**An Empirical Investigation of Bilateral Trade Flow Shocks: Nigeria-India**

**Abstract**

This study empirically investigates the shock relationship of exchange rate volatility on bilateral trade flows between Nigeria and India. We estimate a VAR model to identify unanticipated shocks in trade flows and evaluate its related shock impacts as a result of the volatile nature of the rate of exchange in the level of bilateral trade between Nigeria and India. To justify the validity of shock effects, we considered macroeconomic challenges on trade flows, due to the level of income of price in these economies. These analyses enable us to focus on examining the degree of shock exchange rate volatility elicit to obstruct bilateral trade flows between these countries.

The estimates of the innovations of Nigeria trade flows shocks to related India price and income shocks shows that it generates inconsistencies that distorts the levels of Nigeria imports and exports due to uncertainties created as a results of the volatile nature of the domestic rate of interest. It weakens the levels of exports, suppress the levels of imports and transmit negative shocks that cause inconsistencies in the level of domestic income. These findings have implication for cross border trade, tariff reforms, international investors and macroeconomic institutions that has links with international finance and trade organizations.

**JEL Code**: C22, F17, F31.

**Key Words**: Exchange Rate, Uncertainty, Trade Flows

**1. Introduction**

Advances in international finance and trade policies reveal that increased trade liberalization, unconstipated capital flow liberalization and regular cross-border financial transactions may enlarge beyond bounds, the effect of exchange rate volatility on trade flows between countries especially advanced and developing countries (McKenzine, 1999; Arize, Osang and Slottje, 2000; Sauer and Bohara, 2001; Clark, Tamirisa and Wei, 2004; Grier and Smallwood, 2007; Caglayan and Di, 2008; Baum and Caglayan, 2009). The position of most scholars affirm that exchange rate uncertainty will likely demoralise the heightened levels of the volume of international trade by increasing the riskiness of international trade activities which will likely inhibit associated levels of trade flows (Wei, 1999; Barkoulas, Baum, and Caglayan, 2002; Engel and Wang, 2007).

Scholastic views on these issues expose missed facts with stricted controversies and strong divides on rigorous debates of empirical findings that suggest that the negative effect of exchange rate volatility on trade flow is prevalent in developing countries while industrialized countries enjoy a stronger positive position in related trade flow situations (Akhtar and Hilton, 1984; Edison and Melvin, 1990; Chawdhury, 1993; Edward, 1999; Arize, Osang and Slottje, 2000; Sauer and Bohara, 2001; Grier and Smallwood, 2007; Baum and Caglayan, 2009; Huchet-Bourdon and Korinek, 2011).

Identifying the dynamic impacts of exchange rate volatility on trade flows and economic activity in Nigeria and India is necessary to affirm the strength of the levels of the flows of the bilateral trade policies between these countries. We will also confirm if the nature of the trade policy agreement between these countries provides shocks that gradually shift the trade flows and in turn affect the levels of transaction flows in the arrangement. Consequently, we will closely investigate the central principle of the importance of bilateral trade between these countries in order to note how trade flows react to changes in gross domestic income and uncertainties in the rates of exchange. These objectives are necessary because the research work of Fullerton and sprinkle (2005) which investigated the error correction of trade flows between the United States and Mexico asserted that relative price variations may likely be generated by uncertainties in the levels of national price levels, the nature of tariff manipulation, and changes in the related rates of exchange. To establish these objectives, the price variation in both the levels of import and export demand levels are separated into constituent elements to evaluate the nature of the obtained levels of trade flows and comprehend its reactions to changes in Nigerian prices, Indian prices and the changes in the rate of exchange.

The other part of the study relates the theoretical and empirical research outcomes of trade flows variations in section two. Section three expresses the nature of the data set used for the empirical test in the study. It also demonstrates the relative strength of the empirical model in accordance to revealing the related policy shock impacts of the variable in the model. Section four states theoretical implication of the findings and documented the empirical findings obtained from the shock reactions of the variables in the model. Section five draws together the implications for the study and concludes the research work.

**2.1 Literature Review**

Theoretically, it is suggested that trade liberalization, liberalization of capital flows and increase in cross-border financial transactions amplifies the magnitude and influence of exchange rate movement on other key macroeconomic variables that are trade related. But Clark, Tamirisa, Wei, Sadikov and Zeng (2004) suggested that theoretically, there are no clearly defined relationship between the rate of exchange volatility and the levels of trade flows depends on a number of specific assumptions and may not hold. This view cannot hold where the empirical model is a general equilibrium since other variables in the model change, with changes in the rate of exchange. Obviously, in countries where exchange rate volatility impacts of trade flows, the increasing use of financial hedging instruments were noticed to reduce the impact of the vulnerability of trade to exchange rate volatility (Edward, 1999; Wei, 1999; Engel, and Wang, 2007).

To justify these views, Clark, Tamirisa, Wei, Sadikov and Zeng (2004) considered the impact of exchange rate volatility on world trade, and reveal that new phenomenon in international trade and finance shows that the levels of exchange rate volatility has hiked the levels of fluctuations in trade levels. Increase in the liberalization of capital flows and large increase in the scale of cross-border financial transactions have increased exchange rate movements, that has lead to currency crises in most emerging economies and currencies uncertainty adjustments in Central and Eastern Europe.

**2.2 Empirical Literature**

Examining the volatility of the rates of exchange and its effects on trade flows in a developing and developed country trade relationship, Vergil (2002) followed Kenen and Rodrik (1986) and Thursby and Thursby (1993) in order to generate the generalized autoregressive conditional heteroscedastic GARCH to make up for the measure of exchange rate volatility. To test the empirical relationship of exchange rate volatility and trade flows, he followed Johansen (1991) cointegration and error correction mechanism to investigate the short-run dynamics impact of the association between the selected macroeconomic variables in the model. He observed that the real exchange rate volatility variable has a significant negative effect on real exports.

To empirically evaluate the bilateral trade elasticities between an advanced and a developing country, Fullerton and sprinkle (2005) applied an error correction approach that allows imports and exports to adjust over time to changes other macroeconomic variables in the model that influence their demand behaviours. This technique permitted the joint assessment of the long-run determinants and the short-run dynamic adjustments to predict the nature of the investigated trade patterns. They revealed that the levels of exports and imports in these countries react to heterogeneous variation in domestic price, foreign prices and the rates of exchange. The short-run changes in the advanced country imports in relation to the developing country trade flows were notice to be sensitive to income changes than to price changes. While changes in the advanced countries exports to the levels of trade flows in the developing countries due to price changes were most likely equal to those associated with income shocks in the developing country in the short-run. In these relationships, the income effect took preeminence in the long-run.

Considering the volatility of international trade flows and the levels of exchange rate uncertainty, Baum and Caglayan (2009) adopted the bivariate GARCH-in-mean (GARCH-M), statistical results observed, showed that exchange rate uncertainty has a consistent positive and significant effect on the levels of volatility in bilateral trade flows which does not necessarily affect the volume of trade in the advanced countries studies. Baum and Caglayan (2009) empirical evidence showed that exchange rate volatility produce a consistent positive and significant effect which influences the levels of volatility of bilateral trade flows between countries. Also, they disclosed that exchange volatility does not affect the levels of trade flows in major industrialized economies. This result was closely linked to Baum, Caglayan and Ozkan (2004) that specified a nonlinear empirical relationship between the variables in the model and observed that the effect of exchange rate volatility on trade flows is positive and ensures interwoven complexities. Baum and Caglayan (2009) affirmed that results from related studies were inconclusive because they were generally sensitive to the choices of sample period, model specification, forms of proxies for exchange rate volatility and countries particular economic characteristics (Clark, 1973; Baron, 1976; Cushman, 1983; Franke, 1991; Sercu and Vanhulle, 1992; Bacchetta and Van Wincoop, 2000; Barkoulas et al., 2002; Obstfeld and Rogoff, 2003).

Huchet-Boourdon and Korinek (2011) studied the relationship between the Asian power, China, the Euro area and the United State with close insights from the agriculture, manufacturing and mining sectors. They suggested that fluctuation in the rate of exchange is slightly linked to trade deficits or surpluses.

**3. Methodology**

**3.1 Data**

We obtained annual data on bilateral aggregate real exports, real import and real GDP from the IMF’s Directions of Trade Statistics (DOTS) and export price deflators, consumer price indices and exchange rate from the IMF’s International Financial Statistics (IFS). In order to obtain proxies for exchange rate volatility and trade flows, we adopted a variance evaluation system for the real exchange rate, trade flow, real import, real export and real GDP data. This technique allows us to generate internally consistent conditional variances of this data set that represented their specified volatility.

**3.1.2 The Dynamic Model**

To effectively capture the empirical dynamic shock behaviour of the relationship of bilateral trade between Nigeria and India considering the levels of exchange rate volatility and trade flows. We reflected on the effect of the retard influence of the independent variables in the model by considering shock impact of their lags obtained from the results of the lag length criteria test. Also, it is necessary to examine the dynamics of the dependent variable as a result of a transaction delay linked to the nature of the process of trade flow.

Fundamentally, the long-run levels of imports are logically connected to the levels of aggregate domestic income, the foreign currency price of the imported commodity, the price of the domestic manufactured goods competitive with commodity imports and the real bilateral exchange rate of the importing country. Consequently, the long-run export quantity demanded will be related to the levels of economic activity, the internationally accepted price of export, the price of export substitute goods and the rate of exchange, in the exporting country (Sawyer and Sprinkle, 1996; Fullerton and Sprinkle, 2005).

