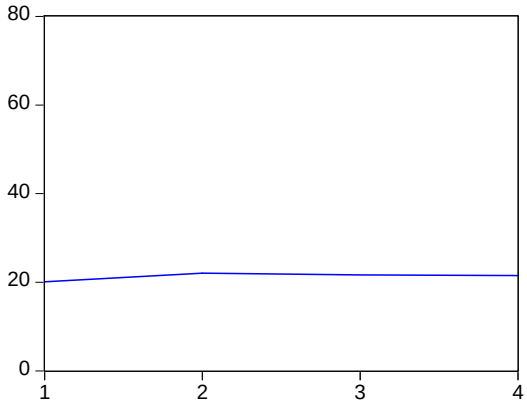

Variance Decomposition of DEXC
80
70
60
50
40
30
20
10
0
1
2
3
4
INF
DINTE
DEXC
RET

Variance Decomposition

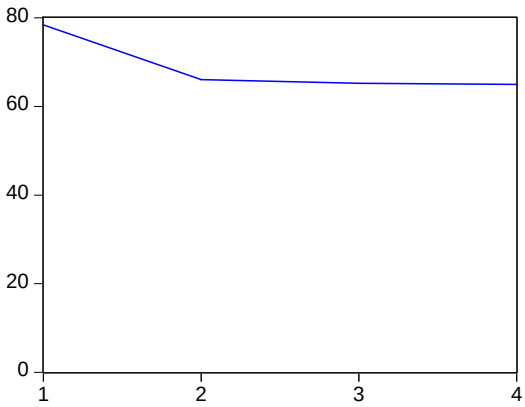
Percent DEXC variance due to INF



Percent DEXC variance due to DINTE



Percent DEXC variance due to DEXC