Practically, we assume that the demand function is homogeneous of degree zero in price, in which case the levels of import and export prices can be defined as a set of relative prices of domestic import prices, domestic export prices and the domestic rate of exchange in both countries (Fullerton and Sprinkle, 2005). Although homogeneity may not fully capture a steady process, it absence permits some levels of heterogeneity (Murray and Ginman, 1976; Fullerton and Sprinkle, 2005). The basic models to be analyzed are in this the following form:





Where;

NM=Total Volume of imports by Nigeria from India

NX=Total Volume of exports by Nigeria to India

NGDP=Nigeria GDP

IGDP=India GDP

NWP=Nigeria Wholesale Price Index

IWP=India Wholesale Price Index

NEXV=Nigeria Exchange Rate Volatility, a measure of the standard deviation of India rupee per Nigerian Naira.

Therefore, the study analysed the shock effect of exchange rate volatility and trade flows by specifying a VAR model.

**3.2 Structural VAR model: Based shock measures**

**3.2.1 Basic frameworks**

This part of the study evaluates the shock impacts and responses of trade flow no macroeconomic variable fundamental shocks. We estimate a structural VAR model to an autoregressive system composed of four variables in four lags. Since the variables in the model follow a stationary stochastic process that responds to two types of non-autocorrelated orthogonal shocks:

1. Demand shocks which are due to transitory structural error and
2. Self induced shocks which are most likely due to parameter disturbances.

The structural model can be given a moving average representation as follows:



Where;

and

Are identification procedures that follows Blanchard and Quah (1989) and Hoffmaister and Roldos (1997), further it is assumed that the change in the variables in the model are stationary, and that the parameter disturbance and transitory structural errors, respectively, are uncorrelated white noise disturbance. The variance of the structural shocks is normalized so that



This can be viewed as the identity matrix.

To identify this structural model, the autoregressive reduced-form vector autoregression of the model is first estimated:



Where;

= vector of estimated residuals

q= the number of lags

We note that. Given that the stochastic process is stationary, equation 3.2 may be written as an infinite moving-averge process, (or the moving-average representation of the reduced-form of the model is):



Where;

= vector of estimated reduced-form residuals with variance  and the matrices

= represent the impulse response functions of shocks to change in the dependent and independent (explanatory) variables in the model.

The residual of the model’s reduced form are thus, related to the structural residual in the following way:



This implies that



Since  and thus,



In order to identify the structural shocks from the information obtained by estimating the vector autoregressive equation (equation 3.4), which means, from the reduced-form shocks and their variance, we need to provide sufficient identifying restrictions to evaluate the elements in.

In this multivariable system,  have about sixteen elements. Since the estimated variance-covariance matrix  is symmetric, equation (3.8) provide about twelve independent identifying restrictions. Thus, about six additional restrictions must be imposed.

We note that the matrix of long-run effects of reduced-form shocks is related to the equivalent matrix of structural shocks, through the relation below:



Where,

The matrix is calculated from the estimated vector autoregressions and is the polynomial value for L=1.

If the multivariable in this model cointegrates, it implies certain long-run restrictions (King, Plosser, Stock and Watson, 1991).

Therefore, the trade flow decomposition below can be obtained:

Where,

A\*(L) =the transitory components of the permanent shocks on the parameters.

The first five terms on the right-hand side represents the measures of the first difference of the potential trade flow in Nigeria while the other parameters represents likely parameter disturbances by other variables in the model. This is the standard bootstrap approach (Runkel, 1987; Jeong and Maddala, 1993) which presents the confidence intervals around the estimated potential foreign aid.

Following the multivariate method as stated by Beveridge-Nelson (Watson, 1986), where parameter and cyclical components are perfectly correlated, the decomposition can be expressed as:



Here, the first difference of potential trade flow is simply the first two terms on the right-hand side of the equation. This implies that potential foreign aid is perfectly correlated with the cyclical components in the model.

**3.2.2 Impulse responses**

This aspect of the VAR study made VAR econometrics useful in applied work. The impulse response function simulates, over time, the effect of a one-time shock in one of the equation series on itself and on other equation series in the entire equation system. Also, this response function uses a method that converts the VAR model into its moving average representation (Hamilton, 1994).

Therefore, the researcher imposes a one-time exogenous shock on one of the VAR variable on the system, in other to examine the annual impulse responses of the other respondent endogenous variables. This enable the researcher to discern what the sample’s long-run and historical trends would generate as answers to the research questions.

Subsequently, it is important to note that the impulse response effect is an elasticity-like multiplier that reveals the long-run average percentage change in the shocked variable. Consequently, signs are important. A positive (negative) sign suggests that the respondent variables reaction is in the same (opposing) direction as the shock.

Considering the VAR model in equation (3.8), the generalized impulse response function for a system-wide shock, Uot, is defined by;

 - - (3.12)

Where;

 = The conditional mathematical expectation taken with respect to the VAR model in equation (3.8).

 = A particular historical realization of the process at time t-1

With a view of its moving average, the above equation will like become;

 - - (3.13)

This equation is independent of the ‘history’ of the process. Therefore, it is specific to linear systems and does not carry over to non-linear dynamic models. Practically, the choice of the vector of shocks, Uot, is arbitrary. To improve this situation, the empirical distribution function of ANUot for all these shocks, in the case were Uot is drawn from the same distribution as Ut, a multivariate normal distribution with zero means and a constant covariance matrix ∑ we have the analytical result that;

 ~  - - (3.14)

The elements AN∑A1N, if appropriately scaled are the ‘persistence profiles’ that analyses the speed of convergence to equilibrium (Lee and Pasaran, 1993; Pasaran and Shin, 1996). Also, note that when the VAR model in equation (3.9) is stable, the limit of the ‘persistence profile’ as N 🡪 ∞ tends to the spectral density function of Rt(without the Wts) at zero frequency (apart from a multiple of Л) (Sims, 1981; 1986).

To find the effect of the variable specific shocks on the evolution of the R’s and that for a given Ut, the VAR model in equation (3.8) is hit by the shock of size  to the ith equation at time t. This will change the Impulse Respond equation to;

 - - (3.12)

Expressing the equation above in a moving average, we have;

 ~  - - (3.15)

This equation is ‘history invariant’, that is, it does not depend on. To compute (the conditional expectations), depends on the nature of the multivariate distribution assumed for the disturbances, Ut. Then, as ~ , we have;

 =  - - (3.16)

From above, the unit shock is defined as, . Therefore, the impulse responds will be:

 i,j, = 1, 2, ..., m (3.17)

Where,

et = selection vector.

This is close to a Cholesky impulse response function of a unit shock to the ith equation in the VAR model.

**4. Empirical Results**

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**APPENDIX**

**Descriptive Statistics of Variables in the Model**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | NX | NM | NEXV | NGDP | NWP | IX | IM | IEXV | IGDP | IWP |
| Mean | 2011.687 | 464.2320 | 23.33385 | 4221.631 | 96.24136 | 441.4513 | 1848.560 | 15.10476 | 19430.79 | 66.93479 |
| Median | 568.5660 | 158.2670 | -48.66700 | 1773.654 | 85.68000 | 143.8790 | 80.37500 | 19.64900 | 9996.900 | 59.29100 |
| Maximum | 12499.87 | 2917.765 | 482.9180 | 17388.57 | 200.9650 | 2625.514 | 13749.85 | 37.72900 | 81489.52 | 149.0670 |
| Minimum | 0.001000 | 0.001000 | -97.46800 | 42.53500 | 47.12700 | 0.001000 | 0.360000 | -7.624000 | 1145.090 | 16.89200 |
| Std. Dev. | 3214.812 | 690.3841 | 154.2977 | 5405.164 | 38.63997 | 618.4613 | 3457.087 | 15.53079 | 21661.83 | 38.49493 |
| Skewness | 1.864936 | 2.085397 | 1.658946 | 1.162929 | 1.274203 | 1.992629 | 2.097248 | -0.230818 | 1.380803 | 0.344609 |
| Kurtosis | 5.614068 | 6.784162 | 4.630770 | 3.016819 | 4.122660 | 6.588858 | 6.450264 | 1.432281 | 4.051881 | 1.972043 |
|  |  |  |  |  |  |  |  |  |  |  |
| Jarque-Bera | 28.52478 | 43.60867 | 18.79325 | 7.438610 | 10.66276 | 39.54799 | 40.55992 | 3.672419 | 12.00777 | 2.106109 |
| Probability | 0.000001 | 0.000000 | 0.000083 | 0.024251 | 0.004837 | 0.000000 | 0.000000 | 0.159421 | 0.002469 | 0.348870 |
|  |  |  |  |  |  |  |  |  |  |  |
| Sum | 66385.66 | 15319.65 | 770.0170 | 139313.8 | 3175.965 | 14567.89 | 61002.48 | 498.4570 | 641215.9 | 2208.848 |
| Sum Sq. Dev. | 3.31E+08 | 15252167 | 761849.1 | 9.35E+08 | 47777.52 | 12239822 | 3.82E+08 | 7718.570 | 1.50E+10 | 47419.50 |
|  |  |  |  |  |  |  |  |  |  |  |
| Observations | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 |

Group Unit Root Test-The Second Difference Value of Variables in the Model with Intercept and No Trend

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Null Hypothesis: Unit root (individual unit root process) | | | | | | |  |
| Series: DDIGDP, DDIWP, DDNEX, DDNEXV, DDNGDP, DDNM, DDNWP, | | | | | | |  |
| DDNX | |  |  |  |  |  |  |
| Date: 09/17/12 Time: 00:30 | | | |  |  |  |  |
| Sample: 1979 2011 | | |  |  |  |  |  |
| Exogenous variables: Individual effects | | | | |  |  |  |
| Automatic selection of maximum lags | | | | |  |  |  |
| Automatic selection of lags based on SIC: 0 to 7 | | | | | |  |  |
| Total number of observations: 217 | | | | |  |  |  |
| Cross-sections included: 8 | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Method | |  |  |  | Statistic |  | Prob.\*\* |
| Im, Pesaran and Shin W-stat | | | |  | -8.54165 |  | 0.0000 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| \*\* Probabilities are computed assuming asympotic normality | | | | | | |  |
|  |  |  |  |  |  |  |  |
| Intermediate ADF test results | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | Max |  |
| Series | t-Stat | Prob. | E(t) | E(Var) | Lag | Lag | Obs |
| DDIGDP | -7.4726 |  | -1.518 | 0.837 | 1 | 7 | 29 |
| DDIWP | -6.9718 |  | -1.453 | 0.881 | 2 | 7 | 28 |
| DDNEX | -4.9721 |  | -1.526 | 0.789 | 0 | 7 | 30 |
| DDNEXV | -4.9721 |  | -1.526 | 0.789 | 0 | 7 | 30 |
| DDNGDP | -5.8439 |  | -1.453 | 0.881 | 2 | 7 | 28 |
| DDNM | -0.1828 |  | -1.279 | 1.139 | 6 | 7 | 24 |
| DDNWP | -5.1085 |  | -1.351 | 1.055 | 5 | 7 | 25 |
| DDNX | 0.6670 |  | -1.259 | 1.193 | 7 | 7 | 23 |
|  |  |  |  |  |  |  |  |
| Average | -4.3571 |  | -1.421 | 0.945 |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Warning: for some series the expected mean and variance for the given lag | | | | | | | |
| and observation are not covered in IPS paper | | | | | | |  |

Group Unit Root-The Second difference value of all variables in the Model with intercept and a Linear Trend

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Null Hypothesis: Unit root (individual unit root process) | | | | | | |  |
| Series: DDIGDP, DDIWP, DDNEX, DDNEXV, DDNGDP, DDNM, DDNWP, | | | | | | |  |
| DDNX | |  |  |  |  |  |  |
| Date: 09/17/12 Time: 00:33 | | | |  |  |  |  |
| Sample: 1979 2011 | | |  |  |  |  |  |
| Exogenous variables: Individual effects, individual linear trends | | | | | | | |
| Automatic selection of maximum lags | | | | |  |  |  |
| Automatic selection of lags based on SIC: 1 to 6 | | | | | |  |  |
| Total number of observations: 210 | | | | |  |  |  |
| Cross-sections included: 8 | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Method | |  |  |  | Statistic |  | Prob.\*\* |
| Im, Pesaran and Shin W-stat | | | |  | -9.55281 |  | 0.0000 |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| \*\* Probabilities are computed assuming asympotic normality | | | | | | |  |
|  |  |  |  |  |  |  |  |
| Intermediate ADF test results | | | |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  | Max |  |
| Series | t-Stat | Prob. | E(t) | E(Var) | Lag | Lag | Obs |
| DDIGDP | -7.6775 |  | -2.173 | 0.741 | 1 | 6 | 29 |
| DDIWP | -6.8708 |  | -2.087 | 0.772 | 2 | 6 | 28 |
| DDNEX | -4.2565 |  | -1.976 | 0.899 | 4 | 6 | 26 |
| DDNEXV | -4.2565 |  | -1.976 | 0.899 | 4 | 6 | 26 |
| DDNGDP | -5.7859 |  | -2.087 | 0.772 | 2 | 6 | 28 |
| DDNM | -1.5603 |  | -1.850 | 1.093 | 6 | 6 | 24 |
| DDNWP | -4.9492 |  | -1.955 | 0.991 | 5 | 6 | 25 |
| DDNX | -6.3362 |  | -1.850 | 1.093 | 6 | 6 | 24 |
|  |  |  |  |  |  |  |  |
| Average | -5.2116 |  | -1.994 | 0.908 |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| Warning: for some series the expected mean and variance for the given lag | | | | | | | |
| and observation are not covered in IPS paper | | | | | | |  |

Lag Length Specification Test

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| VAR Lag Order Selection Criteria | | |  |  |  |  |
| Endogenous variables: DDNM DDNGDP DDIWP DDNWP DDNEXV | | | | |  |  |
| Exogenous variables: C | | |  |  |  |  |
| Date: 09/17/12 Time: 00:45 | | |  |  |  |  |
| Sample: 1979 2011 | |  |  |  |  |  |
| Included observations: 27 | | |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Lag | LogL | LR | FPE | AIC | SC | HQ |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 0 | -785.5033 | NA | 1.85e+19 | 58.55580 | 58.79577 | 58.62715 |
| 1 | -751.1167 | 53.49031 | 9.60e+18 | 57.86049 | 59.30031 | 58.28863 |
| 2 | -699.4883 | 61.18915\* | 1.65e+18 | 55.88802 | 58.52769 | 56.67293 |
| 3 | -656.7028 | 34.86227 | 8.40e+17 | 54.57058 | 58.41009 | 55.71227 |
| 4 | -573.2794 | 37.07706 | 6.24e+16\* | 50.24292\* | 55.28229\* | 51.74139\* |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| \* indicates lag order selected by the criterion | | | |  |  |  |
| LR: sequential modified LR test statistic (each test at 5% level) | | | | |  |  |
| FPE: Final prediction error | | |  |  |  |  |
| AIC: Akaike information criterion | | |  |  |  |  |
| SC: Schwarz information criterion | | |  |  |  |  |
| HQ: Hannan-Quinn information criterion | | | |  |  |  |
|  |  |  |  |  |  |  |