Percent DEXC variance due to RET

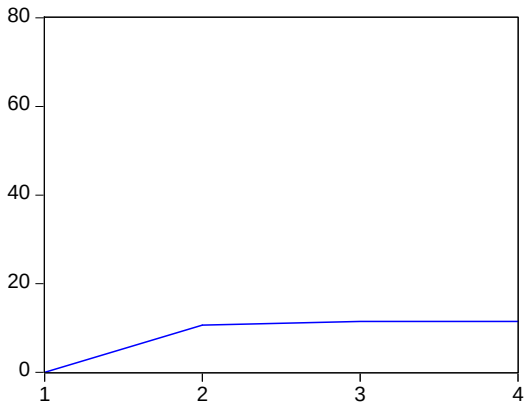


Figure 5.7

The response to One S.D Innovation ± 2 Standard errors

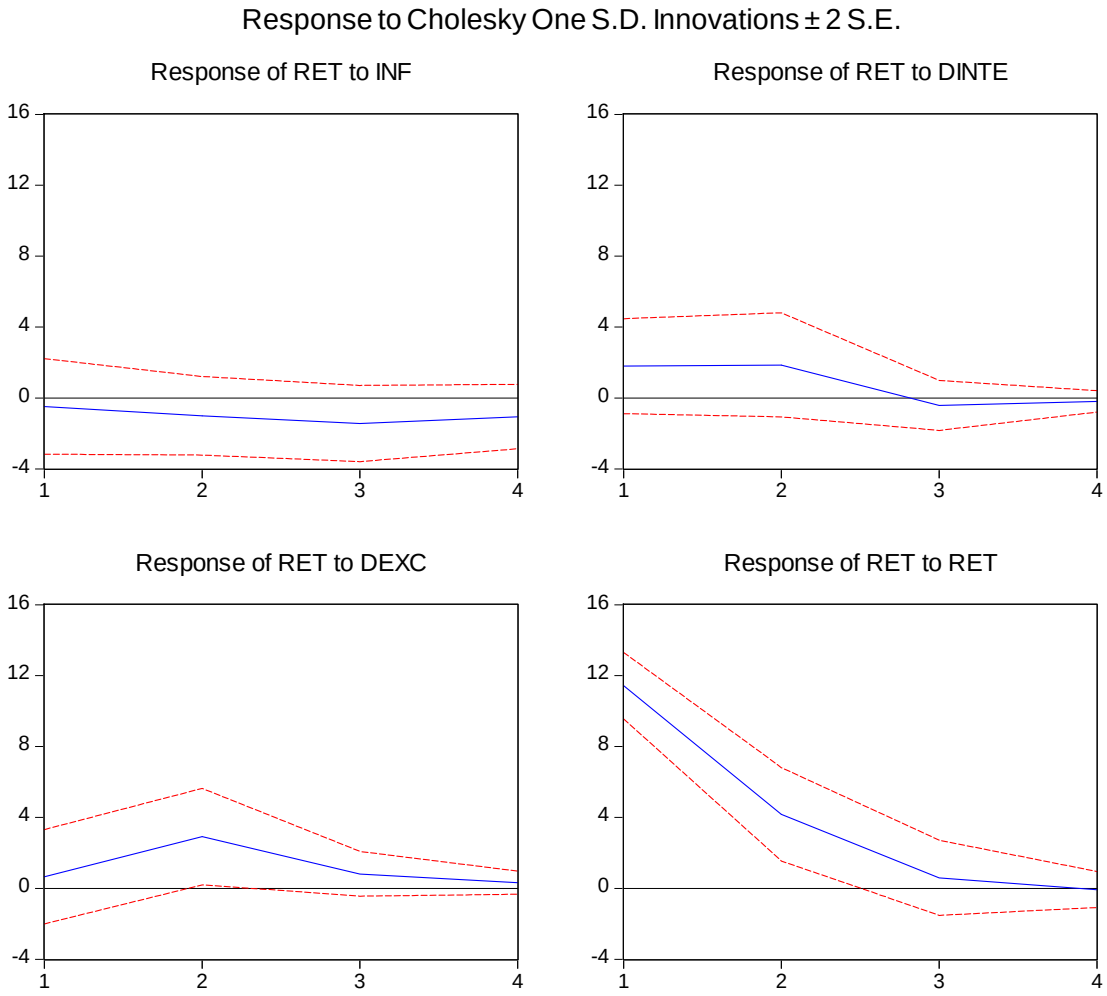
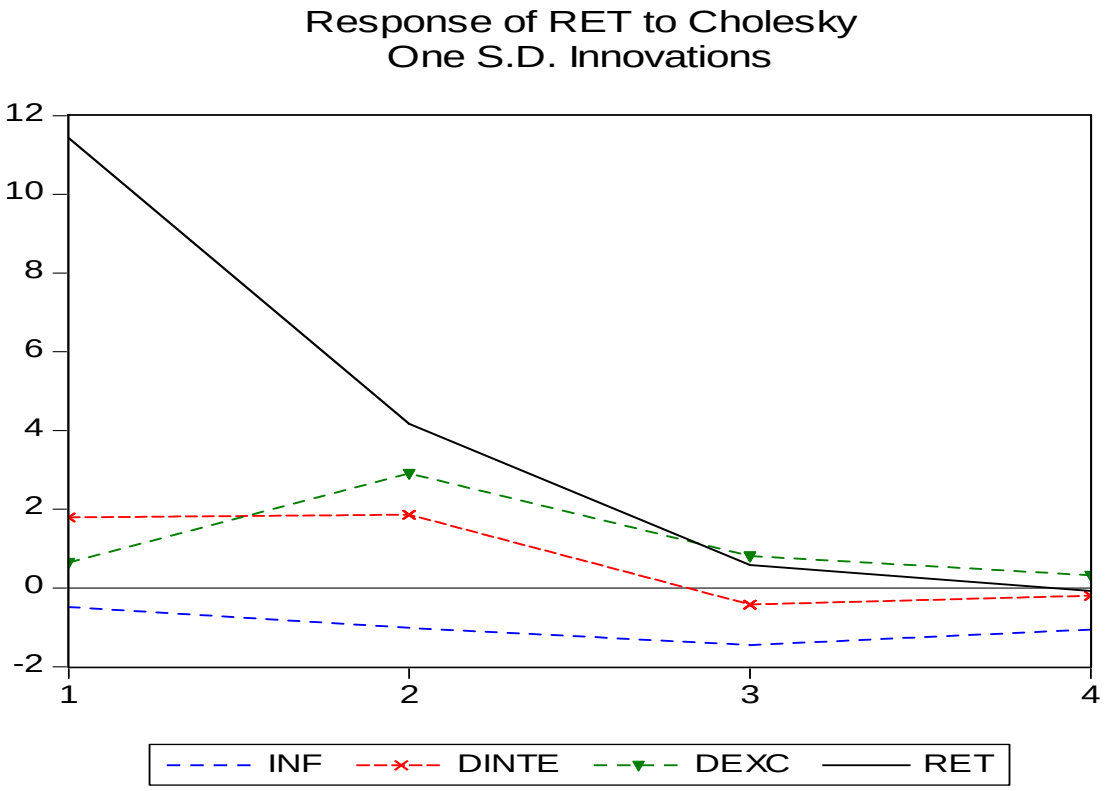
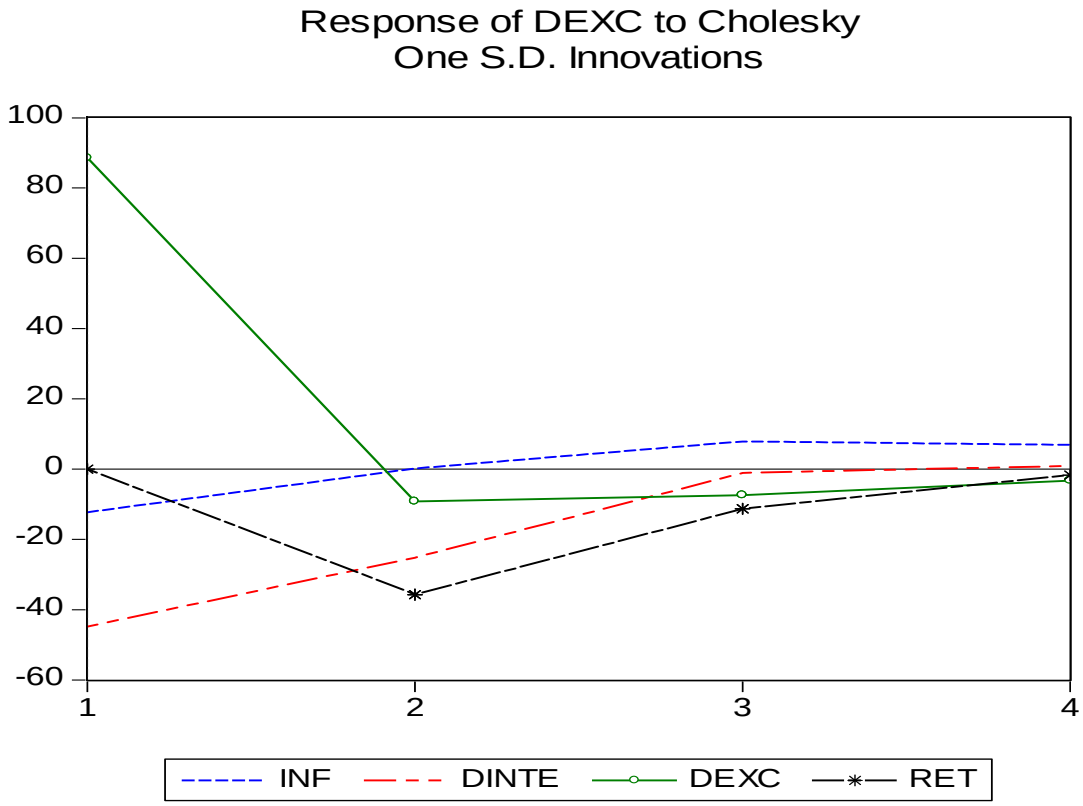