VAR Results-of Equation One (Import Equation) at 4th Lag

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Vector Autoregression Estimates | | |  |  |  |
| Date: 09/17/12 Time: 00:46 | | |  |  |  |
| Sample (adjusted): 1985 2011 | | |  |  |  |
| Included observations: 27 after adjustments | | | |  |  |
| Standard errors in ( ) & t-statistics in [ ] | | | |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| DDNM(-1) | -0.759968 | 4.164933 | -0.016199 | 0.058581 | 0.061103 |
|  | (0.45924) | (1.35719) | (0.02002) | (0.06503) | (0.35492) |
|  | [-1.65483] | [ 3.06879] | [-0.80909] | [ 0.90078] | [ 0.17216] |
|  |  |  |  |  |  |
| DDNM(-2) | -0.761442 | 2.453213 | -0.029940 | -0.096443 | 0.155573 |
|  | (0.96761) | (2.85955) | (0.04218) | (0.13702) | (0.74780) |
|  | [-0.78693] | [ 0.85790] | [-0.70976] | [-0.70384] | [ 0.20804] |
|  |  |  |  |  |  |
| DDNM(-3) | -0.029099 | 2.726940 | -0.025749 | 0.149414 | 1.057834 |
|  | (0.68015) | (2.01003) | (0.02965) | (0.09632) | (0.52564) |
|  | [-0.04278] | [ 1.35667] | [-0.86839] | [ 1.55129] | [ 2.01246] |
|  |  |  |  |  |  |
| DDNM(-4) | 0.379899 | -1.441224 | 0.028438 | 0.199342 | 0.560704 |
|  | (0.73236) | (2.16431) | (0.03193) | (0.10371) | (0.56599) |
|  | [ 0.51873] | [-0.66590] | [ 0.89069] | [ 1.92212] | [ 0.99066] |
|  |  |  |  |  |  |
| DDNGDP(-1) | 0.180680 | -0.764902 | 0.011880 | 0.057102 | 0.068744 |
|  | (0.16828) | (0.49731) | (0.00734) | (0.02383) | (0.13005) |
|  | [ 1.07370] | [-1.53808] | [ 1.61936] | [ 2.39621] | [ 0.52859] |
|  |  |  |  |  |  |
| DDNGDP(-2) | 0.181520 | -1.579392 | -0.004966 | -0.030566 | -0.168035 |
|  | (0.16634) | (0.49157) | (0.00725) | (0.02356) | (0.12855) |
|  | [ 1.09128] | [-3.21295] | [-0.68485] | [-1.29766] | [-1.30715] |
|  |  |  |  |  |  |
| DDNGDP(-3) | 0.224574 | -0.969261 | 0.015541 | 0.055193 | 0.096995 |
|  | (0.22075) | (0.65238) | (0.00962) | (0.03126) | (0.17060) |
|  | [ 1.01732] | [-1.48574] | [ 1.61488] | [ 1.76557] | [ 0.56854] |
|  |  |  |  |  |  |
| DDNGDP(-4) | 0.116486 | -1.067362 | 0.002303 | -0.063117 | -0.205138 |
|  | (0.19088) | (0.56411) | (0.00832) | (0.02703) | (0.14752) |
|  | [ 0.61024] | [-1.89210] | [ 0.27677] | [-2.33499] | [-1.39057] |
|  |  |  |  |  |  |
| DDIWP(-1) | 18.11998 | -19.67719 | 0.133124 | 3.378449 | 8.314767 |
|  | (12.1696) | (35.9644) | (0.53054) | (1.72334) | (9.40502) |
|  | [ 1.48896] | [-0.54713] | [ 0.25092] | [ 1.96041] | [ 0.88408] |
|  |  |  |  |  |  |
| DDIWP(-2) | 21.80203 | -88.45544 | 0.534537 | -0.965523 | -1.141884 |
|  | (11.4700) | (33.8971) | (0.50004) | (1.62428) | (8.86440) |
|  | [ 1.90078] | [-2.60953] | [ 1.06898] | [-0.59443] | [-0.12882] |
|  |  |  |  |  |  |
| DDIWP(-3) | 13.91570 | -71.28855 | 0.415094 | 0.978900 | 0.368820 |
|  | (10.3712) | (30.6496) | (0.45214) | (1.46867) | (8.01517) |
|  | [ 1.34177] | [-2.32592] | [ 0.91807] | [ 0.66652] | [ 0.04602] |
|  |  |  |  |  |  |
| DDIWP(-4) | 7.757693 | -35.06594 | 0.456944 | -0.398016 | -1.355099 |
|  | (9.05287) | (26.7537) | (0.39467) | (1.28198) | (6.99635) |
|  | [ 0.85693] | [-1.31069] | [ 1.15780] | [-0.31047] | [-0.19369] |
|  |  |  |  |  |  |
| DDNWP(-1) | -1.900669 | 3.740048 | 0.179600 | -0.385174 | 1.579914 |
|  | (1.74585) | (5.15946) | (0.07611) | (0.24723) | (1.34925) |
|  | [-1.08868] | [ 0.72489] | [ 2.35970] | [-1.55795] | [ 1.17096] |
|  |  |  |  |  |  |
| DDNWP(-2) | -1.765790 | 11.33079 | 0.002124 | -1.264891 | -0.340148 |
|  | (2.59704) | (7.67495) | (0.11322) | (0.36777) | (2.00707) |
|  | [-0.67993] | [ 1.47633] | [ 0.01876] | [-3.43938] | [-0.16947] |
|  |  |  |  |  |  |
| DDNWP(-3) | -4.486645 | 10.62523 | -0.053873 | -0.629876 | 2.056193 |
|  | (2.41818) | (7.14639) | (0.10542) | (0.34244) | (1.86885) |
|  | [-1.85538] | [ 1.48680] | [-0.51102] | [-1.83938] | [ 1.10025] |
|  |  |  |  |  |  |
| DDNWP(-4) | -2.652841 | 16.84667 | 0.009393 | 0.226188 | 3.176160 |
|  | (3.08864) | (9.12779) | (0.13465) | (0.43738) | (2.38700) |
|  | [-0.85890] | [ 1.84565] | [ 0.06976] | [ 0.51714] | [ 1.33061] |
|  |  |  |  |  |  |
| DDNEXV(-1) | -0.216784 | -0.231699 | -0.035371 | -0.175733 | -0.394548 |
|  | (0.76776) | (2.26895) | (0.03347) | (0.10872) | (0.59335) |
|  | [-0.28236] | [-0.10212] | [-1.05675] | [-1.61633] | [-0.66495] |
|  |  |  |  |  |  |
| DDNEXV(-2) | -0.234480 | 1.622891 | -0.000361 | 0.116259 | 0.175841 |
|  | (0.69194) | (2.04486) | (0.03017) | (0.09799) | (0.53475) |
|  | [-0.33888] | [ 0.79364] | [-0.01196] | [ 1.18649] | [ 0.32883] |
|  |  |  |  |  |  |
| DDNEXV(-3) | 0.366193 | -0.907490 | -0.021052 | -0.053717 | -0.829460 |
|  | (0.52882) | (1.56280) | (0.02305) | (0.07489) | (0.40869) |
|  | [ 0.69247] | [-0.58068] | [-0.91314] | [-0.71732] | [-2.02957] |
|  |  |  |  |  |  |
| DDNEXV(-4) | 0.135964 | 0.184641 | -0.002910 | -0.133492 | 0.043260 |
|  | (0.59543) | (1.75965) | (0.02596) | (0.08432) | (0.46017) |
|  | [ 0.22835] | [ 0.10493] | [-0.11210] | [-1.58318] | [ 0.09401] |
|  |  |  |  |  |  |
| C | -11.24713 | 202.8465 | -0.652857 | -3.729109 | -10.72848 |
|  | (35.7702) | (105.711) | (1.55943) | (5.06544) | (27.6443) |
|  | [-0.31443] | [ 1.91888] | [-0.41865] | [-0.73619] | [-0.38809] |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| R-squared | 0.923368 | 0.874453 | 0.951456 | 0.966443 | 0.665989 |
| Adj. R-squared | 0.667926 | 0.455965 | 0.789644 | 0.854586 | -0.447382 |
| Sum sq. resids | 94916.68 | 828968.0 | 180.3972 | 1903.413 | 56690.75 |
| S.E. equation | 125.7754 | 371.7006 | 5.483266 | 17.81111 | 97.20318 |
| F-statistic | 3.614794 | 2.089552 | 5.880005 | 8.640017 | 0.598173 |
| Log likelihood | -148.5377 | -177.7947 | -63.95222 | -95.76150 | -141.5800 |
| Akaike AIC | 12.55835 | 14.72553 | 6.292757 | 8.649000 | 12.04296 |
| Schwarz SC | 13.56622 | 15.73341 | 7.300630 | 9.656873 | 13.05084 |
| Mean dependent | 29.92230 | 48.97270 | 0.579556 | -0.298444 | -6.442741 |
| S.D. dependent | 218.2621 | 503.9411 | 11.95534 | 46.70770 | 80.79582 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Determinant resid covariance (dof adj.) | | 3.52E+15 |  |  |  |
| Determinant resid covariance | | 1.91E+12 |  |  |  |
| Log likelihood | | -573.2794 |  |  |  |
| Akaike information criterion | | 50.24292 |  |  |  |
| Schwarz criterion | | 55.28229 |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Impulse Response for Equation One at 4 lags



Impulse Response Table of equation One at 4 Lags

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Response of DDNM: |  |  |  |  |  |
| Period | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | 125.7754 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
|  | (17.1159) | (0.00000) | (0.00000) | (0.00000) | (0.00000) |
| 2 | -64.19563 | -7.166919 | 107.3524 | -30.32113 | -6.325783 |
|  | (59.3204) | (39.2812) | (49.6464) | (39.5166) | (22.4199) |
| 3 | -0.903979 | 17.50723 | -58.89912 | 18.76294 | -9.715969 |
|  | (85.1437) | (48.6828) | (84.6044) | (60.5169) | (34.9095) |
| 4 | 96.86348 | -14.49473 | 46.26083 | -10.25315 | 0.461794 |
|  | (98.7802) | (57.8141) | (90.1307) | (62.3236) | (35.4349) |
| 5 | -139.1459 | -29.49142 | 12.40073 | -35.58211 | -6.570215 |
|  | (104.513) | (69.0505) | (91.9084) | (72.4227) | (38.8409) |
| 6 | -33.49849 | 51.28735 | -76.56303 | 80.10314 | 24.06940 |
|  | (113.564) | (79.8073) | (105.250) | (82.9638) | (38.8495) |
| 7 | 173.5678 | -26.76566 | 5.355275 | -54.66437 | -25.01319 |
|  | (220.320) | (83.1730) | (126.711) | (85.1143) | (37.4784) |
| 8 | -147.0186 | -66.08214 | 72.17021 | -15.52164 | 10.79868 |
|  | (268.573) | (110.957) | (186.775) | (122.713) | (53.3818) |
| 9 | -77.77287 | 136.4249 | -82.89155 | 54.37230 | 2.931186 |
|  | (266.683) | (126.255) | (209.837) | (150.106) | (59.6350) |
| 10 | 354.7676 | -83.38481 | 1.653226 | -34.34498 | -12.39547 |
|  | (353.720) | (127.990) | (197.429) | (146.921) | (61.2884) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Response of DDNGDP: |  |  |  |  |  |
| Period | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | 163.9089 | 333.6094 | 0.000000 | 0.000000 | 0.000000 |
|  | (67.9674) | (45.3985) | (0.00000) | (0.00000) | (0.00000) |
| 2 | 386.8934 | -197.5107 | -147.3977 | 22.10189 | -6.760990 |
|  | (176.218) | (104.769) | (140.621) | (116.135) | (66.2145) |
| 3 | -447.0651 | -88.38835 | 131.6596 | 13.41544 | 29.97916 |
|  | (301.415) | (157.843) | (270.151) | (181.362) | (105.924) |
| 4 | -64.54637 | 38.07879 | 1.222086 | -100.2393 | -54.03332 |
|  | (345.472) | (223.031) | (395.983) | (287.845) | (160.700) |
| 5 | 237.8161 | 116.0771 | 37.37161 | 175.7255 | 90.82237 |
|  | (418.310) | (244.605) | (355.174) | (237.206) | (130.396) |
| 6 | 189.5206 | -49.79578 | 98.39990 | -138.9417 | -64.03377 |
|  | (364.537) | (276.905) | (423.563) | (297.428) | (170.144) |
| 7 | -423.2257 | -73.56856 | -89.99490 | 46.46676 | -5.762433 |
|  | (438.568) | (259.369) | (351.069) | (220.280) | (132.593) |
| 8 | 155.4743 | 71.28470 | -96.46392 | -30.78804 | -49.14309 |
|  | (595.303) | (259.249) | (350.388) | (257.941) | (175.425) |
| 9 | 401.9787 | -64.10057 | 212.4771 | -97.37074 | 37.56253 |
|  | (705.236) | (258.420) | (322.390) | (225.090) | (125.049) |
| 10 | -702.6350 | -15.94524 | -42.33603 | 160.6030 | 77.53522 |
|  | (667.435) | (285.228) | (399.227) | (290.021) | (177.574) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Response of DDIWP: |  |  |  |  |  |
| Period | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | -0.343461 | -1.911487 | 5.127812 | 0.000000 | 0.000000 |
|  | (1.05422) | (1.02055) | (0.69781) | (0.00000) | (0.00000) |
| 2 | -1.112141 | 3.032882 | -2.216401 | -0.322070 | -1.032115 |
|  | (2.49988) | (1.56449) | (2.08461) | (1.72455) | (0.98674) |
| 3 | 3.453000 | -4.881347 | 1.384566 | -1.475448 | -0.639528 |
|  | (3.41316) | (1.94621) | (3.38034) | (2.37374) | (1.36813) |
| 4 | -7.822612 | 2.418248 | -0.066714 | -0.985385 | 0.321937 |
|  | (4.31645) | (2.68341) | (3.59012) | (2.87433) | (1.65776) |
| 5 | 6.984408 | -1.540928 | -4.337468 | 2.283247 | 0.752064 |
|  | (5.72803) | (3.59497) | (4.39014) | (3.77530) | (2.17220) |
| 6 | -7.062314 | 0.614885 | 2.428774 | 0.239496 | 0.305386 |
|  | (6.85759) | (4.37299) | (5.37925) | (4.54386) | (2.49301) |
| 7 | 1.411012 | -1.143721 | -0.593587 | -2.275572 | -1.449010 |
|  | (9.38140) | (5.06944) | (6.76402) | (4.98396) | (2.66310) |
| 8 | 0.238864 | 5.309996 | -0.722544 | 3.405736 | 1.816104 |
|  | (10.5370) | (5.49788) | (6.18996) | (4.72124) | (2.55006) |
| 9 | 8.617848 | -4.311420 | -1.119606 | -2.437590 | -1.037050 |
|  | (9.93448) | (6.16304) | (8.31400) | (6.12787) | (2.85872) |
| 10 | -13.72974 | -0.521907 | 1.805268 | 1.878357 | 1.404001 |
|  | (13.2630) | (6.16604) | (9.11110) | (6.50179) | (3.32760) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Response of DDNWP: |  |  |  |  |  |
| Period | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | -4.658264 | 9.550341 | -10.72975 | 9.444555 | 0.000000 |
|  | (3.36862) | (3.04249) | (2.33145) | (1.28524) | (0.00000) |
| 2 | 16.66774 | -2.966891 | 16.62780 | -13.66548 | -5.127905 |
|  | (9.12837) | (6.32022) | (7.57928) | (5.94776) | (3.24839) |
| 3 | -3.564934 | -12.08257 | -6.813041 | -0.316870 | 3.147204 |
|  | (13.7556) | (8.86581) | (14.1075) | (11.6965) | (6.64601) |
| 4 | -12.68342 | 4.549755 | -1.525884 | 9.548920 | 4.544890 |
|  | (19.8115) | (10.0615) | (14.3546) | (10.6337) | (6.03508) |
| 5 | 5.505827 | -5.009045 | -2.136236 | -8.941328 | -7.026911 |
|  | (19.8504) | (13.6773) | (20.1912) | (14.7220) | (7.78193) |
| 6 | -7.270703 | 3.136454 | 15.85076 | 2.314698 | 1.733313 |
|  | (18.0157) | (14.2714) | (20.7459) | (13.8837) | (7.08634) |
| 7 | 13.98160 | 21.30241 | -7.497512 | -1.805434 | -1.232580 |
|  | (27.9441) | (12.9756) | (16.8819) | (11.0015) | (6.25812) |
| 8 | 13.26300 | -23.69313 | -11.44883 | 7.899173 | 4.821243 |
|  | (40.5960) | (14.8491) | (17.6952) | (13.3288) | (6.91113) |
| 9 | -54.39857 | -3.148034 | 3.507943 | -5.330231 | -1.534235 |
|  | (41.3110) | (18.0149) | (29.8786) | (21.0170) | (10.0776) |
| 10 | 31.00102 | 8.286789 | -9.034133 | -0.283735 | -2.504342 |
|  | (50.8716) | (23.2903) | (39.3096) | (32.6854) | (15.3994) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Response of DDNEXV: |  |  |  |  |  |
| Period | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | 3.947319 | 67.60327 | 27.47954 | 57.06202 | 29.18007 |
|  | (18.6990) | (16.2706) | (12.8886) | (9.58300) | (3.97090) |
| 2 | 7.180032 | -4.544055 | 14.84250 | -7.592105 | -11.51293 |
|  | (42.3767) | (25.6993) | (36.5317) | (30.4564) | (17.3848) |
| 3 | 31.62305 | -36.92875 | 1.038786 | -14.78480 | -7.861289 |
|  | (57.1431) | (27.0121) | (54.8840) | (30.5069) | (18.3111) |
| 4 | 37.64677 | -26.07581 | 3.779892 | -37.52743 | -18.92973 |
|  | (56.5904) | (39.6659) | (65.9727) | (42.8732) | (23.4819) |
| 5 | -0.377647 | -0.457847 | 48.57265 | -5.345540 | -2.092045 |
|  | (63.3417) | (43.7171) | (67.7116) | (37.9977) | (22.4361) |
| 6 | -16.66061 | 4.785944 | 35.96660 | -9.213942 | -6.432603 |
|  | (62.6155) | (38.9325) | (70.6290) | (41.3926) | (28.2289) |
| 7 | -11.59391 | 2.005660 | 2.256720 | 7.008925 | 9.102379 |
|  | (96.2854) | (38.6758) | (83.5595) | (46.5890) | (26.0991) |
| 8 | -79.96108 | -4.238260 | -62.26014 | 19.59350 | 6.870062 |
|  | (94.1752) | (41.8791) | (74.1445) | (42.2605) | (26.5158) |
| 9 | 6.319825 | 9.804587 | -49.48340 | 14.16139 | 0.559413 |
|  | (117.076) | (49.1596) | (82.4825) | (62.0264) | (31.2938) |
| 10 | 47.79359 | -7.194666 | 11.42992 | -21.65868 | -7.267064 |
|  | (123.422) | (47.1675) | (102.763) | (54.5103) | (32.0308) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Cholesky Ordering: DDNM DDNGDP DDIWP DDNWP DDNEXV |  |  |  |  |  |
| Standard Errors: Analytic |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Variance Decomposition of Equation one at 4 Lags



Variance Decomposition Table of Equation one at 4 Lags

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Variance Decomposition of DDNM: |  |  |  |  |  |  |
| Period | S.E. | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 125.7754 | 100.0000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 180.2105 | 61.40116 | 0.158163 | 35.48652 | 2.830940 | 0.123216 |
| 3 | 191.5690 | 54.33803 | 0.975151 | 40.85607 | 3.464479 | 0.366268 |
| 4 | 220.3105 | 60.41585 | 1.170176 | 35.30050 | 2.836091 | 0.277375 |
| 5 | 265.0115 | 69.32181 | 2.047112 | 24.61515 | 3.762766 | 0.253159 |
| 6 | 294.6886 | 57.35470 | 4.684520 | 26.65709 | 10.43183 | 0.871857 |
| 7 | 348.3189 | 65.88310 | 3.943507 | 19.10394 | 9.929719 | 1.139732 |
| 8 | 390.9904 | 66.42608 | 5.986226 | 18.56869 | 8.038189 | 0.980814 |
| 9 | 432.8623 | 57.42466 | 14.81728 | 18.81713 | 8.136107 | 0.804823 |
| 10 | 567.0263 | 72.61053 | 10.79754 | 10.96681 | 5.108312 | 0.516811 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Variance Decomposition of DDNGDP: |  |  |  |  |  |  |
| Period | S.E. | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 371.7006 | 19.44548 | 80.55452 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 590.8626 | 50.57096 | 43.05290 | 6.223123 | 0.139922 | 0.013093 |
| 3 | 758.4268 | 65.44028 | 27.48871 | 6.790605 | 0.116212 | 0.164194 |
| 4 | 770.5819 | 64.09369 | 26.87253 | 6.578317 | 1.804725 | 0.650738 |
| 5 | 839.2566 | 62.06311 | 24.56756 | 5.744070 | 5.905551 | 1.719704 |
| 6 | 880.8161 | 60.97423 | 22.62352 | 6.462825 | 7.849671 | 2.089754 |
| 7 | 985.2212 | 67.18934 | 18.64029 | 6.000044 | 6.496586 | 1.673735 |
| 8 | 1006.272 | 66.79482 | 18.37040 | 6.670601 | 6.321233 | 1.842944 |
| 9 | 1110.998 | 67.88691 | 15.40320 | 9.129898 | 5.953801 | 1.626185 |
| 10 | 1327.353 | 75.58104 | 10.80552 | 6.497901 | 5.635058 | 1.480476 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Variance Decomposition of DDIWP: |  |  |  |  |  |  |
| Period | S.E. | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 5.483266 | 0.392352 | 12.15245 | 87.45519 | 0.000000 | 0.000000 |
| 2 | 6.825164 | 2.908417 | 27.58988 | 66.99221 | 0.222676 | 2.286810 |
| 3 | 9.318615 | 15.29083 | 42.23992 | 38.14511 | 2.626400 | 1.697739 |
| 4 | 12.44817 | 48.05938 | 27.44482 | 21.37909 | 2.098429 | 1.018285 |
| 5 | 15.18900 | 53.42445 | 19.46293 | 22.51439 | 3.669123 | 0.929107 |
| 6 | 16.94136 | 60.32185 | 15.77653 | 20.15296 | 2.969320 | 0.779334 |
| 7 | 17.26091 | 58.77732 | 15.63685 | 19.53195 | 4.598414 | 1.455464 |
| 8 | 18.48273 | 51.27978 | 21.89164 | 17.18776 | 7.405931 | 2.234887 |
| 9 | 21.04134 | 56.34144 | 21.08983 | 13.54501 | 7.056398 | 1.967327 |
| 10 | 25.30364 | 68.40045 | 14.62577 | 9.875122 | 5.430418 | 1.668241 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Variance Decomposition of DDNWP: |  |  |  |  |  |  |
| Period | S.E. | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 17.81111 | 6.840162 | 28.75119 | 36.29086 | 28.11779 | 0.000000 |
| 2 | 33.06624 | 27.39340 | 9.147032 | 35.81671 | 25.23789 | 2.404974 |
| 3 | 36.17314 | 23.86110 | 18.80020 | 33.47575 | 21.09639 | 2.766558 |
| 4 | 40.05286 | 29.49018 | 16.62479 | 27.44973 | 22.89116 | 3.544147 |
| 5 | 42.35003 | 28.06791 | 16.26912 | 24.80706 | 24.93273 | 5.923186 |
| 6 | 45.99820 | 26.29072 | 14.25575 | 32.90274 | 21.38790 | 5.162890 |
| 7 | 53.16111 | 26.60034 | 26.73012 | 26.62252 | 16.12793 | 3.919086 |
| 8 | 61.48245 | 24.54068 | 34.83474 | 23.37128 | 13.70837 | 3.544935 |
| 9 | 82.41527 | 57.22476 | 19.53241 | 13.18794 | 8.047380 | 2.007511 |
| 10 | 88.93806 | 61.28875 | 17.64058 | 12.35625 | 6.911280 | 1.803133 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Variance Decomposition of DDNEXV: |  |  |  |  |  |  |
| Period | S.E. | DDNM | DDNGDP | DDIWP | DDNWP | DDNEXV |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 97.20318 | 0.164909 | 48.36981 | 7.992045 | 34.46143 | 9.011802 |
| 2 | 99.65514 | 0.675996 | 46.22678 | 9.821875 | 33.36688 | 9.908461 |
| 3 | 112.1444 | 8.485374 | 47.34740 | 7.764595 | 28.08685 | 8.315786 |
| 4 | 128.2752 | 15.09877 | 40.32040 | 6.021393 | 30.02586 | 8.533571 |
| 5 | 137.2848 | 13.18277 | 35.20292 | 17.77509 | 26.36575 | 7.473473 |
| 6 | 143.4137 | 13.42969 | 32.36976 | 22.57782 | 24.57318 | 7.049543 |
| 7 | 144.3710 | 13.89708 | 31.96118 | 22.30381 | 24.48405 | 7.353871 |
| 8 | 177.6574 | 29.43506 | 21.16341 | 27.01054 | 17.38510 | 5.005883 |
| 9 | 185.3313 | 27.16422 | 19.72697 | 31.94891 | 16.55907 | 4.600826 |
| 10 | 193.2259 | 31.10787 | 18.28659 | 29.74150 | 16.49003 | 4.374002 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Cholesky Ordering: DDNM DDNGDP DDIWP DDNWP DDNEXV |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |

VAR Results of Equation Two (export equation) at 4 Lags

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Vector Autoregression Estimates | | |  |  |  |
| Date: 09/17/12 Time: 00:59 | | |  |  |  |
| Sample (adjusted): 1985 2011 | | |  |  |  |
| Included observations: 27 after adjustments | | | |  |  |
| Standard errors in ( ) & t-statistics in [ ] | | | |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| DDNX(-1) | -0.034854 | 2.112972 | 0.001769 | 0.001473 | -0.040209 |
|  | (0.51434) | (1.96840) | (0.00671) | (0.00161) | (0.03748) |
|  | [-0.06777] | [ 1.07345] | [ 0.26358] | [ 0.91651] | [-1.07285] |
|  |  |  |  |  |  |
| DDNX(-2) | -0.973601 | -1.151460 | -0.005266 | 0.000501 | 0.006932 |
|  | (0.35086) | (1.34278) | (0.00458) | (0.00110) | (0.02557) |
|  | [-2.77486] | [-0.85752] | [-1.15003] | [ 0.45736] | [ 0.27112] |
|  |  |  |  |  |  |
| DDNX(-3) | 0.217149 | 2.281869 | 0.006848 | 0.001128 | -0.057783 |
|  | (0.60499) | (2.31535) | (0.00790) | (0.00189) | (0.04409) |
|  | [ 0.35893] | [ 0.98554] | [ 0.86725] | [ 0.59707] | [-1.31072] |
|  |  |  |  |  |  |
| DDNX(-4) | -1.253862 | -0.985198 | -0.008059 | 0.005510 | 0.038786 |
|  | (0.55045) | (2.10660) | (0.00718) | (0.00172) | (0.04011) |
|  | [-2.27789] | [-0.46767] | [-1.12179] | [ 3.20423] | [ 0.96697] |
|  |  |  |  |  |  |
| DDIGDP(-1) | 0.001859 | -1.542870 | -0.004270 | -5.57E-05 | 0.002735 |
|  | (0.13287) | (0.50850) | (0.00173) | (0.00042) | (0.00968) |
|  | [ 0.01399] | [-3.03413] | [-2.46212] | [-0.13432] | [ 0.28246] |
|  |  |  |  |  |  |
| DDIGDP(-2) | 0.051068 | -1.315216 | -0.005907 | -0.000301 | 0.007408 |
|  | (0.19307) | (0.73888) | (0.00252) | (0.00060) | (0.01407) |
|  | [ 0.26451] | [-1.78001] | [-2.34409] | [-0.49830] | [ 0.52653] |
|  |  |  |  |  |  |
| DDIGDP(-3) | 0.143015 | -0.911133 | -0.005887 | -9.65E-05 | 0.008822 |
|  | (0.19715) | (0.75451) | (0.00257) | (0.00062) | (0.01437) |
|  | [ 0.72541] | [-1.20758] | [-2.28772] | [-0.15669] | [ 0.61409] |
|  |  |  |  |  |  |
| DDIGDP(-4) | 0.074730 | -0.854998 | -0.002374 | -0.000392 | 0.014791 |
|  | (0.16467) | (0.63021) | (0.00215) | (0.00051) | (0.01200) |
|  | [ 0.45381] | [-1.35668] | [-1.10453] | [-0.76292] | [ 1.23266] |
|  |  |  |  |  |  |
| DDNWP(-1) | 0.712473 | -17.93219 | -0.890374 | 0.043503 | 0.337439 |
|  | (15.2263) | (58.2719) | (0.19873) | (0.04756) | (1.10952) |
|  | [ 0.04679] | [-0.30773] | [-4.48037] | [ 0.91465] | [ 0.30413] |
|  |  |  |  |  |  |
| DDNWP(-2) | 12.85768 | -74.19050 | -1.344862 | 0.163332 | 0.828115 |
|  | (21.4318) | (82.0207) | (0.27972) | (0.06695) | (1.56171) |
|  | [ 0.59994] | [-0.90453] | [-4.80788] | [ 2.43972] | [ 0.53026] |
|  |  |  |  |  |  |
| DDNWP(-3) | -31.57460 | -131.4238 | -1.343572 | 0.007416 | 2.307763 |
|  | (32.0620) | (122.703) | (0.41846) | (0.10015) | (2.33632) |
|  | [-0.98480] | [-1.07107] | [-3.21073] | [ 0.07405] | [ 0.98778] |
|  |  |  |  |  |  |
| DDNWP(-4) | 29.55965 | 100.7051 | -0.616366 | -0.034239 | -1.499053 |
|  | (27.0367) | (103.471) | (0.35287) | (0.08446) | (1.97013) |
|  | [ 1.09332] | [ 0.97327] | [-1.74670] | [-0.40542] | [-0.76089] |
|  |  |  |  |  |  |
| DDIWP(-1) | 131.1100 | 708.1740 | 1.622713 | -0.995927 | -10.80689 |
|  | (145.485) | (556.781) | (1.89882) | (0.45446) | (10.6013) |
|  | [ 0.90119] | [ 1.27191] | [ 0.85459] | [-2.19147] | [-1.01939] |
|  |  |  |  |  |  |
| DDIWP(-2) | -127.9089 | 244.2852 | 0.912486 | 0.269849 | 0.911598 |
|  | (109.503) | (419.073) | (1.42919) | (0.34206) | (7.97932) |
|  | [-1.16809] | [ 0.58292] | [ 0.63846] | [ 0.78890] | [ 0.11425] |
|  |  |  |  |  |  |
| DDIWP(-3) | -43.03519 | -136.8340 | 0.773584 | 0.294684 | 1.108195 |
|  | (122.626) | (469.297) | (1.60047) | (0.38305) | (8.93560) |
|  | [-0.35095] | [-0.29157] | [ 0.48335] | [ 0.76931] | [ 0.12402] |
|  |  |  |  |  |  |
| DDIWP(-4) | -14.28756 | -145.0885 | -1.502541 | 0.116406 | -3.877118 |
|  | (94.9502) | (363.380) | (1.23926) | (0.29660) | (6.91891) |
|  | [-0.15047] | [-0.39927] | [-1.21245] | [ 0.39247] | [-0.56037] |
|  |  |  |  |  |  |
| DDNEXV(-1) | -11.42268 | -24.95262 | 0.021243 | -0.001182 | 0.532321 |
|  | (7.35618) | (28.1526) | (0.09601) | (0.02298) | (0.53604) |
|  | [-1.55280] | [-0.88633] | [ 0.22126] | [-0.05142] | [ 0.99307] |
|  |  |  |  |  |  |
| DDNEXV(-2) | 3.977250 | 27.01382 | -0.017893 | -0.015010 | -0.847014 |
|  | (6.68420) | (25.5809) | (0.08724) | (0.02088) | (0.48707) |
|  | [ 0.59502] | [ 1.05602] | [-0.20511] | [-0.71889] | [-1.73900] |
|  |  |  |  |  |  |
| DDNEXV(-3) | 0.534171 | -5.044520 | 0.101787 | -0.028888 | -0.351858 |
|  | (6.01458) | (23.0182) | (0.07850) | (0.01879) | (0.43828) |
|  | [ 0.08881] | [-0.21915] | [ 1.29664] | [-1.53757] | [-0.80282] |
|  |  |  |  |  |  |
| DDNEXV(-4) | -2.133026 | 6.232703 | -0.084354 | -0.002236 | 0.050304 |
|  | (5.38193) | (20.5970) | (0.07024) | (0.01681) | (0.39218) |
|  | [-0.39633] | [ 0.30260] | [-1.20089] | [-0.13299] | [ 0.12827] |
|  |  |  |  |  |  |
| C | 3.735910 | 1127.601 | 5.434368 | 0.055847 | -5.083043 |
|  | (305.944) | (1170.87) | (3.99308) | (0.95568) | (22.2938) |
|  | [ 0.01221] | [ 0.96305] | [ 1.36095] | [ 0.05844] | [-0.22800] |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| R-squared | 0.926493 | 0.734737 | 0.962213 | 0.966962 | 0.606366 |
| Adj. R-squared | 0.681471 | -0.149474 | 0.836256 | 0.856837 | -0.705747 |
| Sum sq. resids | 12582300 | 1.84E+08 | 2143.346 | 122.7739 | 66810.35 |
| S.E. equation | 1448.119 | 5542.047 | 18.90038 | 4.523530 | 105.5228 |
| F-statistic | 3.781262 | 0.830952 | 7.639246 | 8.780557 | 0.462129 |
| Log likelihood | -214.5129 | -250.7495 | -97.36421 | -58.75720 | -143.7973 |
| Akaike AIC | 17.44540 | 20.12959 | 8.767719 | 5.907940 | 12.20721 |
| Schwarz SC | 18.45327 | 21.13747 | 9.775592 | 6.915814 | 13.21508 |
| Mean dependent | 116.2339 | 387.8296 | -0.298444 | 0.579556 | -6.442741 |
| S.D. dependent | 2565.842 | 5169.168 | 46.70770 | 11.95534 | 80.79582 |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Determinant resid covariance (dof adj.) | | 4.62E+17 |  |  |  |
| Determinant resid covariance | | 2.50E+14 |  |  |  |
| Log likelihood | | -639.1300 |  |  |  |
| Akaike information criterion | | 55.12074 |  |  |  |
| Schwarz criterion | | 60.16011 |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Impulse Responses of Equation Two (export equation) at 4 Lags