Figure 5.8

The responses to One S.D Innovation




Response of DEXC to Cholesky
One S.D. Innovations
100
80
60
40
20
0
-20
-40
-60
1
2
3
4
INF
DINTE
DEXC
RET

APPENDIX G

List of Data

Month	VN-Index	Inflation % (INF)	Basic Interest rate (INT)	Exchange rate-VND/USD (EXC)	Lending Interest rate % (INTE)
Jan-2003	172.4	0.9	0.0062	15,426.00	0.9
Feb-2003	164.6	2.2	0.0062	15,426.00	0.9
Mar-2003	145.4	-0.6	0.00625	15,450.00	0.93
Apr-2003	152.5	0	0.00625	15,459.00	0.97
May-2003	152.2	-0.1	0.00625	15,469.00	0.98
Jun-2003	152.3	-0.3	0.00625	15,492.00	1
Jul-2003	146.3	-0.3	0.00625	15,509.00	1.05
Aug-2003	142.7	-0.1	0.00625	15,516.00	1.05
Sep-2003	139.3	0.1	0.00625	15,549.00	1.05
Oct-2003	136.2	-0.2	0.00625	15,610.00	1.05
Nov-2003	163.9	0.6	0.00625	15,621.00	1.05
Dec-2003	166.9	0.8	0.00625	15,673.00	1.05
Jan-2004	214.3	1.1	0.00625	15,693.00	1.05
Feb-2004	260.6	3	0.00625	15,749.00	0.95
Mar-2004	277.4	0.8	0.00625	15,717.00	0.9
Apr-2004	264.4	0.5	0.00625	15,713.00	0.9
May-2004	252	0.9	0.00625	15,736.00	0.9
Jun-2004	249.7	0.8	0.00625	15,719.00	1

List of Data (continue)

Month	VN-Index	Inflation % (INF)	Basic Interest rate (INT)	Exchange rate-VND/USD (EXC)	Lending Interest rate % (INTE)
Jul-2004	238.4	0.5	0.00625	15,743.00	1.05
Aug-2004	232.4	0.6	0.00625	15,755.00	1.05
Sep-2004	233.2	0.3	0.00625	15,740.00	1.05
Oct-2004	232.6	0	0.00625	15,745.00	1.05
Nov-2004	229.6	0.2	0.00625	15,768.00	1.05
Dec-2004	239.3	0.6	0.00625	15,768.00	1.05
Jan-2005	233.3	1.1	0.00625	15,781.00	1.05
Feb-2005	235.1	2.5	0.0065	15,798.00	1.1
Mar-2005	246.5	0.1	0.0065	15,814.00	1.1
Apr-2005	246.3	0.6	0.0065	15,823.00	1.1
May-2005	244.2	0.5	0.0065	15,855.00	1.1
Jun-2005	246.8	0.4	0.0065	15,846.00	1.1
Jul-2005	245.5	0.4	0.0065	15,873.00	1.1
Aug-2005	254.5	0.4	0.0065	15,867.00	1.1
Sep-2005	289.3	0.8	0.0065	15,895.00	1.1
Oct-2005	307.4	0.4	0.0065	15,891.00	1.1

List of Data (continue)

Month	RET	INF (%)	INT	EXC	INTE (%)
Nov-2005	311.3	0.4	0.0065	15,907.00	1.1
Dec-2005	307.5	0.8	0.006875	15,913.00	1.15
Jan-2006	312.3	1.2	0.006875	15,913.00	1.1
Feb-2006	390.7	2.1	0.006875	15,909.00	1.1
Mar-2006	503.6	-0.5	0.006875	15,920.00	1.1
Apr-2006	595.5	0.2	0.006875	15,940.00	1.1
May-2006	538.9	0.6	0.006875	15,966.00	1.1
Jun-2006	515.6	0.4	0.006875	15,995.92	0.9
Jul-2006	422.4	0.4	0.006875	16,006.25	0.9
Aug-2006	491.2	0.4	0.006875	16,013.79	0.9
Sep-2006	526.7	0.3	0.006875	16,053.50	0.9
Oct-2006	511.5	0.2	0.006875	16,076.69	1.05
Nov-2006	633.1	0.6	0.006875	16,078.25	1.05
Dec-2006	751.8	0.5	0.00825	16,054.10	1.05
Jan-2007	1041.3	1.1	0.00825	16,045.00	1.05
Feb-2007	1137.7	2.2	0.00825	15,996.00	1.15
Mar-2007	1071.3	-0.2	0.00825	16,009.00	1.15
Apr-2007	923.9	0.5	0.00825	16,043.00	1.15

List of Data (continue)

Month	RET	INF (%)	INT	EXC	INTE (%)
May-2007	1081.5	0.8	0.00825	16,084.00	1.15
Jun-2007	1024.7	0.9	0.00825	16,126.00	1.15
Jul-2007	908	0.9	0.00825	16,135.00	1.15
Aug-2007	908.4	0.6	0.00825	16,235.00	1.15
Sep-2007	1046.9	0.5	0.00825	16,075.00	1.15
Oct-2007	1065.1	0.7	0.00825	16,064.00	1.2
Nov-2007	972.4	1.2	0.00825	16,035.00	1.2
Dec-2007	927	2.9	0.00825	16,018.00	1.7
Jan-2008	844.1	2.38	0.00825	15,976.18	1.42
Feb-2008	663.3	3.56	0.00875	15,934.11	1.45
Mar-2008	516.9	2.99	0.00875	16,110.75	1.65
Apr-2008	522.4	2.2	0.00875	16,120.39	1.8
May-2008	414.1	3.91	0.01	16,245.20	1.75
Jun-2008	399.4	2.14	0.011667	16,841.61	1.5
Jul-2008	451.4	1.13	0.011667	16,763.75	1.75
Aug-2008	539.1	1.56	0.011667	16,601.25	1.75
Sep-2008	456.7	0.18	0.011667	16,600.54	1.75
Oct-2008	347.1	-0.19	0.010833	16,830.75	1.67

List of Data (continue)

Month	RET	INF (%	INT	EXC	INTE (%)
Nov-2008	314.7	-0.76	0.01	16,972.54	1.56
Dec-2008	315.6	-0.68	0.008333	17,476.33	1.24
Jan-2009	303.2	0.32	0.007083	17,482.68	1.05
Feb-2009	245.7	1.17	0.005833	17,478.71	0.85
Mar-2009	280.7	-0.17	0.005833	17,785.62	0.9
Apr-2009	315.7	0.35	0.005833	17,782.50	0.87