Impulse Response Table of Equation Two at 4 Lags

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Response of DDNX: |  |  |  |  |  |
| Period | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | 1448.119 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
|  | (197.064) | (0.00000) | (0.00000) | (0.00000) | (0.00000) |
| 2 | -1086.972 | 372.6499 | -72.35048 | 598.0051 | -39.41104 |
|  | (578.146) | (431.755) | (336.446) | (510.612) | (25.9411) |
| 3 | -527.6552 | -369.4226 | 499.6675 | -321.4768 | -6.525530 |
|  | (722.782) | (618.738) | (538.009) | (706.471) | (23.7530) |
| 4 | 653.9372 | 150.4979 | -958.5612 | 103.5213 | 38.04295 |
|  | (1062.78) | (699.061) | (567.210) | (740.115) | (28.2789) |
| 5 | -268.5651 | -167.1525 | 625.3819 | -919.6639 | 17.21357 |
|  | (1391.25) | (802.679) | (627.596) | (813.289) | (29.4309) |
| 6 | 1095.249 | -265.4052 | 151.1933 | 718.0424 | 4.456877 |
|  | (1452.11) | (864.320) | (685.777) | (891.045) | (31.2454) |
| 7 | -2045.733 | 514.2480 | 169.0349 | -521.5393 | -21.07776 |
|  | (1681.93) | (953.718) | (961.875) | (1043.79) | (35.8554) |
| 8 | 659.2278 | -599.8492 | -626.4817 | 862.7618 | -4.135406 |
|  | (2001.84) | (1285.50) | (1530.44) | (1671.03) | (46.1496) |
| 9 | 412.0256 | 229.3796 | -601.2780 | -835.9077 | 37.70594 |
|  | (2604.43) | (1531.74) | (1758.06) | (2108.90) | (44.0636) |
| 10 | 933.1821 | 573.1407 | 1955.700 | -139.4524 | -49.92833 |
|  | (3886.21) | (1551.24) | (1900.57) | (2145.70) | (66.5647) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Response of DDIGDP: |  |  |  |  |  |
| Period | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | 3276.953 | 4469.437 | 0.000000 | 0.000000 | 0.000000 |
|  | (968.869) | (608.213) | (0.00000) | (0.00000) | (0.00000) |
| 2 | -4223.871 | -4897.130 | -1316.426 | 2422.811 | -86.09261 |
|  | (2408.86) | (1794.69) | (1308.22) | (1956.99) | (97.8373) |
| 3 | 1612.788 | 1742.810 | 1724.617 | -3332.957 | 92.72938 |
|  | (3335.86) | (2849.67) | (2541.48) | (3272.33) | (110.536) |
| 4 | 1730.801 | -932.5119 | -42.43200 | 1564.115 | -33.75095 |
|  | (4388.12) | (3049.95) | (2991.33) | (3797.51) | (100.507) |
| 5 | -2055.515 | 846.5513 | -1046.690 | 197.2986 | -2.562848 |
|  | (6219.33) | (3076.73) | (3032.68) | (3923.77) | (108.979) |
| 6 | 91.81826 | -167.0858 | 1188.714 | -699.4027 | -15.29121 |
|  | (7302.82) | (3280.95) | (2797.21) | (3836.69) | (107.944) |
| 7 | -195.0050 | -8.322698 | -1751.826 | 848.5761 | 50.53278 |
|  | (8212.36) | (3398.37) | (2843.41) | (3500.99) | (104.130) |
| 8 | -647.8471 | -219.3125 | 2173.394 | -2400.818 | 5.339725 |
|  | (8790.56) | (3819.69) | (4149.71) | (3733.23) | (101.103) |
| 9 | 4604.012 | 314.9893 | -2062.261 | 3136.216 | 2.724565 |
|  | (7975.46) | (4909.09) | (5852.76) | (5591.70) | (109.880) |
| 10 | -6586.812 | -281.8720 | 1932.779 | -2043.451 | -85.68866 |
|  | (9253.20) | (5663.21) | (7626.36) | (7329.57) | (183.035) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Response of DDNWP: |  |  |  |  |  |
| Period | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | 14.97392 | -0.918762 | 11.49617 | 0.000000 | 0.000000 |
|  | (3.01303) | (2.21597) | (1.56443) | (0.00000) | (0.00000) |
| 2 | -21.29160 | -13.70067 | -14.22104 | 3.828887 | 0.073295 |
|  | (8.56838) | (6.36609) | (4.61392) | (6.59903) | (0.33141) |
| 3 | -10.38843 | 5.763234 | 5.811590 | -14.97940 | 0.203267 |
|  | (13.1337) | (11.0247) | (9.75113) | (12.7095) | (0.46013) |
| 4 | 38.05668 | 11.52791 | -4.261024 | 10.25834 | 0.170287 |
|  | (18.7383) | (12.7313) | (10.6813) | (14.4308) | (0.54794) |
| 5 | -30.62109 | 5.273535 | 10.05837 | 0.285062 | -0.851095 |
|  | (29.1798) | (17.9738) | (13.8201) | (19.0752) | (0.77729) |
| 6 | 7.753373 | -9.150481 | -5.553848 | 14.90499 | -0.126136 |
|  | (31.6498) | (21.2034) | (17.1469) | (22.0250) | (0.70696) |
| 7 | -6.902952 | -19.96882 | -14.73361 | -18.57443 | 0.941702 |
|  | (35.0282) | (21.9278) | (20.8282) | (23.7882) | (0.77988) |
| 8 | 26.89479 | 16.92375 | 25.00403 | -13.19044 | 0.157009 |
|  | (42.1164) | (24.6800) | (26.6241) | (28.9868) | (0.93845) |
| 9 | -3.125599 | 11.52534 | -11.50322 | 27.81450 | -0.669557 |
|  | (52.5383) | (30.3774) | (33.8856) | (40.9155) | (1.12128) |
| 10 | -48.33944 | -3.741954 | 8.843202 | -9.224658 | -0.786850 |
|  | (76.4037) | (33.7836) | (37.6431) | (44.7549) | (1.17769) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Response of DDIWP: |  |  |  |  |  |
| Period | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | 0.809798 | 2.809206 | -2.215286 | 2.647153 | 0.000000 |
|  | (0.86355) | (0.76644) | (0.59196) | (0.36023) | (0.00000) |
| 2 | 1.674658 | -3.087242 | 2.728094 | -2.610413 | -0.004077 |
|  | (1.94913) | (1.53841) | (1.16790) | (1.61402) | (0.07928) |
| 3 | -3.078658 | 2.582475 | -1.834378 | 4.603540 | -0.099943 |
|  | (2.73786) | (2.34535) | (2.08406) | (2.56120) | (0.08561) |
| 4 | -1.797906 | -3.748724 | 1.187389 | -4.025528 | -0.016027 |
|  | (3.93485) | (2.88587) | (2.85760) | (3.63621) | (0.10681) |
| 5 | 7.120480 | 4.054311 | -2.944740 | 5.176457 | -0.030677 |
|  | (5.70644) | (3.52375) | (3.59163) | (4.47649) | (0.12683) |
| 6 | -6.400145 | 0.508986 | 4.349823 | -3.825455 | -0.113905 |
|  | (8.06192) | (4.65074) | (4.48678) | (6.00099) | (0.18529) |
| 7 | 3.780512 | -3.553174 | -1.927660 | 5.081913 | -0.001981 |
|  | (10.8665) | (5.31531) | (4.80565) | (6.81413) | (0.18150) |
| 8 | -5.496881 | 3.593151 | -2.910135 | -5.430350 | 0.191436 |
|  | (13.7234) | (5.97957) | (5.29042) | (7.06977) | (0.19600) |
| 9 | 5.928170 | -8.021604 | 5.127329 | -0.305826 | 0.019665 |
|  | (14.5612) | (7.39425) | (6.79367) | (8.04777) | (0.22653) |
| 10 | -0.058174 | 10.33618 | -4.157907 | 1.876431 | 0.084123 |
|  | (14.8268) | (8.74573) | (10.3561) | (10.7044) | (0.23808) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Response of DDNEXV: |  |  |  |  |  |
| Period | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| 1 | 101.5026 | 0.290573 | -18.37616 | -21.96829 | 3.450244 |
|  | (14.8868) | (5.55189) | (4.95667) | (3.06236) | (0.46952) |
| 2 | 1.067304 | -18.29098 | 18.03760 | -40.30169 | 1.836639 |
|  | (40.5516) | (31.3534) | (24.4175) | (37.1369) | (1.86627) |
| 3 | -31.08318 | 25.28820 | -2.304625 | 11.65017 | -0.526690 |
|  | (44.7385) | (36.2978) | (26.1390) | (40.9735) | (1.91187) |
| 4 | -72.01362 | 15.07919 | 0.903834 | 22.89107 | -2.239307 |
|  | (62.7122) | (39.9831) | (27.4906) | (40.1978) | (1.84325) |
| 5 | 57.62985 | 3.153391 | -7.174550 | 9.847469 | -0.208634 |
|  | (72.9498) | (50.4454) | (29.8588) | (43.2025) | (2.40597) |
| 6 | 5.909922 | -26.23572 | -18.87803 | 1.645657 | 0.206042 |
|  | (75.0774) | (53.4261) | (33.9799) | (49.7413) | (2.30394) |
| 7 | 64.36189 | -7.544196 | 35.89615 | -29.43697 | 0.463251 |
|  | (106.740) | (53.0624) | (36.6798) | (48.9280) | (2.31744) |
| 8 | -11.75169 | 41.71162 | -10.28374 | 40.03518 | -1.165136 |
|  | (118.362) | (66.8085) | (37.0881) | (54.9160) | (2.80077) |
| 9 | -111.8470 | -12.16604 | 14.52769 | -19.69149 | -0.709560 |
|  | (115.804) | (71.4886) | (47.5852) | (63.5882) | (2.86639) |
| 10 | 37.77930 | -27.57901 | -54.53359 | 3.631687 | 3.236993 |
|  | (113.525) | (81.0076) | (90.9215) | (78.0896) | (3.30266) |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
| Cholesky Ordering: DDNX DDIGDP DDNWP DDIWP DDNEXV |  |  |  |  |  |
| Standard Errors: Analytic |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

Variance Decomposition Test Results of Equation Two at 4 Lags



Variance Decomposition Table Test Results of Equation Two at 4 Lags

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Variance Decomposition of DDNX: |  |  |  |  |  |  |
| Period | S.E. | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 1448.119 | 100.0000 | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 1944.691 | 86.69251 | 3.671984 | 0.138414 | 9.456021 | 0.041071 |
| 3 | 2133.020 | 78.17922 | 6.051752 | 5.602523 | 10.13143 | 0.035075 |
| 4 | 2435.377 | 67.18210 | 5.024239 | 19.78974 | 7.952608 | 0.051307 |
| 5 | 2695.980 | 55.81407 | 4.484271 | 21.52969 | 18.12603 | 0.045944 |
| 6 | 3012.770 | 57.90938 | 4.366862 | 17.49192 | 20.19483 | 0.037009 |
| 7 | 3718.505 | 68.28048 | 4.779116 | 11.68904 | 15.22385 | 0.027507 |
| 8 | 3969.702 | 62.67026 | 6.476750 | 12.74710 | 18.08164 | 0.024245 |
| 9 | 4128.270 | 58.94448 | 6.297484 | 13.90803 | 20.81925 | 0.030760 |
| 10 | 4699.854 | 49.42138 | 6.346006 | 28.04634 | 16.15125 | 0.035019 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Variance Decomposition of DDIGDP: |  |  |  |  |  |  |
| Period | S.E. | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 5542.047 | 34.96230 | 65.03770 | 0.000000 | 0.000000 | 0.000000 |
| 2 | 8952.523 | 35.65857 | 54.84595 | 2.162232 | 7.323998 | 0.009248 |
| 3 | 9993.880 | 31.21880 | 47.05271 | 4.713047 | 16.99942 | 0.016030 |
| 4 | 10304.96 | 32.18338 | 45.07362 | 4.434485 | 18.29236 | 0.016150 |
| 5 | 10595.69 | 34.20495 | 43.27245 | 5.170317 | 17.33700 | 0.015282 |
| 6 | 10686.78 | 33.63167 | 42.56230 | 6.319804 | 17.47100 | 0.015227 |
| 7 | 10864.48 | 32.57273 | 41.18146 | 8.714706 | 17.51421 | 0.016896 |
| 8 | 11357.48 | 30.13168 | 37.72118 | 11.63651 | 20.49514 | 0.015483 |
| 9 | 12820.97 | 36.54063 | 29.66143 | 11.71885 | 22.06693 | 0.012155 |
| 10 | 14688.82 | 47.94673 | 22.63430 | 10.65935 | 18.74695 | 0.012663 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Variance Decomposition of DDNWP: |  |  |  |  |  |  |
| Period | S.E. | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 18.90038 | 62.76680 | 0.236301 | 36.99690 | 0.000000 | 0.000000 |
| 2 | 34.85927 | 55.75773 | 15.51657 | 27.51881 | 1.206448 | 0.000442 |
| 3 | 40.18086 | 48.65093 | 13.73597 | 22.80423 | 14.80598 | 0.002892 |
| 4 | 57.61183 | 67.30031 | 10.68536 | 11.63955 | 10.37251 | 0.002280 |
| 5 | 66.23112 | 72.29881 | 8.719140 | 11.11353 | 7.850285 | 0.018239 |
| 6 | 69.16232 | 67.55713 | 9.746186 | 10.83631 | 11.84332 | 0.017058 |
| 7 | 76.11049 | 56.60808 | 14.93154 | 12.69551 | 15.73548 | 0.029394 |
| 8 | 87.18810 | 52.65260 | 15.14607 | 17.89884 | 14.27976 | 0.022724 |
| 9 | 93.00961 | 46.38071 | 14.84492 | 17.25799 | 21.49123 | 0.025151 |
| 10 | 105.6665 | 56.86311 | 11.62703 | 14.07163 | 17.41320 | 0.025031 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Variance Decomposition of DDIWP: |  |  |  |  |  |  |
| Period | S.E. | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 4.523530 | 3.204785 | 38.56668 | 23.98307 | 34.24547 | 0.000000 |
| 2 | 6.859638 | 7.353690 | 37.02654 | 26.24607 | 29.37367 | 3.53E-05 |
| 3 | 9.368536 | 14.74133 | 27.44905 | 17.90479 | 39.89344 | 0.011400 |
| 4 | 11.07564 | 13.18241 | 31.09550 | 13.96009 | 41.75363 | 0.008366 |
| 5 | 15.00922 | 29.68442 | 24.22898 | 11.45095 | 34.63068 | 0.004973 |
| 6 | 17.32240 | 35.93678 | 18.27644 | 14.90250 | 30.87623 | 0.008057 |
| 7 | 18.88186 | 34.25463 | 18.92333 | 13.58480 | 33.23046 | 0.006783 |
| 8 | 20.91998 | 34.80944 | 18.36581 | 13.00186 | 33.80899 | 0.013899 |
| 9 | 23.73854 | 33.27047 | 25.68209 | 14.76289 | 26.27369 | 0.010863 |
| 10 | 26.29020 | 27.12608 | 36.39600 | 14.53754 | 21.93050 | 0.009881 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Variance Decomposition of DDNEXV: |  |  |  |  |  |  |
| Period | S.E. | DDNX | DDIGDP | DDNWP | DDIWP | DDNEXV |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 1 | 105.5228 | 92.52561 | 0.000758 | 3.032615 | 4.334110 | 0.106907 |
| 2 | 115.8607 | 76.75909 | 2.492935 | 4.939308 | 15.69485 | 0.113809 |
| 3 | 123.1693 | 74.28856 | 6.421184 | 4.405535 | 14.78219 | 0.102532 |
| 4 | 145.3061 | 77.93954 | 5.690667 | 3.169324 | 13.10305 | 0.097421 |
| 5 | 156.8231 | 80.41657 | 4.925951 | 2.930209 | 11.64345 | 0.083814 |
| 6 | 160.2369 | 77.16263 | 7.399075 | 4.194682 | 11.16317 | 0.080446 |
| 7 | 178.9707 | 74.78688 | 6.108835 | 7.385316 | 11.65381 | 0.065156 |
| 8 | 188.7284 | 67.64123 | 10.37820 | 6.938295 | 14.97987 | 0.062404 |
| 9 | 221.0780 | 74.88924 | 7.866036 | 5.488158 | 11.71005 | 0.046508 |
| 10 | 232.5101 | 70.34609 | 8.518469 | 10.46278 | 10.61124 | 0.061429 |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
| Cholesky Ordering: DDNX DDIGDP DDNWP DDIWP DDNEXV |  |  |  |  |  |  |
|  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |